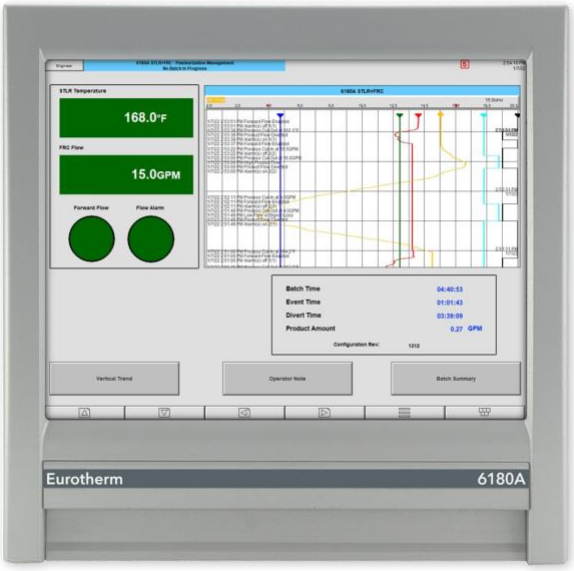
Digital Engineered Solution

6180A Standardized STLR+FRC Solution

User Guide

For Pasteurization Safety Thermal Limit Recorder and Flow Recorder/Controller Applications

Eurotherm® *a **Watlow** brand*



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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Watlow software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Note: Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Watlow for any consequences arising out of the use of this material.

Note: A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment, and has received safety training to recognize and avoid the hazards involved.

Safety and EMC

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not use the product for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.

Signal and power voltage wiring must be kept separate from one another. Where this is impractical, all wires must be rated to the power voltage and shielded cables are recommended for signal wiring. When shielded cable is used, it must be grounded at one end only.

This product has been designed for environment A (Industrial). Use of this product in environment B (domestic, commercial and light industrial) may cause unwanted electromagnetic disturbances in which cases the installer may be required to take adequate mitigation measures.

For Electromagnetic Compatibility, the panel or DIN rail to which the product is attached must be grounded.

Observe all electrostatic discharge precautions before handling the unit. Electrically conductive pollution must be excluded from the cabinet in which the recorder is mounted for example, carbon dust. In conditions of conductive pollution in the environment, fit an air filter to the air intake of the cabinet. Where condensation is likely, for example, at low temperature, include a thermostatically controlled heater in the cabinet.

Use appropriate safety interlocks where personnel and/or equipment hazards exist. Install and operate this equipment in an enclosure appropriately rated for its intended environment.

At commissioning, ensure cybersecurity robustness of the installation.

Ensure all cables and wiring harness are secured using a relevant strain relief mechanism.

The application of this product requires expertise in the design and programming of Control/data management systems. Only persons with such expertise must be allowed to program, install, alter and commission this product.

During commissioning ensure all operating states and potential fault conditions are carefully tested.

Do not use, or implement a recorder/controller configuration (recording/control strategy) into service without ensuring the configuration has completed all operational tests, been commissioned and approved for service.

It is the responsibility of the person commissioning the recorder/controller to ensure the configuration is correct.

Failure to follow these instructions can result in death, serious injury or equipment damage.

About this Guide

This User Guide is intended to be a supplement to the standard Eurotherm 6100A/6180A Graphic Recorder User Guide HA028910. The 6100A/6180A Graphic Recorder User Guide is available as a free download at www.eurotherm.com/downloads/.

This User Guide has been designed to offer specific information about the 6180A standardized STLR+FRC solution, and its use within a pasteurization process. However, much of this manual can be used as a guide for similar Eurotherm standardized pasteurization solution recorder instrument variants.

- 6180A STLR+FRC
- 6180A STLR
- 6180A FRC
- 6100A STLR+FRC
- 6100A STLR
- 6100A FRC

All references to the pasteurized milk ordinance (PMO) are based on the U.S. Department of Health and Human Services Public Health Service Food and Drug Administration ‘Grade “A” Pasteurized Milk Ordinance’ 2019 revision.

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Background

The traditional use of paper-based chart records in the pasteurization industry is now considered to carry significant risks through data integrity challenges such as, attributability, legibility, accuracy, completeness, durability, and availability. Paper charts also incur unnecessary business costs and sustainability issues through the need for paper and pens, causing continuous spares management, maintenance, and environmental waste. Instead, best practice guidance advises the use of digital data recording solutions, which should comply with the requirements of the Grade “A” Pasteurized Milk Ordinance (PMO), FDA 21 CFR Part 11 standard for Electronic Records and Electronic Signatures, and the ALCOA+ data integrity principles.

The Eurotherm 6000 Series paperless graphic recorders are highly configurable instruments which can be used to record pasteurization critical control parameters. However, when used for this purpose, they must be ordered pre-configured for the specific pasteurization recording application. This standardized configuration helps to ensure the correct operation of the instrument in compliance with the recording criteria for public health controls in the Grade “A” Pasteurized Milk Ordinance (PMO) 2019 revision.

Available configurations:

- **6180A STLR+FRC:** standardized Safety Thermal Limit Recorder and Flow Recorder/Controller solution
- **6180A STLR:** standardized Safety Thermal Limit Recorder solution
- **6180A FRC:** standardized Flow Recorder/Controller solution
- **6100A STLR+FRC:** standardized Safety Thermal Limit Recorder and Flow Recorder/Controller solution
- **6100A STLR:** standardized Safety Thermal Limit Recorder solution
- **6100A FRC:** standardized Flow Recorder/Controller solution

Digital Data Recording

The 6180A paperless graphic recorder, pre-configured as a Eurotherm 6180A standardized STLR+FRC solution, offers users of pasteurization systems a relief from the inefficiencies associated with paper-based data management, and a migration path to an Industry 4.0 digitized data management solution.

All measured values connected to a 6180A STLR+FRC solution are updated every 125ms. However, for the standardized Eurotherm solution, the internal recording and display screen trend update rates are both set to 1 second. This results in approximately 15-30 days of data storage within the 6180A recorder’s internal flash memory. This data can be viewed via the display by using the History feature within the 6180A recorder.

Regional and federal pasteurization regulators can require that data be archived for two years, or longer. Therefore, a dairy plant can establish a secure data archiving network that will allow data records to be transferred to a secure data storage location (PC or server). This PC or server can host the Eurotherm Data Reviewer software for the purpose of data review, inspection, audit, export, and printing. The 6180A STLR+FRC solution can be programmed to push data files to a storage

location via Secure File Transfer Protocol (SFTP). Alternatively, the Eurotherm Data Reviewer software can be programmed to pull the data from the 6180A STLR+FRC.

The 6180A standardized STLR+FRC solution has been designed to aid compliance with the FDA 21 CFR Part 11 standard for securing electronic records and electronic signatures, as well as the ALCOA+ data integrity principles. Process data is recorded with a time stamp into a tamper-resistant file format and stored in non-volatile flash memory within the instrument. Additionally, metadata related to cut-in, cut-out, batch information, operator notes, and other events are also stored to provide contextual information about the data.

To assist dairy plants in becoming compliant with FDA 21 CFR Part 11 and ALCOA+ principles, including the tenets of secure electronic records and electronic signatures, all 6180A STLR+FRC users must have a unique User ID and Password. An operator is prompted to enter their User ID and Password before making any changes to the 6180A STLR+FRC. The operator User ID then becomes part of the 6180A standardized STLR+FRC solution audit trail and metadata, providing attributability for changes.

Figure 1 - 6180A STLR+FRC login window

Data Archiving

Process and contextual metadata are recorded by the 6180A STLR+FRC using the instrument's flash memory. This is a first-in-first-out memory that can hold 15-30 days of data history with the default configuration. Since most pasteurizers are required to retain data for a much longer period, data can be transferred to a PC or server for access as needed.

It is recommended that an Ethernet data network is installed to efficiently transfer data from the 6180A STLR+FRC to a data archiving location.

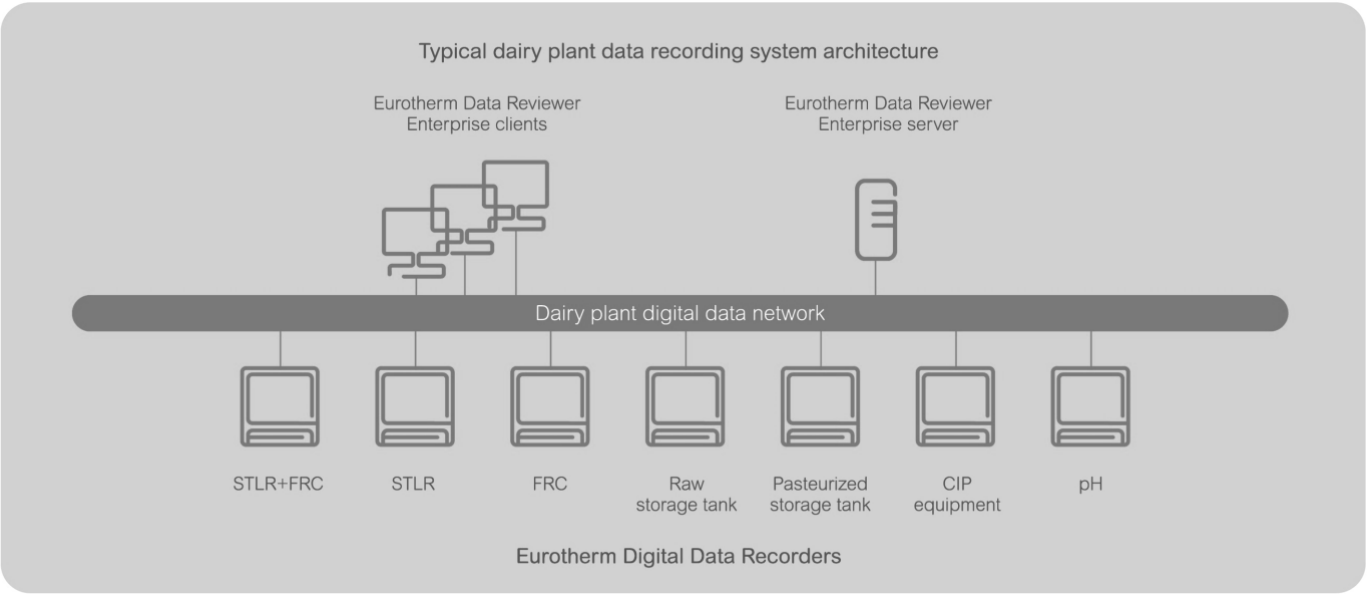

Figure 2 - Dairy plant digital data archiving network

Cybersecurity

Pasteurization is a critical process that should be assessed to reduce the risk of cyberattack. To remain compliant with the PMO, the network connection between the 6180A STLR+FRC and the data archiving point must remain secure. The 6180A STLR+FRC is available with secure file transfer protocol (SFTP), and Eurotherm offers a range of cybersecurity services to help secure the data archiving network.

www.eurotherm.com/industrial-cybersecurity

Sanitation

The 6180A STLR+FRC is rated at IP66. If required, an appropriate protective viewing cover can be used.

Security Sealing

To remain compliant with the PMO, the 6180A STLR+FRC offers the following methods for security sealing.

- For configuration security, a jumper must be applied across the rear terminals of the 6180A STLR+FRC solution (see "Configuration Disable" on figure 7 on page 16) to allow the edit and saving of configuration related parameters that are associated with any process variables being recorded.
- When the security jumper is not present, changes to the configuration via HMI, USB, or Ethernet will be disabled regardless of user ID level.
- The 6180A STLR+FRC solution also utilizes a rear cover that will prevent access to instrument wiring once a dairy industry security seal is applied (see Figure 3 on page 11)
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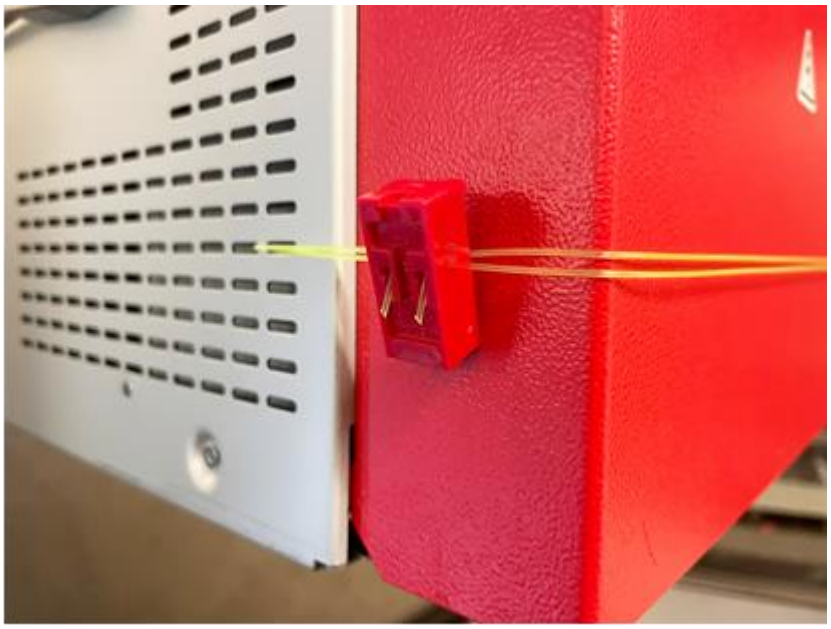


Figure 3 – Rear cover security seal example

- A standard dairy industry security seal can be applied to the 6180A STLR+FRC solution enclosure doors if access is not needed for other purposes.

6180A Recorder Navigation

On power up, the 6180A STLR+FRC will show the “Home” display, which is a Pasteurization Management view that includes a vertical trend of the STLR and FRC operation. There are six buttons for basic navigation.

Figure 4 – Basic navigation

- **Root Menu:** The Root Menu allows access to a Home button, which takes the user to the Home display (Pasteurization Management). The Root Menu also allows an operator to select a specific View by touching the Go to View button. Specific choices include Pasteurization Management, Vertical Trend, STLR Temp Sensors (if appropriate), Alarm Summary, Message Log and Batch Summary. For an individual with a configuration level password, the Root Menu is where access is gained to the configuration environment.
- **Options Menu:** The Options Menu provides a user with access to Batch, Operator Notes, Faceplate On/Off toggling, Channel Cycling (defaulted to On), and Enter History.
- **Groups Buttons:** The 6180A standardized STLR+FRC solution is configured with two groups. 6180A STLR+FRC (Group 1) and STLR Sensors (Group 2) can be viewed via these buttons.
- **Down Through Views:** This button scrolls from the Pasteurization Management (Home) view to the Vertical Trend view.
- **Up Through Views:** This button operates as the button above, but in the reverse order.

