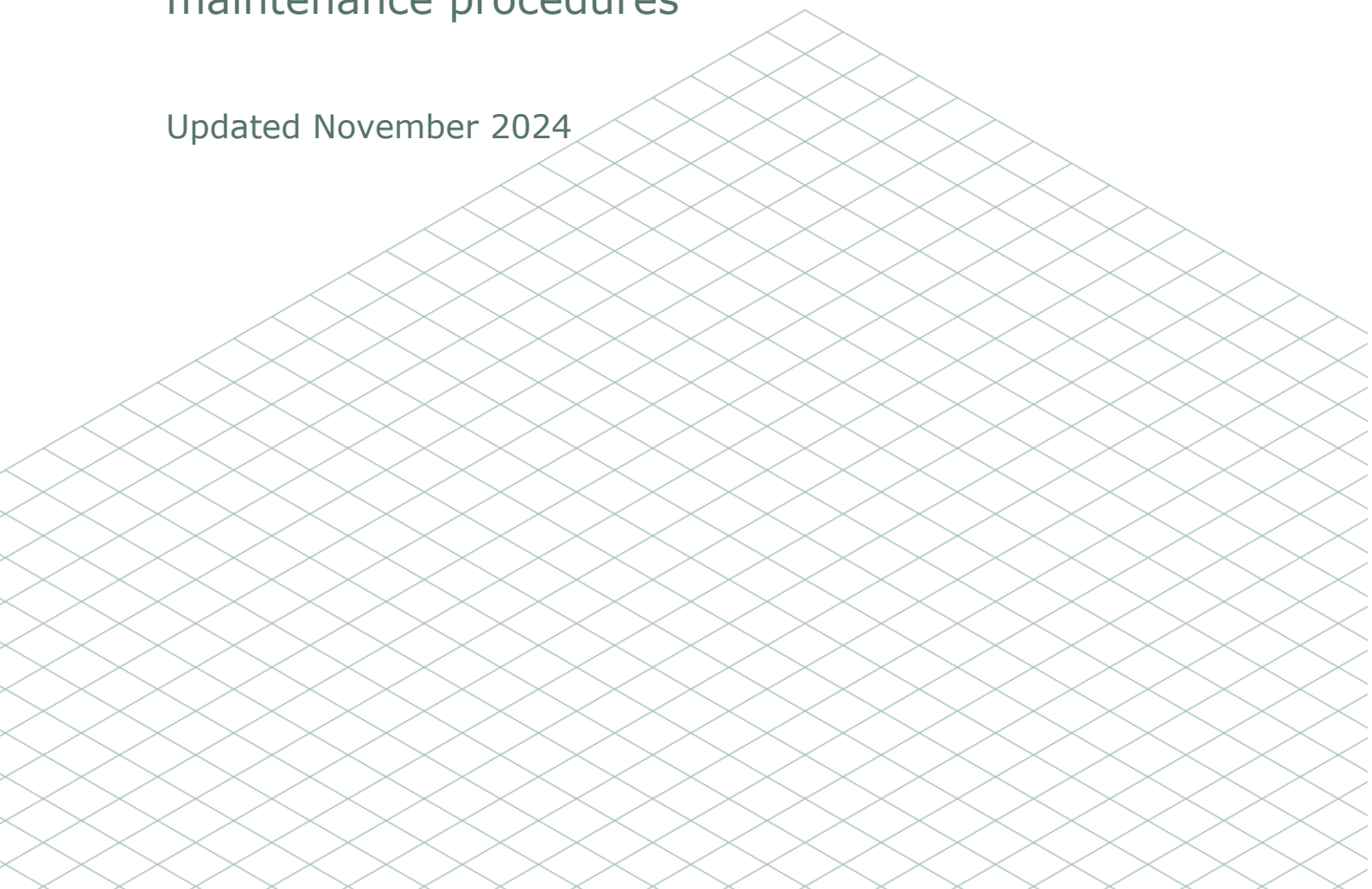




F-Series Operating Manual

Including Factory2 software information and
maintenance procedures

Updated November 2024





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F-Series Operating Manual

This manual contains important information on the installation, setup, configuration and maintenance of the FRAMECAD F-Series machines and the Factory2 software (v2.14).

All personnel who are required to operate and / or service the FRAMECAD F-Series machines must review all the information contained herein. It is particularly important that all personnel involved are aware of any potential hazards and how to manage these to both ensure the safety of themselves and others.

The manual is deliberately structured to provide the general specifications, safety and an introduction to the various components first. The chapters that then follow describe the installation, power-up and operating instructions of the machine and software. The remaining chapters provide detail on the tuning the FRAMECAD F-Series machines to correct any product errors along with general service and maintenance information.

Please note that some variations will exist between machine types. This manual includes images that may differ to those used on some machines. Where a setup and configuration procedure is defined, every effort has been made to cover all variations and versions where possible.

Symbols Used

ICON/TEXT	MEANING	CONSEQUENCE IF DISREGARDED
NOTE!	An important note highlighting a critical requirement	- The procedure or task may not perform as well as expected - Damage may be done to equipment or property - Minor injury may result
CAUTION!	Possible dangerous situation	Minor injuries and/or equipment/property damage
 WARNING!	Possible dangerous situation	Severe or fatal injury
 DANGER!		
 ELECTRIC SHOCK HAZARD!	Possible electric shock hazard	Severe or fatal injury
TIP!	Useful tip or information to help simplify a task or procedure	

1 About the F-Series Machines

The FRAMECAD F-Series machines are an advanced manufacturing solution for producing light gauge steel wall and truss frames. The FRAMECAD® system comprises a suite of design, manufacturing and engineering software products.

The F-Series machinery hardware consists of a rollformer and decoiler.

Raw materials used in the machine are:

- steel strip
- lubrication fluid for the steel and printer ink (optional).

What does the machinery do?

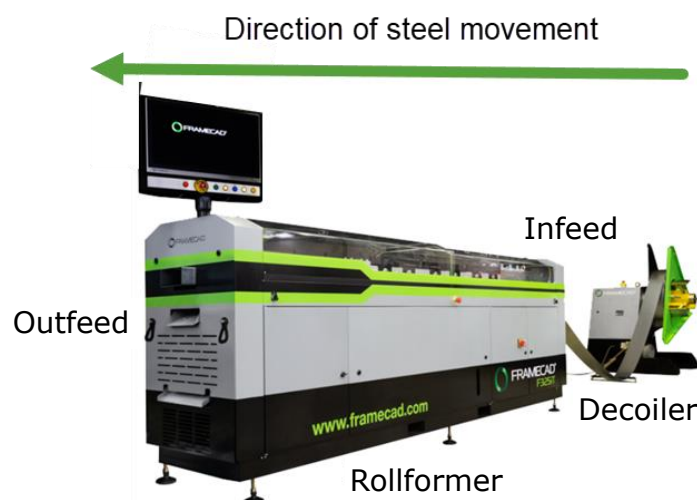
The F-Series models of rollformer produce cold-formed steel framing and truss components, called "profiles", for use in residential and light commercial applications.

Design information for the profiles is loaded onto the machine control software before production begins.

During production, steel is unspooled from the decoiler and enters the rollformer infeed. It is then driven through the machine where it is shaped through a sequence of roll forming stations.

Additional tooling stations cut, punch or form various shapes in the strip to aid in assembling profiles into frames and trusses.

At the outfeed end, a printing system marks identifying information on each piece of framing. The completed piece is then cut (sheared) and ejected from the outfeed, ready for assembly.



F-series models produce framing components for walls, joists and trusses for residential to light commercial applications.

There are three models in the range:

F325iT



F325iT-L (longer version of the F325iT)



F450iT



MODEL	LENGTH	WIDTH	MAX. TOOLS IN TOOLBLOCK	CAN CREATE PROFILE WIDTH*	CAN PROCESS BMT**
F325iT	3700mm (12')	800mm (2ft 7½in)	7	63 - 150mm (2½" - 6")	0.55 - 1.15mm (27 - 43 Mils)
F325iT-L	4500mm (14'9")	800mm (2ft 7½in)	14	63 - 150mm (2½" - 6")	0.55 - 1.15mm (27 - 43 Mils)
F450iT	4500mm (14'9")	800mm (2ft 7½in)	7	75 - 150mm (3" - 6")	0.75 - 1.55mm (33 - 54 Mils)

* Single measurement from within this range

** BMT: Base Metal Thicknesses (thickness of the steel without protective coating applied / uncoated steel thickness) units used in the US are Mils (1/1000 of an inch). Metric units and Mils used in the table above do not directly correspond with each other and conversion is not advisable - use the units in your home country and do not convert.

Main distinctions

- F450iT models can process slightly thicker steel than F325 models, and has swappable tool cartridges
- F325iT-L has the capability to include the most tools in the toolblock
- F325iT is the lightest weight and most cost-effective.

2 About the Factory2 Software

FRAMECAD Factory2 is the software that ultimately controls all the primary functions of the FRAMECAD rollforming machinery.

A job “project” that is comprised of frame assembly and manufacturing data (.rfy) is loaded via a USB flash drive or network connection into the FRAMECAD machine, which is running Factory2. This information is then translated by the software into the various tooling operations and stick lengths to produce the required framing components.

The Factory2 software also allows the operator to:

- Reconfigure the manufacturing order of panel assemblies in the job schedule.
- Add / remove tooling operations.
- Collect diagnostic information on items such as material produced, waste produced, tool operation counts and an operation log.
- Calibrate the machine for stick length accuracy and tool operation placement accuracy.
- View the shape and status of the current frame being produced.
- Manage the overall speed and acceleration of the machine.
- Manually operate the machine and all its tooling operations.
- View the status of the electrical input/output for troubleshooting purposes.
- Set the up/down times for each tool operation.
- Trend various operating parameters in near real time.

Manufacturing and machine performance information is entered via the Operator Touch screen. Minimal finger pressure is required to activate the touch screen commands. Sharp or solid objects should never be used to “tap” or “drag” across the screen. The screen has a USB2 port which can be used to accept USB memory sticks. You can also plug in a keyboard and/or mouse to control the screen.

NOTE! This manual provides information on FRAMECAD Factory2 v2.14 only. For all other versions please discuss with your regional FRAMECAD office or visit [MyFRAMECAD](https://myframecad.com).

3 Safety

Customers are responsible for implementing the following safety measures for safe operation of their FRAMECAD machinery.

3.1 Operator Training

All operators, including new staff hired after initial training with FRAMECAD staff, must:

1. Be fully trained in safe operating practices and potential hazards in and around the machinery, AND
2. Have read and understand all manuals supplied with FRAMECAD machinery that are relevant to their duties.

3.2 Machinery On and Off States

It is important to understand the four distinct states that the machinery may be in.

NON-OPERATING STATES (IT IS SAFE TO BE IN DANGER ZONES AND/OR COMPLETE NON-ELECTRICAL MAINTENANCE TASKS)		OPERATING STATES (NO ENTRANCE PERMITTED TO DANGER ZONES)	
ISOLATION SWITCH OFF	ISOLATION SWITCH ON		
ISOLATED STATE	EMERGENCY-STOPPED STATE	OPERATION-READY STATE	OPERATING STATE
The machinery is OFF at the isolation switch (and ideally the switch is locked out to prevent accidental reconnection). In this state: • All hydraulic and mechanical energy is immediately removed from the machinery	The machinery is ON at the isolation switch, but the safety circuit has been tripped (via pressing an Emergency Stop pushbutton OR opening the safety guards) and therefore the machinery cannot be operated. In this state:	The machinery is ON at the isolation switch, the safety circuit system has been reset, and the machinery is ready for Manual, Semi-Automatic or Automatic mode. In this state: • Operation has not yet started but could be	The machinery is ON at the isolation switch, the safety circuit system has been reset, and operation of the machine has been initiated by the operator in either Manual, Semi-Automatic or Automatic mode. In this state:

• It is safe to be in the machinery Danger Zones • It is safe to complete non-electrical maintenance tasks on the machinery • After the isolation switch is turned off, it will take up to 15 minutes for residual electrical energy in the AC electrical cabinet to dissipate. 15 minutes after the isolation switch is powered off, the AC cabinet may be accessed by certified electrical staff¹. • It is safe to complete production setup, cleaning and shutdown procedures.	• All mechanical and hydraulic energy is immediately removed from the machinery • It is safe to be in the machinery Danger Zones • It is safe to complete production setup, cleaning and shutdown procedures.	initiated by the operator at any time • Nobody should be within the danger zones around the machinery; the ONLY exceptions are procedures for setting and testing decoiler dancer arm calibration²	• The machine is currently rolling steel or capable of continuing to roll steel as soon as production is initiated by the operator • Nobody should be within the danger zones around the machinery
---	---	--	---

¹ Only certified electrical staff should be permitted access to the electrical cabinets for the purpose of doing electrical maintenance work.

² In this state, it is also possible to initiate the decoiler mandrel to spin by lifting the dancer arm, in order to check its calibration or safety control cutoff point. These are the ONLY procedures that permit entry into the danger zone when the machinery is in an operating state; see [Check Decoiler Dancer Arm Safety Control Height](#) for more detail.

3.3 Power (Isolation) Switch

Electrically isolate the machine prior to opening the back of the screen. When accessing the main computer board, avoid touching or wiping hands / fingers / clothing across any electronic printed circuit board. The electronic components on these boards are highly sensitive to static electricity which can accumulate on your body and clothing. Static electrical discharges can result in damage and/or reduce the reliability of electronic devices.

Always discharge any static electricity on your person through contact with a metal surface effectively bonded to earth. Where practical, use anti-static protection (e.g. an anti-static wristband) to ensure your person always remains effectively bonded to earth.

The main power switch to the machinery is called the isolation switch.

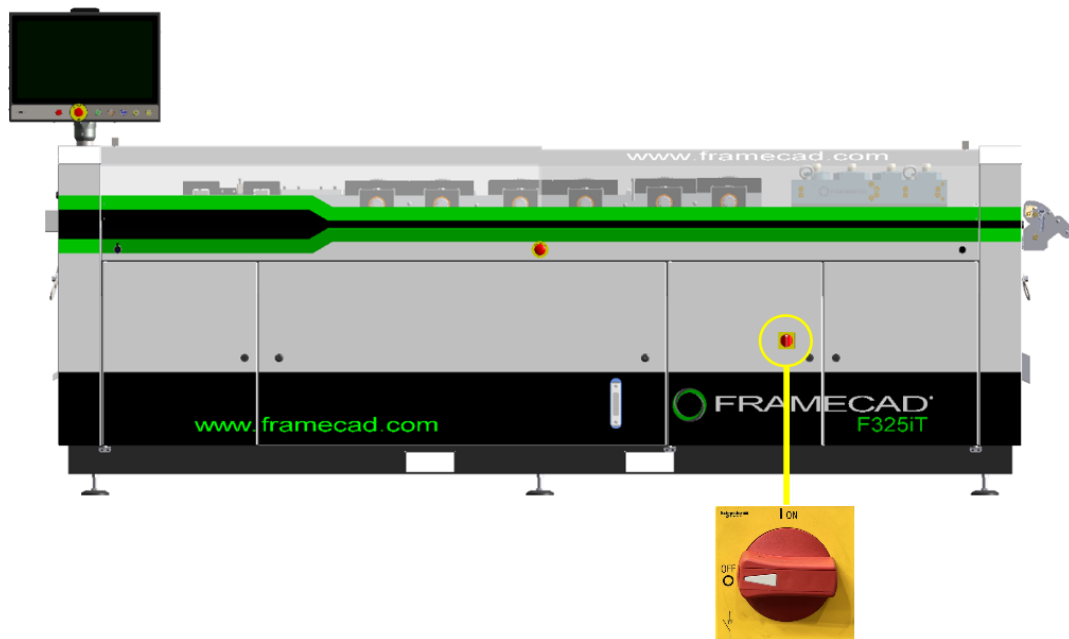
In the OFF position, the rollformer and decoiler will be electrically isolated so that there is no electrical energy in the machine (except within the electrical cabinets).

When the isolation switch is first turned to the ON position, the machine will start in a safety circuit tripped state, meaning that the safety control system will need to be reset before the machine can be operated.

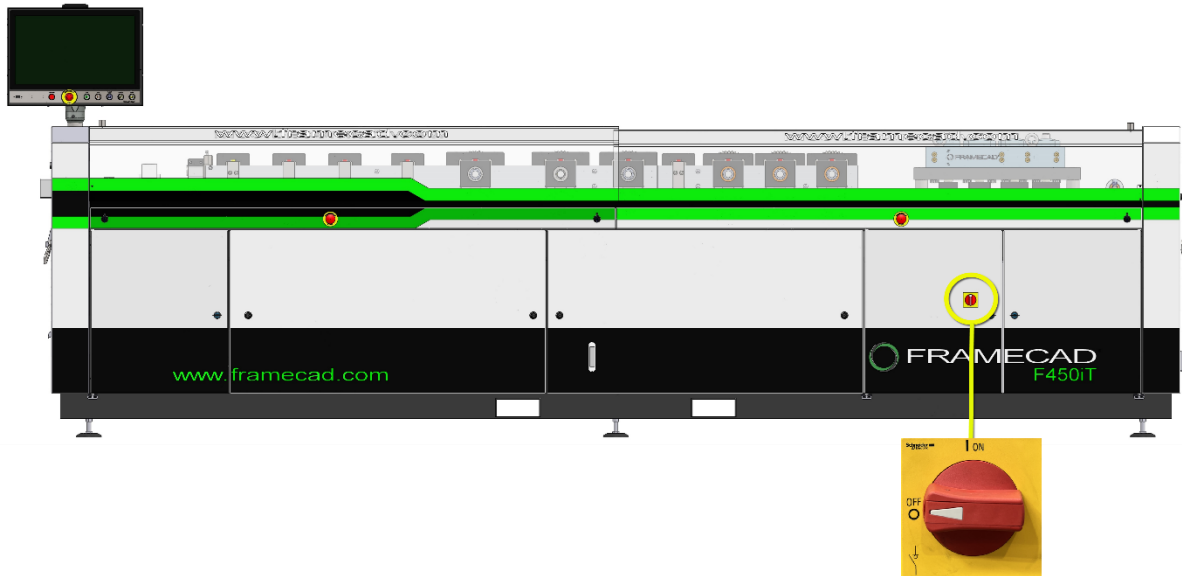
See [Safety Control \(Emergency Stop\) System](#) for information on how to use and reset the safety control system.

The electrical isolation switch is located on the outside of the AC electrical cabinet.

F325iT



F325iT-L and F450iT



 **DANGER!** Electric shock hazard. Do not access the electrical cabinets. Even with the isolation switch in the OFF position, dangerous voltages still exist inside the electrical cabinets.

Ability to use lockout tags

The isolation switch has capability to be used with a lockout tag procedure. Customers are responsible for implementing a lockout tag procedure at their site. Pull the front of the switch out to access holes for the tags.

3.4 Safety Control (Emergency Stop) System

All F-series machines have in-built safety controls that will immediately halt the rollformer and decoiler completely (rolling operations, decoiler rotation, hydraulic system, electrical cabinet fan) if:

- An **Emergency Stop** button is pressed, and/or
- Either of the top sliding covers is opened and/or
- The decoiler dancer arm is raised above the threshold of approximately 1.0m (3.3ft).

The **Emergency Stop** buttons and sliding covers must be tested each day before production begins according to the procedure in [Test Safety Control \(Emergency Stop\) System](#).

TIP! The decoiler dancer arm safety control will be tested as part of regular maintenance. See [Check Decoiler Dancer Arm Safety Control Height](#).

Emergency Stop buttons

The machinery contains **Emergency Stop** buttons that can be pressed at any time to trip the safety circuit, which will immediately halt the machine (if operating) and put it into an emergency-stopped state.

Locations of the **Emergency Stop** buttons are:

1. Side covers (front and rear side)
2. Operator Touchscreen
3. Top of decoiler.

Before resuming production, the safety control system must be manually reset (see [Test Safety Control \(Emergency Stop\) System](#) for safety reset procedure).

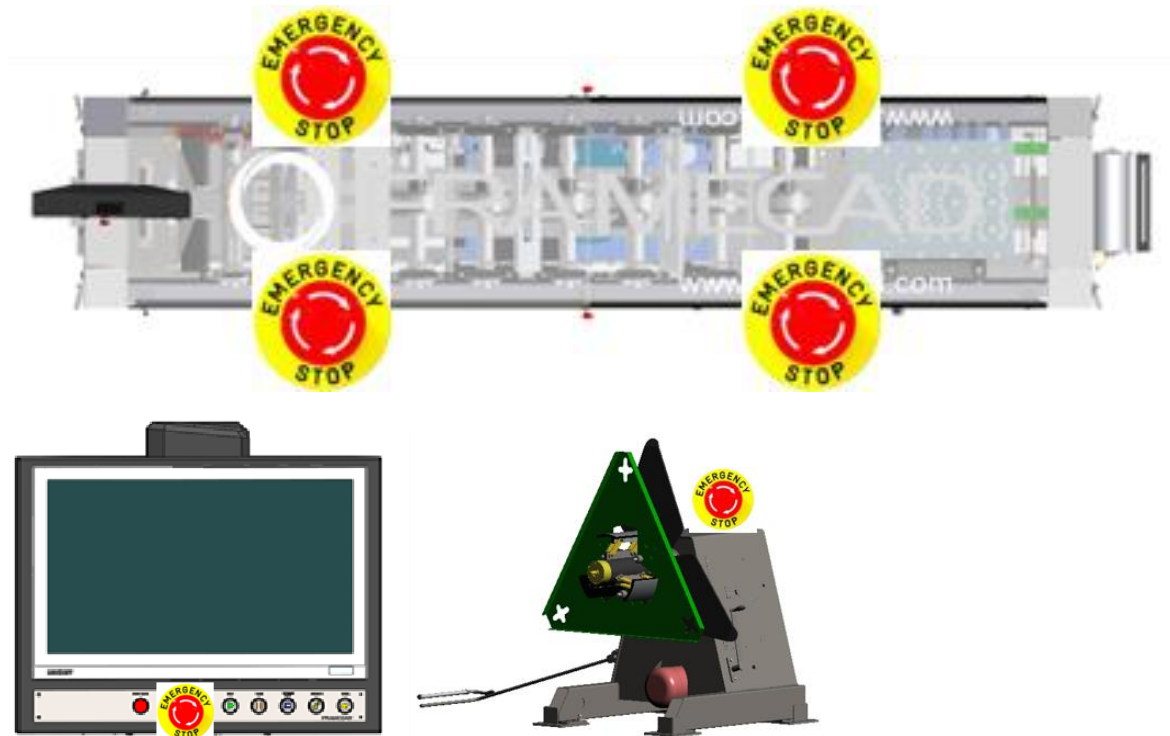
F325iT Emergency Stop buttons

There are four emergency stop buttons on the F325iT:



F325iT-L and F450iT emergency stop buttons

There are six emergency stop buttons on the F325iT-L and F450iT models:

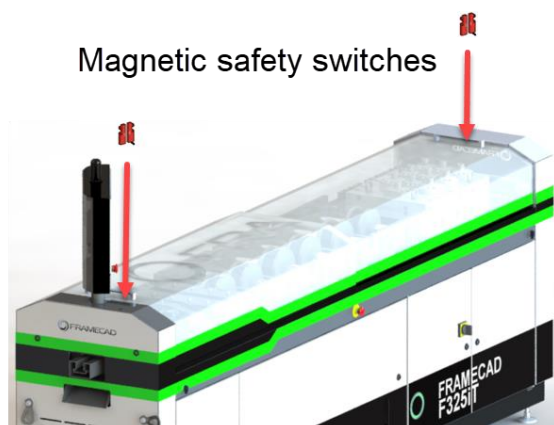


⚠ WARNING! The **Emergency Stop** buttons are intended to cease machine operation only and are not to be used to perform maintenance, service or repair work on the machine due to risk of injury from residual hydraulic, mechanical and/or electrical energy in the machine. See [Maintenance Procedures](#) for full electrical isolation procedures.

Protective covers with magnetic safety switches

F-Series rollformers have two clear sliding guard covers to protect operators from moving parts inside the machine.

Both covers incorporate magnetic safety switches that are electrically interlocked with the machine. If the sliding guards are opened when the machinery is ON at the isolation switch, the machine will enter an emergency-stopped state. The machinery will immediately halt, and a Guards open alarm will appear on the Operator Touchscreen.



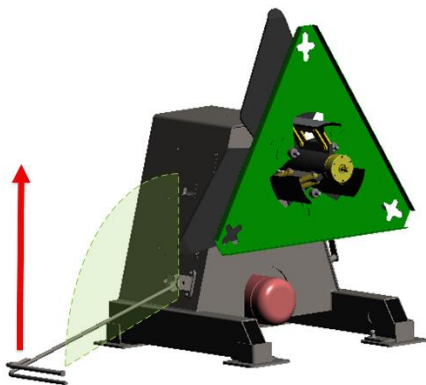
 **WARNING!** Take extreme care with the covers open due to risk of injury from moving parts. ALWAYS assume that there is residual hydraulic pressure and/or mechanical energy in the machine tooling and rolling sections.

The magnetic safety switches are not intended to provide electrical isolation for maintenance, service or repair work on the machine due to risk of injury from residual hydraulic, mechanical and/or electrical energy in the machine. See [Maintenance Procedures](#) for full electrical isolation procedures.

The machine must never be operated with any of the sliding guards opened.

Decoiler dancer arm trip height

The F-Series decoiler dancer arm is designed to move up and down with the steel strip. The dancer arm moves upwards as the decoiler speeds up.



To prevent the decoiler from rotating too fast, if the dancer arm is raised more than 1200mm, the machine will enter an **emergency-stopped state**. The machinery will immediately halt, and an alarm will appear on the Operator Touchscreen.

3.5 Personal Protective Equipment (PPE)

We recommend all people operating and working around the FRAMECAD machinery, including performing framing assembly tasks, wear the following PPE:

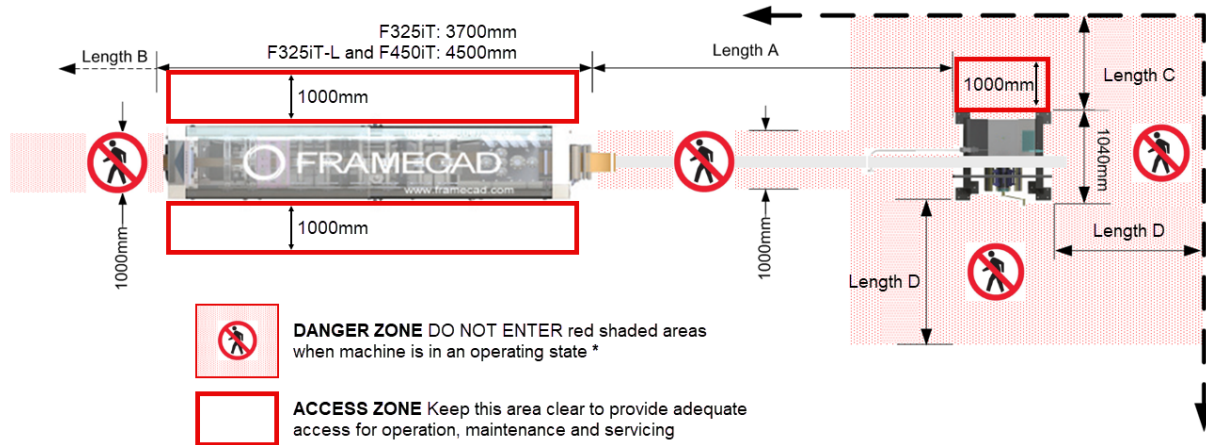
- Steel-capped boots for foot protection
- Gloves for hand protection when handling steel
- High visibility vest for visibility around heavy machinery
- Eye protection

Extra PPE may be required for certain procedures, such as working with printer ink and cleaning the machine with compressed air. We will specify the recommended PPE in the relevant procedure.

3.6 Danger Zones

Below is the floor plan for the showing the areas that contain potential hazards.

F-Series Danger Zones



Length A 3000 - 4000mm depending on thickness of steel (final distance will be determined by FRAMECAD Technician during installation)

Length C At least 1000mm from boundary wall or other machinery

Length B Length of runout table. Should be an appropriate length to safely accommodate the longest sticks produced by your machine. 3000mm and 6000mm runout table options are available from FRAMECAD (table tops only)

Length D At least 2000mm from boundary wall or other machinery

* Operating state defined as machinery ON at isolation switch, safety circuit has been reset, and machinery ready for Manual, Semi-Automatic or Automatic production mode, or any of these modes has been initiated by the operator



DANGER! No access is permitted in the danger zones identified in the diagram above while the machine is in an operating state.

Customers are responsible for installing safety guarding around the danger zones to prevent entry when machine is in an operating state, including a run-out table at the outfeed of the rollformer.

Hazards present in danger zones

- **Area around the decoiler:** the mandrel, back plate and safety guard form a large piece of moving machinery which is a safety risk if bodily contact were to be made.
- **Heavy steel coil on decoiler:** always use the safety guard to prevent the steel coil from sliding off the mandrel during rotation.



- **Steel strip between decoiler and rollformer infeed:** The exposed steel strip is sharp and heavy and may make sudden up and down movements depending on speed of production, or the operations being performed on the steel as it moves through the rollformer.
- **Rollformer outfeed:** Rollformed steel framing sticks are ejected from the outfeed, which is a safety risk if a run-out table is not present to catch the ejected sticks.



WARNING! Never operate the decoiler without its safety guard in place.



WARNING! Never step over the steel strip between the decoiler and where it enters the rollformer while the machinery is in an operating state.



WARNING! Take extreme care at the outfeed of the machine due to risk of bodily injury from strong steel framing sticks being ejected from the machine.

3.7 Other hazards

Hydraulic system: When the machine is in an operating state, all lower covers must be fitted and locked to protect staff in case of any high-pressure leaks from the hydraulic system.

Inkjet printer system: Machines with the Matthews printer system should keep the printer doors closed during operation in case of any leaks from the pressurized ink delivery system.



WARNING! Never operate the machinery without all of the lower covers in place.

3.8 Hazardous materials

Inks used in the printer systems require special PPE, policies and procedures for handling, spill and disposal.

Cartridge Printer

Cartridges supplied at shipping

We supply four cartridges (in a packet with cloths) with your machine. On arrival they will be stored in the printer cabinet.

CAUTION! Ink contained in the cartridges is a flammable liquid and requires special safety precautions when handling and disposing. Consult the supplier **Material Safety Data Sheet**.

Ordering printer cartridges

FRAMECAD is an authorised reseller of these cartridges. Contact your regional FRAMECAD office for information on replacement ink cartridges.

CARTRIDGE (EVOLUTION) PRINTER CARTRIDGES	
Ink Type	E4710BK Non-porous Ink Cartridge, Black PolyTIJ Ink Cartridge, Black 2.64

Inkjet (Matthews) Printer

Ordering ink and cleaner

We do not ship ink or cleaner with FRAMECAD products using the Matthews Inkjet printer system.

You must order the ink and cleaner directly from the supplier - visit the Matthews website OR contact your regional FRAMECAD office to find a supplier near you.

INKJET (MATTHEWS) PRINTER INK AND CLEANER	
Ink Type	Matthews SCP-700A (Fast Dry) Black, 1L
Ink Part No.	71002851 (Case of 6 x 1L bottles)
Ink Data Sheet	This is supplied with the ink when ordered.
Cleaner Type	Matthews SCP-700C Cleaner, 1L
Cleaner Part No.	71002847 (Case of 6 x 1L bottles)
Cleaner Data Sheet	This is supplied with the ink when ordered.

 **WARNING!** Ink and cleaner used in this printer system are hazardous materials (Methyl Ethyl Ketone). These products are highly flammable and require special safety precautions for handling due to risk of irritation from exposure. Customers are responsible for putting special handling, storage and disposal policies in place according to the supplier's data sheets for these products.

PPE (Personal Protective Equipment) required

When working with the printing system or handling ink or cleaner, always wear appropriate PPE, including (at a minimum):

- **Nitrile** rubber gloves
- Safety glasses

3.9 Before Startup Safety Checks

The following checks must be completed **before** the machine is powered up with the isolation switch.

 **DANGER!** Before starting the machinery make sure no people are in the machinery danger zone.

BEFORE STARTUP CHECKLIST	
SAFETY CHECKS	
No people are in the machinery danger zone	
All lower cabinet covers are in place and are closed on rollformer	
All cabinet covers are in place and closed on decoiler	
Safety guard in place on decoiler	
Decoiler dancer arm is resting on the ground	

4 Controlling the Machinery

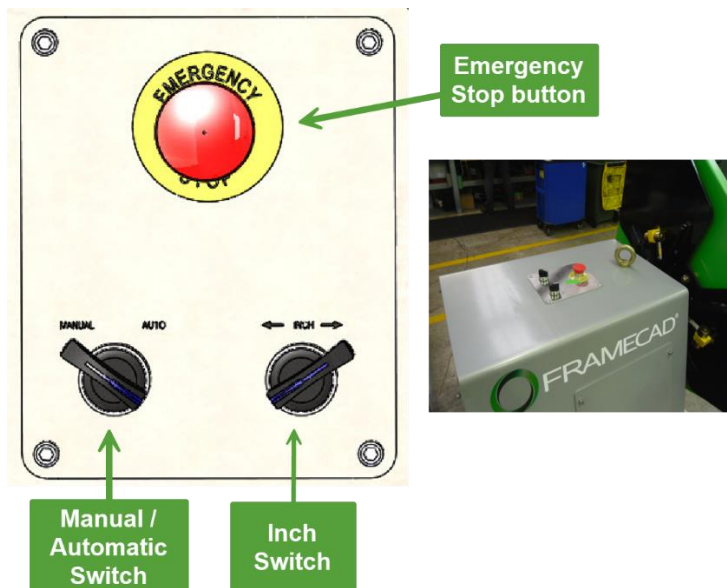
The Operator will control the F-Series machinery mainly using Operator Touchscreen. There are additional controls such as Inch switches and **Emergency Stop** pushbuttons.



4.1 3MT Decoiler Controls

For 3MT decoilers, there is no reason to change the setup or controls on the decoiler after installation, apart from daily testing of the **Emergency Stop** button.

For completeness we have included a description of the controls here.



Emergency Stop button

Can be used to immediately halt the machine. Must be tested daily as part of daily setup and safety control testing. See [Safety Control \(Emergency Stop\) System](#) and [Test Safety Control \(Emergency Stop\) System](#).

Manual / Automatic switch

Currently there are no customer procedures that require the 3T decoiler to be in Manual operation mode. Therefore do not move the switch from the Automatic position.

Inch switch

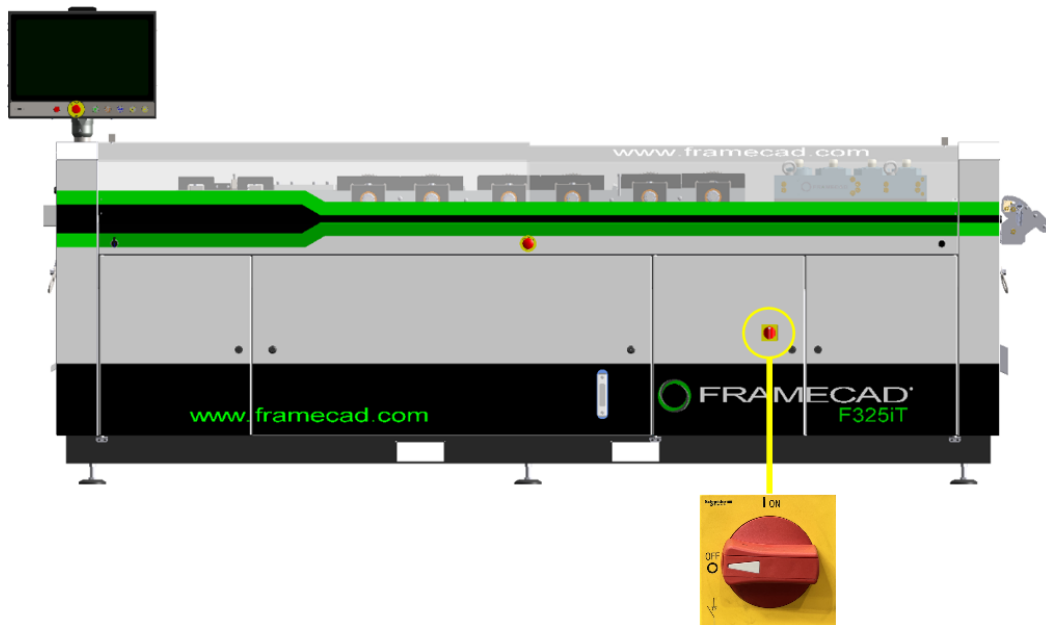
Currently there are no procedures that require the Inch switch to be used.

4.2 Power Up Procedure

 **DANGER!** Before starting the machinery make sure no people are in the machinery danger zone.

To switch on power to the machine and decoiler:

1. Turn the isolation switch on the side of the machine to the ON position.



2. You will hear the fans to cool the electrical cabinets start up. On the **Operator Touchscreen**, the machine control software will begin the boot up sequence.

Log into machine software

Whenever the FRAMECAD machine is powered up, FRAMECAD Factory2 will automatically load. During this "boot-up" sequence the system will complete general checks and display information text on the Operator Screen; this is normal.

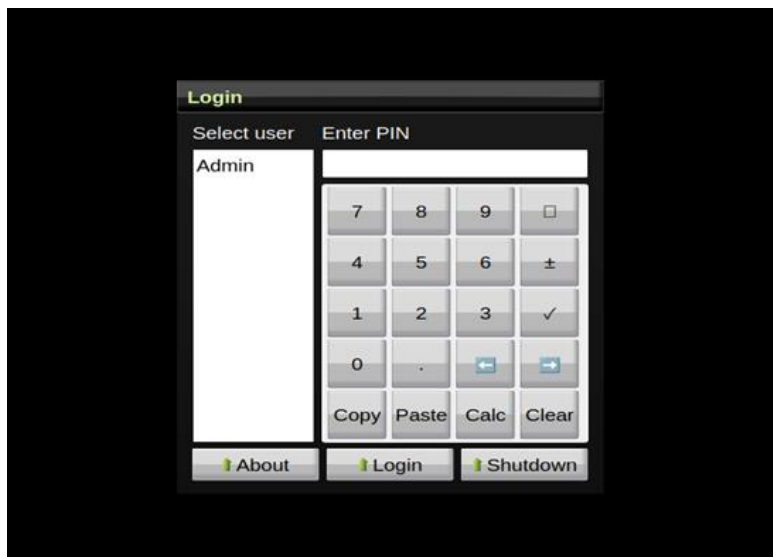
Once the software has completed its startup checks, a five-second countdown prompt will appear. Do not touch the screen during the countdown unless you

have a reason to access the **Admin** menu - wait for the countdown to finish and the Login screen appears (shown below). Select your Username and enter your PIN to log in.

IMPORTANT SECURITY NOTE!

All FRAMECAD machines are shipped by default with Admin user access only. It is highly recommended that a site security policy is developed around user access that meets your security requirements. Non-Admin users cannot change many of the machine configuration settings inside the FRAMECAD Factory2 software.

All events and actions initiated from FRAMECAD Factory2 software will be recorded against the user logged in at the time.

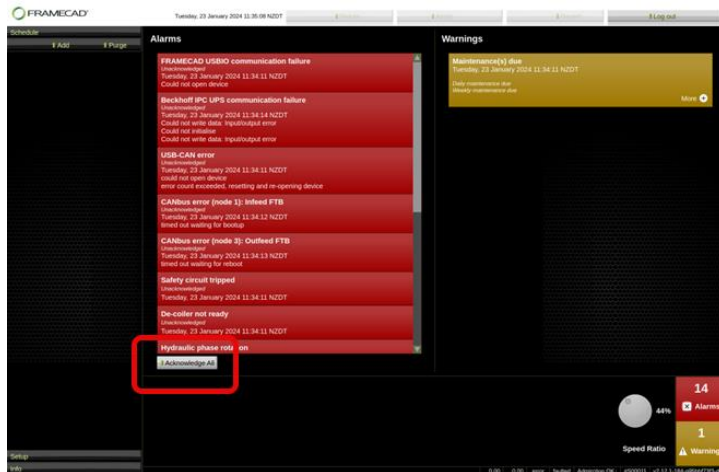


TIP! If you have not yet set up a login for operators, use the default PIN 1234 to log in.

Clear alarms after logging in

The first screen after login will show a list of alarms. Do not worry if there are unexpected alarms showing.

Press **Acknowledge All** before dealing with any remaining alarms.



Reset safety controls

The safety circuit will need to be reset when the machinery is first started. After acknowledging the alarms, press the **Safety Reset** button  below the screen.

Test safety controls

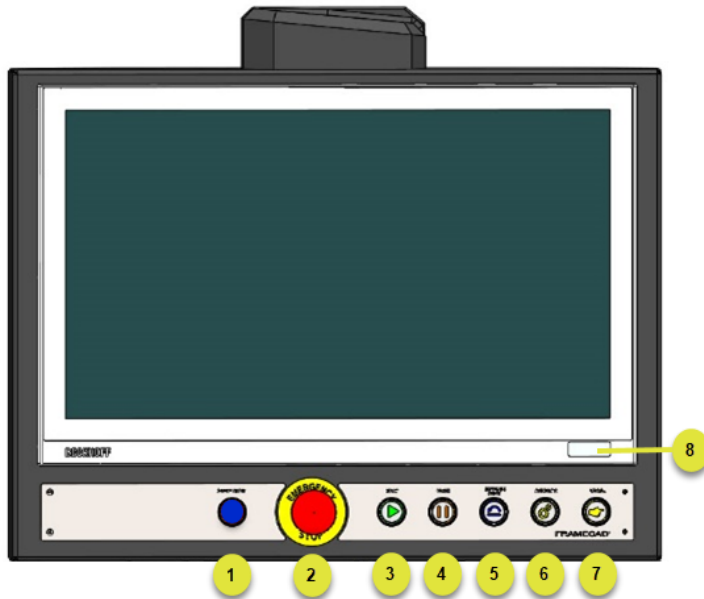
At the start of each day, **always** **Test Safety Control (Emergency Stop) System** to confirm it is operational before beginning testing and production.

4.3 Operator Touchscreen Overview

Operators will control the machinery via the Operator Touchscreen (and occasionally via Inch controls on the side(s) of the rollformer).

The Operator interface hardware includes a touch-sensitive screen. There are also pushbuttons, and a USB port located below the screen.

NOTE! Use minimal finger pressure on the touchscreen. Do not use sharp or solid objects on the screen.



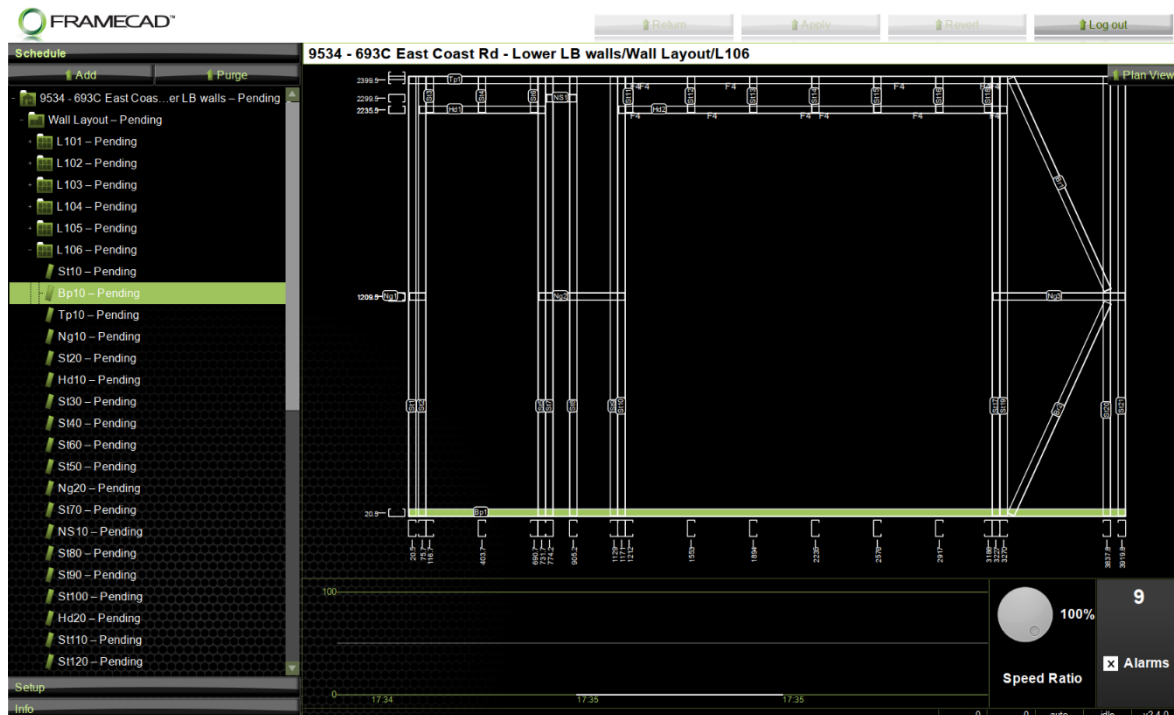
NUMBER IN DIAGRAM	BUTTON SYMBOL	ACTION
1.		SAFETY RESET button
2.		EMERGENCY STOP button
3.		START button
4.		PAUSE button
5.		SOFTWARE RESET button
6.		AUTOMATIC MODE button
7.		MANUAL MODE button
8.	-	USB port

To access the USB port, push the cover to pop it up: then turn the cover to open the USB port.

You can also plug in a keyboard and/or mouse to the USB port to control the screen.

4.4 Machine Software User Interface

The User Interface of the software is divided into two panels. A left panel containing three menus: Schedule, Setup and Info, and a right panel displaying details of whichever item is selected on the left.



Left Side Menu

Screen Display

Left Side Menus

On the left side of the screen, the following top-level menus will always be visible. Touch the menu name to expand the contents underneath.

Schedule	This tab displays the job schedule screen. From this screen the Operator can view the current status, load, edit, delete, re-schedule and move jobs around in the production queue. This is the main screen used during production. The above picture displays an example of this.
Setup	This tab contains all the screens associated with the setup and configuration of the FRAMECAD machine. Screen access will be dependent on the User security level with only Admin users granted full access.
Info	This tab contains a collection of screens that provide feedback and information on the FRAMECAD machine. Here the Operator will find details on the machine inputs and outputs, licensing, productivity, alarms, and service-related information.

Schedule menu

The schedule menu will open by default when a job is loaded. Otherwise, press on the **Schedule** menu to open it. When the Schedule menu is in use, the left panel will display the jobs/projects currently loaded on the machine, and the order in which the machine will produce them (the machine will produce the topmost items first). An example is shown below:

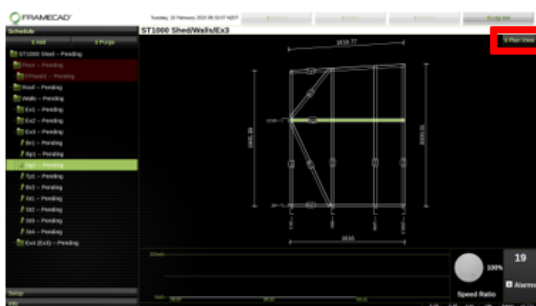


Schedule List

Sub-assembly Display

Some things to note:

- **Structure of jobs/projects:** Individual sticks are contained within three nested folders. At the top level is a whole project (e.g. a whole house), then plan level (e.g. bottom floor external walls), then frame (sub-assembly) level. Press on the folders to open the sub-folders and see the sticks within.
- **Plan view and elevation view:** You can toggle between side-on and top-down views using the **Plan View** and **Elevation View** options.



Elevation view shows the current frame portion being run. Plan view shows the top down view.

Setup menu

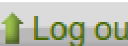
This menu allows setup and configuration of the machinery tools, production preferences, users, units of measurement and more. More about the setup menu is contained in [Machine Software Configuration](#).

Information menu

This menu contains information for maintenance and diagnostic purposes.

Options at top of screen

The four options at the top of the screen are:

	Pressing this button will return the Operator back to the Home screen for the currently selected control mode (either Automatic or Manual – see below for more detail). This button will only be highlighted if the Home screen for the current control mode is not already being displayed.
	Whenever a value or parameter is changed inside Factory2, this button will be highlighted prompting the Operator for confirmation of the new setting. Setting changes <i>will not be saved</i> until the Apply button is pressed.
	Once a value or setting change has been entered inside Factory2, the Operator can cancel the change and revert back to the original setting by pressing this button.
	This will return the user to the login screen if the user confirms they want to logout.

4.5 Machine Operation Modes

The machinery can be operated in one of three modes: Manual mode, Automatic mode and Semi-Automatic mode.

The Operator can change between these modes using the pushbuttons on the Operator Touchscreen.

- **Manual mode** is a non-production mode. It is used mainly for threading steel through the machine, quality control and other testing, and troubleshooting. When the machine is first powered on at the isolation switch, it will be in Manual mode by default. In Manual mode, the operator must use the Inch switches on the machine to move steel through the machine and use the Operator Touchscreen to execute all tooling operations.
- **Automatic mode** is the normal production mode. A job must be loaded into the machine software and the machine will automatically process the job file information to produce sticks without the need for operator intervention. At the end of a frame, the job schedule will be re-scanned from the top of the list to find any items which may have been added, moved, or remade since starting. This way it keeps the various job parts together.
- **Semi-automatic mode** is a form of slow production mode. The operator must manually move steel through the machine using the Inch switches, but all tooling operations will be automatically executed according to the job file. This mode is typically used to coax the steel through the machine

if there is a possibility it will not be driven through easily on the rollers, for example if there are many cut-outs in the steel.

4.5.1 Manual Operation Mode

When you start the machine (and clear alarms and reset the safety circuit), it will be in Manual mode by default. You can tell the machine is in Manual mode as the Start  and Manual  buttons will be lit (solid, not flashing).

In Manual mode, you will use the Inch switches on the side of the machine to move steel through the machine.

Manual mode is a non-production mode that can be used for:

- testing operation of various machine tools and systems
- testing of production output (quality control testing)
- turning the Lip Box unit on or off (i.e. form profile with or without lips respectively) on a machine with a hydraulically controlled lipbox
- removing steel from the machine, when changing coil or troubleshooting a jam-up.

In Manual mode, the screen shows the tools available to the operator. Tools can be manually operated by pressing the option onscreen (when the hydraulic pressure is adequate).



TIP! If the Manual Home screen is not currently being displayed press the Return option at the top of the screen.

To change to Manual mode

For changing coil or troubleshooting purposes, you can switch from Automatic modes to Manual mode using the steps below.

1. Press the **Pause** button .
2. Press the **Software Reset** button .
3. Press the **Manual Mode** button  to change to Manual control mode.
The **Manual** button  will be lit.
4. Use the Inch switches to move steel through the machine, and you can activate tool operations using the software.

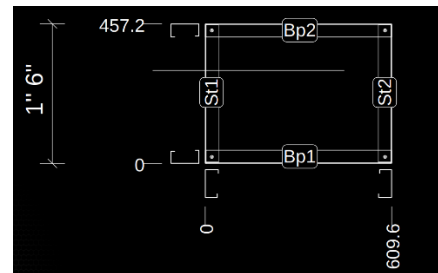
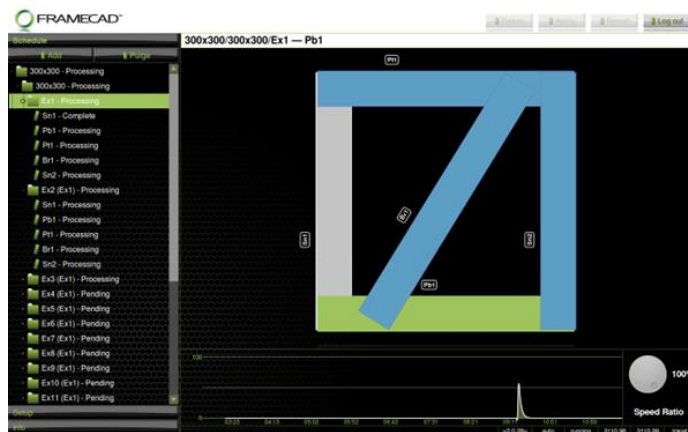
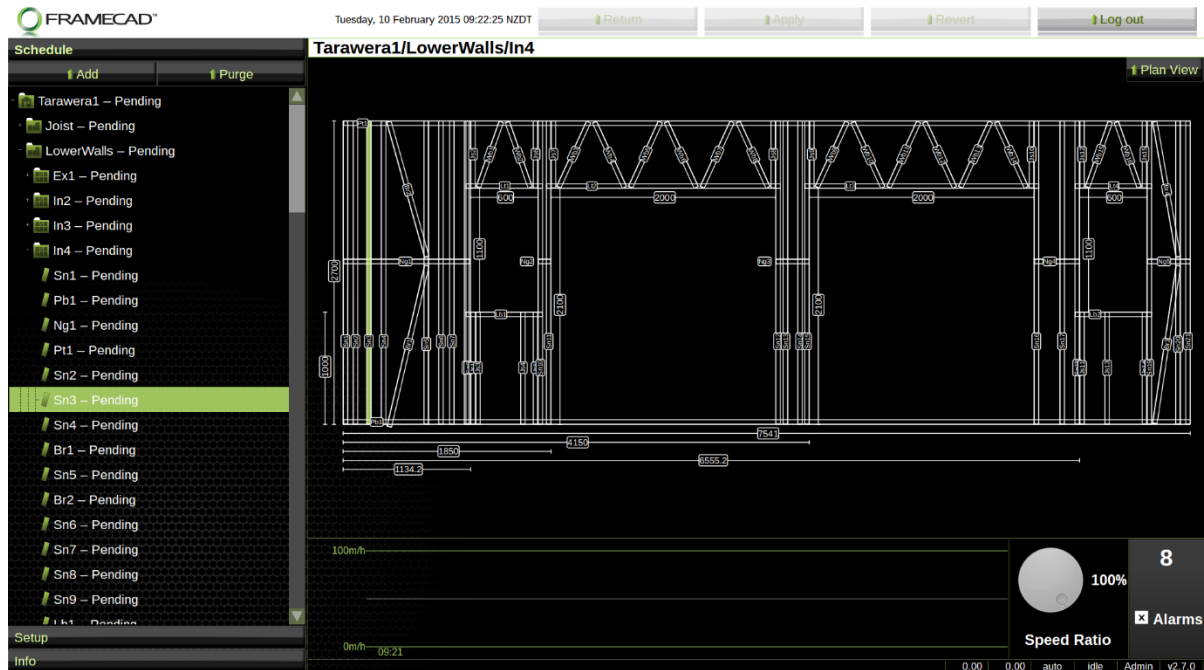
NOTE! Changing from Automatic modes to Manual mode will interrupt production, and if the Inch switch is used to drive steel through the machine, or manual tool operation is performed, the stick(s) in progress will need to be scrapped as it will no longer adhere to the design specs in the job file.

For instructions on testing tooling operations using Manual mode, see [Manually Operate Tools](#).

4.5.2 Automatic Mode

In Automatic mode, the screen will display a colour-coded image of the sub-assembly currently in production according to the job schedule on the left.

The schedule list not only shows the various sub-assemblies that comprise the project but also the order in which they will be made. Each sub-assembly can then be viewed by selecting the item from the schedule list. An example is shown below:



- **Green:** The stick shown in green will be the next stick to exit the machine
- **Blue:** Sticks shown in BLUE are still being processed and are waiting in the queue.
- **Grey:** Sticks shown in GREY have already been completed and exited the machine.
- **Clear:** Sticks shown as clear have not been processed or completed.

Production rates are shown in the trend graph at the bottom of the screen. This graph displays the amount of steel produced per hour over the last 8 hours.

In Automatic control mode, the machine will automatically process all items occurring in the job schedule, starting with the first (top) item, and proceeding one frame at a time sequentially down the schedule.

At the end of a frame (sub-assembly), the software will scan the job schedule from the top of the list to find any items which may have been added, moved, or re-made since starting. This is to keep the various job parts together.

The software will then begin to produce the next job folder it finds with the **Pending** status.

To change to Automatic mode



DANGER! Always check there is nobody in the danger zones around the machinery before pressing the **Start** button in Automatic mode.

To change from Manual mode (default mode on startup) to Automatic mode:

1. Press the **Automatic mode** button . The Automatic button  lamp will illuminate indicating that the machine is now in the Automatic control mode.
2. When you are ready to begin Automatic production, press the **Start** button . During production in Automatic mode, the **Start** button  and **Automatic** button  are both lit.
3. Wait for the machine to run out the steel that is already threaded through the machine - it will run two scrap pieces to clear out the machine and your production job will start from the third stick.

4.5.3 Semi-Automatic Mode

For sticks that have a lot of cutouts, particularly cutouts in the web, it may help to change to Semi-Automatic mode to avoid steel jams.

Semi-Automatic mode is a combination of both Automatic and Manual control.

In Semi-Automatic control mode, the machine will automatically process all items occurring in the job schedule as per the fully Automatic control mode BUT the operator must use the Inch selector switch position mounted on the side of the machine, in order to progress the steel strip.

Tooling operations are performed automatically as the steel is moved through the machine at the pace chosen by the operator using the Inch switch.

This control mode can be useful for running out complicated or troublesome pieces in the machine.

To change to Semi-automatic mode



DANGER! Always check there is nobody in the danger zones around the machinery before using the Inch switches in Semi-automatic mode.

To change from Manual mode (default mode on startup) to Semi-automatic mode:

1. Press the **Automatic mode** button . The Automatic button  lamp will illuminate indicating that the machine is now in the Automatic control mode.
2. Press the **Automatic mode** button  a second time to switch into Semi-Automatic control mode. The Automatic button lamp will **flash ON and OFF** to indicate the machine is now in Semi-Automatic control mode.
3. Press the **Start** button  to start production in Semi-Automatic mode.
4. Use the Inch (jog) switches to progress the steel strip through the machine. Once the steel reaches the required tool operation position it will automatically stop, actuate the tool, and then wait for the operator to inch the steel manually through to the next tool position and so on.

To toggle between Semi-automatic and Automatic modes

Press the **Automatic mode** button  to toggle between these two modes.

- When the Automatic button is lit (without flashing), the machine is in Automatic mode.
- When the Automatic button is flashing on and off, the machine is in Semi-Automatic mode.

4.5.4 Manual Forward/Reverse using Inching Controls (Jog Switch)

The Inch control function is only permitted when the machine is in **Manual** or **Semi-Automatic** control mode.

Several **Inch** control switches are mounted on the sides of the machine.



The switch can be rotated to manually move steel strip through the machine - either forwards (towards the outfeed) or backwards (back towards the infeed).

Using the inch switch without steel in the machine

TIP! You can use the inch switch without steel in the machine to spin the rollers in the main roller assembly so they can be cleaned.

4.6 Turn Lipbox On or Off in Software

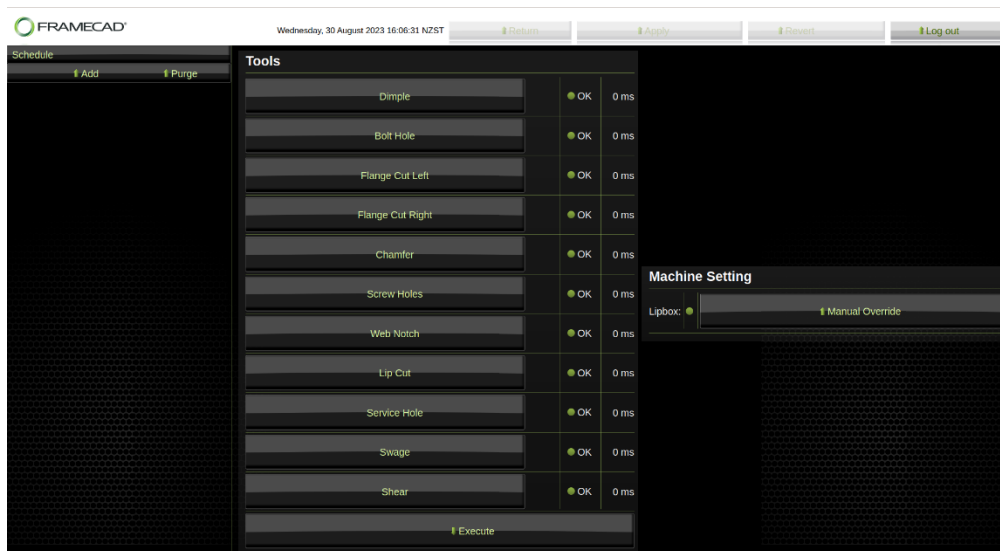
TIP! This procedure applies to machines with hydraulically controlled lipboxes only. Manual lipboxes cannot be disengaged using the software.

Reasons for turning the lipbox off include:

- Removing steel from the machine. It is much easier to remove steel with the lipbox turned off.
- Troubleshooting the lipbox.
- Running unlippped sections.

Turn off lipbox via software

If the machine is not in Manual mode, press the **Manual** button . The Manual Home screen will appear, shown below.



Press the **Manual** button  until the onscreen indication lamp is OFF (i.e. grey colour instead of green which is ON). This will disengage the lipbox unit.

Cut off the steel strip at the infeed.

Because the machine is in manual mode, you will need to use the Inch selector switch to slowly "inch" the steel out of the machine.



When the steel can no longer be driven forward by the rollers (i.e. it is no longer riding on any driven rollers), you can remove it by hand.

Turn lipbox back on

To reset the lipbox unit, either:

- Press the **Software Reset** button , or
- Press the **Manual** button  again.

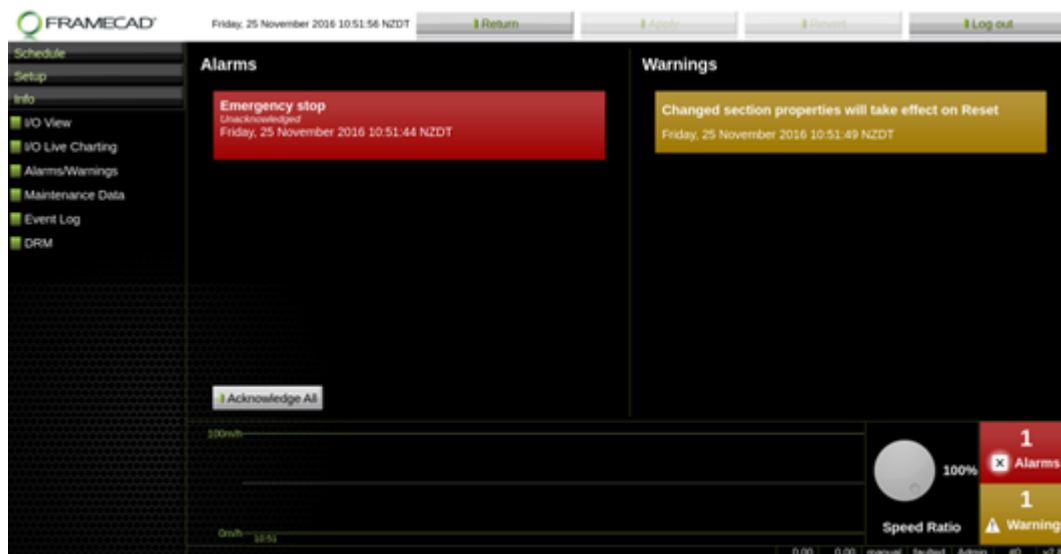
4.7 Alarms and Warnings

Alarms

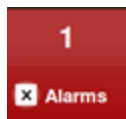
An alarm will display if the software finds any problems with sensors, machine performance, or anything that could compromise the safety of the Operator.

Alarm display

Whenever an alarm state is activated, the Alarm screen will be automatically displayed.



If the Operator navigates away from the alarm screen while an alarm is still active the following shortcut will appear in the bottom right-side of the currently displayed screen:



Acknowledging alarms

Operators acknowledge an alarm by pressing **Acknowledge All** on the screen. By acknowledging an alarm, an Operator can distinguish between new (in red) and old (greyed-out) alarm events.

If the condition that caused the alarm event is still present, the alarm message will continue to be displayed but the banner will change colour from red to grey.

An example of an acknowledged alarm is shown below.



Clearing the alarm

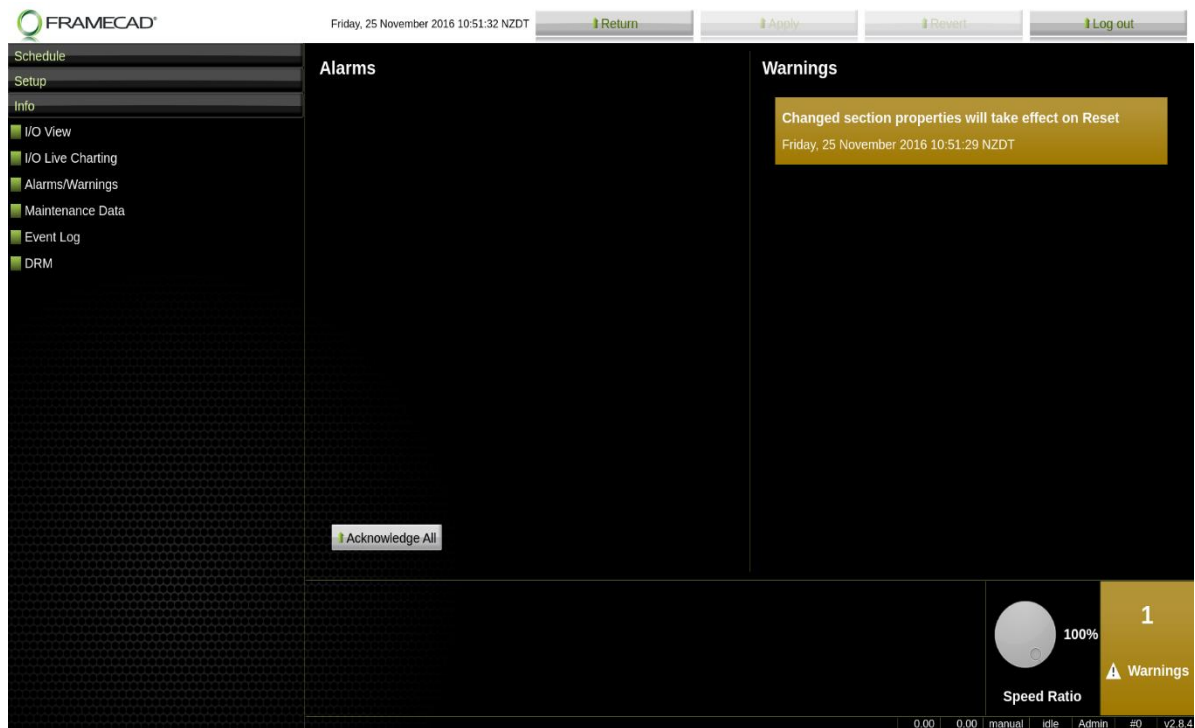
Most, but not all, alarms require the alarm state to be properly cleared before operation can resume. If the alarm condition will not damage the machine, the machine can operate with the alarm present, e.g. losing comms with a printer system.

If the problem that triggered the alarm has been addressed and the user has acknowledged the alarm, the alarm notification will be automatically removed from the alarm list. If an alarm remains in the list, then the condition or event that triggered the alarm has not been resolved and further investigation is required. In the example shown above the **Emergency Stop** button needs to be released and the safety control circuit reset before the alarm is removed from the list.

Most alarms will require the alarm state to be properly cleared before operation can resume.

See [Troubleshooting Alarms](#) for more information.

The Alarms screen includes a **Warning Indicator** as well. See below:



Warnings

Warnings are displayed and accessed in the same way as alarms.

Warnings cannot be acknowledged.

Warnings will not stop the machine operation but will stay visible on the bottom right until the warning condition disappears.

See [Troubleshooting Warnings](#) for more information.

5 Machine Software Configuration

NOTE! Some of the configuration options in this section, such as tool setup, are factory-set by FRAMECAD and should not be changed.

Much of the software configuration of your machinery will be done at the FRAMECAD factory and by your FRAMECAD Technician during installation.

However there are other preferences that may be configured, such as:

- User setup
- Production preferences
- Text to be printed on sticks
- Software updates and license renewals.

5.1 Manage Users

IMPORTANT SECURITY NOTE!

All FRAMECAD machines are shipped by default with **Admin user access only**. It is highly recommended that a site security policy is developed around user access that meets your security requirements.

TIP! We recommend only certain users should be given full access (as an Admin user) to ensure suitable protection of critical configuration settings.

NOTE! All events and actions initiated from the software will be recoded against the user logged in at the time, and available in machine logs.

About user roles

There are only two types of roles: Admin and non-admin.

Admin role users can:

- Add, edit and delete other users of the machine.
- Perform all tasks on the machine
- Access all menus and change all configuration settings on the machine.

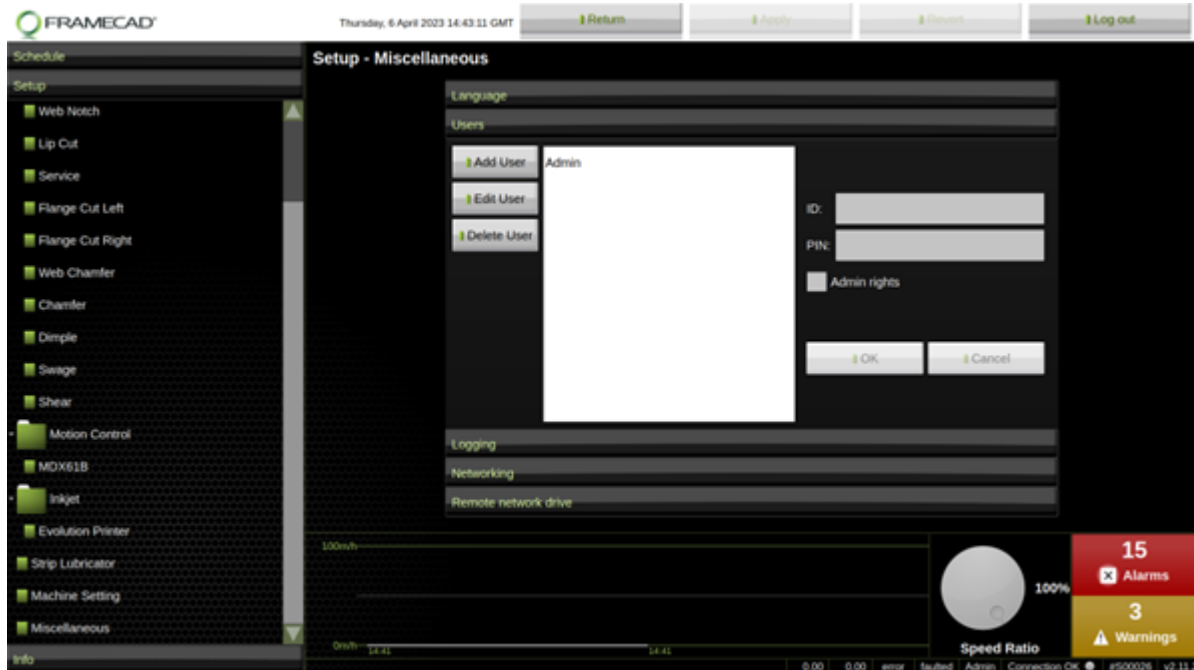
Non-admin role

Non-admin users cannot do many of the machine configuration or change settings - these areas will be greyed out in the software.

Add, edit or delete a user

Only users with the Admin role can add new users.

To add, edit or delete user profiles, go to **Setup > Miscellaneous > Users** tab.



1. Press the **Add User** option.
2. Enter the user's name into the **ID** text box.
3. Enter a **PIN** that the user must enter to log into the machine.
4. If you wish the new User to have full Admin rights, select the **Admin rights** checkbox.
5. Press **OK** to enter the new user.

5.2 Set Time and Date

You can set the local date and time for your machine.

This is important:

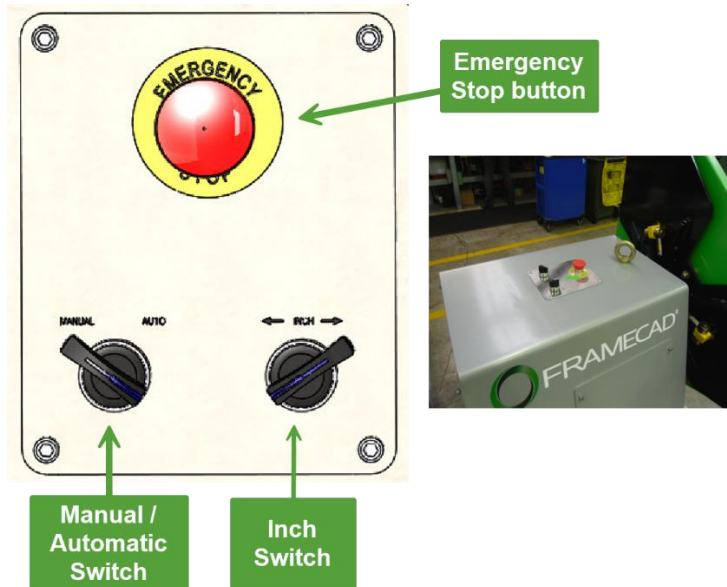
- if you choose to print time/date of production on sticks produced by the machine
- to display the correct license period for the software
- for monitoring production data in [MyFRAMECAD](#) (if your machine is connected to the internet).

Access Admin menu

After safely powering on the machine (see 3MT Decoiler Controls

For 3MT decoilers, there is no reason to change the setup or controls on the decoiler after installation, apart from daily testing of the **Emergency Stop** button.

For completeness we have included a description of the controls here.



Emergency Stop button

Can be used to immediately halt the machine. Must be tested daily as part of daily setup and safety control testing. See [Safety Control \(Emergency Stop\) System](#) and [Test Safety Control \(Emergency Stop\) System](#).

Manual / Automatic switch

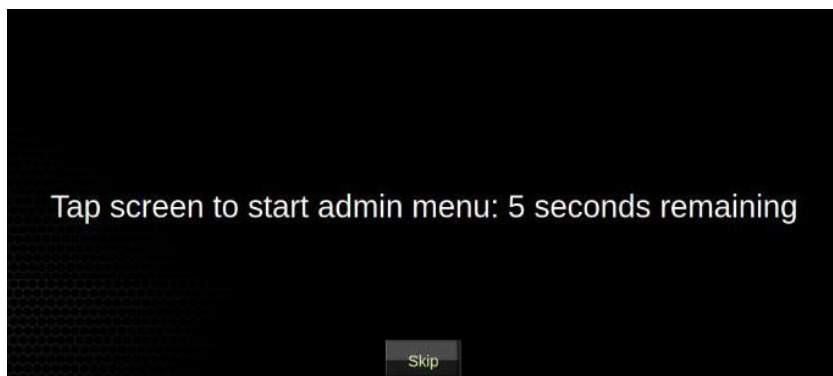
Currently there are no customer procedures that require the 3T decoiler to be in Manual operation mode. Therefore do not move the switch from the Automatic position.

Inch switch

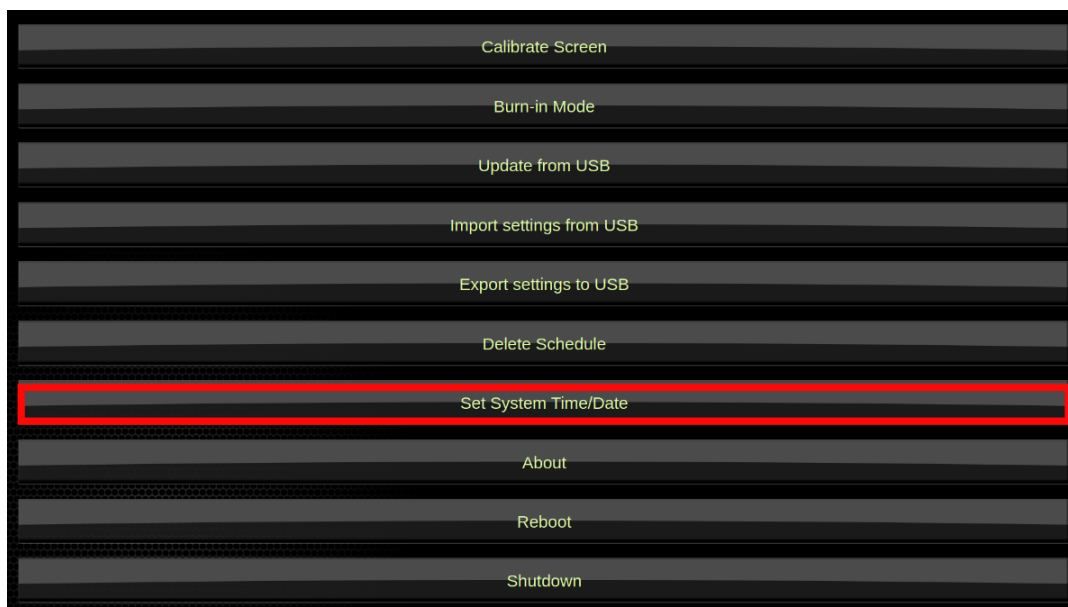
Currently there are no procedures that require the Inch switch to be used.

Power Up Procedure), observe the Operator Touchscreen and wait for the software boot up sequence to complete.

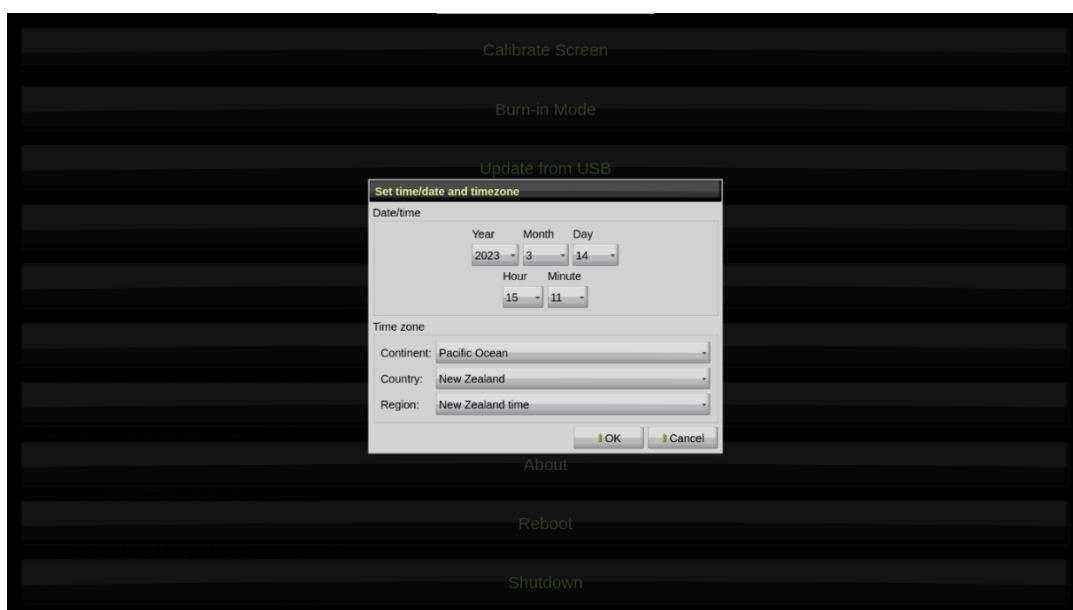
After booting is complete, a 5-second countdown will begin. Tap the Operator Touchscreen before the countdown has finished.



The Admin Menu will open.



Press the **Set System Time/Date** option. The Set time/date and timezone popup will appear.



Enter your time zone information and click **OK** to return to the Admin menu.

Press **Reboot** on the **Admin** menu to reboot the system for the new configuration file to be applied.

TIP! If you are having trouble setting the time and date, the clock's battery may be flat. Please contact us and we can send you a replacement battery.

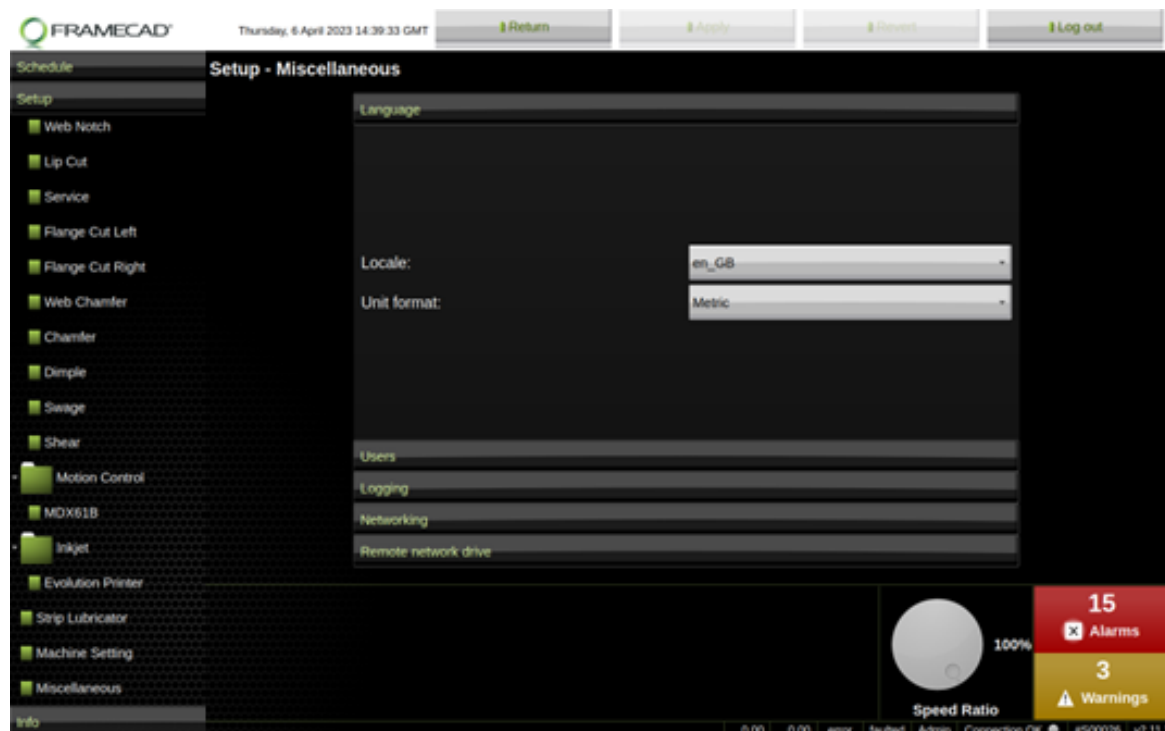
5.3 Select Language & Units of Measurement

To change regional settings including Language and Units of Measurement, go to **Setup > Miscellaneous > Language** tab.

