

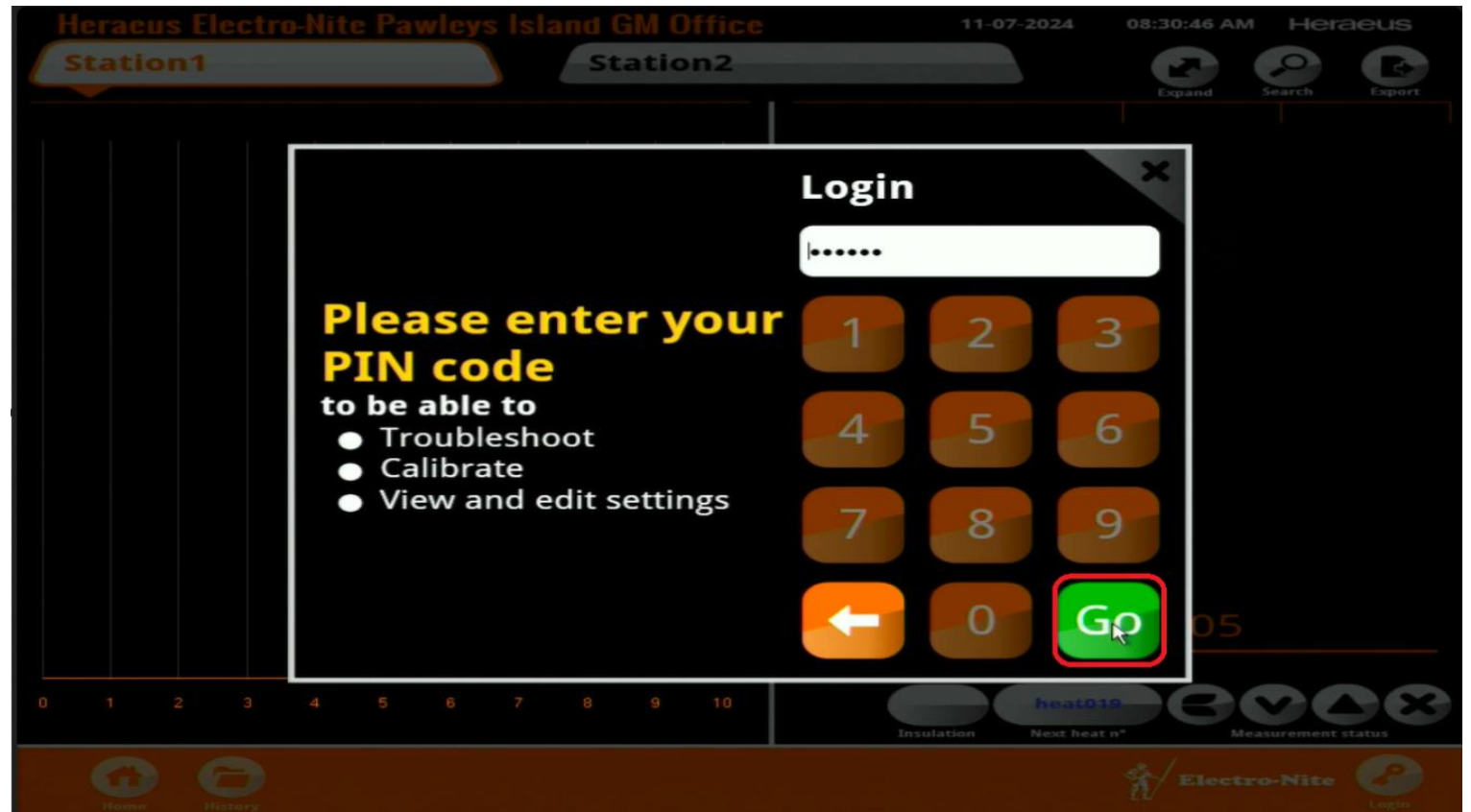
SensorLab Thermocouple (temperature-rise) Bath Level Detection

Description:

- **Thermocouple Bath Level Detection (SensorLab):** Step-by-step guide to configuring temperature-rise bath level parameters and verifying detection by monitoring the Bath Level status bit (status-bit only commissioning).

Log In

- Log in with “24816”.



Settings

- Click <Settings>
- The program with the light bulb is the active program
- Select the active program and click <Edit>

The screenshot displays the 'Settings' page of the Electro-Nite software. At the top, the title 'Settings' is on the left, and the date '08-19-2024', time '09:18:16 AM', and user 'Heraeus' are on the right. Below the header is a table with columns: 'Act' (checkbox), 'Version no', 'Created on', 'Comment', and 'Preset'. The table is divided into sections: 'RemoveMe', 'Liberty Peoria', and 'EIP'. In the 'RemoveMe' section, 'Version 1' is highlighted with a red box, and a light bulb icon in the 'Act' column is also circled in red. To the right of the table is a vertical sidebar with buttons: 'Activate', 'Edit' (circled in red), 'Delete', 'Compare', 'Export', 'Import', 'Set preset', 'Delete preset', 'Delete Meas.', 'Customer info', 'LAN settings', 'Set Date/Time', and 'Wireless Safety'. At the bottom is an orange navigation bar with icons for Home, History, Troubleshoot, Settings (active), User settings, About, and System tools, along with the Electro-Nite logo and a Log Out button.