For more information on 6180A STLR+FRC navigation see section “6180A STLR+FRC Navigation” and the 6100A/6180A Graphic Recorder User Guide HA028910.

Messages and Operator Notes

Messages and Operator Notes are used to augment process data with contextual metadata. For more information about how to use Messages and Operator Notes refer to the 6100A/6180A Graphical Recorder User Guide HA028910.

Messages

Messages are date and time stamped. Messages in the 6180A standardized STLR+FRC fall into several categories.

- **System:** These are messages that detail changes to a configuration or system security.
- **Alarms:** This message type details the occurrence of channel alarms in the system. The Alarm Messages record the date and time that an alarm became active and the time that the alarm became inactive.
- **Power Up:** These messages record a date and time stamp for a power up condition.
- **Log in/out:** This message type records operators logging in and out of the 6180A STLR+FRC.
- **Auditor:** This message type records events related to the auditor feature.
- **Signing:** These messages record events where “signing” is required.
- **Batch:** This message type records the date and time stamp of the starting and stopping of a batch.
- **All Messages:** This button displays all messages from the above categories. This list can also show any custom messages that have been triggered.

6180A STLR Custom Messages

These Custom Messages are appended to the 6180A standardized STLR+FRC solution data file with a date and time stamp for the occurrence.

6180A standardized STLR+FRC solutions can be configured for °F or °C temperature measurement units.

- **Forward Flow Enabled:** This message is recorded when the pasteurization process switches from diverted flow to forward flow.
- **Product Flow Diverted:** This message is recorded when the pasteurization process switches from forward flow to diverted flow.
- **Process Cut-Out at xxx.x°F:** Cut-Out is the temperature at which the milk product is diverted for reprocessing if the pasteurization temperature is not met. When a temperature related Cut-Out occurs, this message will be recorded. The xxx.x represents the current temperature being read by the STLR sensor at Cut-Out.
- **Process Cut-In at xxx.x°F:** Cut-In is the temperature at which pasteurized milk is sent forward to the heat exchanger for cooling. When a temperature related Cut-In occurs, this message will be recorded. The xxx.x represents the current temperature being read by the STLR sensor at Cut-In.

6180A FRC Custom Messages

These Custom Messages are appended to the 6180A standardized STLR+FRC solution data file with a date and time stamp for the occurrence.

6180A standardized STLR+FRC solutions can be configured for gallons per minute (GPM), liters per minute (LPM), or some other suitable flow rate measurement units.

- **Forward Flow Enabled:** This message is recorded when the pasteurization process switches from diverted flow to forward flow.
- **Product Flow Diverted:** This message is recorded when the pasteurization process switches from forward flow to diverted flow.
- **Low Flow or Signal Loss:** This message is automatically recorded when the pasteurization flow rate falls below the low flow alarm setting.
- **High Product Flow:** This message is recorded when the pasteurization flow rate increases above the high flow alarm setting.
- **Process Cut-Out at xxx.xGPM:** For flow, Cut-Out is the flow rate (too high or too low) at which the milk product is diverted for reprocessing. This message is recorded when a flow related Cut-Out occurs. The xxx.x represents the current flow rate being read by the FRC flow sensor at Cut-Out.
- **Process Cut-In at xxx.xGPM:** For flow, Cut-In is the flow rate at which pasteurized milk is sent forward to the heat exchanger for cooling. This message will be recorded when a flow related Cut-In occurs. The xxx.x represents the current flow rate being read by the FRC flow sensor at Cut-In.

Operator Notes

Operator Notes are used to append key information to the pasteurization process metadata. These digital notes serve as an alternative to handwritten notes on paper charts.

Specifically, the PMO requires that the operator record the following information at the start of each pasteurization run.

- The temperature displayed by the STLR compared to the temperature displayed by the Indicating Thermometer or Digital Reference Thermometer (DRT).
- The temperature displayed by the Indicating Thermometer at Cut-Out.
- The temperature displayed by the Indicating Thermometer at Cut-In.

Operator Notes can be used to record these events.

Operator Notes can be written by using the 6180A STLR+FRC touchscreen or by optional, external USB keyboard.

For detailed information on Operator Notes, see the 6180A/6100A Graphic Recorder User Guide HA028910.

Alarm Summary

The Alarm Summary provides specific information related to the current alarm state. All alarm occurrences are recorded with a date and time stamp. The Alarm Summary can be reached from any view by touching the alarm beacon icon found at the top of the view.

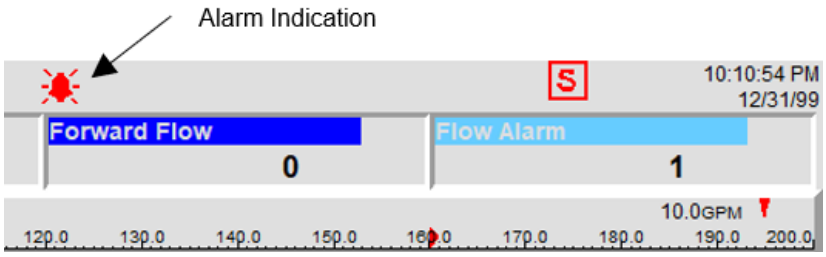


Figure 5 - Alarm indication

In the Alarm Summary example below, STLR Temperature has dropped below the low alarm Cut-Out level of 162.1°F. The red down arrow is indicating that this is a low alarm. Also, in this example, the FRC flow rate has exceeded the high alarm setting. The red up arrow is indicating that this is a high alarm.

Figure 6 - Alarm summary view

The alarms are non-latching. This means that an operator acknowledgement is not needed to clear the alarm.

All alarm occurrences are recorded as part of the instrument's metadata.

Audit Trail

To be compliant with the PMO guidelines for process data and metadata archiving, and to be compliant with industry requirements for secure electronic data recording and electronic signature, the 6180A STLR+FRC features Audit Trail capability.

The Audit Trail feature requires that before any change is made to the instrument, an operator must first login to the 6180A STLR+FRC. Second, an operator must create a note explaining why the instrument is being changed (batch start, seal check, cut-in, cut-out, shift start, shift end, STLR to Indicating Thermometer comparison, etc.). A record of the change will be appended to the data file.

This ensures attributability for recorded metadata.

More detail on the use of the Audit Trail function can be found in the 6100A/6180A Graphic Recorder User Guide HA028910.

6180A STLR+FRC Solution Wiring

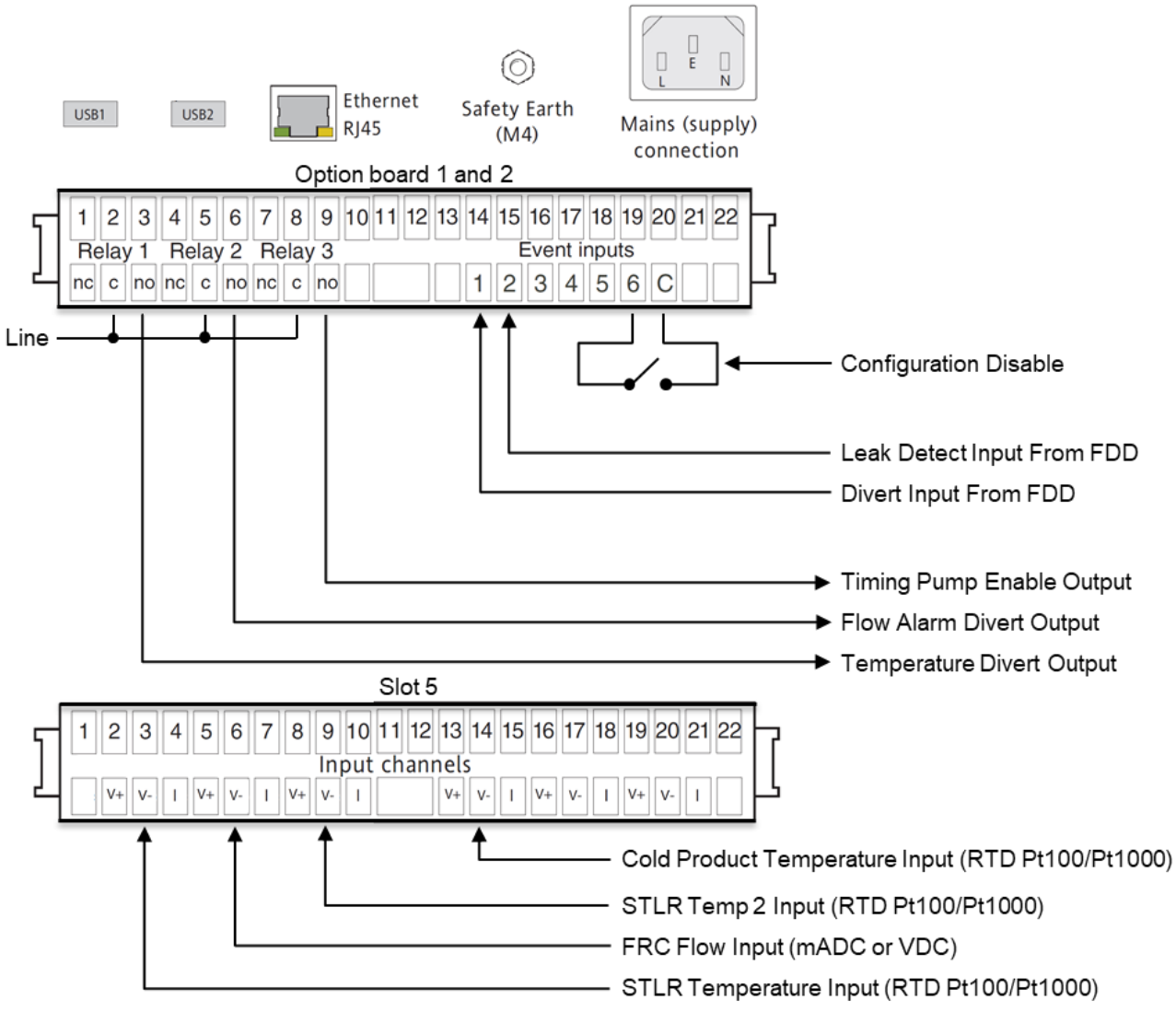


Figure 7 – 6180A standardized STLR+FRC solution wiring example

6180A STLR+FRC Solution Navigation

The navigation for the 6180A standardized STLR+FRC solution is described in this section.

The state of the pasteurization process can be monitored from two views found within the 6180A STLR+FRC. These two views are identified as Pasteurization Management (Home) and Vertical Trend. An optional third view is available for comparing the primary STLR temperature sensor to the secondary STLR temperature sensor (group 2). A 6180A STLR+FRC system with connections to/from external PID control loops may also have a view for accessing the PID (proportional, integral, derivative) control loop parameters.

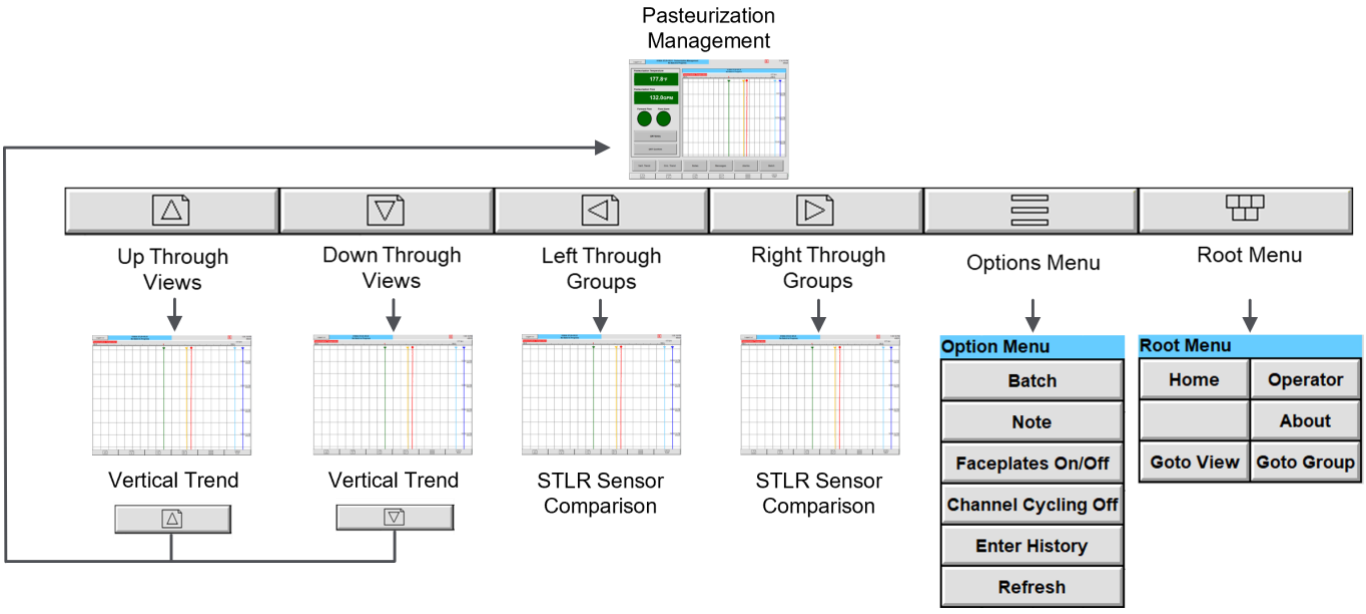


Figure 8 – 6180A standardized STLR+FRC solution navigation

Vertical Trend View

The Vertical Trend view can be reached from the Root Menu by selecting Go to View. For the Vertical Trend view, all new data will enter the view from the top.

All 6180A STLR+FRC views provide key information for managing the pasteurization process.