Language Format

The Language tab is used to configure the on-screen Operator display. From here the Operator can select the language to be displayed and the type of units used.

To change the language, simple select the required option from the Locale list box.



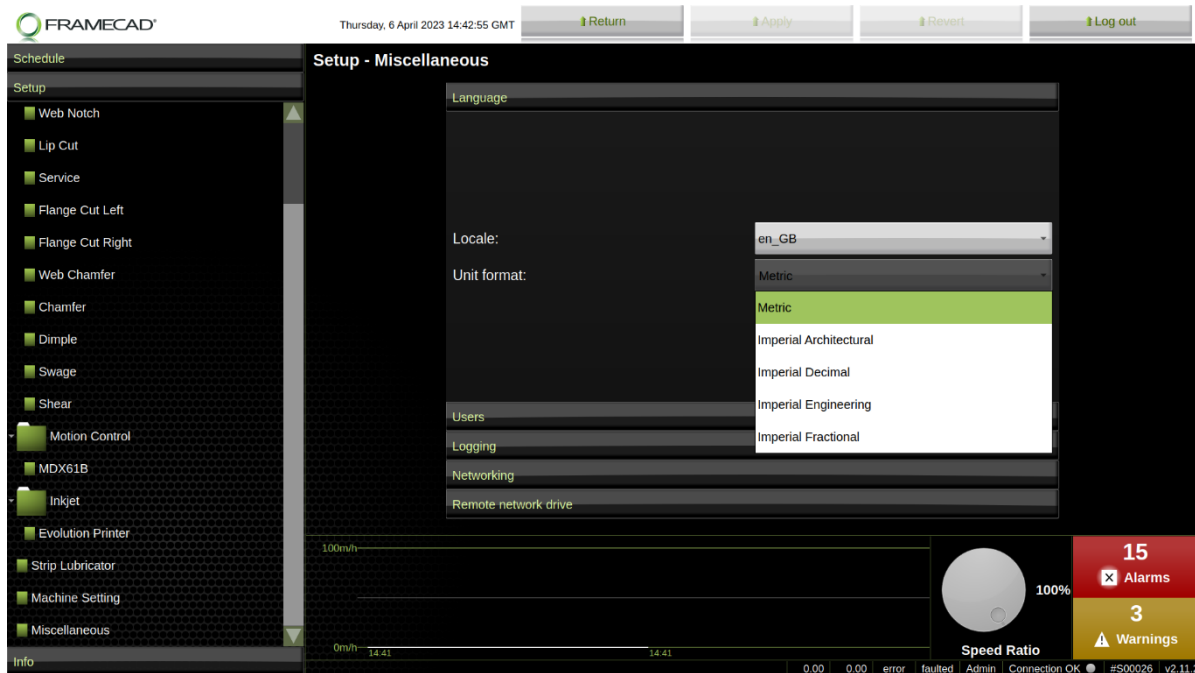
Unit format

To change the type of units used throughout Factory2, select the required option from the Unit format list box. There are 5 options available.

FORMAT	EXAMPLE
--------	---------

framecad.com

Metric	2345.67mm
Imperial Architectural	7'-8 5/8"
Imperial Decimal	92.349"
Imperial Engineering	7'8.349"
Imperial Fractional	3 5/8"



The above will change the type of units to be displayed, and how users enter measurements, in the software.

This will also determine the type of profile options available when configuring the machine setting.

5.4 Connect Machine to the Internet

Each machine is supplied network ready for standard wired Ethernet (i.e. a physical cable connection) or wireless.

TIP! Advantages of connecting your machine to the internet are:

Remote, online diagnosis and support for any problems with your machine
Reporting tools available on our customer portal, [MyFRAMECAD](https://myframecad.com).

There are four options to connect your machine to the internet:

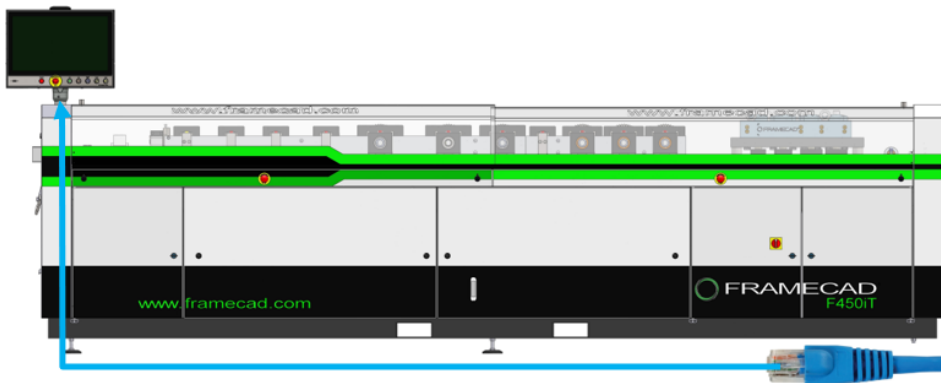
1. **Wired/Automatic:** Use this when your network server supports automatic configuration (DHCP) and you have a physical Ethernet cable

available at the machine. The Ethernet cable must be plugged into one of the LAN ports on the machine Computer (located in the back of the Operator Screen).

2. **Wired/Static IP:** Use this when your network server does NOT support automatic configuration (DHCP) and you must manually enter a Static IP address for connection. You must also have a physical Ethernet cable available at the machine. The Ethernet cable must be plugged into one of the LAN ports on the machine Computer (located in the back of the Operator Screen).
3. **Wireless/Automatic:** Use this when connecting to a Wireless network. You must also have available the SSID (Service Set Identifier) name of the wireless network you will connect to along with the correct security key code. An example of how to connect to a wireless network is given below.
4. **Modem:** Use this when you do not have an available Ethernet (wired or wireless) connection. This will allow you to connect to a digital cellular network (i.e. as used by mobile phones). Typically, you will need your cellular network username and password as supplied by your cellular network service provider.

5.5 Connect to a Wired (DHCP) Network

Connect ethernet cable



Locate the Ethernet ports in the rear of the screen cabinet and insert your network cable into the LAN2 Ethernet port in the screen.

Use only a Category 6 (Cat 6) Ethernet cable to connect the machine to your local area network (up to a maximum length of 100m). This is to ensure the highest quality signal is available.

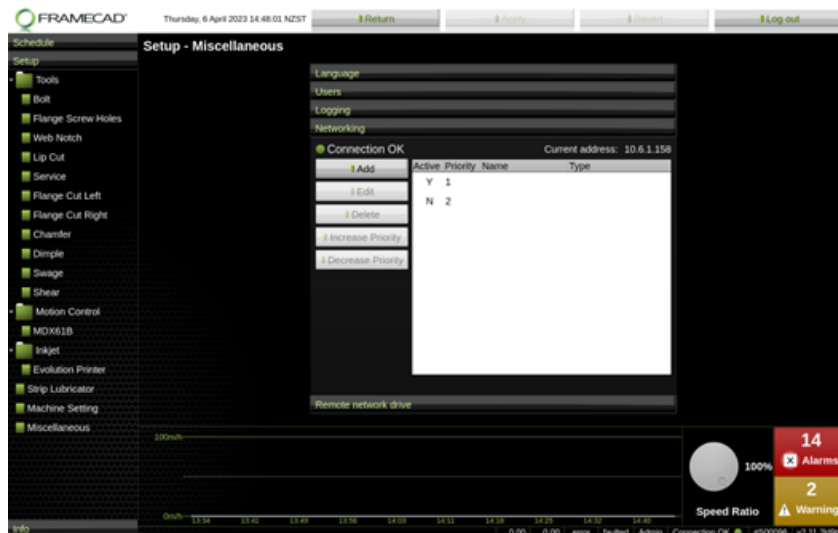
Always take care to ensure the cable is correctly routed through the swivel collar and chassis to avoid mechanical damage to the cable itself.

This example assumes your network is configured for DHCP access which will automatically allocate an available IP address to your computer (client) once connected. If the network is not set up for DHCP, you will need to select the

Wired/Static IP option and enter a static IP address. If you are not sure, please discuss this with your Network Administrator.

Configure machine

Go to the **Setup > Miscellaneous > Networking** tab.



Press **Add** and select the Wired/Automatic option.

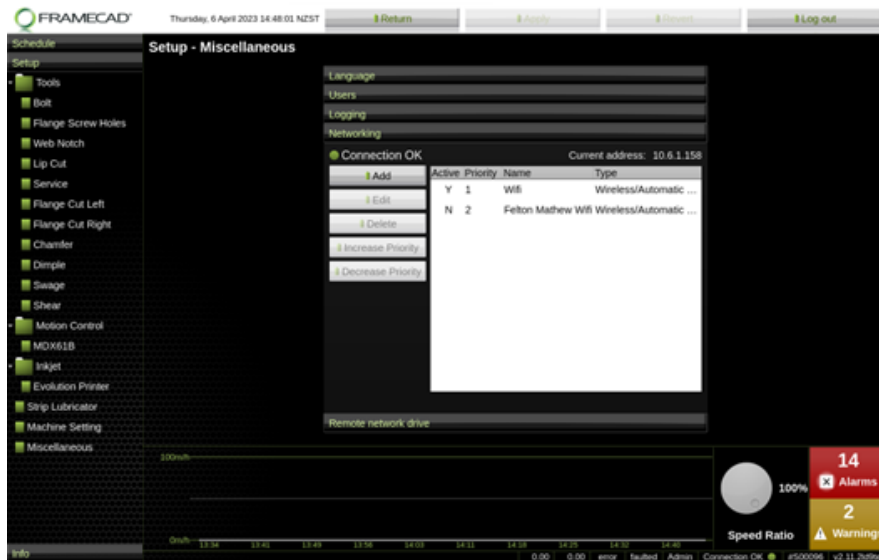
Enter two parameters:

- **Name:** Enter here the name you wish to give your hard-wired network or leave as the default setting. This is just a generic name you can choose to help identify various networks you may have configured on your machine.
- **Interface:** This identifies the Ethernet port you have connected your cable to on the machine computer. For LAN2 this should be 'eth1'.

If the network connection is successful, the **Connection OK** indicator light will be illuminated green on the **Setup > Miscellaneous > Networking** screen and also on the bottom right of the Operator Touchscreen.

5.6 Connect to a Wireless Network

Go to **Setup > Miscellaneous > Networking** tab.



Configure the five parameters below.



- **Name:** Enter here the name you wish to give you wireless network or leave as the default setting. Please note this is not the SSID or wireless network name but a generic name you can choose.
- **Interface: IMPORTANT - Do not change this from the default setting 'wlan0'.** This identifies the wireless card and card number installed on the machine computer.
- **SSID:** This is the actual wireless network name – you must enter the correct SSID. Your IT support team will be able to provide you with this.

- **Key:** This is the wireless security key (password) to be able to log on to the network. Your IT support team will be able to provide you with this.
- **WPA:** Select this option if your network requires WiFi Protected Access to be enabled. Your IT support team will be able to confirm if this is a requirement.

If the network connection is successful, the **Connection OK** indicator light will be illuminated green on the **Setup > Miscellaneous > Networking** screen and also on the bottom right of the Operator Touchscreen.

5.7 Set Up a Remote Network Drive

Your machine can be configured to access a remote network drive.

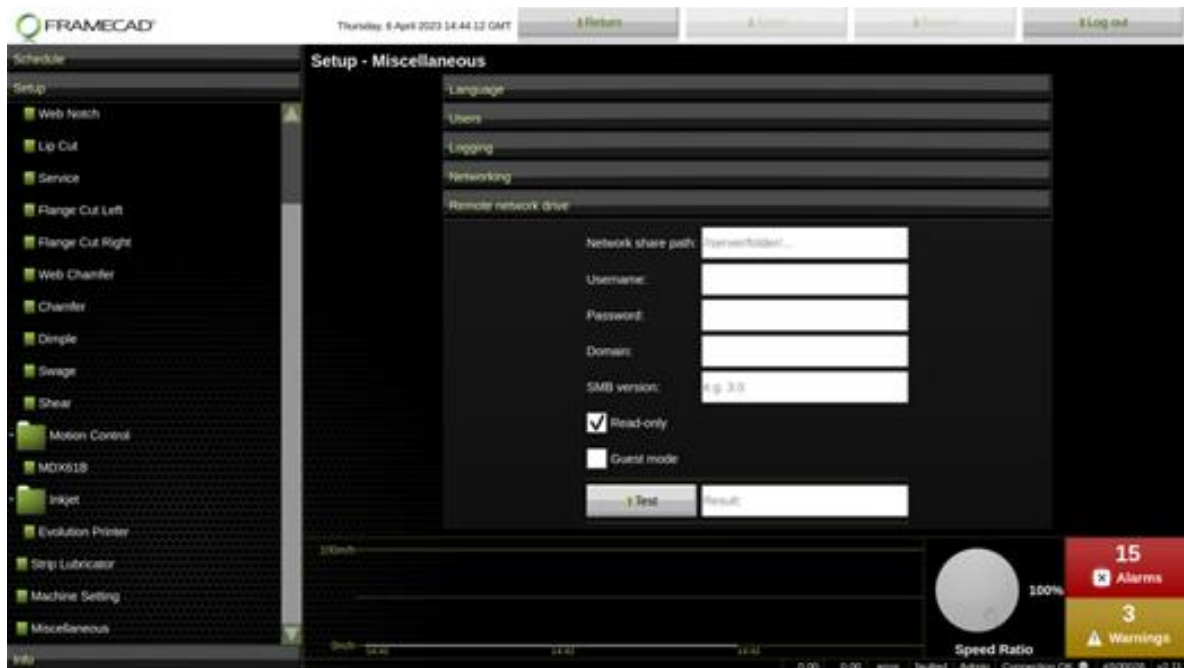
You can then load jobs onto the machine from the network, rather than loading them onto the machine via USB stick.

Prerequisites

To do this, the machine must be connected to the internet, and you must have permission to access the network drive.

Procedure

Go to the **Setup > Miscellaneous menu, Remote Network Drive** tab.



Enter information:

- **Network share path:** This is the path of the network drive where the job files will be stored. Please note that the network share path should use forward slashes (/) instead of backward slashes (\).

- **Username:** The username required for accessing the network share path.
- **Password:** The password required for accessing the network share path.
- **Domain:** The domain of the network share path.
- **SMB Version:** This is the CIFS protocol used for accessing the network share path. This is usually 3.0.

Press **Test** to verify the connection. If the connection is successful, the Result box will display Success!

Press **Apply** to save the information.

See [Load a Job for Production](#) for instructions on loading jobs from the network drive.

5.8 Pause Automatic Production after Each Frame

The machine has a feature that will automatically pause production after all components of a frame have been produced.

A frame is a sub-assembly of sticks, also called a panel. Examples include a wall or truss.

A reminder about job components is below.

About job (project) components

Jobs are structured in a hierarchy that includes four nested folders:

- Top level: Job / Project. A collection of plans.
 - Next level: Plan. Designs for a structure, or part thereof.
 - Next level: Frame. A sub-assembly of the structure, such as a wall or truss. Also known as a panel.
 - Next level: Stick. The individual components that make up the sub-assembly above it. Also called a profile.

Reasons to pause production after each frame

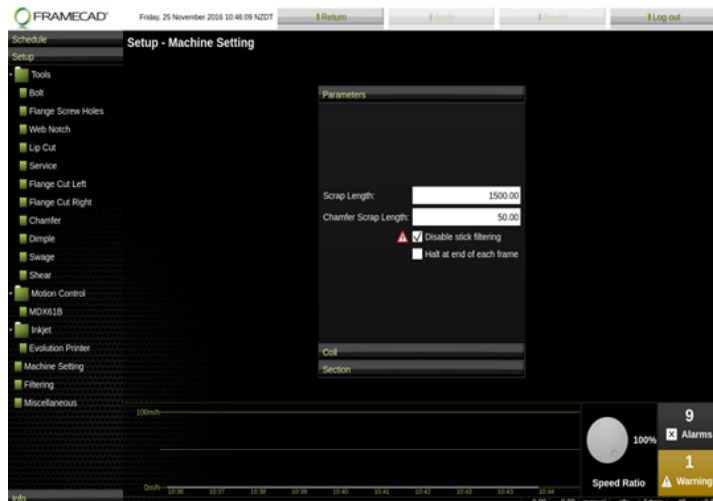
Pausing production gives operators time to collect all the sticks for the frame and put them in a place ready to be assembled.

Automatic production will be paused until the operator resumes it with the **Start** button .

How to enable this feature

To enable pausing after a frame during Automatic production:

1. Go to **Setup > Machine Setting** and select the **Parameters** tab.



2. Check the box next to Halt at end of each frame.

5.9 Edit Text Printed on a Stick

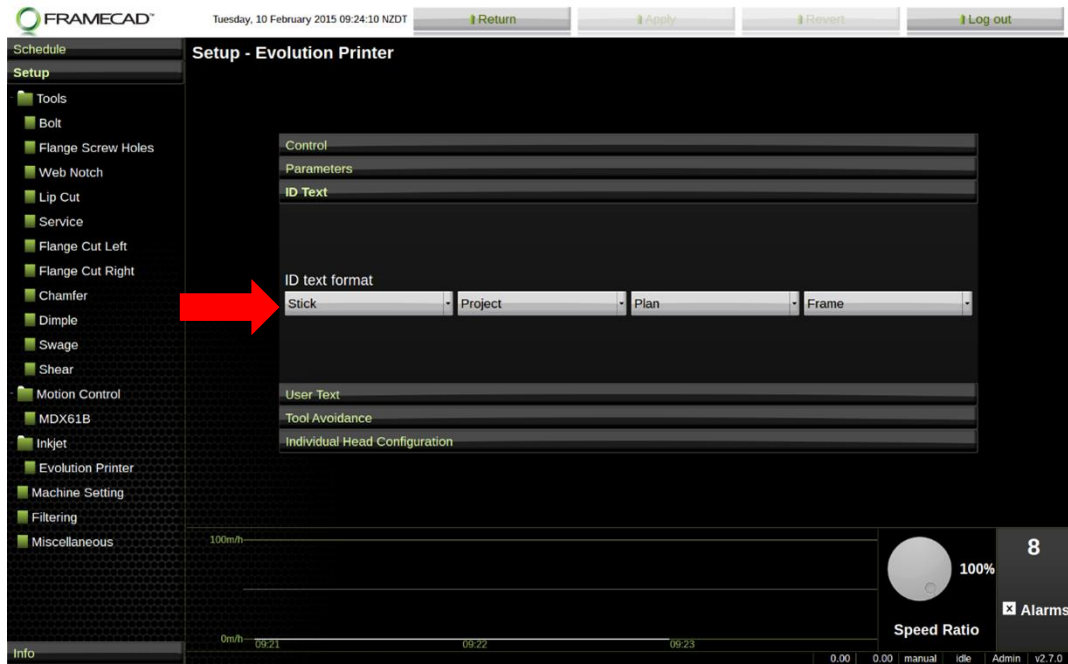
To define the text you wish to be printed on sticks, go to the ID Text and User Text tabs on the **Setup > Inkjet** page.

One side of the stick will be printed with identification information set up with the ID Text tab, and the other side of the stick is available for any information you wish to include, which can be set up with the User Text tab.

ID Text tab

By default, the identification text printed on each stick will include information on the *project name*, *plan*, and *frame* details. Each field can be turned on or off and the printed order of each changed to suit requirements using the drop-down list boxes found under this tab.

Typically, only one side of the stick is used for identification (this is to ensure that the identification information is all on the same side of the profile during assembly).



User Text tab

This tab provides options to create text to appear on sticks.

Text on sticks could be the date/time of manufacture, project name, quality assurance details (for example the coil number, shift name, etc.) or the manufacturer's name or contact information.

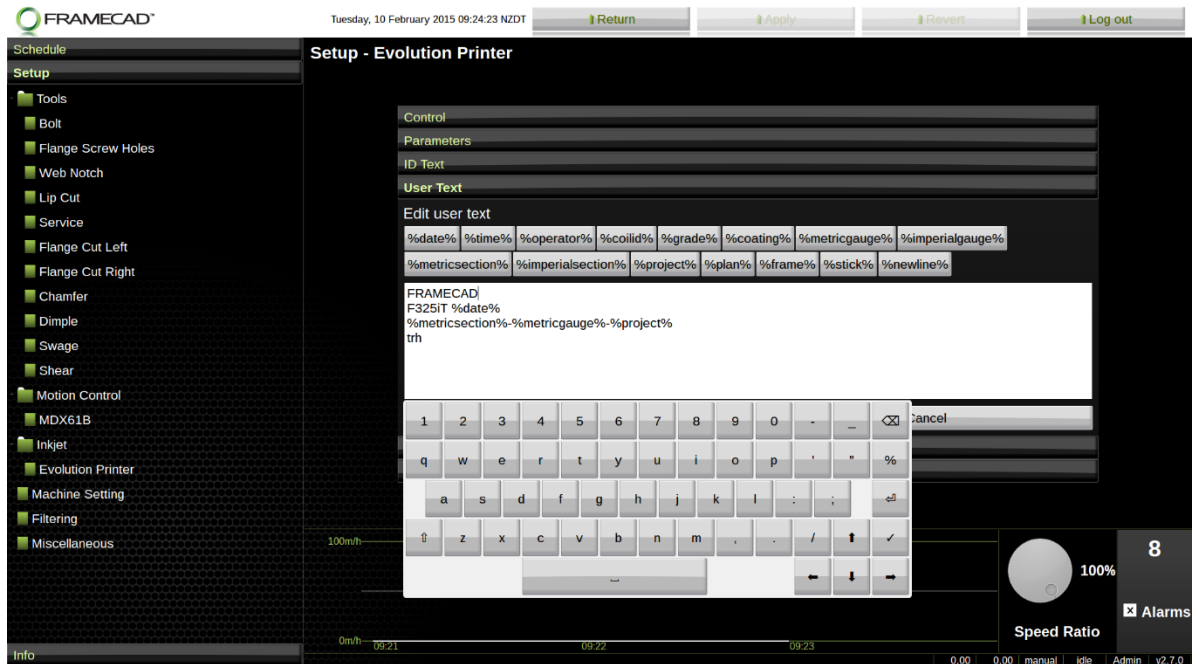
You can select a new user text message from existing options, edit an existing message or directly import a new text message from a network connection or a USB memory stick.

In addition to simple text messages, there are pre-defined power fields that can be used to insert a default system variable within a particular user text message. Some common examples are:

- %date% - this will insert the current system date in the User Text.
- %time% - this will insert the current system time in the User Text field.
- %operator% - this will insert the logged in Operator in the User Text field.
- %coilid% - this will insert the current Coil ID number in the User Text field.

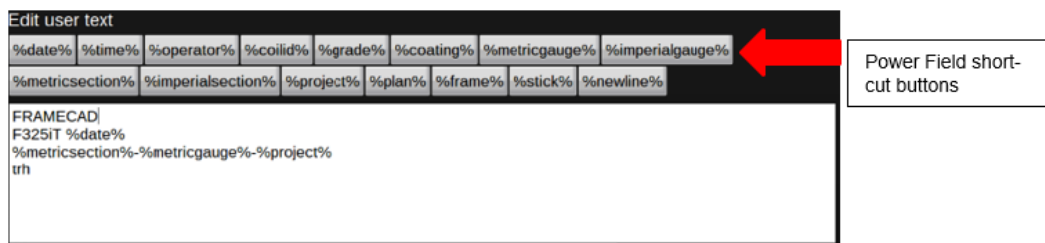
Editing an existing User Text field

To edit a user text field, select the field inside the text box so that it is highlighted in green. Then press the **Edit user text** option below the text box.

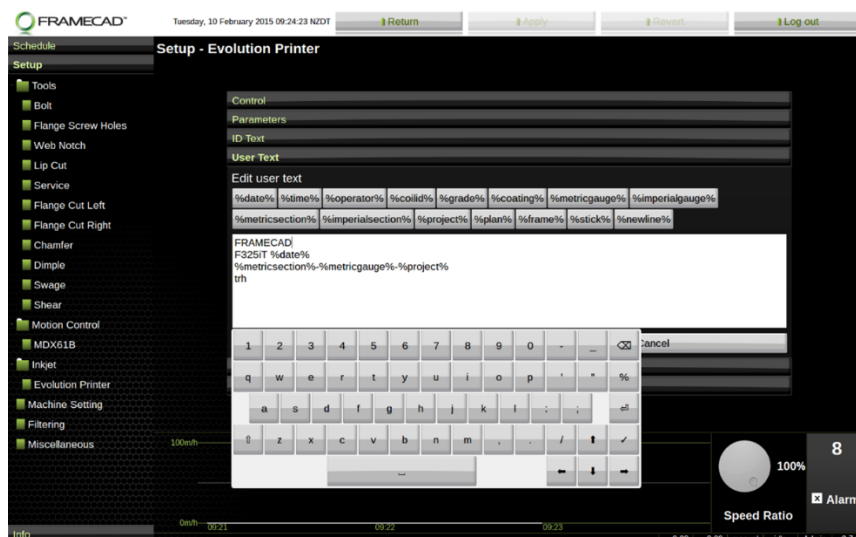


You can then use the pop-up keyboard to edit the text as required, or insert a power field:

- To insert a power field, press one of the short-cut options listed above to insert the power field text or directly type in using the pop-up keyboard (remember to use the "%" delimiter)



- Or press inside the text box and use the pop-up keyboard to type in text.



Creating User Text using an external file

Sometimes it may be preferable to create new user text messages using an external text editor (such as Notepad.exe or similar) that can produce *.txt files. You can upload the *.txt file to the machine via the USB port on the Operator Touchscreen or via network connection (if set up).

To import the file, from the User Text tab, press the **Import new user text file** option, and select the file from your USB stick. Press **Load**. The user text messages will be uploaded. You can then choose which user text option you want printed.

IMPORTANT NOTE!

Each User Text message should be entered in a ***single continuous line***. Each new line will be interpreted as a separate User Text message. Messages cannot exceed 48 characters in length.

User Text spacing is not supported for Evolution Printers.

Avoiding printing text on tool cutouts

The **Tool Avoidance** tab allows the operator to specify tool cutouts to *avoid* when printing on the stick. This means printed information will not be lost on cutouts on the stick, e.g. flange cuts, as these remove steel from the surface of the stick that is used for printing.

The name of the tool and its physical length (which varies by machine) must be input in this tab.

Use the drop down lists next to Avoid Tool (LH) and Avoid Tool (RH) (one is available for each side of the stick profile) to select the tool. Tap the option once to display the list then select the appropriate tool.

The length of the tool can be found under **Setup > Tools**, and must be entered in mm.



IMPORTANT NOTES!

Each User Text message should be entered in a ***single continuous line***. Each new line will be interpreted as a separate User Text message.

User Text messages are limited 48 characters in length.

ONLY the standard ASCII character set is available.

5.10 Set Machine to Operate in Cold Mode

There is an option to enable a "Cold Mode" of hydraulic operation on your machine.

You can enable Cold Mode:

- as a precautionary measure when temperatures in your operating environment approach the lower operating limit of 0°C, or
- you observe that steel gets jammed in your machine when temperatures are cold.

What does Cold Mode do?

When Cold Mode is enabled, whenever production is started after the hydraulics have been off for more than six hours, the hydraulic punch tools in the machine will punch slower (i.e. the Up Delay and Down Delay times for all tools will be doubled) for the first 30 minutes of machine operation. This reduces the likelihood of tools jamming while the hydraulic system is warming up.

After 30 minutes, the Up Delay and Down Delay times will return to normal.

Cold Mode will slightly slow down the manufacturing speed of the machine for the first 30 minutes, therefore a warning will appear on the Operator Screen indicating that Cold Mode is active.

Warnings

Cold mode is enabled, this will slow the machine's speed

Wednesday, 1 November 2023 08:49:00 GMT

How to enable Cold Mode

Go to **Setup > Hydraulics** and check the **Enable Cold Mode** checkbox.

Setup - Hydraulics

Cold Mode

☒ Enable Cold Mode

Diagnostics

5.11 Set Scrap Lengths

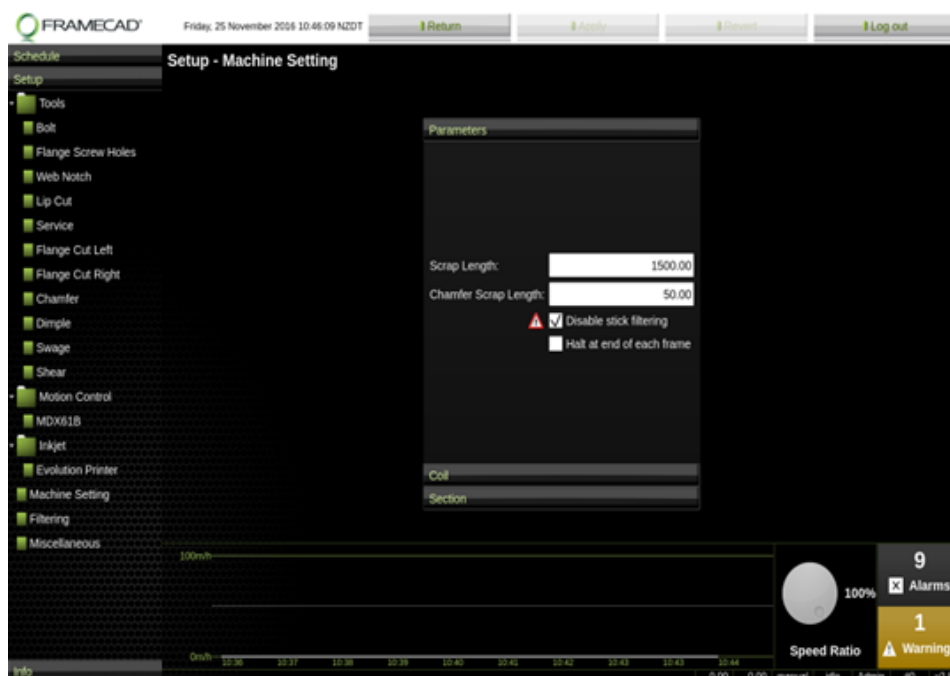
Whenever the machine is first placed into Automatic (or Semi-Automatic) control, the length of steel strip inside the machine - from the first tool to the shear tool - will be wasted as *scrap*.

You can tell the software to cut this scrap steel into smaller, more usable lengths if required.

NOTE! The machine will still produce the same quantity of scrap but will cut it into the (shorter) specified length.

To set scrap length, go to **Setup > Machine Setting, Parameters** tab.

Enter your desired scrap length value in the **Scrap length** field.



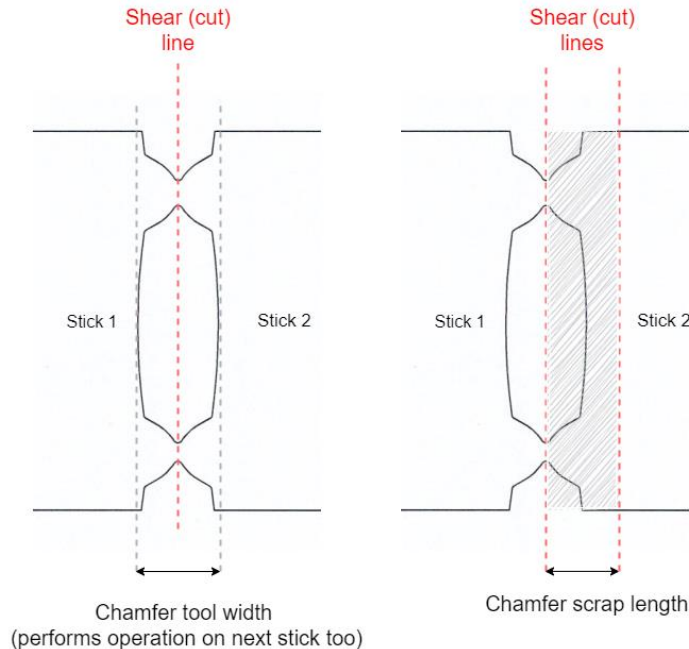
Set chamfer scrap length (mm)

The chamfer tool cuts the stick so that the end is rounded. Sticks with rounded ends may be inserted into other sticks at an angle.

However the tool will also perform the chamfer operation on the next stick in line, unless a value is set up for a length of scrap to be added after the stick requiring the chamfer.

Usually the next stick does not require the chamfer cut, so you can set a scrap length for the next stick so that the other side of the chamfer cut does not appear on the stick.

NOTE! This scrap length must not end directly on the existing chamfer cut, due to the tendency of the steel to warp and jam in the shear assembly when there are pieces of the steel missing.



You may wish to increase this length if you are having trouble with the steel getting jammed in the machine.

To set the chamfer scrap length, enter a value in mm in the **Chamfer Scrap Length** field.

5.12 Set Up Downtime Logging for Automatic Production

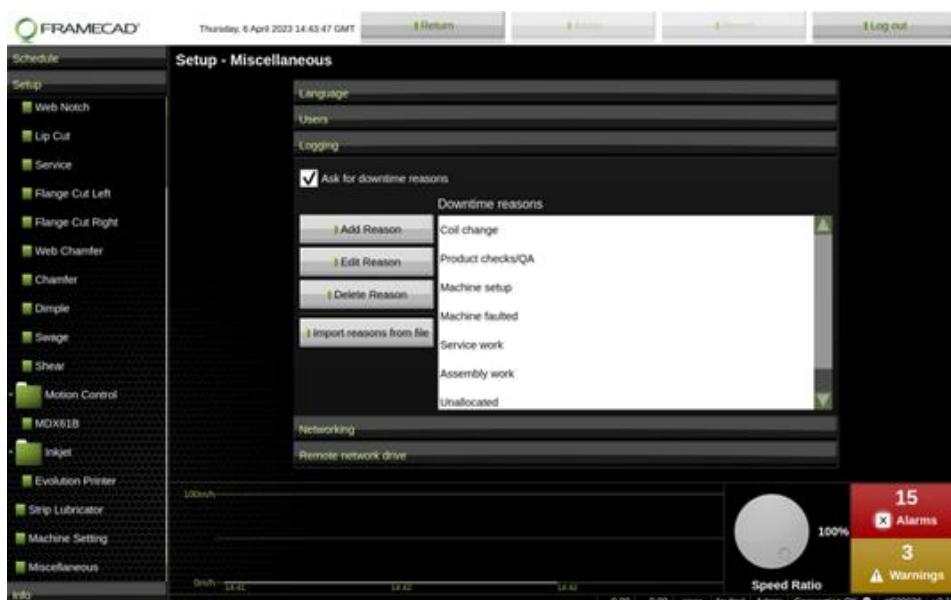
The software provides an option to ask the operators to enter a reason if they need to pause automatic production. A popup asking for a reason will appear if the machine is paused for more than 10 seconds. Production will not resume until the operator has selected a reason.

This feature is called **Downtime Logging**.

The downtime reasons are logged so that managers can review events that contribute to down-time or steel scrap.



To set up Downtime Logging, go to the **Setup > Miscellaneous** menu, **Logging** tab.



- Select the **Ask for downtime reasons** checkbox to enable this feature.
- A list of default reasons will appear in the **Downtime reasons** box.
- You can add, edit or delete downtime reasons as required.
- You can add reasons via a plain *.txt file if you wish. Note that each reason needs to be on a new line.

All downtime reasons will be logged so that summary data can be extracted using online tools available at [MyFRAMECAD](https://myframecad.com).

Accessing downtime reason logs

To access the information logged by operators for downtime reasons, see [Accessing Machine Logs](#).

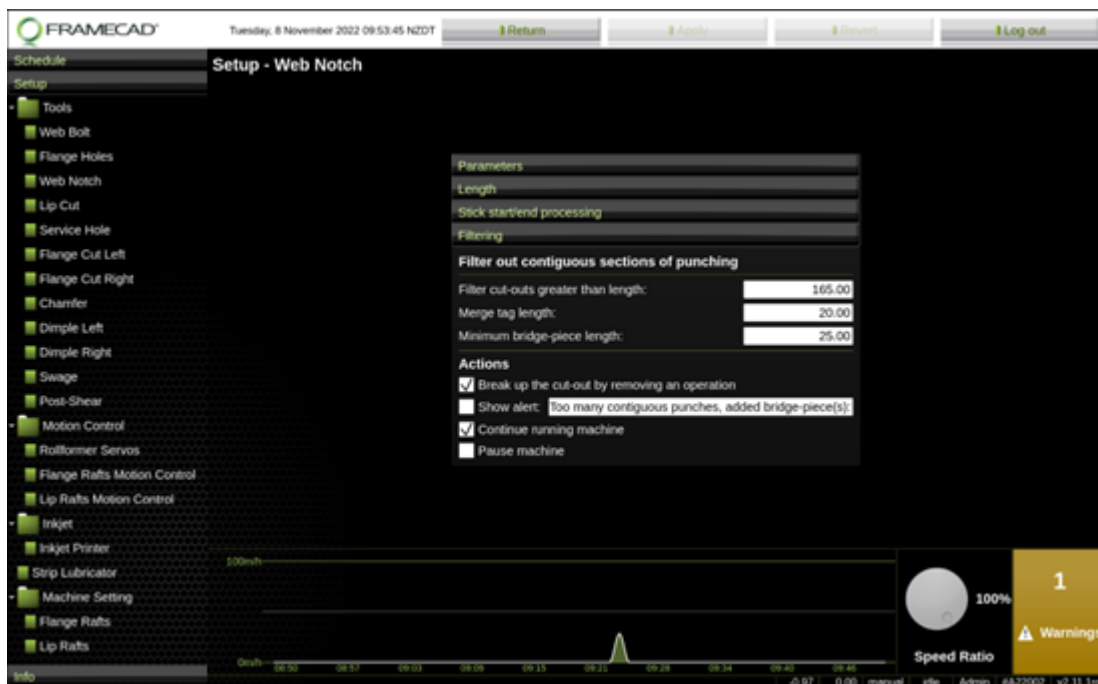
framecad.com

5.13 Filter for Problematic Tool Sequences

Occasionally profiles are designed with certain sequences in tooling that can cause undesirable results. For example, too much steel removed from a web (punching out too many successive web notches in a row) will limit the steel's contact with the rollers and prevent its movement inside the machine, resulting in a jam-up. Another example is too little steel being left in between lip cuts, as this will create a very sharp point in between the lip cuts.

To prevent these undesirable results, the machine control software allows you to create "filters" that look for specific tool sequences with the potential to cause problems. If such a tool sequence is encountered, you can define how the sequence will be managed.

These filters can be created in **Setup > Tools**, on the **Filtering** tab for the tool. This tab appears for length tools only, for example Flange Cut, Lip Cut, and Web Notch.



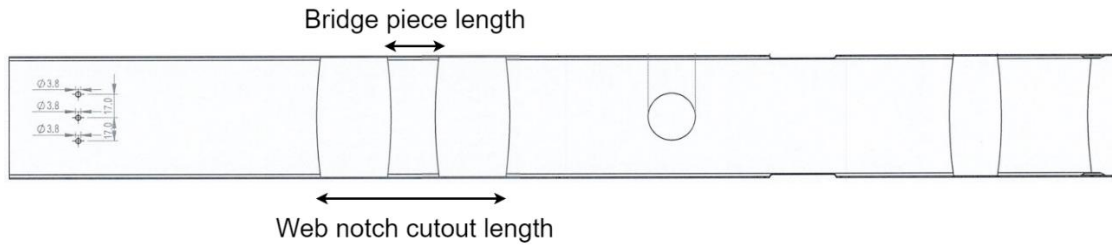
Filtering tab in software

Filter out problematic sequences of punching

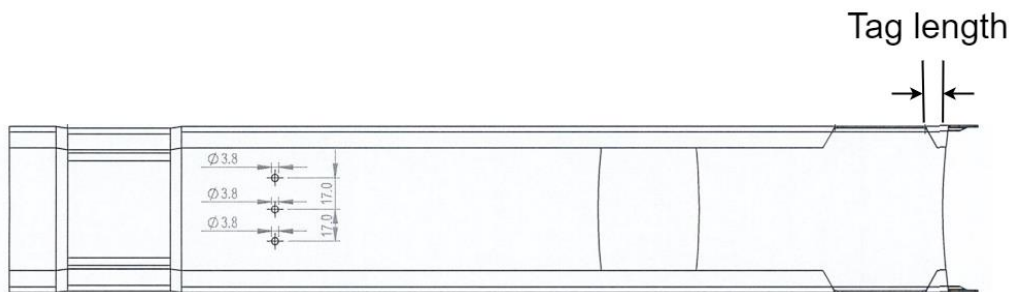
When a profile is formed in the machine, the software will perform the following checks:

1. Look for **cutouts longer than a specified length** - for example if a web notch is punched successively too many times and removes a length of web over a certain threshold, you can tell the software to leave in a piece (called a "bridge piece") that you can remove using steel snips later (removing the bridge piece by hand is far easier than removing a jammed piece of steel from the machine). This bridge piece is formed by removing

one or more punches of the tool (e.g. web notch) that would normally remove the bridge piece.



2. Look for **pieces of steel in between cutouts that are below a minimum length** (called "tag lengths") and remove them. This could be to ensure no sharp pieces are left over from lip cuts, or no thin strips are left between web notches due to the risk of them warping and jamming in the machine.



To prevent the machine removing too many cutouts and potentially causing a jam-up

1. Enter a value in the **Filter cut-outs greater than length** box. If the software encounters successive cut-outs greater than this value, it will perform the actions selected under the Actions heading, AND
2. Enter a value for the **Minimum bridge piece** length that should be kept in place to provide adequate surface area for grip during the rolling process. If the software finds a bridge piece shorter than this length, it will perform the actions selected under the Actions heading.
3. Select the Action(s) that will be triggered by the above:

Actions	
☒	Break up the cut-out by removing an operation
☐	Show alert: Too many contiguous punches, added bridge-piece(s):
☒	Continue running machine
☐	Pause machine

- a. **Break up the cut-out by removing an operation:** Selecting this checkbox will force the software to remove one or more tooling operations to bring the cut-out size back within the criteria established by the filter.

- b. **Show Alert:** Selecting this checkbox will display an Alert message on the Operator Screen when the operation is removed.
- c. **Continue running the machine:** Select this option to keep the machine running even when the tool scenario defined by the filter has been detected.
- d. **Pause the machine:** Select this option to automatically pause the machine when the tool scenario defined by the filter has been detected. This will allow the Operator to make any changes necessary (i.e. edit the Stick parameters or place the machine into Semi-Automatic control).

To merge tag lengths

Enter a value in the **Merge tag length** field. The software will merge tool cutouts if the tag length (the length between two successive cutouts) is $\leq$ this value (in mm). It will do this by performing an extra punch to remove the tag piece. Tag lengths below a certain minimum will be removed because it is not ideal to have small pieces of steel in between cutouts due to risk of them warping and getting stuck in the machine, and sharp pieces present risk of injury.

There are no **Actions** required for this selection.

5.14 Renew Machine Software License

The software on FRAMECAD machinery is licensed, paid software. You need a valid license for the software in order to use the machine.

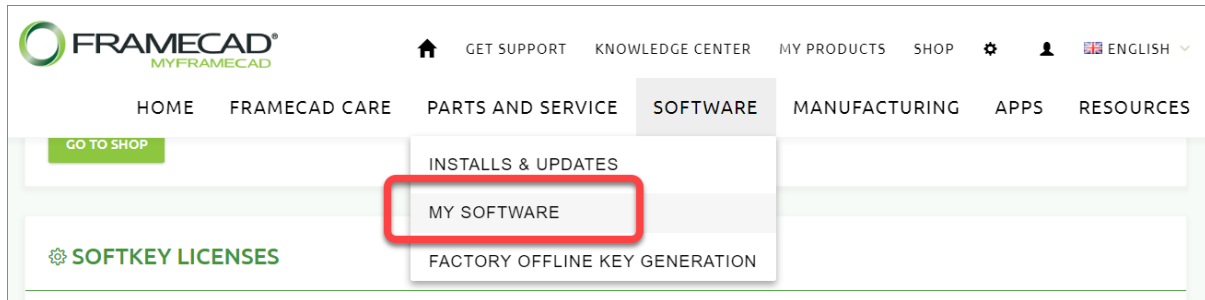
When there are 30 days remaining on your license, a warning message will appear on your operator touchscreen reminding you to renew your license. A message will also appear in the MyFRAMECAD customer portal advising of the imminent expiry.

When your license expires, a **No License** alarm will appear, and you will not be able to use your machine.

How to tell how much time is left on your license

The best way is to visit [MyFRAMECAD](https://myframecad.com).

Go to the MY SOFTWARE page in the SOFTWARE menu.



Scroll down to the SOFTKEY LICENSES heading to see your Factory2 (machine software) license.

SOFTKEY LICENSES					
	Machine Serial	Seats in Use	Serial No	Secret Key	Expiry Date
FRAMECAD Structure		0/1	SR-000618-0TW7AA		Jan 1, 2024
FRAMECAD Detailer		0/1	DT-000747-2WTVTD		Feb 14, 2023
FRAMECAD Factory	S00070	0/1	FA-000784-A1Q5B7		Feb 28, 2024

You can also look in the **Info > DRM Licensing** screen on your machine.

How to renew your license

Step 1: Buy license

You will need to buy a license from MyFRAMECAD.

Log into [MyFRAMECAD](#).

Click on the **SHOP** menu.

Renew your license for your desired period.

Step 2: Update your software version

After you've paid for your license, it's a good idea to update your software version to get the latest developments. See [Update Machine Software Version](#) below.

Step 3: If your machine is online

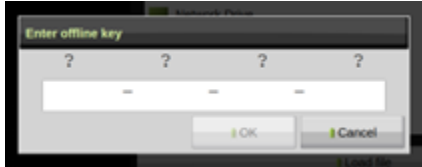
If your machine is connected to the internet, it will download the license key automatically as soon as the payment is processed, and the license is available in MyFRAMECAD.

If you suspect connectivity issues, press the **Refresh** button on the DRM Licensing page.

Step 4: If your machine is offline

As soon as your payment is processed, you will receive an email advising that your license key is available in MyFRAMECAD. Go to [MyFRAMECAD](#) and make a note of the key.

Input the 24-digit alphanumeric license key into the **Info > DRM Licensing** screen, **Update** tab.



5.15 Update Machine Software Version

As a company that thrives on innovation, FRAMECAD is committed to the process of continuous improvement and development of all its products, including Factory2. As new enhancements or features are introduced, software updates are released that can be installed to ensure that your FRAMECAD machine is always running with the latest version.

IMPORTANT NOTE!

If you are not currently running a version of FRAMECAD Factory2, please discuss with our Customer Success team as other updates will be required first. See [Further Support](#) for detail on access to your customer portal.

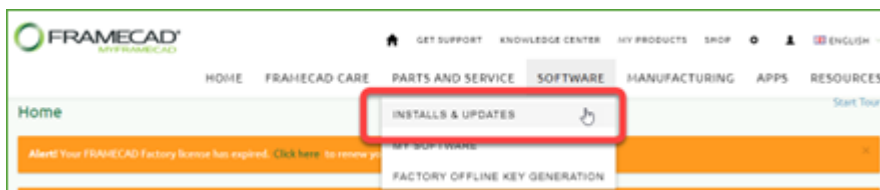
As long as you have a valid (paid) license, you can download an updated version anytime.

Items required

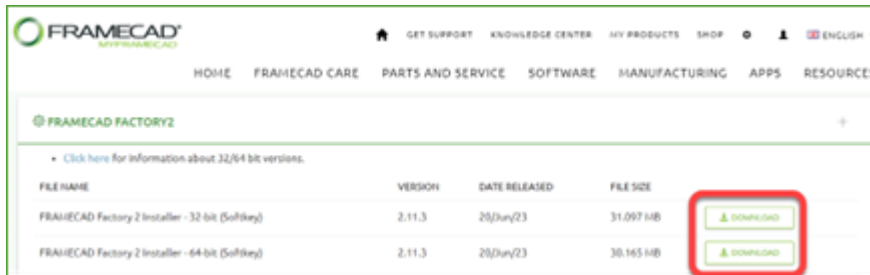
- USB stick
- PC or laptop
- Machine already running a version of Factory2. If your machine is running Factory 1 or earlier, please contact us before updating.

Download updated software version

1. Log into [MyFRAMECAD](#).
2. Go to the **SOFTWARE > INSTALLS & UPDATES** menu.



3. Scroll to the bottom of the page until you reach the **FRAMECAD FACTORY2** heading. Download the version applicable to your machine (32bit, 64bit or Framecad OS).



4. Transfer the downloaded package onto your USB stick.
5. Take the USB stick to your machine. Insert into the USB port on the Operator Screen.

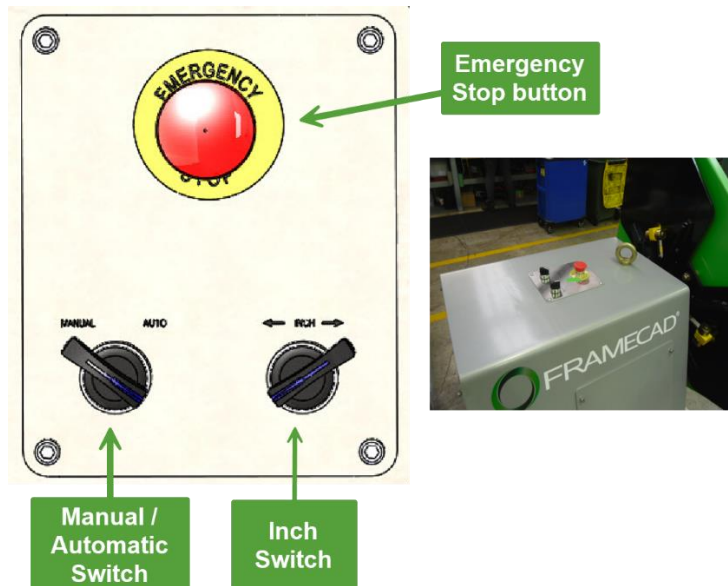
Upload new Factory2 version to machine

Access Admin menu

After safely powering on the machine (see 3MT Decoiler Controls

For 3MT decoilers, there is no reason to change the setup or controls on the decoiler after installation, apart from daily testing of the **Emergency Stop** button.

For completeness we have included a description of the controls here.



Emergency Stop button

Can be used to immediately halt the machine. Must be tested daily as part of daily setup and safety control testing. See [Safety Control \(Emergency Stop\) System](#) and [Test Safety Control \(Emergency Stop\) System](#).

Manual / Automatic switch

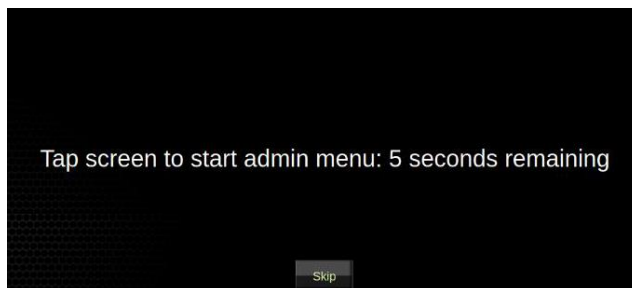
Currently there are no customer procedures that require the 3T decoiler to be in Manual operation mode. Therefore do not move the switch from the Automatic position.

Inch switch

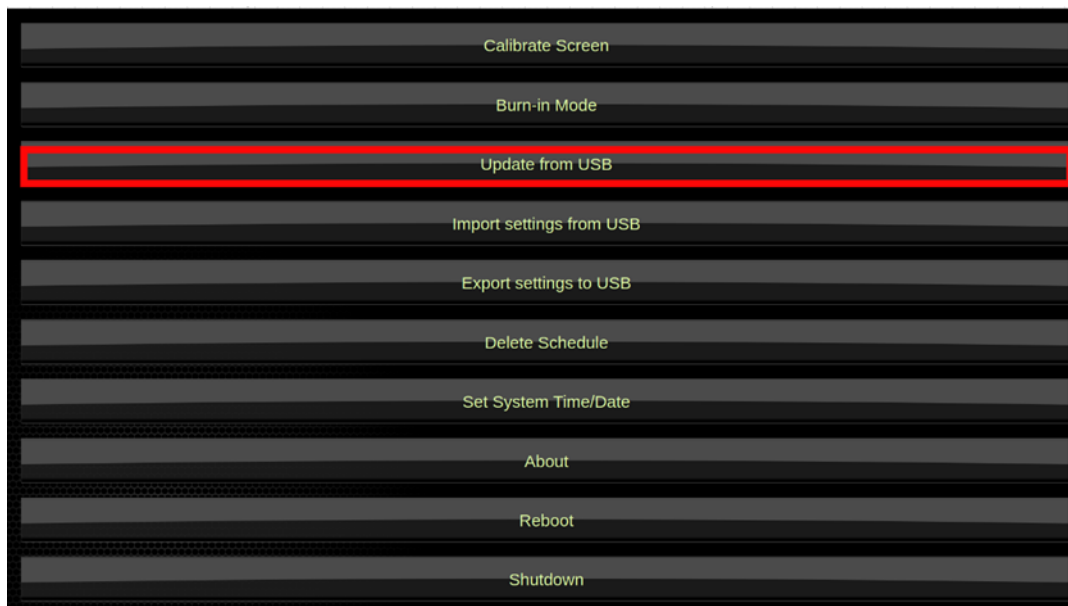
Currently there are no procedures that require the Inch switch to be used.

Power Up Procedure), observe the Operator Touchscreen and wait for the software boot up sequence to complete.

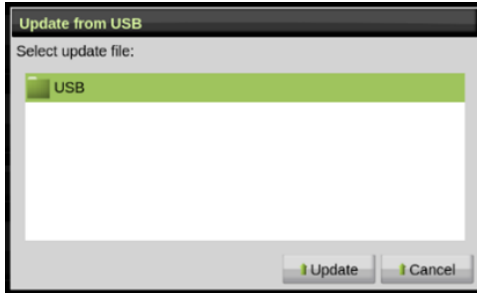
After booting is complete, a 5-second countdown will begin. Tap the Operator Touchscreen before the countdown has finished.



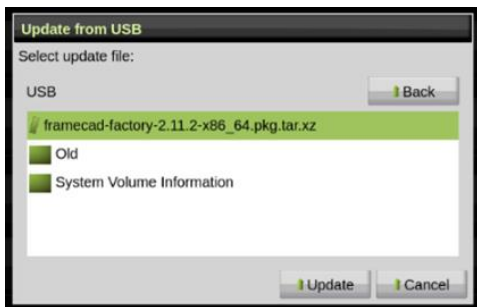
The Admin Menu will open.



From the Admin menu, select **Update from USB**. The Update from USB popup will appear.



Select the USB and the files on the USB will appear. Select the package file you want and press **Update**.



When finished, a popup showing **Installation Finished** will appear. Press **OK** to return to the Admin menu.

Press **Reboot** on the **Admin** menu to reboot the system for the new configuration file to be applied.

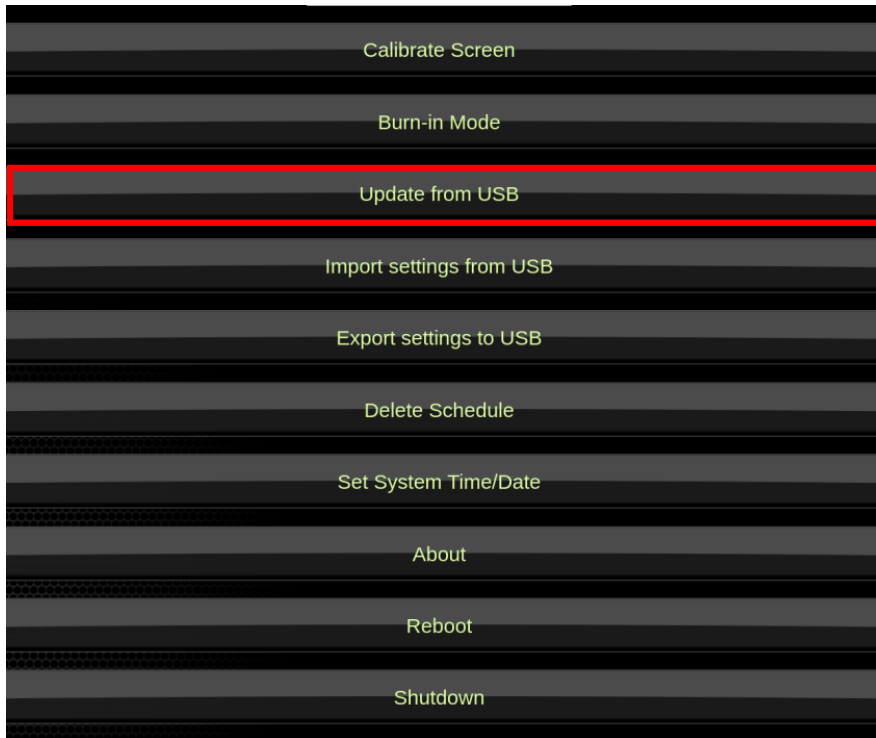
After the system reboots, confirm the latest version is running - the version is displayed on the bottom right of every screen.

5.16 Update Scripts

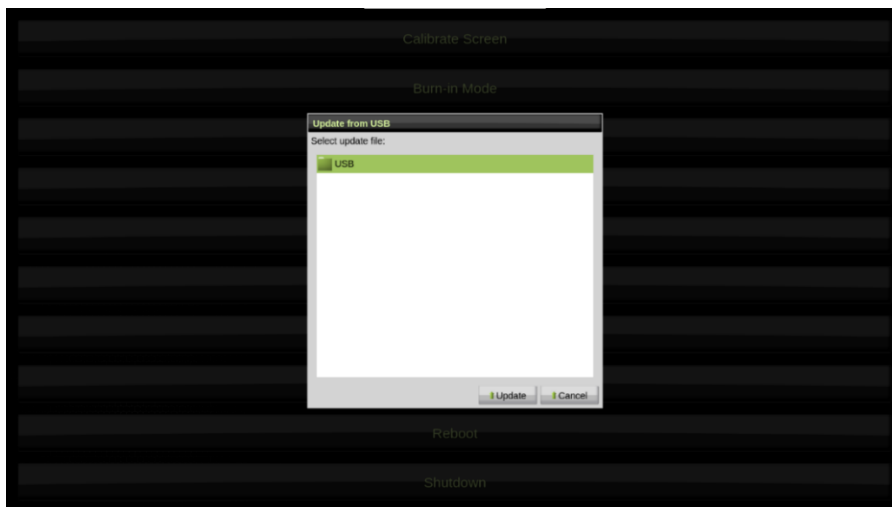
This is done when FRAMECAD provides a script that updates the Factory2 software when a hardware or configuration change is made to the machine.

This script will be provided by a FRAMECAD technician or staff member.

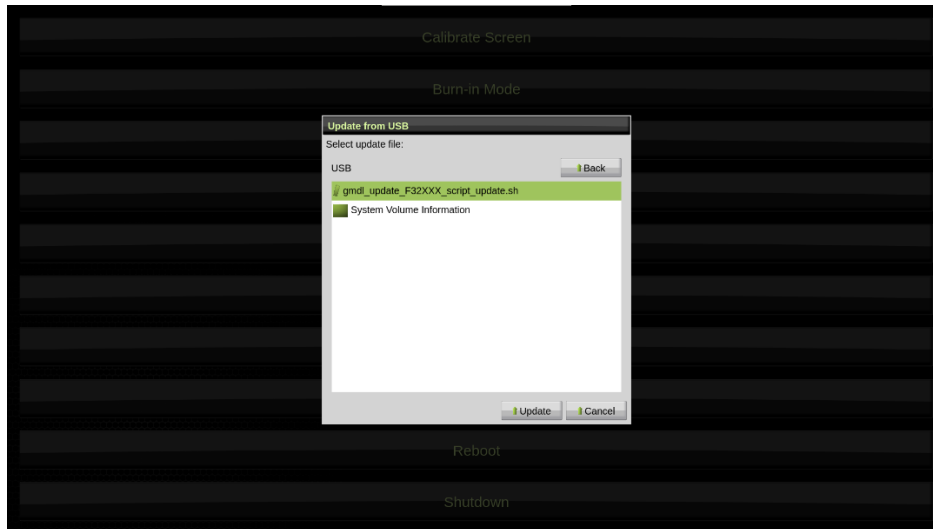
1. Transfer the script onto a USB flash drive.
2. Insert the USB Drive into the USB port on the front of the Operator Touchscreen.
3. In the Admin Menu, press the "Update From USB" button.



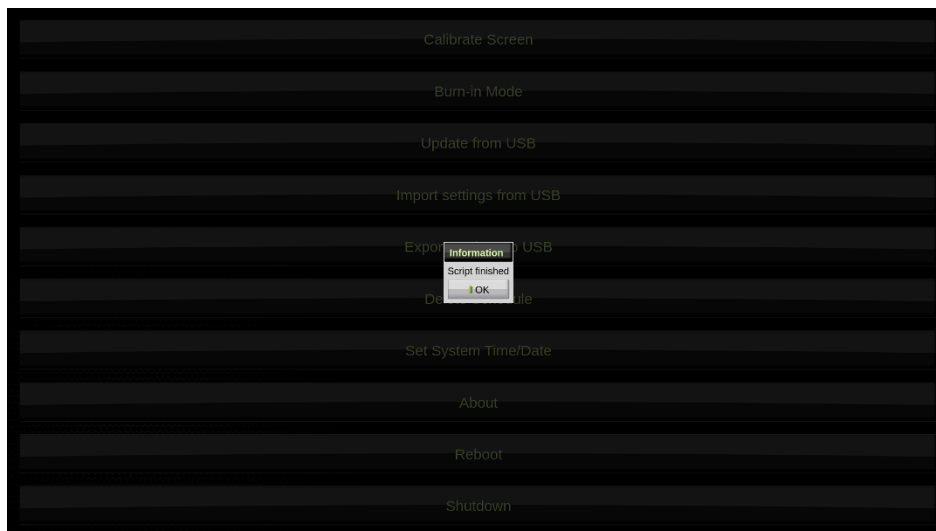
4. Select USB in the pop up that opens. This will now show the files and folders on the USB flash drive.



5. Select the script and press the Update button.



6. The update will now be applied. Once finished, a pop up showing "Script Finished" will appear.
7. Press OK to confirm your upgrade and return to the Admin menu.



5.17 How to use the Calculator

You can use the calculator in the machine operating software to perform various calculations.

The calculator is accessible from numeric keypad that appears whenever you enter numbers into the software.



Press the **Calc** option to launch a calculator with the current field value preloaded.



Use the calculator as follows:

- Press **Orig** to paste the "original" value from the current field value
- Press **Ans** to paste the answer from the previous calculation
- Press **Insert** to paste the result of the calculation back into the field being edited.

5.18 Back Up Software Settings

A backup can be done of the parameters of the software for this machine so that you can restore them if required.

Procedure

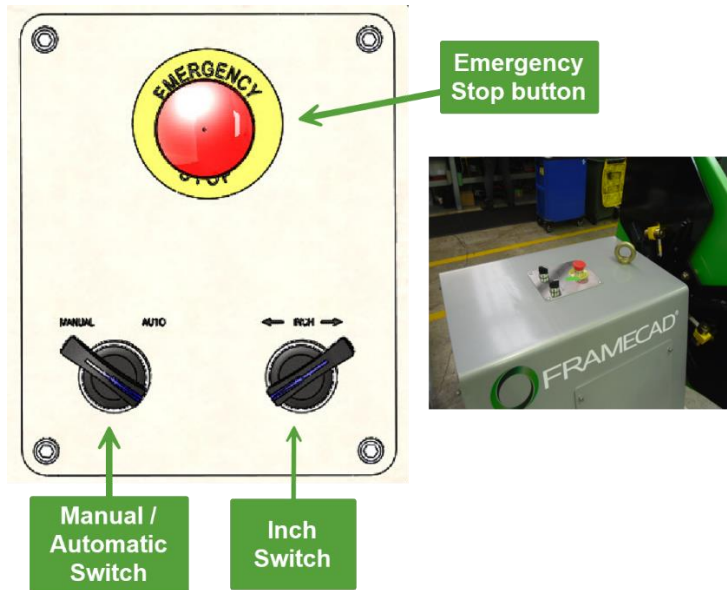
Plug a USB into the Operator Touchscreen.

Access Admin menu

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For 3MT decoilers, there is no reason to change the setup or controls on the decoiler after installation, apart from daily testing of the **Emergency Stop** button.

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Can be used to immediately halt the machine. Must be tested daily as part of daily setup and safety control testing. See [Safety Control \(Emergency Stop\) System](#) and [Test Safety Control \(Emergency Stop\) System](#).

Manual / Automatic switch

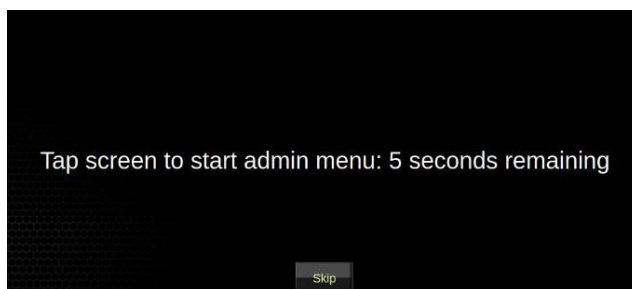
Currently there are no customer procedures that require the 3T decoiler to be in Manual operation mode. Therefore do not move the switch from the Automatic position.

Inch switch

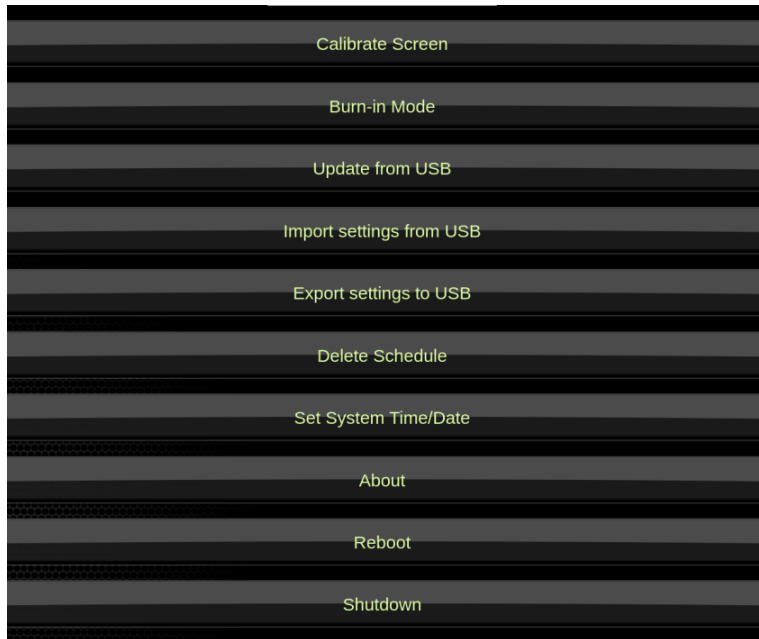
Currently there are no procedures that require the Inch switch to be used.

Power Up Procedure), observe the Operator Touchscreen and wait for the software boot up sequence to complete.

After booting is complete, a 5-second countdown will begin. Tap the Operator Touchscreen before the countdown has finished.



The Admin Menu will open.



Press **"Export settings to USB"**. The export will begin immediately.

When finished, a message saying **Finished exporting settings bundle** will appear. Click OK to return to the Admin menu.

The settings file (with .tar.gz extension) will be saved on your USB.

Press **Reboot** on the **Admin** menu to reboot the software.

5.19 Disable Filtering for Noncompliant Sticks

NOTE! Disabling stick filtering removes an important checking mechanism of the software that is intended to highlight a discrepancy between the profiles in design files and the capability of the machine to produce these profiles. It will also override important checks done to ensure the coil matches the job file. **Use extreme caution if you decide to enable this feature.** FRAMECAD is not responsible for problems that may arise as a result of enabling this feature.

The feature where noncompliant sticks are highlighted in red can be turned OFF by selecting the **Disable stick filtering** checkbox.

From the **Setup > Machine Setting** menu, **Parameters** tab, check the box next to **Disable stick filtering**.

FRAMECAD Friday, 25 November 2016 10:46:09 NZDT [Return](#) [Apply](#) [Revert](#) [Log out](#)

Schedule Setup

Tools

- Bolt
- Flange Screw Holes
- Web Notch
- Lip Cut
- Service
- Flange Cut Left
- Flange Cut Right
- Chamfer
- Dimple
- Swage
- Shear
- Motion Control
- MDX61B
- Inkjet
- Evolution Printer
- Machine Setting
- Filtering
- Miscellaneous

Parameters

Scrap Length: 1500.00

Chamfer Scrap Length: 50.00

☒ Disable stick filtering

☐ Halt at end of each frame

Coil

Section

100m/h

0m/h 10:36 10:37 10:38 10:39 10:40 10:41 10:42 10:43 10:44

0.00 0.00 manual idle Admin #0 v2.8.4

Speed Ratio 100% 9 Alarms 1 Warnings

FRAMECAD Friday, 25 November 2016 10:46:30 NZDT [Return](#) [Apply](#) [Revert](#) [Log out](#)

Schedule Setup

Tools

- Bolt
- Flange Screw Holes
- Web Notch
- Lip Cut
- Service
- Flange Cut Left
- Flange Cut Right
- Chamfer
- Dimple
- Swage
- Shear
- Motion Control
- MDX61B
- Inkjet
- Evolution Printer
- Machine Setting
- Filtering
- Miscellaneous

Alarms

Friday, 25 November 2016 10:35:56 NZDT

Hydraulic phase rotation
Acknowledged
Friday, 25 November 2016 10:35:56 NZDT

Inkjet communication error
Acknowledged
Friday, 25 November 2016 10:35:56 NZDT
No reply

Emergency stop
Acknowledged
Friday, 25 November 2016 10:35:56 NZDT

Guards open
Acknowledged
Friday, 25 November 2016 10:35:56 NZDT

No strip at infeed
Acknowledged
Friday, 25 November 2016 10:35:56 NZDT

[Acknowledge All](#)

Warnings

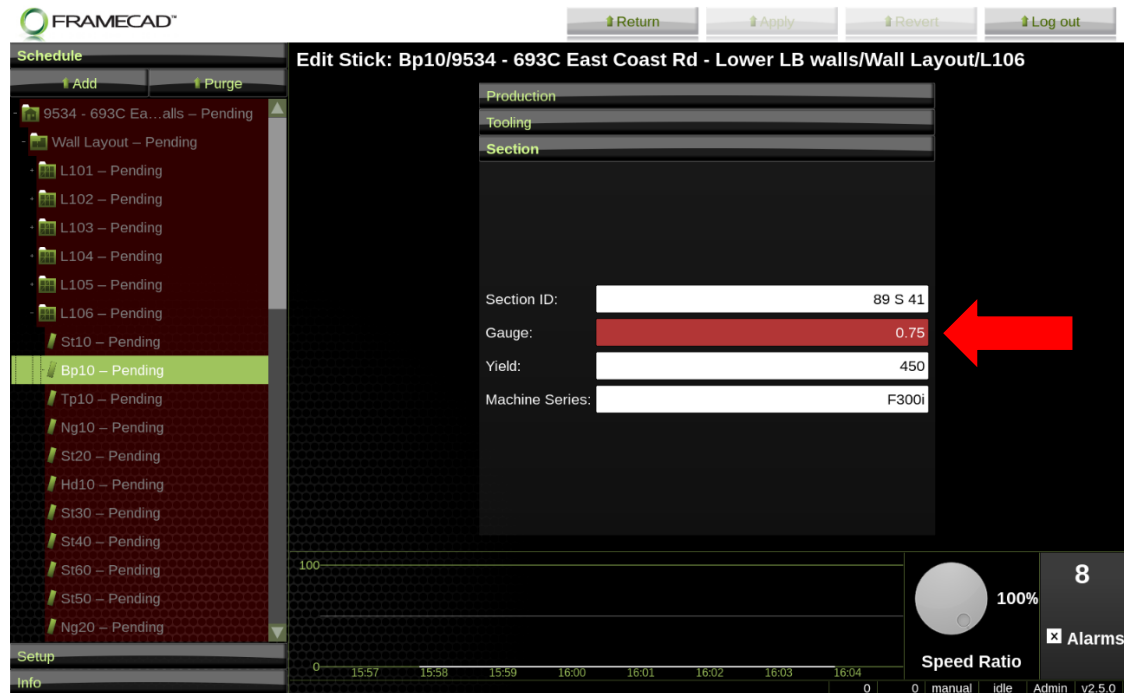
Stick filtering disabled
Friday, 25 November 2016 10:45:55 NZDT

100m/h

0m/h 10:36 10:37 10:38 10:39 10:40 10:41 10:42 10:43 10:44

0.00 0.00 manual idle Admin #0 v2.8.4

Speed Ratio 100% 9 Alarms 1 Warnings

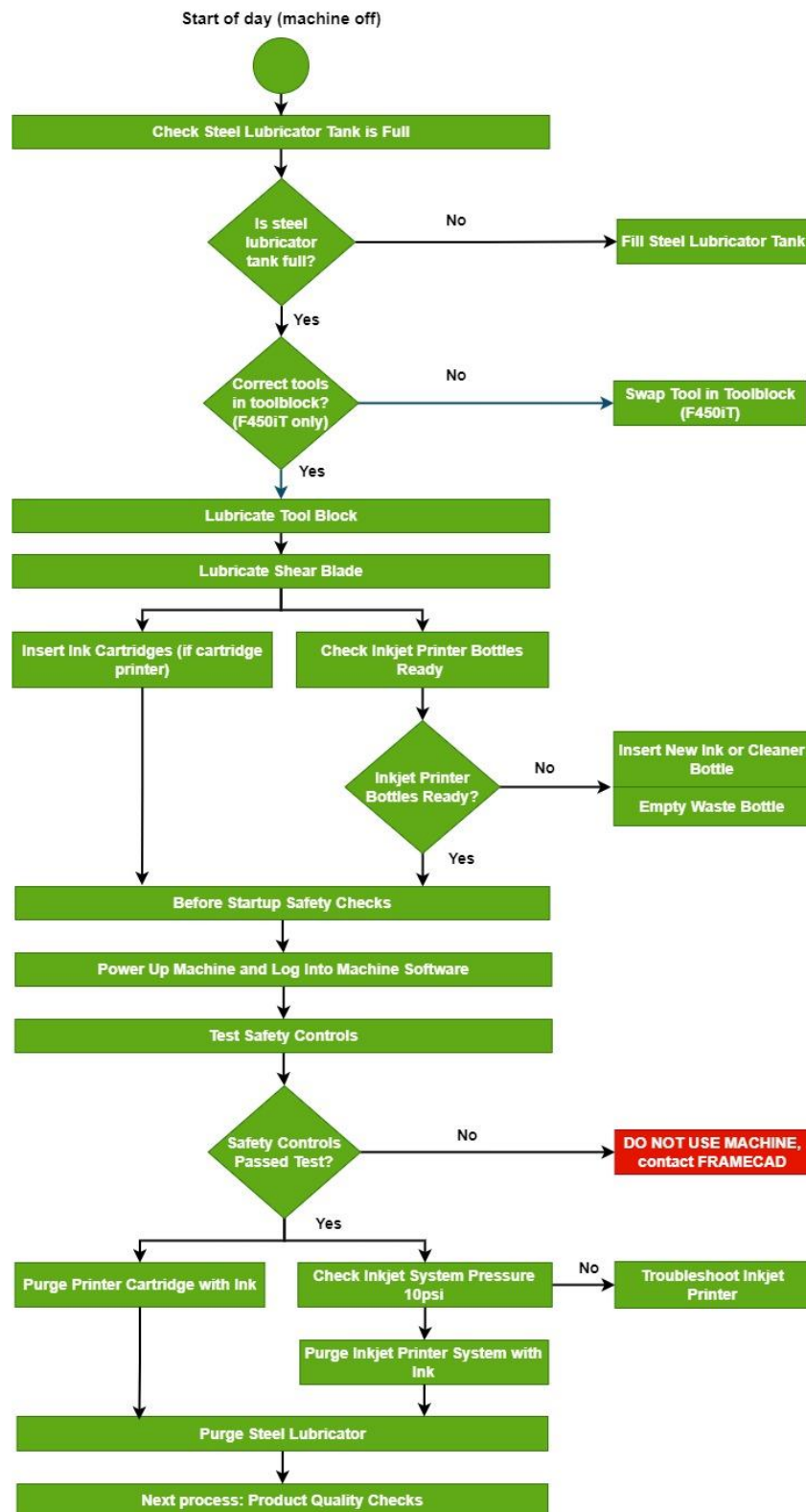


Example – the Gauge value for the Job shown above is different to the machine setting

If any of the machine section settings are changed, the Operator will be prompted to perform a Software Reset (by pressing the **Software Reset**  button).

6 Daily Machine Setup

Below is a typical process for setting up your machine at the start of each production day.



6.1 Check Steel Lubricator Tank Level

Every day before starting production, check that there is enough steel lubrication mixture in the tank for your production needs.

Prerequisites

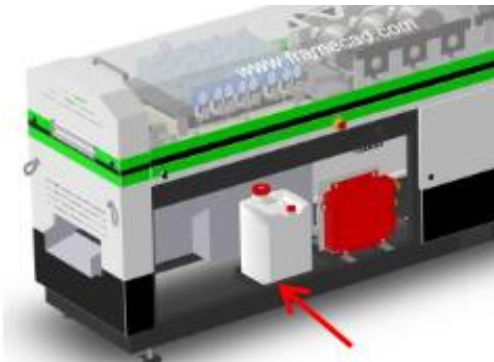
The machine should be OFF at the isolation switch or in emergency-stopped state.

Tools required

Machine cabinet key

Procedure

1. Locate the cabinet with the tank. The cabinet with the tank is located closest to the infeed, on the rear side of the machine.



2. Use the machine key to open the cabinet and remove the cover.
3. The tank is opaque so the level of liquid cannot be seen from the outside. The best method is to pick up the tank and shake it to assess how full it is.
4. If the tank needs to be filled, follow the procedure below.

6.2 Fill Steel Lubrication Tank

The steel strip lubrication tank holds 20L of steel strip lubricant that has been diluted with water 30:1.

A rule of thumb is that one full tank is enough for three days of production.

When the tank is nearly empty, use the below procedure to fill it.

Use the "Check Steel Lubricator Tank Level" procedure above to find out how full the tank is before filling it.

Prerequisites

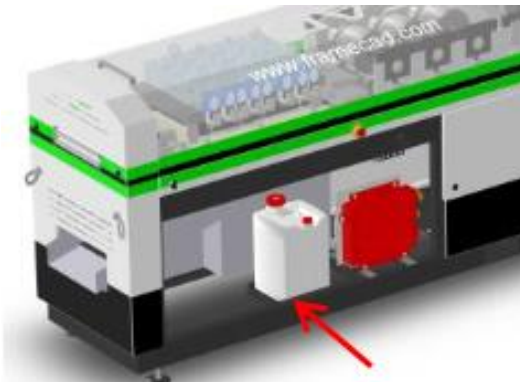
The machine should be OFF at the isolation switch or in emergency-stopped state.

Tools required

- Machine cabinet key
- 500ml bottle of steel lubricant. Recommended brands are:
 - **North America:** HOCUT 787B or SPIRIT MS 5000
 - **Europe:** SPIRIT MS 5000 or SPIRIT WBF 5400
 - **Asia:** SPIRIT MS 5000
 - **Africa:** SPIRIT MS 5000 or SPIRIT WBF 5400
 - **Australia:** SPIRIT MS 5000, SPIRIT WBF 5200 or SPIRIT WBF 5400
 - **New Zealand:** SPIRIT WBF 5400
- Water

Procedure

1. Use the machine cabinet key to open and take off the cover from the cabinet containing the steel lubricant tank.

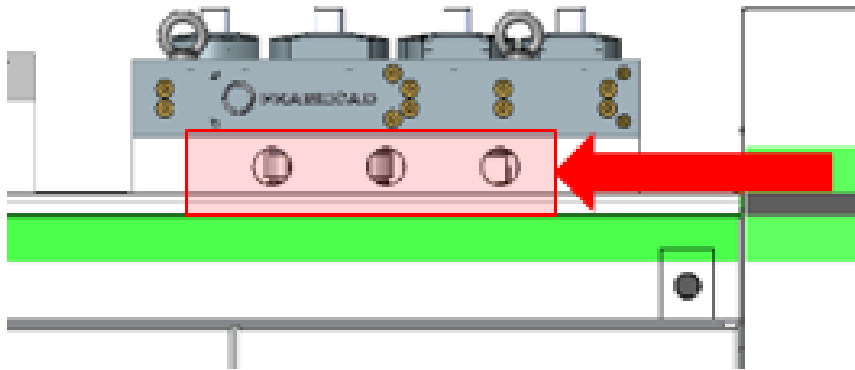


2. Unscrew the cap and remove the tank from the machine.
3. Fill the tank with 500ml of the steel strip lubricant.
4. Fill the tank with water.
5. Replace tank into the cabinet and replace the lid.
6. Replace the cabinet door.

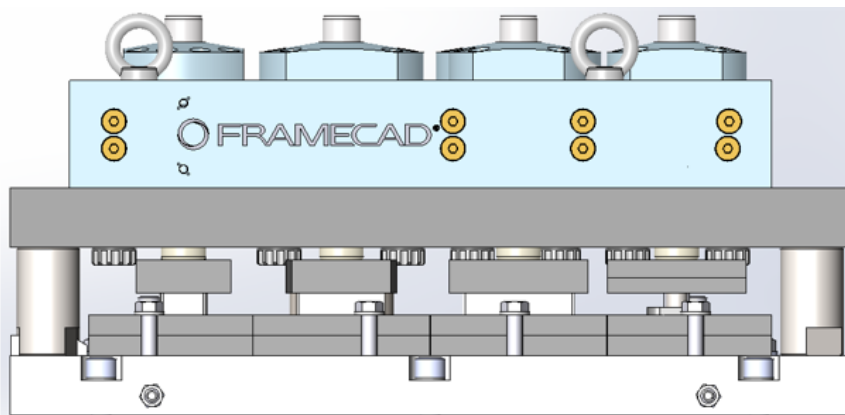
6.3 Lubricate Tool Block

Every day before production, it is important to lubricate the tool block at the areas shown. These are accessible from the front side of the machine. If your tool block contains more tools than shown below, it is important to lubricate them too.

Toolblock for F325iT models look like the below (from operator side):



Toolblock for F450iT (from both Operator and rear sides):



Prerequisites

The machine should be OFF at the isolation switch or in emergency-stopped state.

Procedure

Open the sliding guard at the infeed end of the machine.

There are two methods we recommend to lubricate the tool block. Either method is acceptable.

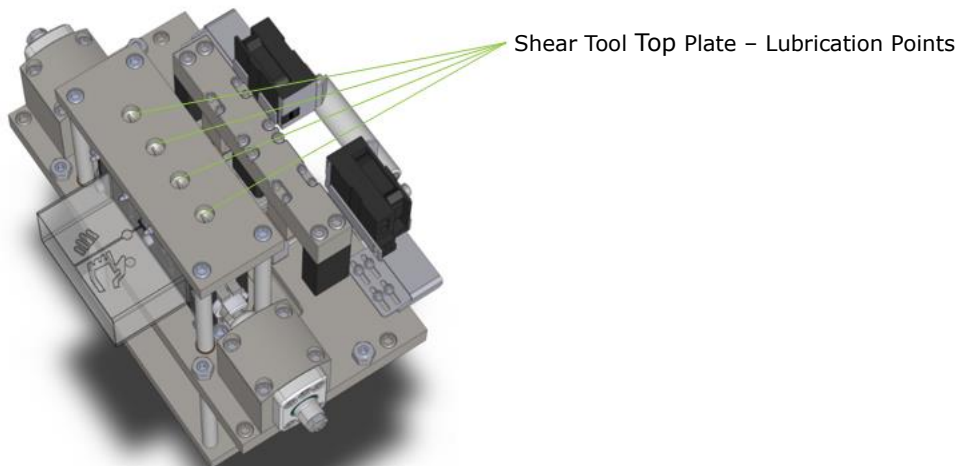
- Spray white lithium grease spray inside the holes on the front side of the machine.
- Using an oil can, squirt light grade engine oil into the holes. When the tools are moving during production, oil will be spread adequately around the tools. It is ok to do both of these procedures with steel inside the toolblock.

6.4 Lubricate Shear Blade

It is vital to keep the shear blade well lubricated.

Procedure

At the start of each production day, and at least four times daily, using an oil can, apply four drops of light grade machine lubricating oil into the four oil recesses on top of the shear plate.



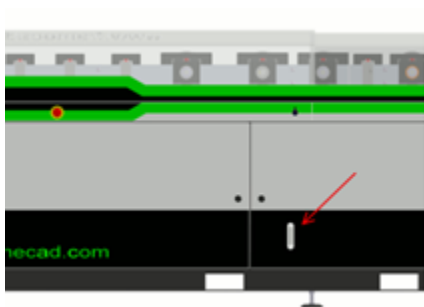
6.5 Check Hydraulic Oil Level

The hydraulic reservoir is accessible from the operator side of the machine.

The reservoir has a combined sight glass and temperature gauge fitted to the side of the tank.

It is good practice to confirm during daily setup that the level is as expected. The level must be not less than 80 litres (21US gal).

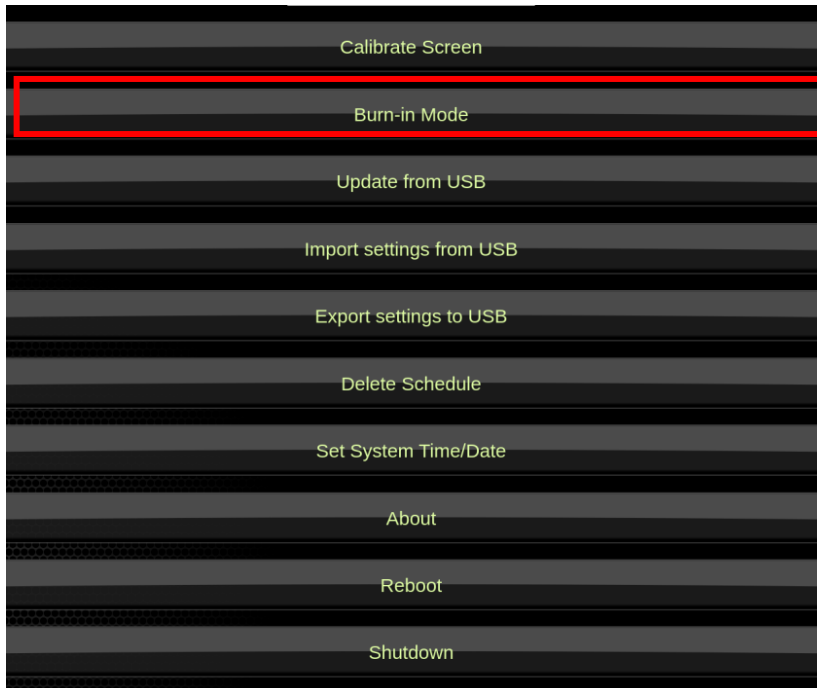
TIP! It would be unusual for the hydraulic oil level to drop - if it does so, there will be noticeable signs of a leak or inability for the hydraulic system to reach the required pressure.



6.6 Check Hydraulic Hosing (Burn-in Mode)

Burn-in mode is used to check that the hydraulic hosing is tight and connected.

1. In the **Admin Menu**, press the "**Burn-in Mode**" button.
2. Check load on the gearbox without steel in the machine
3. Diagnose general machine issues without scrapping steel



6.7 Test Safety Control (Emergency Stop) System

The safety controls provide a vital safety net if anything goes wrong during production. Additionally the machine must be in emergency-stopped state for various procedures.

Therefore the safety controls must be checked every day before the start of production.

Refer to [Safety Control \(Emergency Stop\) System](#) to remind yourself of the safety controls on your model.

Procedure for testing safety controls

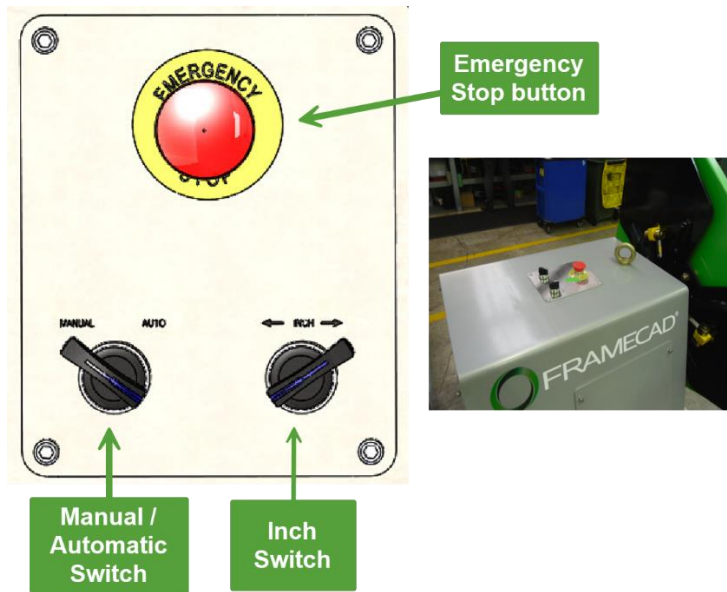
All **Emergency Stop** pushbuttons and both sliding guards should be tested every day directly after starting the machinery.

How to test Emergency Stop buttons

1. Start up the machine according to the 3MT Decoiler Controls

For 3MT decoilers, there is no reason to change the setup or controls on the decoiler after installation, apart from daily testing of the **Emergency Stop** button.

For completeness we have included a description of the controls here.



Emergency Stop button

Can be used to immediately halt the machine. Must be tested daily as part of daily setup and safety control testing. See [Safety Control \(Emergency Stop\) System](#) and [Test Safety Control \(Emergency Stop\) System](#).

Manual / Automatic switch

Currently there are no customer procedures that require the 3T decoiler to be in Manual operation mode. Therefore do not move the switch from the Automatic position.

Inch switch

Currently there are no procedures that require the Inch switch to be used.

2. Power Up Procedure. At the end of the procedure, the machine will be in Manual mode.
3. Start up the hydraulic system by turning one of the inch control switches on the side of the rollformer (labelled 'INCH') to the left or right. You will hear the hydraulic pump start up.
4. Press one of the **Emergency Stop** buttons.
5. Check **all of the below conditions are met:**
 - a. The hydraulic system stops completely. (In a production scenario the emergency stop button will halt the rollformer and decoiler completely, including rolling operations, hydraulic system, electrical cabinet fan), AND

- b. The inch switches do not work (testing the one closest to the Operator Touchscreen is ok to confirm this), AND
 - c. The emergency stop button remains down in a latched state, AND
 - d. A **Safety circuit tripped** alarm and an emergency stop alarm appears on the Operator Screen saying that the Emergency Stop system has been activated, AND
 - e. The **Safety Reset** button is flashing alternately with the other three left-most buttons (Start, Pause and Software Reset).
6. If all of the above conditions are met, the test has succeeded. If any of the above conditions are NOT met, the Emergency Stop system has FAILED and you MUST NOT USE THE MACHINERY. Call FRAMECAD for support.
7. Reset the safety control system (using the procedure below).
8. Repeat for all Emergency Stop buttons. Test the function of each button before progressing to the next one (including the Emergency Stop button on the decoiler).

How to test sliding guard safety controls

1. With the machinery in Manual control mode, start up the hydraulic system by turning one of the inch control switches on the side of the rollformer (labelled 'INCH') to the left or right. You will hear the hydraulic pump start up.
2. Open each sliding guard cover.
3. Check **all of the below conditions are met:**
 - a. The hydraulic system stops completely. (In a production scenario, opening the sliding guards will halt the rollformer and decoiler completely, including rolling operations, hydraulic system, electrical cabinet fan), AND
 - b. The inch switches do not work (testing the one closest to the Operator Touchscreen is ok to confirm this), AND
 - c. A **Safety circuit tripped** alarm and a guard switch alarm appears on the Operator Screen saying that a sliding guard has been opened, AND
 - d. The **Safety Reset** button is flashing alternately with the other three left-most buttons (Start, Pause and Software Reset).
4. If all of the above conditions are met, the test has succeeded. If any of the above conditions are NOT met, the sliding guard safety control system has FAILED, and you MUST NOT USE THE MACHINERY. Call FRAMECAD for support.

5. Reset the safety control system (using the procedure below).
6. Repeat for the other sliding cover.

If safety control testing fails

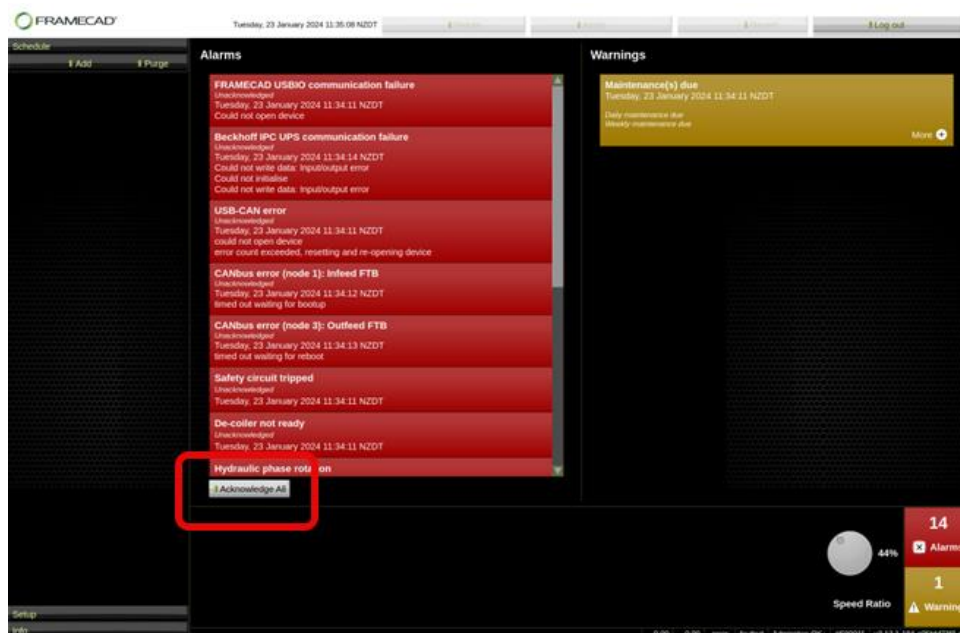
If any of the system fails, all production must be suspended until a qualified FRAMECAD technician has re-tested and resolved the issue.

Procedure to reset safety controls

1. Twist and release the **Emergency Stop** buttons (so that none remain latched in the pressed-down state). Make sure guards are closed.



2. On the Operator Touchscreen, press **Acknowledge All** to acknowledge the safety circuit alarm. Now the **Safety Reset** button  below the screen (to the left of the **Emergency Stop** button) should be blinking on and off.



3. Press the **Safety Reset** button  to complete the reset of the safety control system. (Do not confuse the **Safety Reset** button with the **Software Reset** button.)

	Correct - Safety Reset Button
---	-------------------------------



WRONG! - Software Reset Button

6.8 Purge Steel Lubricator

At the beginning of the production day, it's a good idea to purge the steel lubricator, especially if the machine has not been used for a while.

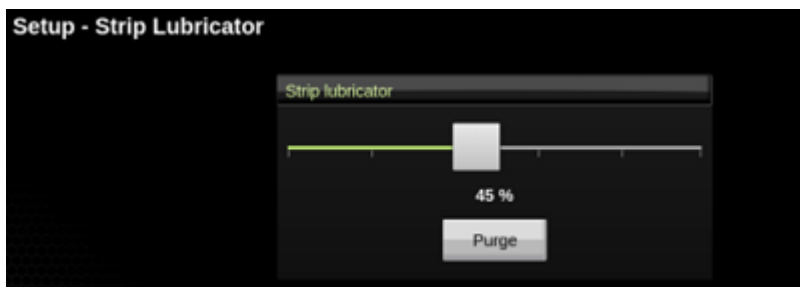
This will make sure there is enough steel strip lubricant in the lubricator for the beginning of production.

Prerequisites

Machine should be ON at the isolation switch, alarms acknowledged, and safety system reset.

Procedure

1. In the software, go to **Setup > Strip Lubricator**.



2. Hold down the **Purge** option for 15 seconds. Check the lubricator unit to make sure it is functioning correctly.

6.9 Swap F450iT Tool Cartridge

F450iT toolblocks have easily swappable tool cartridges, allowing different tools to be used for certain production requirements.

If your production job requires a different tool to the one currently loaded in the toolblock, follow this procedure to change it.

TIP! This procedure can also be used to replace worn tool cartridges on the F450iT.

Prerequisites

- Remove steel from the rollformer: [Remove Steel From Rollformer](#)
- Machinery should be OFF at the isolation switch.

Safety

- Wear standard PPE for this procedure, especially foot protection due to the heavy parts involved

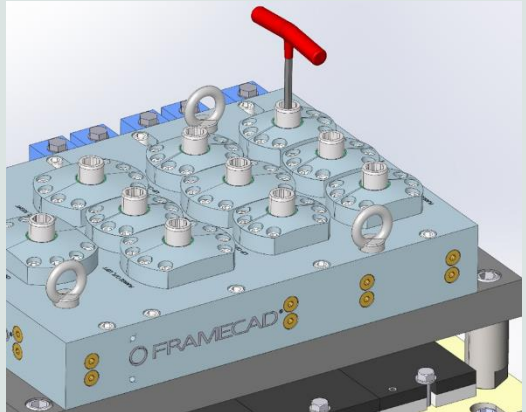
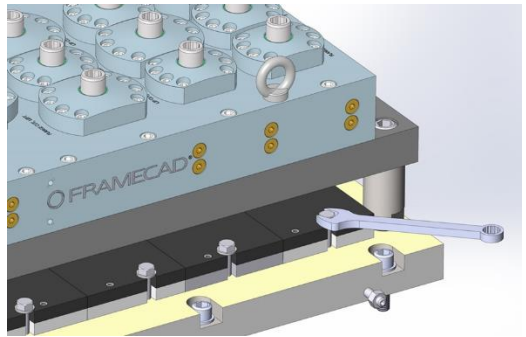
Tools required

- Replacement tool cartridge
- 10mm Hex Key
- 8mm Hex Key
- 18mm spanner or adjustable wrench

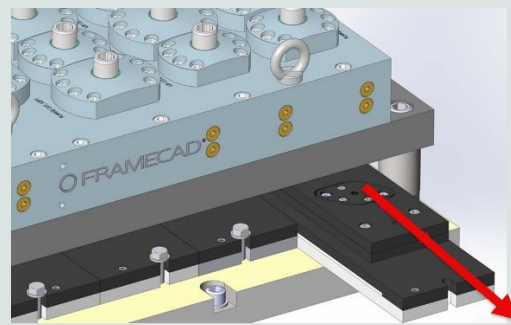
Toolblock cartridge replacement procedure

 **DANGER!** This procedure must be completed with the machinery in an **electrically isolated state** (i.e. isolation switch OFF).

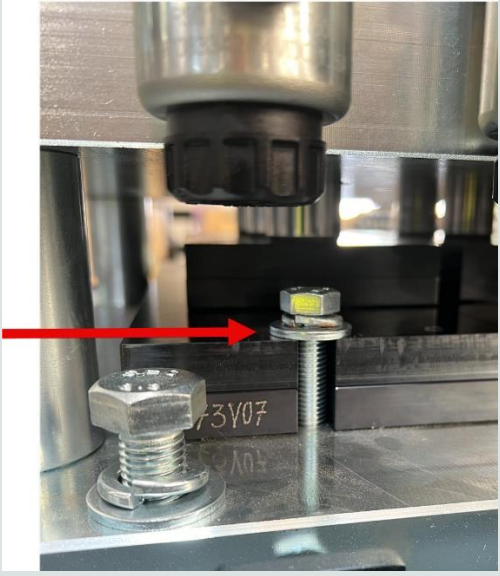
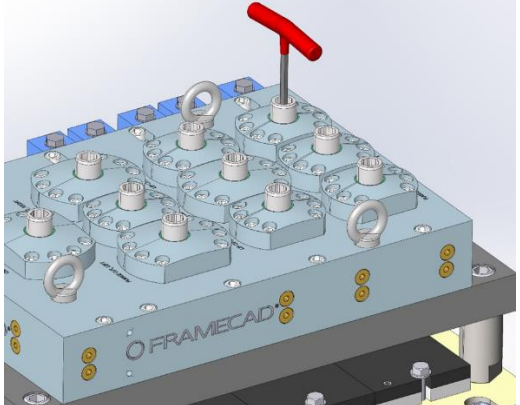
Remove cartridge from toolblock

STEP	ILLUSTRATION
Use the 8mm Hex Key to loosen and remove the cylinder bolt on the required tool cartridge.	
Use the 18mm spanner/wrench to loosen and remove the hold-down bolt on the required tool cartridge. There is a hold-down screw on both sides of the machine.	

Slide out the tool cartridge.



Insert new cartridge

STEP	ILLUSTRATION
Insert the new cartridge into position and insert the hold down bolts. Tighten the hold down bolts but not all the way yet - the washers should still be free to spin at this stage.	
Insert cylinder bolt but do not tighten yet.	

Activate solenoid valve

Before the cylinder bolts can be tightened, the solenoid valve must be manually activated, otherwise the bolt will not engage the tool to be pulled up to the correct height.

This means the cylinder must be manually pushed down before the cylinder screw can be fully tightened.

To do this, insert a small (2.5 - 3mm) hex key or similar tool into the solenoid to override it:

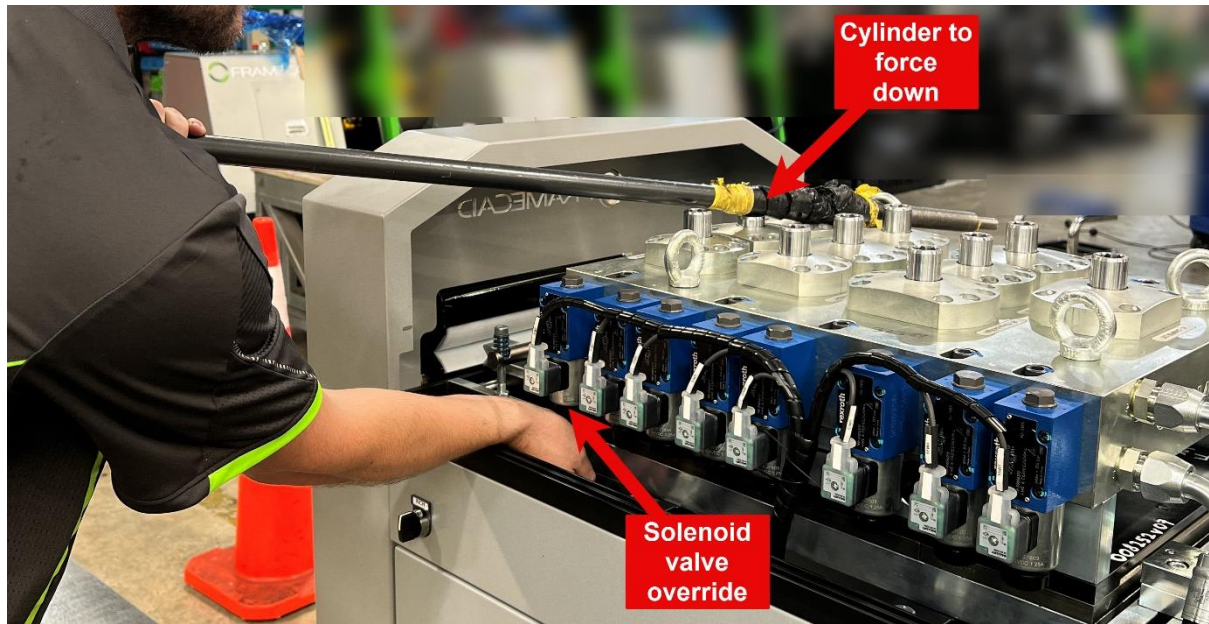


The underneath of the solenoid valve looks like the below; note the override is in the middle.



While the solenoid is in an overridden state, use a nylon hammer to force the cylinder into the down position.

Note that a nylon hammer may not provide enough pressure. The picture below shows a metal rod using the lifting eye bolt as leverage to force the cylinder down (while simultaneously manually overriding the solenoid valve).



Tighten screws and bolts

You can now tighten the bolts in the following order:

- Cylinder bolts, until hand tight, then
- Both hold-down bolts fully, then
- Cylinder bolts to specified torque (55 Ft-lbs).

Reset tool count when replacing a worn out tool

The tool count can be reset using the **Info > Maintenance Data** screen.



6.10 Insert Ink Cartridges

New ink cartridges are located inside the printer cabinet when the machine is shipped. When machine is not in active production, they should be stored in the printer cabinet.

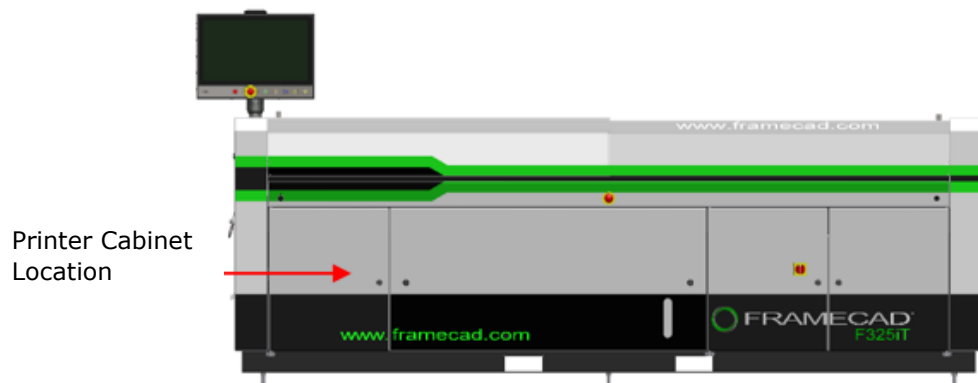
At the beginning of each day, insert the printer cartridges into the printer heads.

Safety

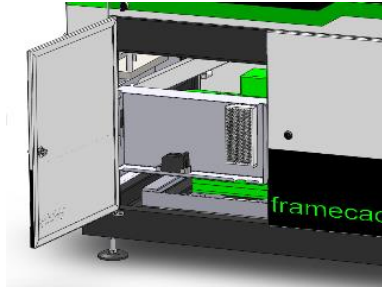
The machine can be OFF or safety circuit tripped state for this procedure (safety circuit will be tripped when top covers are opened to access printer heads).

Procedure to insert ink cartridges

1. Open printer cabinet.



2. Locate the ink cartridges inside the cabinet.

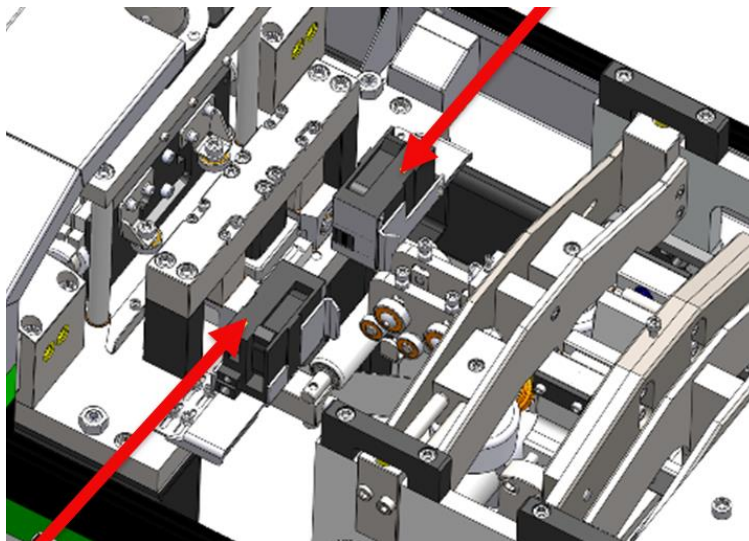


3. Carefully remove the cartridges from the protective covers. If installing new replacement cartridges or cartridges that have been in long-term storage, you will need to remove the protective film from the face of the cartridge. It is recommended that you retain this film as it can be reapplied if the cartridges are to be removed and stored for any lengthy period.

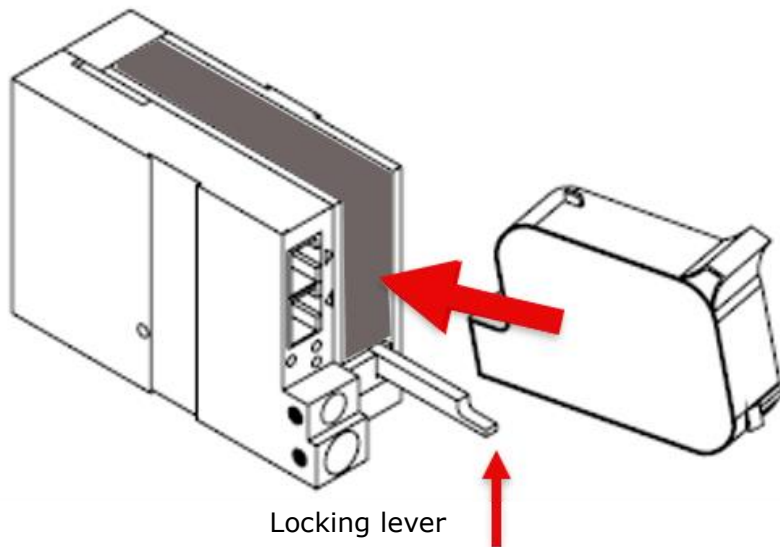


If installing new replacement cartridges, remove the protective film first

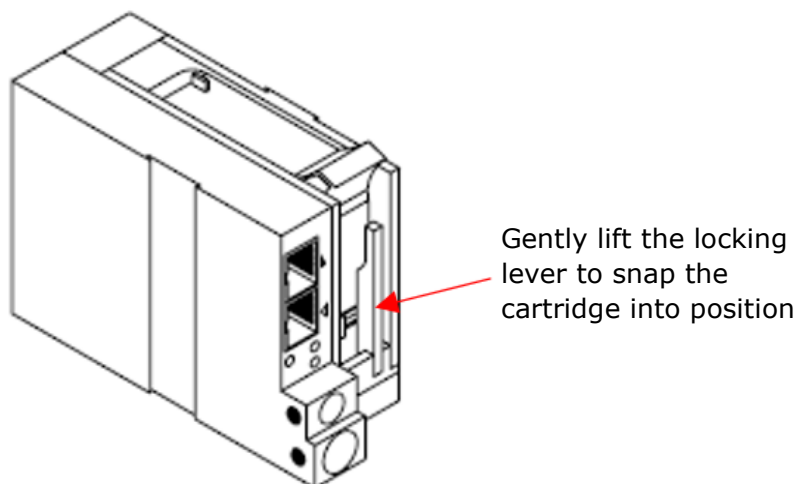
4. Open the sliding covers of the rollformer and locate the cartridge print head assemblies.



5. Insert the ink cartridges into the printer head assemblies. To insert an ink cartridge, ensure the locking lever is released. Insert the cartridge into the gap and push the cartridge in and down:

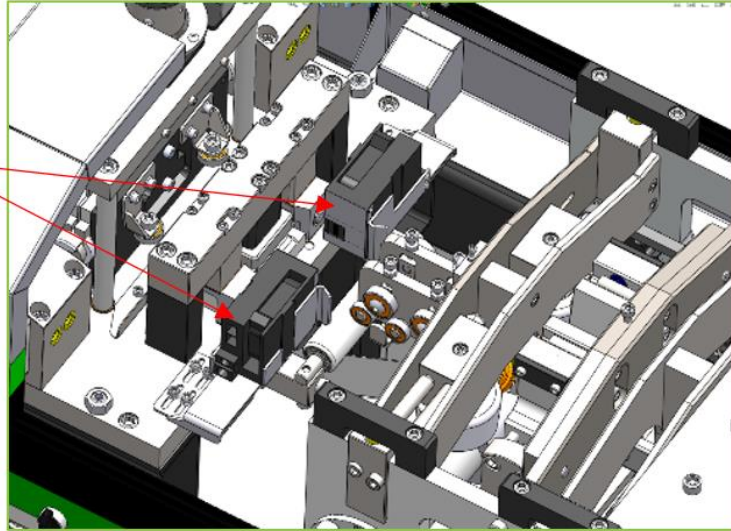


6. Gently lift the locking lever on the rear of the printer head assembly and press against the cartridge. The locking lever will snap the cartridge into position.



7. Ensure the cartridges are securely locked into position.

Make sure ink cartridges are securely locked into position

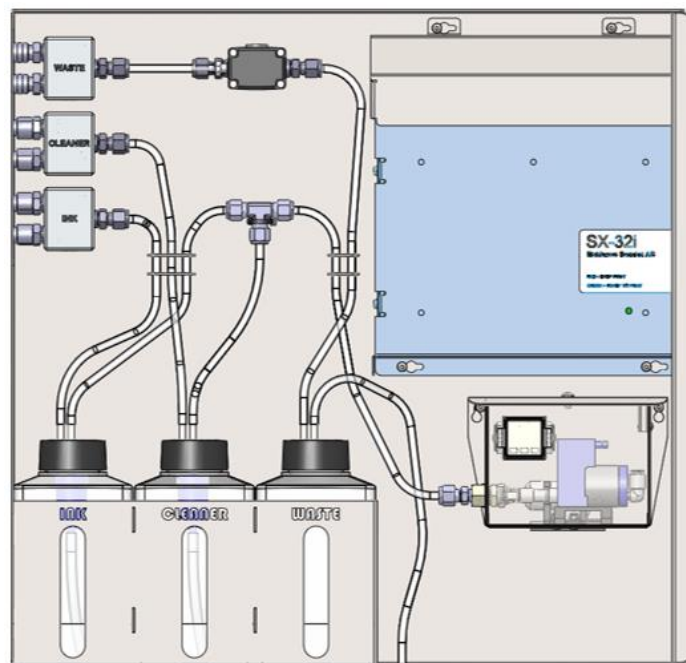


8. Return the cartridge covers to the printer cabinet and shut the printer cabinet door.

6.11 Check Inkjet Printer Bottles

At the start of each production day, open the printer cabinet and visually inspect the levels of the three bottles.

Check that there is enough ink and cleaner to cover daily needs, and that the waste bottle has enough empty space.



If you need to swap ink or cleaner bottles for new ones, see [Insert New Ink or Cleaner Bottle](#).

If you need to empty the waste bottle, see [Empty Inkjet Printer Waste Bottle](#).

6.12 Check Inkjet Printer System Pressure

At the beginning of each production day, confirm that the printer system pressure is at the operating pressure of 10psi.

Prerequisites

For this procedure, the printer system compressor must be powered. Therefore the machine should be ON at the isolation switch, alarms acknowledged, and safety system reset.

TIP! The printer system compressor is de-powered and there will be no pressure displayed in a safety circuit trip. So the machine must be in a powered on and in manual mode.

Safety

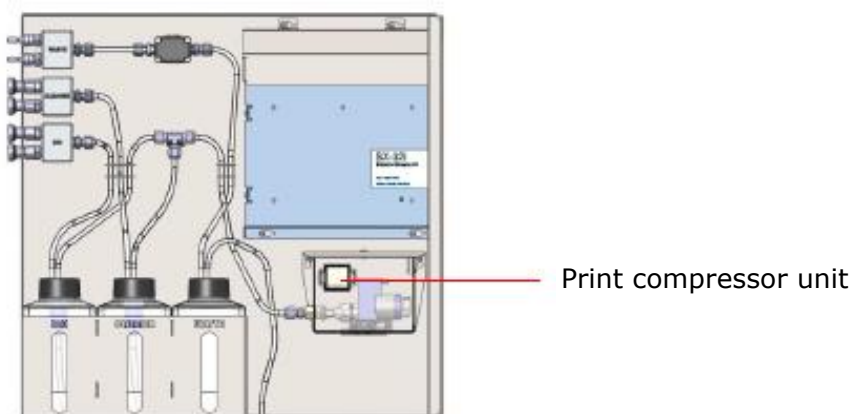
CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

- Wear PPE for this procedure - nitrile gloves and eye protection.

Procedure

Open the printer cabinet door and locate the print compressor unit:



The digital display on the print compressor unit should show a value of approximately 10psi.

If the pressure reading is less than 9.5psi, then check for air leaks in the tubing and ink/cleaner bottle caps.

6.13 Purge Inkjet Printer System With Ink

At the end of the previous production day (or extended shutdown), the printer system tubes would have been flushed with cleaner.

Therefore before beginning production you will need to purge (fill) the system with ink to be able to print again.

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

Procedure

Machine should be ON at the isolation switch, alarms acknowledged, and safety system reset.

Safety

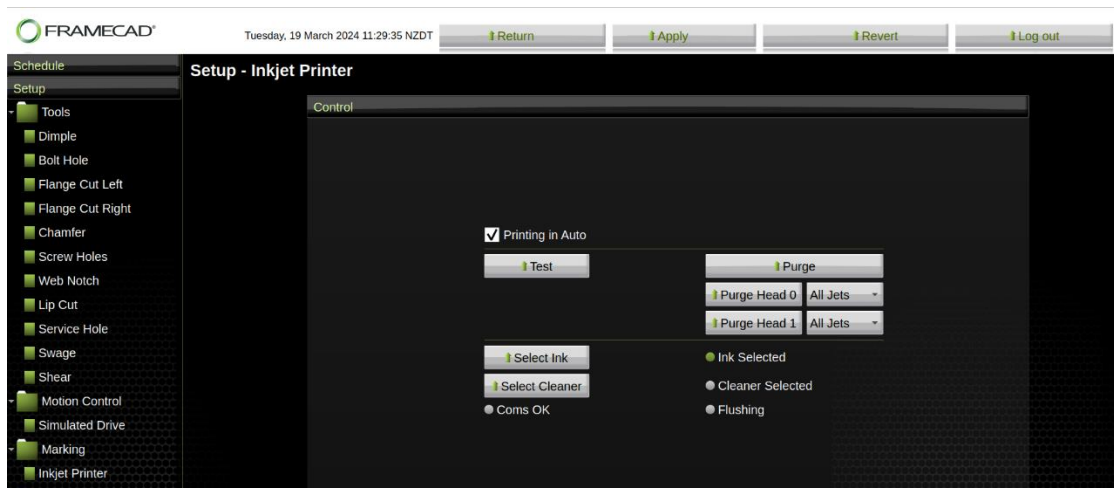
Wear safety glasses, nitrile gloves and other PPE as indicated in the supplier **Material Safety Data Sheet**.

Tools required

- If there is no steel in the machine, insert a piece of cardboard between the printer heads to prevent the ink from squirting onto the other printer head.

Procedure to purge system with ink

1. **Remove residual cleaner from the lines:** Go to **Setup > Marking > Inkjet Printer**. On the Control tab, choose **Select Ink** – this will switch the print control system over to use ink fluid instead of cleaner, and will flush the tubes going up to the printer heads and back down to the waste bottle for a period of 0.5 seconds.



2. **Flush cleaner/air out of the printer heads:** If there is no steel in the machine, insert a piece of cardboard in the space between the two printer heads to prevent ink from one printer head being sprayed onto the other. Press the **Purge** option. This will momentarily send ink up into the printer heads and eject through the nozzles. Repeat this until there is a consistent spray of ink from the printer head whenever **Purge** is pressed.

6.14 Insert New Ink or Cleaner Bottle

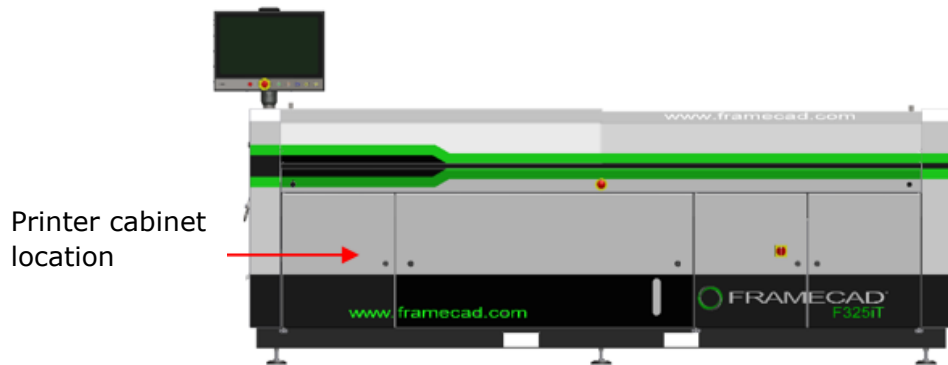
If you have the inkjet printer system with liquid ink and cleaner, follow this procedure to replace an empty bottle with a full one.

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

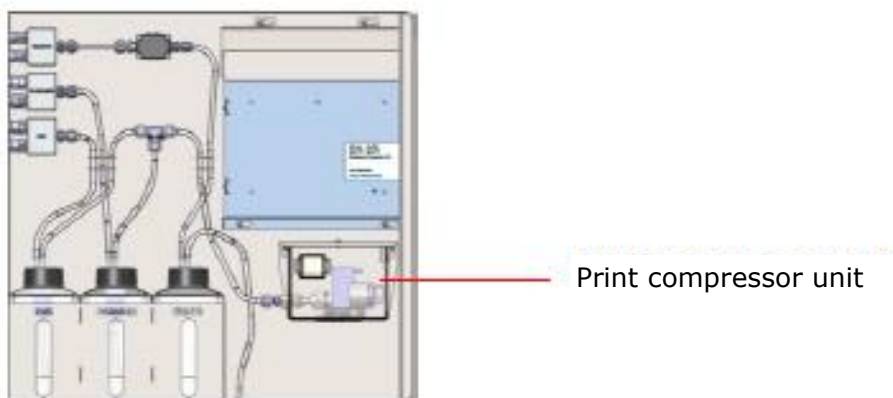
The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

Depressurize the ink and cleaner system

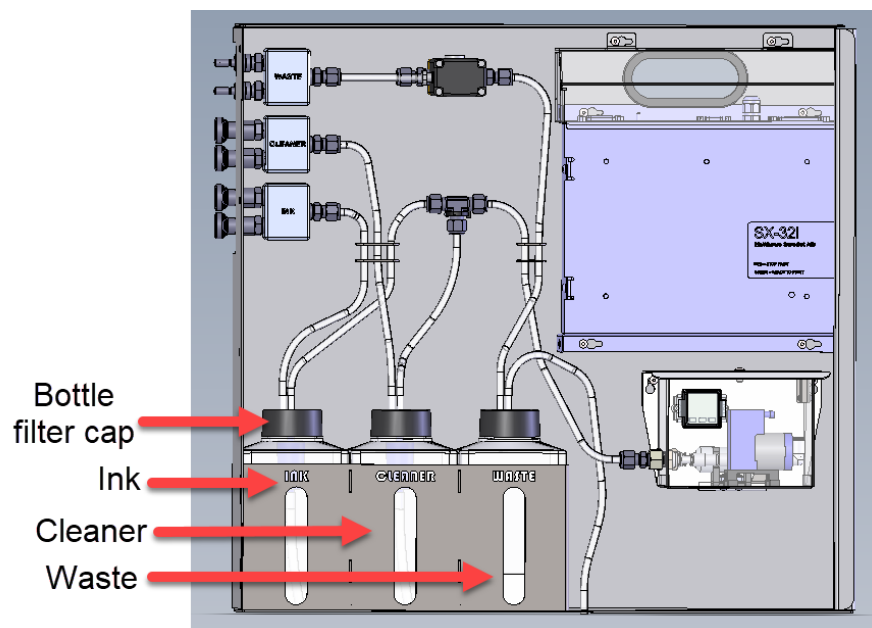
1. Ensure machine is OFF at the isolation switch, and lockout measures have been taken to prevent accidental re-connection.
2. Open the printer cabinet door



3. Ensure there is no display on the Print Compressor Display Screen (to confirm the system is not powered).



4. Carefully unscrew the black filter cap on either the ink, cleaner or waste bottles to gently relieve pressure in the system.



Procedure to replace ink or cleaner bottles

1. Locate the empty ink or cleaner bottle. Carefully unscrew the black filter-cap and withdraw this from the bottle (if the machine has been powered previously, the bottle may be pressurised – remove cap slowly to release pressure), using a clean rag to catch any residual ink.
2. Before removing the bottle completely, close with a spare cap to prevent any accidental spills of residual ink in the bottle.
3. Carefully remove the empty ink bottle and insert replacement ink bottle and remove cap. If the replacement ink bottle is new and has not been opened before, the top will be sealed. DO NOT try to peel the seal off – doing so may leave remnants of the seal stuck to the top of the bottle, causing air leaks when the system is pressurised:
4. Using a knife, carefully cut the seal in an “X” shaped pattern.

NOTE! Take care not to cut or damage the edges around the bottle opening as this may prevent a reliable seal from being created when the filter cap is put back on.

5. Replace the filter cap onto the bottle and tighten.

6.15 Empty Inkjet Printer Waste Bottle

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

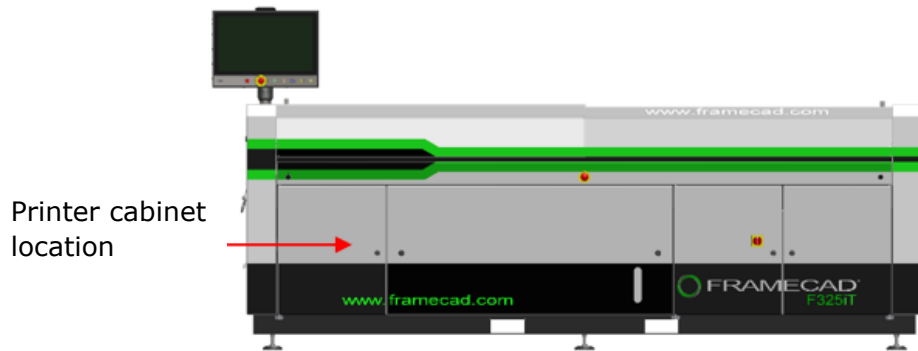
Safety

Wear appropriate PPE, including safety glasses and nitrile gloves and other PPE as recommended in the supplier **Material Safety Data Sheet**.

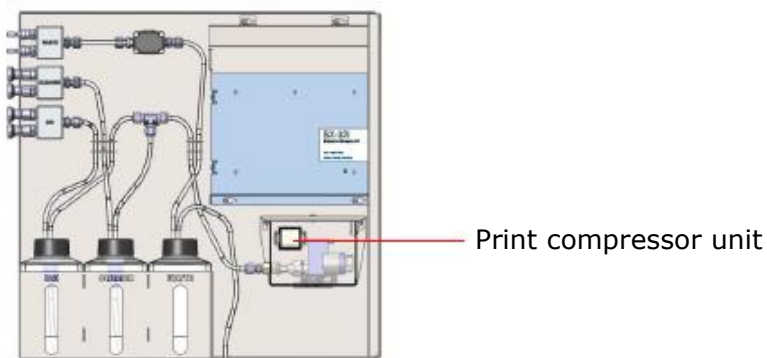
Consult your company's hazardous material disposal policy to determine in advance where the waste will go.

Depressurize the ink and cleaner system

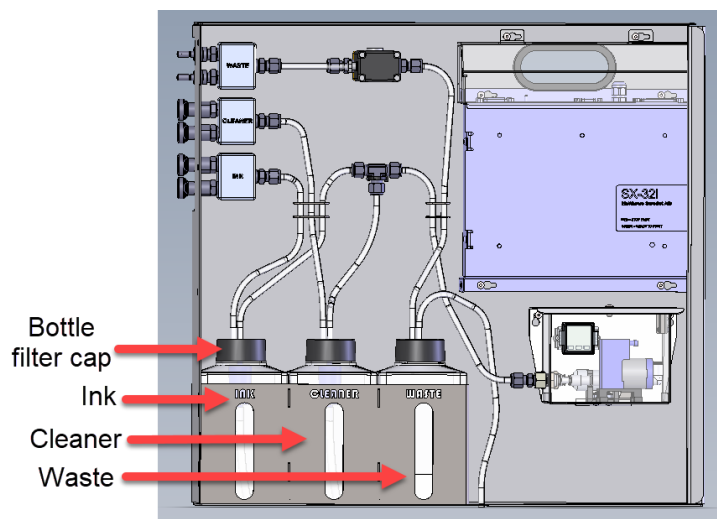
1. Ensure machine is OFF at the isolation switch, and lockout measures have been taken to prevent accidental re-connection.
2. Open the printer cabinet door



3. Ensure there is no display on the Print Compressor Display Screen (to confirm the system is not powered).



4. Carefully unscrew the black filter cap on either the ink, cleaner or waste bottles to gently relieve pressure in the system.



Empty cleaner bottle

Carefully unscrew the lid of the cleaner bottle and remove the bottle.

Replace with the spare bottle included in your Machine Spare Parts kit.

Dispose of the waste according to your company's hazardous materials handling policy.

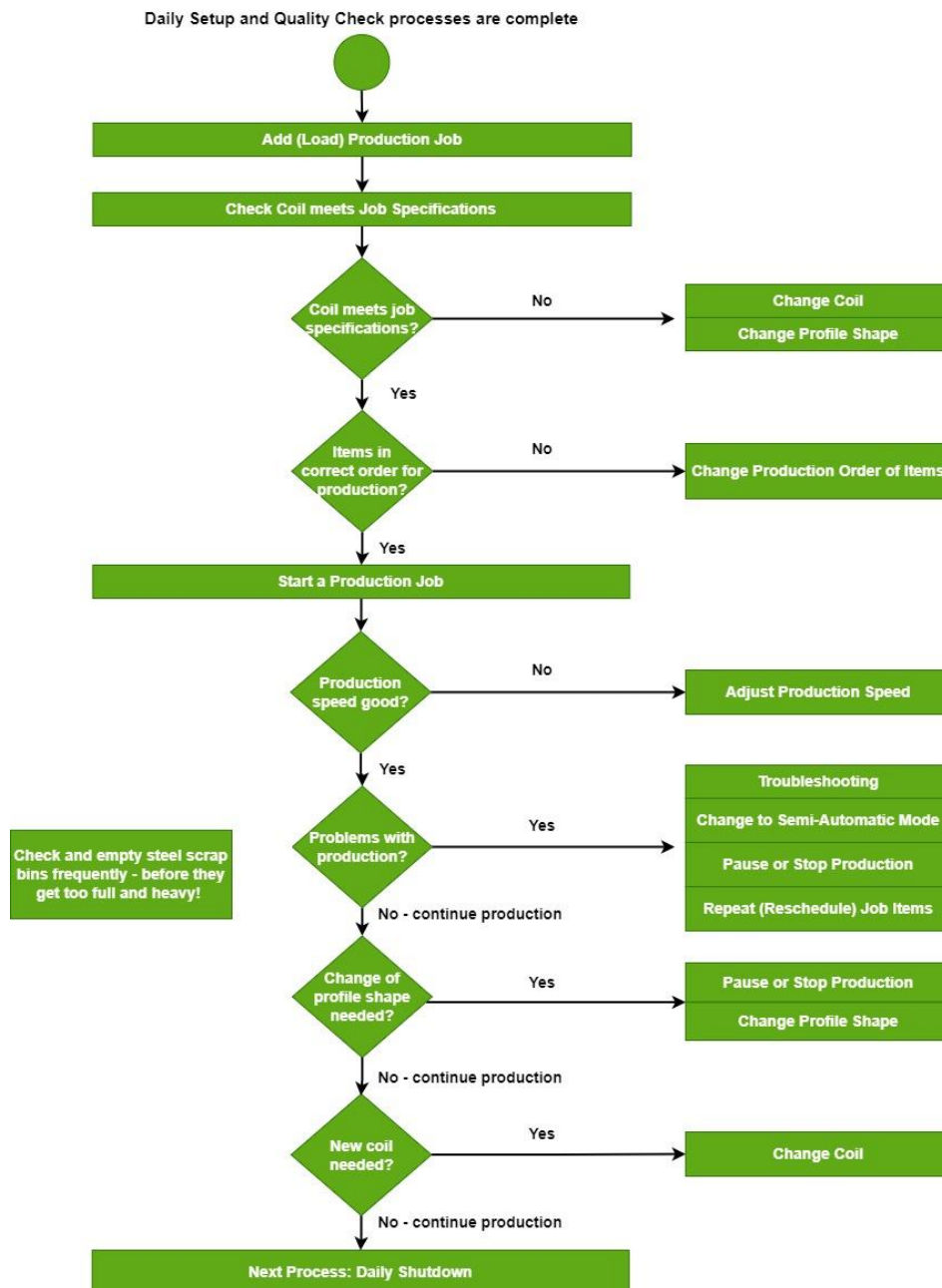
framecad.com

7 Production

 **DANGER!** Do not start production until the machinery is in a production-ready condition, and make sure no people are in the machinery danger zone.

7.1 Production Process

Below is a typical process for production and some of the procedures and scenarios you might encounter.



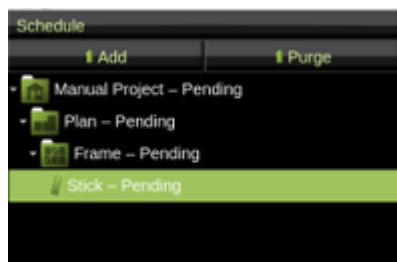
7.2 Load a Job for Production

To load a job (project) for production on the machine:

1. Select the **Schedule** tab from the left side menu to open up the job schedule screen.
2. Press the **Add** option.
3. Select a job file from one of the following locations: USB, Local Disk (if the job is locally saved) or Network Drive. If the job to be loaded is stored on a USB stick, make sure the USB stick is inserted into the USB port on the front of the Operator Touchscreen. If there is an LED on the USB flash drive, wait until the LED stops flickering - this indicates that it has been recognised by the computer.
4. Select the job file from your source location. This will move the job file into the **Components** window.
5. Double-tap the folders to expand the contents.
6. Select the components you wish to load onto the machine. Selected components will display a white tick next to the component name. To select ALL tick the job root folder (highest level folder) in the components list.



7. Press **Load Job**. The selected components will now be added to the Schedule tab on the left of the screen. By default the newest added job will appear below the existing jobs in the schedule. To rearrange them, see [Change Order of Items in Production Schedule](#).



About job (project) components

Jobs are structured in a hierarchy that includes four nested folders:

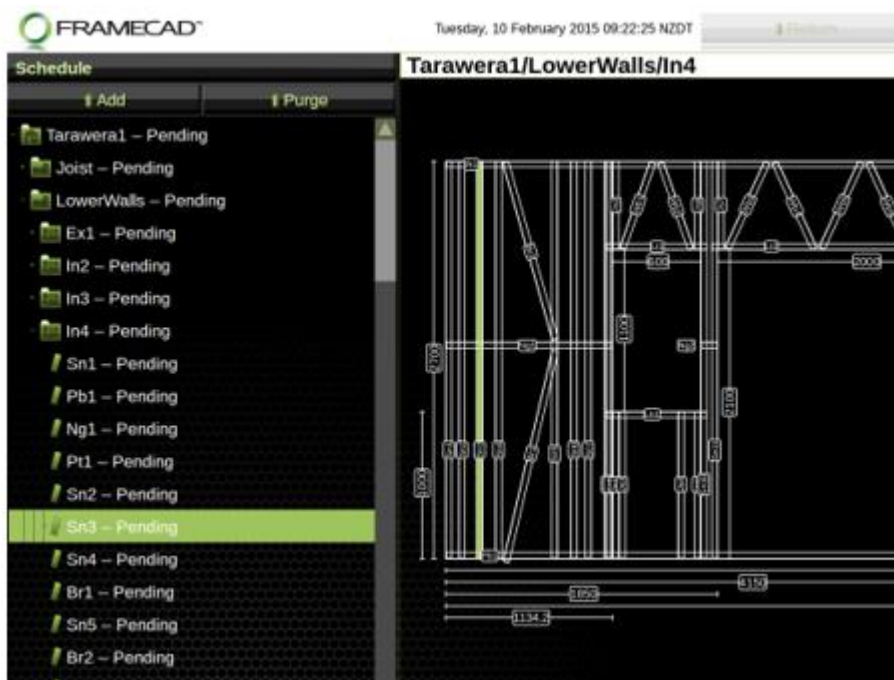
- Top level: Job / Project. A collection of plans.
 - Next level: Plan. Designs for a structure, or part thereof.
 - Next level: Frame. A sub-assembly of the structure, such as a wall or truss. Also known as a panel.
 - Next level: Stick. The individual components that make up the sub-assembly above it. Also called a profile.

Job status

When a job is loaded, its components will be shown as **Pending**, which means the component is queued waiting to be run through the machine.

Once the job is started by the Operator, the status of the components will change as follows:

- **Processing:** The component is being run through the machine and is currently being produced.
- **Completed:** The component has successfully been produced by the machine.



NOTE! If the job file has been designed for a different machine or a different profile to what the machine is configured for, or the steel properties don't match the currently loaded coil, it will be highlighted in red. Refer to [Check Coil Matches Job Spec.](#)



7.3 Understanding the Job File

Setting up the machine begins with loading and understanding the job file.

The job file comes from software that contains design information about the framing components to be produced using the machine.

Information in the job file that is important for setting up your machine includes:

- Specifications for the steel to be used for the framing components. These include thickness of the steel to be used, and other properties such as Grade of steel. This can be found in the information for each stick - see [View \(and Edit\) Stick Properties](#).
- Tools to be used - if you have configurable tools (in the F-Series only F450iT provides this option) you may need to swap tool(s) in the toolblock
- Profile shapes in the job - if the job contains both S and U profiles you will have to configure the machine accordingly.

7.4 Check Coil Matches Job Spec

Before starting production, check that the coil you have loaded is the correct coil for the job.

If the following information is entered, the machine software will help identify any sticks in the job that do not match the coil information loaded in the software.

Prerequisites

Coil information

The operator must have entered details of the physical coil on the decoiler into the **Setup > Coil** screen. Instructions are in [Enter Coil Information](#). The Operator should enter information on this screen every time a coil is loaded.

Coil specification included in job file

The job file loaded on the machine must contain specifications of the steel required for the job.

Procedure

Step 1: Check for sticks that are highlighted in red in the job schedule

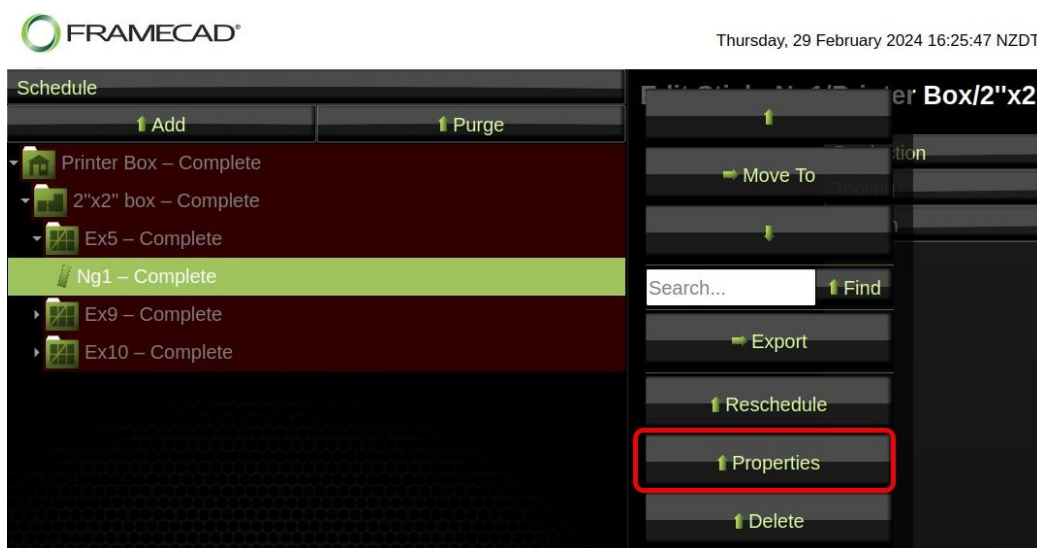
Any sticks that the software interprets as not meeting the coil specifications in the job file will be highlighted in red in the job schedule.



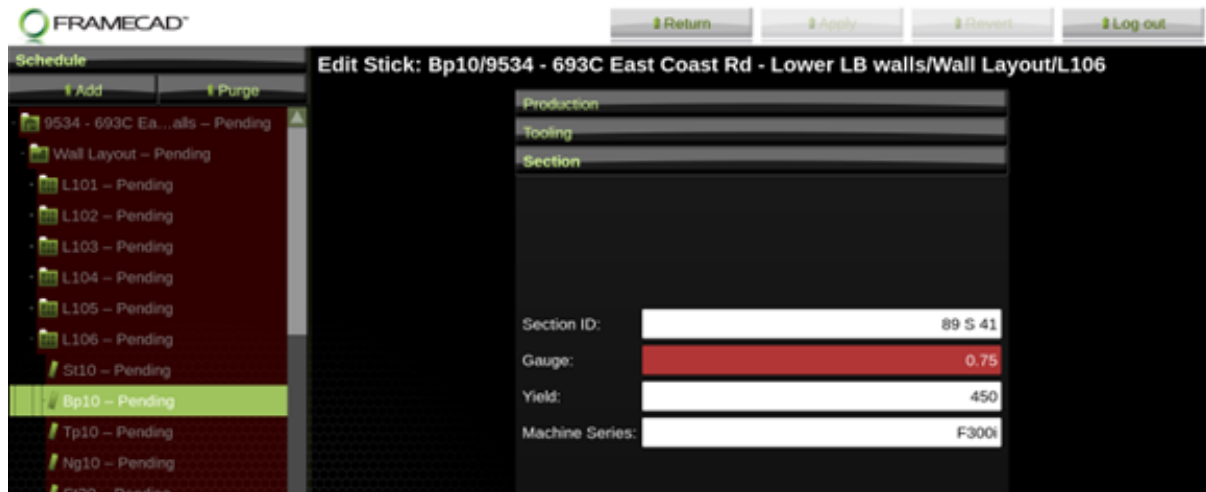
Note that these sticks might be red because the machine is configured for a different profile shape. If that is the case, the Section ID will be highlighted in red. Refer to [Change Profile \(Section\) Shape](#) for the procedure to change profile type.

Step 2: Look for the reason on the Edit Stick screen

From the Schedule menu, select a highlighted stick. The stick will be highlighted, and a pop-up menu will appear. Select **Properties**.



The **Edit Stick** screen will open.



The **Section** tab will give more information about why the stick does not comply. In the example above the thickness (gauge) of the stick in the job file does not match the thickness entered by the Operator on the **Setup > Coil** screen.

Unless there is a problem with the job file, it is most likely that the incorrect coil has been loaded, or its data has been input incorrectly. Refer to [Coil and Steel Setup](#) for more information.

7.5 View (and Edit) Stick Properties

Information about an individual stick can be viewed on the Edit Stick screen. If you have created a manual test stick for any purpose, you can edit the stick properties here.

This screen is essential for finding information relevant to production, and you are able to check whether anything needs to change in the machine setup, including:

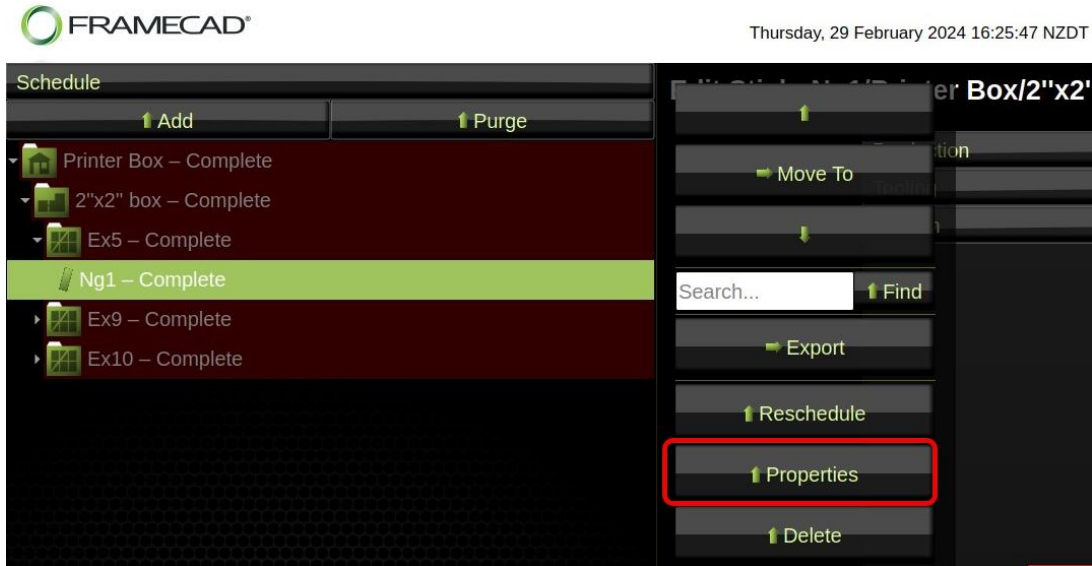
- Type or size of steel loaded
- Profile shape (S or U section)
- Tools used.

If anything in the job file does not match how the machine is configured, the associated property will be highlighted in red.

NOTE! Under normal circumstances you would not edit a stick that has come from an externally designed job file. Exceptions would be for Quality Control testing or for tool sequences that are difficult for the rollformer to drive through.

To view or edit the properties of a stick:

1. Select the individual stick from the job schedule list. Take care to choose the stick (lowest level in the hierarchy). The stick will be highlighted, and a pop-up menu will appear.



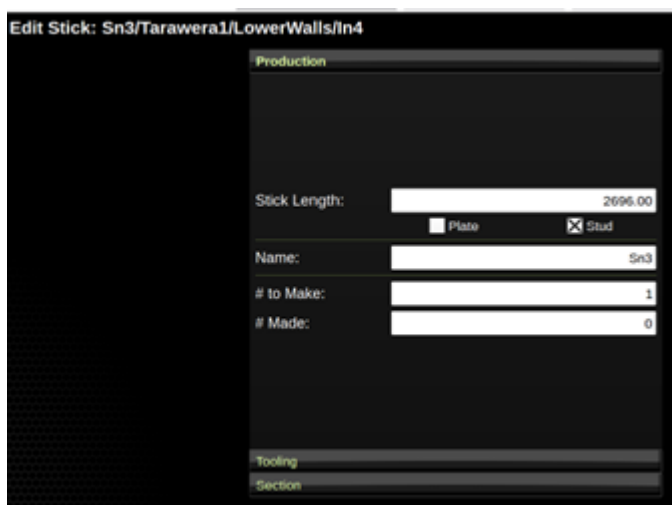
2. Select **Properties**. The **Edit Stick** screen will appear. From this screen you will be presented with 3 tab options which will allow the properties associated with the selected job schedule list item to be edited.

The options available from the **Edit Stick** screen are discussed in more detail below:

Production tab

If making a test stick. this is the only screen you need to edit.

The Production tab will display information relating to the length, quantity still to be made and the number already made. The stick can also be identified as a *Plate* or *Stud*.



Stick Length This is the total length of the stick to be made. If you change this, you may also need to adjust some of the other tool positions to maintain the relative position of these to each end of the stick.

to Make This is the total quantity of this particular stick to be made.

Made This displays the quantity of this particular stick that has *already been* made.

When you have entered all properties, press **Apply** on the top of the screen, then press the **Software Reset** button .

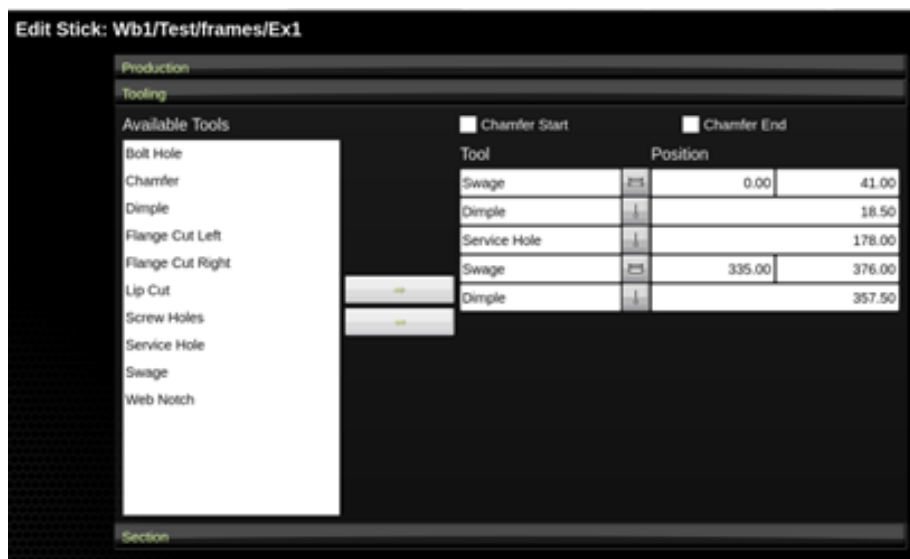
Tooling tab

The Tooling tab displays information about the tooling operations that will be performed on this particular stick.

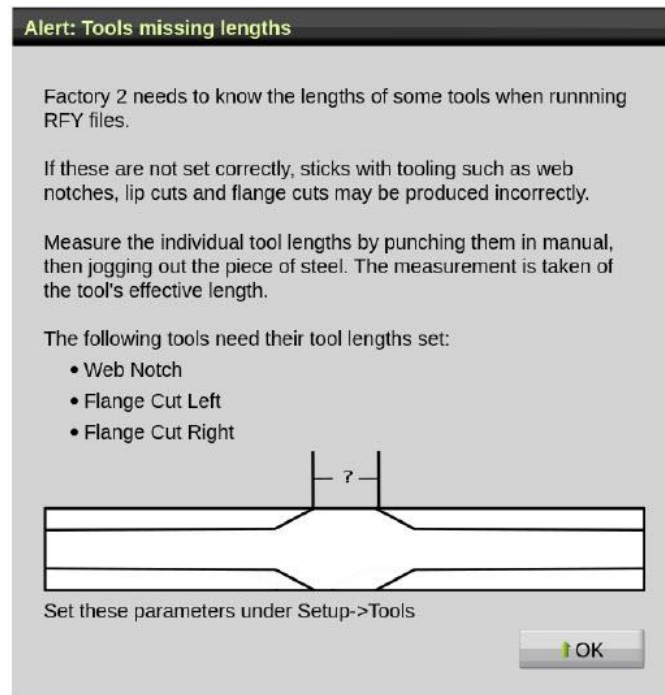
If you wanted to create a manual test stick with tools in specific positions, you could input all tooling information here. If you want to test the tool functions without their positions being important, a more efficient method is to put the machine in Manual mode and manually execute each tooling function as the stick passes through the machine – see [Manually Operate Tools](#).

NOTE!

The tools shown in the following screenshot(s) may vary to actual depending on machine configuration at time of order placement.



The length for the Web notch, Lip cut, Swage and Web Notch must be set up, otherwise the alert message comes up:



If you try to run a stick with tools that haven't had their tool lengths set up, the machine will stop and display the following alarm message:



A warning message will also be displayed all the time to remind you that the tool length has to be set up.



Available tools: displays all of the physical tools available on this particular machine. Use the arrows to add or subtract a tool to this stick.

Tool and position: Tooling operations that will be performed on this particular stick are listed here. The information comes from the job file.

Chamfer Start		Chamfer End	
Tool	Position		
Swage		0.00	41.00
Dimple			18.50
Service Hole			178.00
Swage		335.00	376.00
Dimple			357.50

Position values for the tool depends on whether the tool is a "length" or "point" tool.

'Point' tools perform the operation at a single specific location:

1. Bolt Hole
2. Chamfer
3. Dimple
4. Screw Holes
5. Service Hole

Point tools show the location, relative to the end of the stick, where the tooling operation will be performed.

'Length' tools perform the operation over a given length:

1. Flange Cuts
2. Lip Cut
3. Swage
4. Web Notch

Length tools show two positions (start and end of the operation) relative to the end of the stick. The difference between the two values is the length.

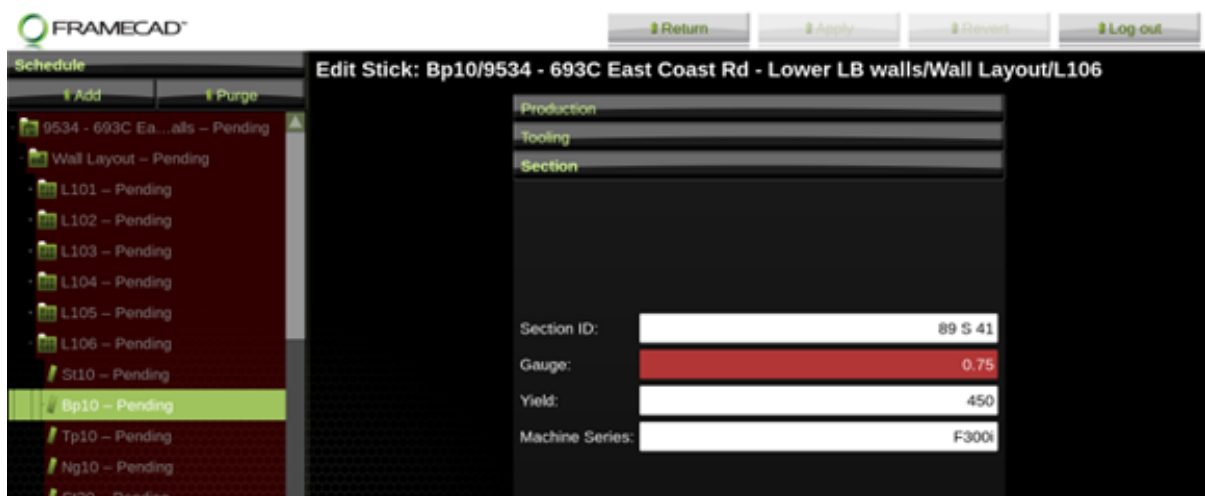
The **Chamfer Start** and **Chamfer End** checkboxes can be used to force a chamfer tool operation to be included at either the start or end of a stick.

NOTE! If a tool position value is entered outside the Stick Length setting, the value text box will be highlighted in red.

Section tab

It is not necessary to input information here when making a manual test stick.

NOTE! If a job file does not match the coil information input by the operator, then the relevant field(s) will be highlighted in red. In the below screenshot the steel thickness (colloquially known as "gauge" is incorrect for this stick. More information about incorrect coil is in [Check Coil Matches Job Spec](#))



FRAMECAD

Return Apply Revert Log out

Schedule

Add Purge

9534 - 693C Ea...alls - Pending

Wall Layout - Pending

L101 - Pending

L102 - Pending

L103 - Pending

L104 - Pending

L105 - Pending

L106 - Pending

S110 - Pending

Bp10 - Pending

Tp10 - Pending

Ng10 - Pending

S120 - Pending

Edit Stick: Bp10/9534 - 693C East Coast Rd - Lower LB walls/Wall Layout/L106

Production

Tooling

Section

Section ID: 89 S 41

Gauge: 0.75

Yield: 450

Machine Series: F3001

The Section tab displays information on the specific section (stick) specified. This will include:

Section ID	The shape of the stick and its dimensions as determined in the job file. Shape will be either S (with lips) or U (without lips). The value before the S or U is the web width; the value after the S or U is the flange length. If the profile is an S shape, the flanges will be shorter as some of the flange height will be taken by the lips. Must match the shape that the machine is configured for - if not this will be highlighted in red and you will need to configure the machine for the profile shape – see Change Profile (Section) Shape .
Gauge	This means the material thickness specified in the job file for this particular stick. Corresponds to the Gauge of steel input by the operator in the Coil tab of the Setup > Coil screen when the coil was loaded – see Enter Coil Information .
Yield	The given yield strength of the steel specified in the job file for this stick. Corresponds to the Grade of steel input by the operator in the Coil tab of the Setup > Coil screen when the coil was loaded – see Enter Coil Information .
Machine series	The machine model that this stick was designed for.

7.6 Coil and Steel Setup

This section contains procedures relating to coil changes, including:

- Loading and unloading the decoiler
- Threading steel through the machine
- Removing steel from the machine
- Recording coil information in the machine software.

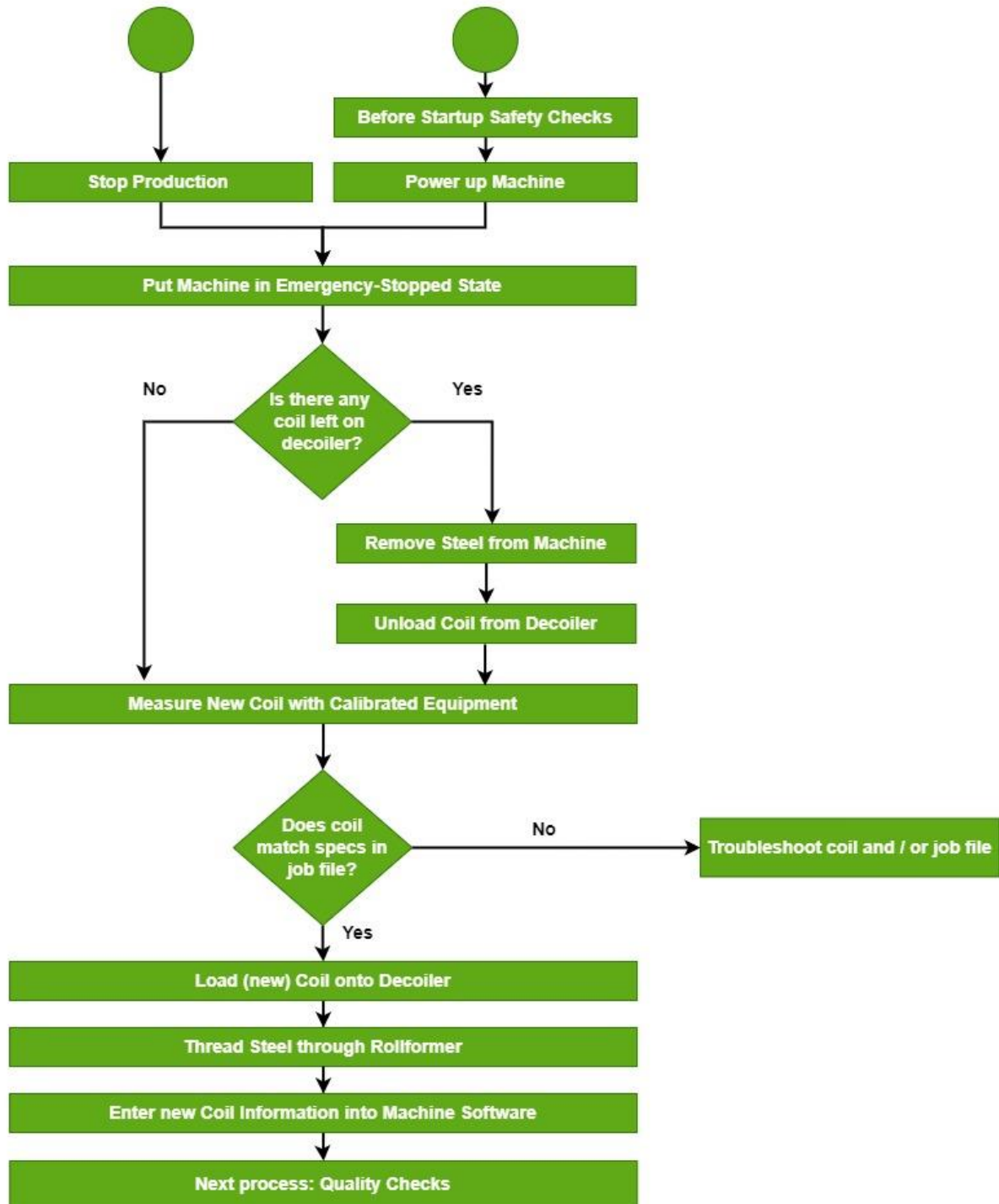
NOTE! If your company has ICC certification, there may be additional steps to ensure quality and traceability of your coil.

Overview of coil change process

A typical process for changing coil would include the below steps.

Change of coil needed during production

Start of day (machine off)



7.6.1 Load a New Coil onto Decoiler

This procedure explains how to load a steel coil onto an empty decoiler.

 **DANGER!** Coil handling is dangerous due to the risk of injury from mishandling heavy steel coils and/or the equipment needed to move steel coil. To reduce this risk:

- * Staff involved in working with steel coil must be trained in the procedures and equipment used to lift and move the coil.
- * Equipment used to move coil must be certified to lift the maximum weight of coil you will use.
- * Coil to be loaded must be securely strapped to prevent risk of injury from the steel strip suddenly unwinding during the loading process.

Decoiler model

This procedure is for 3T decoilers supplied with F-Series models of rollformer.

Prerequisites

Ensure coil to be loaded is correct specification for your job, rollformer and decoiler.

Procedure

 **DANGER!** The machinery must be in an **emergency-stopped** state (achieved by pressing one of the **Emergency Stop** pushbuttons on the rollformer).

This procedure requires entry to the machinery danger zone near the decoiler, and the emergency stop reduces risk of serious injury from the spinning decoiler mandrel being accidentally activated.

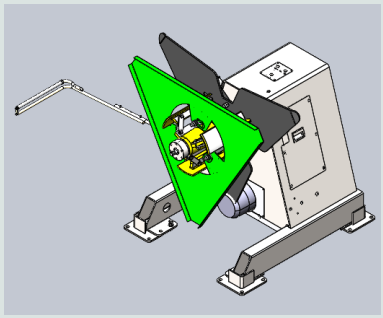
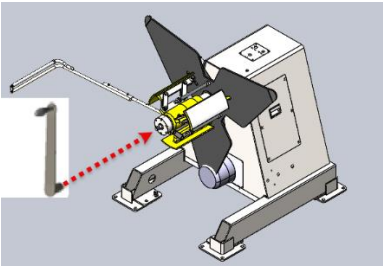
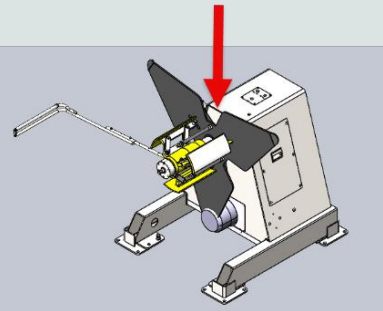
Tools / equipment required

- Standard PPE: safety boots, cut-resistant gloves, hi-vis clothing
- Steel coil lifting equipment, including strop rated to lift the weight of your coil
- Decoiler winder handle (found on reverse side of decoiler)
- Steel coil measuring equipment, e.g. calibrated and high accuracy vernier callipers

Prepare coil

Measure coil with accurately calibrated equipment to make sure it matches the job file loaded onto the machine.

Prepare decoiler

STEP	ILLUSTRATION
Press Emergency Stop button on machinery.	
Loosen the three large locking nuts holding the green triangular safety guard in place. You will be able to rotate the safety guard anticlockwise and lift it over the locking nuts.	
Remove safety guard from decoiler.	
Use decoiler winder handle to contract mandrel shoe plates inwards so that there is enough clearance to receive the new coil.	
Ensure back plate is oriented with flat side and cutout at the top; if not rotate back plate by hand until in position shown.	

Load coil

NOTE! These steps contain pictures of a FRAMECAD Travelling Gantry with electric hoist, which can be supplied by FRAMECAD. If you have chosen to supply your own coil moving equipment, you will need to create your own instructions for lifting coil between storage and decoiler.