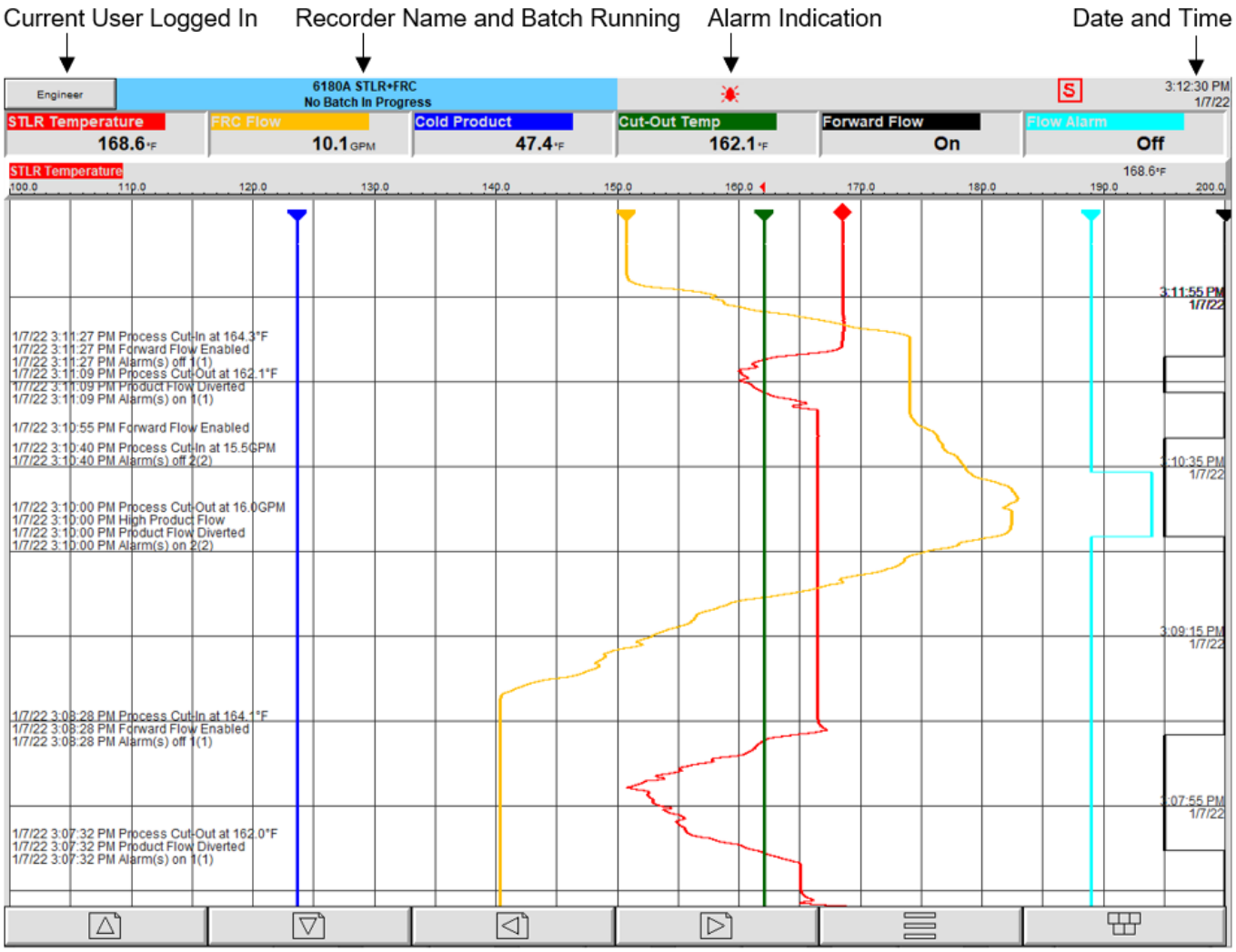


Figure 9 – 6180A standardized STLR+FRC solution view

Additionally, the Vertical Trend view provides the following information.

1. Faceplates at the top or side of the view for the values being trended.
    a. STLR Temperature
    b. STLR Temp 2 (optional)
    c. FRC Flow
    d. Cold Product (optional)
    e. Cut-Out Temp
    f. Forward Flow
    g. Flow Alarm
2. Channel cycling at the top of the view conveys a descriptor, span, alarm points, and value.
3. STLR Temperature in red. Within the STLR Temperature faceplate there is a left arrow on the scale indicating the Cut-Out setpoint (low alarm).
4. If fitted, the second STLR sensor temperature will be seen in orange.
5. FRC Flow in yellow. Within the FRC Flow faceplate there is a left arrow on the scale indicating the low flow alarm point, and a right arrow on the scale indicating the high flow alarm point.

6. If fitted, Cold Product will be seen in blue.
7. Cut-Out Temperature in green.
8. Forward Flow in black. Forward Flow is represented in the Vertical Trend as “1” for On or “0” for Off. The Forward Flow trace is offset to the far right of the viewing area (95 to 100%), so that it does not interfere with the viewing of other process values.
9. Flow Alarm in cyan. Flow Alarm is represented in the Vertical Trend as “1” for On or “0” for Off”. The Flow Alarm Flow trace is offset to the far right of the viewing area (89 to 94%), so that it does not interfere with the viewing of other process values.

Low Temperature Condition

As shown in Figure 10, when the STLR Temperature (red) drops below the Cut-Out Temp (green), the Forward Flow (black) moves from “1” to “0”.

This indicates that product flow has been diverted. As this is an alarm condition, an alarm beacon will be blinking at the top center of the view. Touching the alarm beacon will take an operator to the alarm summary.

Further indication of this new condition is conveyed in a message with a time and date stamp, which appears on the left side of the Vertical Trend view. This information is also recorded as part of the metadata. See section “How to Configure” for instructions on changing the Cut-Out Temp setting.

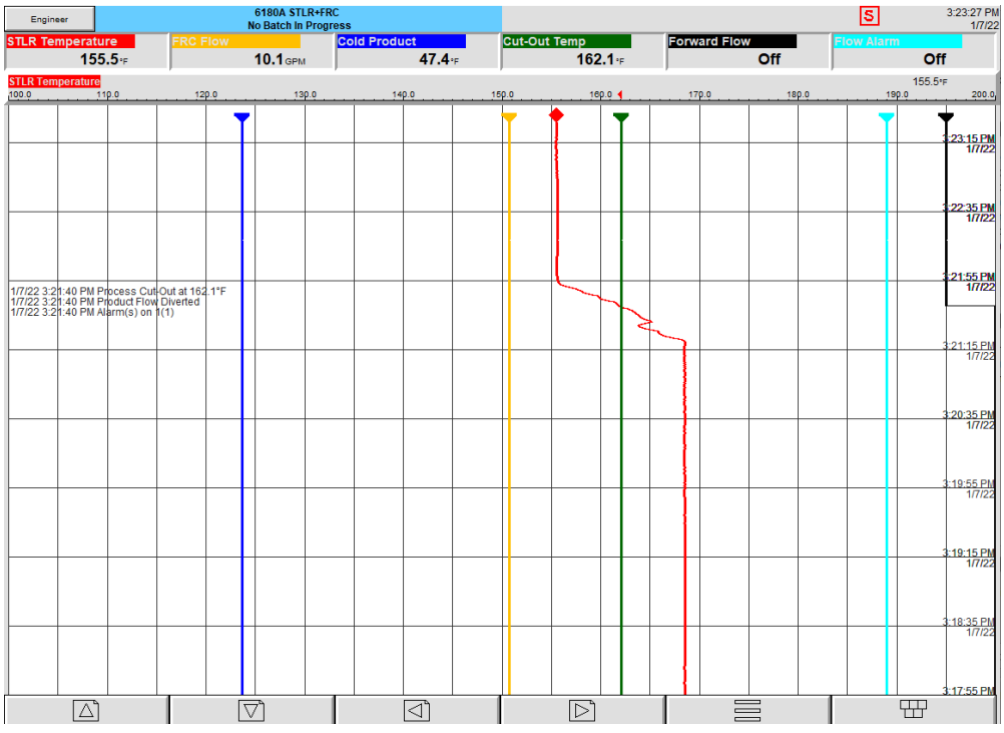


Figure 10 - 6180A standardized STLR+FRC solution trend during a temperature related Cut-Out

The 6180A STLR+FRC offers the use of a hysteresis setting that creates a dead band above the Cut-Out Temperature value. This dead band setting aids in preventing alarm “chatter” around a trigger point, helping to protect the Flow Diversion Device (FDD) from premature degradation. The 6180A standardized STLR+FRC solution is configured for a default hysteresis of 2°F (or metric equivalent). In this example, the pasteurization system will Cut-Out at 162.1°F, but it will not Cut-In until 164.1°F. When Cut-In occurs the messages on the Vertical Trend view will be “Forward Flow Enabled” and “Process Cut-In at 164.1°F” for a 6180A STLR+FRC configured for degrees Farenheit.

The Cut-Out Temperature hysteresis parameter can be changed by the dairy plant. See section “How to Configure” for instructions on changing the hysteresis parameter.

Low Pasteurization Flow Alarm

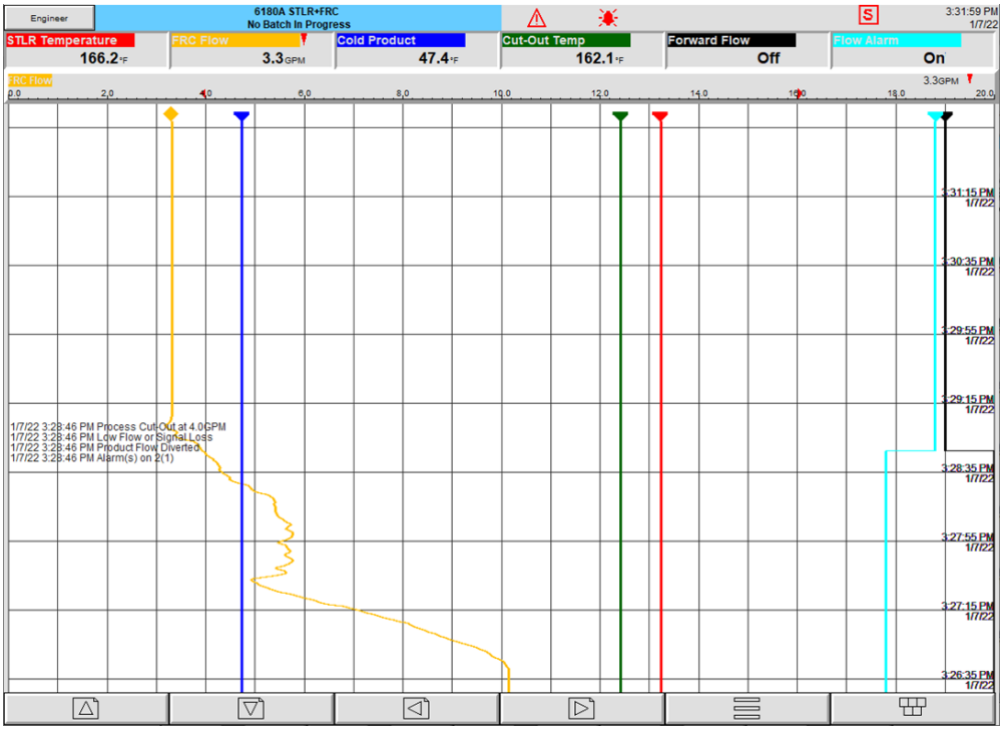
In the 6180A standardized STLR+FRC solution FRC Flow is set to a default range of 0.0 to 20.0GPM (or metric equivalent).

Figure 11 shows that when FRC Flow (yellow) drops below the default Low Product Flow Alarm setting of 4.0GPM, Forward Flow (black) moves from “1” to “0”, and Flow Alarm (cyan) moves from “0” to “1”.

This indicates that product flow has been diverted. Since this is an alarm condition, an alarm beacon will be blinking at the top center of the view. Touching the alarm beacon will take an operator to the alarm summary.

Further indication of this new condition is conveyed as text with a time and date stamp to the left side of the Vertical Trend view. This information is also part of the recorded metadata. For this change in condition the messages recorded will be “Low Flow or Signal Loss”, “Product Flow Diverted”, and “Process Cut-Out at 4.0GPM”. See section “How to Configure” for instructions on changing the Low Flow Alarm setting.

Figure 11 - 6180A standardized STLR+FRC solution trend during a flow related Cut-Out



The 6180A STLR+FRC offers the use of a hysteresis setting that creates a dead band above the Low Product Flow Alarm value. This dead band setting aids in preventing alarm “chatter” around a trigger point, helping to protect the FDD from premature degradation. The 6180A standardized STLR+FRC solution is configured for a default hysteresis of 0.2GPM (or metric equivalent) for flow alarms. In this example, the pasteurization system will Cut-Out at 4.0GPM, but it will not Cut-In until 4.2GPM. When this condition occurs the messages on the Vertical Trend view will be “Forward Flow Enabled” and “Cut-In at 4.2GPM”.

The FRC Flow span and hysteresis settings can be changed by the dairy plant. See section “How to Configure” for instructions on changing these settings.

High Pasteurization Flow Alarm

This condition is similar to the Low Pasteurization Flow Alarm. When FRC Flow (yellow) exceeds the default High Product Flow Alarm setting of 16.0GPM (or metric equivalent), Forward Flow (black) moves from “1” to “0”, and Flow Alarm (cyan) moves from “0” to “1”.

This indicates that product flow has been diverted. Since this is an alarm condition, an alarm beacon will be blinking at the top center of the view. Touching the alarm beacon will take an operator to the alarm summary.

Further indication of this new condition is conveyed as text with a time and date stamp to the left side of the Verticle Trend view. This information is also part of the recorded metadata. For this change in condition the messages recorded will be “High Product Flow”, “Product Flow Diverted”, and “Process Cut-Out at 16.0GPM”. See section “How to Configure” for instructions on changing the High Flow Alarm setting.

The 6180A STLR+FRC offers the use of a hysteresis setting that creates a dead band below the High Product Flow Alarm value. This dead band setting aids in preventing alarm “chatter” around a trigger point, helping to protect the FDD from premature degradation. The 6180A standardized STLR+FRC solution is configured for a default hysteresis of 0.2GPM (or metric equivalent) for flow alarms. In this example, the pasteurization system will Cut-Out at 16.0GPM, but it will not Cut-In until 15.8GPM. When this condition occurs the messages on the Vertical Trend view will be “Forward Flow Enabled” and “Process Cut-In at 15.8GPM”.

The PMO standards require a minimum delay equal to the holding time of the pasteurizer (typically 15 seconds) before returning from a high flow condition. See section “How to Configure” for instructions on changing the value of this timer.

FDD Feedback

The 6180A standardized STLR+FRC solution is fitted with a dry (passive) contact input that is configured to recognize a divert signal from the FDD. When this input is active the message provided will be “Product Flow Diverted”. The Forward Flow (black) trace will move from “1” to “0”. When this input is inactive the message provided will be “Forward Flow Enabled”. The Forward Flow (black) trace will move from “0” to “1”. See Figure 11.