STEP	ILLUSTRATION
Use your lifting equipment to position the coil onto the decoiler. Note: • Make sure coil will unwind from the top of the coil towards the rollformer. • Ensure that the steel coil once loaded is in-line with the infeed to the machine. • There should be around 10mm of clearance between the back plate and the coil. • Maintain tension on the strop holding up the coil - do not rest the full weight of the coil on the decoiler yet.	
Use winder handle to expand mandrel shoe plates up against the inside diameter of the steel coil. Note: • It may take some trial and error to adjust vertical position of the coil at the same time as expanding the shoe plates. • Do not tighten shoe plates all the way - wait until decoiler has taken full weight of the coil • Do not overtighten mandrel shoe plates.	
Release weight of coil to rest fully on the mandrel. Remove strop.	

Expand mandrel plates fully to evenly distribute the weight of the coil.



Put green safety guard back onto decoiler and secure with the three locking nuts.



Unstrap coil

 **DANGER!** Take extreme care during this step. Risk of injury when unstrapping coil as the end of the strip will unwind extremely quickly from the coil as soon as strapping is removed.

STEP	ILLUSTRATION
Hold the end of the coil firmly while cutting the strap.	
CAREFULLY let go of the steel strap, making sure there is nobody standing in the path of the unwinding steel.  DANGER! Make sure there are no people behind the decoiler when you let go of the end of the strip, as it will unwind into the space behind the decoiler very fast and with a lot of force.	
Once you have let go of the coil, it will be resting on the ground behind the decoiler as shown.	

Thread steel through dancer arm

TIP! While the machine is in an emergency-stopped state, the decoiler mandrel can be rotated by hand. You can pull on the steel to uncoil it.

STEP	ILLUSTRATION
Pull the end of the steel over the top of the coil and down through the dancer arm.	
After the steel is threaded through the dancer arm, it can be fed into the rollformer. See below.	

7.6.2 Thread Steel through Rollformer

This procedure explains how to feed the steel strip into the rollformer and thread it through the various tooling stations until it exits the shear station end.

Procedure

 **DANGER!** The machinery must be in an emergency-stopped state (achieved by pressing one of the **Emergency Stop** pushbuttons on the rollformer).

This procedure requires entry to the machinery danger zone near the decoiler, and the emergency stop reduces risk of serious injury from the spinning decoiler mandrel being accidentally activated.

Prerequisites

- Coil must be loaded onto decoiler following the Load a New Coil onto Decoiler on page 102 procedure
- Coil strip width must be exactly the same as the previous coil. Make sure you have confirmed this by measuring the width
- Lipbox rollers should be engaged (unless you know you are going to be producing U-shaped - unlipped - profiles).

Tools / equipment required

- Standard PPE: safety boots, cut-resistant gloves, hi-vis clothing, safety glasses
- Tool to cut through steel strip, e.g. steel shears or electric steel nibbler.

Prepare steel - cut corners off end of strip

STEP	ILLUSTRATION
If machinery is not already in an emergency-stopped state, press one of the Emergency Stop buttons.	
Using your preferred tool, cut the corners off the end of the steel strip. This minimises the potential for sharp/warped corners to become jammed in the machine when inserting the strip.	

Insert steel strip into rollformer

TIP! While the machine is in an emergency-stopped state, the decoiler mandrel can be rotated by hand. You can pull on the steel to uncoil it.

STEP	ILLUSTRATION
Carefully feed the end of the steel strip through the infeed rollers.	

Carefully push the steel into the rollformer. Once through the infeed rollers, the steel will pass through the lubricator rollers and into the infeed guides (A).

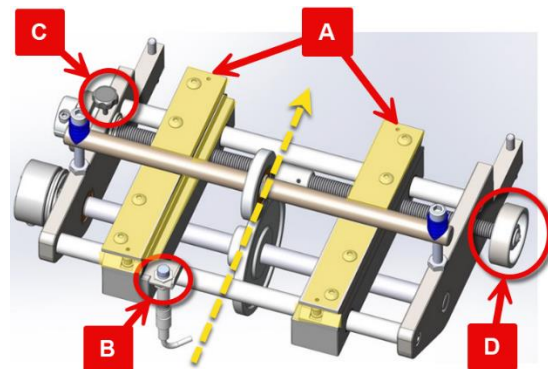
Fine-tune the infeed guides to ensure the strip is evenly centred in the machine.

Check that the infeed guides are firm on the steel but not tight. You can test this by moving the steel strip from side to side inside the guides; there should be little to no movement.

To adjust the infeed guides (A) inward or outwards, loosen the locking screw (C) and wind the knurled adjustment wheel (D) until there is a firm fit. Then loosen the adjustment wheel off about 1mm.

The infeed guides should prevent the steel from sideways movement, but the steel should not be hard up against the rollers inside the infeed guides, otherwise the rollers will get unnecessarily worn.

Re-tighten the locking screw when complete.



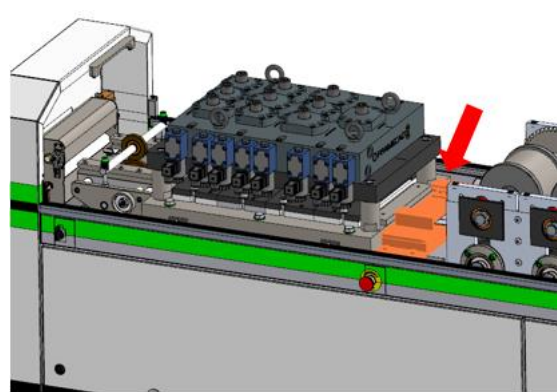
This step requires some strength. Push the steel past the infeed, through the tool block and into the roller section.

If you meet resistance, this could indicate the steel is bent and caught inside the machine. Pull the steel out and check for bending, particularly around the leading edge of the steel. Cutting off the corners at the end minimises the possibility of the steel getting stuck while being inserted.

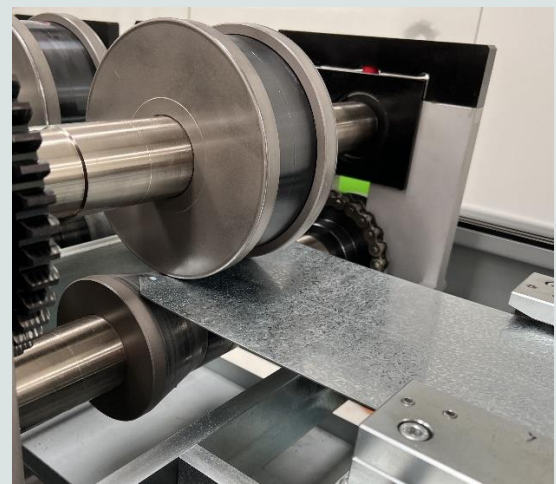


Once the steel strip has reached the first roller station, make sure the guides mounted at the outfeed end of the tool block are just touching the sides of the steel strip.

The infeed guides should prevent the steel from sideways movement, but the steel should not be hard up against the rollers inside the infeed guides, otherwise the rollers will get unnecessarily worn.



Push the steel strip so that it is firmly wedged in between the first two rollers, with enough surface area engaged so that it will be caught by the rollers and driven along when the rollformer is started.



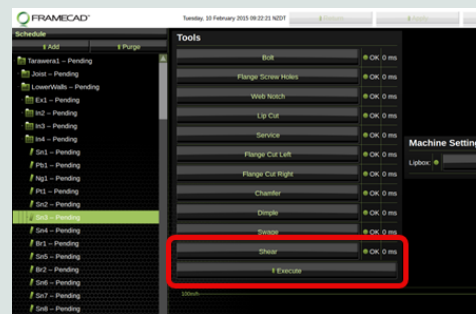
Inch steel strip through machine and manually shear steel

STEP	ILLUSTRATION
Clear the emergency-stopped status of the machine: 1. Twist the Emergency Stop button that was pressed to release it. 2. Acknowledge the Emergency Stop alarm on the Operator Touchscreen. 3. Press the Reset button  below the Operator Touchscreen. The machine will now be in Manual operation mode.	
With the machine in Manual mode, use one of the Inch switches (turn it to the left) to manually move the steel through the roller section and through to the outfeed. If the rollers spin without gripping the steel, you will need to push the steel by hand in	

through the infeed to be gripped by the rollers more strongly.

Continue to inch the steel through the machine. When the steel reaches the outfeed, allow 10mm of steel to exit past the outfeed guard.

Then, on the Operator Touchscreen, press the **Shear** option to highlight it, then press **Execute** to perform a manual shear operation.



Check to make sure there is sufficient lubricant being applied to the steel strip. The steel strip should have a wet, even film of lubricant across the strip width.

Next steps

After changing coil, ALWAYS do [Product Quality Checks](#) on the profiles to confirm dimensions and shape are acceptable

7.6.3 Enter Coil Information

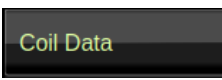
The software can record coil identification information. We recommend using this feature because it is useful for traceability of production pieces in the event of any quality issues with coil supply.

When a job is loaded, the software will cross-check this coil data with any steel specifications included in the job file (see [Check Coil Matches Job Spec](#)). If there are any discrepancies between coil data on this screen and the information in the job file (for example if the thickness of steel is incorrect), the software will highlight sticks in the job schedule in red. You can view the discrepancy using the [View \(and Edit\) Stick Properties](#) screen.

Enter Coil Information from Setup screen

Go to **Setup > Coil** and select the Coil tab.

TIP! Information needed for this screen will be available in the **Mill Certificate** that was supplied with your coil.



Coil Data	
Coil label:	Coil123
Gauge (mm):	0.55
Standard:	EN 10346
Grade:	S390GD
Coating:	Z180
Strip width:	89
Weight (kg):	1000.00
 Swap	
Length (m):	2498.27
Alert below length:	10.00

Enter information as follows.

Coil Label	A unique identifier for this coil according to your internal processes and how you wish to track coil from different suppliers or batches.
Gauge	This value is the Base Metal Thickness (BMT) of the steel. NOTE! BMT is the uncoated thickness of the steel. This may differ to the <i>design (i.e. coated) thickness</i> of the steel being used.
Standard	The specified standard that the steel must comply with. This should match the specification as shown on the mill certificate supplied with the steel coils.
Grade	The Grade of the steel being used. This should be shown on the mill certificate supplied with the steel coils.
Coating	The type of coating applied to the steel surface. This should match the coating as shown on the mill certificate supplied with the steel coils.
Strip Width	The width of the strip for this coil. Also shown in the mill certificate.
Measured Weight	The weight of this coil. This value is also in your mill certificate, but if you have already used some of this coil, you will need to weigh it again before entering its weight.
Remaining Length	The software has an inbuilt coil "weight-to-length" calculator. This uses the coil details to estimate the length of steel in a coil, and also to calculate when coil is running low if the 'Alert below length' checkbox is selected. To calculate the remaining length, enter the details below in the following order:

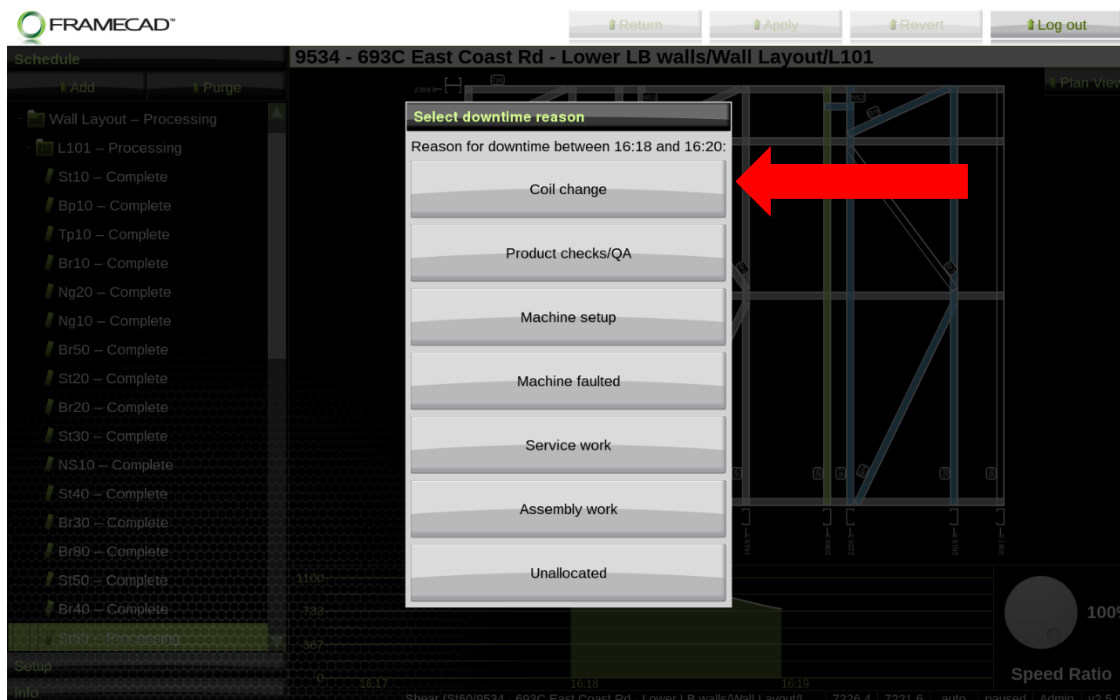
	1. Enter correct coil details (gauge, coating, strip width, etc.) 2. Enter the Measured Weight. The Remaining Length will automatically be calculated. 3. If you are happy with the value, press Apply at the top of the screen to tell the software to use this value.
Alert below length	You can set up the software to display an Alert when the coil reaches a certain length (using the remaining length value above and data from production about how much coil has been used since this value was calculated) so that you can make advance preparations for loading a new coil.

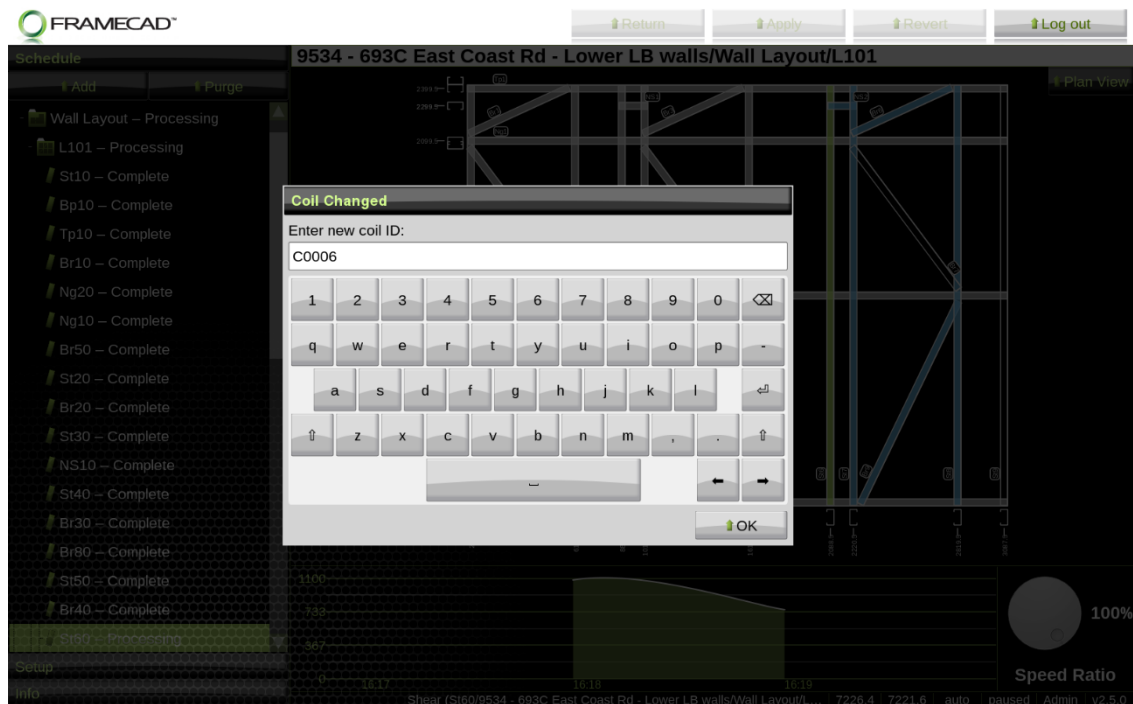
Enter Coil ID after coil change

After selecting coil change as a downtime reason

If you are in the middle of Automatic production, and you have Downtime Reason Logging set up (see [Set Up Downtime Logging for Automatic Production](#)) and you select **Coil change** as your downtime reason, a popup will appear asking you to enter information about the new coil.

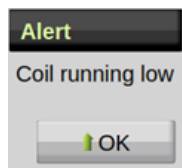
TIP! We recommend also entering the full details of the coil on the **Setup > Coil** screen if you wish to make use of information for traceability purposes, or to configure an alert for when your coil length gets low.





7.6.4 Set Up Alert for Low Coil Length

You can configure the software to tell you when you will soon run out of the currently loaded coil.



TIP! This alert must be set up at the time of entering information for a new coil on the **Setup > Coil screen**.

For instructions on setting up the alert, see [Enter Coil Information](#).

7.6.5 Remove Steel From Rollformer

This procedure explains how to remove steel from inside the rollformer.

You will need to remove steel from the rollformer for any of the following reasons:

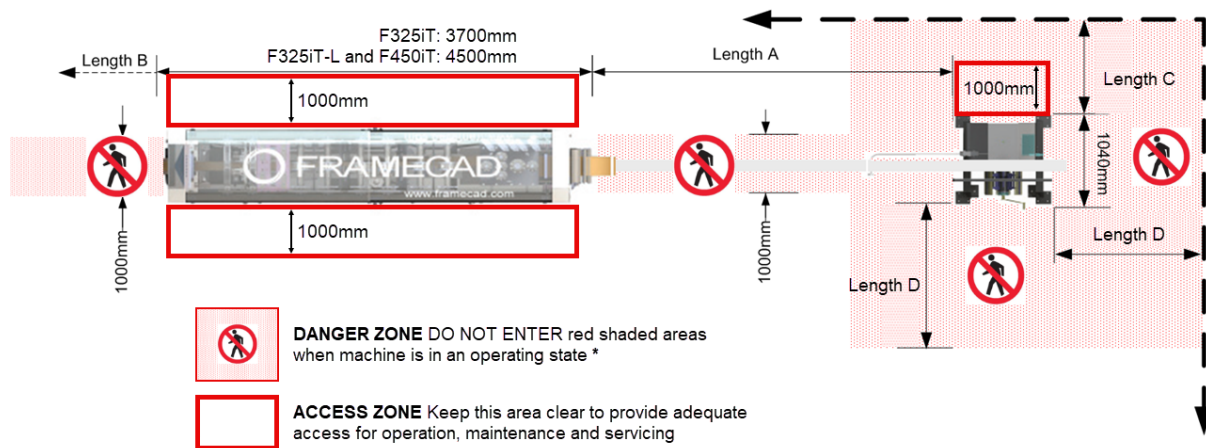
- Changing the coil, for example if a different thickness is required
- Reaching the end of a coil
- After cutting off the steel at the infeed for any reason, such as troubleshooting.

Procedure

⚠ DANGER! The machinery must be in an emergency-stopped state (achieved by pressing one of the **Emergency Stop** pushbuttons on the rollformer).

This procedure requires entry to the machinery danger zone near the decoiler, and the emergency stop reduces risk of serious injury from the spinning decoiler mandrel.

Machine Danger Zone



Length A 3000 - 4000mm depending on thickness of steel (final distance will be determined by FRAMECAD Technician during installation)

Length C At least 1000mm from boundary wall or other machinery

Length B Length of runout table. Should be an appropriate length to safely accommodate the longest sticks produced by your machine. 3000mm and 6000mm runout table options are available from FRAMECAD (table tops only)

Length D At least 2000mm from boundary wall or other machinery

* Operating state defined as machinery ON at isolation switch, safety circuit has been reset, and machinery ready for Manual, Semi-Automatic or Automatic production mode, or any of these modes has been initiated by the operator

Tools / equipment required

- Standard PPE: safety boots, cut-resistant gloves, hi-vis clothing
- Tool to cut through steel strip, e.g. steel shears or electric steel nibbler.

Cut steel off at infeed

STEP	ILLUSTRATION
If machinery is not already in an emergency-stopped state, press one of the Emergency Stop buttons.	

Cut the steel strip. We recommend using an electric steel nibbler for this step as it is easier to cut the steel into a flat shape (without waves), making it easier to thread through the machine again.



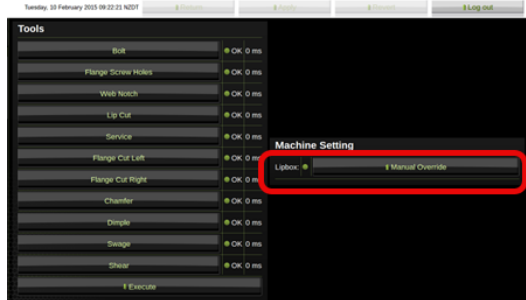
(Optional) You may also wish to prepare the end of the strip for the next time it is inserted into the machine by cutting off the corners.



Disengage lipbox rollers

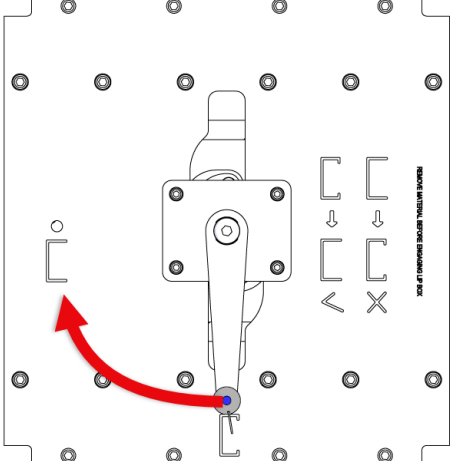
Turning off the lipbox makes it easier to remove steel from the machine. Engagement of the lipbox on an F325iT is a software automated function. Engagement of the lipbox on an F450iT is a manual function. The process for both are identified below.

How to disengage lipbox rollers for the F325iT and F325iT-L:

STEP	ILLUSTRATION
Clear the emergency-stopped status of the machine: 1. Twist the Emergency Stop button that was pressed to release it. 2. Acknowledge alarms on the Operator Touchscreen. 3. Press the Reset button  below the Operator Touchscreen. The machine will now be in Manual operation mode.	
On the Manual option home screen, press Manual Override to turn the lipbox off. The small green icon next to the option should turn grey to indicate the lipbox is off.	

Check the lipbox assembly to confirm the rollers are disengaged.

How to disengage lipbox rollers for F450iT:

STEP	ILLUSTRATION
Open the sliding cover near the Operator Touchscreen. This will put the machinery in an emergency-stopped state.	
Use the winder handle to move the lipbox rollers from a lipped to an unlipped position.	

Inch steel out of machine

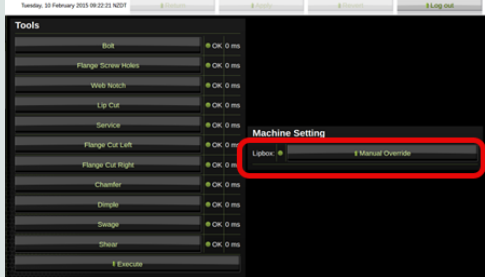
After the lipbox rollers are out of the way, you can move the steel through the machine.

STEP	ILLUSTRATION
Use the Inch switch to move the steel through the machine.	
When the steel can no longer be driven forward (due to not being contact with any driven rollers), you can grip it from the outfeed and pull it out by hand.	

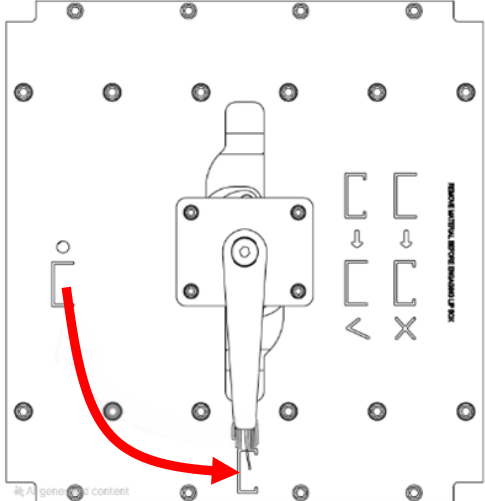
Engage lipbox rollers

Once all the steel has been removed from the rollformer and before threading new steel into the rollformer, the equipment should be prepared for the next profiles. For lipped profiles the lipbox rollers must be engaged.

How to engage lipbox rollers for F325iT or F325iT-L models:

STEP	ILLUSTRATION
On the Manual home screen, press Manual Override. The small grey icon next to the option should turn green to indicate the lipbox is on.	
Check the lipbox assembly to confirm the rollers are engaged.	
Inch the steel through the machine to re-engage the rollers	

How to engage lipbox rollers for F450iT:

STEP	ILLUSTRATION
Open the sliding cover near the Operator Touchscreen. This will put the machinery in an emergency-stopped state.	
Use the winder handle to move the lipbox rollers from the unlipped position to the lipped to position.	

7.6.6 Unload Coil from Decoiler

This procedure explains how to remove coil from the decoiler.

 **DANGER!** Coil handling is dangerous due to the risk of injury from mishandling heavy steel coils and/or the equipment needed to move steel coil. To reduce this risk:

- * Staff involved in working with steel coil must be trained in the procedures and equipment used to lift and move the coil.
- * Equipment used to move coil must be certified to lift the maximum weight of coil you will use.
- * Coil to be loaded must be securely strapped to prevent risk of injury from the steel strip suddenly unwinding during the loading process

Decoiler model

This procedure is for 3T decoilers supplied with F325iT, F325iT-L and F450iT models of rollformer.

Procedure

 **DANGER!** The machinery must be in an emergency-stopped state (achieved by pressing one of the **Emergency Stop** pushbuttons on the rollformer).

This procedure requires entry to the machinery danger zone near the decoiler, and the emergency stop reduces risk of serious injury from the spinning decoiler mandrel being accidentally activated.

Tools / equipment required

- Standard PPE: safety boots, cut-resistant gloves, hi-vis clothing
- Steel coil lifting equipment, including strop rated to lift the weight of your coil
- Decoiler winder handle (found on reverse side of decoiler)
- Clamp
- Steel strapping for coil
- Tool to cut through steel strip, e.g. steel shears or electric steel nibbler.

Cut steel off at infeed

STEP	ILLUSTRATION
If machinery is not already in an emergency-stopped state, press one of the Emergency Stop buttons.	

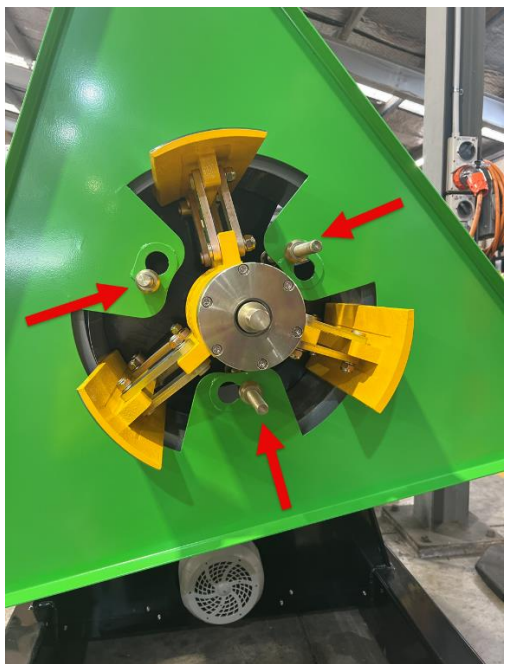
Cut the steel strip. We recommend using an electric steel nibbler for this step as it is easier to cut the steel into a flat shape (without waves), making it easier to thread through the machine again.



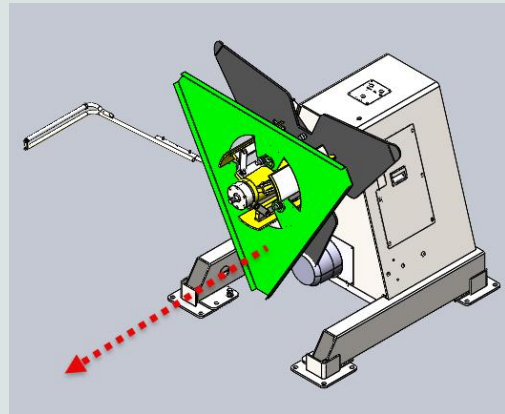
(Optional) You may also wish to prepare the end of the strip for the next time it is inserted into the machine by cutting off the corners.



Wind up coil and strap with steel strapping

STEP	ILLUSTRATION
Prepare a clamp to hold the end of the coil in place until you can strap it.	
Undo the three locking nuts holding the safety guard in place.	

Remove safety guard from decoiler.



Rotate decoiler mandrel by hand to wind up steel strip.



Clamp the coil together close to the end.



Wind steel strapping around the coil.



Secure the steel strapping in place

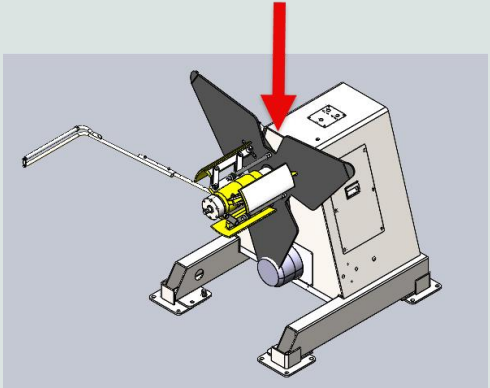


Ratchet / tension the steel strapping to firmly secure the end of the coil.

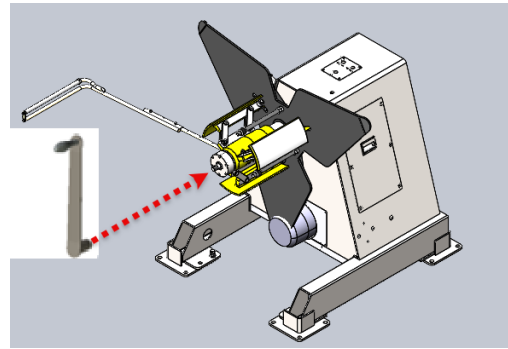


Take coil off decoiler

NOTE! This procedure contains pictures of a FRAMECAD Travelling Gantry with electric hoist, which can be supplied by FRAMECAD. If you have chosen to supply your own coil moving equipment, you will need to create your own instructions for lifting coil between storage and decoiler.

STEP	ILLUSTRATION
Rotate decoiler mandrel by hand until back plate is oriented with flat side and cutout at the top.	
Thread stop through middle of coil. It is easier to do this with the back plate cutout at the top. Hook the stop onto your lifting equipment.	
Use your lifting equipment to lift and apply tension on the stop until it is taut.	

Attach the decoiler winder handle to the mandrel.



Use the winder handle to contract the mandrel shoe plates.
At the same time, you may need to apply more tension to the strop holding up the coil.



Contract the mandrel shoe plates until there is enough clearance to move the coil off the mandrel.
Use your lifting equipment to slowly remove the coil from the decoiler.



7.7 Start a Production Job (Automatic Mode)

Prerequisites

Before beginning production:

- Ensure a job is loaded ([Load a Job for Production](#))
- Complete quality checks ([Product Quality Checks](#)) to confirm production output is ok ([Check Coil Matches Job Spec](#)).

Procedure

For production, the machine will be in Automatic mode.

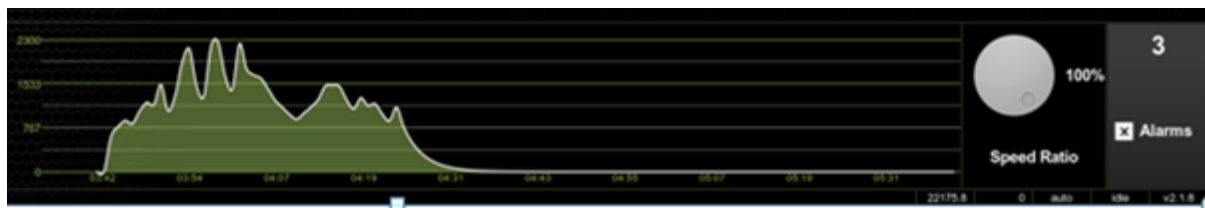
In Automatic control mode, the machine will automatically process all items occurring in the job schedule, starting with the first (top) item, and proceeding one frame at a time sequentially down the schedule.

At the end of a frame (sub-assembly), the software will scan the job schedule from the top of the list to find any items which may have been added, moved, or re-made since starting. This is to keep the various job parts together.

The software will then begin to produce the next job folder it finds with the Pending status.

7.7.1 Adjust Production Speed (Automatic Mode only)

When running in Automatic control mode, the bottom of the Schedule Screen will display a graph of the average production rate (processed steel / hour averaged over the last 8 hours of automatic production).



Adjust speed of production using Speed Ratio dial

To the right of the graph is the machine Speed Ratio dial. To increase or decrease the operating speed of the machine, the dial can be turned either left or right respectively.

NOTE! The dial is calibrated in % of Feed-rate as set in the **Setup > Motion Control** screens.

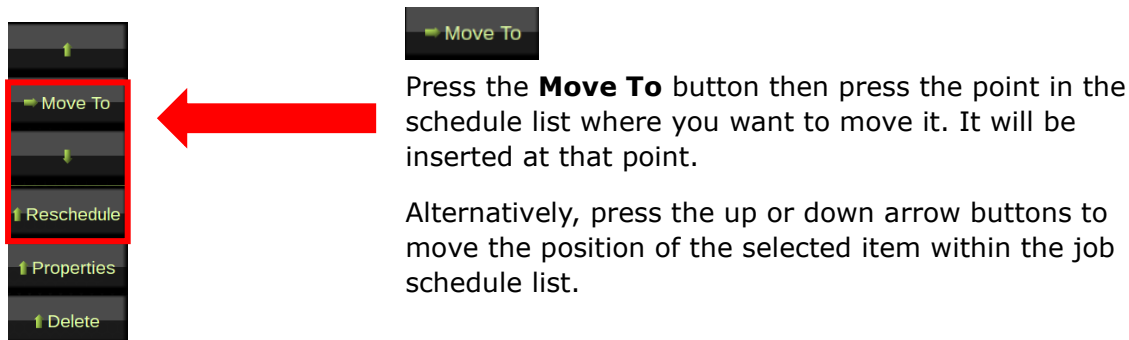
This speed adjustment dial is only valid for Automatic control and has **no effect** on the speed of the machine in Manual control.

7.7.2 Change Order of Items in Production Schedule

To change the order that a component (at any level: project, plan, frame or stick) will be produced by the machine:

Open the **Schedule** menu.

Select the component you wish to move. The following pop-up menu will appear.



7.8 Pause or Stop Production

There are a few ways to pause or stop the machine when it is in Automatic production mode. These methods apply to Automatic production mode only - when the machine is continuously producing framing sticks.

1. Pause mid-production so that the machine will pause immediately, even with sticks in progress inside the machine.
2. Pause production so that the machine will stop after the next stick exits the machine.
3. Pause production so that in-progress sticks will be scrapped, and the machine will re-do these when production is resumed.

TIP! In addition to the above methods that are one-time ways to pause production, there is a software setting that will pause the machine after each frame to give operators time to collate all the sticks together - see [Pause Automatic Production after Each Frame](#).

7.8.1 Pause production immediately

To pause production immediately:

1. Press the **Pause** button  to suspend Automatic production. Production will automatically pause, even if in the middle of production of a stick. However, if a tool is in the middle of operation, it will finish its cycle before the machine stops.
2. Press the **Pause** button  again to resume Automatic production.

7.8.2 Pause production after next stick

If you wish to stop production during Automatic mode after the next stick is produced (this is also called a **controlled stop**):

1. Press the **Start** button  while machine is in Automatic mode to initiate a controlled production stop. The **Start** button  lamp will flash to indicate a controlled production stop is in progress.
2. Once the current stick has been completed, the machine will pause production. The machine will be in a controlled stop state.
3. Press **Start** button  to resume automatic production.

7.8.3 Pause production and redo in-progress stick(s)

TIP! Use this method to re-do any in-progress sticks if you need to stop production to perform a task that will render the in-progress sticks unusable, for example changing coil.

If you press the **Software Reset** button  when the machine is in Automatic mode, the software will restore any in-progress sticks to Pending status so that they will be done again when production resumes.

1. Press the **Pause** button . This will immediately pause Automatic production.
2. Press the **Software Reset** button . This will return any in-progress sticks to pending status. **Any steel in the machine will be scrapped.** The machine will return to Manual mode (the **Manual** button  will be lit).
3. When you are ready to resume production, press the **Automatic** button  to put the machine in Automatic production mode. Then, press the Start button  to begin Automatic production (or the **Automatic** button  again to begin Semi-automatic production).

7.9 Change Profile (Section) Shape

The rollformer's lipbox is physically configured for the rollers to be either:

- Engaged, i.e. the rollers are in position towards the steel, and the lipbox will form lipped "S" profiles, or
- Disengaged, where the rollers are moved outwards and will not touch the steel, therefore the machine will produce unlipped "U" profiles.

In order to change from one profile type to another, you need to engage or disengage the lipbox rollers.

How to tell when to change profile shape

If your job contains a different type of profile shape than your machine's lipbox is configured for, the "illegal" sticks will be shown in red in the job schedule. This most likely means that you will need to change profile shape before the machine can process the highlighted sticks.

TIP! Items highlighted in red in the job schedule could also mean that the wrong coil or wrong job is loaded, see [Check Coil Matches Job Spec](#) just in case.



How to tell which profile is currently selected in software

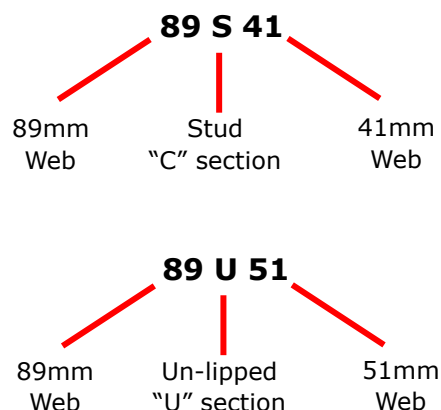
In the software, the available profile types for your machine are shown on the **Setup > Machine Setting** menu, **Section** tab.

This allows the Operator to choose if the machine will produce "C" or "U" section profile sticks. The Lip Box configurations differ based on the machine type.

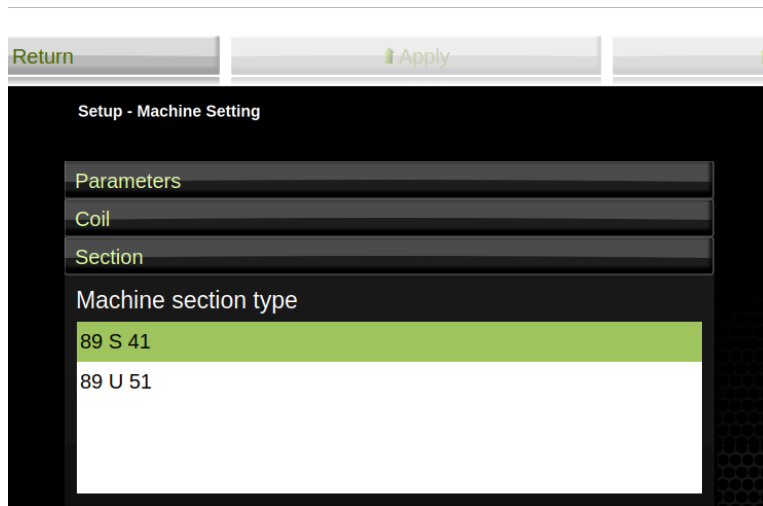
FRAMECAD machines with a hydraulically controlled Lip Box unit can engage or disengage the Lip Box by changing the section.

FRAMECAD machines with a mechanically controlled Lip Box unit will need to manually engage or disengage the Lip Box.

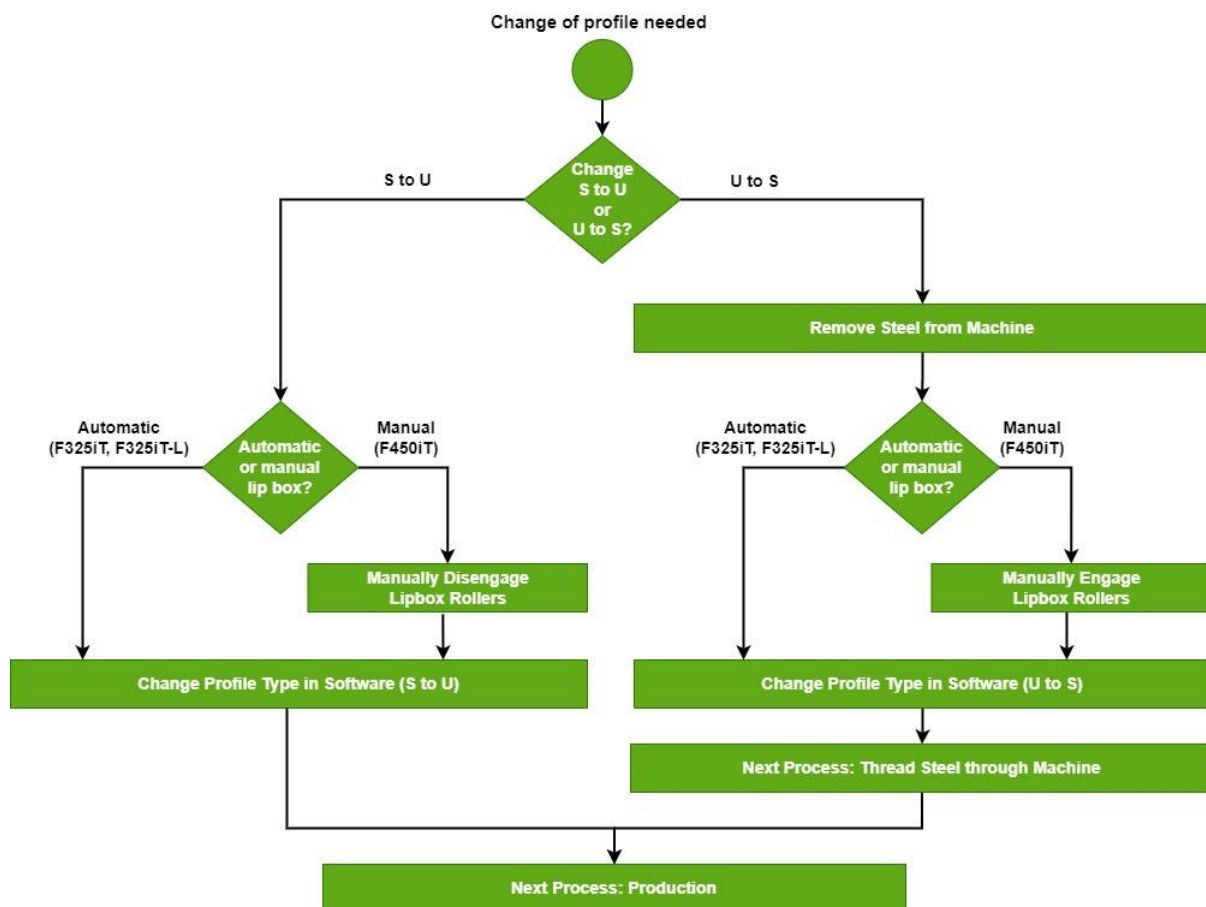
An example for a machine that can produce an S profile and a U profile is shown below:



- S profile: **89 S 41** means the web is 89cm, and the height of the flange is 41cm. The software will show the length of the longest flange if the profile is asymmetric (i.e. one flange is longer than the other)
- U profile: **89 U 51** means that the web is 89cm and the flange is 51cm (but note that the flange height will depend on variables like the coil specifications and steel strip width used).



7.9.1 Process overview for changing profile (section) types



7.9.2 Change From S to U

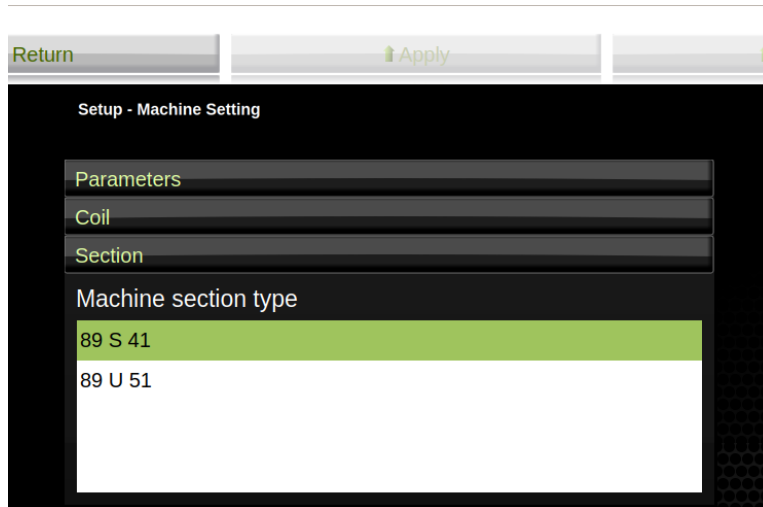
This procedure involves disengaging the lipbox rollers, moving them outwards, and so this procedure can be done with steel inside the machine.

If your machine has a manually operated lipbox, disengage the rollers

This procedure applies to F450iT machine models only. Refer to the Disengage Lipbox Rollers procedure in [Engage or Disengage Manual Lipbox](#).

Select the new profile shape in the software

1. Go to **Setup > Machine Setting** menu, Section tab. The currently-selected profile shape will be highlighted in green.



2. Select the U profile type from the box and press the **Software Reset** button (⌂). The new profile type should now be highlighted in green. The job schedule will be refreshed, and if you have a hydraulically controlled lipbox (F325iT and F325iT-L models only), the lipbox will automatically disengage.

7.9.3 Change From U to S

This procedure involves engaging the lipbox rollers, moving them inwards, and cannot be done with steel inside the rollformer.

NOTE! This procedure involves moving the lipbox rollers into the lipped position. The lipbox and rollers are not strong enough to move back into position with steel inside the machine, and attempting to do so could break or damage the rollers.

Step 1: Remove steel from the rollformer

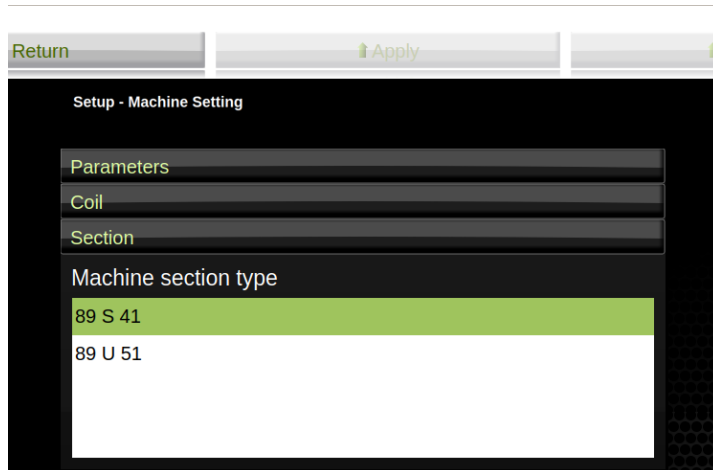
Cut off the steel strip at the infeed and remove the steel from inside using the procedure in [Remove Steel From Rollformer](#).

Step 2: If your machine has a manually operated lipbox, engage the rollers

This procedure applies to F450iT machine models only. Refer to the Engage Lipbox Rollers procedure in [Engage or Disengage Manual Lipbox](#).

Step 3: Select the new profile shape in the software

1. Go to **Setup > Machine Setting** menu, **Section** tab. The currently selected profile shape will be highlighted in green.



2. Select the U profile type from the box and press the **Software Reset** button (⌂). The new profile type should now be highlighted in green. The job schedule will be refreshed, and if you have a hydraulically controlled lipbox (F325iT and F325iT-L models only), the lipbox will automatically disengage.

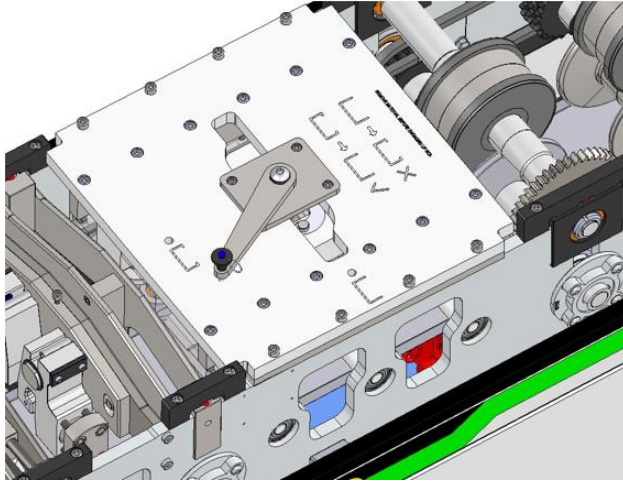
Step 4: Thread steel through rollformer

Put steel back into the rollformer before resuming production.

7.9.4 Engage or Disengage Manual Lipbox

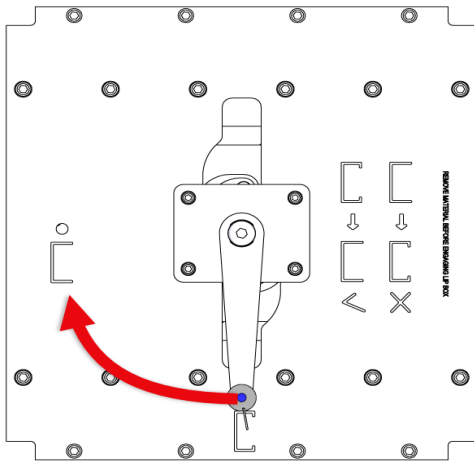
NOTE! This procedure is required for F450iT machine models that have a hand-operated mechanism to engage or disengage the lipbox rollers.

The F450iT rollformer has a lipbox that requires the rollers to be manually moved in or out using a crank handle. An illustration of the lipbox and handle is below.



Procedure to disengage lipbox (change from S to U profile shape)

To move the rollers out, this can be done with steel inside the machine. Move the handle on the lipbox from the lipped to the unlipped position, as shown below.



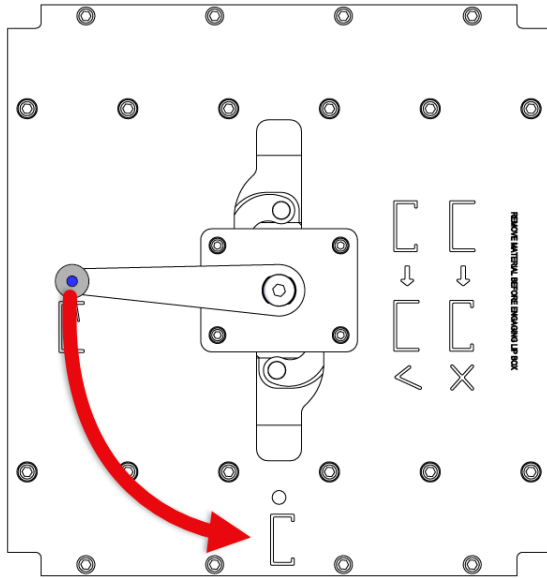
Procedure to engage lipbox (change from U to S profile shape)

Prerequisite procedure

IMPORTANT: Make sure that you have removed steel from the machine before this procedure.

NOTE! This procedure involves moving the lipbox rollers into the lipped position. The lipbox and rollers are not strong enough to move back into position with steel inside the machine, and attempting to do so could break or damage the rollers.

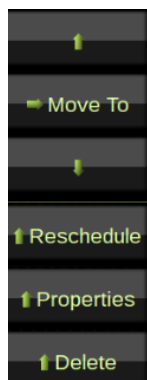
To move the rollers in, move the handle on the lipbox from the unlipped to the lipped position, as shown below.



7.10 Repeat (Reschedule) a Job

Once a job has been completed and you want to repeat (re-schedule) the complete job or a part of it, simply select the complete job folder or sub-assembly (e.g. a frame) from the job schedule list:

1. Open the **Schedule** tab in the left menu.
2. Select the component from the schedule. You can select any level: the complete job folder, or frame or individual stick. The following pop-up menu will appear.

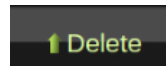
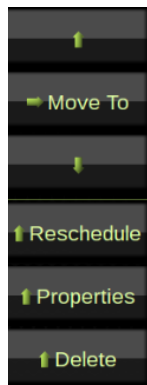


Press the **Reschedule** button to re-make the item selected from the job schedule list. The job status for the re-scheduled items will now revert from **completed** to **pending**.

7.11 Delete Jobs

To delete a particular component:

1. Open the **Schedule** tab in the left menu.
2. Select the component from the schedule. You can select any level: the complete job folder, frame or individual stick. The following pop-up menu will appear.



Press the **Delete** button to remove the selected item from the schedule list.

8 Product Quality Checks

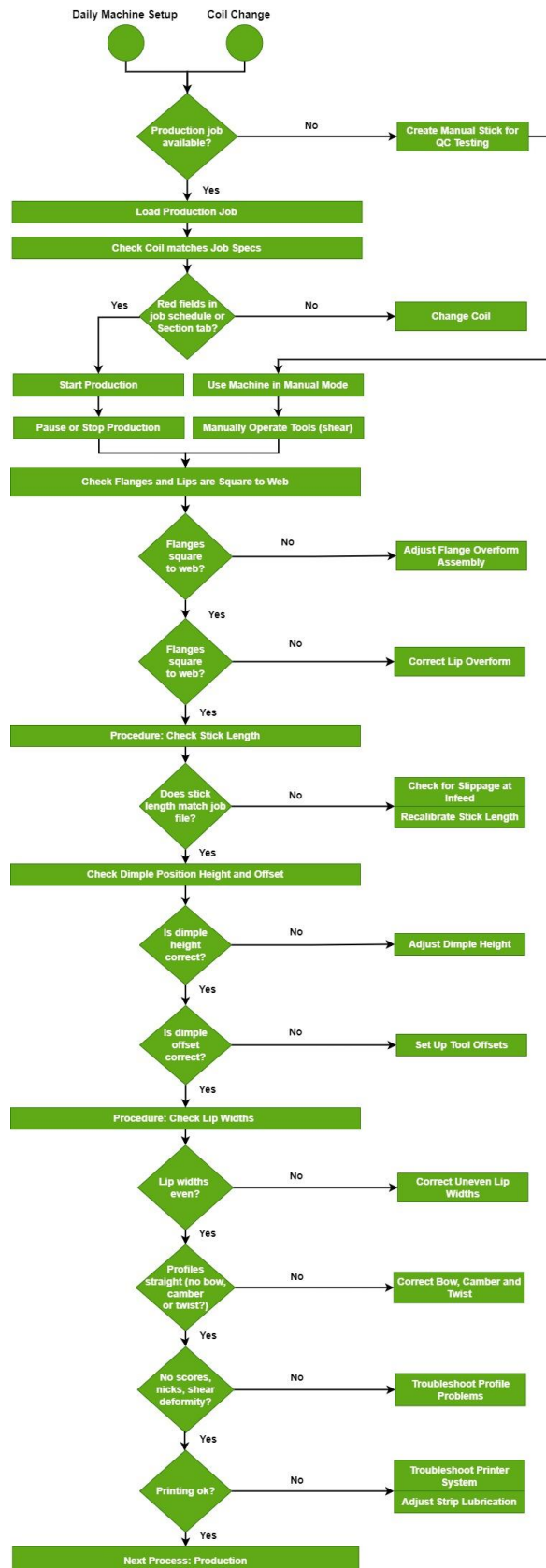
It is important to complete quality checks on the finished product:

- At the beginning of each production day, and
- After changing coil.

You can use a production job to check profiles, or you can create manual sticks.

The checks you need to perform are outlined below.

8.1 FRAMECAD's recommended process for quality checks



8.2 Production Quality Checks

Regular checks are required to keep the machines in good condition and running properly. These are detailed below.

NOTE! The below checks assumes that the coil loaded is appropriate for the job, and the coil has been measured and data input for traceability purposes.

8.3 Check Profile Length

This procedure explains how to check the accuracy of profile lengths being processed by the machine.

PROCEDURE OVERVIEW	
Related processes	Product Quality Checks, Coil Change
Expertise level	Operator
Frequency	Daily before production and after changing coil
Number of people required	2
Time required for this procedure	30 mins

Tools required

Accurate measuring tape

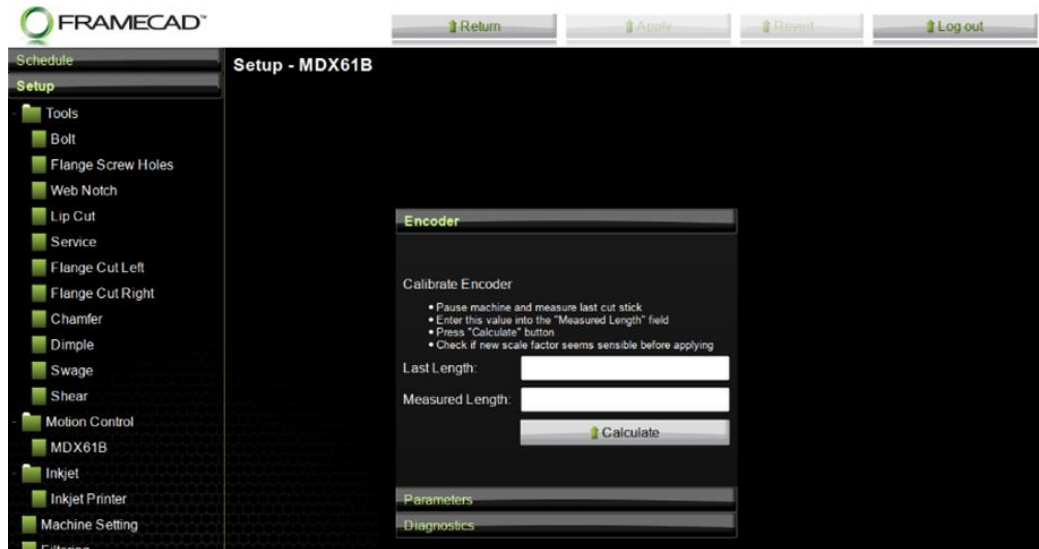
Safety

- ALWAYS wear cut-resistant gloves during this procedure.
- NEVER stand directly in front of the machine outfeed.

Procedure

1. Find a stick of at least 3000mm (10ft) in length in your job file. Or you can [Make a Manual \(Test\) Stick](#) of 3000m.
2. Run the test stick(s) in Automatic mode, stopping after the first stick. It is best to use the **Start** button , which will pause the machine at the end of the current stick being produced (see [Pause or Stop Production](#)).
3. Measure the length of the stick with a tape measure. For accuracy, it is good practice to start the measurement at 100mm on your tape measure and subtract 100mm from the final value.
4. Go to the select **Setup > Motion Control - MDX61B** screen. Select the **Encoder** tab. Take note of the value in the **Last Length** field. This is the

length of the last stick according to the value in the Edit Stick screen for the stick you just made.



5. Compare your measurement with the **Last Length** value. The stick should be the same length as the Last length value, or there should be less than 1mm difference over the length of the 3000m stick.

Determine whether difference in length is consistent or not

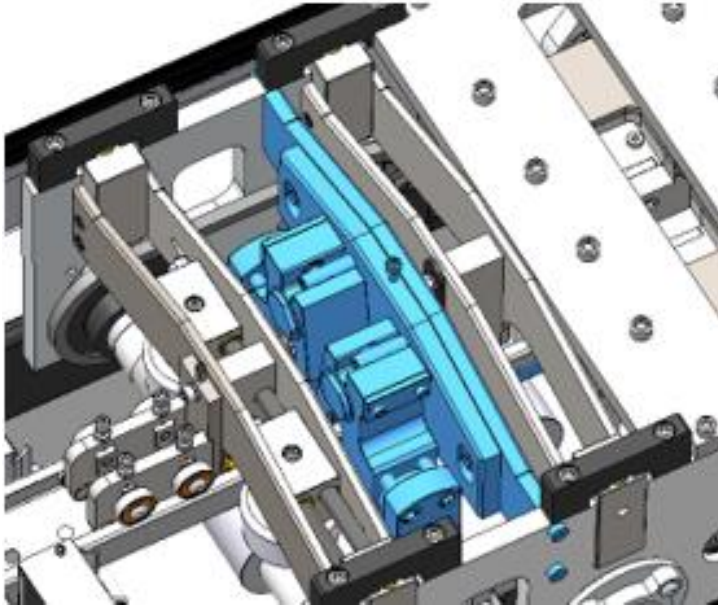
If there is a difference between the **Last Length** and **Measured Length**, run a few more sticks to check whether the length difference is consistent across further sticks. Then, refer to [Recalibrate Stick Length](#).

8.4 Check Dimple Height and Offset

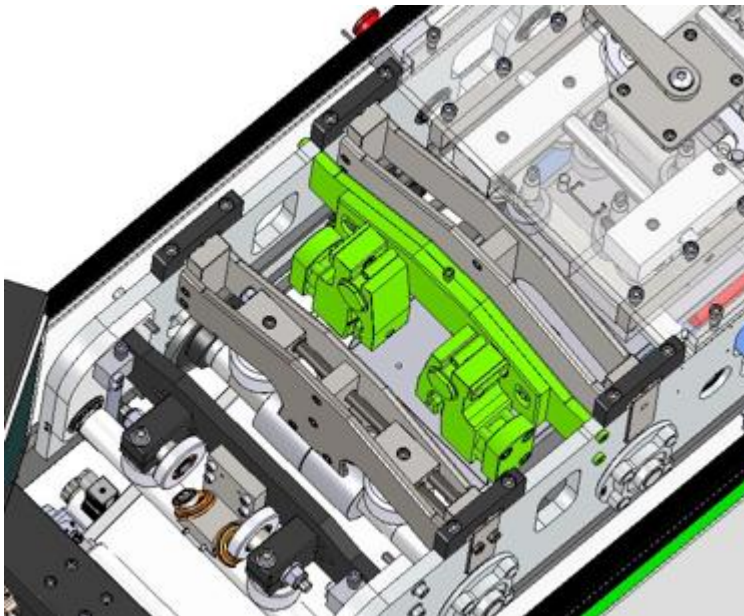
Location of dimple tools

The dimple tools (one for each side of the flange) are located between the pinch rollers and the flange overform rollers.

F325iT and F325iT-L dimple tools:



F450iT dimple tools:



Tools needed

- Sample production stick with dimple hole
- Engineer's square
- Vernier callipers

Procedure to check dimple height

Run a production stick that contains dimple holes.

Use the engineers square identify the position of the bottom of the web as the measurement reference point. Then use the vernier callipers to measure the distance from the edge of the square to the centre of the dimple hole.

Alternatively measure to the closest edge of the dimple hole and add half the dimple radius to the measurement.

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The dimple height should be compared against the height specified in the profile drawing with a tolerance of 0.25mm

Procedure to check dimple offset

On the production stick, measure the distance from the end of the stick to the dimple hole. It should match the length specified for that stick on the **Edit Stick** > **Tooling** tab.

8.5 Check Flanges and Lips are Square

As part of daily and coil-change QC checks, you should confirm that the profiles are square.

Tools required

Engineer's square

Procedure

Start your measurement at least 300mm from the end of the stick.

Confirm the flanges are square to the web, as shown below. If you observe that the flanges are not square, refer to [Adjust Flange Overform Assembly](#).

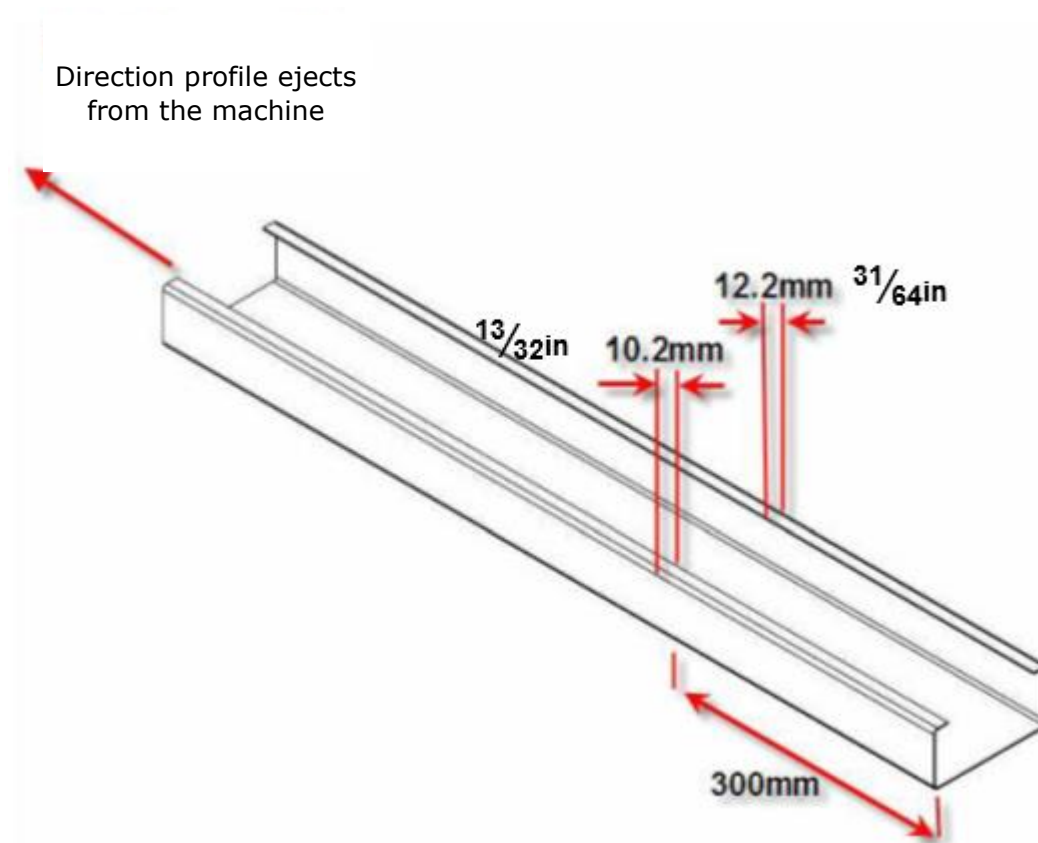


Next, confirm the lips are square to the flanges. If they are not, refer to [Correct Lip Over-form or Flare \(F450iT\)](#).

8.6 Check Lip Widths and Evenness

When checking lip widths, always measure 300mm from the end of the stick.

The lip width on either side of the profile should be approximately the same. There should be less than 0.8mm / 1/32in from one side to the other.



8.7 Check and Adjust Strip Lubrication

The steel lubricator assembly is responsible for applying steel lubricant to the steel strip before it is processed by the rollers and hydraulic punches during the rollforming process.

It is important to make sure there is lubrication added to the steel strip.

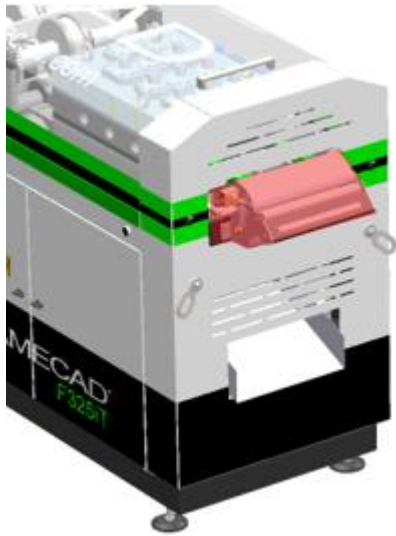
This lubrication is the main protection against wear and tear of the tools and other components that are in contact with the steel as it moves through the machine.

It is good practice to add as much lubrication mix as you can without impacting the quality of printing on the stick. Too much lubrication mix can sometimes prevent the printer ink from drying properly.

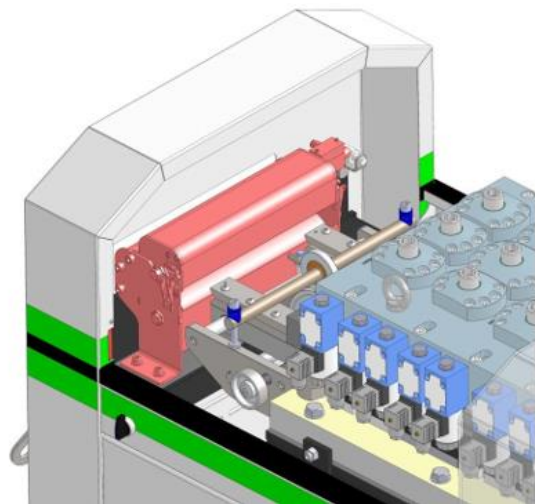
The steel strip should have a wet, even film of lubricant across the strip width.

Location of steel lubricator

It should not be necessary to touch the steel lubricator during normal operations. Its location is shown here for information purposes only.



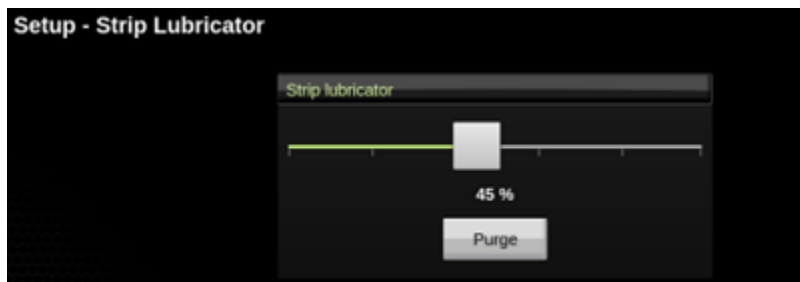
Steel lubricator for F325iT



Steel lubricator for F325iT-L and F450iT

Adjust amount of lubricant added to steel

The amount of steel lubricant added is controlled by the machine software. Go to **Setup > Strip Lubricator** and move the slider to change the amount of lubrication added to the steel.



8.8 Make a Manual (Test) Stick

FRAMECAD Factory2 allows for jobs to be entered directly into the machine without loading from an alternate source. This can be very useful for producing test pieces while calibrating/tuning the machine.

TIP! Manual sticks are non-production sticks used specifically for testing production output, and also during troubleshooting to test if the machine needs re-calibrating.

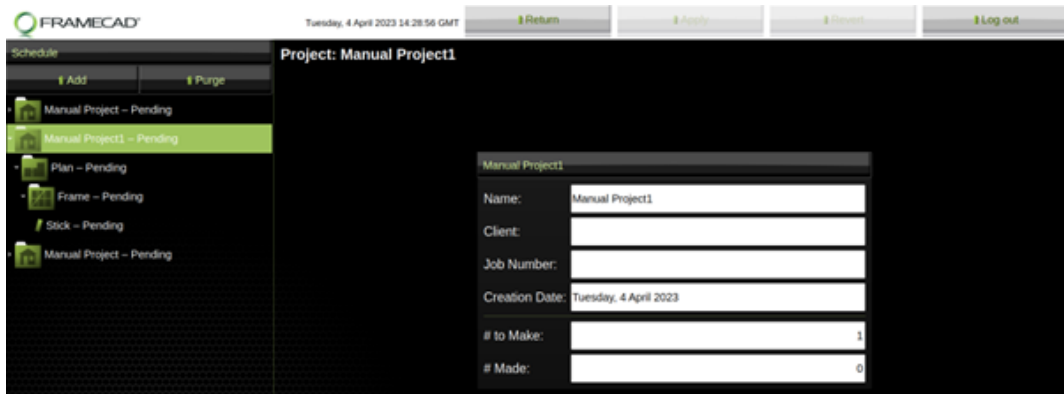
To make a stick for testing purposes, follow the below procedure.

Procedure

Step 1: Create a manual job containing a test stick

1. Press **Add** from the **Schedule** screen to load a job as you normally would.

2. Instead of selecting an existing job, select **Create Manual Stick** from the **Select Source** directory. The Manual Project screen will appear. The project will include four folders (Plan, Frame and Stick) underneath it.



Project: Manual Project1

Name:	Manual Project1
Client:	
Job Number:	
Creation Date:	Tuesday, 4 April 2023
# to Make:	1
# Made:	0

3. Enter information about the Project into the text boxes. (Note that this information mirrors what is in a real job file, and it is not essential to add anything other than the project Name for a test stick.)

Name	The name of the job.
Client	The client for this job.
Job Number	The identifying number for this job.
Creation Date	The date the job was created.
# to Make	The number of times this job will be run.
# Made	The number of times this job has been run so far.

Step 2: Edit stick properties

Now you can configure the stick with properties such as length. See [View \(and Edit\) Stick Properties](#).

Don't forget to select **Apply** on the top of the screen, then press the **Software Reset** button  for the information to be saved.

Step 3: Make the test stick

Prerequisites: Ensure there is steel inside the machine.



DANGER! Always check there is nobody in the danger zones around the machinery before using the Inch switches in Manual Mode.

1. Rest the safety control system. The machine will be in Manual Mode.
2. Use the Inch switches to move steel through the machine. Note that the shear will be the first thing to operate, then the machine will run two scrap pieces out to clear the steel already threaded through the machine.

3. When enough of the stick has exited the outfeed (refer to [Product Quality Checks](#) to see the length is required), you can manually activate the shear.

8.9 Manually Operate Tools

When the machine is in Manual mode, the **Home** screen will change display to allow direct control of all of the tools available on your machine.

Manual operation of tools is useful for:

- Shearing a manual stick if you have created a manual stick to do quality testing
- Testing or troubleshooting tools
- Disengaging the lipbox before removing steel from the machine (note that software-controlled lipboxes available for F325iT and F325iT-L models only. F450iT lipboxes must be disengaged by hand).

TIP! The tools shown below are an example and may differ on your machine.

Procedure to manually operate a tool

1. Touch the screen to select the required tool operation. This will highlight the tool to be actuated.
2. Press **Execute** to operate the tool.
 - a. If the hydraulic pump is already running and is at the required pressure, then the hydraulic tool operation will be performed immediately. (Note that because the machine is in manual mode, the Inch switches would normally be required to start the hydraulic pump.)
 - b. If the hydraulic pump is *not running*, it will need time to start and build the required pressure before the tool is actuated. When the pressure is ready, the option next to OK will be green. If it is not ready, it will be grey instead of green.

Tools		
Bolt	● OK	0 ms
Flange Screw Holes	● OK	0 ms
Web Notch	● OK	0 ms
Lip Cut	● OK	0 ms
Service	● OK	0 ms
Flange Cut Left	● OK	0 ms
Flange Cut Right	● OK	0 ms
Chamfer	● OK	0 ms
Dimple	● OK	0 ms
Swage	● OK	0 ms
Shear	● OK	0 ms
↓ Execute		

Status Indicator Light – will turn green when the tooling operation is complete and hydraulic pressure is available.

Time in milliseconds – this is the cycle time of the last tool operation.

- Use the Inch switches to move the steel out of the machine to inspect the tool's operation on the steel.

Hydraulic pressure and cycle time information

This screen also provides feedback information on:

Available hydraulic pressure available for the tool: the status indicator light will remain grey until the system builds the required pressure to actuate the tool. configured cycle time for each tool operation.

8.10 Manually Test Cartridge Printer

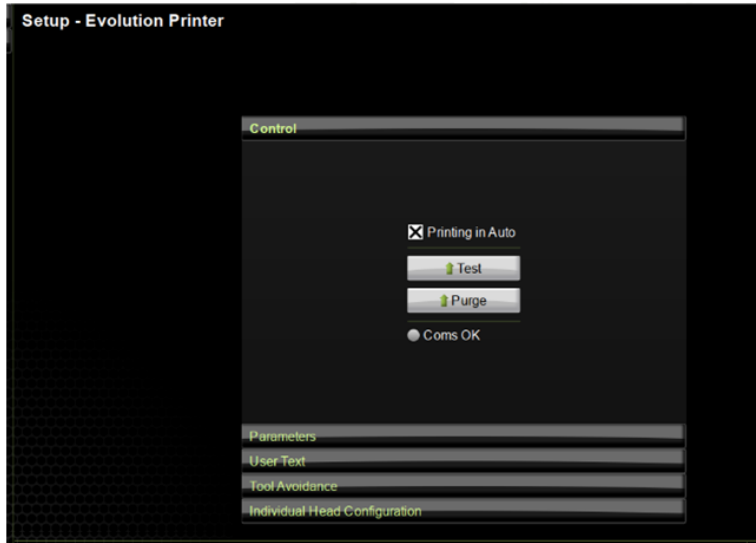
This procedure can be used to troubleshoot the printer system if you observe problems with printing.

It can also be used for confirming printing is working during [Product Quality Checks](#) if you are using a Manual Stick (rather than a production job) to do these checks.

Procedure

Put the machine in [Manual Operation Mode](#).

1. On the Operator Touchscreen, go to the **Setup** menu, **Marking > Evolution Printer** screen. Select the **Control** tab.



2. Select **Test** and use the Inch switch to drive the steel forward (test print will only work if the steel is moving in a forward direction, i.e. towards the outfeed).
3. When the printed text exits the outfeed, press Return to go back to the Manual screen and execute the Shear tool.
4. Inspect the printed text. It should be clearly legible. If it isn't, see [Troubleshooting Cartridge Printer](#).

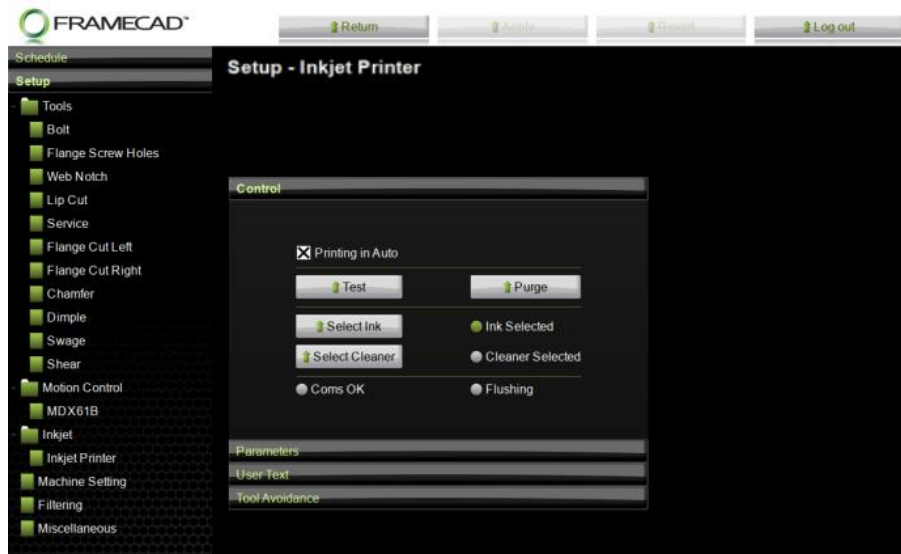
8.11 Manually Test Inkjet Printer

This procedure can be used to troubleshoot the printer system if you observe problems with printing.

It can also be used for confirming printing is working during [Product Quality Checks](#) if you are using a Manual Stick (rather than a production job) to do these checks.

Procedure

1. Put the machine in [Manual Operation Mode](#).
2. Go to the **Marking > Inkjet Printer** screen, **Control** tab:



3. Select **Test** and use the **Inch** switch to drive the steel forward (test print will only work if the steel is moving in a forward direction, i.e. towards the outfeed).
4. When the printed text exits the outfeed, press Return to go back to the Manual screen and execute the Shear tool.
5. Inspect the printed text. It should be clearly legible. If it isn't see [Troubleshooting Inkjet Printer System](#).

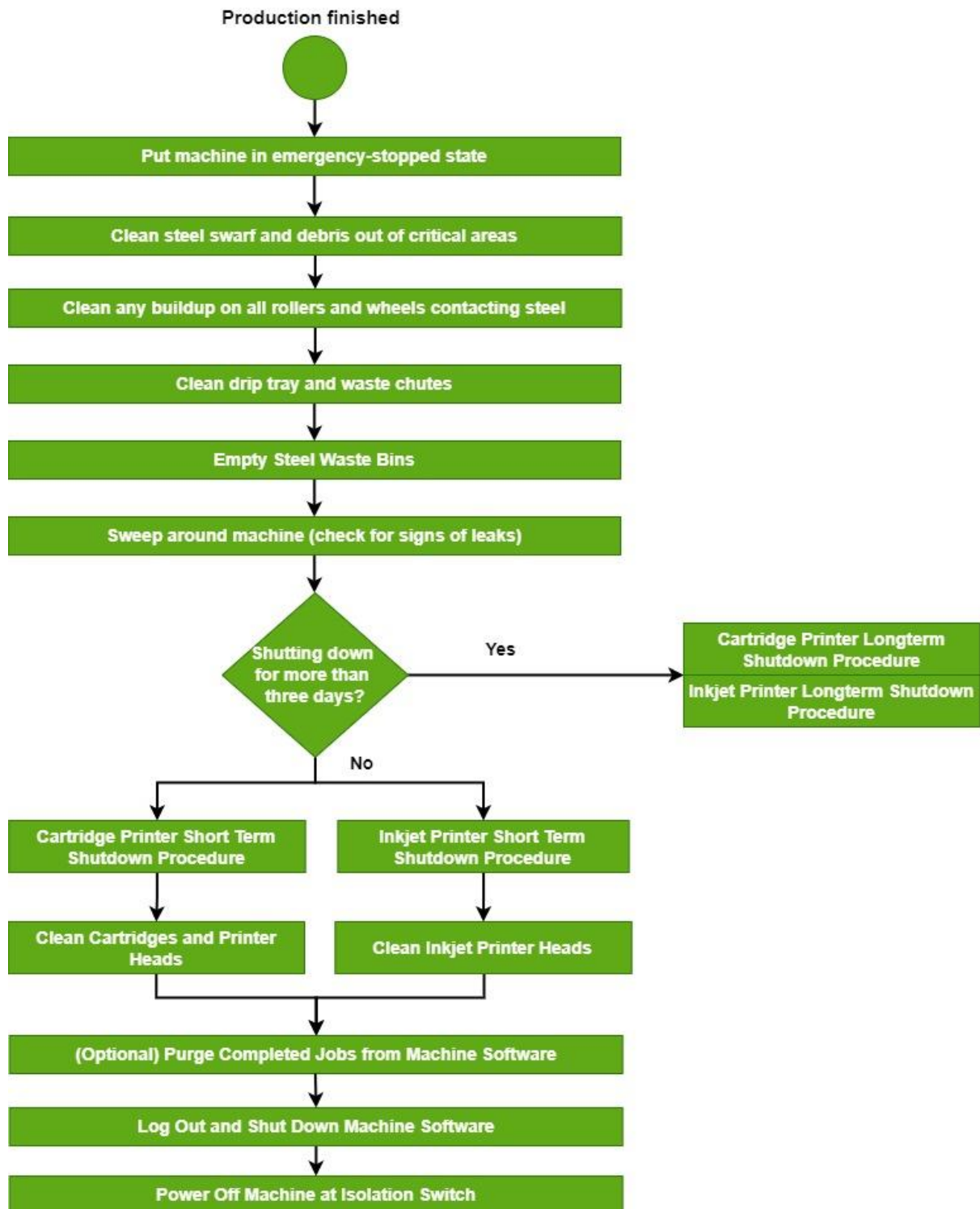
8.12 Quality Checks Log (Production Log)

Information related to quality testing of end products may be recorded on the Production Log screen.

Production Log					
Operator name:				Reason:	Beginning of shift
Test Performed	1	2	3	4	QAM
Steel Coil Thickness [actual measurement]:	0.00	0.00	0.00	0.00	0.00
Part Length [tick if within +/-3/32" (+/-2.4mm)]:	☐	☐	☐	☐	☐
Web Width [tick if within +/-1/32" (+/-0.8mm)]:	☐	☐	☐	☐	☐
Flange Height [tick if >= minimum]:	☐	☐	☐	☐	☐
Lip Size [tick if >= minimum]:	☐	☐	☐	☐	☐
Flare passes visual inspection:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Camber passes visual inspection:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Bow passes visual inspection:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Twist passes visual inspection:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Inkjet label passes visual inspection:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Printed ICC ES or ATI CCRR Number is correct:	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Sync					

9 Shutdown Procedures

Below is a summary of tasks to do at the end of production.



Maintenance Procedures

Don't forget to do any regular maintenance procedures if they are due. See the [Recommended](#) Maintenance Schedule.

9.1 Purge Completed Jobs

The **Purge** option in the job schedule will delete all jobs in the schedule with **Completed** status and leave all **Pending** jobs.

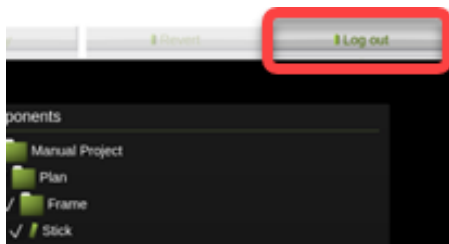
9.2 Machine Shutdown Procedure

After you have completed the shutdown procedures that require the machine to be powered up, you can shut down the machine.

NOTE! Always log out and shut down the machine software properly before turning off power to the machine (i.e. turning the isolation switch to the OFF position).

To shut down the machine:

1. Press **Logout** on the top right of the screen.



2. From the Login screen, press **Shutdown**.



3. The screen will display information-only text as the software shuts down.

4. When the screen stops displaying text, the isolation switch on the machine can be turned off.

NOTE! The machine is fitted with an Uninterruptable Power Supply (UPS) unit that is designed to provide a battery backup supply for the computer system in the event that the main electrical power supply to the machine is accidentally disconnected or fails. If the main electrical supply is disconnected for any reason, the UPS unit will switch over to battery backup and issue a shut-down signal to the computer system. The UPS unit will then continue to maintain battery supply for a period long enough for the software to complete an orderly shutdown.

5. Once the machine software is completely shut down, you can power off the machine at the isolation switch.

TIP! It is always good practice to properly log out of Factory2 whenever you shut down the software. AVOID switching the electrical power off to the machine without logging off. Once the software has fully shut down then you can turn the electrical power OFF to the machine.

9.3 Printer Shutdown Procedures

There are two procedures here, depending on whether you are stopping production for the day, or for more than three days.

If shutting down production for three days or more, all ink must be removed from the system before purging the printer heads with cleaner fluid.

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

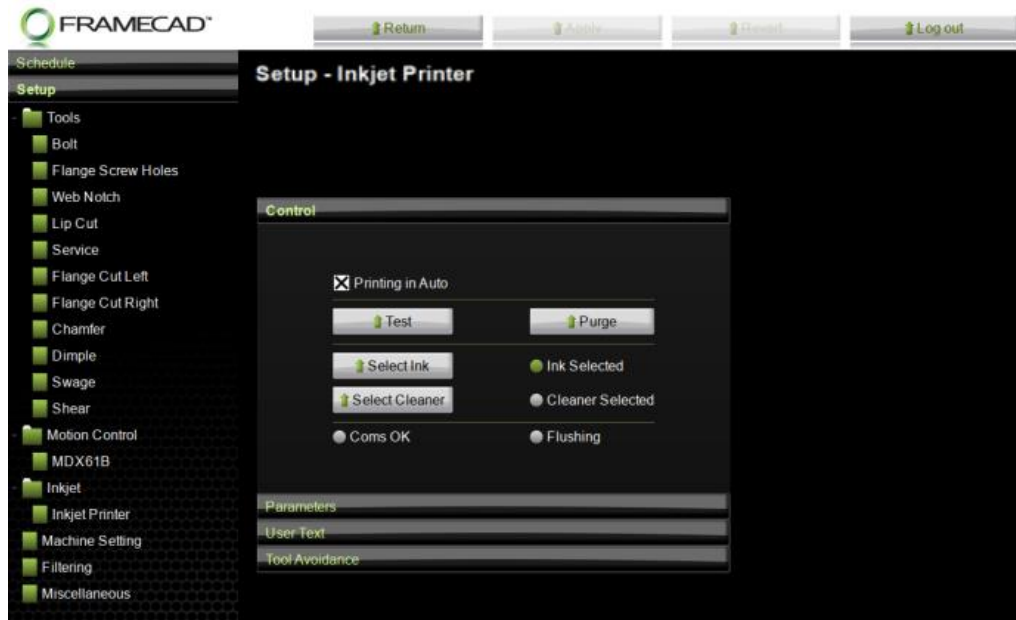
At the end of each production day

Purge printer heads with cleaner fluid

Properly purge the printer heads with cleaner fluid at the end of each production day to prevent the ink from drying out overnight and causing blockages.

1. Use pause or stop button to stop machine.
2. If there is no steel in the machine, insert a piece of cardboard between the printer heads to prevent cleaner fluid from one printer head being sprayed onto the other.

3. Open printer cabinet and ensure pressure is approximately 10psi.
4. On the Operator Touchscreen, go to **Setup > Marking > Inkjet Printer** and select the **Control** tab.



5. Press the **Select Cleaner** option. This will flush the tubes going up to the printer heads and back down to the waste bottle with cleaner for a period of 0.5 seconds and remove any residual ink from the lines.
6. Next, press **Purge**. This will momentarily send cleaner fluid up into the printer heads and eject through the nozzles. Repeat this until the cleaner fluid is a clear colour and free of any noticeable ink contamination.
7. Check the ink and cleaner bottles to make sure there is sufficient quantity for the next day's production requirements. Re-fill as required.
8. Check the waste bottle. If this is full, consult your company's hazardous materials handling policy on how to safely dispose of MEK based inks and solvents.

Extended shutdown (3 days or more)

If production will cease for 3 days or more, before purging the printer heads with cleaner fluid, you will flush ink from all the printer system delivery tubes. This is to prevent the ink from drying out in these tubes and causing blockages.

Tools required

- Spare cleaner bottle filled with cleaner fluid
- Piece of cardboard or paper, if no steel in rollformer

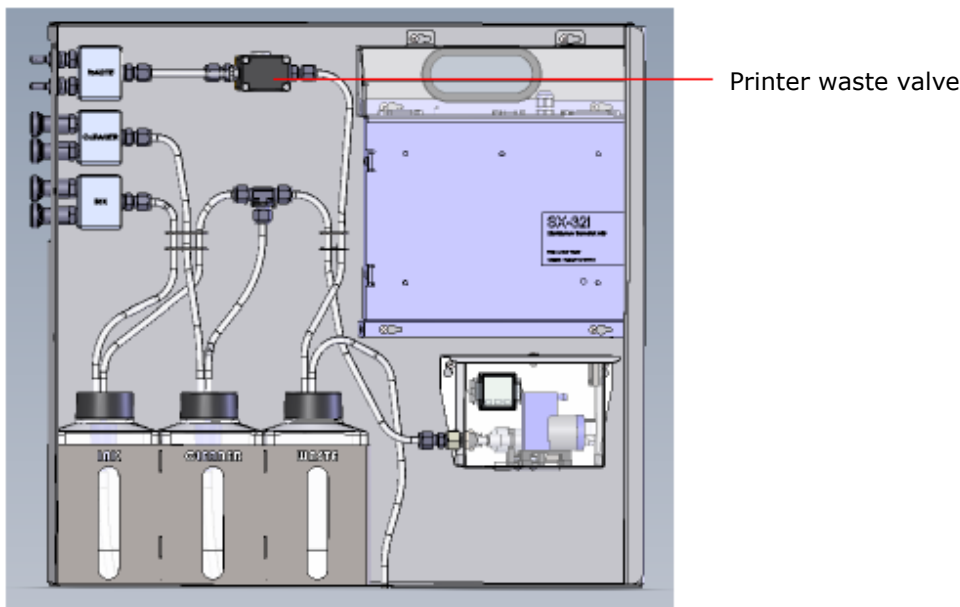
Safety

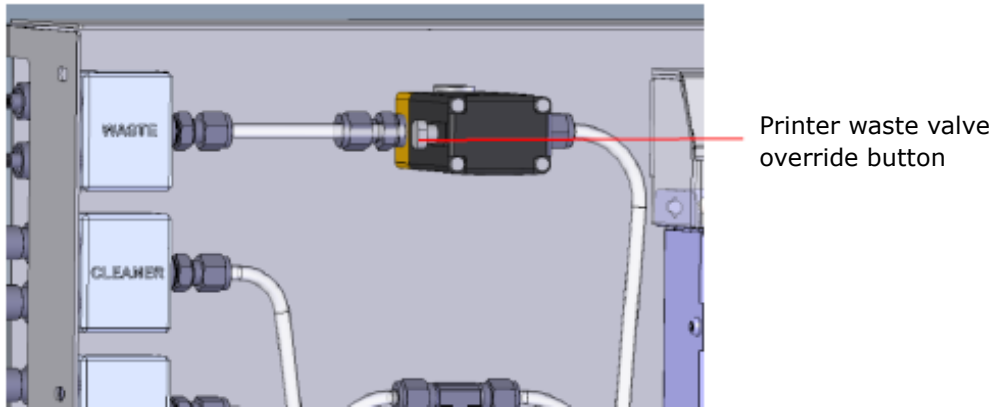
Use safety glasses and appropriate personal protective equipment including Nitrile rubber gloves whenever handling ink or cleaner.

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Step 1: Flush ink tubes with cleaner

1. Activate an Emergency Stop state by pressing any **Emergency Stop** pushbutton on the machine. This will remove power to the printer Air Compressor:
2. Slowly unscrew the black filter cap on the ink bottle to gently relieve pressure in the system. Remove the cap and filter from the ink bottle and insert it into the second cleaner bottle which must be full of cleaner fluid. Make sure the cap is retightened to prevent air leaks.
3. Reset the safety control system (i.e. release any Emergency Stop pushbuttons, close all sliding covers, and reset the safety control system.
4. Ensure printer Air Compressor pressure is at approximately 10psi. This can be checked by viewing the compressor digital display inside the printer control cabinet.
5. In the printer cabinet, locate the waste solenoid valve and press the manual override button on the side of it. This will open up the valve and allow cleaner fluid from the second cleaner bottle (now sitting in the ink position) to flush through the ink tubes and back down into the waste bottle. Continue to do this until tube going into the waste bottle is no longer dark with ink. Release the override button.





TIP! The tube going into the waste bottle will never be completely clear and some discolouration is inevitable.

6. Remove the spare cleaner fluid bottle from the ink position and replace with ink.

Step 2: Purge printer heads with cleaner fluid

Now purge the printer heads with cleaner fluid like you would do for a daily shutdown.

10 Troubleshooting

Types of issues

Issues you might encounter fall broadly into the following categories, therefore this section is divided into the topics below:

- **Correcting Profile Problems:** Profile is not right, e.g. is not the right length, bent, scratched, warped in some way (and would not meet job file specs or quality checks)
- Alarms or Warnings on the Operator Touchscreen
- Printer not working properly
- Steel jams in the machine
- Machinery does not appear to be working properly, which could be a mechanical, hydraulic or electrical issue
- General troubleshooting procedures.

Narrowing down the problem

Recent changes

It can help to identify what has recently changed. Review maintenance records. Changes that can impact performance include:

- Changes in steel (quality, tensile strength, strip width etc)
- Change in steel thickness – has the rollforming section been setup to accommodate the new material thickness?
- Where there any changes to the setup and configuration of the machine?
- Have there been any changes to the machine software?

Running out of consumable items

Check consumable elements on the machine to make sure that they have not simply run out (for example, has printer ink run out, and is there sufficient lubricant being supplied to the steel strip?)

Parts wearing out

Has a tool reached the end of its lifetime and not performing its job properly, e.g. shear blade blunt or dimple punch die broken?

Cleaning and maintenance

Have all maintenance and cleaning tasks been done on the machine? All maintenance tasks should be done as prescribed, otherwise problems will occur.

10.1 Use a Manual (Test) Stick to Test

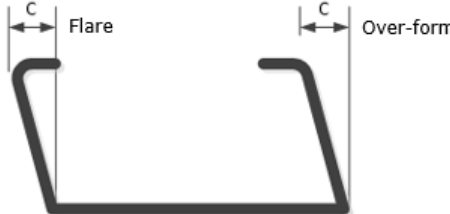
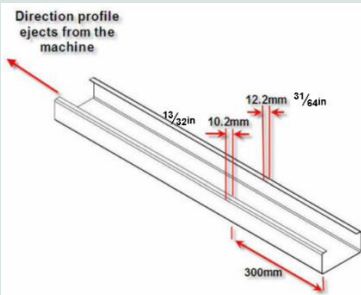
See [Make a Manual \(Test\) Stick](#).

10.2 Correcting Profile Problems

NOTE!

The biggest cause of profile problems is using incorrect steel in your FRAMECAD rollformer. We specify a number of parameters for steel - make sure you buy the steel FRAMECAD has specified. If you have changed steel supply recently, some of the problems below may be due to the change in steel. Contact FRAMECAD for advice.

Below is a list of common problems that can occur with profiles.

PROBLEM	ILLUSTRATION	POTENTIAL SOLUTION(S)
Incorrect stick length The measured length of the stick is different to the job file. If the length error is inconsistent, then this typically indicates “looseness” in the encoder assembly at the infeed of the machine which is allowing the encoder wheel/shaft or belt to slip whenever steel is moved through the machine. If the length error is consistent across all lengths, then this typically indicates a machine calibration issue.	N/A	• Check encoder wheel is not slipping on steel strip at infeed of machine. • Check all encoder couplings to make sure there is no looseness allowing slip. • Recalibrate the stick length, see Recalibrate Stick Length
Flange over-form Flare and over-form are when the flanges are no longer 90 degrees relative to the web. Flare is when the flange is bent outwards from the web. Over-form is when the flange is bent in towards the web.		• Adjust flange overform assembly: see Adjust Flange Overform Assembly
Lip width variation Lip widths on either side of an S profile must be approximately the same. If there is significant variation ($>0.8\text{mm}$) ($1/32\text{in}$) from one side to the other, it indicates that the steel strip is not properly centred in the machine.		• Centralise the steel strip inside the machine: see Centre Strip using Infeed Guides

Bow / problems with straightness

Bow is the amount “bend” in the profile being produced in either an uphill or downhill direction as the product exists the machine.

An example of downhill bow is shown, which looks like an upside-down smile when viewed side on. It is more uncommon to have downhill bow than uphill bow.

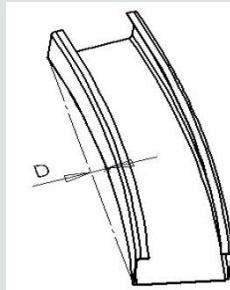
Other problems with straightness include camber, which is when the stick bends towards the middle when viewed from above.



- Correct Bow (F325iT models only)

Lip over-form

The angle between flanges and lips should be 90 degrees.



- Correct Lip Over-form or Flare (F450iT)

Twist

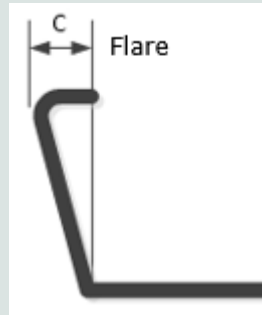
This is the difference in angle between each end of the S section profile. It can be either “clockwise” or “counterclockwise” in direction. Twist is most commonly formed by an uneven pressure being applied to one side of the profile versus the other in the rollforming section.



- Correct Twist

Profile flare after shear operation

After the profile is cut the flanges may flare outwards. To mitigate this, the machine incorporates a technique known as side-crimping during each shear tool operation. The objective of side-crimping is to support the side flanges of "C" section profile during the shear cut. Without side-crimping, the side flanges will tend to "flare" outwards. While some flare is inevitable, significant flaring may be the result of incorrectly adjusted side-crimps.



- [Correct Flare from Shear Tool](#)

10.2.1 Recalibrate Stick Length

NOTE! Before recalibrating the stick length, check the infeed assembly. One of the most common causes for inaccurate length of sticks is “slip” at the infeed unit assembly of the machine, which will typically result in inconsistent differences in the Measured Length of sticks. The term “slip” literally means that the strip encoder shaft is “slipping” as the steel strip is progressed through the machine and thereby introducing measurement errors. Typical areas where slippage can occur are:

Strip encoders that are directly coupled have a small grub screw that locks the strip encoder input shaft inside the bottom guide wheel shaft. If this screw is loose then the strip encoder shaft can slip causing inaccurate measurement – solution, re-tighten grub screw.

Slipping top guide wheel. If the top guide wheel slips on the steel strip as it is being progressed through the machine then measurement errors will be introduced – solution, tighten down top guide wheel shaft.

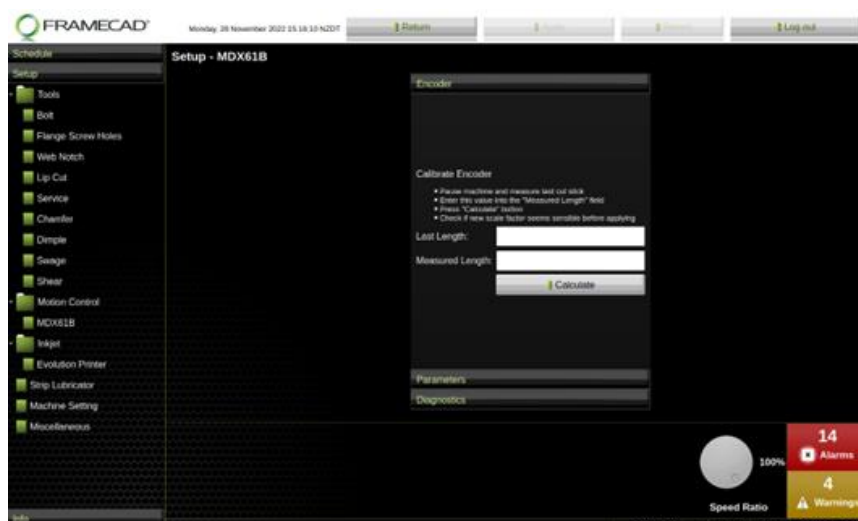
For full instructions on infeed unit setup, see [Check Infeed Unit for Slippage](#), [Centre Strip using Infeed Guides](#), Centre Strip using Infeed Guides or [Adjust Infeed Guide](#) .

Prerequisites

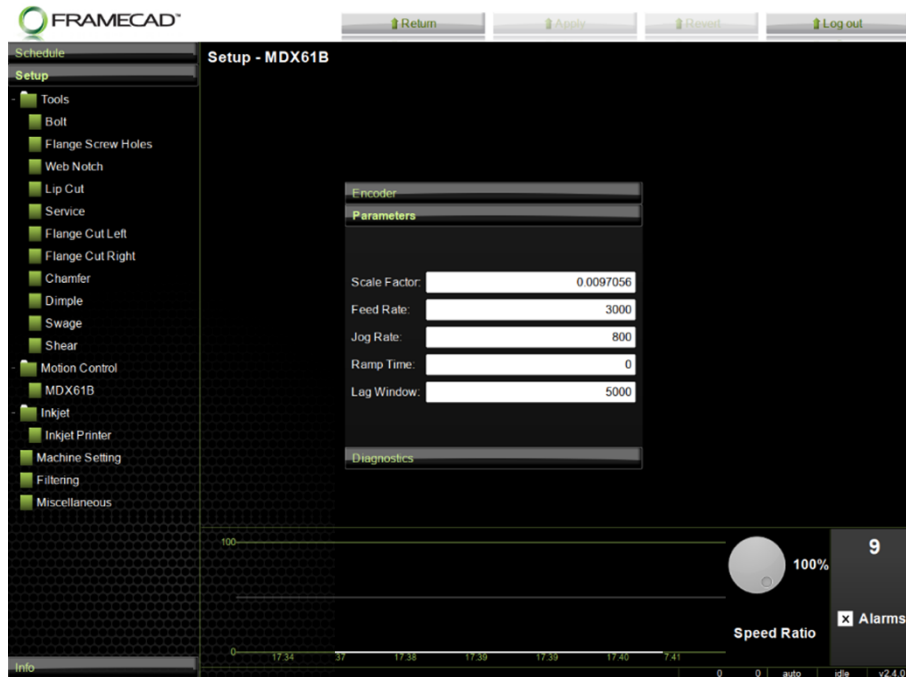
- You will have completed the procedure in [Check Profile Length](#), i.e. run some test sticks and measured a consistent difference (more than 1mm over 3mm) difference between the **Last Length** and **Measured Length** values on the **Setup > Motion Control > MDX61B** screen.
- Confirmed that there is NO slippage or looseness at the infeed assembly that may be introducing measurement errors.

Method to recalibrate stick length

- Go to **Setup > Motion Control > MDX61B**.



2. Enter the measured length (this is the actual length of the last stick you made in [Check Profile Length](#)) into the **Measured Length** text box.
3. Press **Calculate**. The software will calculate a new "Scale Factor" for the encoder.
4. Press **Apply** to save changes.
5. The new scale factor will be visible on the **Parameters** tab to view if you have access; this value is just for information purposes only.



10.2.2 Correct Bow (F325iT models only)

Bow is the amount of bend in a product. It is either an "uphill" or "downhill" bend relative to the direction of steel in the machine. Typically, most bow will tend to be in the downhill direction. The targeted maximum bow is $\pm 1.6\text{mm}$ (1/16in) per 2.4m (8ft) of length (this measurement is carried out on uniform section steel (with no tooling operation cut-outs in the profile)).

To check for bow, place two equal stick lengths back-to-back (web to web). If there is a gap between the centres of the sticks, this is downhill bow. If there are gaps between the sticks at the ends, this is uphill bow.

There are a number of methods available to compensate for bow. The method described below uses the relative height at the infeed or outfeed of the shear tool station to counteract the effect of bow.

The shear unit is the last tool station that the product passes through prior to exiting the machine. This tool is vertically adjustable using jacking bolts. Raising the infeed to the shear assembly will tend to counteract any downhill bow. Lowering the infeed to the shear assembly (or raising the outfeed of the shear assembly) will tend to counteract any uphill bow.

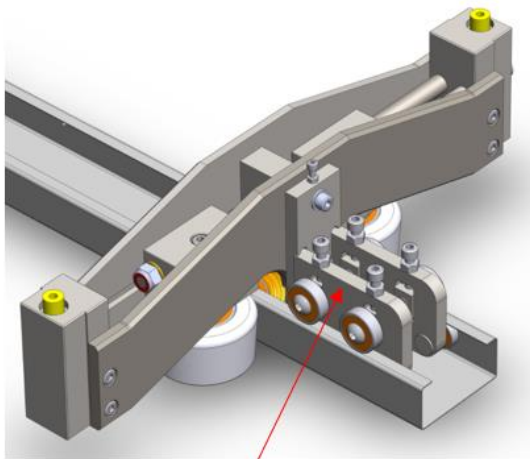


Example of downhill bow

Procedure for correcting downhill bow

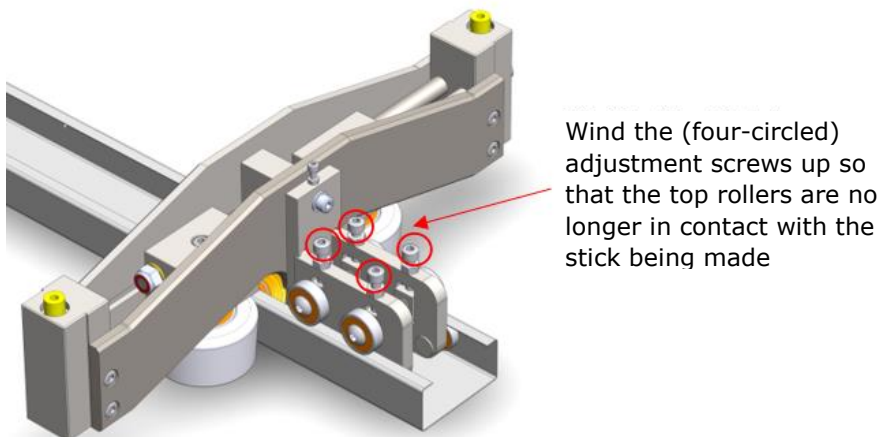
1. Shutdown and isolate the machine from the electrical power supply to prevent injury when working in the machine.
2. Before we commence with making any adjustments at the shear unit to counteract bow, it is a good idea to back-off the lip overform assembly to eliminate any potential impact this may have on our ability to adjust.

Locate the lip over-form adjustment assembly (it is mounted after the flange over-form roller assembly):



Lip over-form adjustment assembly

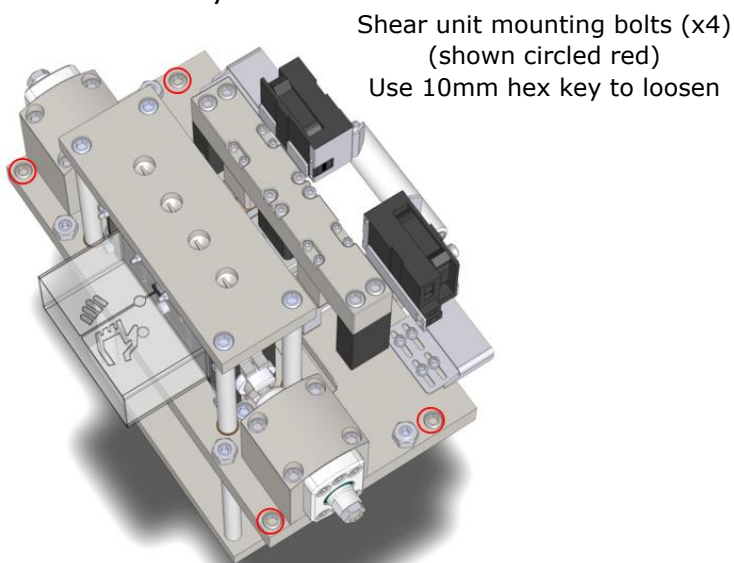
3. Loosen the locknuts on the four (x4) adjustment cap screws. Wind the adjustment screws up so that the top rollers are no longer in contact with the lips on the stick. This is to ensure that the lip over-form adjustment does not interfere with the shear assembly adjustment that will be made next.



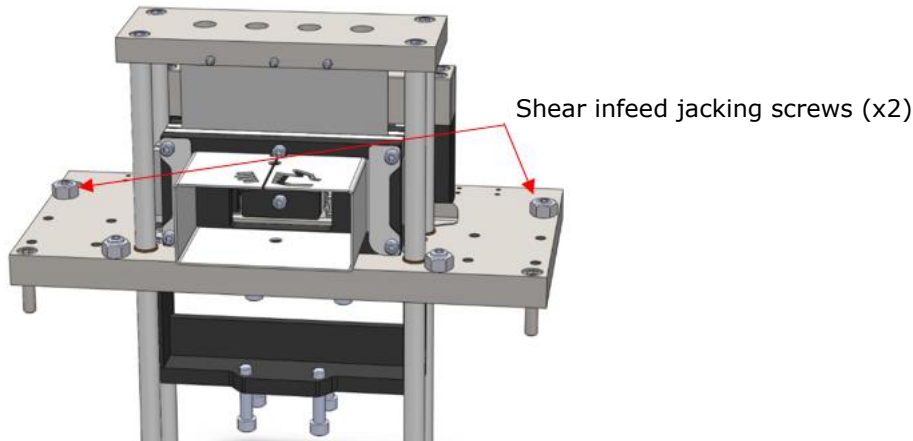
4. Remove the outfeed end cover to allow access to the shear unit:



5. Loosen the four (x4) shear unit mounting bolts (circled below) using the 10mm Hex-Key.



6. Loosen the outer locknuts and then using the 8mm Hex-key wind the two jack screws clockwise on the infeed side of the Shear assembly to raise the rear of the unit – make sure this is done evenly on both sides. The infeed side of the shear assembly should be raised approximately 25% of the measured bow: e.g. if the measured bow is 4mm (5/32in) then the shear should be raised approximately 1mm (3/64in).



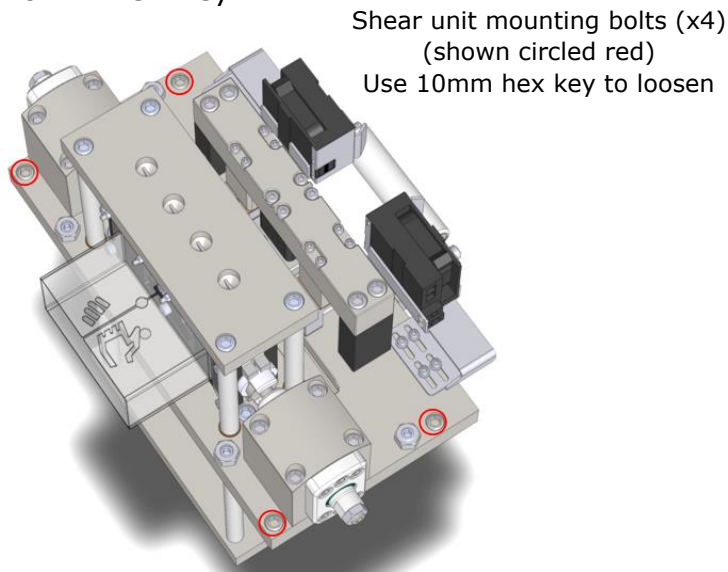
7. Re-tighten the jacking screw locknuts and x4 shear mounting bolts once complete
8. Re-power the machine and run two more 3000mm (10ft) length sticks and re-measure. If still out of limits, repeat this procedure.
9. Once the downhill bow has been removed, simply wind the adjustment screws on the lip over-form assembly back down until the top rollers just contact the lips on the stick being made. Tighten the locknuts and do not adjust any further.

Procedure for correcting uphill bow

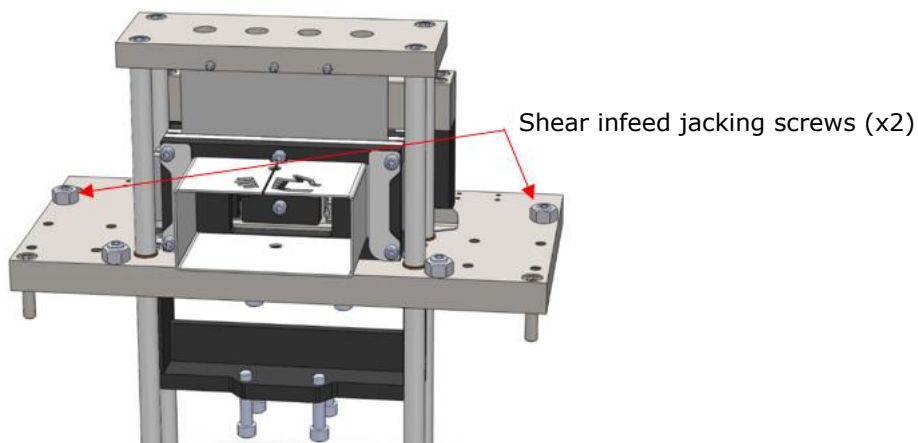
1. Shut down and isolate the machine from the electrical power supply to prevent injury when working in the machine
2. Remove the outfeed end cover to allow access to the Shear unit:



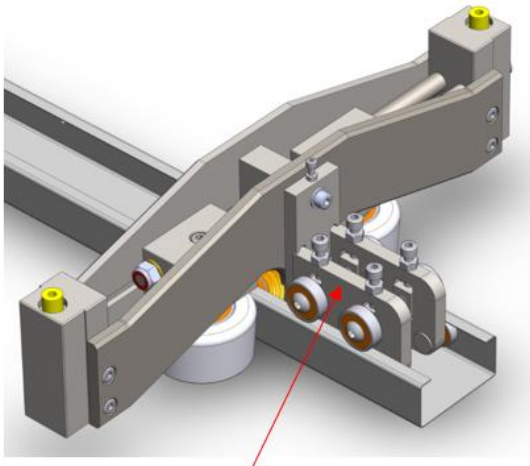
3. Loosen the four (x4) shear unit mounting bolts (circled below) using the 10mm Hex-Key.



4. Release the lock nuts on the four (4x) jacking screws (circled red below) and unscrew the jacking screws until the shear base plate sits flush on the chassis. Re-tighten the mounting screws.

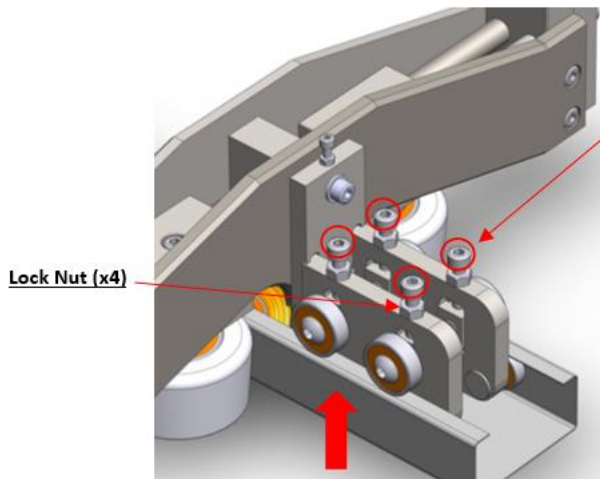


5. Locate the Lip Over-form adjustment assembly (it is mounted post the Flange Over-form roller assembly).



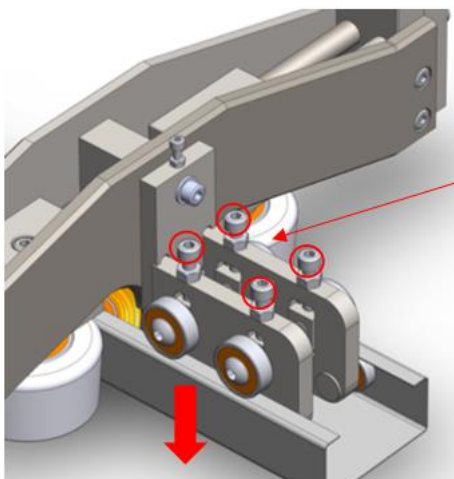
Lip overform adjustment assembly

6. Loosen the locknuts on the four (x4) Adjustment Cap Screws (circled red). Wind the adjustment screws up so that the top rollers are no longer in contact with the lips on the Stick.



Wind these adjustment screws **UP** so that the top rollers are no longer in contact with the stick being made

7. Wind the adjustment screws on the Lip Over-form assembly back down until the tops of all four (x4) rollers are just touching the lips at the top of the Stick:

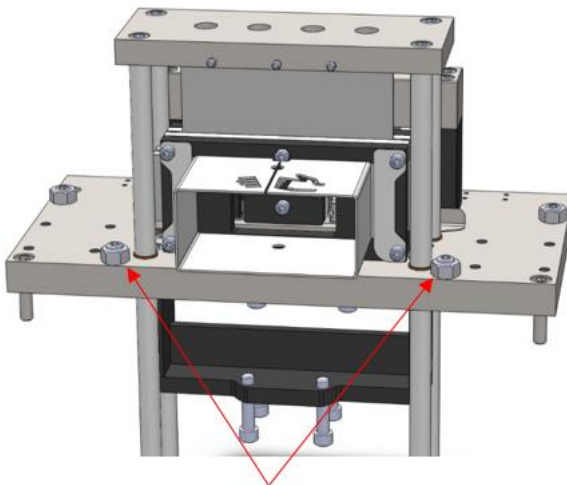


Wind these adjustment screws **DOWN** so that the top four (x4) rollers are no longer touching the lips on the stick being made

8. In small incremental steps (no greater than $\frac{1}{4}$ turn for each adjustment screw), gradually lower the top rollers until the uphill bow has been removed. After each adjustment, retighten the lock-nuts and re-check the amount of bow BEFORE making any further adjustments.

NOTE! Move all rollers down evenly using equal adjustments.

9. If steps 1 – 8 have not fixed the uphill bow further adjustment can be made on the shear unit.
10. Loosen the shear mounting screws (4x).
11. Loosen the locknuts then using the 8mm (5/16in) Hex-key wind the two (2x) jacking screws clockwise on the outfeed side of the Shear assembly to raise the outfeed side of the Shear assembly – make sure this is done evenly on both sides. The outfeed side of the Shear assembly should be raised approximately 25% of the measured bow: e.g. if the measured bow is 4mm (5/32in) then the shear should be raised approximately 1mm (3/64in).



Shear outfeed jacking screws (x2)

12. Re-tighten the jacking screw locknuts and the x4 shear mounting screws once complete.
13. Re-power the machine and run two more 3000mm (10ft) length Sticks and re-measure. If still out of limits, repeat this procedure.

10.2.3 Adjust Flange Overform Assembly

When to adjust flange overform assembly:

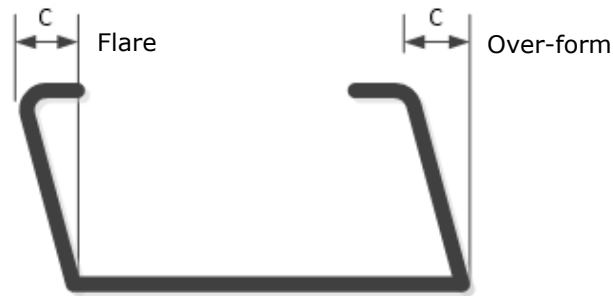
- If your quality checks have identified that the web to flange angle is not 90°
- When you have changed coil, and the steel thickness has changed from what was loaded previously. A good idea is to back the flange overform

rollers off if you are going up in thickness by a quarter of a turn, so you don't put too much pressure on the knife rollers.

About flange over-form and flare

The bend from web to flange should be 90° .

The rollformer will need adjustment when there is either too much flare (not enough over-form) or too much over-form (the over-form rollers are pushing the profile too far inwards at the over-form assembly).

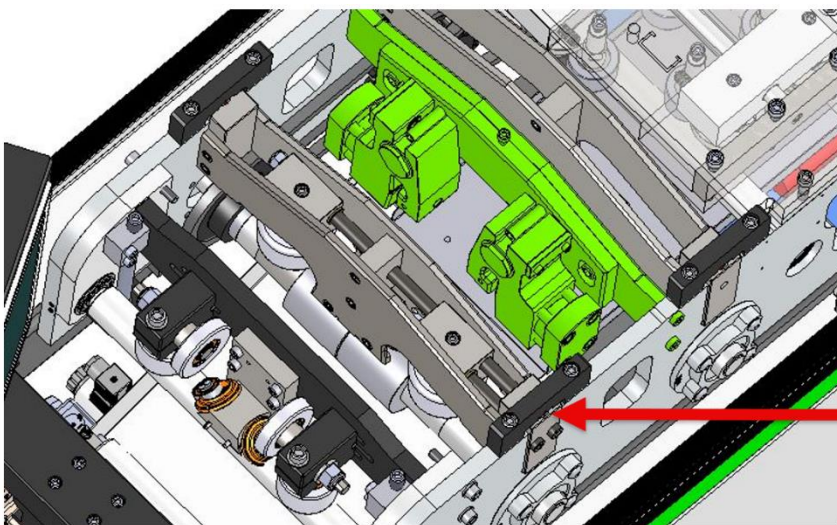


The rolling section will roll the steel strip to 90° during roll forming, but because steel strip has typically has high tensile strength there is a tendency for the steel flanges to want to spring back.

The over form rollers compensate for this by allowing some additional forming after the rolling section: this is known as overforming. The rollformer allows for up to an additional 8 degrees of over form to ensure the profile flanges are at 90° to the web.

Location of the flange over-form assembly

The flange over-form assembly is located just prior to the printer heads near the outfeed of the machine.



Each roller can be independently adjusted from the operator side of the machine.

Procedure for adjusting over-form rollers

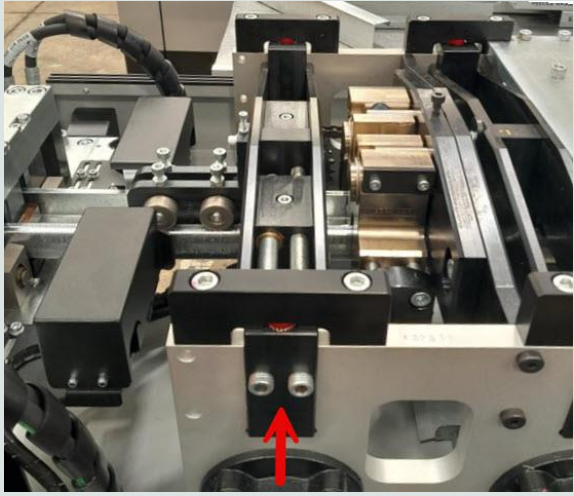
Tools Required

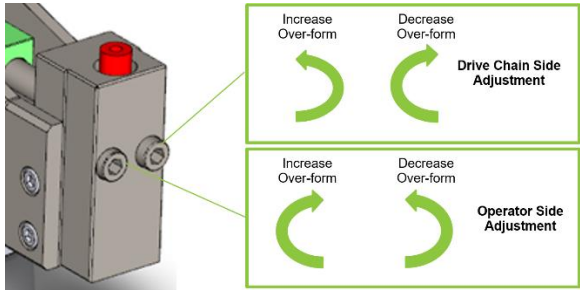
- Engineers square
- 8mm hex key

Safety

- ALWAYS wear cut-resistant gloves when handling steel during this procedure.
- NEVER stand directly in front of the outfeed.

Procedure

STEP	ILLUSTRATION
Make a test stick or use an existing one. Make sure you know which way the stick came out of the machine so that you can adjust the roller on the correct side.	N/A
Using an Engineers Square, check how square (how close the angle is to 90°) the flanges are. ALWAYS check for square of the flanges relative to the web at least 300mm (12in) in from the end of a stick – the reason for this is that the shear cutting action will always introduce a degree of flare (opening up) of the flanges where the shear cut takes place.	N/A
Using the hex key, adjust using the adjustment screws on the operator side of the machine. The left screw will adjust the roller on the operator side of the machine. The right screw will adjust the roller on the other side.	

Adjust according to whether you are increasing or decreasing over-form, according to the diagram below. Make only small adjustments (typically no more than $\frac{1}{4}$ of a turn) before proceeding.	
Close all sliding covers and reset the safety control system. Run out another test stick and re-check the flanges square. If required re-adjust.	N/A

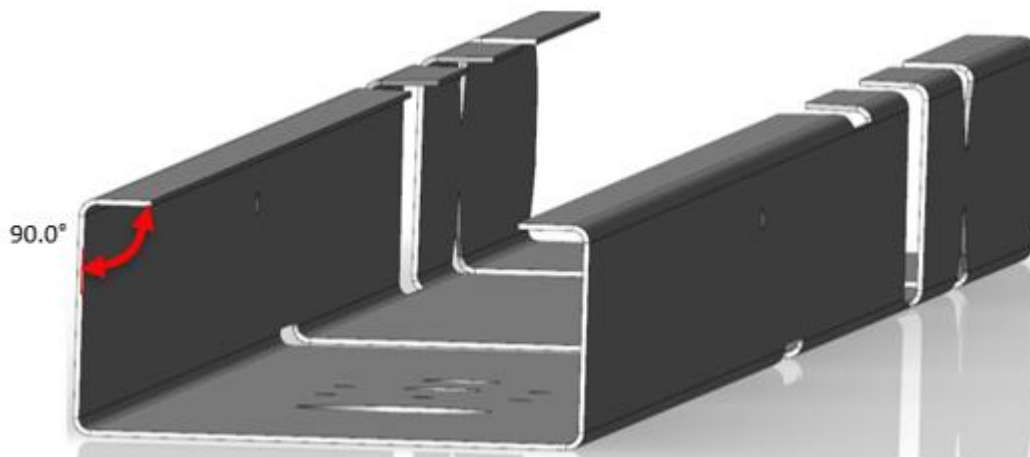
10.2.4 Correct Uneven Lip Widths

Correcting variations in lip width is achieved by adjusting the infeed guide assembly to centralise the steel strip inside the machine.

10.2.5 Correct Lip Over-form or Flare (F450iT)

NOTE! This procedure is for F325iT and F450iT models of rollformer only.

The lip over-form rollers allow you to adjust the angle of the lips to the flanges. This should be 90° .



If the angle is less than 90° , this is lip over-form, and if it is over 90° it is lip flare.

Remember to check the squareness at least 300mm from the ends of a stick (because the shear cutting action will tend to push the lips inwards towards flanges whenever the shear cut takes place).

10.2.6 Adjust Dimple Height

The height of the dimple hole from the web up the side of the flange is critical for accurate assembly of frames.

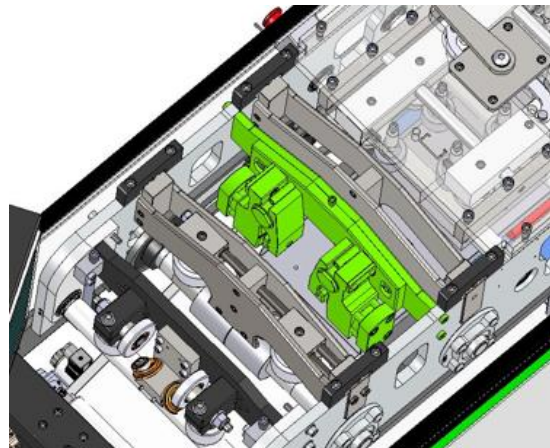
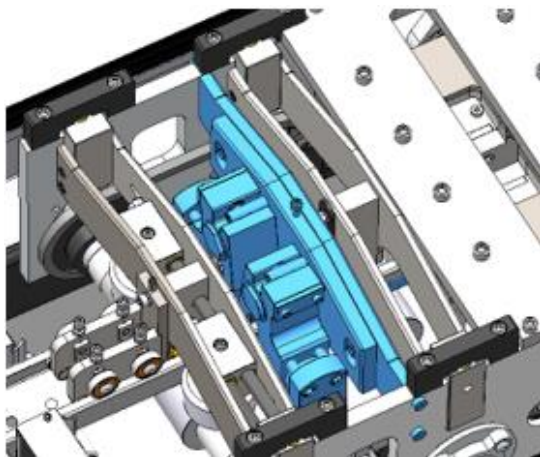
Dimple heights are factory set at half the longest flange height ($\pm 0.2\text{mm}$ ($1/64\text{in}$)) and the distance is measured from the web.

NOTE! The dimple height is factory configured and should not require further adjustment unless the dimple assembly has been physically moved, e.g. during disassembly for troubleshooting. The following procedure is required only if the height is no longer within the above specification. i.e. dimple height on either side is no longer = (Maximum Flange Height)/2 ($\pm 0.2\text{mm}$ $1/64\text{in}$).

Location of dimple tools

The dimple tools (one for each side of the flange) are located between the pinch rollers and the flange overform rollers.

F325iT and F325iT-L dimple tools: **F450iT dimple tools:**



Dimple height adjustment procedure

Prerequisites

- Isolation switch must be OFF and locked out to prevent accidental reconnection
- Steel should be removed from the machine

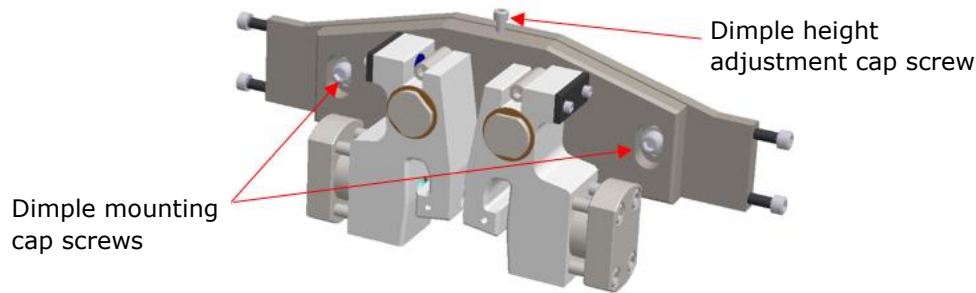
Tools Required

- 10mm hex key
- 6mm hex key
- Steel rule / callipers

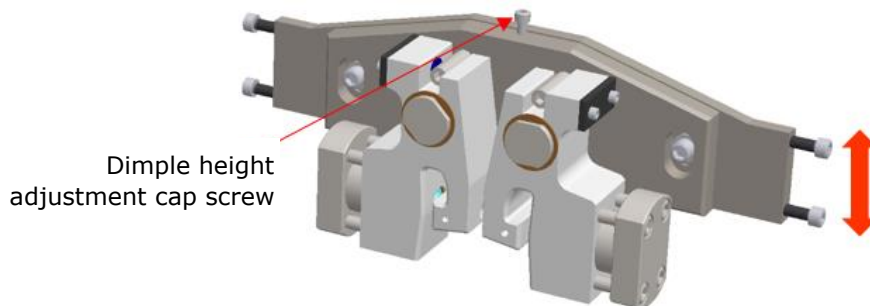
Measure existing dimple height

See the procedure in [Check Dimple Height and Offset](#) to make sure you have accurate measurements of the existing dimple heights. Note down the amount of error and the direction that adjustment is required (up = toward top of flanges; down = towards the web).

1. Loosen the two (x2) Dimple plate mounting cap screws using the 10mm hex key.



2. Loosen the lock nut on the height adjustment cap screw. To adjust the height of the dimple punches, use the 6mm hex key to wind the height adjustment cap screw in or out.



3. Re-tighten the two (x2) dimple plate mounting cap screws.
4. Re-tighten the lock nut on the height adjustment cap screw.

10.2.7 Correct Twist

Twist is more bow on one side of the profile compared to the other. A few checks are making sure both flanges are the same amount of square. The other thing you can do is using the bow adjustor, lift up the lower side of the profile and or lowering the high side.

10.2.8 Set Up Tool Offsets



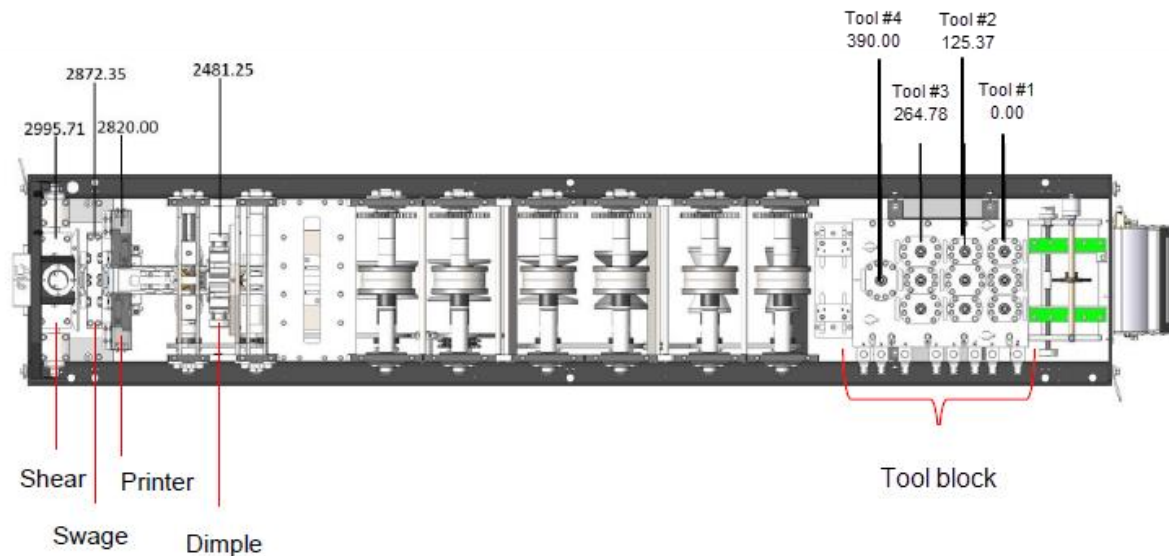
WARNING! The tool configuration values are factory set and should only be adjusted if directed to by a FRAMECAD technician. Incorrect adjustment can significantly alter the performance and/or quality of the product being made. Extreme caution is advised.

About Tool Offsets

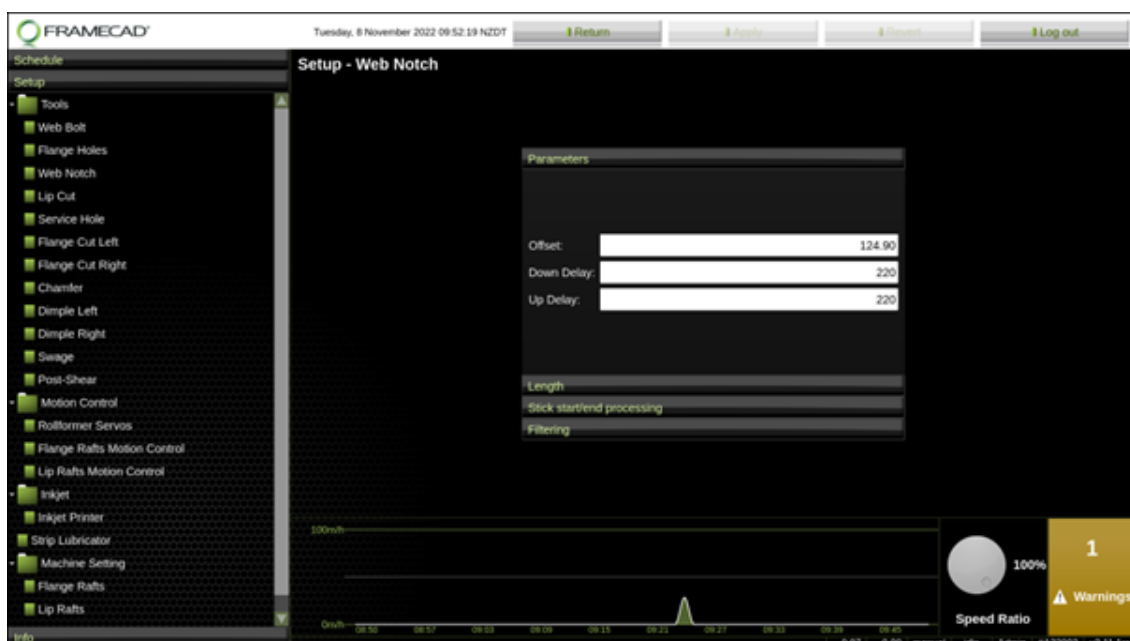
Every tool on the rollformer has an offset value.

The tool offset value is the actual physical position of each successive tool **relative to the centre of the first row of tools** on the machine. The centre of the first row of tools is called the **datum tool** position, and it has an offset value of 0. The offset value for each subsequent tool position, including the shear tool, will therefore be equal to the distance in mm between the centre of the datum tool and the centre of the respective tool. The offset of the shear will be the largest value as it is the tool furthest from the tool block.

The below image shows an example tool setup for an F325iT.



The offset value(s) for each tool are entered in the **Setup > Tools** screen, **Parameters** tab at the FRAMECAD factory.



If the offset position of any tool relative to datum tool is configured incorrectly in the machine software, then the relative location of the tool on the physical stick produced by the machine will also be incorrect.

It would be unusual for the offset values to change, because the value corresponds to the measurement of the physical tool from the datum point. The tools themselves are extremely unlikely to move from their initial positions.

Why would tool offsets change?

If tool positioning is not accurate:

- Check to make sure there is no movement or looseness in the various tool assemblies
- Confirm that the profile length is accurate. There may be a problem with the infeed unit (e.g. slippage) or encoder setup.

Always confirm there are no errors above BEFORE making any changes to tool offset positions.

TIP! An error in the tool offset values is repeatable and therefore discernible from other measurement errors such as strip encoder slippage (which tend to vary based on speed and/or acceleration of the machine).

Tool offset calibration procedure

When to do this procedure

If you have confirmed that there is no other reason for the tool offsets having changed, i.e. you have confirmed there is no looseness in the tool assemblies, and that the profile length is accurate (indicating no problem with encoder or infeed slippage).

Tools Required

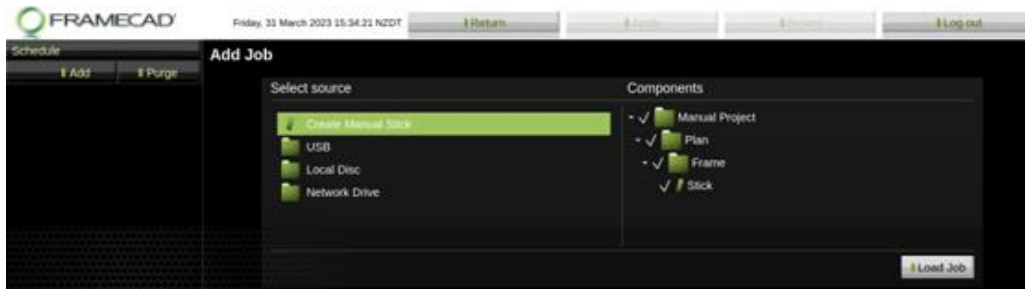
- Accurate measuring tape
- Vernier callipers
- Marker pen
- Calculator

Safety

- ALWAYS wear cut-resistant gloves during this procedure.
- NEVER stand directly in front of the machine outfeed.

Make a test stick

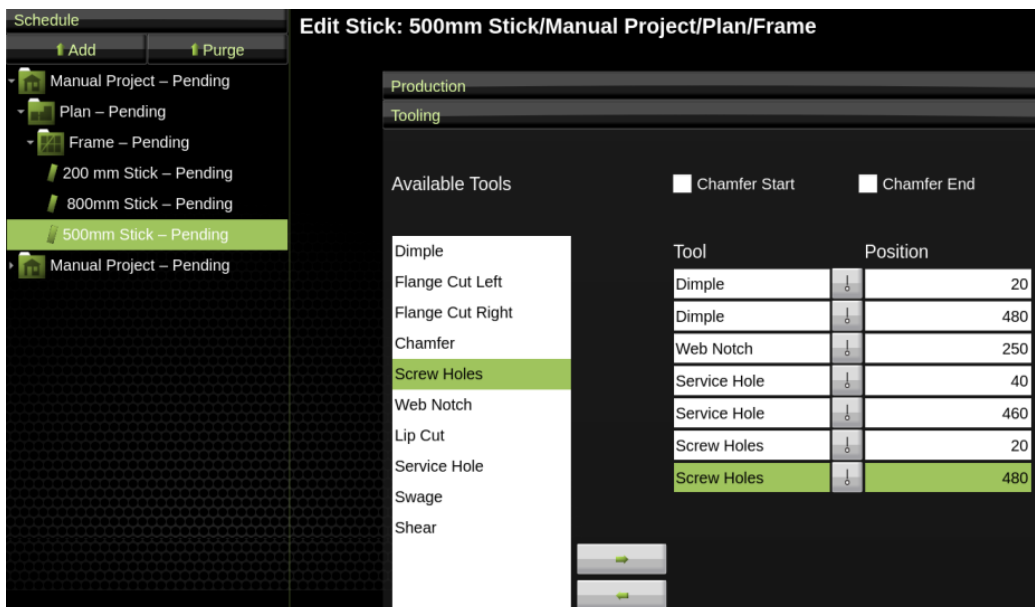
1. Create a manual test stick (**Add Job** and select **Create Manual Stick** then press **Load Job**)



2. Select the stick and make its length 500mm. Make 10 or more sticks as you will need to make multiple test sticks.



3. Then edit the stick using the following parameters:

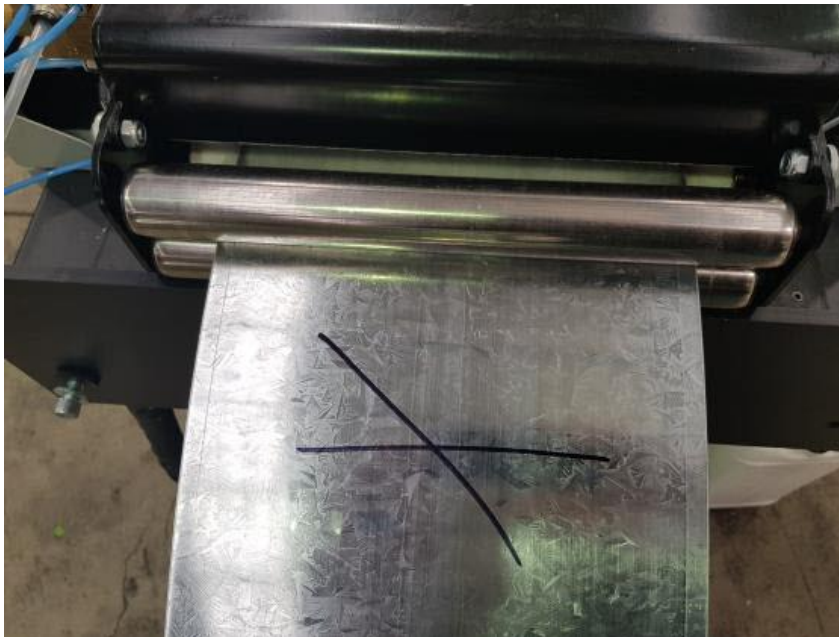


- a. Dimple: 20mm
- b. Dimple: 480mm
- c. Web screw hole: 20mm
- d. Web screw hole 480mm

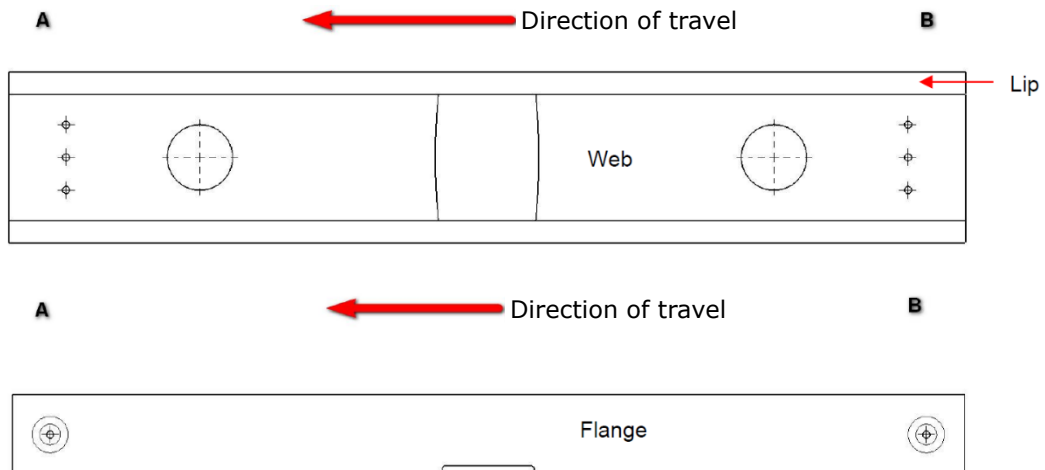
- e. Service hole: 40mm
- f. Service hole: 460mm
- g. Web notch: 250mm

Note: Depending on your machine configuration the Web screw holes might not be installed. Use whatever screw or bolt hole your machine is equipped with and position them equidistant to each other making sure they don't conflict with the position of any other tools that have been added.

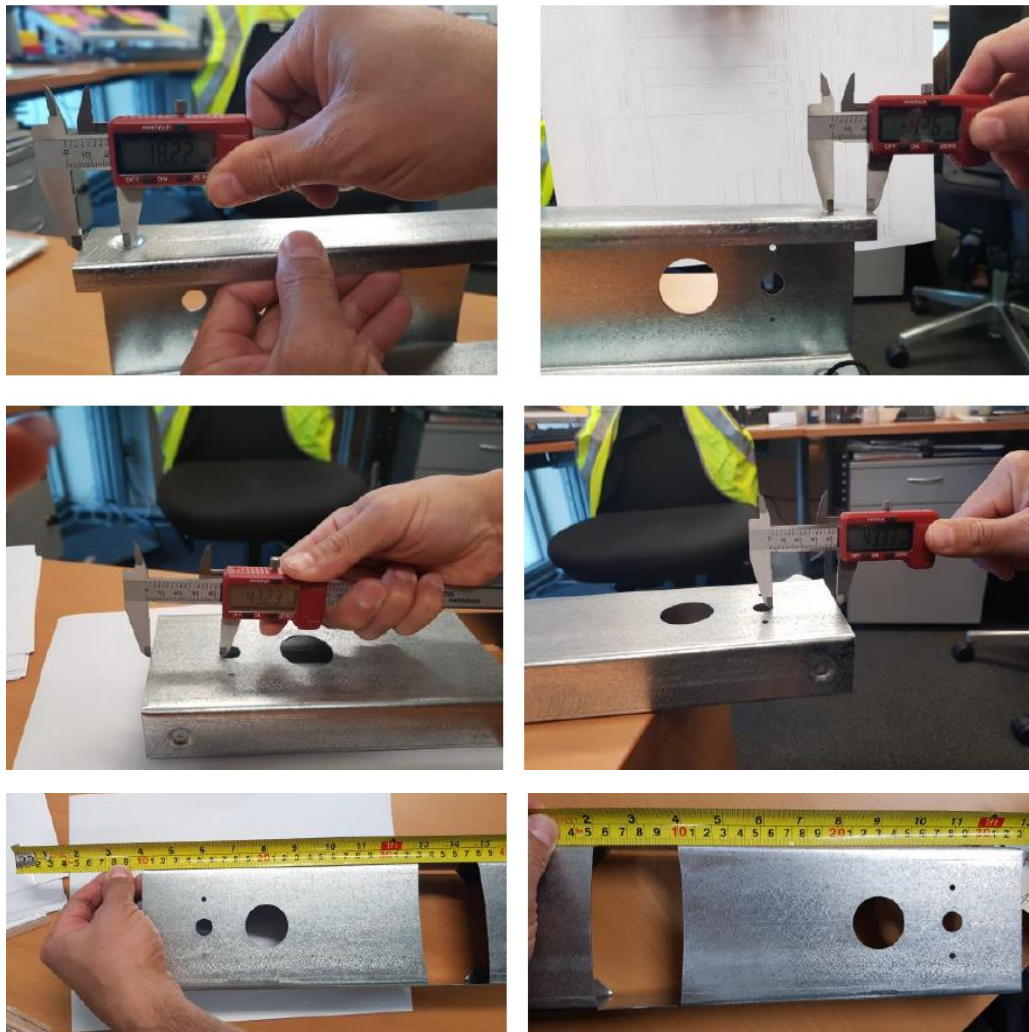
- 4. Apply the changes.
- 5. Use a marker pen to draw a crossed line on the steel strip where it enters the strip lubrication unit. Because all changes to the stick take effect before the encoder, the mark will tell you from where you can take the test stick for measurement when it comes out of the shear.



- 6. When you see the mark as it comes out of the shear, select the stick that exits the machine after the marked stick.
- 7. As soon as the manual stick leaves the machine, draw an arrow on the side indicating in what direction it was moving out of the shear station as you will need to know which is end A and which is end B. The sticks will look like the drawings below.



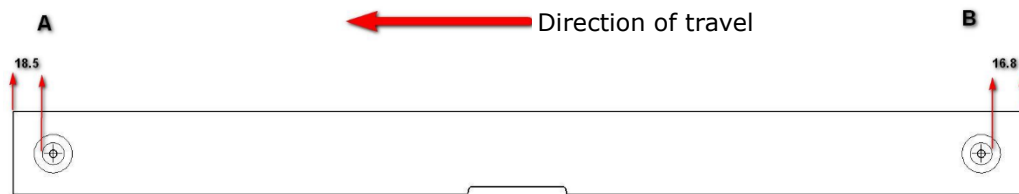
8. Now measure each of the punches relative to the end closest to it as shown in the examples below. Measure from the edge of the hole to the end of the stick.



9. Write down the measurements between the hole and the end of the stick measured.
10. Do this for each set of punched holes.

How to calculate the offset correction value

Example:



If the distance from the Dimple hole to the end is 16.8 at one end and 18.5 at the other end, as shown above:

Subtract the smallest number from the largest then divide the result by 2:

$$A - B = \text{result}$$

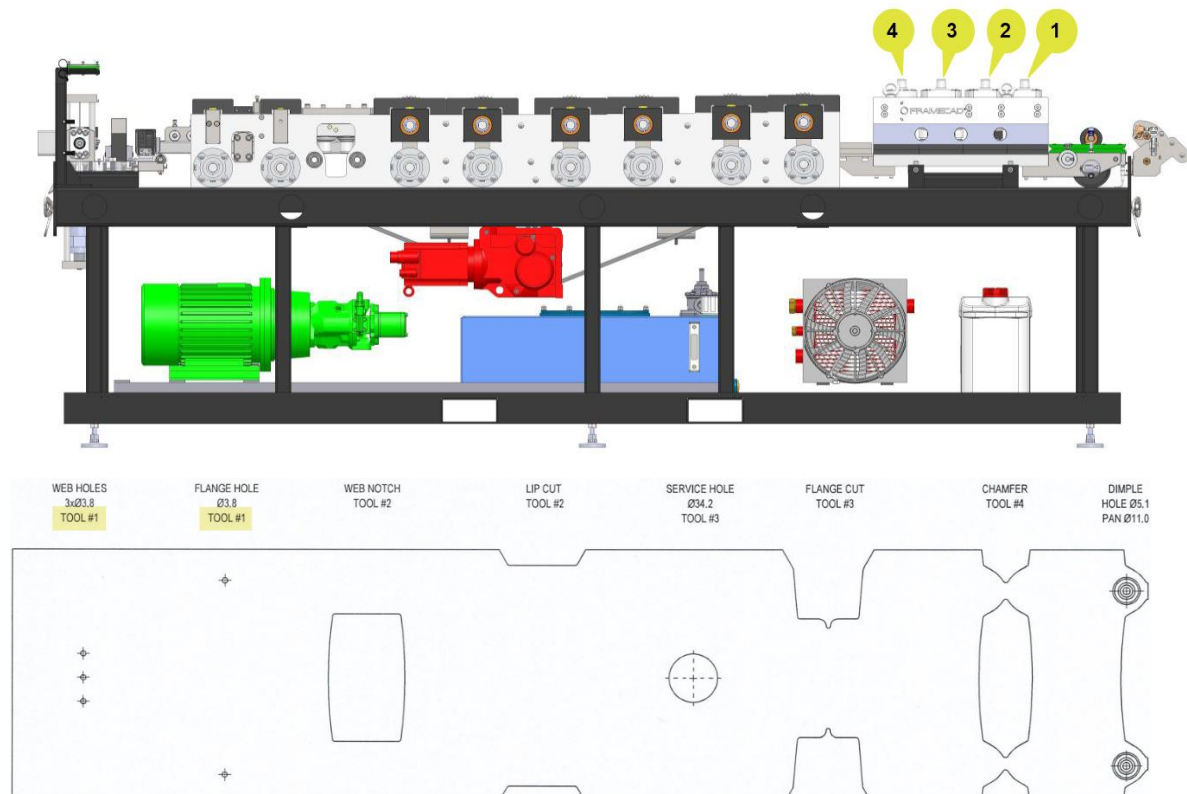
$$18.5 - 16.8 = 1.7$$

$$1.7 / 2 = 0.85\text{mm}$$

0.85mm is the amount the offset needs to be corrected by and needs to be either added or subtracted to the current offset.

How to tell whether to add or subtract the correction value to the offset

The first tool in the punch block (identified by tool #1 on your Profile Drawings) is the datum point where the offsets are always 0.00. In the pictures below, the web holes and flange holes are the tools in position #1 in the tool block.



If the tool is the first tool in the punch block (i.e. datum point / position #1 in your profile drawings)

If $A < B$ subtract (-) the correction value from the tool offset

If $A > B$ add (+) the correction value to the tool offset

Note: Because the first tools always have an offset of 0.00, the difference calculated for the first tools is applied to the Shear Offset.

All other tools

If $A > B$ subtract (-) the correction value from the tool offset

If $A < B$ add (+) the correction value to the tool offset

Example using the dimple tool above:

The dimple tool is not the first tool in the tool block (in fact it is not in the tool block at all; it is after the roller section).

Because A (18.5) is greater than B (16.8) you will subtract 0.85 from 2704.07 = 2703.22.



TIP! If you don't have a calculator, you can use the calculator built into the software. A Calc option will be available when you select the Offset field.

NOTE! Only calibrate one offset at a time then check that tool before rechecking the offsets of the remaining tooling. If multiple tool offsets are entered at the same time this can result in incorrect offset values.

After applying the new offset value to the tool offsets, mark a crossed line at the infeed end then run the machine until the sample stick after the marked piece

comes out of the shear then measure the tool position differences again remembering to draw an arrow on the sample stick to show the direction of travel in case you still need to adjust.

The difference should now be less than the value first measured.

10.2.9 Correct Flare from Shear Tool

To adjust for excessive flare at the shear, adjust the side crimps inwards and then carry out another shear test. Keep adjusting the side crimps until an acceptable profile shear is achieved.

10.3 Troubleshooting Alarms and Warnings

10.3.1 Troubleshooting Alarms

Below are some common Alarms that appear on the Operator Touchscreen.

NOTE! Some resolutions provided in this section should be done under the guidance of a FRAMECAD technician. Incorrect adjustment can significantly alter the performance of the machine and/or quality of the product being made. Extreme caution is advised.

ALARM TEXT	CAUSE	RESOLUTION
Safety circuit tripped	Machine just started up	Reset safety circuit
Guards open	One or more sliding guards are open, or sensors have become physically misaligned, or sensor is not connected after opening outfeed during shear blade change	Reset safety circuit
Emergency stop button pressed	An emergency stop button has been pressed	Release button and reset safety circuit
Decoiler not ready	Decoiler is in Manual Mode	Put decoiler in Automatic Mode
No strip at infeed	Strip sensor does not detect steel strip, due to end of coil, strip sensor too low to detect steel, or faulty sensor	• If no steel in machine - no action • If steel in the machine - troubleshoot sensor
Hydraulic phase rotation	One of the three phase wires is wired incorrectly.	Requires electrician to solve.
Line phase failureMDX61 Fault Code 06, or the rollformer and/or decoiler shuts down intermittently	One of the 3-phases supplying the machine has failed	Have a registered electrician check the incoming supply to the machine. Confirm voltages and frequency.

ALARM TEXT	CAUSE	RESOLUTION
Speed monitoring (steel or mechanical jam, or overspeed) MDX61 Fault Code 08	This means the rolling motor has failed to reach its target top speed in the required time frame. The most likely cause will be due to a mechanical hindrance in the machine, either as a result of incorrect setup (i.e. a misalignment) or the steel fouling on a tool or guide as it is processed inside the machine.	Test the machine in Manual control to investigate the following possible causes: • Check to make sure there is sufficient lubricant being applied to the steel strip. If the steel strip is too dry this will increase the rolling effort required and may result in this error. • Check for mechanical obstructions that may be preventing the steel from moving forward, for example a misalignment or a physical jam-up of the steel. • Check to make sure that no punching tools are stuck down or interfering with the steel movement. Increase the UP and DOWN time settings for the suspect tool in the Setup/Tools screen. • Check that no scrap metal is being caught up in the bottom scrap exit points of the tooling pre-punch block/module. • Increase the Ramp time shown in the Setup/MDX61B screen. This will slow the acceleration of the rolling motor down to accommodate for any increase in mechanical loading in the machine.
MDX61 Fault Code 14 Encoder (check motor encoder wiring)	The VFC has detected a failure with the rolling motor encoder (or resolver).	• Check that no scrap metal is being caught up in the bottom scrap exit points of the tooling pre-punch block/module. • Increase the Ramp time shown in the Setup/MDX61B screen. This will slow the acceleration of the rolling motor down to accommodate for any increase in mechanical loading in the machine. • Check all plug connections to the Encoder on the motor and to the VFC inside the AC Electrical Cabinet and make sure all plugs are firmly connected. Look for a broken or damaged encoder cable and replace if necessary. If all connections have been checked and there is no damage to the cable, replace the encoder.

ALARM TEXT	CAUSE	RESOLUTION
MDX61 Fault Code 28	Communications with the master computer has failed.	• If the RESET button was just pressed or the machine was just powered up, press the acknowledge button and ignore. • Get a registered electrician to check the ethernet plug connections between the computer and the VFC in the AC Electrical Cabinet.
	NOTE: It is not uncommon to receive this fault just after a machine reset or on power-up as both these conditions reset the VFC and may interrupt the communication link with the computer.	
Overtemperature MDX61 Fault Code 31	The motor is too hot.	• Allow motor to cool. If excessive production or ambient temperature, additional cooling may be required. • Have a registered electrician check the state of the motor.
Excessive slip (motor is turning but steel encoder is not - check for jamming or loose rollers or encoder) (Code 42)	The VFC detected too large a difference between the motor encoder signal and the steel strip encoder signal. This fault will often follow or be associated with a fault 08 code (Speed monitoring (steel or mechanical jam, or overspeed)). These two faults are typically caused by similar events. The one that is displayed depends on which occurs first. The 08 fault will most likely occur during acceleration while the 42 fault will occur a little latter after the motor has got to speed.	• The guide wheel(s) at the infeed of the machine is slipping on the steel strip OR the encoder belt pulley is loose (if applicable) OR the Encoder shaft coupling is loose. Check and re-tighten if necessary. • Check to make sure there is sufficient lubricant being applied to the steel strip. If the steel strip is too dry this will increase the rolling effort required and may result in this error. • Check for mechanical obstructions that may be preventing the steel from moving forward (e.g. misalignment or a physical jam-up of the steel). • Check to make sure that no punching tools are stuck down or interfering with the steel movement. • Increase the UP and DOWN time settings for the suspect tool in the Setup/Tools screen. • Check that no scrap metal is being caught up in the bottom scrap exit points of the tooling pre-punch block/module. • Increase the Ramp time shown in the Setup/MDX61B screen. This will slow the acceleration of the rolling motor down to accommodate for any increase in mechanical loading in the machine

ALARM TEXT	CAUSE	RESOLUTION
Hydraulics pressure low	The system cannot build and/or maintain hydraulic loading pressure 165 Bar (2393psi) OR the pressure switch feedback is not correct. While this can indicate an issue with the pressure sensor, hydraulics circuit and/or seals within valves or cylinder. It can also be the result of electrical supply issues to the machine.	• To confirm hydraulic pressure related issues, a test gauge must be used to check the pressure whilst the pump is running: a test port is located at the hydraulic pump for pressure testing. The hydraulic pump pressure is factory set at 165 Bar (2393psi). • Check for hydraulic leaks and hot spots in or around the hydraulic cylinders, valves or manifolds that may indicate hydraulic seal leakage (bypassing) • Hydraulic pressure is set at 165 Bar (2393psi). If a hydraulic pressure test gauge indicates that the pressure is approximately 165 Bar (2393psi) while the pump is running, check the pressure switch feedback (go to the Info/View I/O screen to check if the hydraulic pressure switch input is "ON" (i.e. green). If the pressure switch indication is NOT ON – check for loose or damaged wires – if all is OK, replace the pressure switch. • Have a registered Electrician check the electrical supply to the machine (voltage and frequency). Check hydraulic pump - contact FRAMECAD for further support.
Inkjet Comms Fault	Communication has been lost with the printer heads.	• Check all cabling, look for loose connections and replace or rectify as required. • Contact FRAMECAD for further support.

10.3.2 Troubleshooting Warnings

WARNING TEXT	CAUSE	RESOLUTION
Stick filtering disabled	The "Disable stick filtering" checkbox is selected on the Setup > Machine Setting menu, Parameters tab.	Check if you wish to disable stick filtering - see Disable Filtering for Noncompliant Sticks .
Cold mode is enabled, this will slow the machine's speed	Cold mode is enabled in the Setup > Hydraulics menu.	Uncheck the Enable Cold Mode checkbox.
Maintenance(s) due	A maintenance reminder has been scheduled on the machine.	Record maintenance performed as per Manually Record Maintenance Done . or remove maintenance reminder: Set Reminders for Maintenance

10.4 Troubleshooting Printer Issues

10.4.1 Troubleshooting Cartridge Printer

If the text is too light, not present, or not readable, you can try the following:

1. [Purge Inkjet Printer System With Ink](#)
2. [Clean Ink Cartridges and Printer Heads](#)
3. If purging or cleaning do not work, replace the ink cartridge with a new one.

10.4.2 Troubleshooting Inkjet Printer System

If the text is too light, not present, or not readable, you can try the following:

1. Purge the printer heads with ink
2. Check the amount of ink in the bottle located in the printer cabinet – replace bottle if required
3. Make sure both the ink and cleaner bottle caps are tightly sealed
4. Check the filter in the ink bottle cap for blockages – replace filter if required
5. Check the air compressor pressure of the system is approximately 10psi

6. Check for any kinks or loose connections on the tubing both inside the printer cabinet and going up to the printer heads
7. Clean and purge the printer heads with cleaner before purging again with ink.

If the above steps do not resolve issues with the printer, contact FRAMECAD for support.