Signals from an FDD can be Vac. A control relay and socket must be used to convert the ac voltage signal from the FDD to a dry contact closure.

DANGER

HAZARD OF ELECTRICAL SHOCK, EXPLOSION OR ARC FLASH

Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See applicable national standards e.g. NFPA70E, CSA Z462, BS 7671, NFC 18-510.

Electrical equipment must be installed, operated and maintained by only suitably qualified personnel.

Refer to manual for installation and servicing.

Turn off all power supplying this equipment before working on the loads of the equipment.

This product must be installed, connected and used in compliance with prevailing standards and/or installation regulations.

Do not exceed the device's ratings.

Power line and output circuits must be wired and fused in compliance with local and
national regulatory requirements for the rated current and voltage of the particular equipment, i.e. UK, the latest IEE wiring regulations, (BS7671), and USA, NEC class 1 wiring methods.

Ensure all cables and wiring harness are secured using a relevant strain relief mechanism.

Use appropriate safety interlocks where personnel and/or equipment hazards exist.

Always use a properly rated voltage sensing device to confirm power is off.

Failure to follow these instructions will result in death or serious injury.

Pasteurization Management (Home) View

The 6180A standardized STLR+FRC solution is fitted with a custom Pasteurization Management view which can better convey key operational aspects of the pasteurization process.

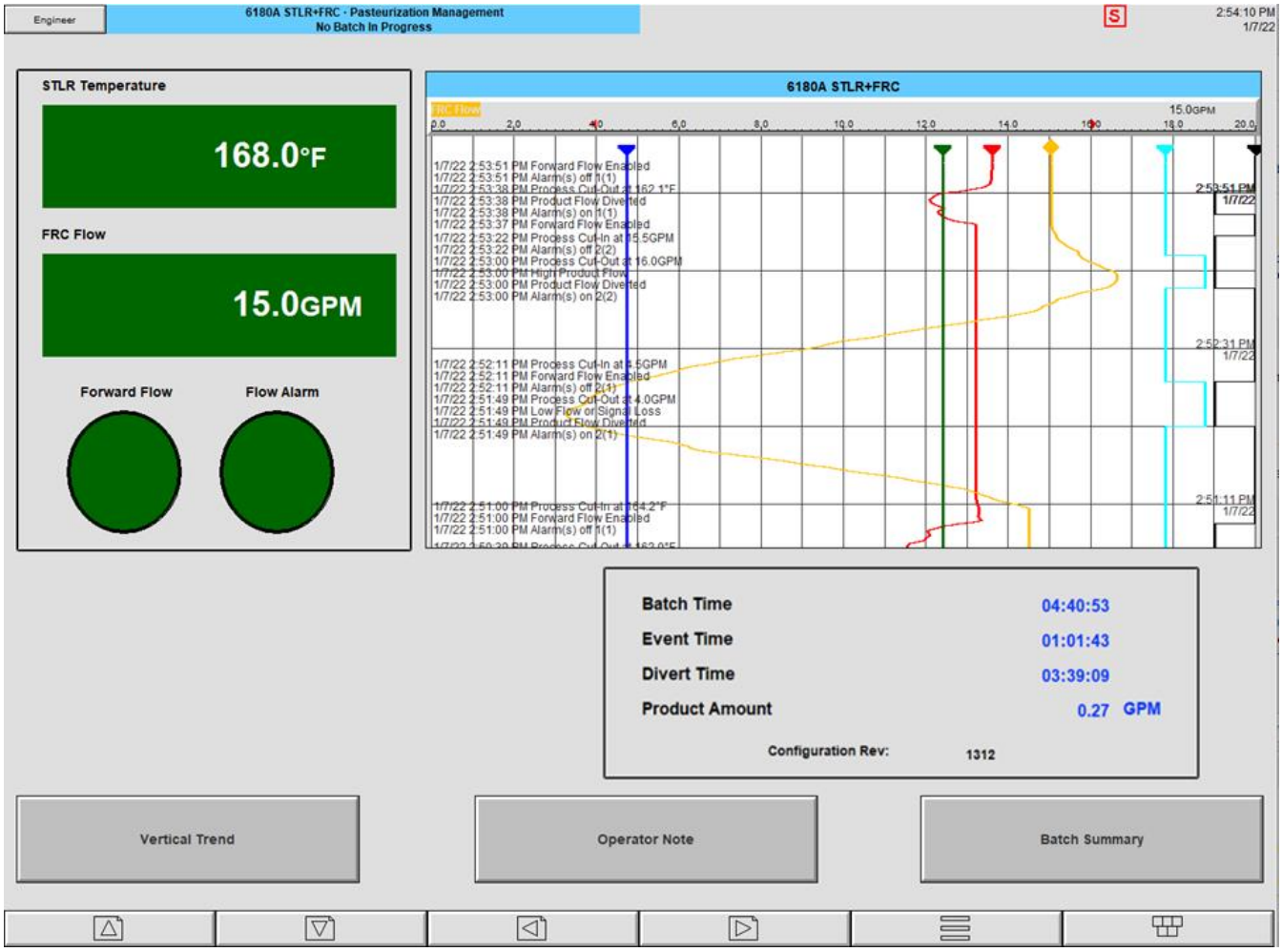


Figure 12 – Pasteurization Management view

This view offers a smaller Vertical Trend view and features navigation buttons for accessing key operational functions.

Also presented is an Alarm Panel view of STLR Temperature, FRC Flow, Forward Flow and Flow Alarm. Within this view the graphical elements of these values will change color dependent on their status. Red or yellow represents an alarm condition. Green indicates no alarms.

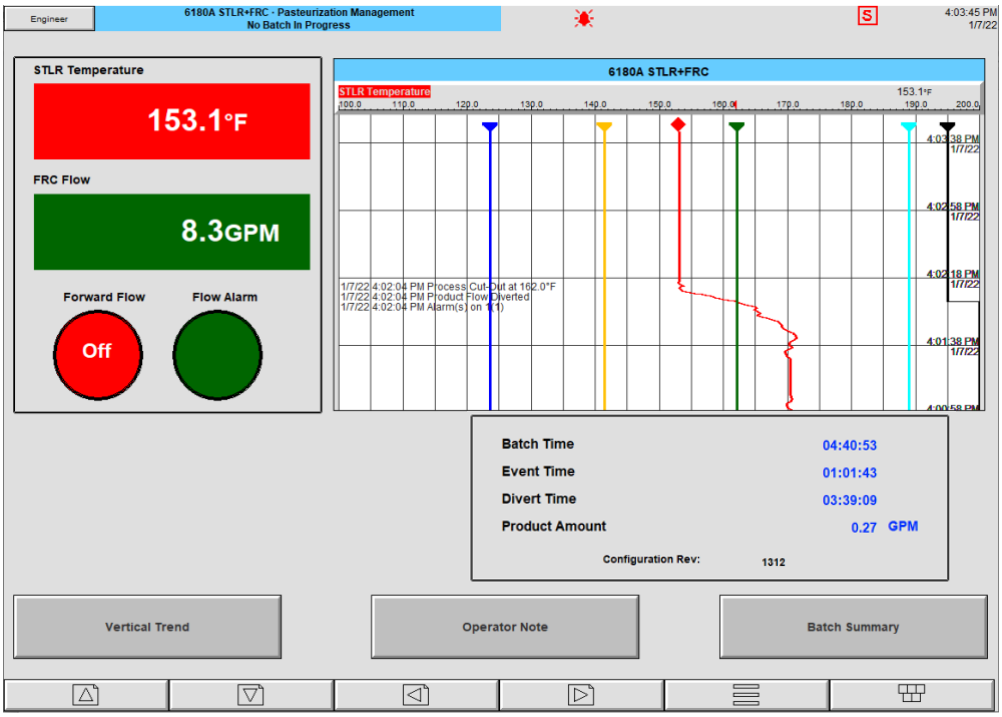


Figure 13 - Cut-Out due to low temperature

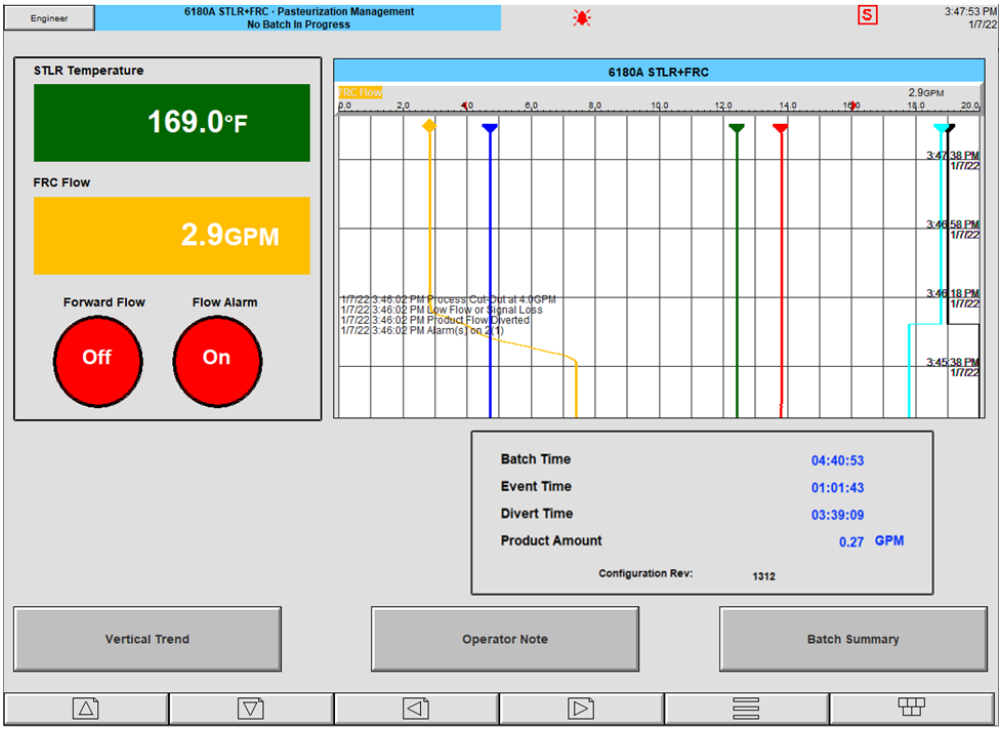


Figure 14 - Cut-Out due to low flow rate

Figure 15 - Cut-Out due to high flow rate

PMO Test: Comparing STLR to Indicating Thermometer

The PMO requires that a pasteurizer operator perform a comparison of the STLR temperature reading, to the temperature measured by the Indicating Thermometer. This can be done from this view using the Operator Notes button.

PMO Test: Indicating Thermometer at Cut-Out

The PMO requires that a pasteurizer operator perform a test where the temperature reading of the Indicating Thermometer is recorded at Cut-Out. This can be done from this view using the Operator Notes button.

PMO Test: Indicating Thermometer at Cut-In

The PMO requires that a pasteurizer operator perform a test where the temperature reading of the Indicating Thermometer is recorded at Cut-In. This can be done from this view using the Operator Notes button.

Equipment Performance Information – 6180A only

The Batch feature within the 6180A standardized STLR+FRC solution offers performance information that can be used to calculate pasteurizer equipment performance.

Once a new batch is started, the Pasteurization Management view displays the elapsed Batch Time. Event Time (forward flow time) and Divert Time (diverted flow time) are also displayed. This information allows the dairy plant to have a reference for the equipment performance and pasteurizer productivity.

Batch Time, Event Time and Divert Time are stopped when the batch is ended. These values are reset when a new batch is started.

The 6180A standardized STLR+FRC solution also calculates the total amount of product produced in the batch. This is accomplished using the totalizer function. Product totalization will be increased or decreased based on the flow rate.

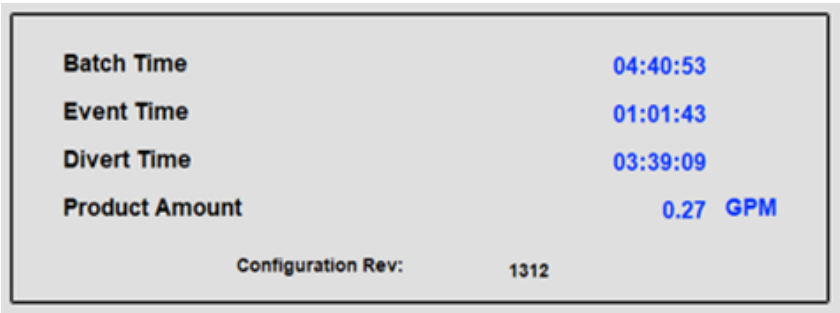


Figure 16 - Performance information

Configuration Tracking

Within the performance information is a configuration reference number. This number is automatically incremented when the 6180A STLR+FRC configuration is changed. This configuration reference number can optionally be used by the dairy plant and local inspectors to ensure that the instrument's configuration has not been changed between inspections.

Batch Recording

The 6180A standardized STLR+FRC solution offers a Batch recording feature. High-temperature-short-time (HTST), higher-heat-shorter-time (HHST), and ultra-high-temperature (UHT) continuous pasteurization processes can be considered to have "batch" characteristics. These processes have a start, and although they can run longer, producing higher volumes, they eventually have a stop. The use of the Batch feature is important for a digitized pasteurization process, because it records key metadata required by the PMO standards.

A new batch can be started by touching the cyan colored banner at the top of any view, from the Options Menu, or from a dedicated button on the Pasteurization Management view. Before starting a new batch, an operator must Log In to the 6180A STLR+FRC.

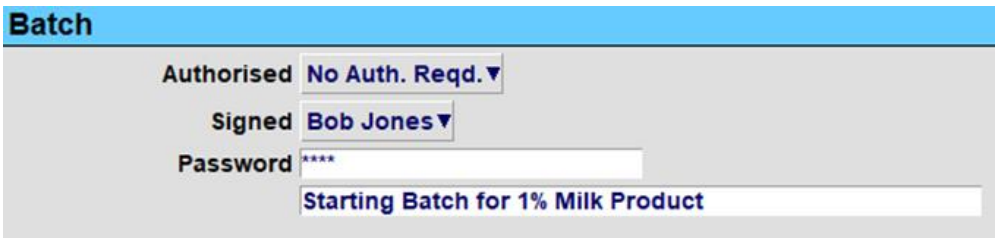


Figure 17 - Starting a Batch

After Log In has been completed an operator can enter the details associated with the new batch.

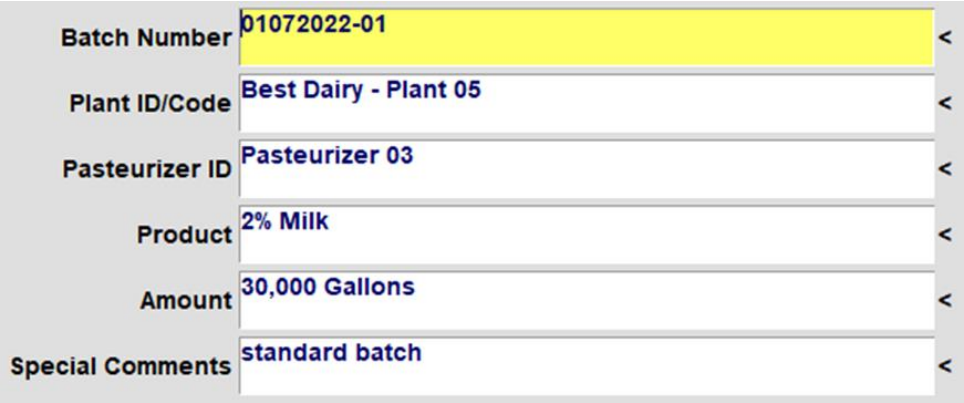


Figure 18 - Batch details

There are six fields that can be used to provide details about a batch. Most of this information is required as per PMO standards.

- **Batch Number:** A Batch Number can be used by the plant to identify the data associated with a specific batch. In the default 6180A standardized STLR+FRC solution configuration the Batch Number is included in the file name of the archived metadata.
- **Plant Name/Locale:** Allows an operator to record the plant name (or code) and location.
- **Pasteurizer ID:** Allows an operator to detail which pasteurization system was used to produce the batch.
- **Product Type:** For entering a description of the product being pasteurized
- **Amount:** Allows the operator to enter the amount of product to be pasteurized.
- **Special Comments:** This field is reserved for any special comments to be made by an operator, as required by the dairy plant standard operating procedures (SOP).

The batch can be started once this information has been entered.

A plant can make changes to the definition of these six Batch field entries, but care must be taken to ensure that PMO standard compliance is maintained.

More details on how to use the Batch feature can be found in the 6100A/6180A Graphical Recorder User Guide HA028910.

Data History

The Vertical Trend view offers a real-time window to the pasteurization process. The recording speed and the trend speed of the 6180A standardized STLR+FRC solution are configured to 1 second intervals. The trend speed will dictate how much real-time data is visible. However, the 6180A STLR+FRC records data into flash memory, and that data can represent 15-30 days of information, or “history”.

The historical data can be accessed from the Options Menu, or by continually touching the 6180A STLR+FRC display for 2 to 3 seconds. The view presented is a Vertical Trend display. However, the presence of a gray background indicates that the 6180A STLR+FRC is showing historical data, rather than real-time data.

The recorded History can be scrolled through using the slider bar at the right-side of the view. Sliding down will look further into the past.

The History view also offers a feature that allows an operator to touch the screen to display a horizontal cursor. This cursor line can be dragged up and down within the view in order to display the specific time that an event occurred.

Figure 19 shows the horizontal cursor at the point when the STLR Temperature (red) crosses the Cut-Out Temp (green), and the Forward Flow (black) changes to the diverted position. The date and time that this Cut-Out event occurred (precisely at 2:15:09PM on November 8th, 2020) can be seen on the right of the Channel faceplate.

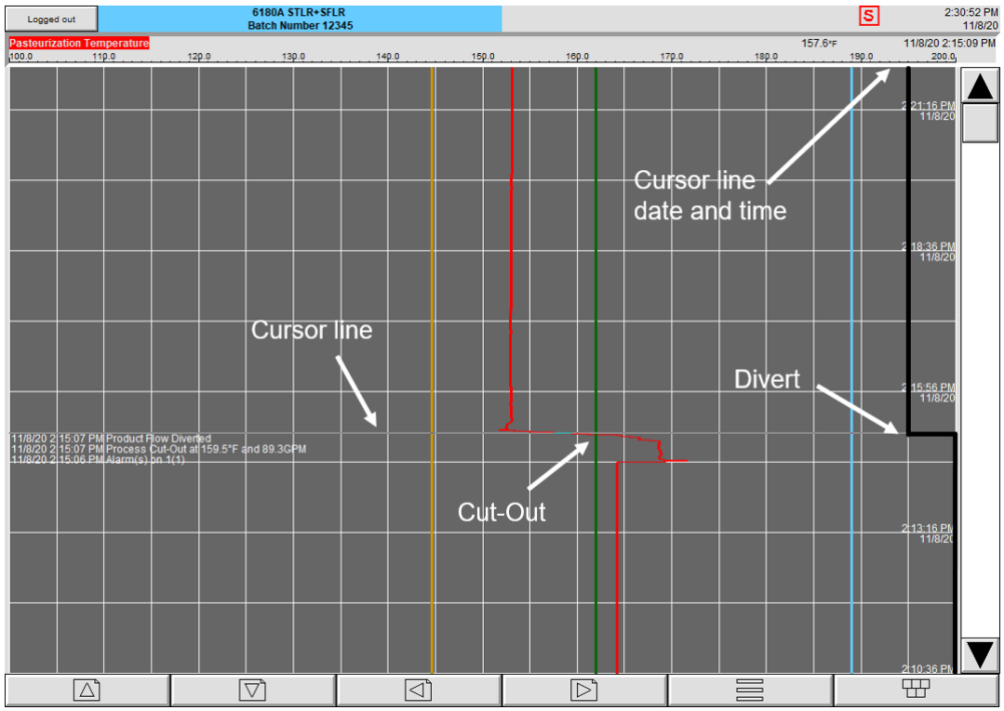


Figure 19 - History mode

Eurotherm Data Reviewer

The Eurotherm Data Reviewer software is a comprehensive software tool that allows access to tamper resistant UHH data files created by the 6180A STLR+FRC solution.

- **Import**: Data can be imported using SFTP via Ethernet communications directly from the instrument or from an SFTP server.
- **Find:** Data is automatically organized by group and batch and can be further searched using other date/name parameters.
- **Display:** Data can be accessed quickly and viewed as either a horizontal linear trend or a circular chart trend.
- **Analyze:** Review data in greater detail using graphical dual cursor mode
- **Report**: Print graph data, event logs, and messages as a PDF report. Data can also be exported in CSV format if needed.
- **Audit:** Achieve a central point of data archiving that supports the ALCOA+ principles of data being attributable, legible, contemporaneous, original, and accurate.

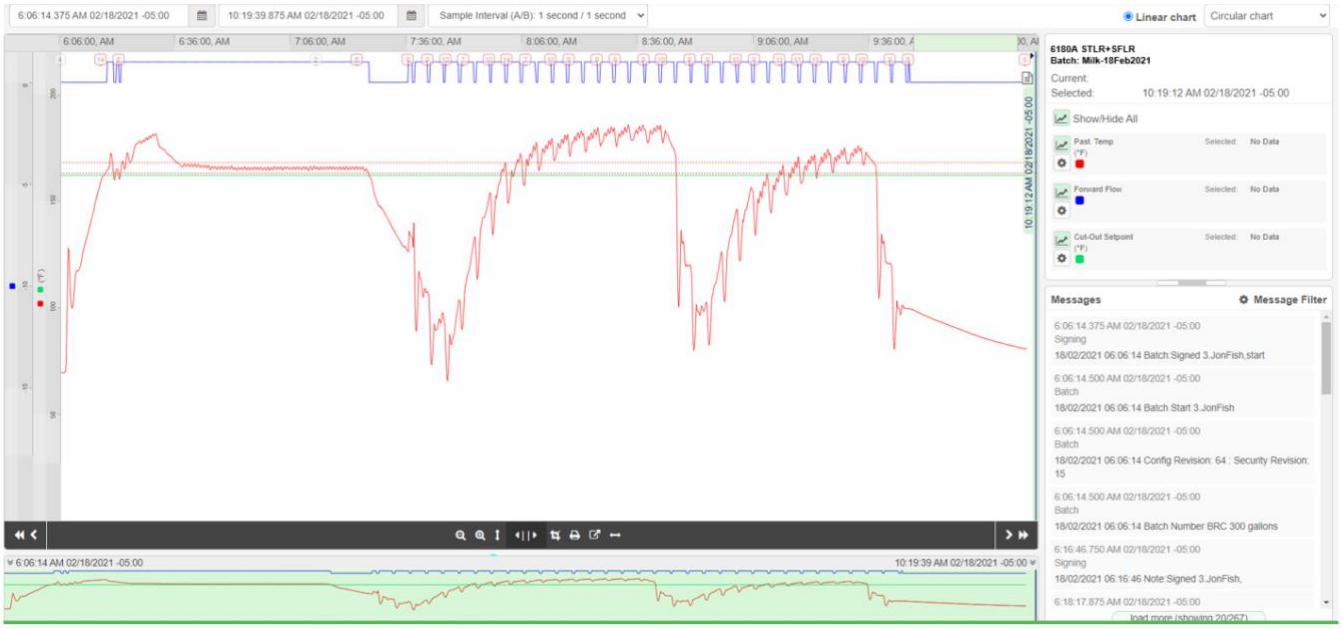


Figure 20 – Linear chart trend visualization

For more information on Eurotherm commitment to Data Integrity visit:

www.eurotherm.com/data-integrity-ls.

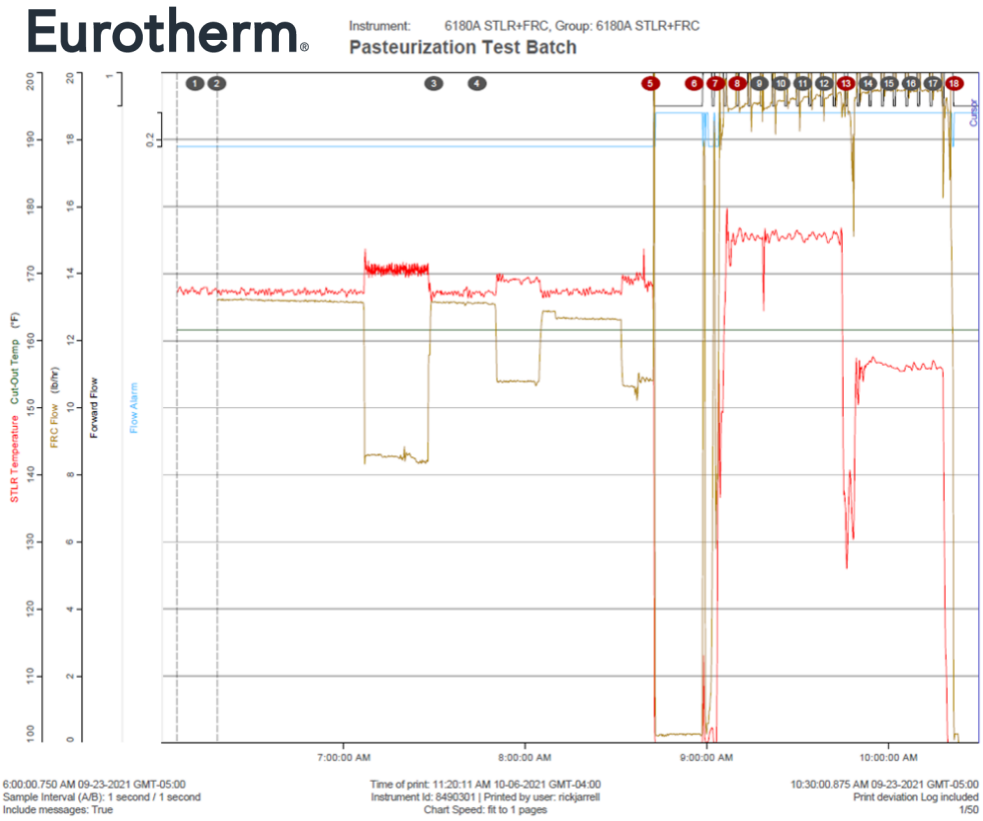
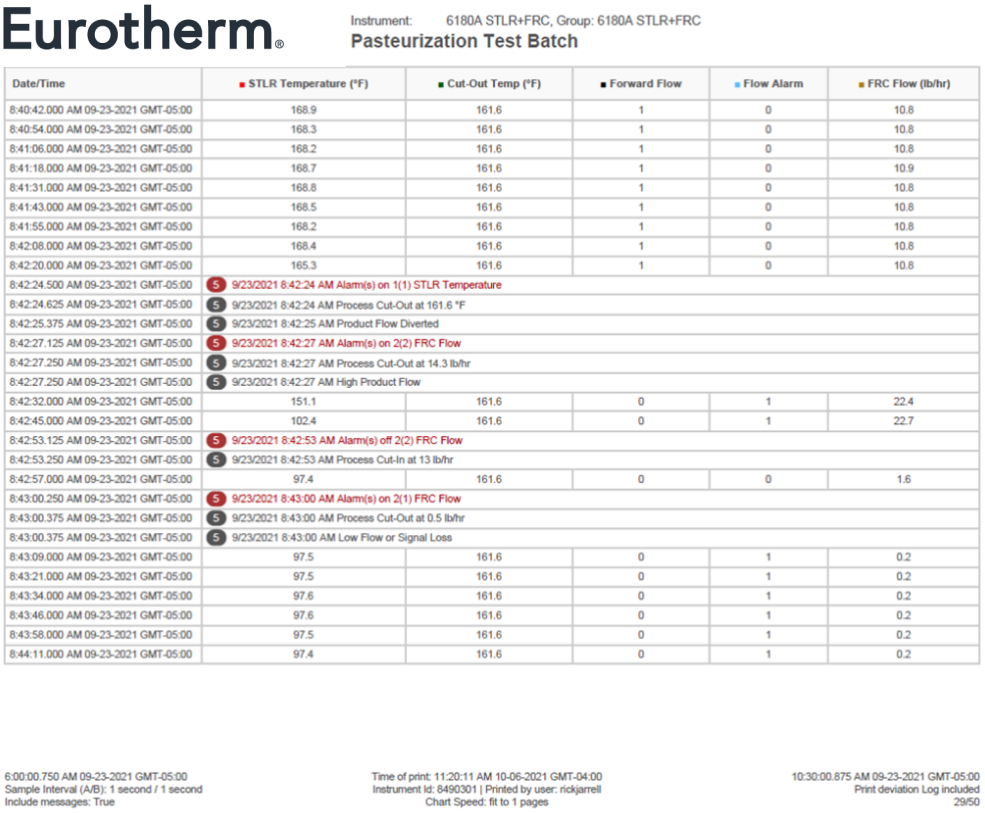