10.5 Mechanical Issues

Common observations and resolutions

ISSUE	CAUSE	RESOLUTION
Rollers shudder or oscillate back and forth during forward motion.	Chain tension loose OR insufficient lubrication on steel strip OR roller station is no longer in contact with steel strip.	• Tighten chain tension • Check sufficient lubrication on the steel strip • Check to make sure all roller stations are in contact with steel
Emergency Stop activation without an Emergency Stop Pushbutton being pressed.	Decoiler dancing arm has been lifted too high OR decoiler VFC has tripped. The decoiler is integrated into the safety control circuit, so if the decoiler has stopped running for any reason both machines will halt in an Emergency Stop state.	Check decoiler dancer arm calibration.
Buildup on rollers		Clean the residue by either scraping or rubbing the build up with fine emery paper.
Machine speed is slow	Feed rate setting is too low OR hydraulic pressure is struggling to maintain pressure. If hydraulic tooling actuation is slow then this indicates a hydraulic system issue.	• Check feed rate setting on Setup > MDX61B screen Check for hydraulic leaks and hot spots in or around the hydraulic cylinders, valves or manifolds that may indicate hydraulic seal leakage (bypassing) • Check hydraulic pump pressure. To confirm hydraulic pressure related issues, a test gauge must be used to check the pressure whilst the pump is running: a test port is located at the hydraulic pump for pressure testing. The hydraulic pump pressure is factory set at 165 Bar (2393psi). • Contact FRAMECAD for further support.
No printing or faint printing	Blocked or clogged printer heads	Manually clean and purge the printer heads

10.6 Issues with the Hydraulic System

Issues that could happen with hydraulic system are rare. Issues include:

1. Bypass (leak)
2. Connections come loose
3. Seal has broken
4. Solenoid has failed - tool will not punch - will get alarm on Operator Touchscreen.

Indication of issues

Indications that something is wrong with hydraulic system:

1. Hydraulic oil appears on sticks
2. Tool on toolblock is extremely hot to the touch - indicates bypass
3. Tool does not punch at all (solenoid) - check if there is an alarm on the Operator Touchscreen
4. Tool does not perform punch correctly and there is a resulting deformation in the profile
5. Temperature of the machine will increase
6. Alarm or warning on Operator Touchscreen.

TIP! Light hydraulic "sweat" around tools on toolblock is normal.

10.7 Steel Jams

A jam-up in the machine can be for any number of reasons, including:

- Incorrect steel strength
- Incorrect steel width
- Hydraulic issue with tools
- Incorrect mechanical setup of machine.

Common scenarios

ISSUE	CAUSE	RESOLUTION
Jam-ups at the lipbox	• Loose infeed guides (resulting in an incorrectly centred steel strip) • Strip thickness exceeds tolerance of lipbox	Recalibrate infeed guides.

		Confirm strip thickness is within specification.
--	--	--

10.8 Electrical Issues

Peculiar or intermittent faults resulting in unexpected machine shut-down, safety circuit trips, failure to start the hydraulics etc are sometimes the result of poor electrical supply. Be aware of this and if you suspect a supply related issue, have a registered electrician investigate.

 **DANGER!** If you suspect an electrical fault, call FRAMECAD for advice. All electrical troubleshooting procedures **MUST BE** done by an electrician who is certified in the country of installation. **DO NOT** open the electrical cabinets.

10.9 Troubleshooting Procedures

10.9.1 Centre Strip using Infeed Guides

NOTE! It should not be necessary to adjust these guides during the normal operations. This procedure is provided as a troubleshooting method only.

This procedure explains how to expand or contract the adjustable guides inside the machine that control how the strip is centred.

These guides are calibrated so that they are evenly spaced from the centre point of the machine. It is possible that they may go out of calibration if the infeed assembly is incorrectly adjusted during other procedures (such as moving the infeed guides in and out to accommodate a change in the strip width of steel used in the machine).

Centring the strip ensures the steel strip is evenly distributed in the machine during the rolling process. If the strip is not well centred at the infeed, problems can result such as:

- Uneven lip widths on end product
- Other problems with profiles, such as bow or camber
- Steel jamming in the machine, especially at the lip box.

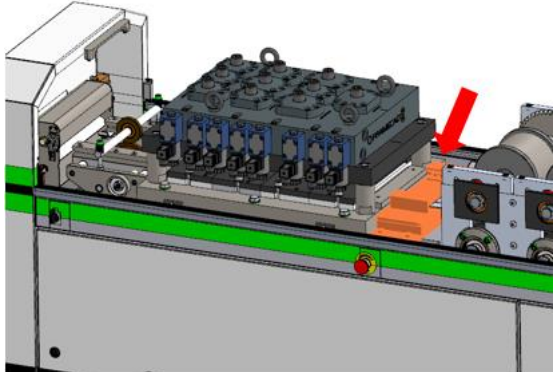
Procedure

Tools required

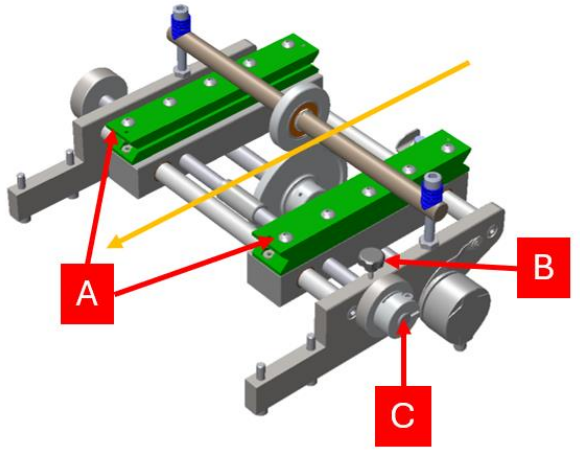
- Standard PPE: safety boots, cut-resistant gloves, hi-vis clothing, safety glasses
- High accuracy vernier calliper.

- Metric / imperial hex key set.
- Metric / imperial spanner set.

Open guides mounted at the outfeed end of the tool block

STEP	ILLUSTRATION
Open the sliding cover at the infeed of the rollformer. This will cause the machine to enter an emergency-stopped state.	
Before making any adjustments to the infeed, open up the guides mounted at the outfeed end of the tool block so that these guides are not touching the steel strip.	

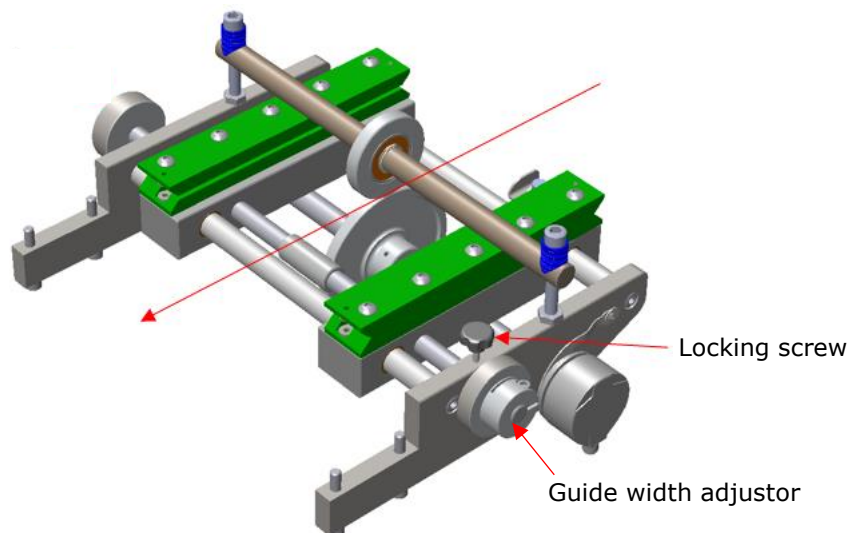
Adjust infeed guides

STEP	ILLUSTRATION
To adjust the infeed guides (A) inward or outward, loosen the locking screw (B) and wind the knurled adjustment wheel (C) until there is a firm fit. Then loosen the adjustment wheel so that the steel has no sideways movement but can still easily move forwards and backwards. The infeed guides should prevent the steel from sideways movement, but the steel should not be hard up against the rollers inside the infeed guides, otherwise the rollers will get unnecessarily worn. Re-tighten the locking screw when complete.	
Insert steel.	
Close the top sliding cover and acknowledge the Guard Switch alarm on the Operator Touchscreen.	

Press the **Reset** button  below the Operator Touchscreen.

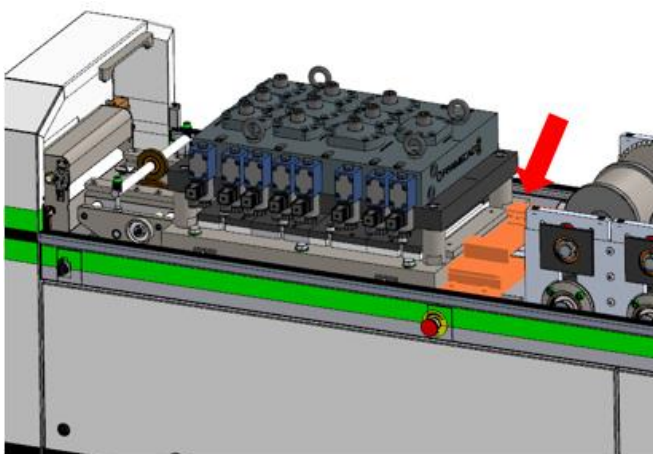
The machine will now be in Manual operation mode.

1. The Infeed Guide has a single Guide Width Adjustor located on the right-side (relative to the direction of steel travel) of the assembly. To adjust, loosen the left-side (relative to direction of steel travel) locking screw and wind the knurled adjustment knob (Guide Width Adjustor) in or out until there is a firm fit. Re-tighten the locking screw when complete.



Infeed guide adjustment

2. Continue to push the steel strip through the tool block and into the first roller station. Once the steel strip has reached the first roller station, close up the guides mounted at the outfeed end of the tool block so that they are just touching the sides of the steel strip as it is fed through into the rollforming section.



3. Continue to push the steel strip through the tool block and into the first roller station. Once the steel strip has reached the first roller station,

continue to push while at the same time rotating one of the side cover Inch selector switches to the Forward position (there is one on either side of the machine at the infeed end). This will allow the rollers to start spinning and take up the steel strip so that it can be fed through the remainder of the machine.

4. The steel strip can now be threaded all the way through using the Inch Forward controls on the side of the machine. Continue to feed until the steel strip has just exited the outfeed end of the machine.

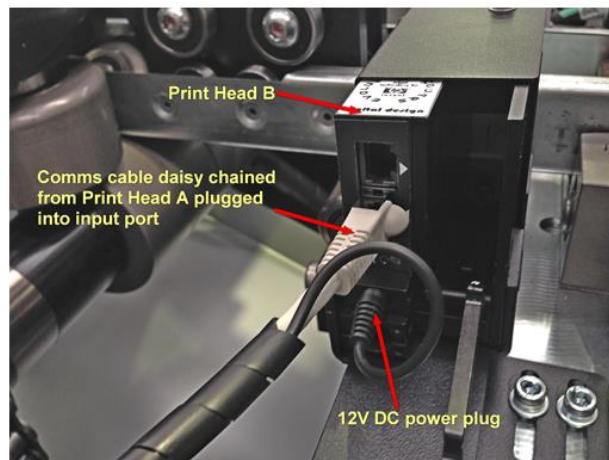
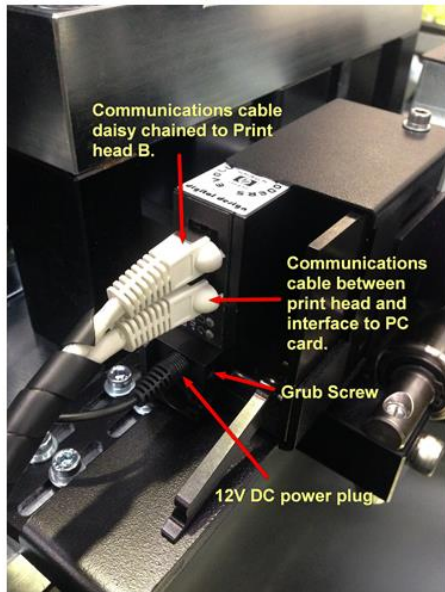
10.9.2 Check Infeed Unit for Slippage

One of the most common causes for inaccurate encoder (scale factor) calibration is “slip” at the infeed unit assembly of the machine. The term “slip” literally means that the strip encoder is “slipping” as the steel strip is progressed through the machine and thereby introducing measurement errors. Typical areas where slippage can occur are:

- Strip encoders that are directly coupled have a small grub screw that locks strip encoder input shaft inside the bottom guide wheel shaft. If this screw is loose then the strip encoder shaft can slip causing inaccurate measurement – solution, re-tighten grub screw.
- Slipping top pressure wheel. If the top guide wheel slips on the steel strip as it is being progressed through the machine then measurement errors will be introduced – solution, tighten down top pressure wheel shaft until the pressure wheel is almost too tight to turn by hand with significant force. Important!: Make sure the pressure wheel is exactly vertical and perpendicular to the steel strip otherwise the pressure wheel can be forced off the bearing.

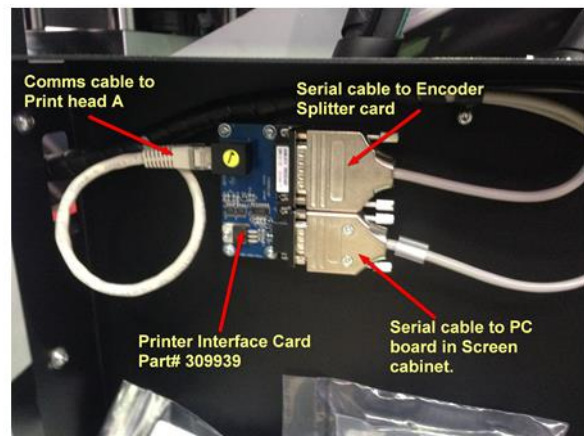
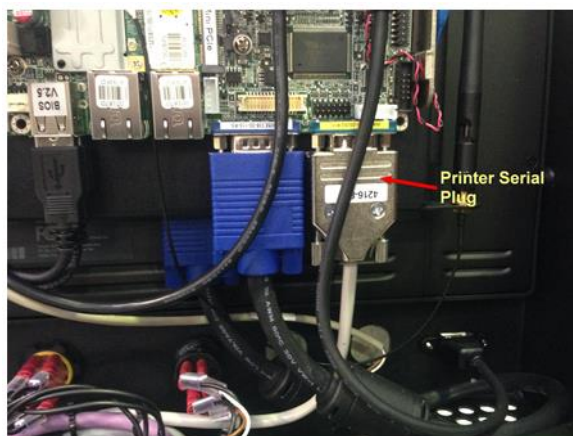
10.9.3 Check Printer Communication Connections

If a message appears on the main screen indicating an Ink Jet Communications Error, check that the 12V DC power plugs are firmly pressed into the back of the print heads; you may need to loosen the grub screw holding the plug in place and then re-tighten it.



Check the Communications cables are plugged into the correct port, are pushed in securely and there is no sign of damage.

Check that the printer serial cable is plugged into the PC card in the screen cabinet. You may need to unplug and then reconnect and make sure securing screws are tight.



10.9.4 Adjust Infeed Guide Position

Use this procedure to recalibrate the infeed guides so that they are equal distances apart from the centre line of the machine. These guides keep the steel centred inside the machine, so it is important to calibrate them correctly.

The guides will be calibrated at commissioning of your machine. However they could go out of calibration if the infeed assembly has been incorrectly adjusted.

If the guides are uneven, this can cause:

- profile problems, especially uneven lip widths
- steel jamming inside the rollformer.

Procedure

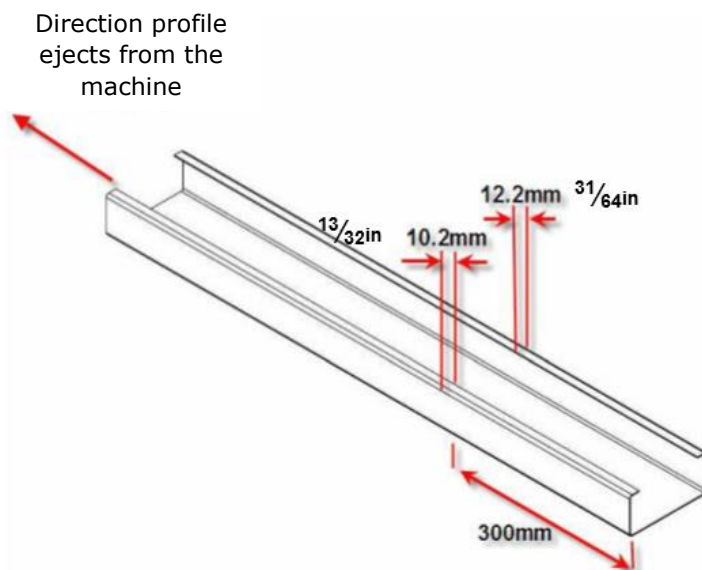
Prerequisites

Remove steel from the machine. See [Remove Steel From Rollformer](#).

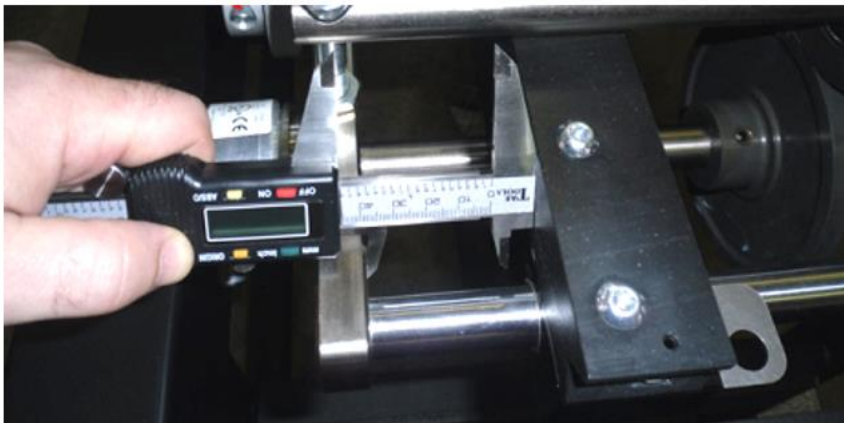
Measure the variance of:

The Lip width on either side of the profile should be approximately the same. If there is significant variation ($>0.8\text{mm}$ or $1/32\text{in}$) from one side to the other, use the Side to Side Lip Adjustment.

The first step is to measure the size of the variance and the direction. Below is an example:

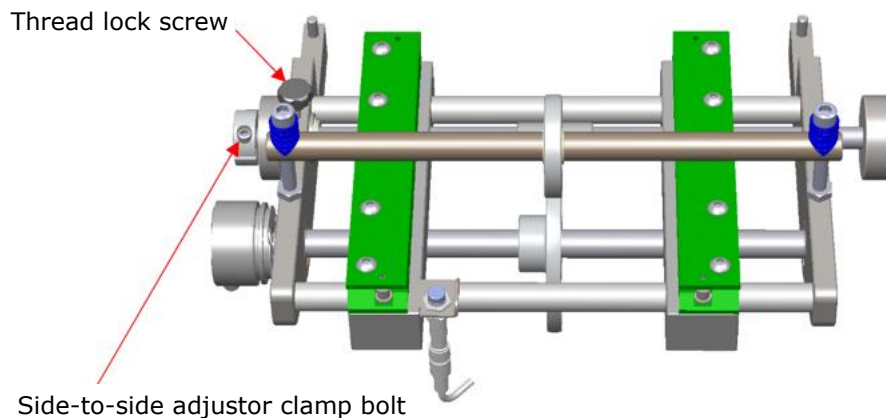


1. Remove the steel strip from the machine. This is the easiest way to adjust the side-to-side positioning of the guides.
2. Measure using a digital or Vernier calliper the distance from the infeed shoulder to the left-side (relative to the direction of steel travel) guide as shown below

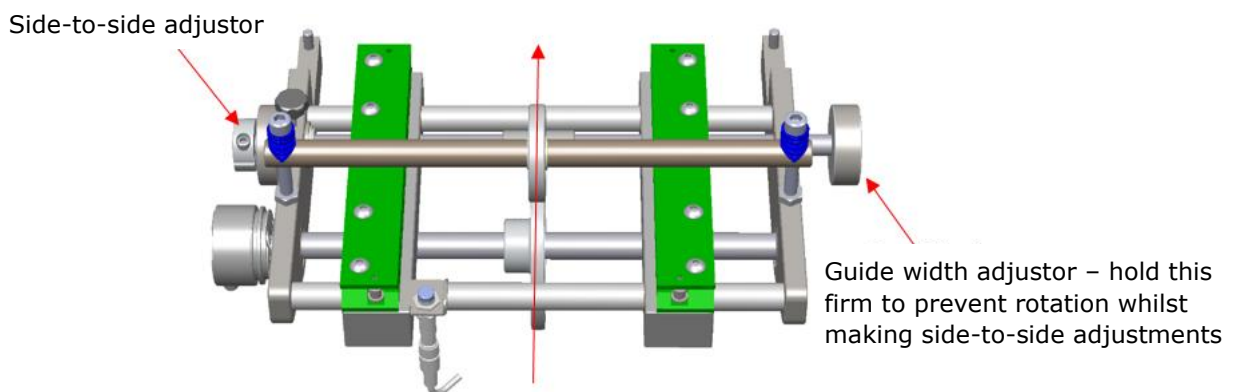


Measure distance between infeed assembly shoulder and the left-side guide

3. Note the measurement then release the side-to-side adjustment clamp bolt and the thread lock screw being careful not to rotate the guide width adjuster.



4. Using both hands, rotate the side-to-side adjuster in the direction required to shift the relative position of the steel strip inside the guides whilst holding the knurled right-side guide width adjuster in a fixed position. As you do so, you will see the infeed guides moving together in the direction of adjustment. Take your time and move the guides in small incremental steps. After each small adjustment, stop and re-measure using the Vernier calliper as shown in 1 until the guides are in the correct position.



5. When desired position is reached re-tighten clamp bolt and thread lock screw.
6. Now check that the guides are still firm on the steel strip by re-inserting the steel and re-check the width of the guides – adjust if necessary (see above).
7. Close all sliding covers: reset the safety control system ready to commence production.

10.9.5 Troubleshoot Steel Lubrication Unit

The lubrication unit will be set up by your FRAMECAD technician during installation of your machine.

Adjusting the amount of lubricant applied is controlled by the machine software, see [Check and Adjust Strip Lubrication](#).

This procedure is included for the purpose of troubleshooting your lubrication unit.

 **WARNING!** Procedures detailed in this section are designed to be completed with electrical power isolated to the machine and without steel strip inserted.

Procedure to access and check lubrication unit

The lubrication unit is mounted at the infeed. Steel strip is passed through the lubrication rollers and a thin film of lubricant is applied to the top and bottom surfaces of the steel.

Tools Required

Machine cabinet key.

Safety

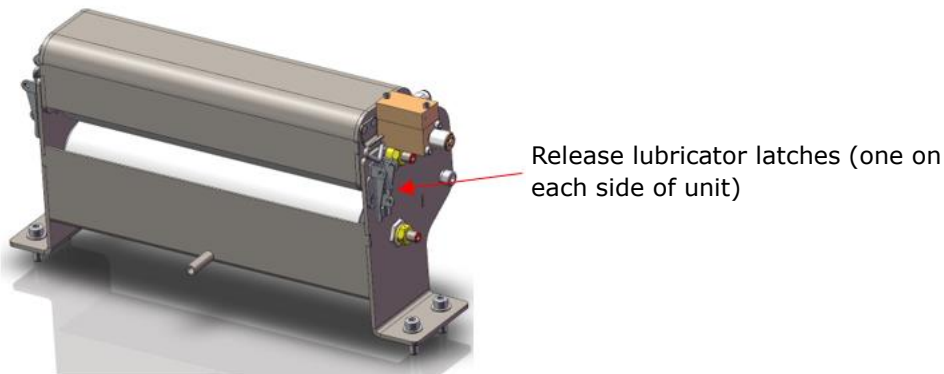
- ISOLATE electrical power to the FRAMECAD F325IT and implement measures to prevent accidental re-connection.
- Use protective gloves when handling lubricant.
- DO NOT have steel sheet loaded into the machine.

Prime the Lubrication Unit

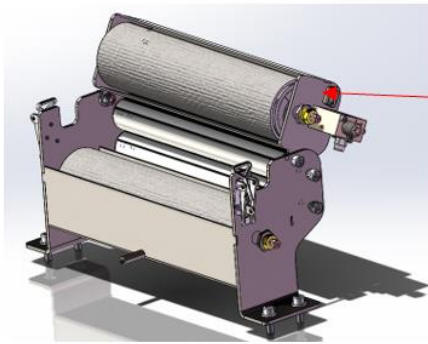
If you have a pump flow adjuster on the side of your lubrication unit, use the following procedure to draw lubricant up and into the top roller.

CAUTION! Be careful not to pinch or damage any of the connecting tubes or fittings during this procedure!

1. Remove the rear infeed cover to gain access to release the two side latches.
2. Release lubricator latches (one on each side of unit)

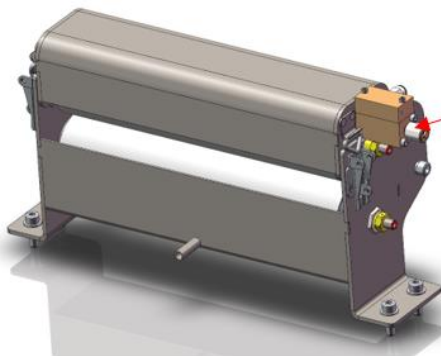


3. Then tilt the top roller assembly back and upwards as shown in the picture below.



Tilt top cover/roller assembly back and rotate roller by hand to draw up lubricant

4. Rotate the top roller by hand. This will draw lubricant up and into the roller.
5. Continue to rotate until the roller feels sufficiently wet/damp.
6. Adjust the amount of lubricant applied using the flow restrictor mounted on the side of the lubrication pump.

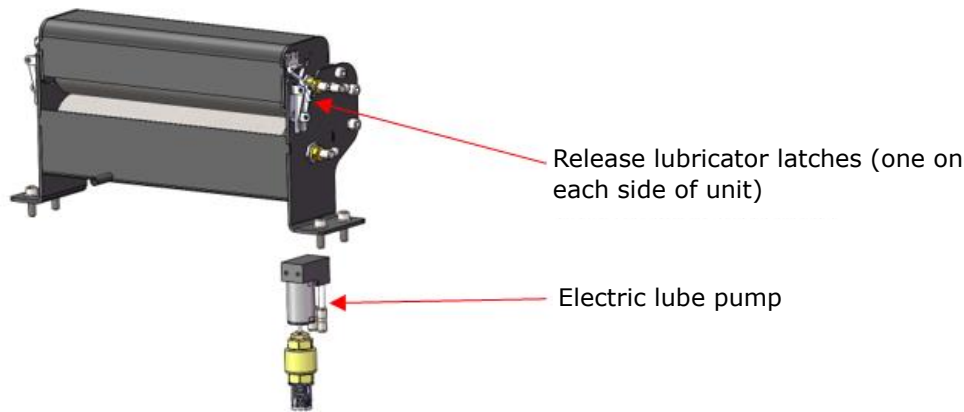


Lubrication pump flow adjustment –
wind in to increase lubricant flow.
Wind out to decrease lubricant flow

7. Adjust as required when testing steel strip running through the machine.
8. Close up the lubrication unit and re-fasten the two side latches. Check to make sure there are no crimped tubes or damaged fittings.

If you have an electric lube pump, the following procedure will draw lubricant up and into the top roller:

1. Remove the infeed cover and release lubricator latches.



2. Tilt the top roller assembly.
3. Rotate the top roller by hand. This will draw lubricant up and into the roller.
4. Continue to rotate until the roller feels sufficiently wet/damp.
5. On the Operator Touchscreen, adjust the amount of lubricator using **Setup > Strip Lubricator**.
6. Further adjustment may be required once steel strip is run through for the first time.
7. Close up the lubrication unit and re-fasten the two side latches. Check to make sure there are no crimped tubes or damaged fittings.

10.9.6 Purge Printers Without Steel in Machine

Safety

We recommend wearing gloves to prevent the ink from getting on your skin.

Procedure

1. If there is no steel in the machine, open the sliding guards at the outfeed of the machine. This will trip the safety circuit which you will need to reset later. Place a piece of cardboard or white paper in the space between the two printer heads to prevent Ink from one printer head being sprayed onto the other.
2. Start the machine and reset the safety control system (i.e. release any Emergency Stop pushbuttons, close all sliding covers, and reset the safety circuit.)
3. This procedure will purge the ink cartridges and ensure there is a consistent flow of ink available. This ensures a high standard of print is achieved. If there is no steel in the machine, it is a good idea to insert a piece of cardboard or white paper in the space between the two printer heads.

4. Once steel strip has been threaded through the machine it is good to test the printer control system before commencing full production.

11 Production Reporting

11.1 Accessing Machine Logs

Various actions and/or events that take place on the machine are logged.

If you have set up downtime reason logging (see [Set Up Downtime Logging for Automatic Production](#)) you can also access that data from here.

Machine log information is available on the **Info > Event Log** screen.



Filtering the event log

Types of events to display can be selected via the drop-down box on the top right.



Event dates can be selected with the Date drop-down calendar:



This screen also includes options to configure the number of events displayed on each page via the **Events per page** dropdown box. To switch between the various event log pages, standard navigation buttons are also provided:

	Go to the First recorded event log page
	Go to the event log page immediately preceding the currently displayed page
	Go to the event log page immediately following the currently displayed page
	Go to the Last recorded event log page

11.2 View Machine Usage Data

To see information on how your machine has been used, go to **Info > Maintenance Data**.

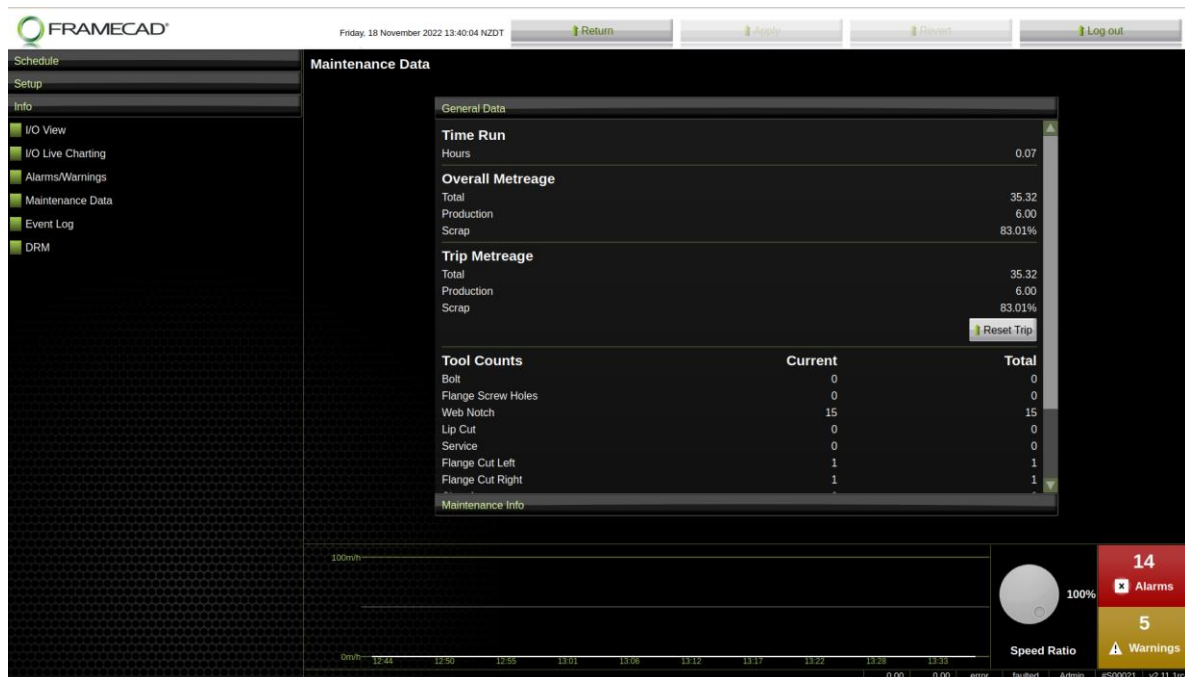
The machine software captures information on production, steel consumption and a running count of hydraulic tool operations.

This information gives an indication of how much wear and tear is likely to have occurred on components and is invaluable for planning service and maintenance regimes.

NOTE!

The maintenance data screen should be an integral component of the FRAMECAD machine management strategy. Productivity performance and even service planning can be driven from the data included on this screen.

Maintaining an effective service plan is crucial to ensuring the continued performance of the machine.



Time Run

This is the total time the machine has been available for “production”. The time is derived from the number of hours the hydraulic power-pack has been running which is a direct indication of the number of hours the machine has technically been available for production.

Overall Meterage

These totals cannot be reset and are a running count of the steel processed throughout the lifetime of the machine.

Total	Total length of steel strip processed on your machine, including all waste (scrap) material processed in either Automatic modes or Manual control mode.
Production	Total amount of steel strip processed (in Automatic control modes ONLY). In other words, this is technically the amount of usable product run off the machine.
Scrap	Estimated amount of scrap steel generated on the machine. It is calculated as follows: $\text{Scrap(\%)} = 100 \times (\text{Total} - \text{Production}) / \text{Total}$

Trip Meterage

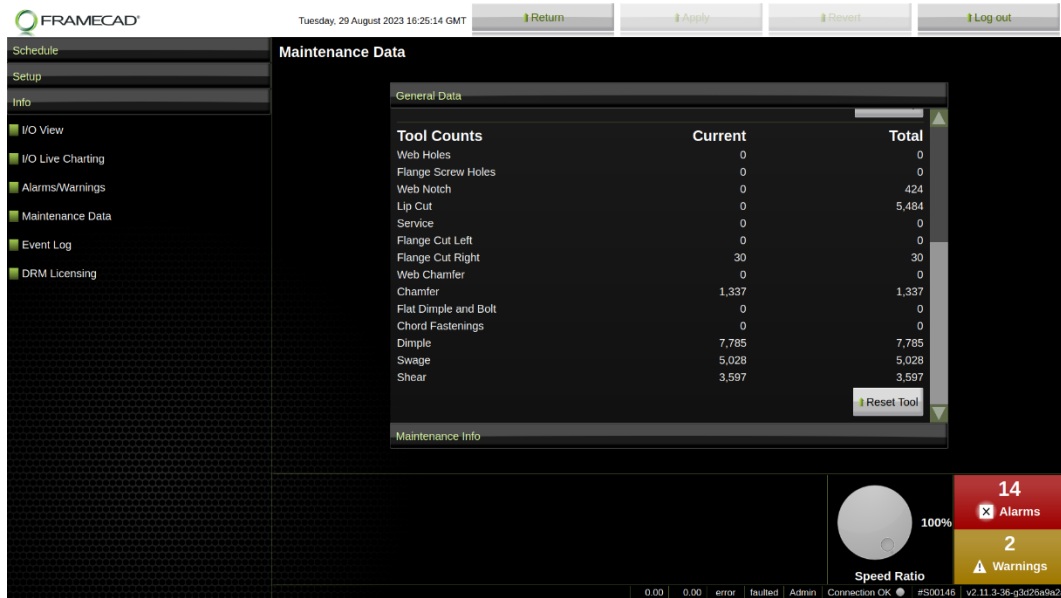
The totals included in this section are calculated in the same way as those in the Overall Meterage section (see above), however they can be reset using the **Reset Trip** option. They can therefore be used to monitor the meterage of steel over any given period. Typically your FRAMECAD technician would reset these totals after servicing your machine.

Tool Counts

This is the number of individual tool operations that have taken place on the machine (in all control modes). This is a useful method for planning scheduled service and maintenance of the tooling.

The **Total** column is for the total over the machine's lifetime.

The Current column shows a running total since the tool was last reset.



The screenshot shows the FRAMECAD Maintenance Data interface. On the left is a sidebar with navigation options: Schedule, Setup, Info, I/O View, I/O Live Charting, Alarms/Warnings, Maintenance Data (selected), Event Log, and DRM Licensing. The main area displays a 'General Data' window with a 'Tool Counts' table. The table has three columns: Tool Name, Current, and Total. Below the table is a 'Reset Tool' button. At the bottom right of the screen, there are status indicators: a 'Speed Ratio' gauge at 100%, and two boxes showing '14 Alarms' and '2 Warnings'. The top of the screen shows the date and time: Tuesday, 29 August 2023 16:25:14 GMT, and navigation buttons: Return, Apply, Revert, and Log out.

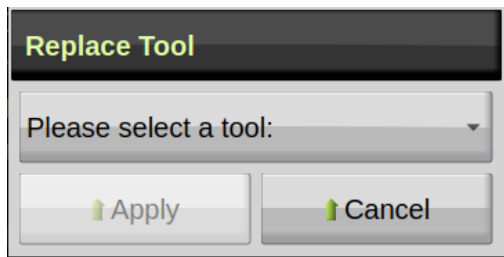
Tool Counts	Current	Total
Web Holes	0	0
Flange Screw Holes	0	0
Web Notch	0	424
Lip Cut	0	5,484
Service	0	0
Flange Cut Left	0	0
Flange Cut Right	30	30
Web Chamfer	0	0
Chamfer	1,337	1,337
Flat Dimple and Bolt	0	0
Chord Fastenings	0	0
Dimple	7,785	7,785
Swage	5,028	5,028
Shear	3,597	3,597

Replacing a tool

If you have replaced tool hardware, you can reset the tool count (in the Current column) to zero.

Press the **Reset Tool** option.

In the **Replace Tool** dialogue box, select the tool that has been replaced and click **Apply**.



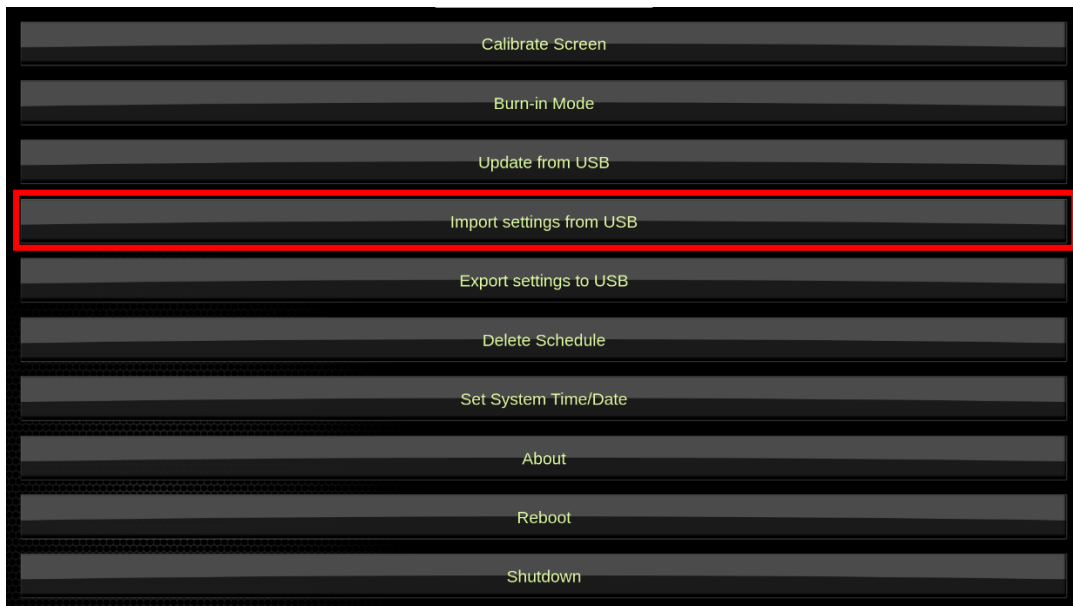
The 'Replace Tool' dialogue box has a title bar with the text 'Replace Tool'. Below the title bar is a text input field with the placeholder text 'Please select a tool:'. At the bottom of the box are two buttons: 'Apply' and 'Cancel'.

12 Factory2 Additional Information

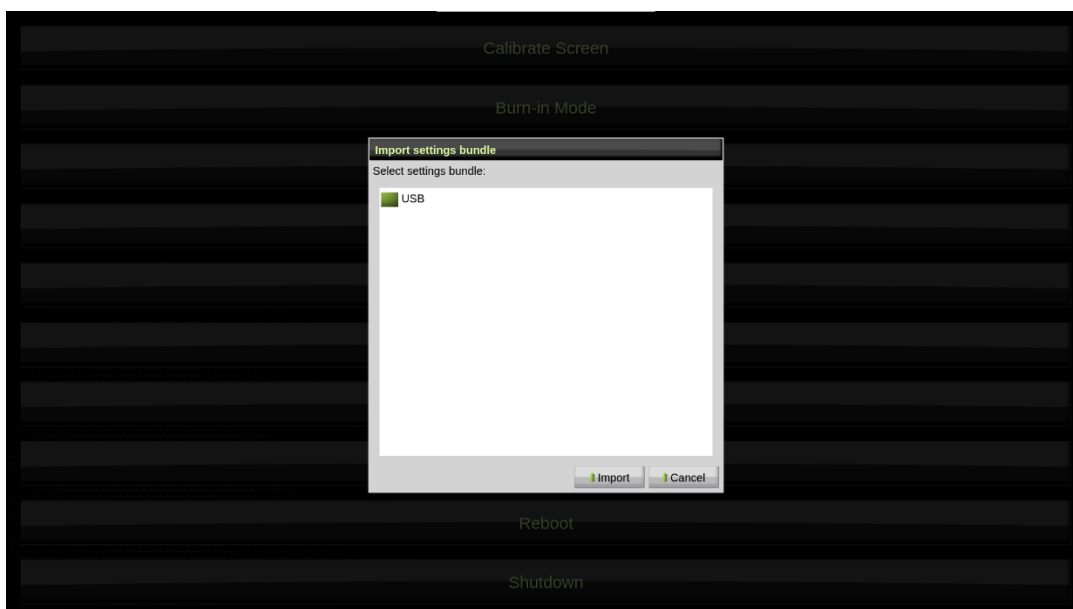
12.1 Importing machine parameters

This is done to restore the parameters of the software for this machine from a .tar.gz file.

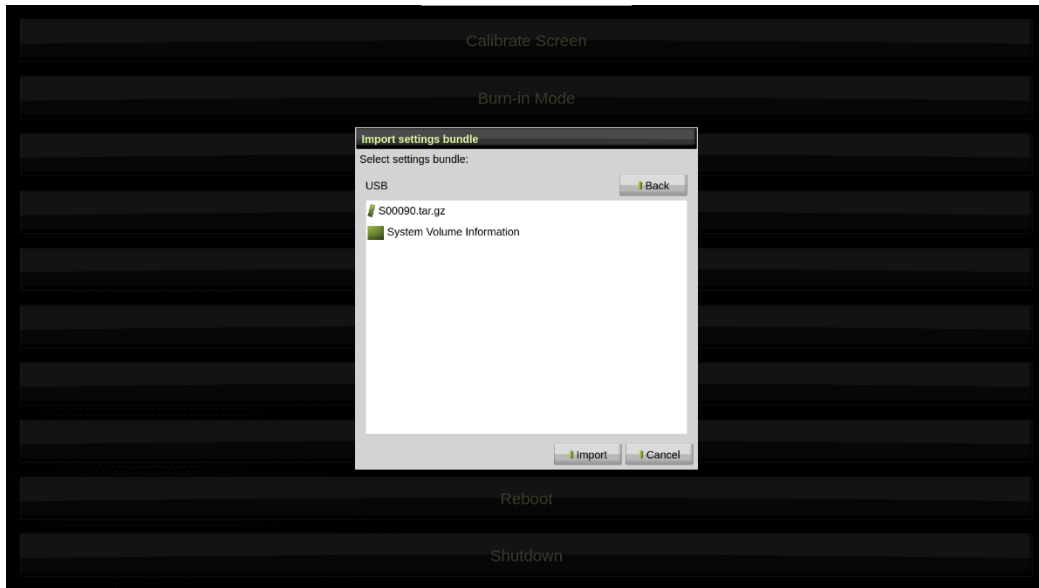
1. Press "Import settings from USB"



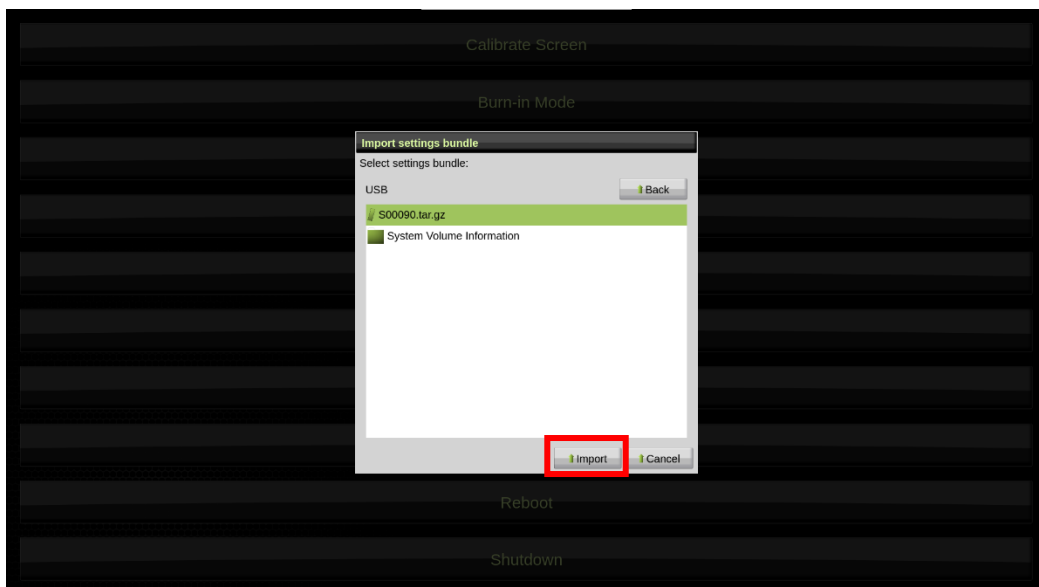
2. In the pop-up menu that opens select the USB folder to open it.



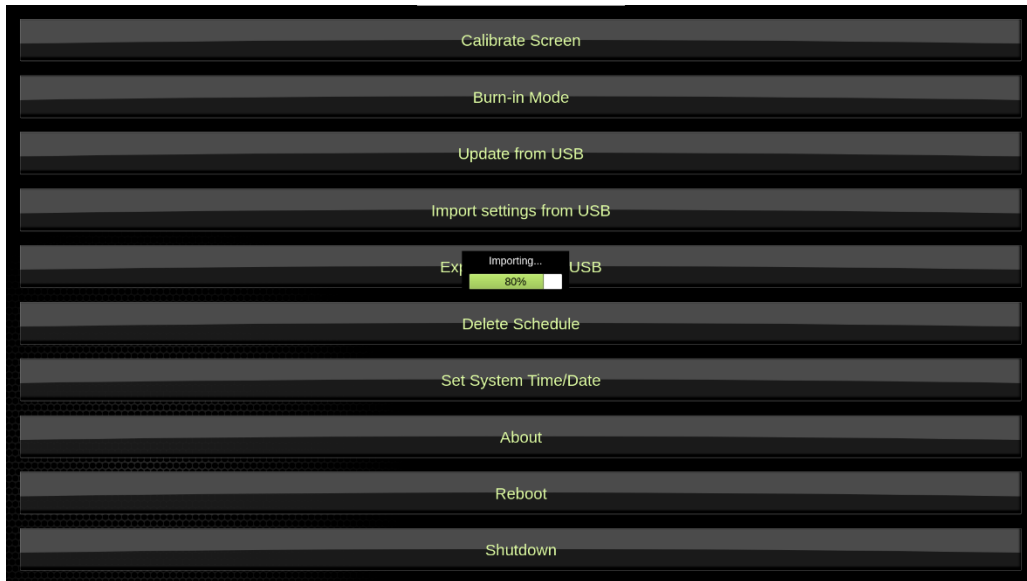
3. Press the .tar.gz file to highlight it.



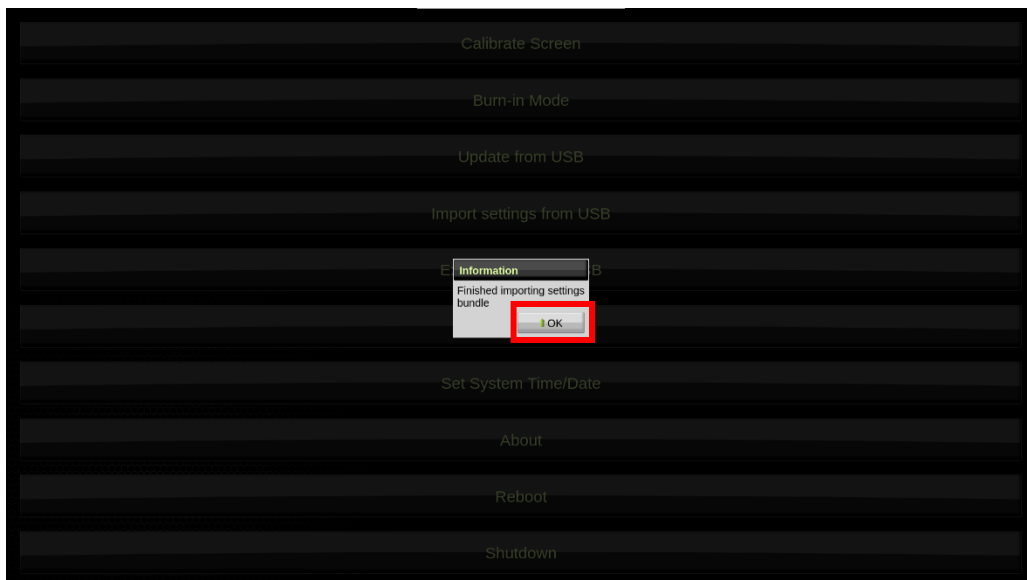
4. Press the Import button to action the file import.



5. The import will begin immediately.



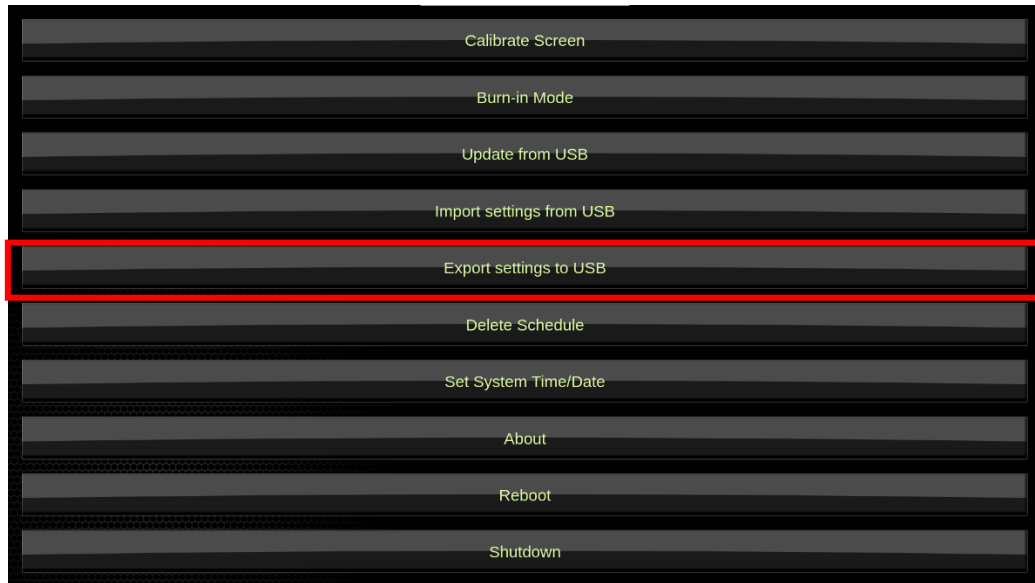
6. When finished a prompt will be displayed. Press the "OK" button.



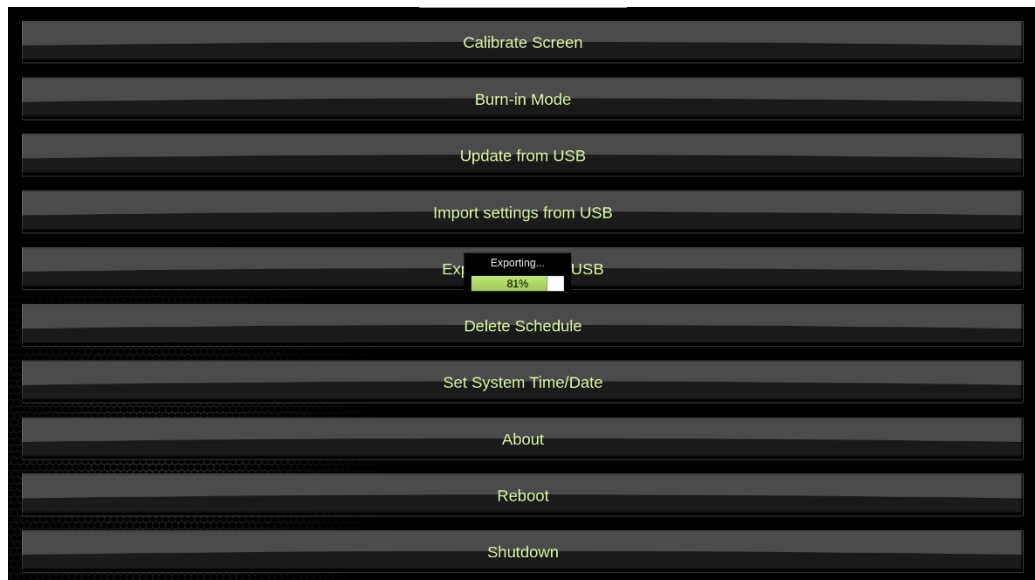
12.2 Exporting tar file

This is done to back up the parameters of the software for this machine.

1. Plug in a USB to the Operator Touchscreen.
2. Press "Export settings to USB"

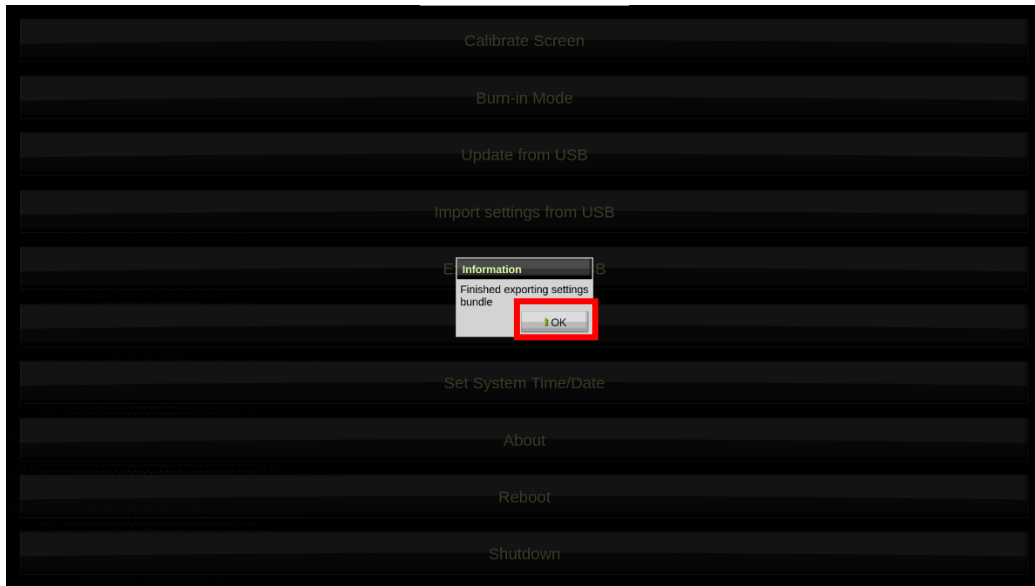


3. The Export will begin immediately.



4. When finished a prompt will be displayed. Click "OK".

The tar file will be saved on your USB. The file will have a file type extension in the format: "tar.gz"



12.3 Info – View I/O Screen

(Info / I/O View Screen)

The I/O View Screen displays the logical state of the *inputs* & *outputs* (I/O) on the FRAMECAD machine. Digital inputs provide the logical state of the various buttons and sensors on the machine. Digital outputs provide the digital state of the solenoid valves, indicator lamps (buttons) and motor stop/start contactors.

Logic State 1 (input or output is "ON"): Green

Logic State 0 (input or output is "OFF"): Grey

In addition to the logical state of the I/O, this screen also provides information on the physical connection point of the input or output. This will relate to the type of I/O device being used. These connection details can then be cross-referenced to the Electrical Circuit diagrams for more detail.



TIP! The I/O view screen can be extremely useful for diagnosing issues that may arise on the machine. It is highly recommended that operators familiarise themselves with the detail shown here.

The information displayed on the view I/O screen will vary depending on the machine type and the various input/output modules types used. The example given above is for demonstration purposes only and may vary to the one displayed on your machine.

12.4 Info – I/O Live Charting Screen

(Info / I/O Live Charting Screen)

The I/O Live Charting Screen allows the Operator to trend (*chart*) various operations of the machine while it is running. A typical example is displayed here, with a trend of the VFC (MDX61B) output current amps. There are many other machine variables that can be trended, including multiple trends updated at the same time.

Trending can be a useful tool in measuring machine performance, determining maintenance/service requirements and monitoring general productivity.

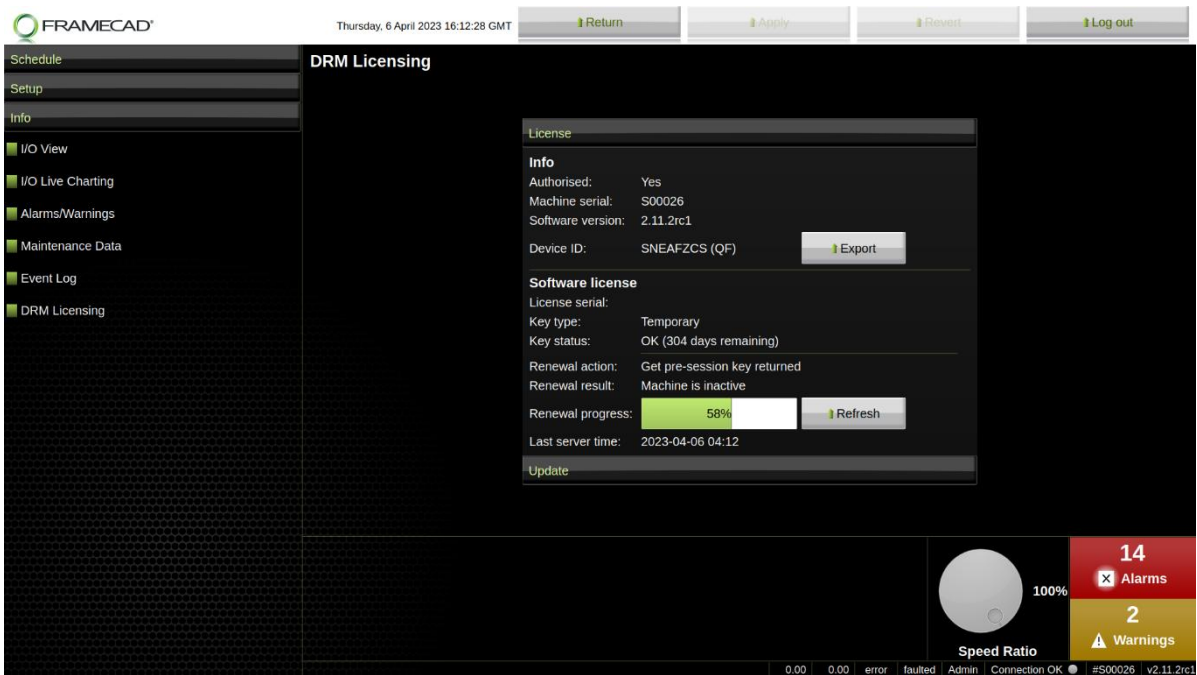
Trends can be selected from the drop-down selection list and then added using the **Add Chart** button.



12.5 Info – DRM Licensing Screen

The DRM (Digital Rights Management) Licensing screen provides information on the current status of the Factory2 software license.

The type of license purchased with the machine will determine the information displayed. Of particular note is the expiry date information.



The screenshot shows the FRAMECAD DRM Licensing screen. The left sidebar contains a menu with options: Schedule, Setup, Info, I/O View, I/O Live Charting, Alarms/Warnings, Maintenance Data, Event Log, and DRM Licensing. The main area displays a "License" window with the following information:

Info	
Authorised:	Yes
Machine serial:	S00026
Software version:	2.11.2rc1
Device ID:	SNEAFZCS (QF)

Below the "Info" section, there is an "Export" button. The "Software license" section displays the following information:

Software license	
License serial:	
Key type:	Temporary
Key status:	OK (304 days remaining)
Renewal action:	Get pre-session key returned
Renewal result:	Machine is inactive
Renewal progress:	58%
Last server time:	2023-04-06 04:12

At the bottom of the screen, there is a "Speed Ratio" gauge showing 100% and a status bar at the bottom indicating "0.00 0.00 error faulted Admin Connection OK #S00026 v2.11.2rc1".

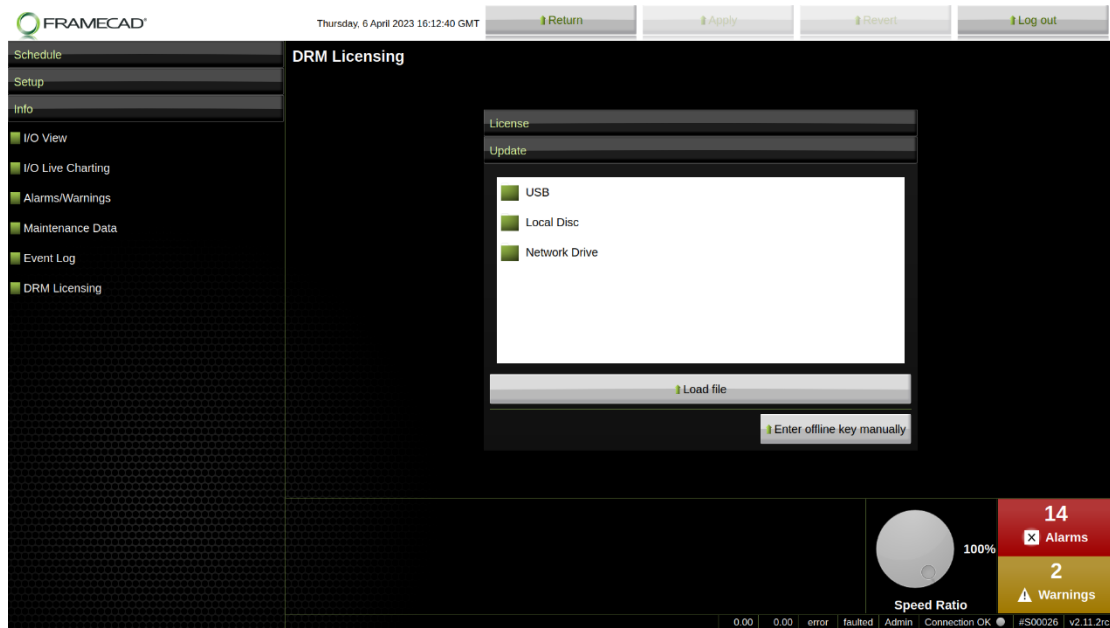
License

Export

This exports a .m2f file onto an attached USB drive this will then be uploaded to the MyFRAMECAD customer portal via a PC. The system will generate a corresponding .f2m file which contains an offline license.

Refresh Button

This refreshes the communication between the machine and the server.



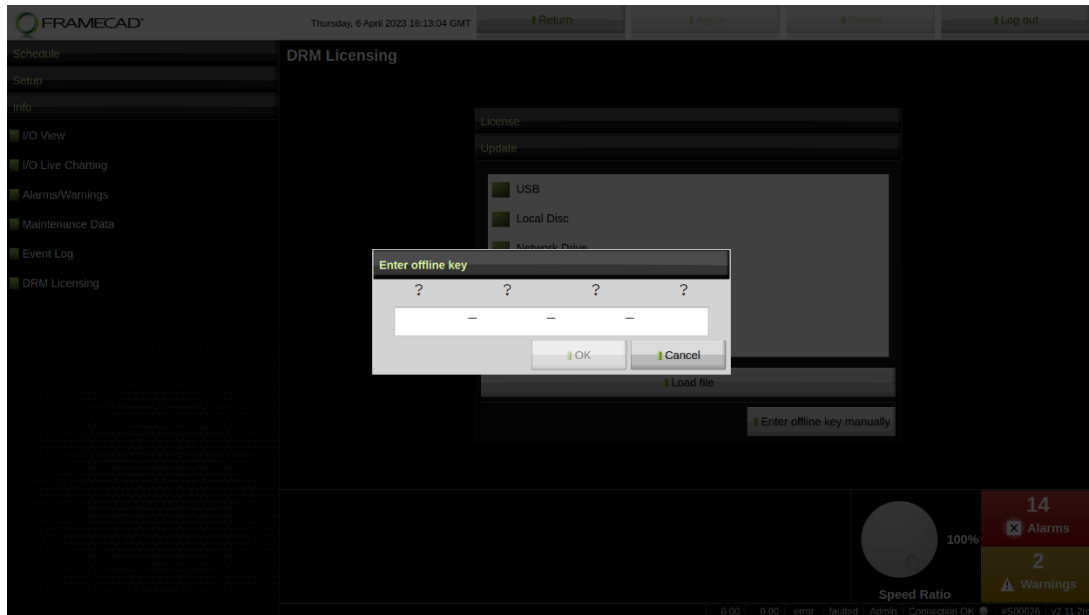
Update

Load file

This is used to update your HASP or use the .f2m file to activate an offline license.

Enter offline key manually

This tool allows you to manually enter your offline key by typing it in directly.

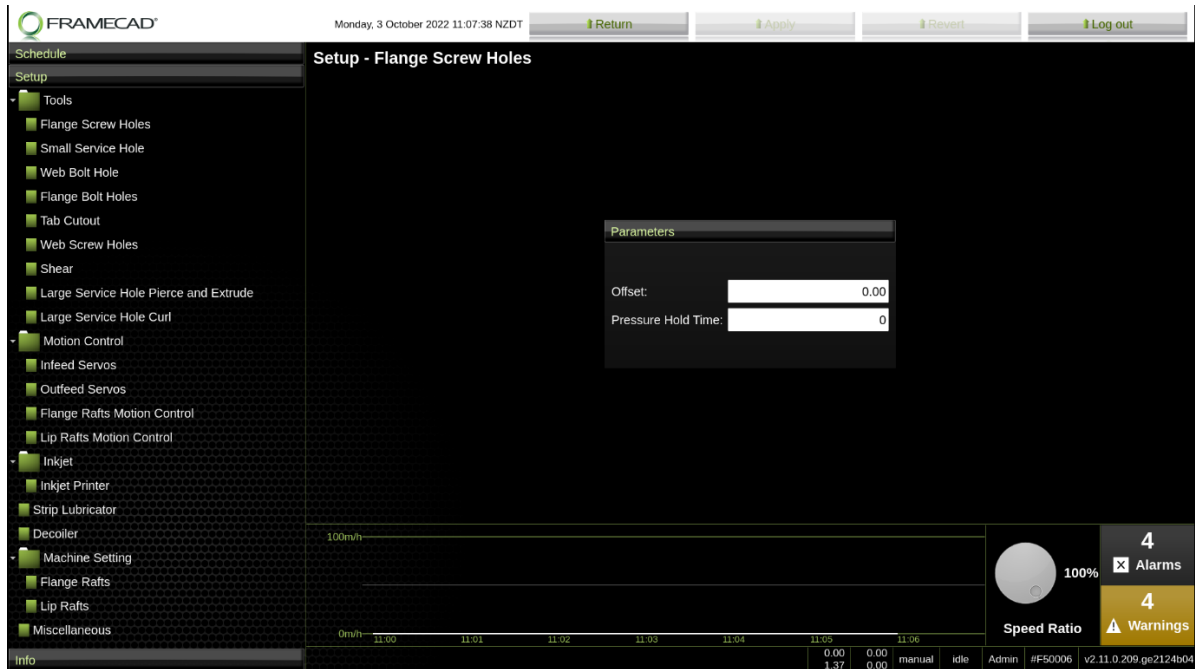


12.6 Info – Fieldbus Screen

The Fieldbus screen provides information on whether Factory2 is able to communicate with the I/O modules, drives and printer on the machine.

12.7 Up & Down Delay Times (ms)

The sum total of the Up and Down times (in milliseconds) is the time allowed for the tool to complete its operating cycle. The hydraulic solenoid valve will remain energised for the period defined in the Down Delay time. Once de-energised the software will wait for the Up-Delay time to elapse before allowing the steel strip to be progressed to the next tool (this is to allow the tool sufficient time to return to its fully retracted position).



Monday, 3 October 2022 11:07:38 NZDT

Return Apply Revert Log out

Schedule

Setup

Tools

- Flange Screw Holes
- Small Service Hole
- Web Bolt Hole
- Flange Bolt Holes
- Tab Cutout
- Web Screw Holes
- Shear
- Large Service Hole Pierce and Extrude
- Large Service Hole Curl

Motion Control

- Infeed Servos
- Outfeed Servos
- Flange Rafts Motion Control
- Lip Rafts Motion Control

Inkjet

- Inkjet Printer
- Strip Lubricator
- Decoiler

Machine Setting

- Flange Rafts
- Lip Rafts
- Miscellaneous

Info

Setup - Flange Screw Holes

Parameters

Offset: 0.00

Pressure Hold Time: 0

100m/h

0m/h

11:00 11:01 11:02 11:03 11:04 11:05 11:06

0.00 0.00 manual idle Admin #F50006 v2.11.0.209.ge2124b04

Speed Ratio 100%

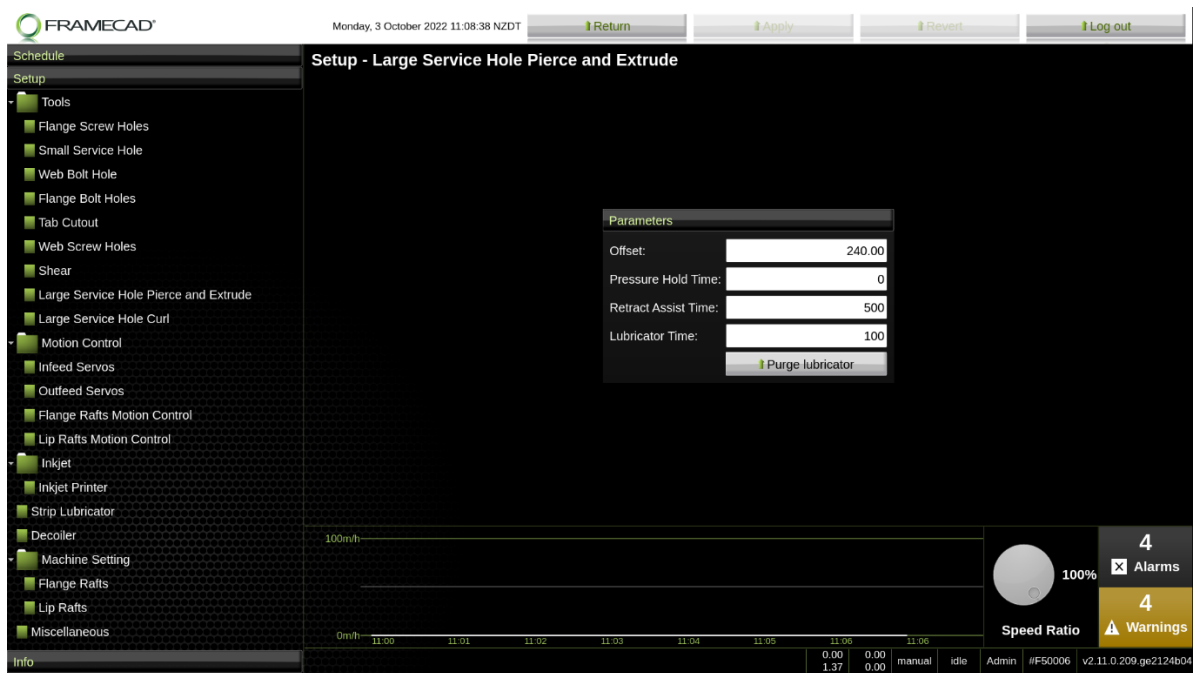
4 Alarms

4 Warnings

12.8 Pressure Hold Time

Tooling on some machines use pressure hold times instead of up and down delay times.

The pressure hold time (in milliseconds) determines the tool operation cycle time.



Monday, 3 October 2022 11:08:38 NZDT

Return Apply Revert Log out

Schedule

Setup

Tools

- Flange Screw Holes
- Small Service Hole
- Web Bolt Hole
- Flange Bolt Holes
- Tab Cutout
- Web Screw Holes
- Shear
- Large Service Hole Pierce and Extrude
- Large Service Hole Curl

Motion Control

- Infeed Servos
- Outfeed Servos
- Flange Rafts Motion Control
- Lip Rafts Motion Control

Inkjet

- Inkjet Printer
- Strip Lubricator
- Decoiler

Machine Setting

- Flange Rafts
- Lip Rafts
- Miscellaneous

Info

Setup - Large Service Hole Pierce and Extrude

Parameters

Offset: 240.00

Pressure Hold Time: 0

Retract Assist Time: 500

Lubricator Time: 100

Purge lubricator

100m/h

0m/h

11:00 11:01 11:02 11:03 11:04 11:05 11:06

0.00 0.00 manual idle Admin #F50006 v2.11.0.209.ge2124b04

Speed Ratio 100%

4 Alarms

4 Warnings

The large service hole tool on the FL650 requires multiple valves to perform the operation. These can be set up on the **Parameters** tab.

12.9 Retract Assist Time (Large Service Hole)

The time (in milliseconds) for the retract assist value to operate.

12.10 Lubricator Time (Large Service Hole)

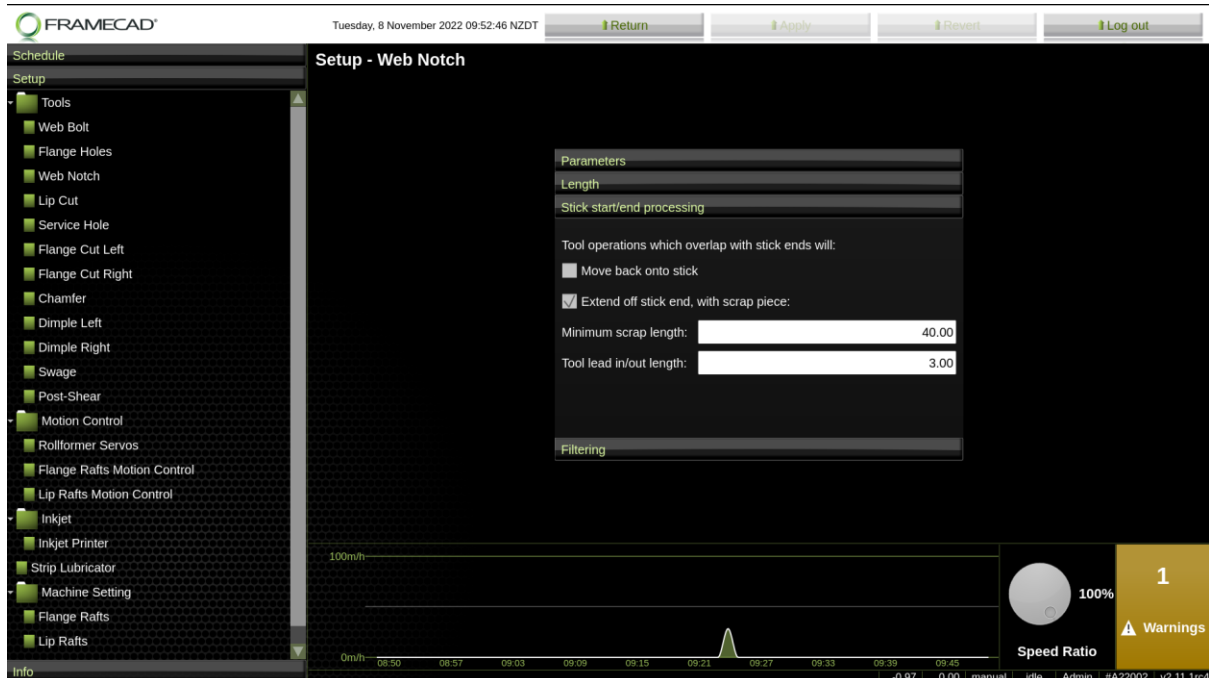
The duration (in milliseconds) of constant lubrication, which starts when the tool starts extending.

12.11 Tool Sequence

The tool starts extending until the control system has seen that the pressure has reached the tool's set pressure for at least the pressure hold time. Then the tool will start to retract and continue until the pressure has reached the tool's set pressure. Normally the pressure hold time should be set to zero. If the tool is blunt, it may be necessary to increase this value.

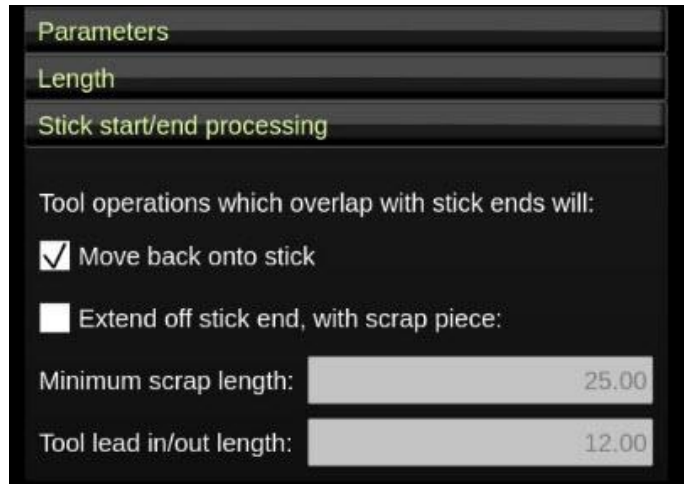
12.12 Stick Start / End Processing

This tab controls situations where a physical tool is longer than the tooling operation needed at both ends of a stick.



Move back onto stick

Tool operation is entirely positioned over the stick without affecting the neighbouring stick.



Parameters

Length

Stick start/end processing

Tool operations which overlap with stick ends will:

☒ Move back onto stick

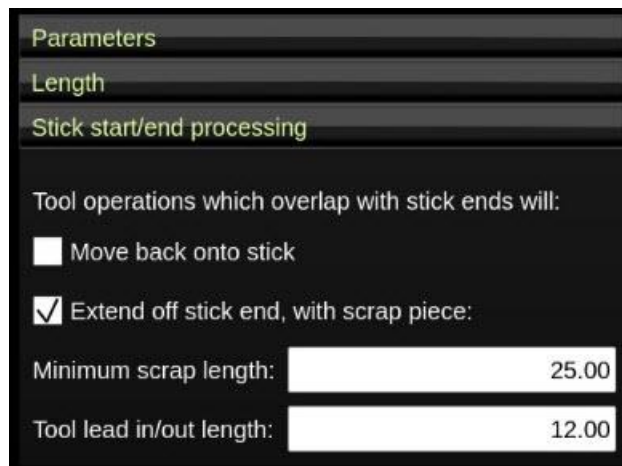
☐ Extend off stick end, with scrap piece:

Minimum scrap length: 25.00

Tool lead in/out length: 12.00

Extend off stick end, with scrap piece

Tool may overhang the end of the stick, but a scrap piece has to be added, so the next stick is not affected. The minimum length of the scrap piece can be setup.



Parameters

Length

Stick start/end processing

Tool operations which overlap with stick ends will:

☐ Move back onto stick

☒ Extend off stick end, with scrap piece:

Minimum scrap length: 25.00

Tool lead in/out length: 12.00

12.13 Motion Control: MDX61B / Servo Motors

These screens contain information about the options that control the overall speed and positioning of steel strip within the machine. The Rafts motion options control the positioning of the tool, flange and lift rafts.

There are options within each screen that are common to all, and so are included once below; additional details are at the end of the section.

CAUTION! These settings should not be changed unless advised by a FRAMECAD technician. Incorrect settings can have detrimental effects on the performance, safety, and accuracy of the FRAMECAD machine.

Encoder

The Encoder tab is used when checking the calibration of the Encoder. In order to accurately position the steel strip during production, the Factory2 software needs to be able to precisely convert the electrical pulses received from the strip encoder into a unit of length. This is a function of the number of pulses produced by the strip encoder in a single revolution (i.e. one turn of the encoder input shaft) and the gearing ratio between the strip encoder input shaft and the diameter of the bottom encoder wheel that runs along the surface of the steel strip. Knowing these quantities allows the system to accurately calculate the scale factor in mm/pulse.

As the number of encoder pulses per revolution or the exact diameter (and therefore circumference) of the bottom encoder wheel are not always easily determined by direct measurement, the control system can be made to automatically compute the correct scale factor (or mm/pulse).

Prior to commencing production, the Scale Factor will need to be checked and a calibration completed to ensure accurate positioning of steel inside the machine.

The information found under the Encoder tab allows the encoder scale factor to be easily calculated. To complete calibration, the Operator simply has to enter the *Measured Length* of the last stick made. See [Recalibrate Stick Length](#) for more information on scale-factor calibration.

TIP! Machine accuracy and performance can also be impacted by slippage of the encoder shaft. Before adjusting the encoder scale factor always check the infeed guide setup and ensure the encoder shaft locking screws are securely fastened to prevent any slippage during rotation. See [Check Infeed Unit for Slippage](#) for more information.

Last Length

This is the length of the last stick made as determined by the Factory2 software. Typically, this is used during the strip encoder calibration procedure.

Measured Length

This is the *actual measured* length of the last stick made, or between the two operations on the stick, as determined by the Operator. Typically, this is used during the strip encoder calibration procedure where the Operator will determine the length using an accurate tape measure and enter the value directly into this text box. Once the measured length value has been entered the Operator can press the **Calculate** button to have Factory2 automatically calculate the correct Scale Factor for the encoder. See [Recalibrate Stick Length](#).

Parameters

The Parameters tab displays information on the various speed and acceleration settings:

- Scale Factor along with for the Variable Frequency Controller (VFC) (MDX61B screen)

- Scale Factor along with various speed and acceleration settings for the Beckhoff drive (Servo Motors screen)
- Raft Scale Factor along with various speed and acceleration settings for the drive (Rafts screen)

CAUTION! The settings inside this tab will alter the overall speed at which steel is positioned inside the machine. Do not change these settings unless you are fully aware of how any alterations will impact the performance from the FRAMECAD machine.