Figure 21 - Trend data report



Date/Time	STLR Temperature (°F)	Cut-Out Temp (°F)	Forward Flow	Flow Alarm	FRC Flow (lb/hr)
8:40:42.000 AM 09-23-2021 GMT-05:00	168.9	161.6	1	0	10.8
8:40:54.000 AM 09-23-2021 GMT-05:00	168.3	161.6	1	0	10.8
8:41:06.000 AM 09-23-2021 GMT-05:00	168.2	161.6	1	0	10.8
8:41:18.000 AM 09-23-2021 GMT-05:00	168.7	161.6	1	0	10.9
8:41:31.000 AM 09-23-2021 GMT-05:00	168.8	161.6	1	0	10.8
8:41:43.000 AM 09-23-2021 GMT-05:00	168.5	161.6	1	0	10.8
8:41:55.000 AM 09-23-2021 GMT-05:00	168.2	161.6	1	0	10.8
8:42:08.000 AM 09-23-2021 GMT-05:00	168.4	161.6	1	0	10.8
8:42:20.000 AM 09-23-2021 GMT-05:00	165.3	161.6	1	0	10.8
8:42:24.500 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:24 AM Alarm(s) on 1(1) STLR Temperature				
8:42:24.625 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:24 AM Process Cut-Out at 161.6 °F				
8:42:25.375 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:25 AM Product Flow Diverted				
8:42:27.125 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:27 AM Alarm(s) on 2(2) FRC Flow				
8:42:27.250 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:27 AM Process Cut-Out at 14.3 lb/hr				
8:42:27.250 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:27 AM High Product Flow				
8:42:32.000 AM 09-23-2021 GMT-05:00	151.1	161.6	0	1	22.4
8:42:45.000 AM 09-23-2021 GMT-05:00	102.4	161.6	0	1	22.7
8:42:53.125 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:53 AM Alarm(s) off 2(2) FRC Flow				
8:42:53.250 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:42:53 AM Process Cut-In at 13 lb/hr				
8:42:57.000 AM 09-23-2021 GMT-05:00	97.4	161.6	0	0	1.6
8:43:00.250 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:43:00 AM Alarm(s) on 2(1) FRC Flow				
8:43:00.375 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:43:00 AM Process Cut-Out at 0.5 lb/hr				
8:43:00.375 AM 09-23-2021 GMT-05:00	S 9/23/2021 8:43:00 AM Low Flow or Signal Loss				
8:43:09.000 AM 09-23-2021 GMT-05:00	97.5	161.6	0	1	0.2
8:43:21.000 AM 09-23-2021 GMT-05:00	97.5	161.6	0	1	0.2
8:43:34.000 AM 09-23-2021 GMT-05:00	97.6	161.6	0	1	0.2
8:43:46.000 AM 09-23-2021 GMT-05:00	97.6	161.6	0	1	0.2
8:43:58.000 AM 09-23-2021 GMT-05:00	97.5	161.6	0	1	0.2
8:44:11.000 AM 09-23-2021 GMT-05:00	97.4	161.6	0	1	0.2

Figure 22 - Numerical data report

Dual STLR Sensors (optional)

Some pasteurization systems utilize dual sensors and allow for a second STLR temperature sensor to be read by the STLR. The 6180A STLR+FRC solution can be configured for a second sensor input.

The primary and secondary STLR sensors can be viewed on the STLR Sensors view.

The 6180A standardized STLR+FRC solution configuration will record an alert message when the difference between the STLR Temperature sensor and STLR Temp 2 sensor exceeds 1.5°F (or metric equivalent). A warning message is recorded when the difference between the STLR Temperature sensor and the STLR Temp 2 sensor exceeds 2°F (or metric equivalent).

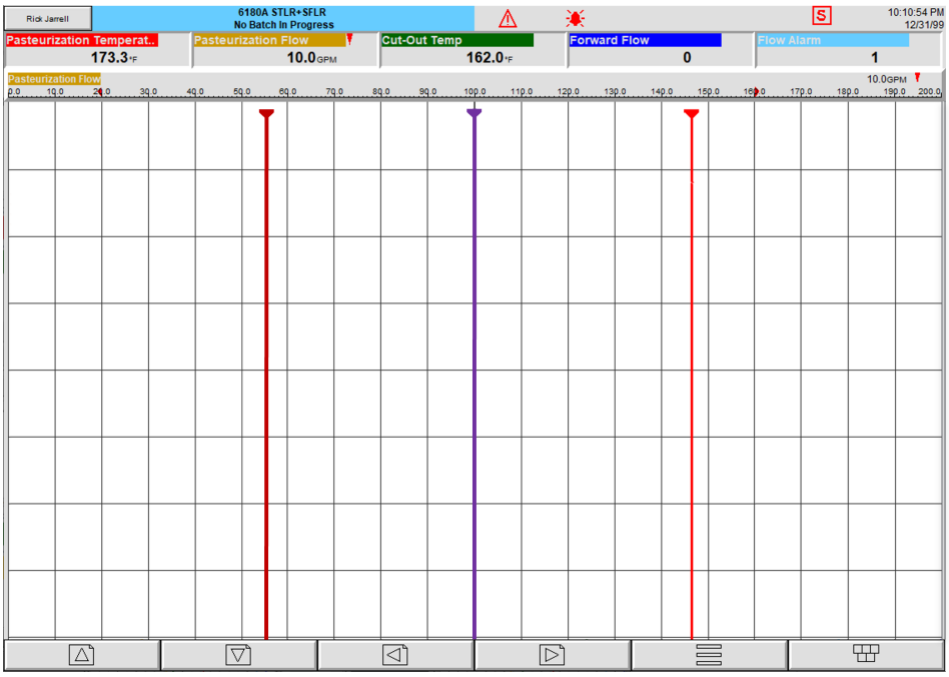


Figure 23 - STLR temperature sensor comparison view

- Red trace: STLR Temperature
- Violet trace: difference between STLR Temperature and STLR Temp 2
- Orange trace: STLR Temp 2

Cold Product Sensor (optional)

The 6180A standardized STLR+FRC solution can be configured to recognize and record a Cold Product temperature sensor. In the default configuration for the 6180A standardized STLR+FRC solution, the Cold Product is represented by a blue trace.

Multiple Cut-Out Setpoints (optional)

The 6180A standardized STLR+FRC solution can be configured to use multiple Cut-Out Temperature setpoints. The selection of a Cut-Out setpoint can be achieved using event buttons or dry contact inputs.

6180A STLR+FRC Test Examples

In dairy plant environments there can be a requirement for regular pasteurizer testing by a Dairy Technical Specialist from a regional regulatory agency as outlined in Appendix I of the PMO. Pasteurization system testing requirements may be as often as four times per year. This section is designed to offer testing recommendations for the 6180A standardized STLR+FRC solution for compliance to the PMO Appendix I.

Using the Batch feature while performing tests allows test results/details added as Messages and Operator Notes to be recorded with the test data.

STLR Sensor and Indicating Thermometer

See the PMO, Appendix I, Test 2, for more specific details on this test.

1. Stabilize a hot water bath, or suitable temperature source, to a level above pasteurization temperature.
2. Compare the measurement of the Indicating Thermometer to the measurement of the STLR temperature sensor.
3. The STLR must read within 1.0°F (0.5°C) of the Indicating Thermometer, but the STLR must not read higher than the Indicating Thermometer.
4. To adjust the STLR to be within 1.0°F (0.5°C) of the Indicating Thermometer, see section “How to Configure” for instructions on this procedure.
5. Use Operator Notes to record test notes.

STLR Time Accuracy

See the PMO, Appendix I, Test 3, for more specific details on this test.

1. Confirm that the 6180A STLR+FRC has the correct date and time configured. See the 6100A/6180A Graphic Recorder User Guide HA028910 for instructions on setting date and time.
2. On the 6180A STLR+FRC display, make a note of the time in the right top corner of any view.
3. Using a known timing reference, start counting time.
4. After 30 minutes have passed, compare the known timing reference to the time on the 6180A STLR+FRC. Verify that 30 minutes have passed, and that the 6180A STLR+FRC is displaying the appropriate time.
5. Use Operator Notes to record test notes.

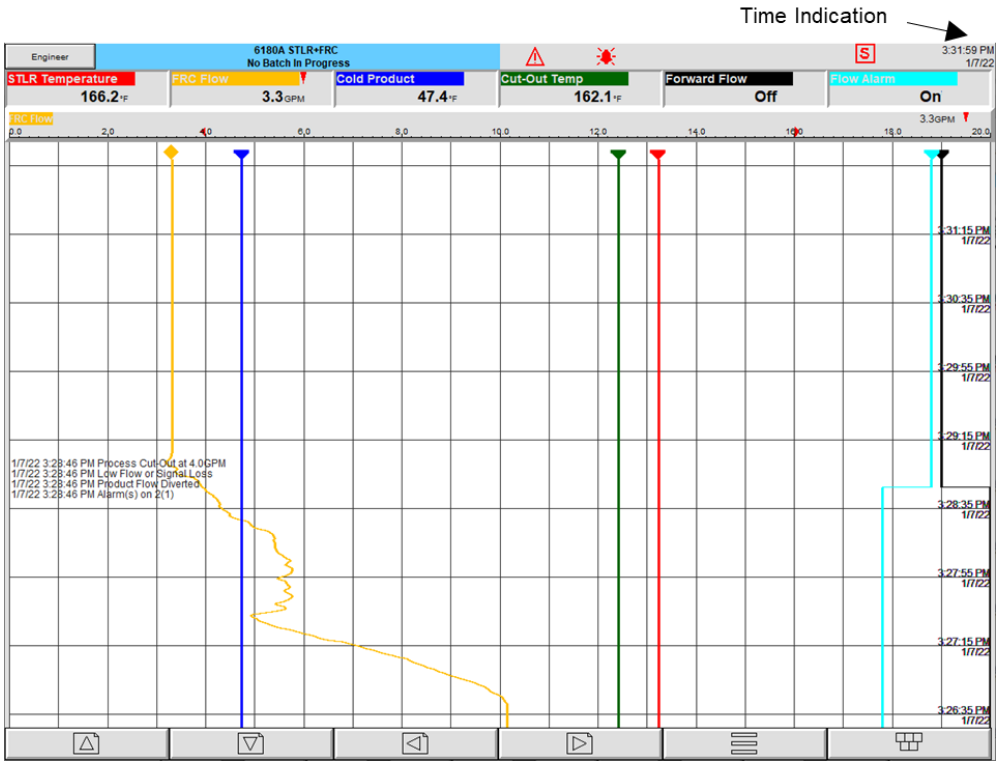


Figure 24 - Time accuracy testing

STLR Sensor and Indicating Thermometer (in process)

See the PMO, Appendix I, Test 4, for more specific details on this test.

1. As per the PMO, the STLR must never read a higher temperature than the Indicating Thermometer.
2. With the system in a stable condition, compare the Indicating Thermometer temperature measurement to the STLR temperature measurement. Record this comparison using Operator Notes. A suitable note could read “PMO: DRT = 164.3°F compared to STLR of 163.9°F”.
3. To adjust the STLR to be within 1.0°F (or metric equivalent) of the Indicating Thermometer, see section “How to Configure” for instructions on this procedure.
4. Use Operator Notes to record test notes.

Timing Pump Enabling

See the PMO, Appendix I, Test 5.4, for more specific details on this test.

1. Disable the Flow Divert Valve (FDV) so that it remains in the forward flow position.
2. Decrease pasteurization temperature until the 6180A STLR+FRC senses a Cut-Out condition. With the FDV disabled, forward flow will continue, even though Cut-Out has occurred.
3. Verify that the timing pump and all forward flow related devices have been disabled.
4. Use Operator Notes to record test notes.

Manual Divert

See the PMO, Appendix I, Test 5.5, for more specific details on this test.

1. Establish normal pasteurizer operation (forward flow).
2. Press the manual divert button/switch.
3. Verify from one of the 6180A STLR+FRC views that Forward Flow = “0”, indicating that flow is diverted.
4. From the 6180A STLR+FRC Vertical Trend view, or from the Message Log (via Root Menu and Goto View), verify that the following messages have been created.
    a. Product Flow Diverted
    b. Process Cut-Out at xxx.x°F
5. Verify that the FDD immediately diverts.
6. Use Operator Notes to record test notes.

Divert Response Time

See the PMO, Appendix I, Test 5.6, for more specific details on this test.

1. Establish normal pasteurization operation (forward flow).
2. Reduce the temperature of the hot water supply or remove the STLR temperature sensor from the pasteurization process to allow the STLR temperature to drop below the Cut-Out value.
3. Start timing when the 6180A STLR+FRC indicates Cut-Out (Forward Flow = “0”).
4. Stop timing when the FDD is fully diverted.
5. The elapsed time must not exceed 1 second.
6. The automated messages created by the 6180A standardized STLR+FRC solution can be used to measure the time between the activation of the Cut-Out alarm, and the change to the divert state by the FDD.
7. Use Operator Notes to record test notes.

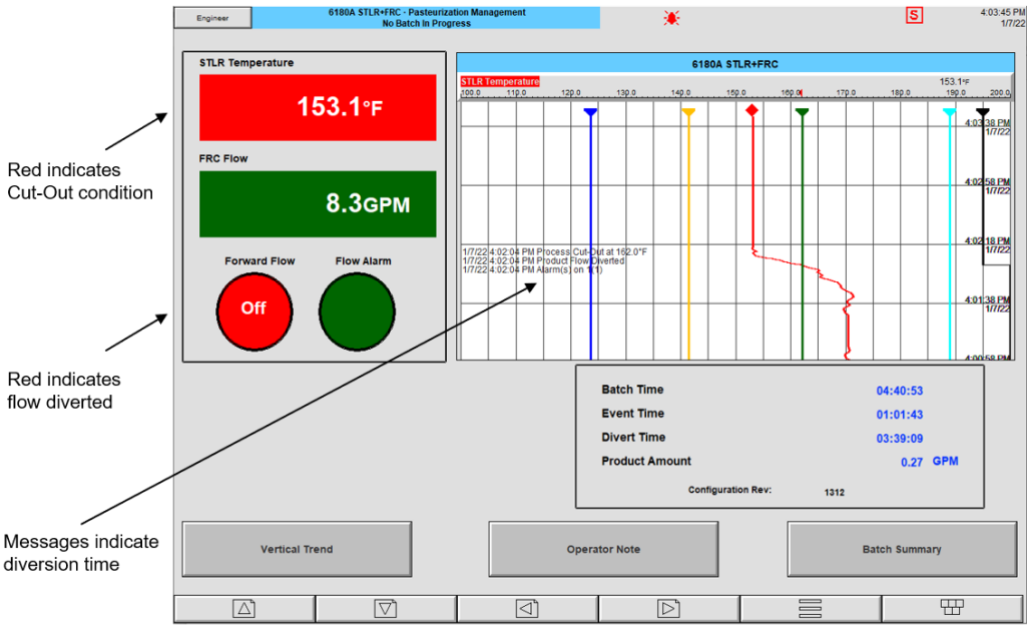


Figure 25 - Divert response time

STLR Temperature Sensor Response Time

See the PMO, Appendix I, Test 8, for more specific details on this test.

1. Heat an agitated water bath to 7°F (or its metric equivalent) above Cut-In temperature.
2. Place the STLR temperature sensor in the water bath.
3. Start a timer when the STLR temperature sensor is 12°F (or its metric equivalent) below the Cut-In temperature.
4. Stop the timer at Cut-In.
5. Elapsed time must not exceed 5 seconds.
6. If elapsed time is too long, consider replacing the STLR temperature sensor.
7. Use Operator Notes to record test notes.

STLR Cut-In and Cut-Out

See the PMO, Appendix I, Test 10, for more specific details on this test.

For this test example it is assumed that the 6180A standardized STLR+FRC solution is configured for a Cut-Out Setpoint of 162.1°F and a hysteresis value of 2.0°F. For these settings Cut-In will occur at 164.1°F and Cut-Out will occur at 162.1°F.

1. Determine the desired hysteresis between Cut-Out and Cut-In. See section “How to Configure” for instructions on changing the Cut-In hysteresis value.
2. Place the STLR temperature sensor and Indicating Thermometer in an agitated water bath.
3. Slowly warm the water bath at a rate not to exceed 1°F per 30 seconds.
4. Document the Indicating Thermometer temperature at the time Forward Flow (Cut-In) occurs and record as a note on the chart.

5. From the 6180A STLR+FRC Vertical Trend view, or from the Message Log (via Root Menu and Goto View), verify that the following messages have been created.
    a. Forward Flow Enabled
    b. Process Cut-In at 164.1°F
6. Slowly cool the water bath at a rate not to exceed 1°F per 30 seconds.
7. Document the Indicating Thermometer temperature at the time Forward Flow is diverted (Cut-Out) and record as a note on the chart.
8. On the 6180A STLR+FRC Vertical Trend view, or from the Message Log (via Root Menu and Goto View), verify that the following messages have occurred.
    a. Product Flow Diverted
    b. Process Cut-Out at 162.1°F
9. Use Operator Notes to record test notes.

FRC High Product Flow Alarm

See the PMO, Appendix I, Test 11.2B, for more specific details on this test.

For this test example, it is assumed that the 6180A standardized STLR+FRC solution is configured for a High Flow alarm setpoint of 16.0GPM, and a hysteresis value of 0.2GPM. This means that a High Flow alarm would occur at 16.0GPM and would clear at 15.8GPM.

As per the PMO, after a High Flow alarm has occurred, forward flow must only return after a delay equal to the holding time of the pasteurizer (typically 15 seconds).

1. Determine the desired alarm setting for the High Product Flow alarm. See “How to Configure” for instructions on changing the High Product Flow alarm setting.
2. Determine the desired hysteresis for the High Product Flow hysteresis value. See “How to Configure” for instructions on changing the High Product Flow alarm hysteresis.
3. Establish normal pasteurization operation (forward flow).
4. Slowly raise the flow rate until the pasteurization system diverts.
5. From the Pasteurization Management view, verify that the Pasteurization Flow measurement background is red, and that a Flow Alarm has occurred (Flow Alarm = “1” and Flow Alarm background is red).
6. On the Vertical Trend view verify that the Flow Alarm trace (cyan) on the vertical trend is in the alarm state (1).
7. As High Product Flow is a Cut-Out condition, also verify that Forward Flow is “0”.
8. Use the Root Menu to select Go to View. Select Message Log. Verify that the Message Summary contains the following messages. Alternatively, use the Vertical Trend view to see these messages.
    a. High Product Flow

b. Process Cut-Out at 16.0GPM

c. Product Flow Diverted

9. Use Operator Notes to record test notes.

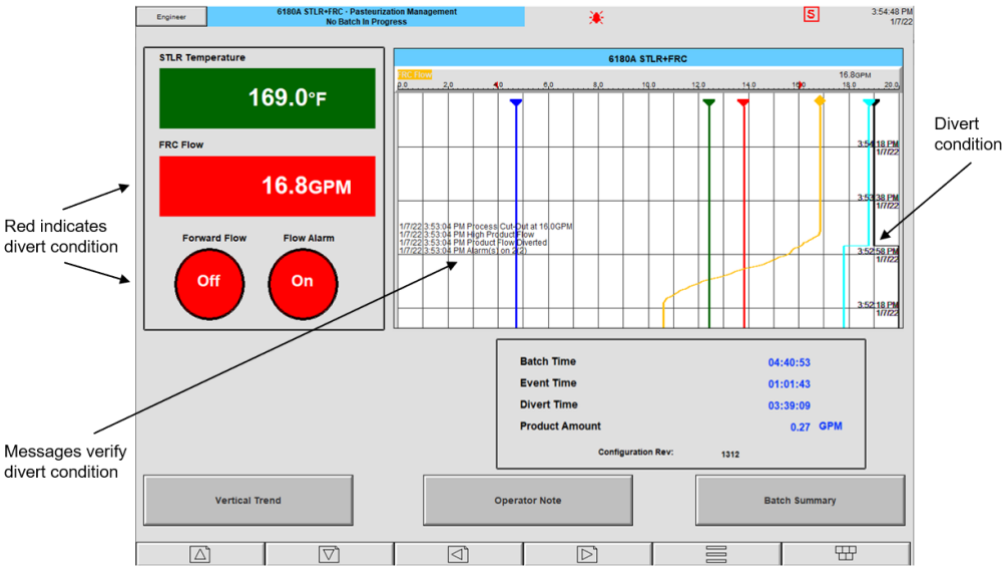


Figure 26 - Divert on high flow rate

FRC Low Product Flow or Loss of Signal Alarm

See the PMO, Appendix I, Test 11.2C, for more specific details on this test.

For this test example, it is assumed that the 6180A standardized STLR+FRC solution is configured for a Low Flow alarm setpoint of 2.0GPM, and a hysteresis of 0.2GPM. This means that a Low Flow alarm would occur at 2.0GPM and would clear at 2.2GPM.

1. Determine the desired alarm setting for the Low Product Flow alarm. See “How to Configure” for instructions on changing the Low Flow Alarm setting.
2. Determine the desired hysteresis value for the Low Product Flow. See section “How to Configure” for instructions on changing the Low Product Flow alarm hysteresis setting.
3. Establish normal pasteurization operation (forward flow).
4. Turn off the power to the flow meter or lower the flow rate below the Low Flow Alarm setpoint.
5. From the Pasteurization Management view verify that the FRC Flow measurement background is yellow, and that a flow alarm has occurred (Flow Alarm = “1” and Flow Alarm background is red).
6. On the Vertical Trend view verify that the Flow Alarm trace (cyan) on the vertical trend is in the alarm state (1).
7. As Low Product Flow is a Cut-Out condition, also verify that Forward Flow is “0”.

8. Use the Root Menu to select Goto View. Select Message Log. Verify that the Message Summary contains the following messages. Alternatively, use the Vertical Trend view to see these messages.
    a. Low Product Flow or Loss of Signal
    b. Process Cut-Out at 2.0GPM
    c. Product Flow Diverted
9. Use Operator Notes to record test notes.

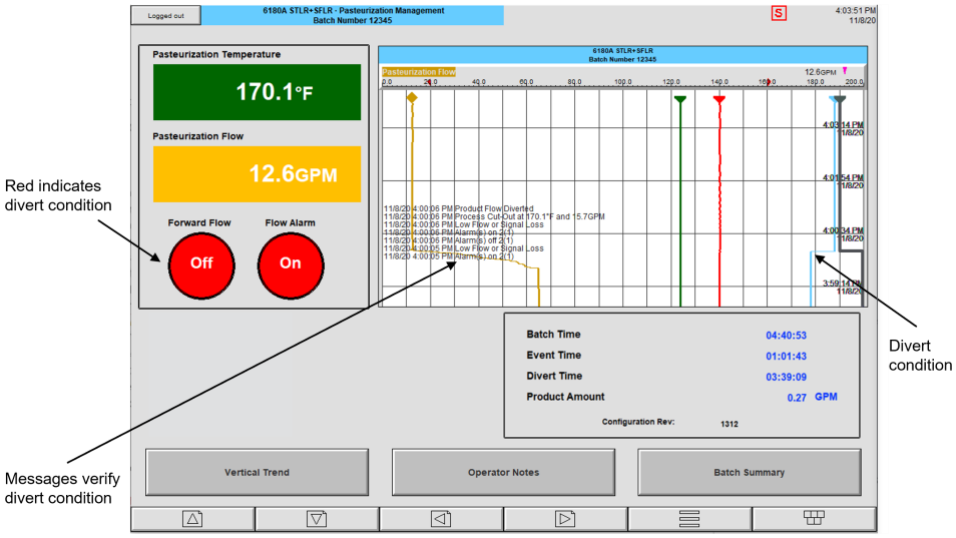


Figure 27 - Divert on low flow rate

FRC Flow Rate Cut-In and Cut-Out

See the PMO, Appendix I, Test 11.2D, for more specific details on this test.

For this test example it is assumed that the 6180A standardized STLR+FRC solution is configured for a High Flow alarm setpoint of 16.0GPM, and a hysteresis value of 0.2GPM. This means that a High Flow alarm would occur at 16.0GPM and it would clear at 15.8GPM. It is further assumed that the Low Flow alarm setpoint is configured to 2.0GPM, with a hysteresis value of 0.2GPM. This means that a Low Flow alarm would occur at 2.0GPM, and it would clear at 2.2GPM.

1. Establish normal pasteurization operation (forward flow).
2. Slowly raise the flow rate until the pasteurization system diverts.
3. Verify that the Flow Alarm = “1” and Flow Alarm background is red.
4. Verify that the FRC Flow is in high alarm (background is red).
5. Verify that the Flow Alarm trace (cyan) on the vertical trend is in the alarm state (1).
6. As High Product Flow is a Cut-Out condition, also verify that Forward Flow is “0”.
7. Verify that the Message Summary displays the following messages.
    a. High Product Flow

b. Process Cut-Out at 16.0GPM

c. Product Flow Diverted

8. Slowly lower the flow rate until the system High Flow Alarm clears.
9. Verify that the Flow Alarm = “0” and Flow Alarm background is green.
10. Verify that the FRC Flow is no longer in alarm (background is green).
11. Verify that the Flow Alarm trace (cyan) on the vertical trend is no longer in the alarm state (0).
12. Verify that the FDD remains diverted for an appropriate delay as per the PMO, and then returns to Forward Flow.
13. Repeat this test to verify that the Low Flow Alarm forces similar results (without the 15 second delay).
14. Use Operator Notes to recorded test notes.

Figure 28 - Divert on high flow rate, forward flow delay

FRC Time Delay After High Product Flow Alarm

See the PMO, Appendix I, Test 11.2E, for more specific details on this test.

1. Adjust the pasteurization system so that it is running above the Cut-In temperature. Also increase flow rate to create the High Flow alarm condition.
2. Slowly lower the flow rate until the High Flow alarm is no longer active. This change in condition is easily seen using the Pasteurization Management view. The change can also be seen by observing the Flow Alarm trace (cyan) on the Vertical Trend. The Flow Alarm value will be “0”. Start a timer when the High Flow alarm is no longer active.
3. Stop the timer when the FDD starts to move to the forward flow position.
4. The time recorded must be equal-to or greater-than the pasteurizer holding time, which is typically 15 seconds for most HTST pasteurizers.
5. Use Operator Notes to record test notes.

FRC High Flow Alarm Response Time

See the PMO, Appendix I, Test 11.2F, for more specific details on this test.

1. Establish normal pasteurization operation (forward flow) with the flow rate at 25% below the High Product Flow alarm setpoint.
2. Quickly raise the flow rate until the 6180A STLR+FRC indicates that the FRC Flow is above the High Product Flow alarm setting. Start a timer.
3. Stop timing when the FDD has moved to the diverted flow position.
4. The elapsed time must be no greater than 1 second.
5. The automated messages created by the 6180A standardized STLR+FRC solution can be used to measure the time between the activation of the High Product Flow alarm, and the change to the divert state by the FDD.
6. Use Operator Notes to record test notes.

How to Configure

This section describes how to configure the basic operational parameters of the 6180A standardized STLR+FRC solution. Included are instructions for changing the following settings.

- Cut-Out Setpoint
- Cut-In Setpoint Hysteresis
- STLR Vertical Trend Span
- STLR Calibration Offset
- FRC Low Flow Alarm Setpoint
- FRC Low Flow Alarm Hysteresis
- FRC High Flow Alarm Setpoint
- FRC High Flow Alarm Hysteresis
- FRC Low and High Signal Input
- FRC Low and High Span
- FRC High Alarm Off-Delay Timer

To change each of these settings, the first step will be to enter the 6180A STLR+FRC configuration mode.

Entering the 6180A STLR+FRC configuration mode is a high-level action, protected by an engineer-level password, and configuration access must only be provided to experienced/approved individuals. Furthermore, entering the 6180A STLR+FRC configuration mode is equivalent to breaking a security seal. Therefore, configuration changes must only be attempted after notifying the local dairy pasteurizer inspection authority.

When the configuration environment is exited, if configuration changes have been made, a system message will be created which conveys a new configuration revision number for the 6180A STLR+FRC. This system message will become a permanent record within the metadata.