If the machine is run at maximum speed, ensure all personnel in close vicinity to the machine are aware of the danger zones and are prohibited from entering these during production (see [Danger Zones](#)).

Never allow personnel to walk directly in front of the outfeed end of the machine as steel product is ejected at high velocity. Failure to do so may cause serious injury.

Scale Factor

This is the calculated encoder Scale Factor. Although the value here can be edited directly it is highly recommended that Operators follow the calibration procedure shown in [Recalibrate Stick Length](#).

Feed Rate

This is the maximum speed in RPM (revolutions per minute) that the rolling section servo motor will be permitted to rotate at. As the speed of rotation at the rolling section ultimately determines the speed at which the steel strip is progressed through the machine, this value will contribute significantly to the overall production output. The maximum permissible value allowed here is 3000(RPM).

If the Operator adjusts the Speed Ratio dial this will adjust the *actual* feed rate to a *percentage* of this value.

NOTE! The Feed Rate value relates directly to the rotation speed of the rolling section servo motor - not the roller section itself. The actual speed of the rolling section will be a derivative of the drive chain gearing, including the servo motor gearbox reduction.

Jog Rate

This is the maximum speed in RPM (revolutions per minute) that the rolling section servo motor will be permitted to rotate at whilst in the Manual control mode. Typically, this value is set to around 500(RPM).

NOTE! The Speed Ratio dial has no impact on the Jog Rate.

Ramp Time

This is the time in milliseconds that the Factory2 software will attempt to accelerate the rolling section servo motor up to the maximum desired speed (see Feed Rate above). Likewise, the software will also try to decelerate the rolling section servo motor back down to 0 RPM using the same ramp time setting.

If this value is set too *low*, the VFC may fault, simply because it cannot ramp the servo motor to the required speed in the given time. If this value is set too *high*, then the overall production rate will be unnecessarily reduced.

Position Window

The maximum allowable error between the expected position and the actual position.

MDX61B Screen – Additional Options

Lag Window

FRAMECAD machines, with a MDX61B VFC, are equipped with two high resolution encoders: the first for measuring the strip position and the second for determining both the angular position and speed of the rolling section servo motor. Both encoder signals are sent back to the VFC unit inside the AC Electrical Cabinet which uses these values to accurately manage the speed and position of steel strip within the machine.

Ideally there should be very little difference between the scaled feedback from these two encoders. However, small variations do exist because of chain tension, slippage between rollers or even stretch in the steel itself. As one encoder infers position based on the number of servo motor revolutions and the other is reading position directly from the moving steel strip these small variations are inevitable. In fact, the VFC uses these very variations to compensate for any mechanical tolerance within the machine and is the reason why positioning is so accurate. This difference between the encoder feedback values is called the *Lag Window* (because typically the Strip encoder value is lagging behind the motor encoder value).

The VFC unit constantly monitors the Lag Window to make sure that the differences between the two encoder values remain acceptable during Automatic control. If the variation becomes too great, then the VFC will assume that a problem has occurred and trigger a fault message that will cause the Factory2 software to stop the FRAMECAD machine. The most common reason for a large variation is when the steel strip “catches” or hits a tool or guide inside the machine. The consequence of this is the steel strip encoder feedback slips further behind the servo motor encoder value than allowed.

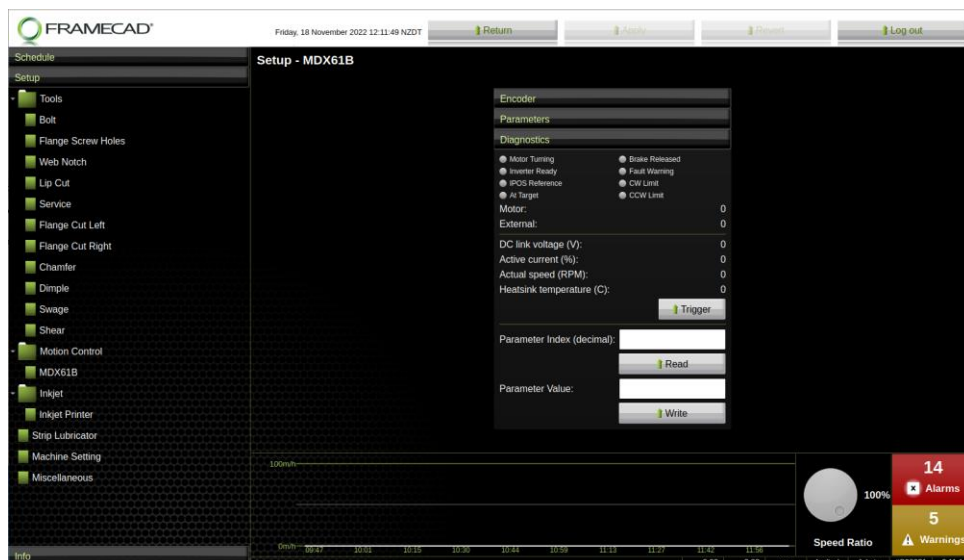
The value in the Lag Window parameter will determine the largest allowed variation between the two encoders. Too large a value and the VFC may not respond in time to a steel jam up in the machine; too low a value will make the VFC too sensitive to minor differences. The value represents the number of

pulses allowed between the two encoders and is factory set before shipping and should not be changed unless advised by an authorised FRAMECAD technician.

Diagnostics

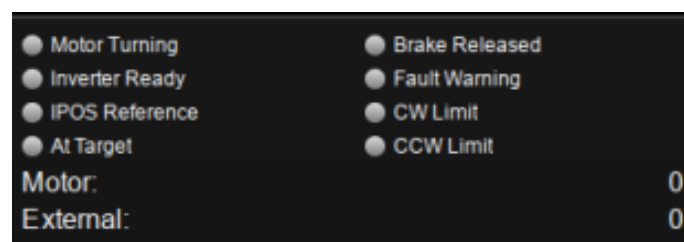
The Diagnostics tab provides specific information on the VFC. It also allows direct manipulation of the internal VFC parameters. Access is provided for diagnostic and servicing purposes ONLY. Any alterations to the settings inside the VFC may alter the performance and operation of the entire FRAMECAD machine. For this reason, **no changes** should be made unless directed to by an authorised FRAMECAD technician.

⚠ WARNING! The MDX61B parameters/values are factory set and should only be adjusted if directed to by an authorised FRAMECAD technician. Incorrect adjustment could cause catastrophic damage to the machine tooling and/or rolling section.



VFC Status Indicators

The information contained in this section can be used by qualified technicians to diagnose specific faults on the MDX61B VFC. The status information also provides the raw (un-scaled) encoder data from both the Strip and Motor encoders.



Monitoring

The information contained in this section can be used for further diagnosis of MDX61B VFC faults.

DC link voltage (V):	0
Active current (%):	0
Actual speed (RPM):	0
Heatsink temperature (C):	0

 Trigger

Parameter Index/Parameter Value

The values allow direct access to the VFC internal memory AND SHOULD NOT be changed unless under the strict guidance of an authorised FRAMECAD technician.

Parameter Index (decimal):	
	 Read
Parameter Value:	
	 Write

Servo Motors - Additional Options

Max Acceleration Rate

This is the maximum allowed acceleration rate (in rpm/second) that the Factory2 software will attempt to accelerate the motor up to the maximum desired speed (see Feed Rate above).

Max Deceleration Rate

This is the maximum allowed deceleration rate (in rpm/second) that the Factory2 software will attempt to decelerate the motor to 0 RPM.

Max Jerk Rate

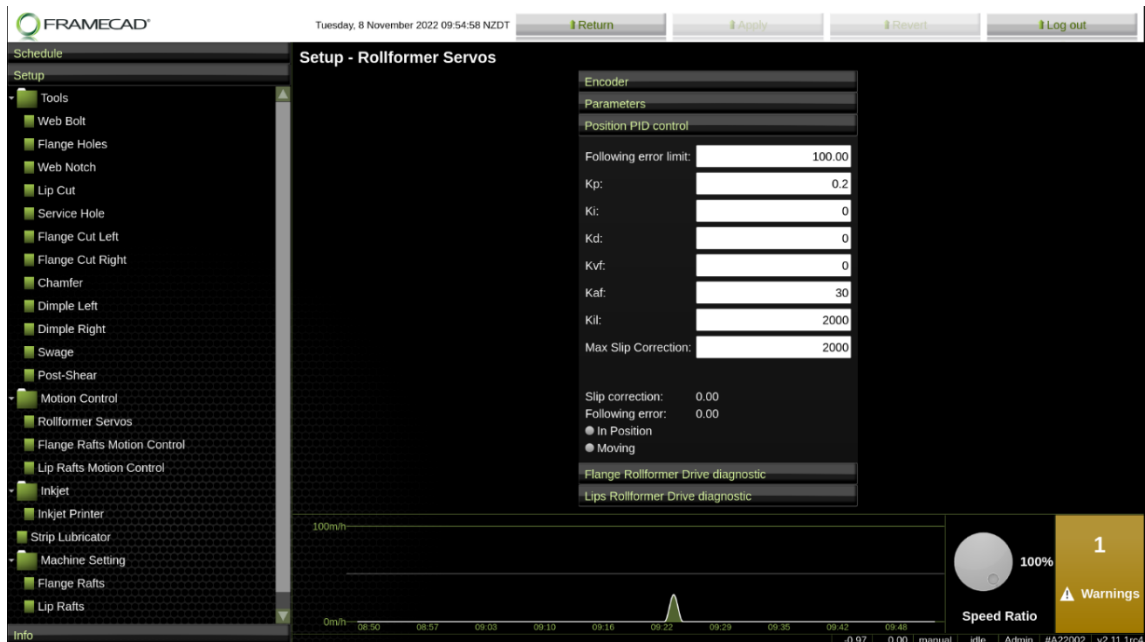
This is the maximum allowed jerk rate (in rpm per second per second).

Run-Out Distance

This is a fixed number which is the length of the rollformer plus an added safety margin. This is used at the end of automatic production to clear the rollformer of finished sticks.

Inter Stick Run-Out Distance

The distance the rollformer will run on its own to create a gap between the stick that was just cut off and the next stick.



The Position PID control tab is used to adjust the positioning and motion of the servo motors. The settings inside this tab will alter the overall speed and motion of the machine. These settings should only be changed by an authorised FRAMECAD technician.



The Diagnostics tabs provides specific information on the Beckhoff drives. This information can be used by authorised FRAMECAD technicians to diagnose and solve problems.

When a drive requires further tuning, an authorised FRAMECAD technician will provide a configuration file to update the drives. The import button will allow the operator to update the drive using a USB. The extension filetype is .xml.

In some cases, the existing drive configuration file will need to be extracted. The operator can export the file by pressing the export button, which will add the file to a connected USB. The filetype is extension .xml.

12.14 Motion Control: Rafts Motion Control

This screen contains information about the Rafts motion control which controls the overall speed and positioning of the tool, flange and lip rafts within the machine.

CAUTION!

These settings should not be changed unless advised by a FRAMECAD technician. Incorrect settings can have detrimental effects on the performance, safety and accuracy of the FRAMECAD machine.

Rafts Motion Control Screen

(Setup / Motion Control / Rafts Motion Control Screens)

From this screen you will have the option to select from three menu tabs. Selecting these tabs will allow you to view and/or edit the different properties associated with the drives. These options are discussed below:



Parameters

The Parameters tab displays information on the current Scale Factor along with various speed and acceleration settings for the drive.

Scale Factor

This is the calculated raft Scale Factor. Although the value here can be edited directly it is highly recommended that Operators follow the calibration procedure.

Deceleration Distance

The distance before rafts aim to begin decelerating to a stable low speed. Ensure this is large enough that the rafts are at a stable low speed for a short period. If this is too small, the rafts won't reach the stable low speed before having to stop

Minimum Creep Distance

The minimum distance to move at a slow speed before reaching the target. This should be set to a large enough value that the rafts are at a stable low speed before beginning deceleration to stop.

Position Window

The maximum allowable error between the expected position and the actual position.

12.15 Printers Setup

This screen allows the Operator to configure the printer control system on the FRAMECAD machine. Most values displayed here are factory set before the FRAMECAD machine is shipped and should not need any further adjusting unless instructed to do so by an authorised FRAMECAD technician.

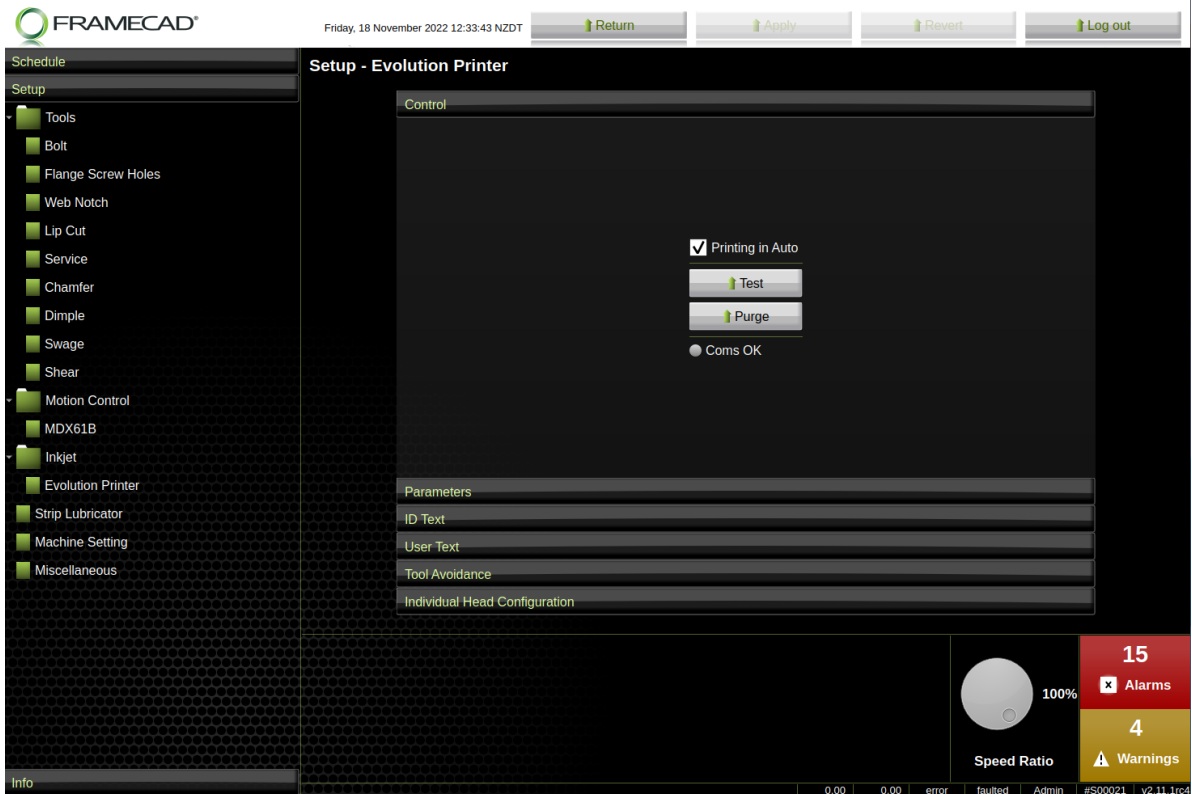
Inkjet Printer

(Setup / Inkjet Printer)

This is the Control section for Evolution Printers:

The image shows a dark, rectangular button with the word "Control" written in a light green font. This button is part of a software interface for printer setup.

The Control tab is used to both purge and test the inkjet cartridges used in the Printer Head assemblies. From here you can also turn on or off printing in Automatic control and confirm that the communication link with the Printer Head assemblies has been established and is functioning correctly.



Printing in Auto

This option, if selected, will allow printing in Automatic control. If de-selected, all automatic printing will be disabled.

On-fly Printing

Typically, the control system will treat a printing operation like any other tool function and momentarily stop before commencing to print text. This results in greater accuracy of where the printed text occurs on the stick.

If the *On-fly Printing* option is selected using this checkbox, the machine **will not** momentarily stop before each print operation. This may result in some variation as to where the printed text will occur on each stick but will increase overall productivity out of the machine.

Test

The **Test** button is used to check the printer system during Manual control mode.

Purge

The **Purge** button is used to draw ink through the cartridge and ensure a consistent flow is available for printing.

Coms OK

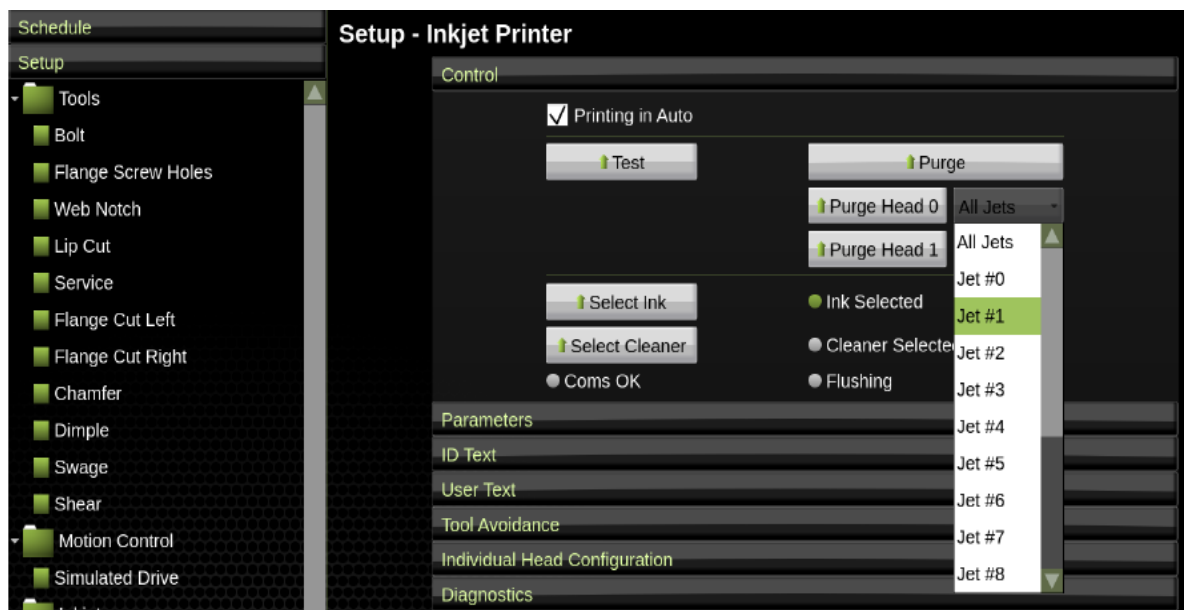
The **Coms OK** indicator will be Green when communications with the Printer Head assemblies has been established and is functioning correctly. If this

indicator is not ON (Not Green) then there is a communication issue with the Printer Head assemblies and will need to be resolved before printing can take place.

This is the Control section for Matthews Printers:

Control

The Control tab is used to both purge and test the inkjet Printer Head assemblies. From here you can also turn on or off printing in Automatic control and confirm that the communication link with the Print Controller has been established and is functioning correctly.



Printing in Auto

This option if selected, will allow printing in Automatic control. If de-selected, all automatic printing will be disabled.

Test

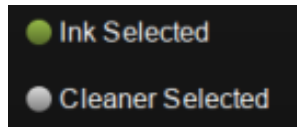
The **Test** button is used to check the printer system during Manual control mode.

Select Ink

The **Select Ink** button is used to switch the print control system over to use Ink. Once pressed the Ink Selected check box will be highlighted to confirm the selection.

Select Cleaner

The **Select Cleaner** button is used to switch the print control system over to use Cleaner (i.e. to flush Ink from the print heads and clean). Once pressed the Cleaner Selected indicator will be green to confirm the selection.



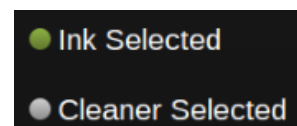
IMPORTANT!

The cleaner and purge functions are used during the inkjet printer head cleaning procedure. Cleaning of the printer heads is important to maintain print quality and operation. Refer to the [Clean Inkjet Printer Heads](#) section for more detail.

Purge

The **Purge** button is used to inject a short burst of either ink or cleaner through both the print heads. The fluid used will be dependent on the selection (i.e. Ink or Cleaner). Refer to the indicators below the **Purge** button to confirm which fluid has been selected.

NOTE! You may purge all or individual jets.



Coms OK

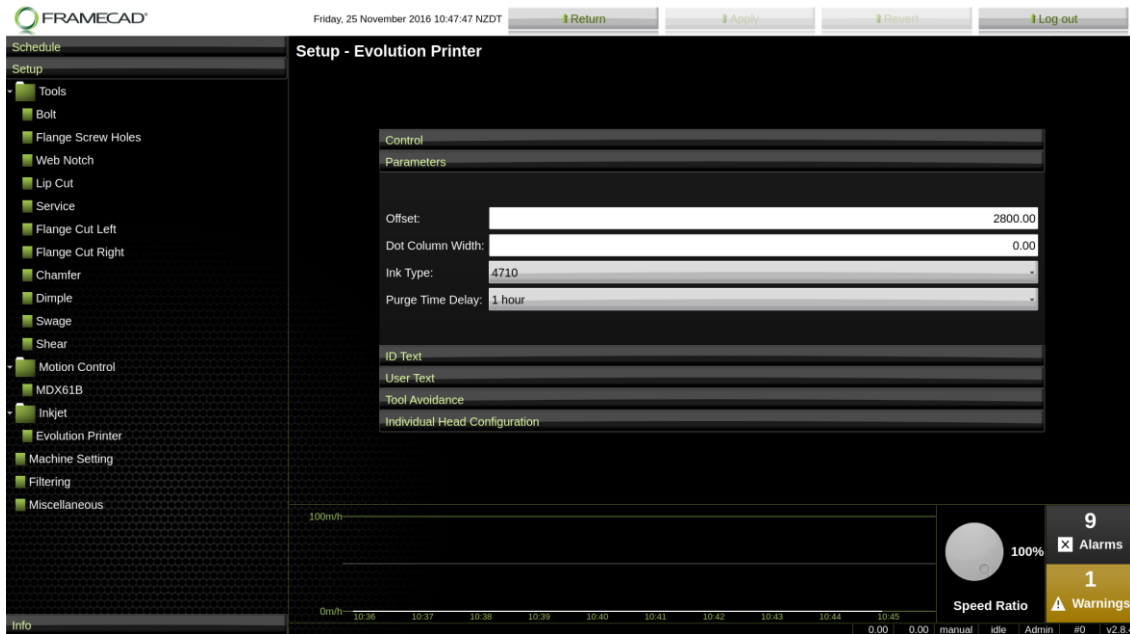
The **Coms OK** indicator will be Green when communications with the Printer Head assemblies has been established and functioning correctly. If this indicator is not ON (Not Green) then there is a communication issue with the Printer Head assemblies and will need to be resolved before printing can take place.

This section is relevant for Evolution Printers:

Parameters

The Parameters tab is used to configure the position of the Printer Head assemblies within the machine, how much physical space each printed message will require and what type of ink cartridge is being used.

CAUTION! The printer heads are factory configured prior to installation on the machine. Never adjust these configuration settings unless under the guidance of an authorised FRAMECAD technician.



Offset

This value determines the physical location of the printer heads within the machine. The value relates to the distance in millimetres between the printer head(s) and the centre of the first tool (the datum point) at the start of the machine. The Factory2 software needs this information to determine where and when to start printing on each stick.

This value is factory set prior to shipping and should not need any further adjustment unless directed to do so by an authorised FRAMECAD technician.

Incorrect settings can cause the print control system to fault or produce poor quality print.

Dot Column Width

The text that is printed on each stick is comprised of a series of dots. This value defines the measured width of a single column of dots. It is required by the Factory2 software so that it can determine the overall width of the printed text. If the text is too long for the given stick length, the software will truncate the text so that it will fit.

Ink Type

Use this drop-down list box to select the type of ink cartridge being used in the printer system.

Purge Time Delay

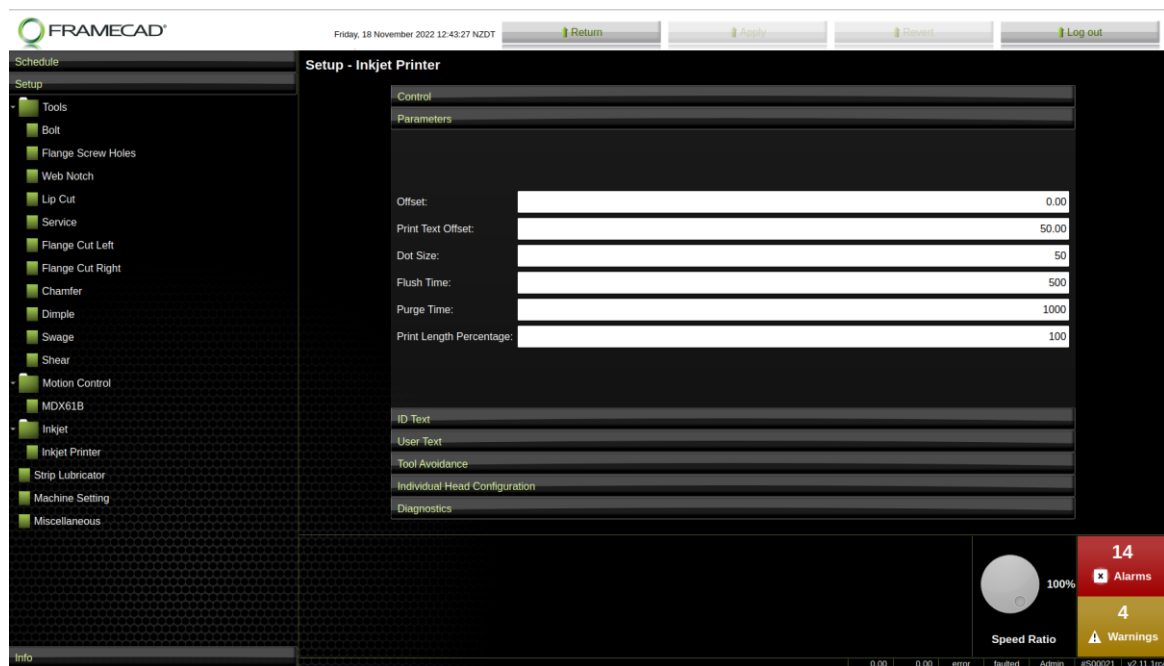
The user can select a time period where if the printer is not used, it will automatically purge the cartridges to ensure they do not dry out. If the cartridges are not removed the user will be warned to remove them at half of this interval.

This is the parameters section for Matthews Printers:

Parameters

The Parameters tab is used to configure the position of the Printer Head assemblies within the machine and how much physical space each printed message will require.

CAUTION! The printer heads are factory configured prior to installation on the machine. Never adjust these configuration settings unless under the guidance of an authorised FRAMECAD technician.



Offset

This value determines the physical location of the printer heads within the machine. The value relates to the distance in millimetres between the printer head(s) and the centre of the first tool (the datum point) at the start of the machine. The Factory2 software needs this information to determine where and when to start printing on each stick.

This value is factory set prior to shipping and should not need any further adjustment unless directed to do so by an authorised FRAMECAD technician.

Incorrect settings can cause the print control system to fault or produce poor quality print.

Dot Column Width

The text that is printed on each stick is comprised of a series of dots. This value defines the measured width of a single column of dots. It is required by the Factory2 software so that it can determine the overall width of the printed text.

If the text is too long for the given stick length, the software will truncate the text so that it will fit.

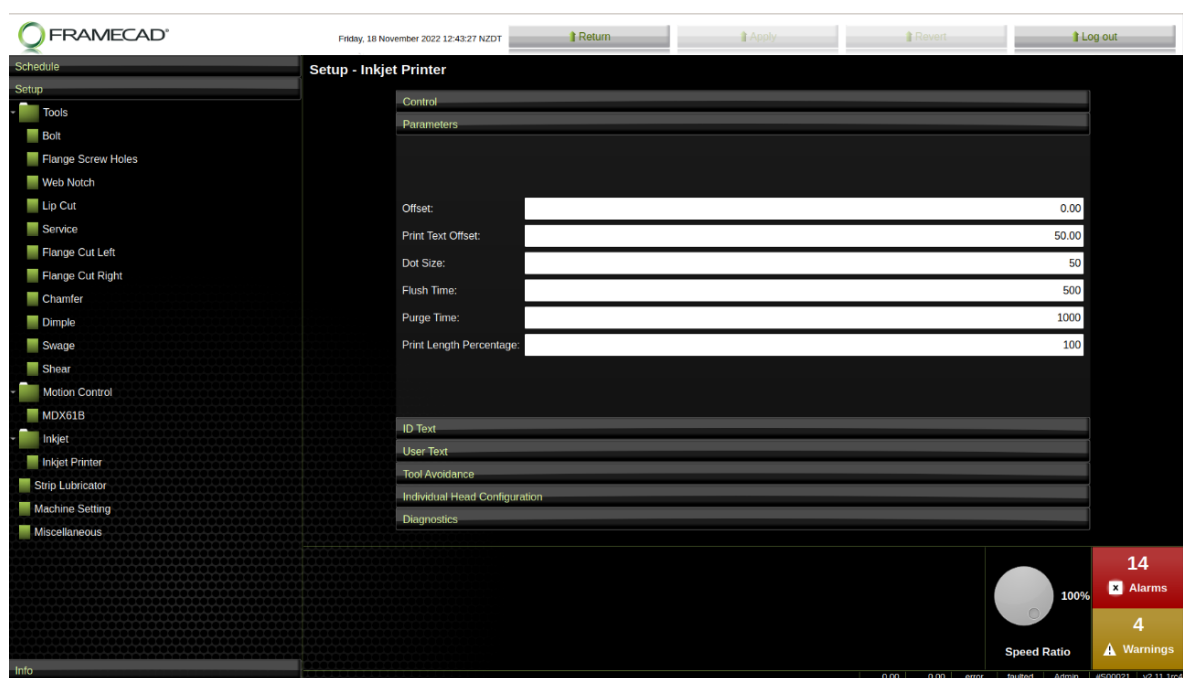
Dot Size

This value determines the physical size of each ink dot. The FRAMECAD machine utilises Matthews 16-valve Printer Heads, where each valve produces an individual “ink dot”. The size of that dot is a function of how long the corresponding valve inside the Printer Head is switched on for. The Dot Size parameter is therefore a time value in periods of 10 microseconds (e.g. if Dot Size value = 80, the Printer Head valve on-time = $80 \times 10 = 800$ microseconds).

Flush Time

Whenever the Print Control system is switched between Ink and Cleaner fluid the Factory2 software will flush the lines for a short period as defined by this value (in milliseconds).

CAUTION! The printer heads are factory configured prior to installation on the machine. Never adjust these configuration settings unless under the guidance of an authorised FRAMECAD technician.



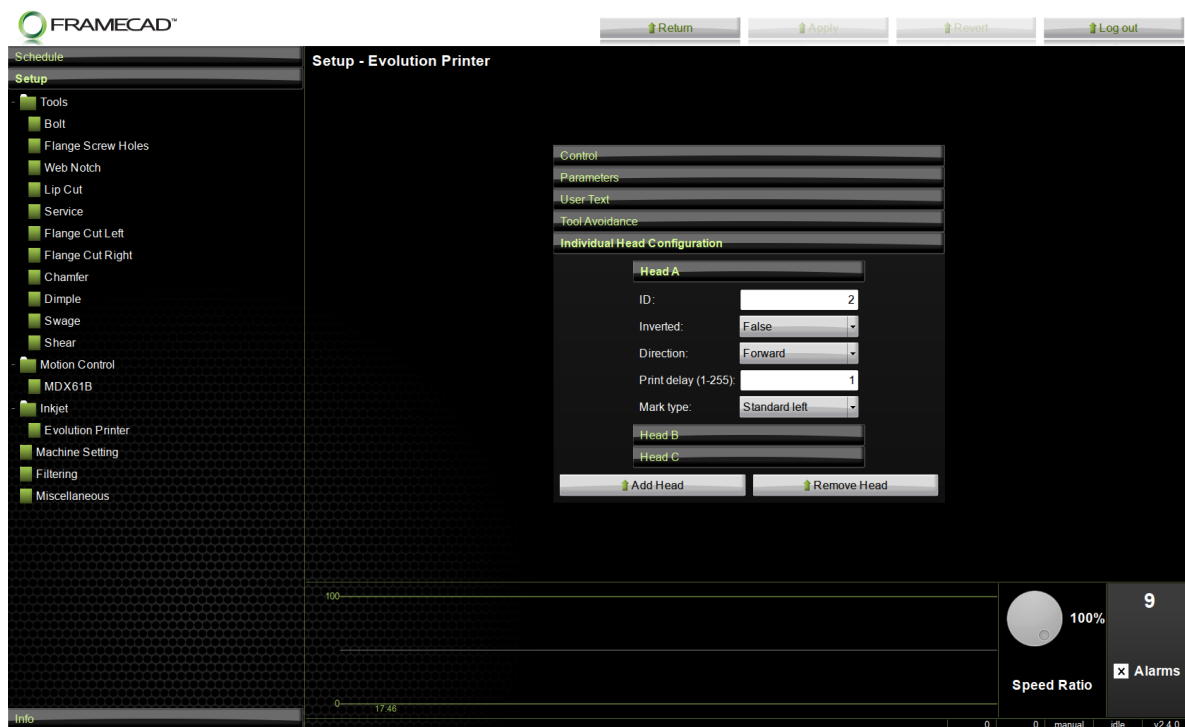
This section is relevant for Evolution Printers:

Individual Head Configuration

Each Printer Head assembly incorporates its own built-in smart controller and can therefore be uniquely configured. For example, all of the Printer Heads are connected to the Computer via the same serial communication network. This means a unique network *identifier* is required for each Printer Head so that the Computer “knows” which head to send information to.

This tab allows access to certain configurable parameters for each of the Printer Heads. To view the configuration of a specific Printer Head, select the applicable tab.

CAUTION! The printer heads are factory configured prior to installation on the machine. Never adjust these configuration settings unless under the guidance of an authorised FRAMECAD technician.



ID

This is a unique number that identifies the Printer Head on the serial communications network. As there can be up to three Printer Heads on the machine the Printer Heads are factory configured as **1**, **2** or **3**.

Inverted

If this parameter is set to TRUE, the printed text will be *inverted* on the stick.

Direction

This parameter determines the direction the steel must be traversing in before printing can take place, relative to the orientation of the Printer Head. For a Printer Head mounted on the *left hand side* web (relative to the direction of steel movement) this is typically set as "Forward" while a Printer Head mounted on the *right hand side* web will typically be set as "Reverse".

Print Delay (1 – 255mm)

This parameter simply delays the start of a printed message. The value is actually related to distance where each increment represents a value of 18 Dot

Columns widths (approximately 1.5mm). The larger the number (between 1 and 255) the further along the steel the printing will commence.

Mark Type

This parameter determines which Printer Head the software will send print messages to, based on the location and orientation of a particular stick being manufactured. This is to ensure that the printed text is always on the correct side and in the right direction for easy assembly. For a Printer Head mounted on the *left hand side* web (relative to the direction of steel movement) this is typically set as "Standard left" while a Printer Head mounted on the *right hand side* web will typically be set as "Standard right".

The **Add Head** and **Remove Head** buttons simply allow the Operator to add or remove Printer Head assemblies.

13 Maintenance

This section is intended to give you information to help you keep your machine in optimum operating condition and reduce downtime.

Periodic maintenance

This section contains:

- Our recommended **schedule for maintenance and cleaning**. There are tasks to do:
 - Daily
 - Weekly
 - Monthly
 - Six-Monthly, and
 - Yearly.
- Detailed **procedures for each maintenance and cleaning task**.

Unscheduled maintenance and parts replacement

This section also contains detailed procedures for unscheduled maintenance, such as replacement of wearable parts.

Maintenance records

Like any large asset, FRAMECAD machinery requires regular maintenance.

Keep good maintenance records, including changes made to:

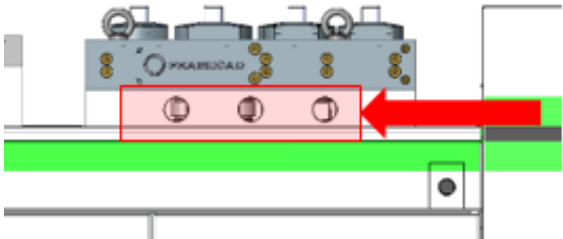
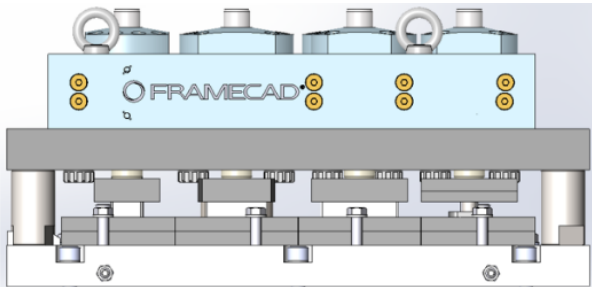
- Coil supply
- Parts that have been changed
- Mechanical adjustments to assemblies
- Changes to software configuration.

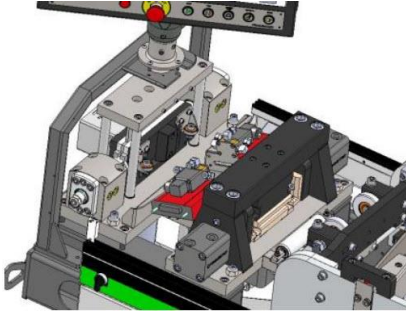
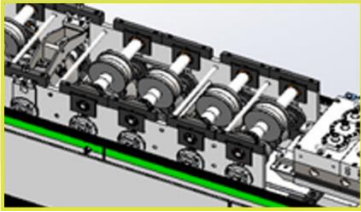
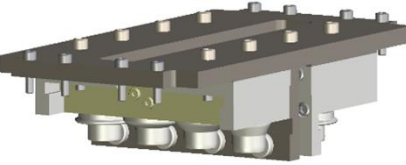
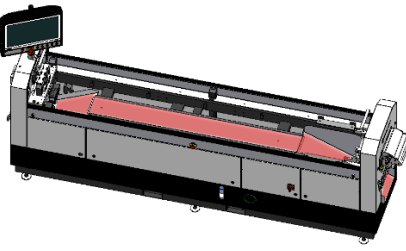
In case of any issues you can refer back to these records to see what has changed.

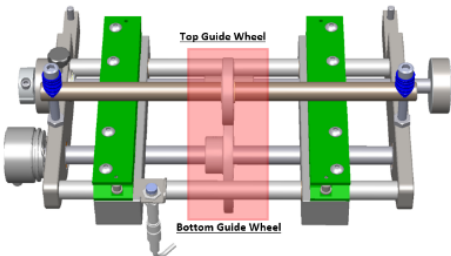
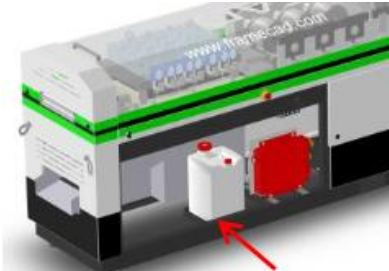
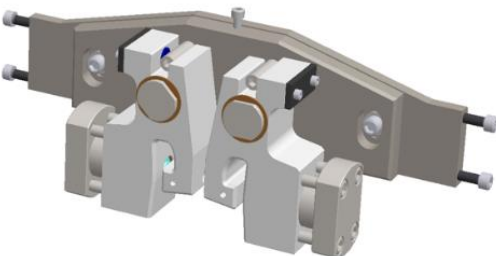
This also helps FRAMECAD technicians and support staff understand the history of what was done to the machine.

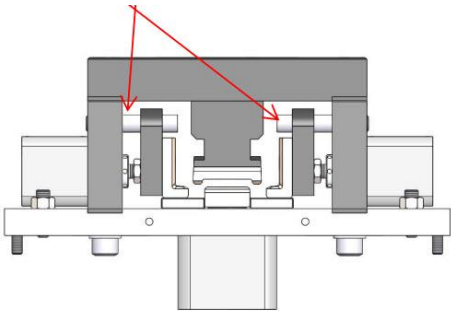
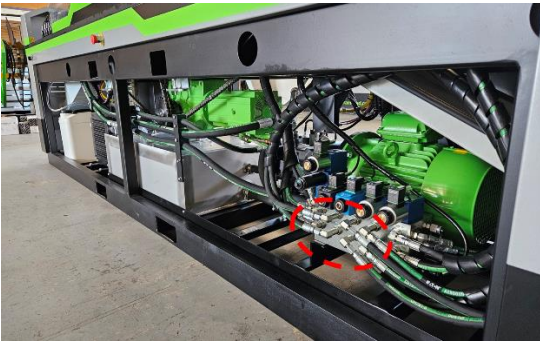
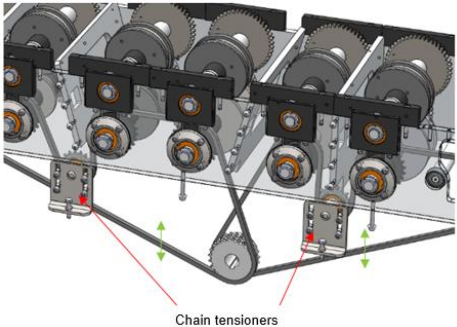
NOTE! Ensure correct PPE is worn when performing all maintenance procedures.

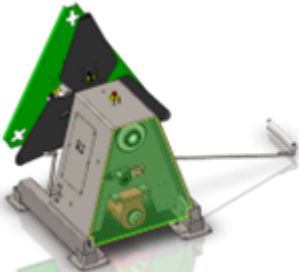
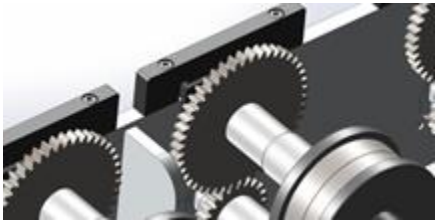
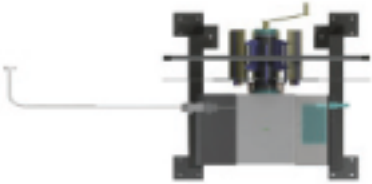
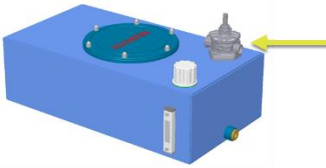
13.1 Recommended Maintenance Schedule

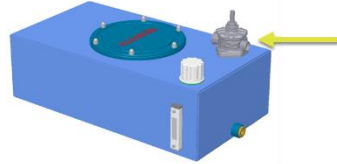
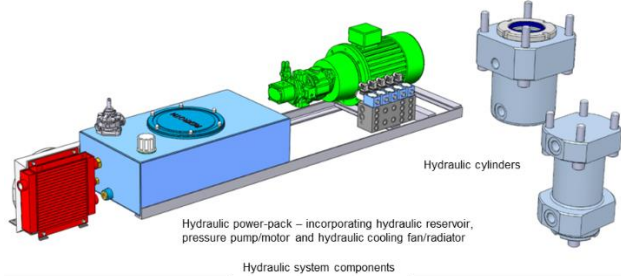
ACTION	FULL PROCEDURE	DIAGRAM
DAILY – STARTUP AND DURING PRODUCTION		
Lubricate shear blade at daily setup and 4x during production day. Put 3-4 drops of light grade machine oil into each of the four shear blade pots.	See Daily Machine Setup	
Lubricate tool block	See Daily Machine Setup	F325iT and F325iT-L Toolblock:  F450iT Toolblock: 

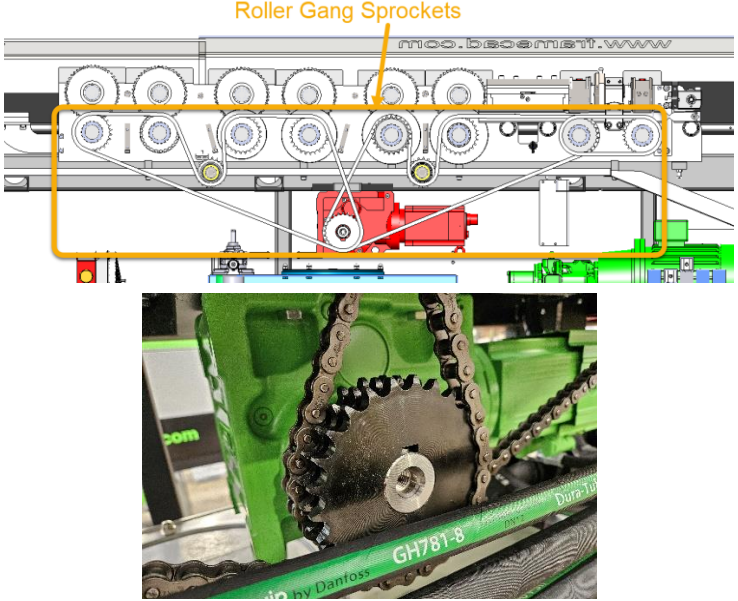
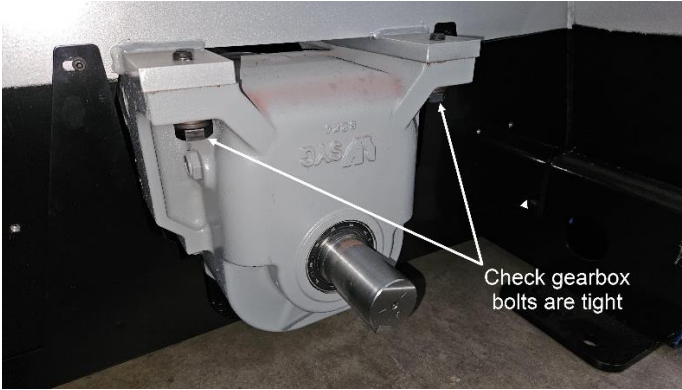
ACTION	FULL PROCEDURE	DIAGRAM
DAILY – AT END OF PRODUCTION		
Clean shear and swage assembly	Carefully blow swarf out with compressed air	
Clean rollers in main roller section	Use CRC or degreaser and a clean rag. To remove stubborn build-up a scouring pad might need to be used	
Clean lipbox rollers	Use CRC or degreaser and a clean rag. To remove stubborn build-up a scouring pad might need to be used	
Clean drip tray and waste chutes	Use clean rags to wipe up swarf and any lubrication residue	

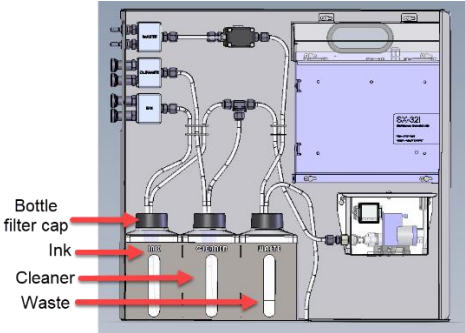
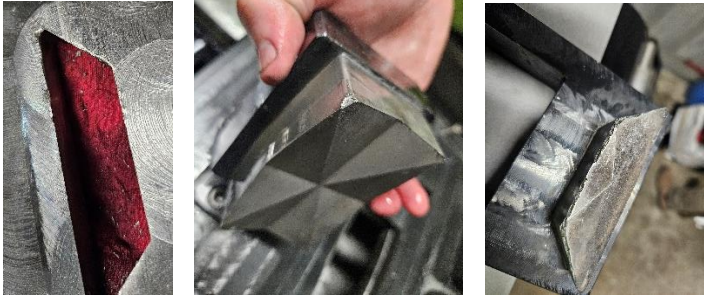
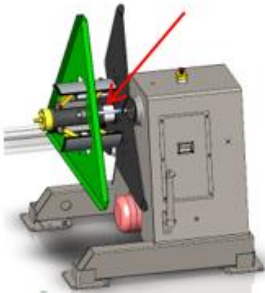
ACTION	FULL PROCEDURE	DIAGRAM
Clean infeed guide wheels	Use CRC or degreaser and a clean rag. To remove stubborn build-up a scouring pad might need to be used	
Sweep around machine and check underneath for signs of hydraulic oil leaks	Carefully use compressed air, a sweeping broom and clean rags	
WEEKLY		
Check steel strip lubricant level and top up as required	See Check Steel Lubricator Tank Level	
Clean the dimple assembly	Use a clean rag to clean the dimple assembly	

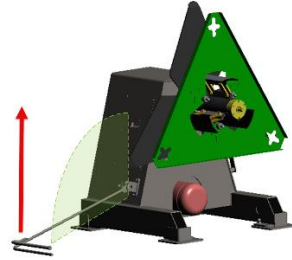
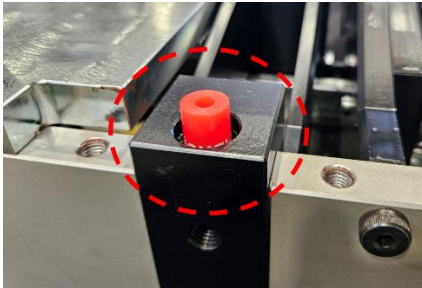
ACTION	FULL PROCEDURE	DIAGRAM
Clean and lubricate guide rods for side dies (F450iT power swage only)	Clean using degreaser and a clean rag. Lightly apply grease to the guide rods	
Confirm no leaks in hydraulic system by checking	Pay special attention around hydraulic fittings and check for damage on hydraulic hoses	
MONTHLY		
Without steel in machine, check roller section chain tension (slack should be 10-20mm) and lightly lubricate	See Check and Adjust Chain Tension – Rollformer	

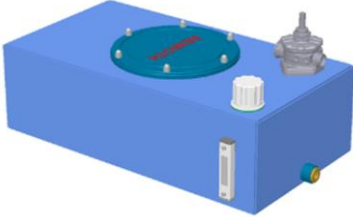
ACTION	FULL PROCEDURE	DIAGRAM
Check decoiler chain tension (slack should be 10-20mm) and lightly lubricate	See Check and Adjust Chain Tension – Decoiler	
Lightly lubricate roller gang spur gears	Clean with degreaser, brush and clean rags. Lubricate using a small amount of grease or silicon spray. Ensure spray does not get onto the rollers	
Lightly lubricate decoiler gears	Clean with degreaser, brush and clean rags. Lubricate using a small amount of grease or chain lubricant	
3 MONTHS AFTER COMMISSIONING (FIRST YEAR ONLY)		
Replace hydraulic filter	See Change Hydraulic Filter	
6-MONTHLY		

ACTION	FULL PROCEDURE	DIAGRAM
Replace hydraulic filter	See Change Hydraulic Filter	
Check all hydraulic cylinders, hoses and connections for leaks or signs of damage	See Hydraulic System Maintenance	
Check for uneven wear on gear teeth	If the gear teeth look excessively worn:  the part will need to be replaced. Contact FRAMECAD for help on how to do this.	

ACTION	FULL PROCEDURE	DIAGRAM
Check for movement of chain and uneven wear on sprocket teeth	For chain tension, see Check and Adjust Chain Tension – Rollformer. If no more adjustment can be made on the chain and the sprocket teeth are excessively worn, replacement chain and sprockets will be needed. Contact FRAMECAD parts for replacements.	
Check tightness of bolts for motor/gearbox assembly - decoiler	See Check Gearbox/Motor Mounting Bolts – Decoiler	

ACTION	FULL PROCEDURE	DIAGRAM
Replace ink and cleaner filters (Inkjet printer system only)	See Replace Ink Filter (Inkjet Printer)	
Remove tool cartridges to inspect the tools for wear and tear	See Inspect Tool Cartridge for Wear	
Lightly lubricate main mandrel shaft	Remove steel from the machine – see Unload Coil from Decoiler . Wind the mandrel shaft all the way out to expose as much of the shaft as possible. Clean shaft with degreaser and apply clean grease.	

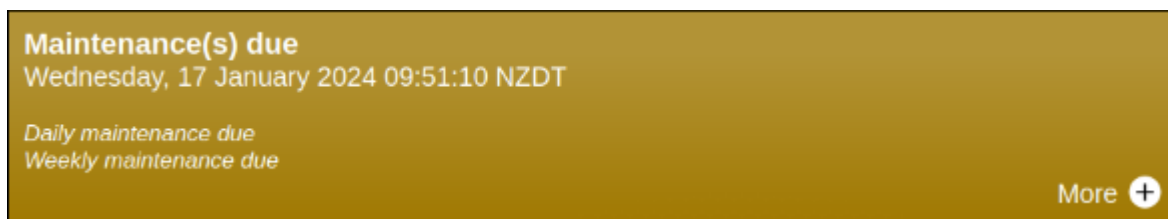
ACTION	FULL PROCEDURE	DIAGRAM
Decoiler dancer arm trip height calibration check	See Check Decoiler Dancer Arm Safety Control Height	
YEARLY		
Check condition of rollergang springs	See Check and Replace Roller Section (Auto-Gauge) Springs	
Level the machine	Start by winding all the mounting feet fully in. Place the spirit level accurately on top of the machine bed. Wind in or out the bolt attached to each of the mounting feet using a 24mm spanner until the FRAMECAD ST950H is level in both directions (width as well as lengthways). Wind in or out the mounting feet using a 24mm spanner until the FRAMECAD ST950H is level in both directions (width as well as lengthways).	

ACTION	FULL PROCEDURE	DIAGRAM
Replace hydraulic oil	See Change Hydraulic Oil	

13.2 Set Reminders for Maintenance

You can set reminders for maintenance on your machine. You can set a reminder for any or all intervals that maintenance should be performed (daily, weekly, monthly etc).

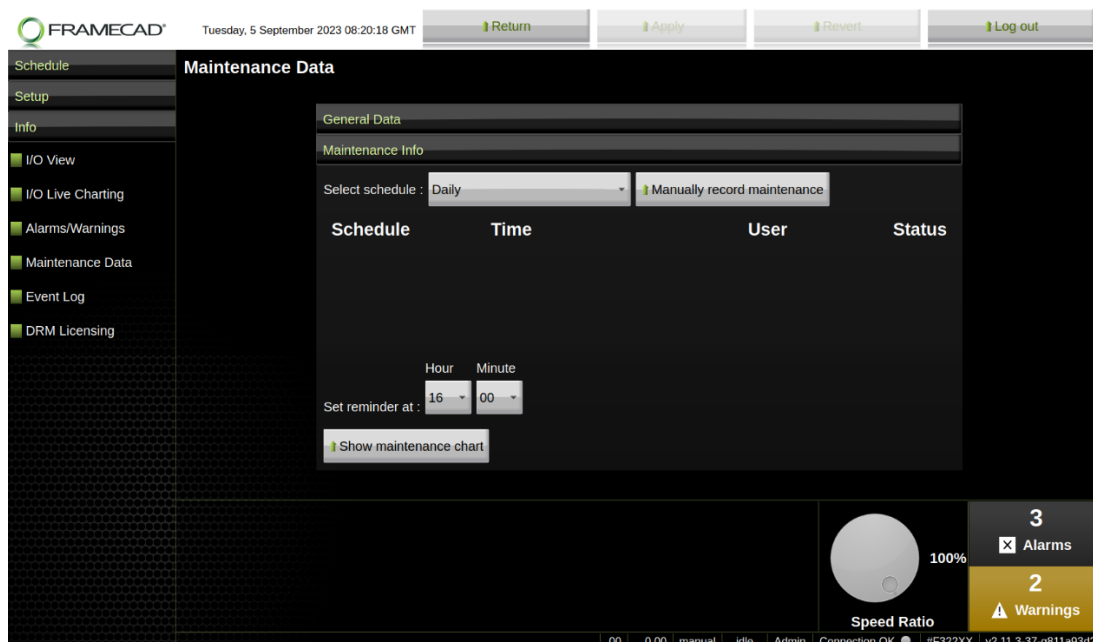
These reminders will appear as a **Maintenance(s) due** Warning on the Operator Screen.



TIP! To see FRAMECAD's recommended maintenance schedule, press the Show maintenance chart button (note that this is not available for all machinery models) or refer to [Recommended Maintenance Schedule](#).

To create a maintenance reminder:

1. Go to the **Info > Maintenance Data** screen and select the **Maintenance** Info tab.
2. Select the interval (daily, weekly, monthly etc) and a time of day that the Warning message should appear.



3. Click the **Apply** button at the top of the screen.

To record that maintenance has been done:

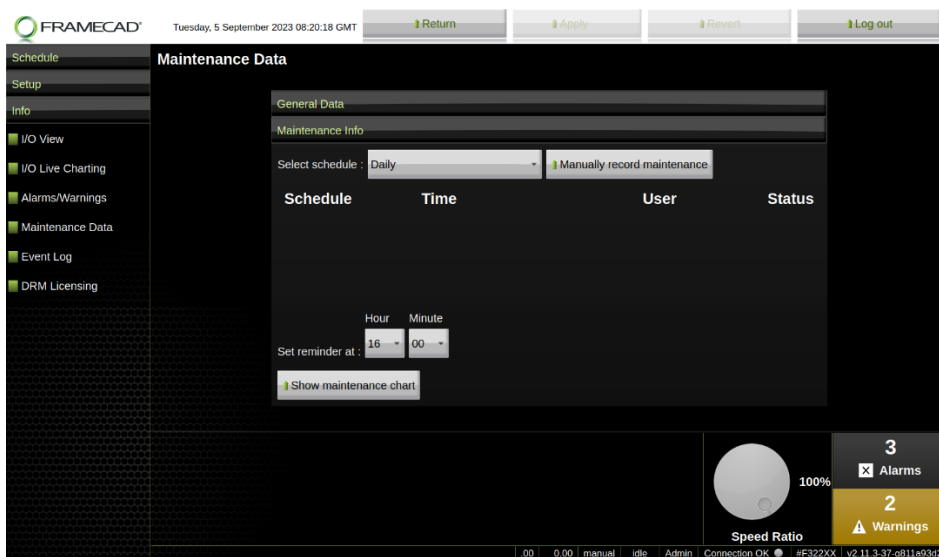
1. Select the Warning message. A **Maintenance reminder** dialogue box will appear.
2. Check the intervals you have completed maintenance for and click **Confirm**.
3. The maintenance will be recorded on the **Maintenance Info** tab as shown below.

Maintenance Info			
Select schedule : Weekly		Manually record maintenance	
Schedule	Time	User	Status
Weekly	07/11/22 09:41 am	Admin	Completed
Weekly	18/01/23 02:13 pm	Admin	Completed
Weekly	09/02/23 01:31 pm	Admin	Completed

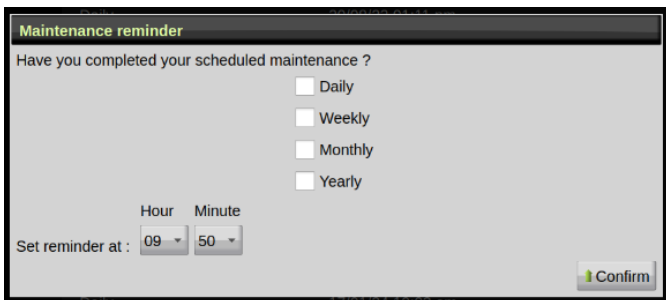
13.3 Manually Record Maintenance Done

If you do not set reminders to complete your machine maintenance tasks (see "Set Reminders for Maintenance" on page 9), you can manually record any maintenance done as follows.

1. Go to the **Info > Maintenance Data** screen, **Maintenance Info** tab.



2. Press the **Manually record maintenance** button.
3. Select the interval for which you have completed maintenance and click Confirm.



Maintenance reminder

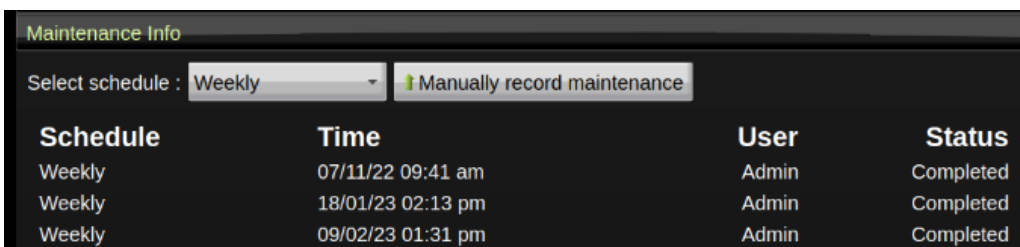
Have you completed your scheduled maintenance ?

☐ Daily
☐ Weekly
☐ Monthly
☐ Yearly

Set reminder at : Hour: 09 Minute: 50



4. The maintenance will be recorded on the **Maintenance Info** tab as shown below.



Maintenance Info

Select schedule : Weekly 

Schedule	Time	User	Status
Weekly	07/11/22 09:41 am	Admin	Completed
Weekly	18/01/23 02:13 pm	Admin	Completed
Weekly	09/02/23 01:31 pm	Admin	Completed

13.4 Maintenance Procedures

13.4.1 Change Hydraulic Filter

The hydraulic filter should be changed at commissioning, 3 months after commissioning and every 6 months thereafter.

The filter is a critical component in keeping the hydraulic system clean and free from contamination.

NOTE! When working with the hydraulic system be sure to prevent swarf, dust or other contaminants from the machine from entering the hydraulic reservoir as this could cause damage to components.

Tools Required

- 16mm spanner
- Phillips head screwdriver
- Adjustable filter removal wrench
- Machine cabinet key
- Replacement oil filter (two are supplied in your machine Spares Kit - ensure two replacements are always on hand as minimum stock levels)

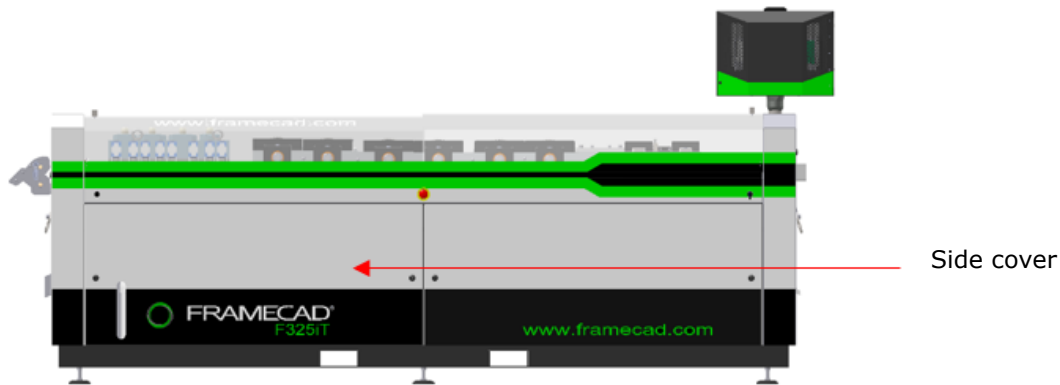
Safety

Isolation switch should be in the OFF position and lockout measures taken to prevent accidental re-connection.

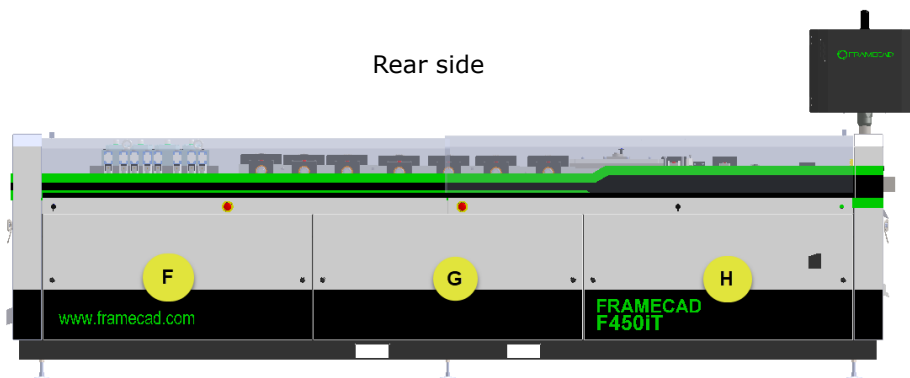
Procedure to replace oil filter

1. For best access to the hydraulic reservoir filter, remove the cabinet cover from the rear side of the machine.

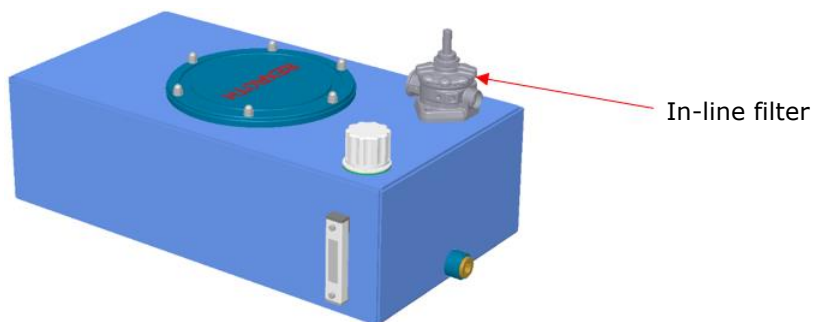
For F325iT:



For F325iT-L and F450iT, best access is from the middle cabinet:



2. Locate the in-line filter housing on top of the hydraulic reservoir



3. The in-line filter also incorporates a filter sensing switch. Unplug the M12 plug connection to the switch before commencing.

Disconnect M12 plug
before removing the
in-line filter cap



4. Unscrew the filter cap (with filter switch attached) – be careful not to damage the cap during its removal. If tight, use an appropriate filter removal wrench.
5. Replace the filter element with a new one and insert back into filter housing.
6. Close and tighten the in-line filter cap (hand-tight only)
7. Re-connect the M12 filter sensor plug connection.

13.4.2 Change Hydraulic Oil

If you are not familiar with this procedure, we recommend booking a third party to change the oil for you, as they can also dispose of the old oil.

If you wish to do this procedure yourself, instructions are below.

NOTE! Always take care to prevent dirt or contaminant from entering the hydraulic reservoir during this procedure.

When to change hydraulic oil

The hydraulic oil should be changed every 12 months.

Tools Required

- Suction pump and hoses to remove oil from reservoir.
- New hydraulic oil (minimum 80ltrs/21USgal). See below for specifications
- 16mm spanner/wrench
- Phillips head screwdriver
- Adjustable filter removal wrench
- Machine cabinet key
- Suitably sized container or drum for capturing old oil (minimum 80ltr/21USgal capacity)
- Replacement oil filter
- Clean rag

Hydraulic oil specifications

When re-ordering oil, it must meet the below specifications.

HYDRAULIC OIL SPECIFICATIONS	
Type	ISO46 Mineral Hydraulic Oil
Fluid Velocity Grade	46
Amount	Hydraulic reservoir capacity is 80litres (21US gal)
Maximum Oil Temperature	65°C (149°F)
Nominal Operating Pressure	165 Bar (1740psi)
Maximum Operating Pressure	195Bar (2828psi)

NOTE! ONLY use mineral hydraulic oil. **DO NOT** use synthetic or semi-synthetic oil or mix it with the mineral oil as it will damage the hydraulic pump.

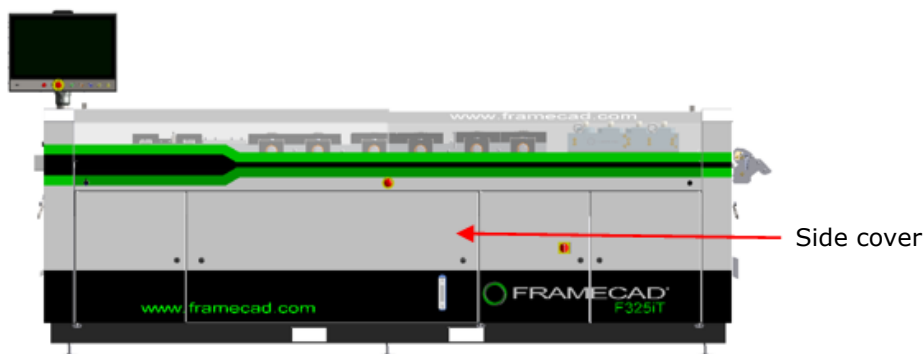
Always consult the supplier **Material Safety Data Sheet** for specific safety information relating to the type of hydraulic oil used with the machine. It is important to ensure this information is readily available for all staff operating the machine **AND** that they are trained in the safe handling, storage, and disposal of this product.

Prerequisites

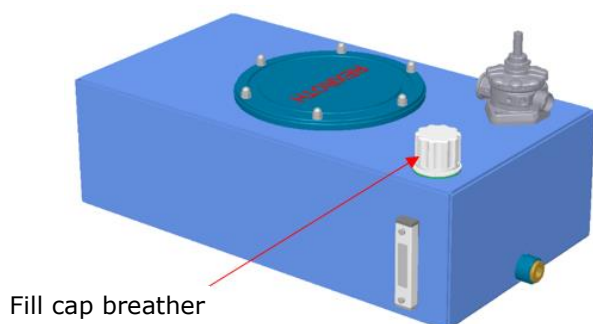
- Machine should be OFF at the isolation switch, and lockout measures implemented to prevent accidental re-connection
- Suitable procedure for disposing of old hydraulic oil.

Procedure to replace hydraulic oil

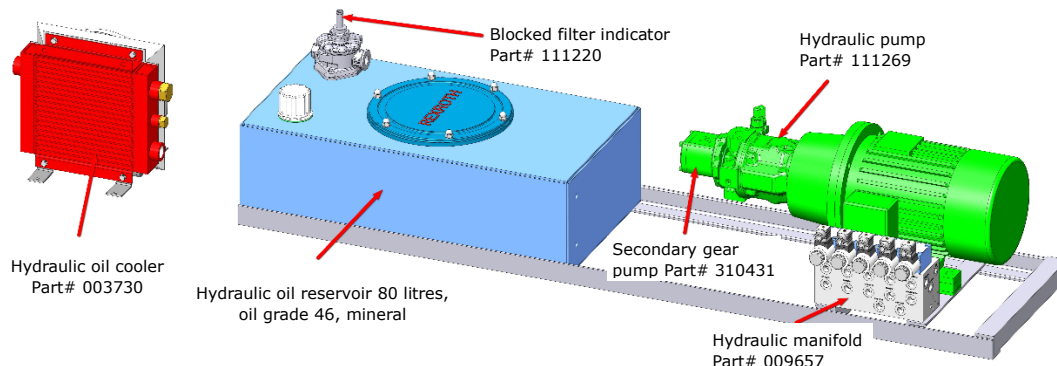
- Place suitably sized container or drum next to the machine (check the level in the reservoir sight-glass).
- Use machine key to open cabinet to gain access to the hydraulic reservoir.



3. Locate the fill cap/breather. Using the Phillips head screwdriver, remove the fill cap/breather from the top of the reservoir. Be careful not to drop any contaminant into the reservoir.



4. Use a suction pump to remove old oil into suitably sized container or drum. Take care to extract all the oil, particularly around the base of the reservoir.
5. Remount the fill cap/breather and screw back down onto the top of the reservoir, take care not to drop anything into the reservoir.
6. Re-fill with new oil until the level is at top of sight-glass (approximately 80ltrs/21USgal). BE CAREFUL not to contaminate the oil with dirt or other loose material.
7. Close up the fill/breather cap.

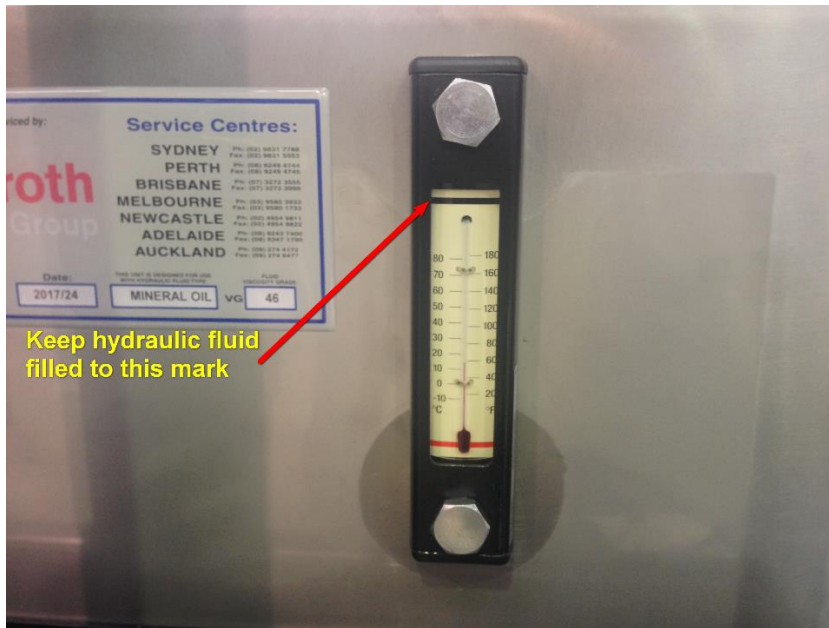


It is very important that the hydraulic oil is kept clean to maximise the longevity of all other hydraulic components such as valves, seals and pumps.

In order to keep the hydraulic system clean, the hydraulic fluid must be replaced at least once a year along with the hydraulic filter.

It is recommended that the hydraulic fluid is changed by your local qualified hydraulics engineer once a year or before each scheduled service.

The reservoir contains 80L of oil and must be filled to the top level of the sight glass.



After each oil change the filter must be replaced as well. Instructions are as follows:



Unplug the blocked filter switch, unscrew filter cap. Slowly pull the filter unit out of the reservoir to give the oil inside the filter cartridge and casing time to drain out.

With a container handy, dry off the filter unit casing and twist and pull the casing away from the filter cap.



This will leave the filter cartridge exposed. Dispose of the old cartridge and check the bottom of the casing for debris or contamination.

Clean out the casing with a clean rag and fit the new filter cartridge.

Replace the return filter unit back onto the hydraulic reservoir in the reverse order.

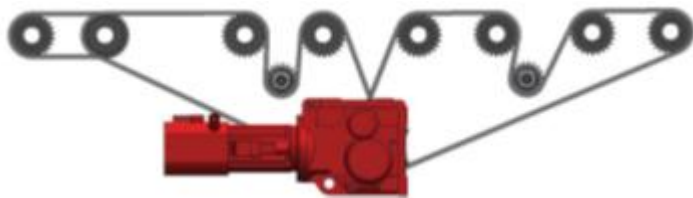
13.4.3 Check and Adjust Chain Tension – Rollformer



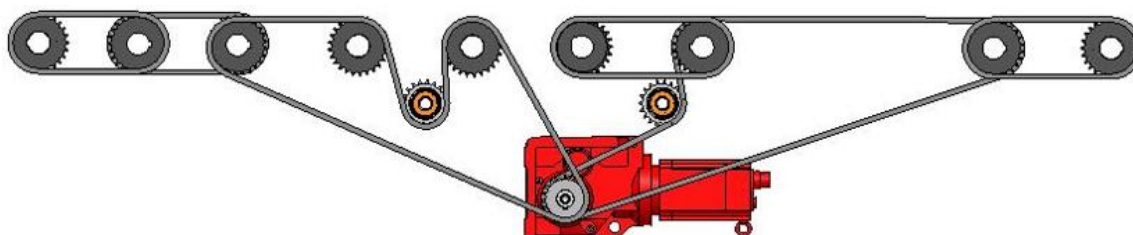
WARNING! This procedure must be completed with the electrical isolation switch off, lockout procedures in place, and without steel inside the machine.

The following procedure explains how to check the tension of the rollformer drivechain and adjust if required.

F325iT and F325iT-L drivechain:



F450iT drivechain:



Tools Required

- Machine cabinet key
- 8mm hex key
- 16mm spanner/wrench

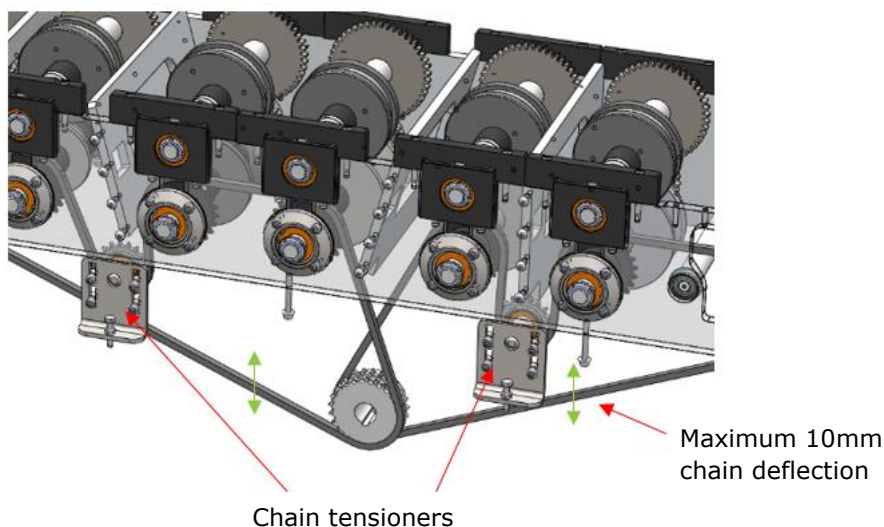
Prerequisites

- Isolation switch should be OFF and lockout measures taken to prevent accidental re-connection
- Steel should be removed from the machine.

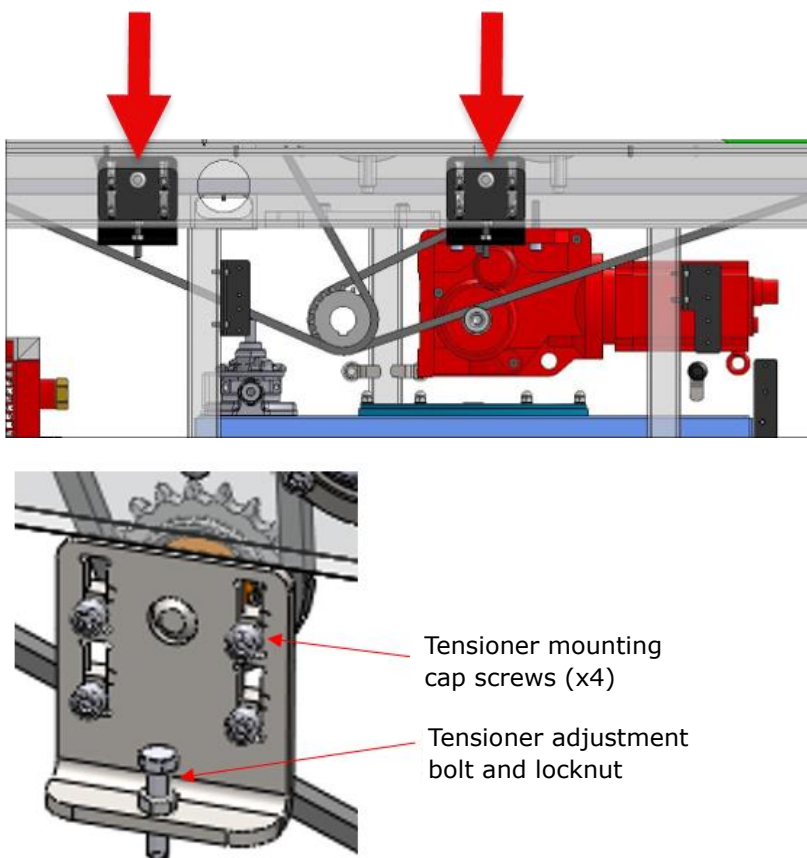
Procedure to check and adjust drive chain tension

Ensure there is no steel threaded through the rollformer. If there is, remove it – see [Remove Steel From Rollformer](#).

1. Using the machine cabinet key, remove the cabinet covers from the drive chain side of the machine.
2. There are two primary drive chains: one for roller stations 1 to 4 and the other for roller stations 5 and 6 and the lip box unit. Check the tension of both drive chains by moving each chain up and down at the longest point (i.e. just after the motor gearbox output sprocket). The total movement of the either chain should be no more than approximately 10mm (25/64in). If either drive chain has more than 10mm (25/64in) of movement, it will need to be tensioned (tightened).



3. There are two tensioners, one for each of the primary drive chains. The tensioner is bolted to the machine chassis using x4 cap screws. On the tensioner to be adjusted, loosen all 4 cap screws using a 16mm hex-key.



4. Using the 16mm spanner, loosen the locknut on the adjustment bolt and turn the bolt to tighten the chain so that there is no more than 10mm (5/64in) of up and down movement in the drive chain. Once complete, re-tighten the locknut and mounting cap screws.

13.4.4 Check and Adjust Chain Tension – Decoiler

Tools Required

- 17mm spanner/wrench
- 19mm spanner/wrench

Prerequisites

- Isolation switch should be OFF and lockout measures taken to prevent accidental re-connection
- Steel should be removed from the machine.

Procedure to check and adjust chain tension

1. Remove the drive end safety cover:



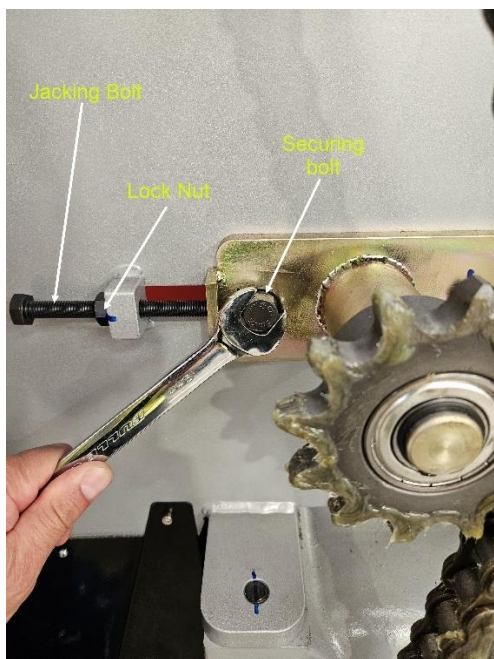
2. At the mid-point of the longest section of chain between the mandrel and drive sprocket, test the slack by moving the chain side to side.

The ideal slack should be about 10mm from rest.

- If the chain is too tight, this can accelerate wear in the sprockets and stretch in the chain.
- If the chain is too loose, this can expose the gearbox and mechanical components to load shock, unnecessary stress and slack in the mandrel.

The slack can be adjusted using the chain tensioner.

3. To adjust the chain, the two bolts securing the tensioner to the decoiler body need to be loosened using a 19mm spanner. Do not remove the bolts, only loosen enough so that the tensioner is able to slide in place.



4. Using a 17mm spanner, loosen the lock nut on the jacking screw, then turn the screw to slide the tensioner to the right to tighten the chain or loosen the jacking bolt to increase slack in the chain.

You may need to grab the chain and pull on it to move the tensioner back or tap in with a rubber mallet.

5. When you are satisfied with the tension in the chain, tighten the two securing bolts and tighten the lock nut on the jacking screw after checking the slack again.

The chain may become tighter after tightening the securing bolts. Some repeat adjustment may be necessary.

13.4.5 Check Gearbox/Motor Mounting Bolts – Decoiler

The motor and gearbox are secured by four bolts which hold the cast body of the gearbox to the decoiler chassis.

If one or more of the bolts becomes loose, it can add more stress to the remaining mounting points and cause the casting of the gearbox mounting points to break.

The bolts can be accessed by removing the drive end cover and removing one or both of the smaller covers.

Tools Required

- 24mm spanner/wrench

Prerequisites

- Isolation switch should be OFF and lockout measures taken to prevent accidental re-connection

- Steel should be removed from the machine.

Procedure to check gearbox/motor mounting bolts

1. Remove the drive end safety cover:
2. Using a 24mm spanner, check that all four bolts are tight.

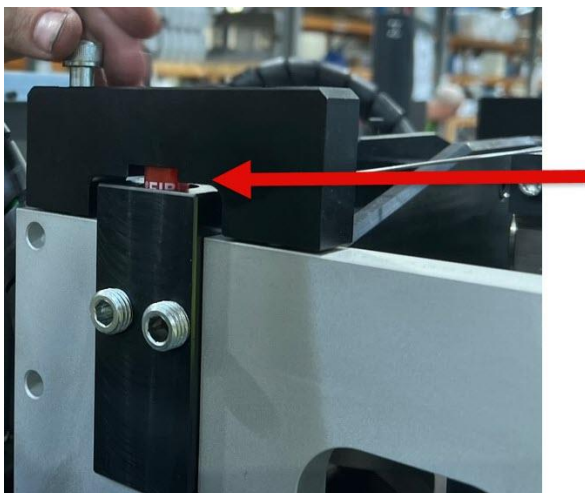


13.4.6 Check and Replace Roller Section (Auto-Gauge) Springs

The red auto-gauging springs (pictured) put tension on the main rollers to maintain pressure across the specified range of steel thicknesses. These springs are a common wear item and need to be replaced periodically or when they sustain damage. Removal / replacement is only necessary if spring damage is suspected, or at the normal annual scheduled service.

The process is detailed below.

1. Remove the two bolts from the load caps.



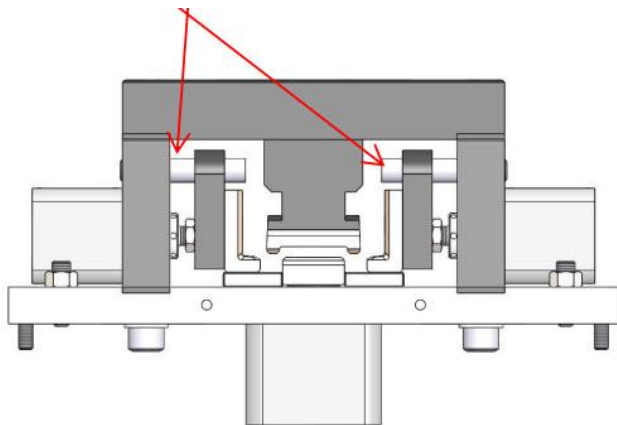
2. Take the load caps off.
3. Remove the spring and inspect for damage.
4. Replace springs when:

- a. Annually / after rolling 160km of steel
- b. Damage is noted

13.4.7 Lubricate Power Swage (F450iT)

TIP! This task is only necessary for F450iT machine models.

Using light grease, apply by hand to lubricate the guide rod for the side dies.
Or use white lithium grease spray.



13.4.8 Replace Fixed Dimple Punches

TIP! There are two spare dimple punches provided in your Machine Spares Kit. Please keep at least two in stock at all times.

The dimple housing contains a fixed die/punch. When used in combination with the moving dimple die, it produces the dimple screw hole and depression on the flange.

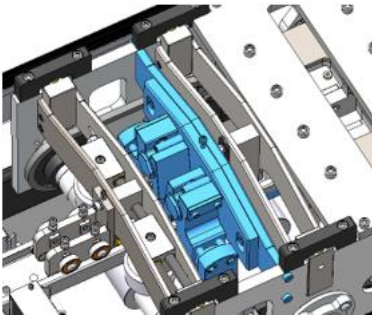


Dimple punches are the most frequently replaced tool in the rollformer given the frequency of operation (generally most sticks will incorporate multiple dimple operations). Generally the punch will snap off at the end, which is the indication that a replacement part is needed.

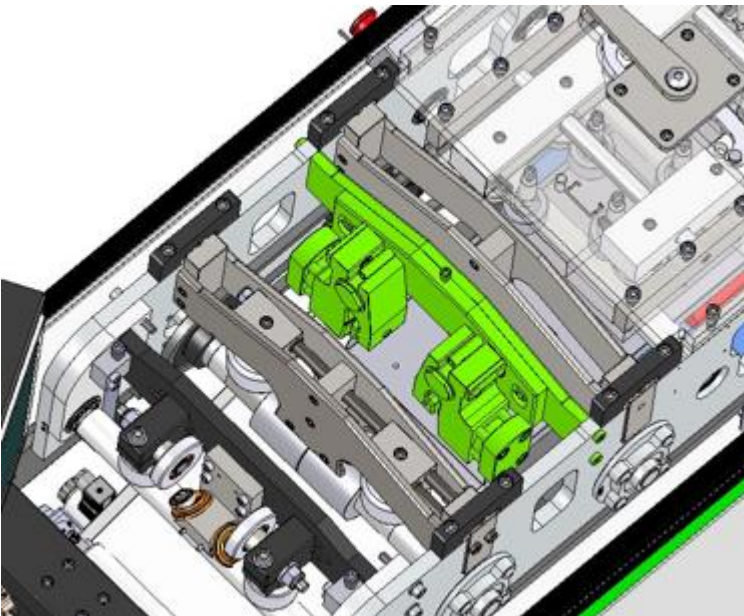
Location of dimple tools

The dimple tools (one for each side of the flange) are located between the pinch rollers and the flange overform rollers.

F325iT and F325iT-L dimple tools:



F450iT dimple tools:



Procedure to replace dimple fixed die/punch

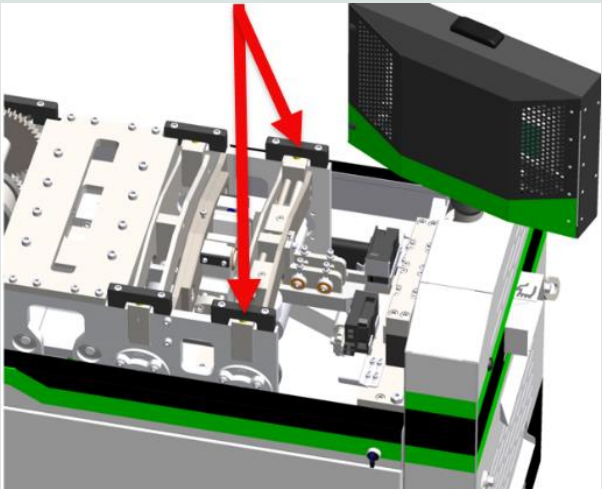
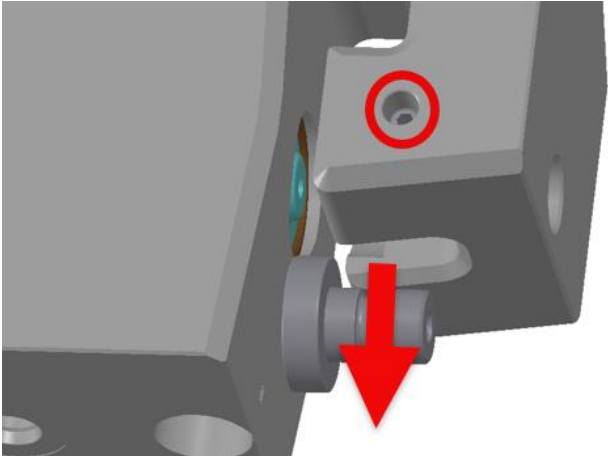
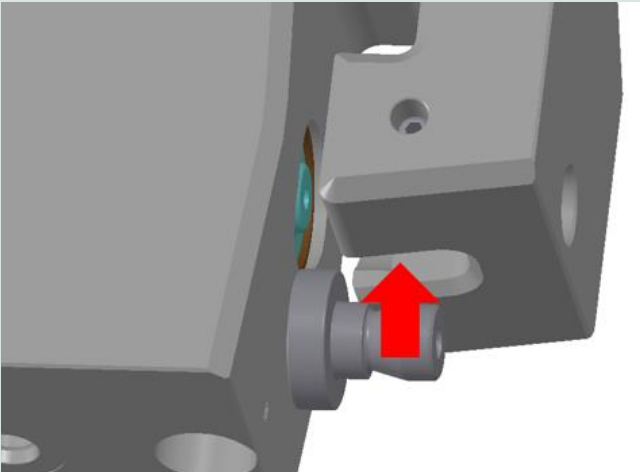
Prerequisites

- Isolation switch must be OFF and locked out to prevent accidental reconnection
- Steel should be removed from the machine

Tools Required

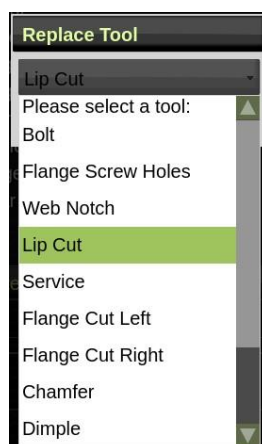
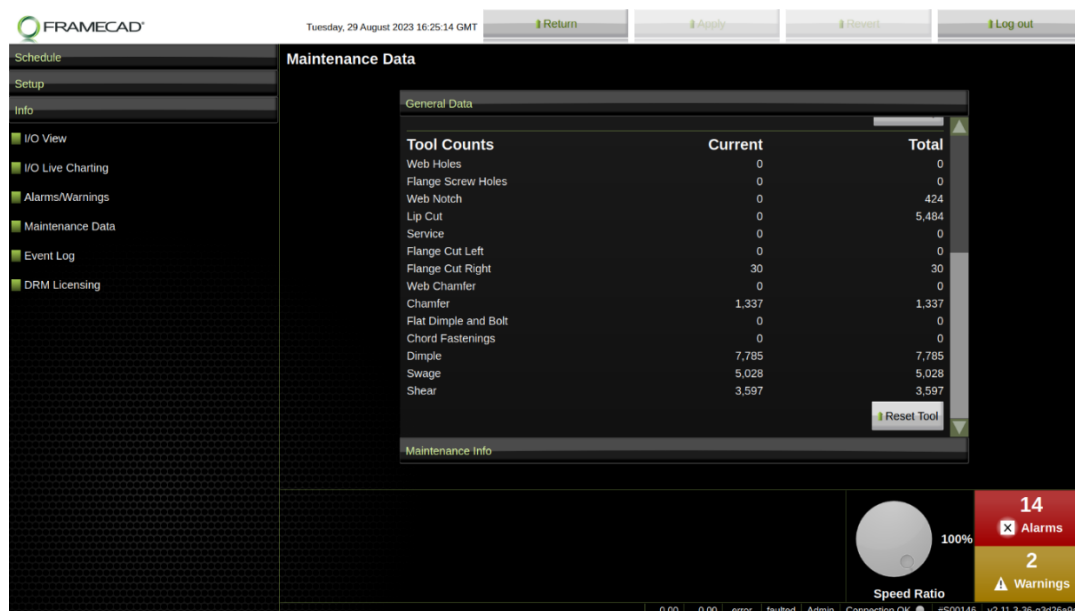
- 10mm hex key
- 6mm hex key
- 2.5mm hex key
- Replacement dimple die/punch

Remove flange and lip overform assemblies

STEP	ILLUSTRATION
To allow easier access to the dimple assembly, remove the flange and lip overform assemblies by removing the two cap screws (x4 total) from either side.	
Using a 2.5mm (3/32in) hex key, loosen the dimple fixed die/punch retaining screw (indicated by the red circle). Then, lever the old dimple die/punch out of the housing so that it falls downwards.	
Carefully insert replacement dimple fixed die/punch so that it is seated as far into the housing as it will go. Retighten retaining screw.	
Reinstall the flange and lip overform assemblies.	

Reset tool count

After replacing a punch tool or shear blade, it is very important that the Tool Count Trip is reset. This is so that the number of punches can be reported accurately in order to proactively inspect and replace the tooling as part of a good maintenance regime.

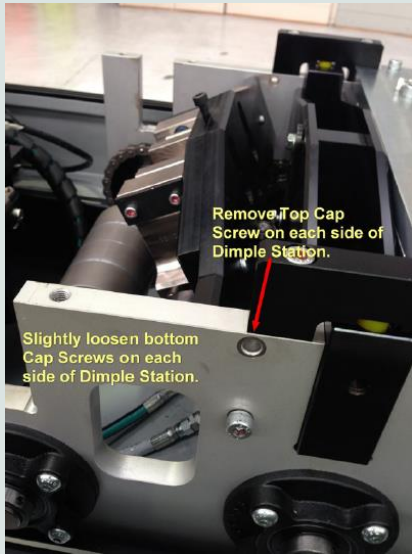
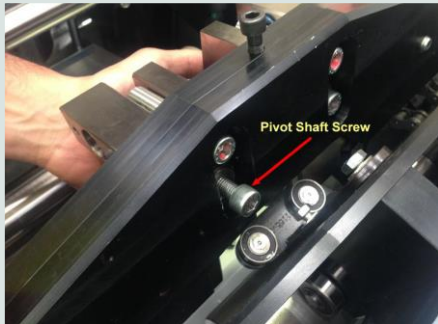


13.4.9 Replace Moving Dimple Die

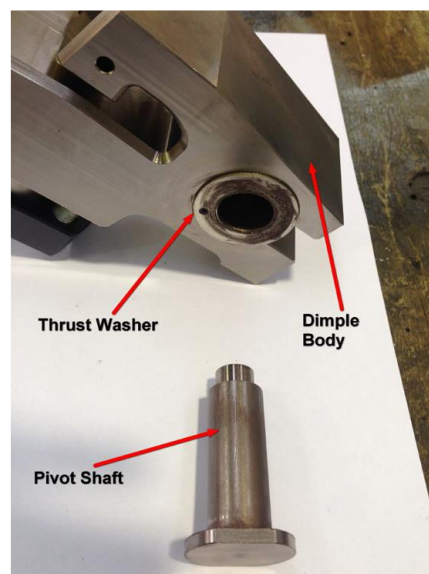
This procedure explains how to remove the dimple bodies from the Dimple Station and lubrication points.

Tools Required

- 8mm Allen key
- 5mm Allen key
- Grease

STEP	ILLUSTRATION
When the flange overform assembly has been removed, the hydraulic hoses attached to the dimple bodies can now be unscrewed and set aside. TIP! A small amount of hydraulic fluid may leak out so you will need a rag handy. There are two cap screws on each side of the dimple station, loosen all four slightly but only completely remove the top cap screws. You can now swivel the dimple station forward to expose the cap screws behind the dimple bodies.	
Using the 5mm Allen key, remove the tension spring in order to make refitting the dimple body easier.	
Remove the lower cap screw using the 8mm Allen key and push it forward as you go in order to push out the pivot shaft. You will need to support the dimple body so it does not fall as you push out the shaft.	

Once you have the dimple body on the workbench you can remove the pivot shaft and thrust washers which must be cleaned and greased before refitting the dimple body to the dimple station.



Note the different colours on each side of the thrust washers. The dark matt side must always fit against the side of the dimple body with the polished side directed outwards.



After cleaning the dimple body and components, add grease to both sides of the thrust washers and fit them back onto the dimple body making sure the internal diameter of the washer fits around the raised bush in the dimple body.

Grease the pivot shaft and fit back into the dimple body.

The dimple body is now ready to fit back onto the dimple station bracket by following the previous instructions in reverse order.



13.4.10 Replace Ink Filter (Inkjet Printer)

The ink bottle contains a filter to remove any dirt or contaminant. The filter should be replaced every 60ltrs (15US gal), or when the printed text begins to fade.

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

Items required

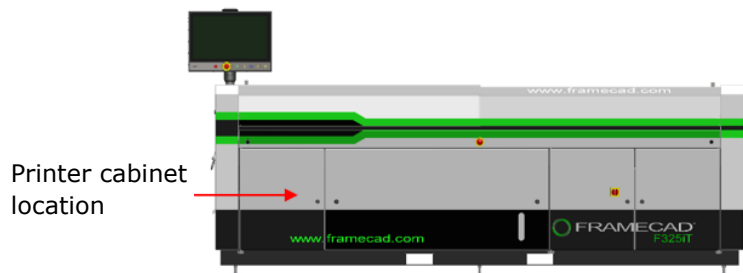
- Replacement ink filter

TIP! FRAMECAD can supply this filter if service is done by a FRAMECAD technician, otherwise you can order spare filters yourself from the supplier (Matthews Marking).

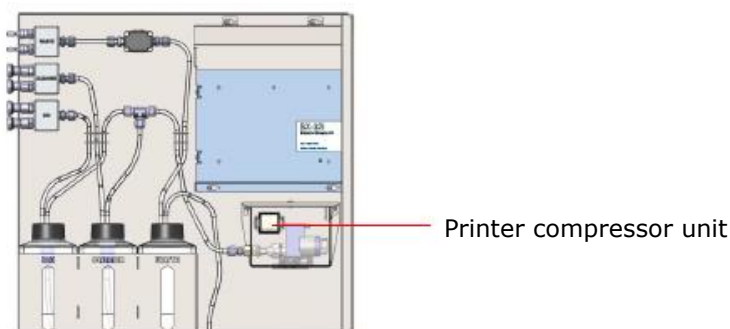
Procedure

Depressurize the ink and cleaner system

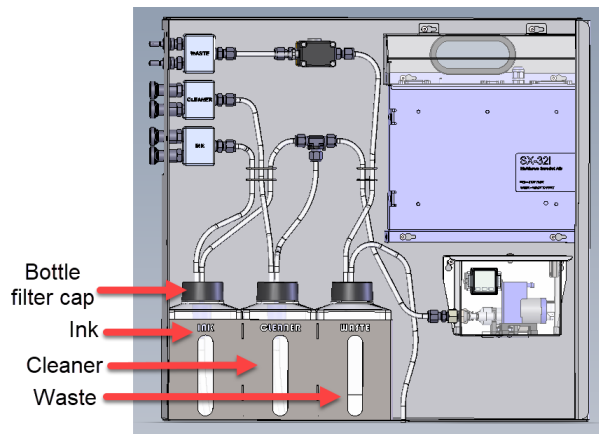
1. Ensure machine is OFF at the isolation switch, and lockout measures have been taken to prevent accidental re-connection.
2. Open the printer cabinet door



3. Ensure there is no display on the Print Compressor Display Screen (to confirm the system is not powered)



4. Carefully unscrew the black filter cap on either the ink, cleaner or waste bottles to gently relieve pressure in the system.



Remove old filter and replace with new

1. Detach the filter from the cap and replace with new.



2. Insert cap and ink filter assembly back into ink bottle. Take care to make sure the ink bottle cap is tightened to enable a good seal.
3. Check the ink and cleaner bottles to make sure there is sufficient quantity for when production will resume. Re-fill as required.

4. Check the waste bottle. If this is full, consult your company's hazardous materials handling policy on how to safely dispose of MEK based inks and solvents.

Start machine and check pressure

Confirm printer system is at the correct pressure. See [Check Inkjet Printer System Pressure](#).

Purge printer system with ink

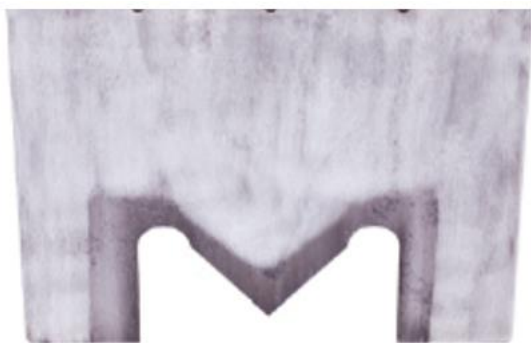
See [Purge Inkjet Printer System With Ink](#) before resuming production.

13.4.11 Replace Shear Blade

Operation of the shear uses significant force. The shear blade therefore, requires frequent lubrication (four times daily) and is considered a high wear item and will require periodic replacement. The actual time between replacement is dependent on operational use and shear actions. The Factory tool count information held in MyProduction can be used to indicate how worn the blade is.

Indications that your shear blade needs replacement include:

- Incomplete shear cuts
- Visible blunting of the blade



Shear blade replacement procedure

Prerequisites

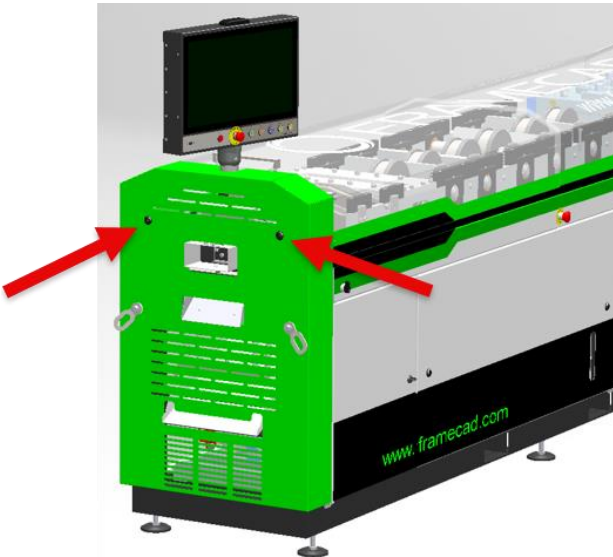
- ISOLATE electrical power to the machinery and implement lockout measures to prevent accidental re-connection.
- Remove steel strip from the machine.

Tools Required

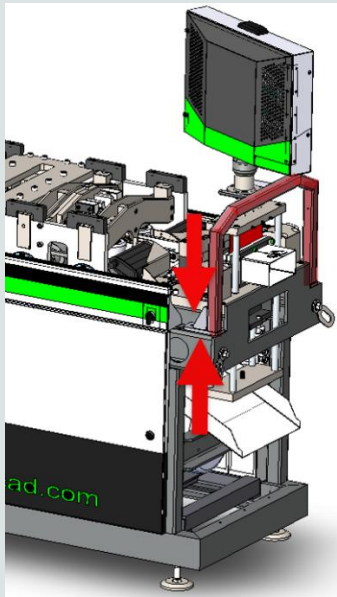
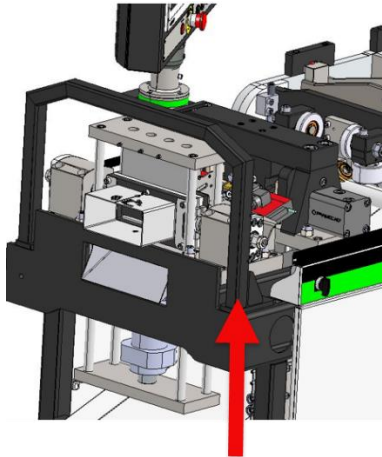
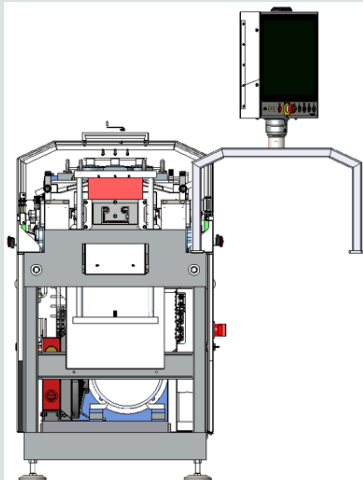
- Machine cabinet key
- 10mm hex key
- 8mm hex key
- 6mm hex key

- 4mm hex key
- Metric/imperial socket set
- Replacement shear blade - at the replacement stage, compare the blades to ensure this is exactly the same size and shape as the one being replaced.

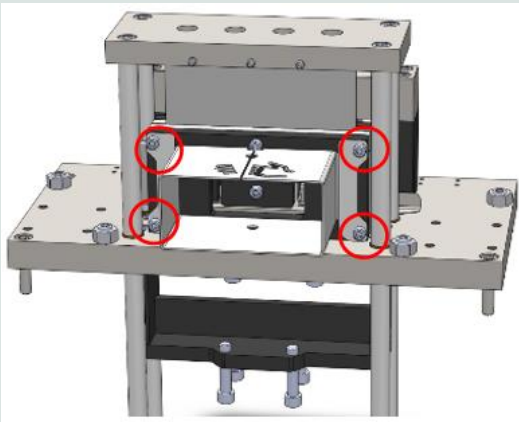
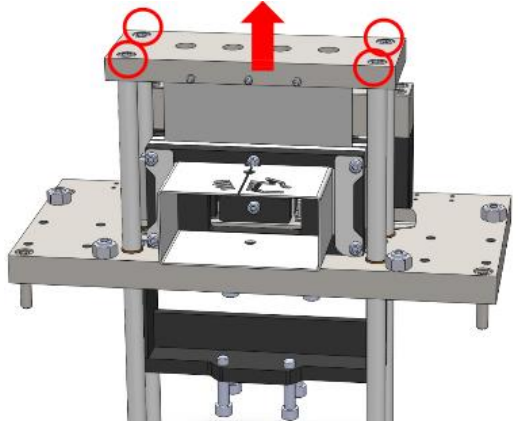
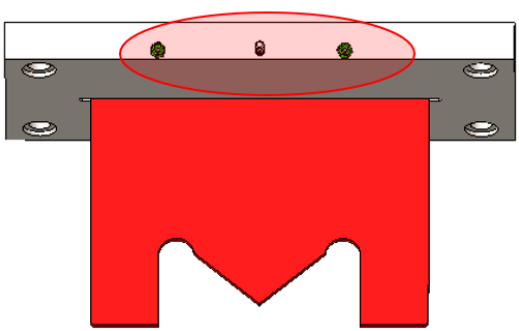
Disconnect sliding guard safety switch and open outfeed cover

STEP	ILLUSTRATION
Open the sliding guard at the outfeed end of the machine, on the rear side. Locate the cable containing the sliding guard safety switch*, which must be disconnected to allow the outfeed cover to open. The switch will be hidden inside a hole in the chassis. Pull out the cable as shown and disconnect the two parts where indicated with the arrow. * This is the safety switch that, if disconnected, will trip the safety control system and not allow the machinery to operate. It is ok to disconnect it now because the machinery is already electrically isolated. However, it must be connected again before powering up the machine again otherwise the machine will be in a permanently safety-tripped state.	
Using the machine key, unlock the end cover of the machine where indicated. It will now be possible to take off the outfeed end cover.	

Swing Operator Touchscreen support frame out of the way

STEP	ILLUSTRATION
To access the shear assembly, it is necessary to move the frame supporting the Operator Touchscreen out of the way. There are four (x4) mounting bolts holding the support frame in place: Two (x2) on either side. The two rear bolts (relative to the outfeed end of the shear) can be accessed from the top. The two front bolts can be accessed via the bottom through access holes cut into the chassis. Remove both support mounting bolts on the rear side of the machine.	
Remove only the front bottom access mounting bolt on the operator side.	
The support frame can now gently be swung out of the way to allow easy access to the shear assembly.	

Access and replace shear blade

STEP	ILLUSTRATION
Loosen (do not remove) the shear assembly front (outfeed end) clamp bolts (x4 circled red).	
Remove the top shear plate bolts (x4 circled red) so that the top plate and shear blade assembly can be lifted upwards.	
Remove the shear blade retaining bolts. CAUTION! Take extreme care when handling shear blades due to risk of cuts from sharp edges.	
Remove the old shear blade and replace with the new one. NOTE! Ensure the replacement blade matches the size and shape of the one being removed.	

Re-assemble the shear assembly, secure the Operator Touchscreen support frame and replace the end cover using the same steps above. Make sure to reconnect the sliding guard safety switch connection too.

Reset tool count

Don't forget to reset the tool count using the **Info > Maintenance Data** screen.



The screenshot shows the FRAMECAD Maintenance Data screen. The left sidebar contains navigation options: Schedule, Setup, Info, I/O View, I/O Live Charting, Alarms/Warnings, Maintenance Data, Event Log, and DRM Licensing. The main area displays the 'Maintenance Data' screen with a 'General Data' tab. Below the tab is a table of tool counts.

Tool Counts	Current	Total
Web Holes	0	0
Flange Screw Holes	0	0
Web Notch	0	424
Lip Cut	0	5,484
Service	0	0
Flange Cut Left	0	0
Flange Cut Right	30	30
Web Chamfer	0	0
Chamfer	1,337	1,337
Flat Dimple and Bolt	0	0
Chord Fastenings	0	0
Dimple	7,785	7,785
Swage	5,028	5,028
Shear	3,597	3,597

At the bottom right of the table is a 'Reset Tool' button. Below the table is a 'Maintenance Info' section. The bottom status bar shows 'Speed Ratio' at 100%, '14 Alarms', and '2 Warnings'.

13.4.12 Replace a Toolblock Tool Cartridge

TIP! This procedure is for tools in the F325iT and F325iT-L models. F450iT models have a different procedure, see [Swap F450iT Tool Cartridge](#).

How to know when a tool needs replacing

Remove the pre-punch tool cartridges (recommended at least every 6-months of production) to inspect the tools for wear and tear. By implementing a consistent inspection regimen, you can plan for replacements before you actually need them.

Look for wear or chipping on the corner edges of each tool and the die plates. Also observe the quality of the cut-out in the steel material: poor cutting which leaves burrs or deformation of the cut-out may indicate worn tools.

Toolblock tool replacement procedure for F325iT and F325iT-L

Prerequisites

Remove steel from the rollformer: see [Remove Steel From Rollformer](#).

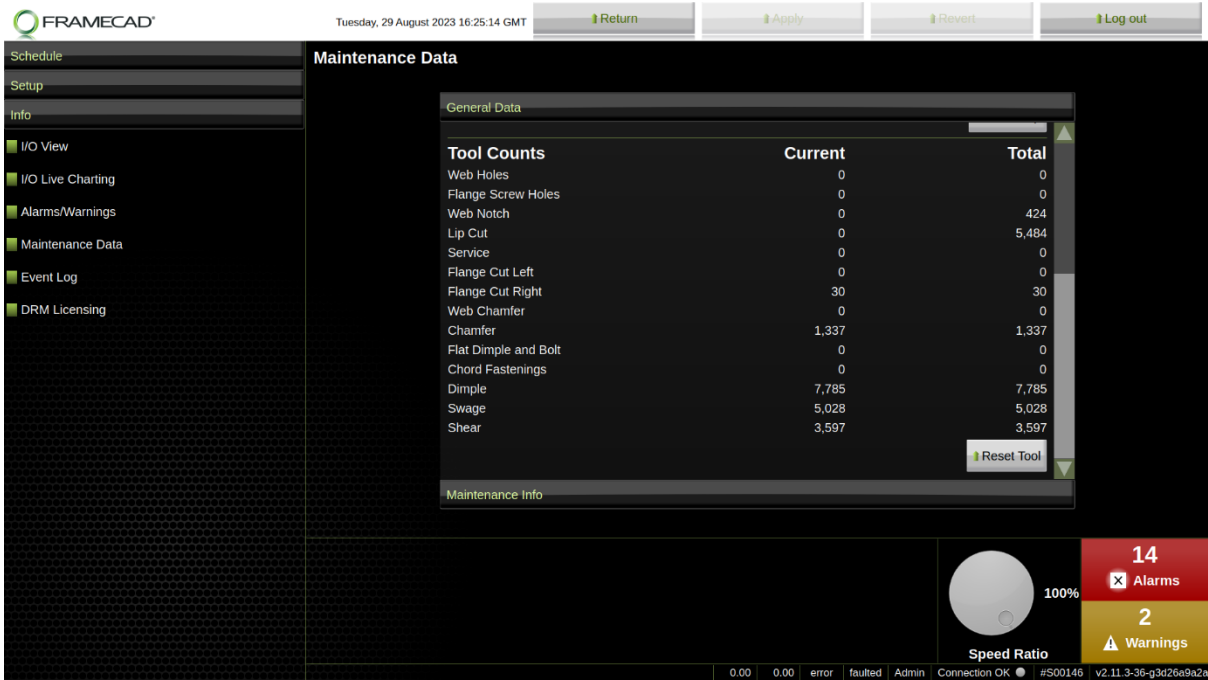
- Machinery should be OFF at the isolation switch.

Tools required

Mechanism for lifting the tool cartridge off.

Reset tool count for the replaced tool

Remember to reset the tool count using the **Info > Maintenance Data** screen.



FRAMECAD Tuesday, 29 August 2023 16:25:14 GMT

Return Apply Revert Log out

Schedule Setup Info

I/O View I/O Live Charting Alarms/Warnings Maintenance Data Event Log DRM Licensing

Maintenance Data

General Data

Tool Counts	Current	Total
Web Holes	0	0
Flange Screw Holes	0	0
Web Notch	0	424
Lip Cut	0	5,484
Service	0	0
Flange Cut Left	0	0
Flange Cut Right	30	30
Web Chamfer	0	0
Chamfer	1,337	1,337
Flat Dimple and Bolt	0	0
Chord Fastenings	0	0
Dimple	7,785	7,785
Swage	5,028	5,028
Shear	3,597	3,597

Reset Tool

Maintenance Info

Speed Ratio 100%

14 Alarms

2 Warnings

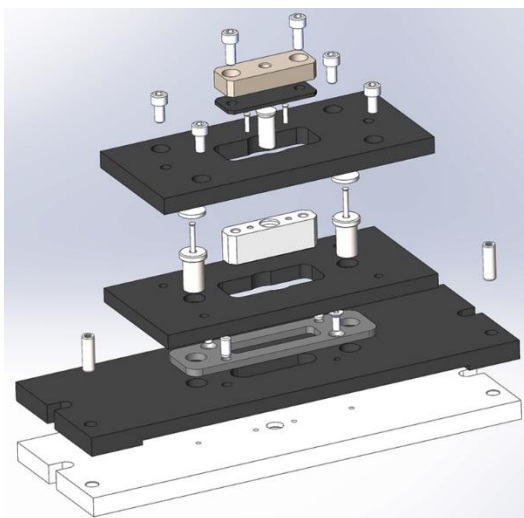
0.00 0.00 error faulted Admin Connection OK #S00146 v2.11.3-36-g3d26e9a2a

13.4.13 Inspect Tool Cartridge for Wear

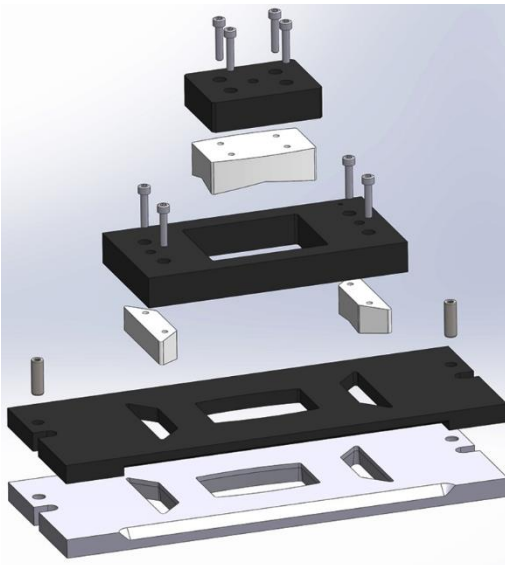
If you happen to be removing a tool cartridge for any reason, it is worthwhile checking the tools for damage.

Below are exploded diagrams of some example cartridges, showing how they are assembled.

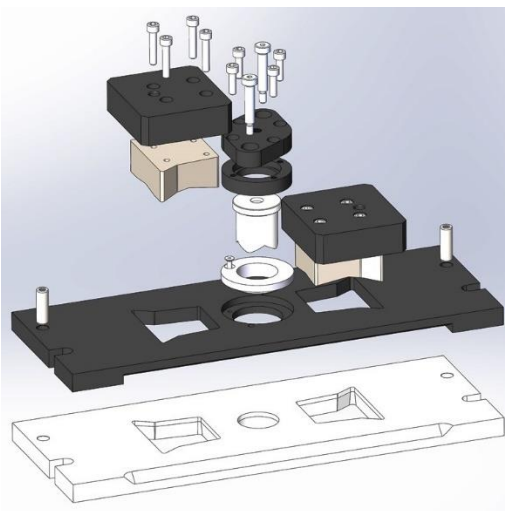
Web bolt hole and flange screw holes cartridge



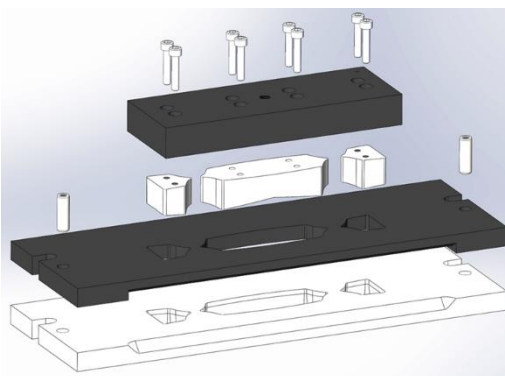
Web notch and lip cut tool cartridge



Service hole and flange cut tool cartridge



Chamfer cut tool cartridge



13.4.14 Hydraulic System Maintenance

Weekly check the following for leaks and tighten or repair if necessary:

- Hose fittings
- Hoses and check for cuts or damage
- Valves at the toolblock and the outfeed hydraulic manifold
- Hydraulic cylinders at the toolblock and the outfeed end tool cylinders.

Fan operation

To ensure hydraulic oil stays at an optimum operational temperature, check that the oil cooler fan is running and that the cooling fins are kept clean and free of dust.

Depending on the surrounding environment, clean the oil cooler fins with an air gun between once a week and once a month.

13.4.15 Check Decoiler Dancer Arm Safety Control Height

Frequency: monthly or whenever the decoiler has been relocated.



DANGER! The decoiler must be empty of coil.



DANGER! The spinning decoiler mandrel is a hazard.



DANGER! Ensure trip hazards are minimized.

Procedure

1. Ensure the machine is in manual mode.
2. Ensure the decoiler is empty of coil.
3. Ensure the decoiler is in Auto mode (switch on top of decoiler).
4. Go to the infeed end of the machine and pick up the decoiler dancer arm.
5. Raise the dancer arm, observing that the mandrel starts to spin when it is lifted 50mm above the ground.
6. Now lower the dancer arm, observing that the mandrel stops spinning when it is below 50mm above the ground.
7. Continue to raise the dancer arm, with the decoiler spinning faster and faster, until a height of 1000mm is reached, upon which the rollformer safety control system should be tripped, and the decoiler should stop spinning.

13.5 Cleaning Procedures

After production is finished for the day, it is important to clean in and around the machine.

Buildup of steel coating can get stuck on rollers; if enough coating is present, it will throw the machine out of calibration.

If not regularly removed, steel swarf and debris can get into places they shouldn't and cause problems.

Follow the procedures in this section to ensure your machine is kept in good working order.

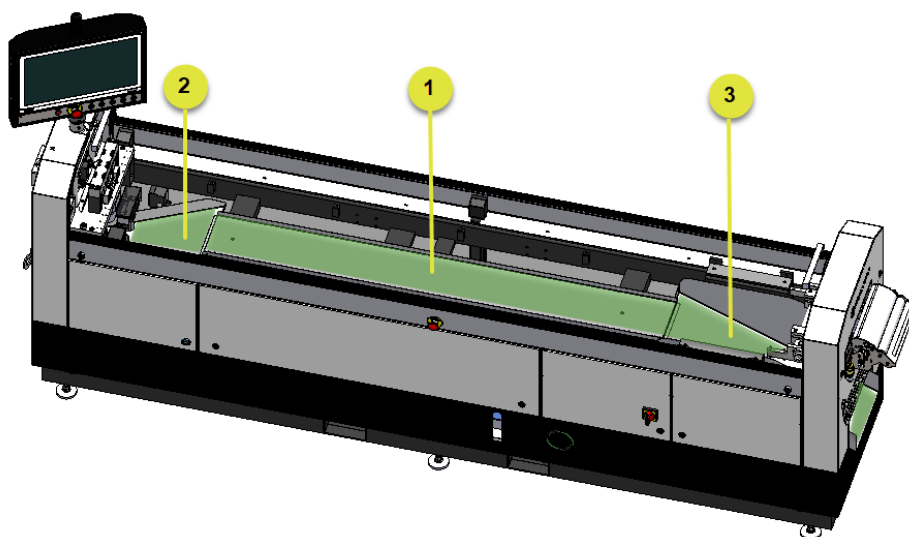
13.5.1 Sweep Around Machine

Every day after cleaning the machine itself, sweep up debris, swarf and any scrap material.

This is also a good chance to check underneath the machine for any leaks that could indicate a problem with the hydraulic system.

13.5.2 Clean Drip Tray and Waste Chutes

Once a week



1. Drip tray: catches waste material from underneath the roller section
2. Dimple waste chute: steel punched from the dimple exits here
3. Tool punch waste chute: steel punched out during tool block operations exit here.
It is not necessary to clean inside the tool block.

Ensure machine is powered off at isolation switch and the wall. Open the guard covers and reach in between the rollers, using a rag to sweep the waste material to the ends of the drip tray so that they exit down the waste chutes.

Sweep the waste material down the waste chutes at either end. It can be difficult to access the dimple waste chute; cleaning does not have to be perfect.

13.5.3 Clean Infeed Guide Wheels

Cleaning the encoder shaft wheel and pressure wheel

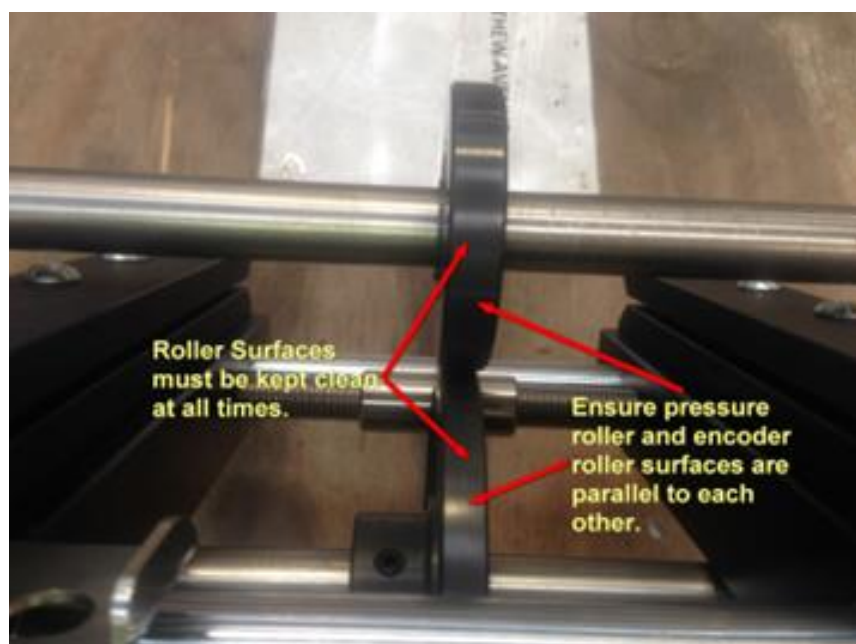
To clean these, use a scouring pad and WD-40 and cleaning rags.

The encoder shaft wheel can similarly become coated in steel coating, lubricant and metal shavings over time. It's critical this remains clean to prevent errors in stick length and tool positions.

Clean the wheel at the start of each day.

The encoder wheel and Pinch/Pressure wheel surfaces must be checked and cleaned daily as build-up of galvanisation and other debris can cause skipping or uneven rotation of the encoder compromising stick lengths and tooling positions.

If a lot of buildup from coating or tape/stickers on coil or bluecoat on certain coil brands (buildup can cause irregularities in stick length etc), Spray CRC and wipe off with sponge scouring pad (like scotch brite)



13.5.4 Clean Lipbox Rollers

Two rollers - visible ones and the ones behind the visible ones (that roll perpendicular to the visible ones)

Lipbox rollers - F450iT

Clean with scouring pad and WD-40 and cleaning rags.

Lipbox rollers - F325iT

Clean with scouring pad and WD-40 and cleaning rags.

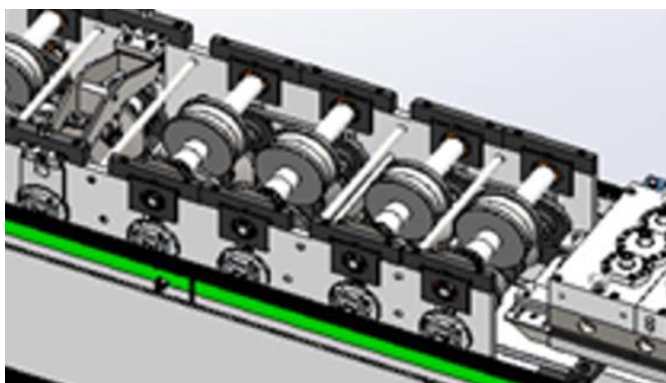
framecad.com

13.5.5 Clean Main Roller Section Rollers

Rollers that contact the steel eventually become coated in steel coating, lubricant and metal shavings. Over time this will increase the diameter of the rollers enough to cause problems with the finished product.

Make sure the rollers that touch the steel are cleaned off at the surfaces shown end of each day.

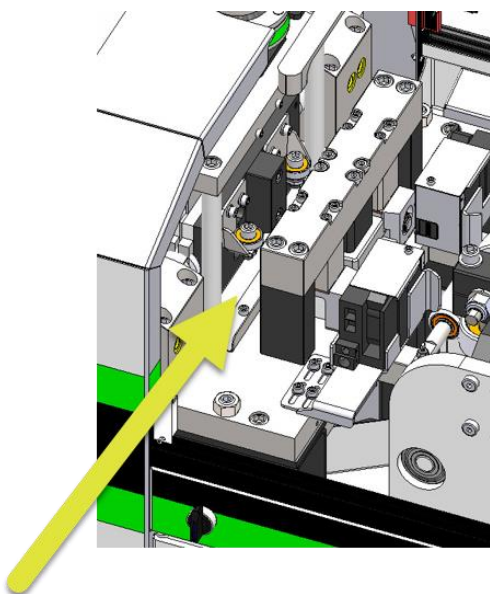
For big rollers in main rolling section, can clean using scouring pad and WD-40 and cleaning rags.



13.5.6 Clean Swage and Shear Assemblies

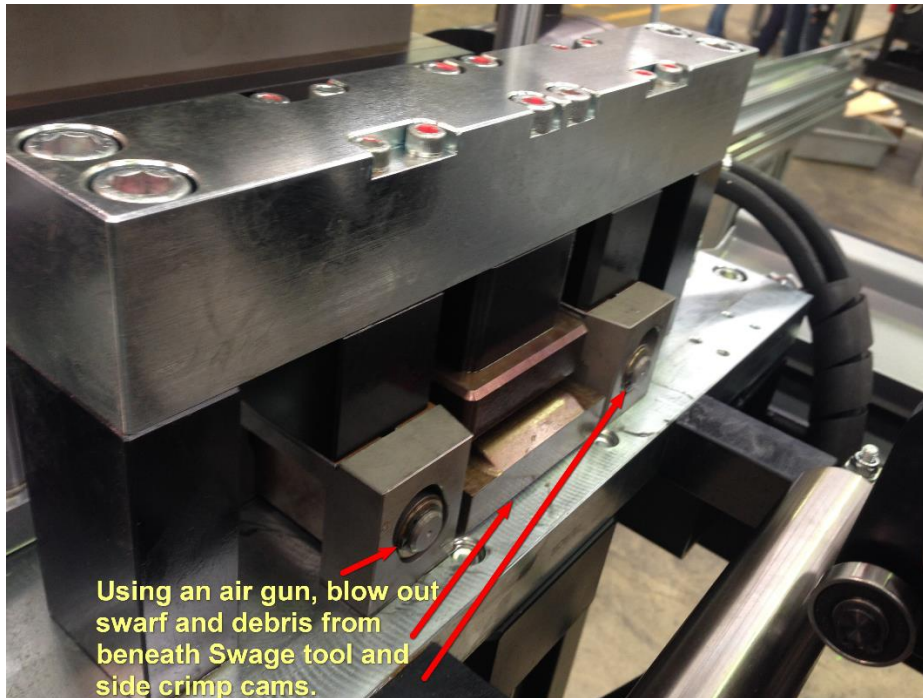
Shear blade and swage areas

Steel dust and shavings tend to accumulate behind the shear blade. The easiest way to clean this is with a magnet attached to the end of a stick.



The Swage Station located just before the Shear Station but part of the same assembly is designed to reduce the profile size of a member in order for it to fit inside the profile of an adjoining member.

The Shear Station, being the last tool, holds the profile in place while cutting the member to the correct length.

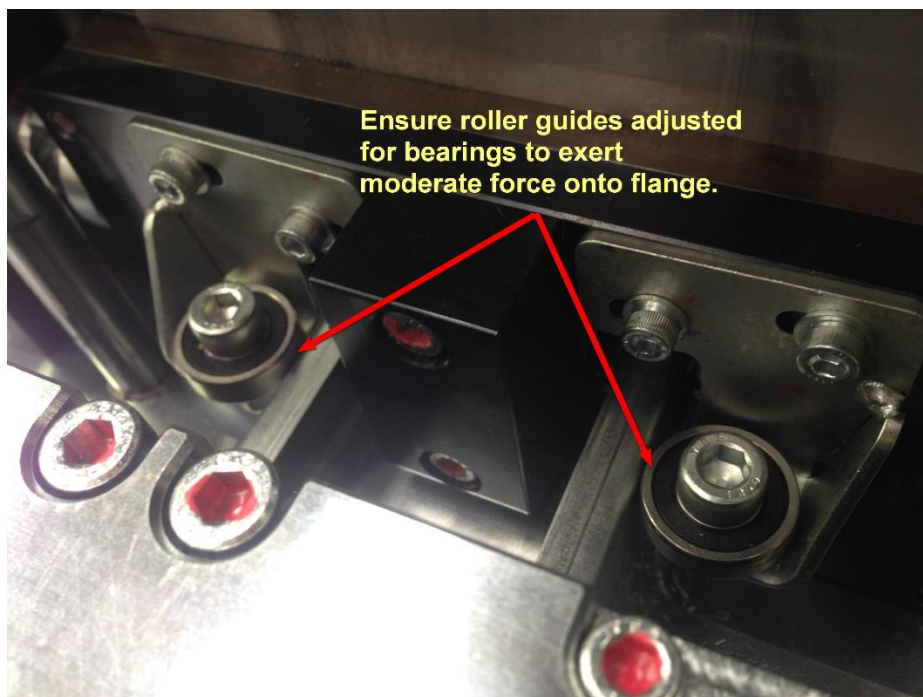


The Shear Blade must be kept lubricated and clean to maximise blade life span and cutting effectiveness.

The lubrication pots and blade must be blown and/or brushed clean every time the shear is lubricated. Add 3 drops of lubricant to each of the 4 pots 3 times a day or at each coil change, whichever comes more frequently.

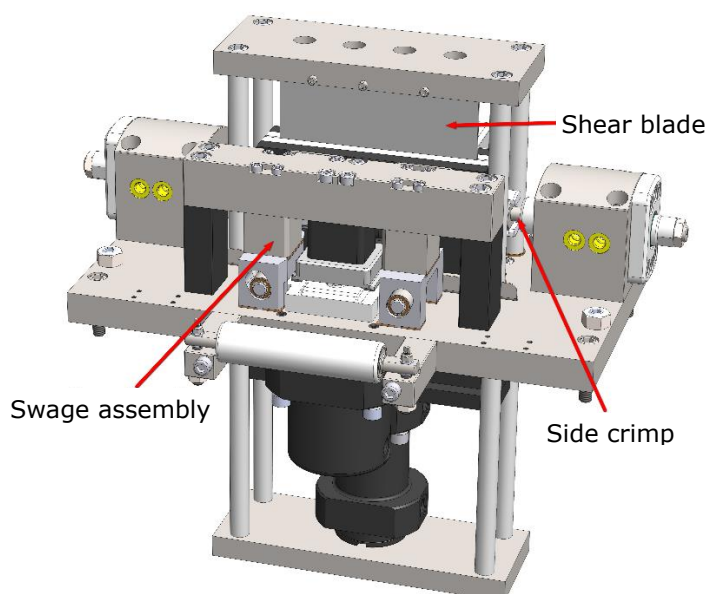


The Shear infeed guide rollers must be adjusted so they are positioned firmly against the profile flange ensuring smooth entry into the shear station and minimising the chance of a jam up.

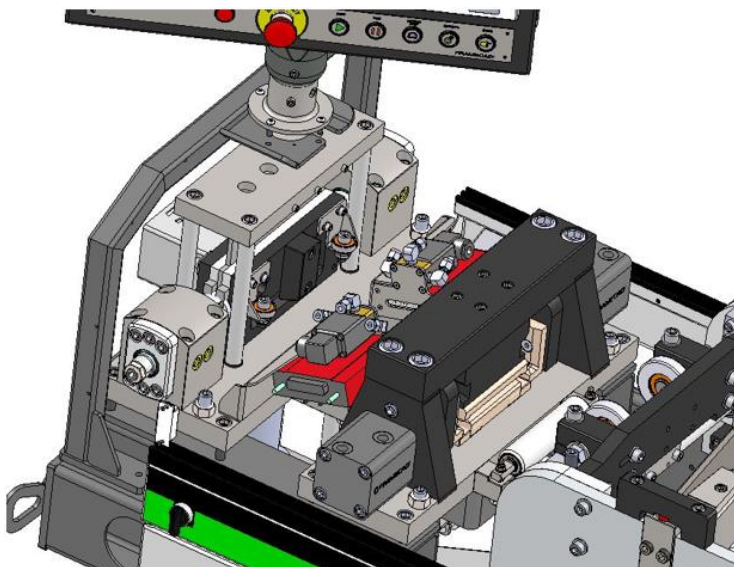


A lot of swarf accumulates in the area of the shear and swage assembly. It is important to clean this area after the end of each production day to prevent the swarf interfering with other machinery parts.

The swage and shear assembly for a F325iT and F325iT-L is shown below.



The assembly for an F450iT is shown below. This includes a power swage for the thicker steel handled by the F450iT models.



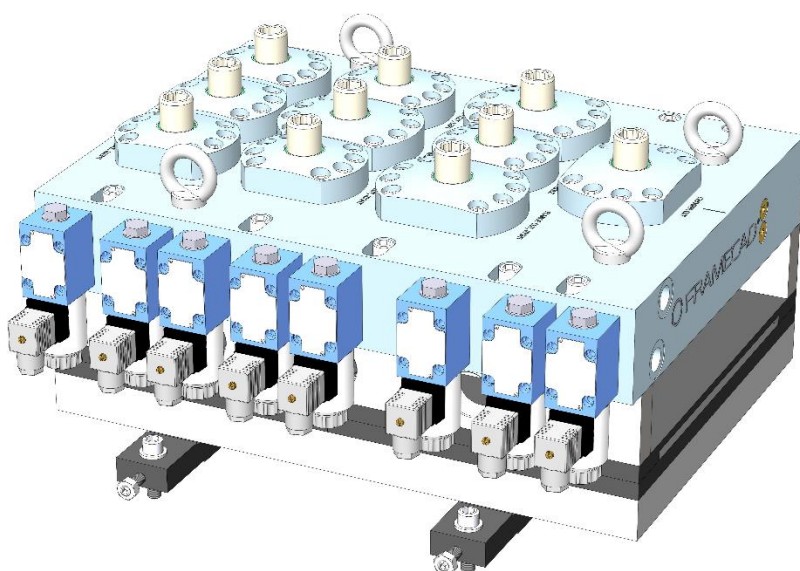
The Swage Station must be kept clean, especially in and around the moving components.

Use an air gun to clear the crimp cam mechanism and the space beneath the Swage Punch.

It will be necessary to manually actuate the Swage when clearing out debris.

If this is not done the Swage punch may not retract completely and the steel profile may end up scraping and catching resulting in a jam up. This should be done daily or more frequently depending on production intensity.

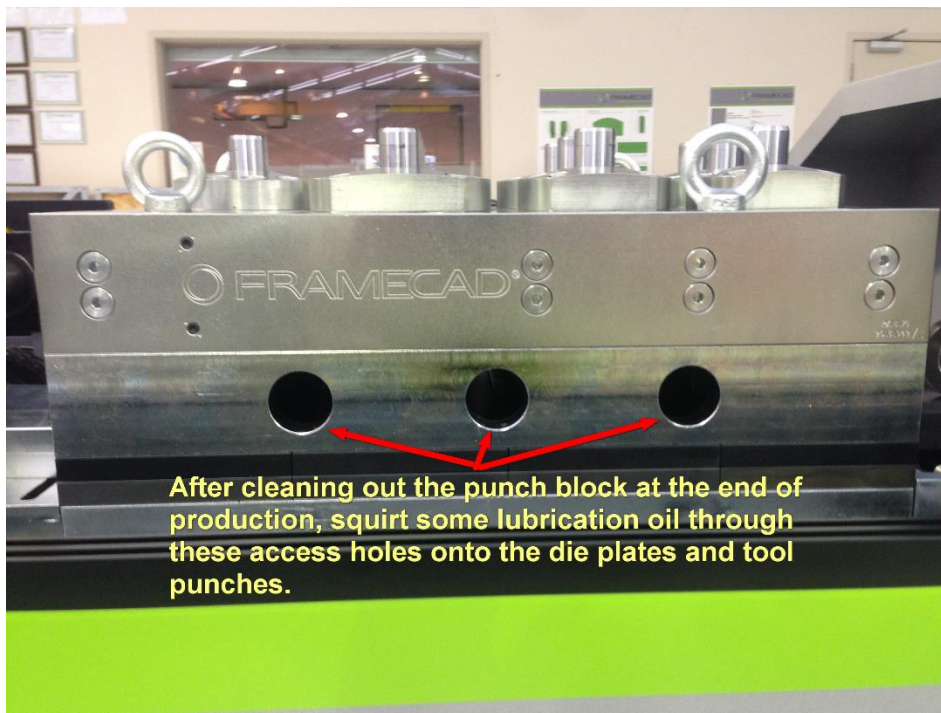
13.5.7 Clean Toolblock



Daily cleaning and lubrication of the toolblock is required to maximise tool lifespan.

Three access holes per side are used for inserting the nozzle of an oil can. Squirt the die plates and tools after the toolblock has been cleaned using an air gun and rag.

Make sure the Emergency Stops have been activated and the machine isolator has been switched to the off position.



13.5.8 Clean Inkjet Printer Heads

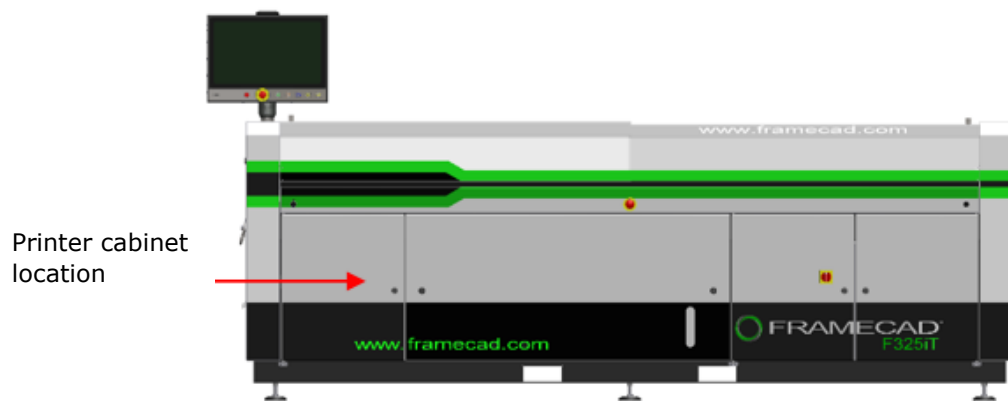
Clean printer heads every 4 hours of use and the end of each production day

CAUTION! Ink and cleaner used in this printer system are MEK (Methyl Ethyl Ketone) based products, which are highly flammable and require special precautions when handling. Always consult the supplier **Material Safety Data Sheets** before use.

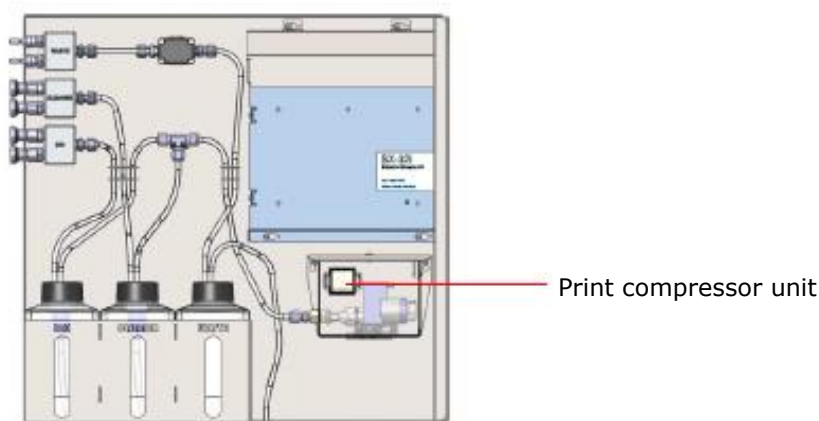
The ink and cleaner delivery system is pressurized. Always use safety glasses and appropriate personal protective equipment when working on or near the ink and cleaner system.

Depressurize the ink and cleaner system

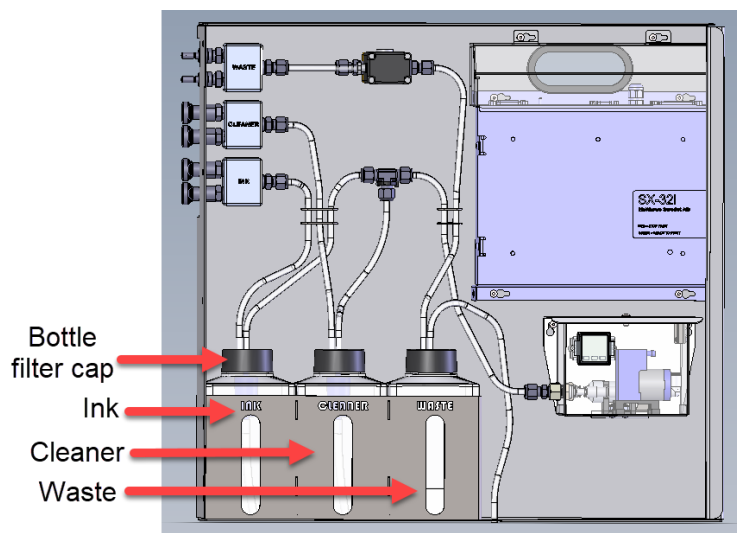
1. Ensure machine is OFF at the isolation switch, and lockout measures have been taken to prevent accidental re-connection.
2. Open the printer cabinet door



3. Ensure there is no display on the Print Compressor Display Screen (to confirm the system is not powered).



4. Carefully unscrew the black filter cap on either the ink, cleaner or waste bottles to gently relieve pressure in the system.



Tools required

- Small paint brush
- Cleaner fluid

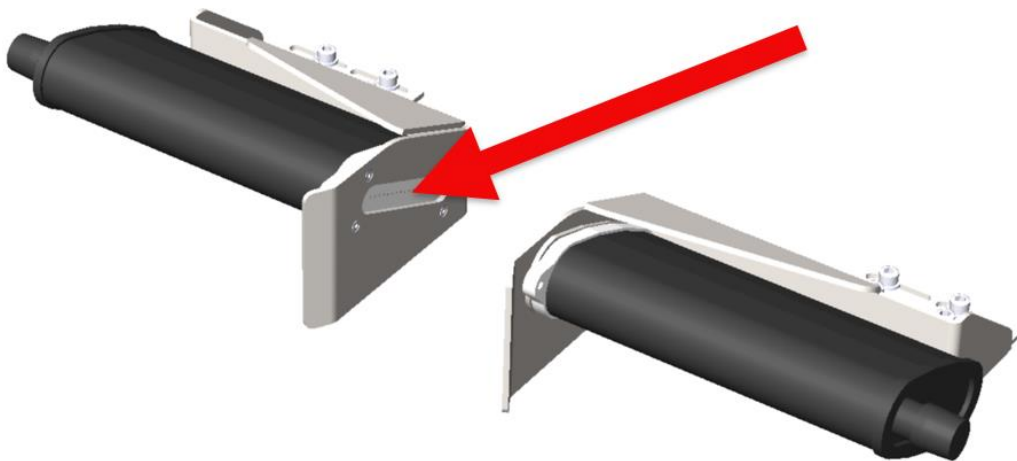
- Rags for capturing any residual cleaner/ink

Safety

- Use safety glasses and appropriate personal protective equipment including Nitrile rubber gloves

Procedure to clean printer heads

Clean the nozzle-end of the print heads (as shown) with a brush dipped in cleaner. The use rags to remove dry or contaminated ink.



Clean Ink Cartridges and Printer Heads

Do this every day.

This can be done as part of troubleshooting the printer system. Do this if the printing becomes unclear as this could indicate a partial blockage or air ingress in the cartridge.

Make sure the ink cartridge nozzle face is clean and free of dust or dirt contaminant.

IMPORTANT NOTE! The ink cartridges must be removed from the printer head assemblies at the end of each production day and inserted into the protective covers. The ink cartridges can then be safely stored inside the printer cabinet as shown in [Cleaning Up Spills](#).

Tools Required

- Lint free wipe.
- Ink cartridge cleaning kit (this is supplied with your Machine Toolkit)

Safety

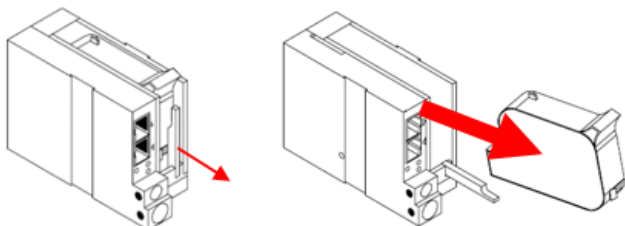
Remove steel from the machine:

1. Activate Emergency Stop state by pressing an Emergency Stop pushbutton.
2. Avoid direct skin or eye contact with ink.

3. Consult the supplier **Material Safety Data Sheets** before use before commencing the procedures describe herein.

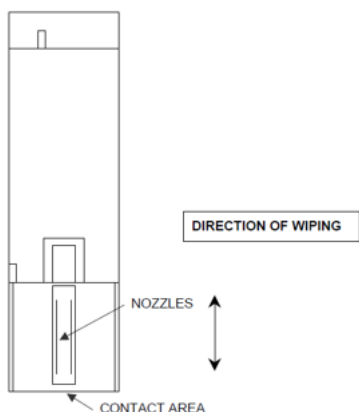
Clean Printer Heads (Inkjet Printer)

1. Activate an Emergency Stop state by pressing one of the Emergency Stop pushbuttons.
2. Remove the ink cartridge from the Print Head assembly. Do this by lowering the locking lever then lifting the rear of ink cartridge up and back.

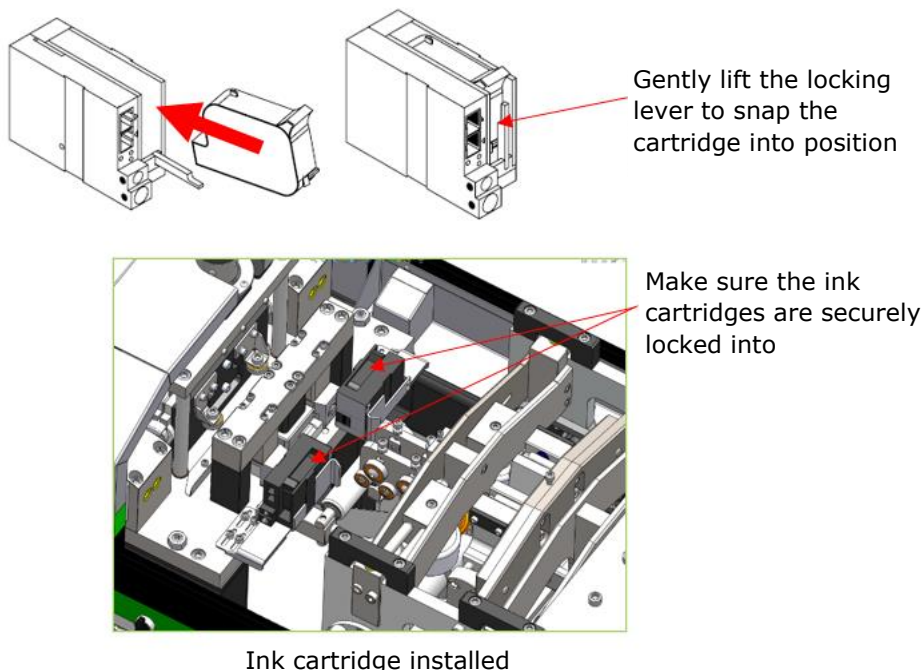


Gently lower the locking lever and lift the cartridge from the rear up and backwards

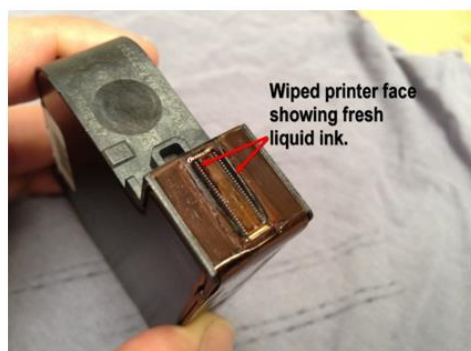
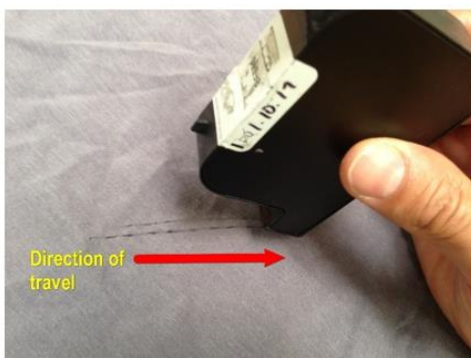
3. Gently wipe the nozzle-end of the ink cartridge with a clean, lint-free wipe to remove any dust or dirt contamination from the nozzle array face.



4. Reinsert the ink cartridge. To insert an ink cartridge, push the cartridge in and down. Gently lift the locking lever on the rear of the printer head assembly and press against the cartridge. The locking lever will snap the cartridge into position.



5. Repeat steps 1 to 5 for all ink cartridges installed on the machine.
6. Once complete, purge the ink cartridges as shown in [Purge Inkjet Printer System With InkError! Reference source not found.](#) Test again using the test procedure described in [Manually Test Cartridge Printer.](#)
7. If after testing the printed text still has missing dots, remove the ink cartridge(s) and clean the printer cartridge face, using a soft, clean rag, lightly place the printing surface on the rag and drag across the rag until you see two dark parallel lines of ink as shown below.

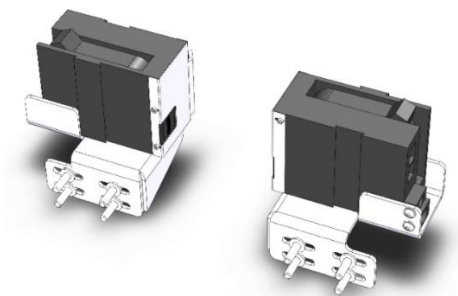


8. If the cartridge is not printing consistently, check that the contacts at the bottom of the cartridge have not been torn or covered in dried ink.
9. The contacts can be torn if not taking care when seating or removing the cartridge in and out of the print head.
10. Re-insert the ink cartridge(s) back into the Print Head assembly as described above. Test again using the test procedure described in [Manually Test Cartridge Printer](#).
11. If the ink cartridge still has missing dots, repeat step 7. If all of the above fails to produce acceptable print quality, replace the ink cartridge.

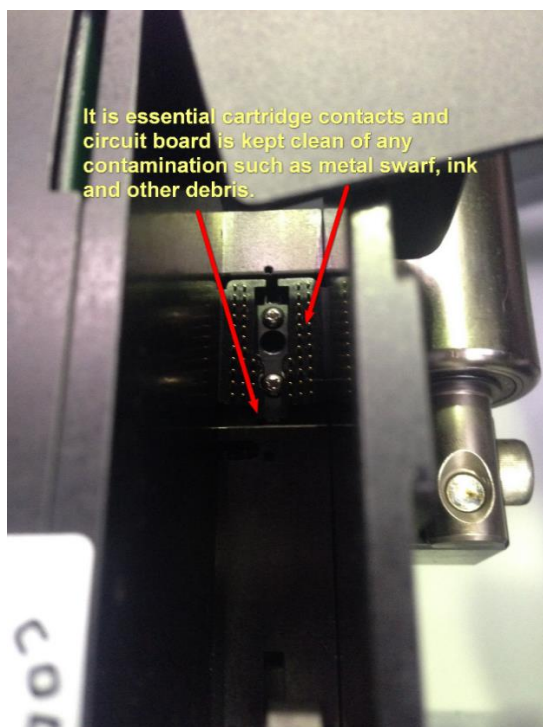
Clean Printer Heads (Cartridge Printer)

This procedure is helpful for when there is missing printer text.

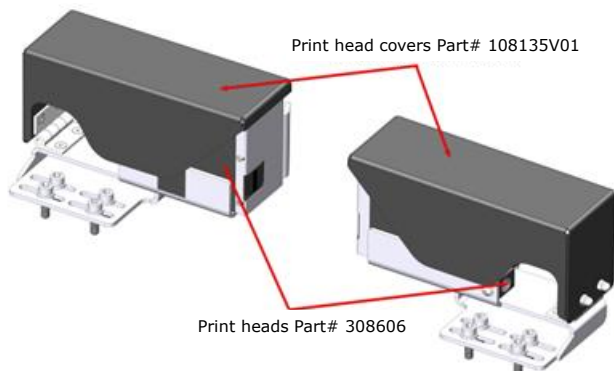
The exposed contacts and circuitry of the cartridge print heads can become contaminated by metal swarf and ink, impeding the flow of ink onto the stick.



Contamination occurs mostly in the areas indicated below.



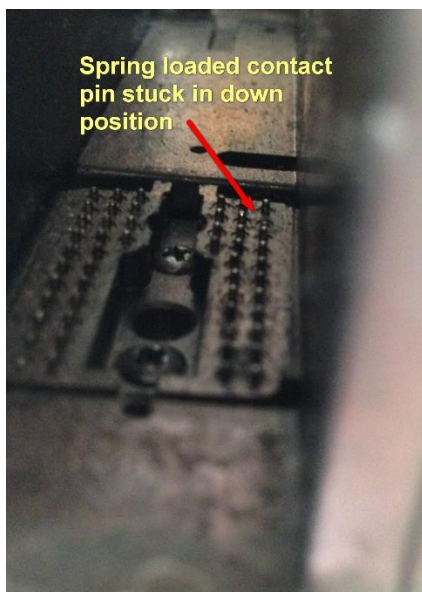
The print heads are normally supplied with a flat cover to help minimise debris falling onto the sensitive electronics although a more protective cover can be purchased from FRAMECAD which fully covers the print head for earlier models.



Ensure the print face of the print head is kept between 3mm and 5mm away from the face of the profile to minimise ink splash back and ingress of swarf/metal contamination.

Every time the ink cartridge is removed and at the end of production the print head must be blown out with an air gun and make sure the air supply is dry as moisture can accumulate in poorly maintained air supplies.

Check that there is no metal swarf on the contact pins or exposed part of the circuit board and that ink has not caused any of the spring-loaded pins to stay depressed in the down position such as shown below. This can result in a loss of pixels or poor communication between the print head and the cartridge. If the printhead is too close to the flange, the ink may not stick to the surface of the steel. Cartridges left overnight may dry up and affect future print quality.



Circuit board cleaner can be purchased from most electronics stores which can be used along with a light small brush to remove the ink and loosen the contact.

Whenever the printer system is not in use, remove the Ink cartridges, place them into the plastic storage cradle and store in a cool dark place to maximise longevity.

Be sure to close the lid on the print head once the cartridge is removed.



13.5.9 Cleaning Up Spills

Always clean up any oil, lubricant and printer ink/cleaner spills immediately.

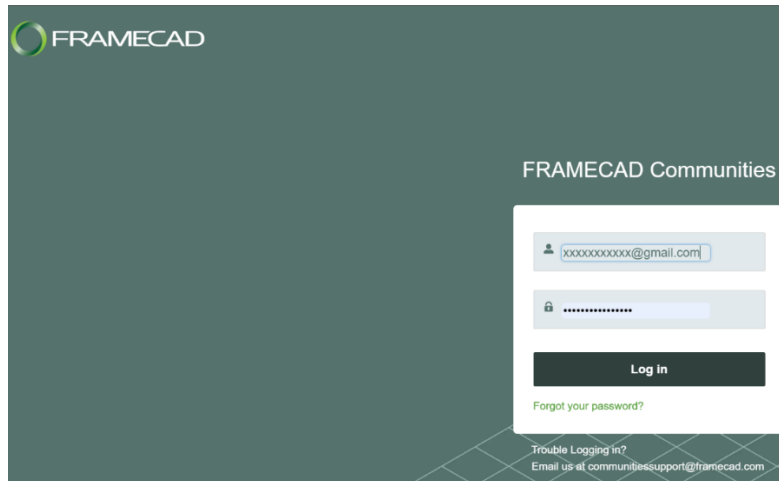
CAUTION! Always consult the supplier **Material Safety Data Sheets** before use for the approved clean-up method.

14 Further Support

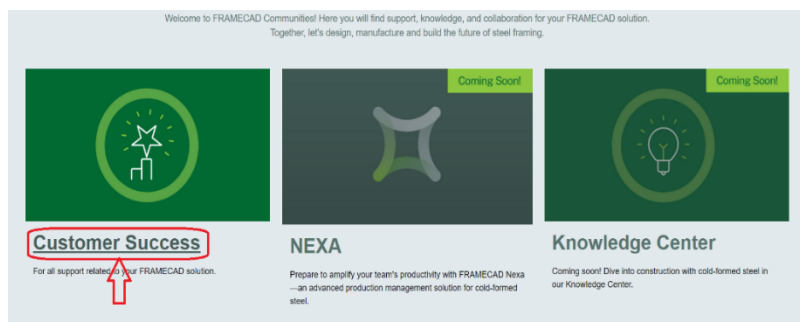
Customers can request all and any support via FRAMECAD's customer portal called "Communities":

<https://communities.framecad.com/s/login/>

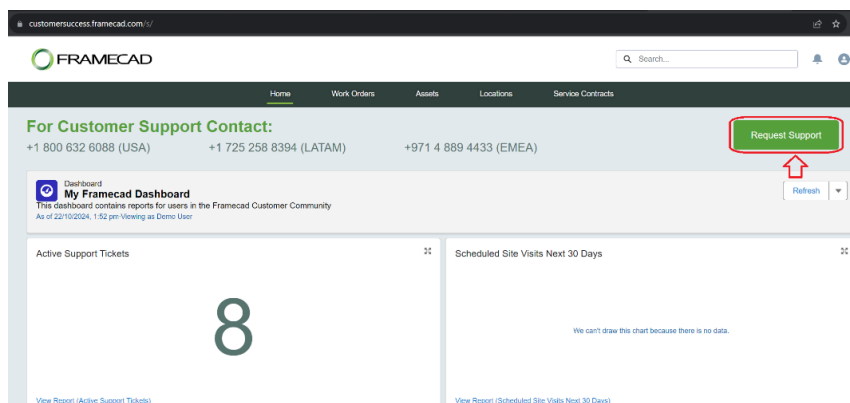
1. Log in using your credentials:



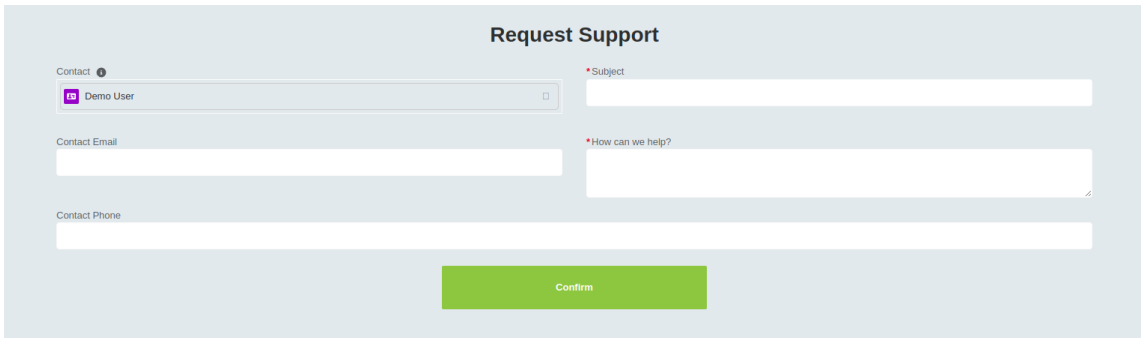
2. Click on Customer Success:



3. Choose "Request Support":



4. In the subject, add the subject of the issue and a short description of the problem. Fill out all the other fields as well and hit "Confirm":



The image shows a "Request Support" form with a light blue background. At the top center is the title "Request Support". Below it, on the left side, is a "Contact" section with a dropdown menu showing "Demo User" and a small square icon to its right. Below this are two input fields: "Contact Email" and "Contact Phone". On the right side, there are two input fields: "Subject" (marked with a red asterisk) and "How can we help?" (also marked with a red asterisk). At the bottom center is a green button labeled "Confirm".

5. A service request will be created with a number. Add relevant error screenshots and files by clicking on "Upload Files".