1. Touch the Log In button in the top left corner of the display. Log In using a configuration level User ID and Password.
2. Touch the Root Menu button to access Operator, then select Config.

STLR Cut-Out Temperature Setpoint

From Config …

1. Select Math
2. Select Maths number “1) Cut-Out Temp”
3. Identify the Constant Value parameter
4. Touch the value box to change Constant Value to the new desired Cut-Out setpoint using the popup keyboard
5. Select Apply
6. Use the Root Menu to return to the Home view
7. Log Out

For 6180A standardized STLR+FRC solutions with multiple Cut-Out Temperature setpoints, the setpoint values will be found against different Math numbers.

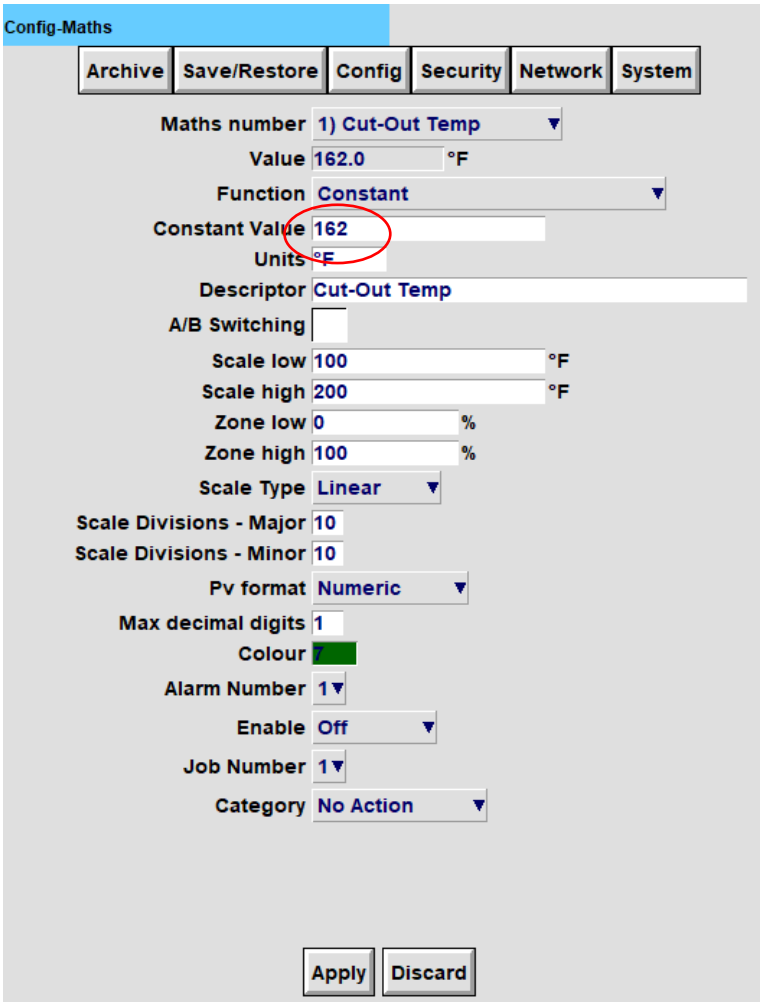


Figure 29 - Changing Cut-Out setpoint value

STLR Cut-In Setpoint Hysteresis

From Config …

1. Select Channels
2. Select Channel “1) STLR Temperature”
3. Scroll down to identify the Hysteresis parameter
4. Touch the value box to change Hysteresis to the new desired value, using the pop-up keyboard
5. Select Apply
6. Use the Root Menu to return to the Home view
7. Log Out

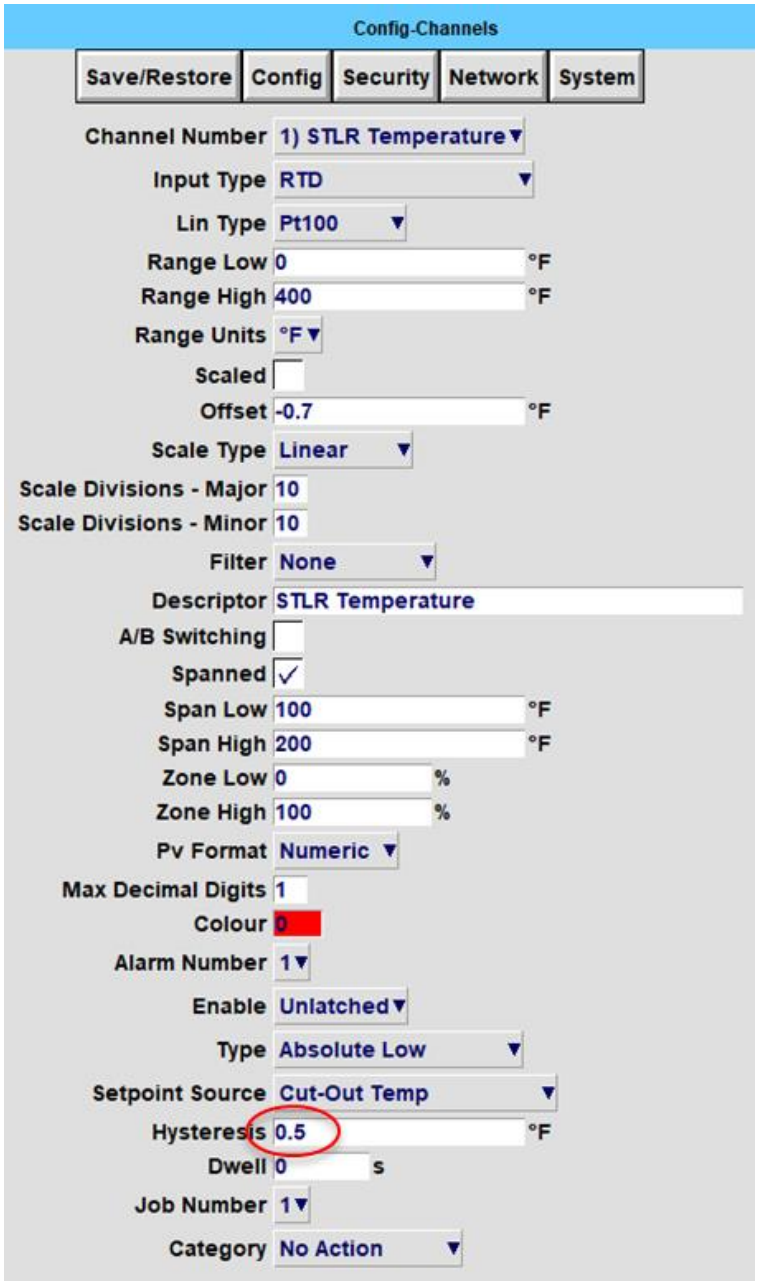


Figure 30 - Changing temperature Cut-In hysteresis value

STLR Vertical Trend Span

From Config …

1. Select Channels
2. Select Channel “1) STLR Temperature”
3. Scroll down to identify the Span Low and Span High parameters
4. Touch the value boxes to change Span Low and Span High to the new desired value using the popup keyboard
5. Select Apply
6. Use the Root Menu to return to the Home view
7. Log Out

STLR Calibration Offset

As per the PMO, it is necessary to compare the STLR temperature measurement against the temperature read by the Indicating Thermometer. It may then be necessary to make the STLR match the Indicating Thermometer. This is done in the 6180A STLR+FRC by changing the “Offset” parameter.

1. Select Channels
2. Select Channel “1) STLR Temperature”
3. Scroll down to identify the Offset parameter
4. Touch the value box to change Offset to the new desired value using the popup keyboard
5. Select Apply
6. Use the Root Menu to return to the Home view
7. Log Out

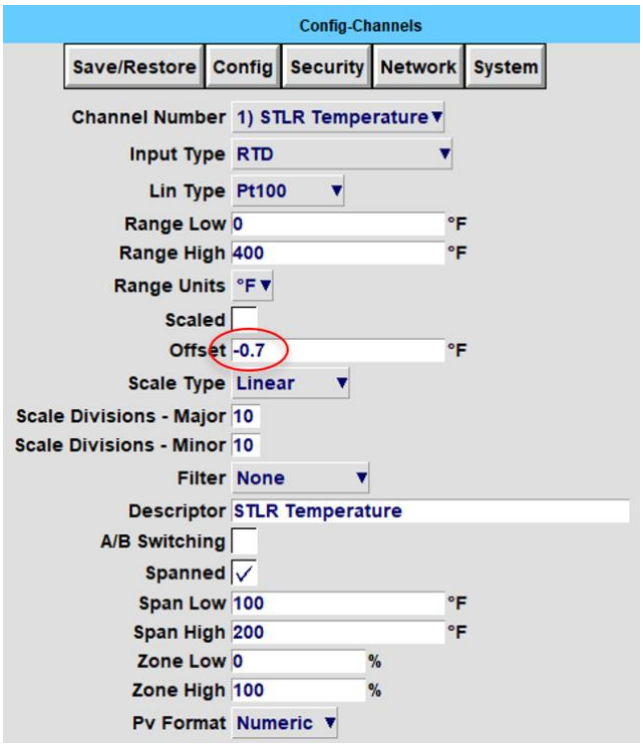


Figure 31 - Changing temperature offset

FRC Units, Low & High Signal Input, Low & High Scale

For use on new equipment, the 6180A standardized STLR+FRC solution is set for the correct flow rate signal input, typically 4-20mA, and set with the correct scale for units of measurement, perhaps 0-20GPM (75LPM). However, if the 6180A STLR+FRC is used to replace an existing instrument on an older system, it may be necessary to adjust the signal input and scale settings.

From Config …

1. Select Channels
2. Select Channel “2) FRC Flow” using the dropdown list
3. Set Input Type to be “mA”
4. Scroll down to the Input Low and Input High. For a 4-20mA input using a shunt resistor (mVDC input) these can be set to “4” and “20”
5. Scroll down to identify Scale Low and Scale High parameters
6. Touch that value boxes to change Scale Low and Scale High to the desired values using the popup keyboard
7. Scroll to Units. Change the Units to the desired value
8. Select Apply
9. Use the Root Menu to return to the Home view
10. Log Out

FRC Low Flow Alarm Setpoint and Hysteresis

From Config …

1. Select Channels
2. Select Channel “2) FRC Flow” using the dropdown list
3. Scroll down to the Alarm Number value
4. Select Alarm Number “1”
5. Scroll down to the Threshold parameter
6. Touch the value box to change Threshold to the desired low flow alarm setting using the popup keyboard
7. Scroll down to the Hysteresis parameter
8. Set Hysteresis to the desired setting
9. Select Apply
10. Use the Root Menu to return to the Home view
11. Log Out

FRC High Flow Alarm Setpoint and Hysteresis

From Config …

1. Select Channels
2. Select Channel “2) FRC Flow” using the dropdown list
3. Scroll down to identify Alarm Number
4. Select Alarm Number “2”
5. Scroll down to the Threshold parameter
6. Touch the value box to change the Threshold to the desired high flow alarm value using the popup keyboard
7. Scroll down to the Hysteresis parameter
8. Set Hysteresis to the desired value
9. Select Apply
10. Use the Root Menu to return to the Home view
11. Log Out

FRC High Flow Alarm Off-Delay Timer

From Config …

1. Select Timers
2. Select Timer number “1) Hi Alm Delay Timer”
3. Scroll down to the Duration parameter
4. Touch the value box to change the Duration to the desired value using the popup keyboard
5. Select Apply
6. Use the Root Menu to return to the Home view
7. Log Out

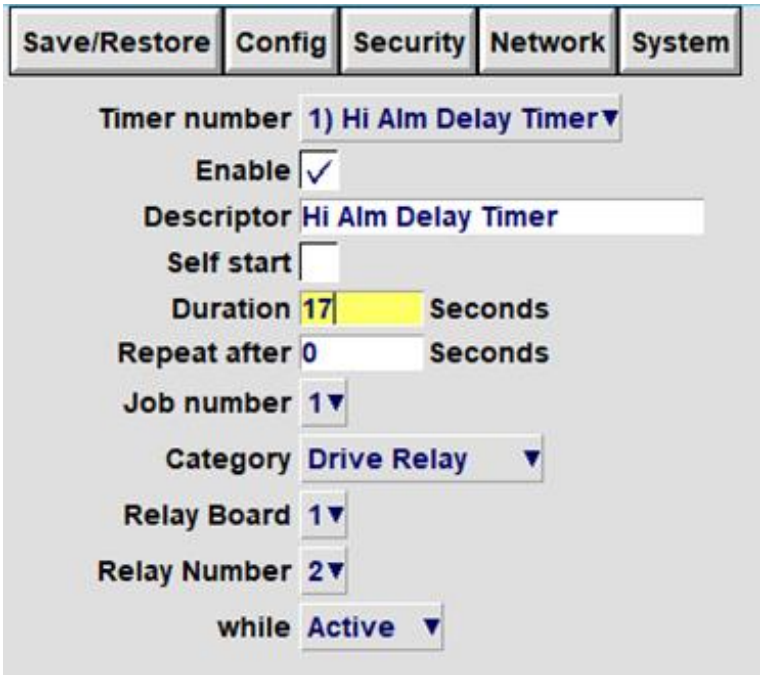


Figure 32 - Changing off-delay timer

Glossary of Acronyms and Definitions

B

BATCH: A particular HTST, HHST, or UHT pasteurization run.

C

CUT-IN: The temperature at which pasteurized milk is sent forward to the heat exchanger for cooling.

CUT-OUT: The temperature at which the milk is diverted for reprocessing if the pasteurization temperature is not met.

D

DRT: Digital reference thermometer (also known as the Indicating Thermometer)

F

FDD: Flow diversion device

FDV: Flow diversion valve

FRC: Flow recorder/controller (also known as an SFLR: safety flow limit recorder)

G

GPM: Gallons per minute

H

HHST: Higher-heat-shorter-time

HTST: High-temperature-short-time

I

INDICATING THERMOMETER: The primary temperature reference for the pasteurization process.

L

LPM: Liters per minute (l/min)

P

PC: Personal computer

PID: Proportional, integral, derivative

PMO: Pasteurized milk ordinance

S

SOP: Standard operating procedure

SFLR: Safety flow limit recorder (referred to in this document as an FRC: flow controller recorder)

SFTP: Secure file transfer protocol

STLR: Safety thermal limit recorder

U

UHH: Eurotherm proprietary historical data file format

UHT: Ultra-high-temperature

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