<input type="checkbox"/>	Act	Version no	Created on	Comment	Preset
RemoveMe					
<input checked="" type="checkbox"/>		Version 1	08-19-2024 08:58:00 AM	Remove_me	
<input type="checkbox"/>		Version 0	07-26-2024 01:38:12 PM	Offset 16	
Liberty Peoria					
<input type="checkbox"/>		Version 14	08-14-2024 01:33:43 PM	Testing New Display	
<input type="checkbox"/>		Version 13	08-14-2024 01:27:13 PM	Testing New Display	
<input type="checkbox"/>		Version 12	08-14-2024 01:01:04 PM	Testing New Display	
<input type="checkbox"/>		Version 11	08-14-2024 12:34:49 PM	Testing New Display	
<input type="checkbox"/>		Version 10	08-14-2024 12:27:14 PM	liberty eaf with eip reg	
<input type="checkbox"/>		Version 9	07-02-2024 04:18:07 PM	Liberty Peoria LMF - Conversion added telegrams for Alpha display	
<input type="checkbox"/>		Version 8	06-24-2024 02:09:10 PM	Liberty Peoria LMF - Conversion Config Regs with P1 Carb Selected	
EIP					
<input type="checkbox"/>		Version 25	08-09-2024 07:02:12 PM	testing input regs enabled lance input	
<input type="checkbox"/>		Version 24	08-09-2024 06:38:12 PM	testing input regs enabled lance input	
<input type="checkbox"/>		Version 23	08-09-2024 04:53:46 PM	testing input regs enabled lance input	
<input type="checkbox"/>		Version 22	08-09-2024 04:44:33 PM	testing input regs	
<input type="checkbox"/>		Version 21	08-09-2024 04:40:36 PM	testing input regs	
<input type="checkbox"/>		Version 20	08-09-2024 04:20:45 PM	testing input regs	

Settings Overview – Navigate to Oxygen Configuration

- In the “Applications” section:
- Choose the Station column(s) to have the Thermocouple Bath level feature enabled:
- Click the edit icon on the right side of the “Oxygen” item to navigate to the configuration screen for that station.

Generic Profinet - Version 18 01-15-2026 03:40:00 PM Heraeus

Settings list Settings version overview

Basic

Customer	Heraeus Electro-Ni		
City	Pawleys Island		
Location	GM Office		
Temp. units	F		
Station	A	B	
Name	Wireless	Manual	
Input source	Wireless 1	ADC 0/1	
Location ID	35A		

Configure

Communication

Unavailable	
Available	

<input checked="" type="checkbox"/> EtherNet/IP	Operational	
<input checked="" type="checkbox"/> Profinet #1	Operational	
<input checked="" type="checkbox"/> Serial #1	Operational	
<input type="checkbox"/> Serial #2	Operational	
<input type="checkbox"/> TCP/IP client #1 (LAN)	Operational	
<input type="checkbox"/> TCP/IP client #2 (LAN)	Operational	
<input type="checkbox"/> TCP/IP client #3 (LAN)	Operational	

Applications

Station A (Checked means active)	Wireless	Station B (Checked means active)	Manual
<input checked="" type="checkbox"/> Oxygen		<input checked="" type="checkbox"/> Oxygen	
<input type="checkbox"/> Slag Oxygen		<input type="checkbox"/> Slag Oxygen	
<input type="checkbox"/> Steel-Slag level		<input type="checkbox"/> Steel-Slag level	
<input type="checkbox"/> Temp-Carbon		<input type="checkbox"/> Temp-Carbon	
<input type="checkbox"/> Carbon		<input type="checkbox"/> Carbon	

Advanced

Telegrams Checkmate

Equations Wireless options

Bath level options Parameters list

Comment

Base Caster SLS Profinet Registers/eip

Cancel Save

Home History Troubleshoot Settings User settings About System tools Presets Electro-Nite Log Out

Enable Thermocouple Bath Level

- Check the “Enable bath level detection ” item in the “Application Parameters” section to activate it.
 - Do not check the “Enable bath level detection EMF ” option as this requires a license.
- Click <Done>.
- Repeat for any additional stations as required.

Generic Profinet - Version 18 - Wireless 01-15-2026 03:38:23 PM Heraeus

Settings list > Settings version overview > **Oxygen configuration**

Oxygen configuration Load Application Presets

Temp channel

TC type: S Temperature scale: IPTS-68 Burnout: Enabled

Evaluation method: Start to end

Start threshold: 2012 F Evaluation delay: 0.5 s

Evaluation windows height & length: Default quality 1: 6 F 1.2 s

EMF channel

☐ Use fixed positive burnout for the EMF channel

Evaluation method: Start to end

Start threshold: -300 mV Evaluation delay: 0.5 s

Evaluation windows height & length: Default quality 1: 5 mV 1.2 s

Application parameters

Max measurement time: Temp: 6 s EMF start delay: 4 s

Max measurement time: Oxygen: 10 s

☒ Enable bath level detection

☐ Enable bath level detection EMF

Advanced

Display setup Remote display setup

Undo Done

Home History Troubleshoot Settings User settings About System tools Presets Electro-Nite Log Out

Navigate to Bath Level Options

- Click the <Bath level options> button to navigate to “Bath Level Options” screen.

Generic Profinet - Version 18 01-15-2026 03:40:00 PM Heraeus

Settings list Settings version overview

Basic

Customer	Heraeus Electro-Ni		
City	Pawleys Island		
Location	GM Office		
Temp. units	F		
Station	A	B	
Name	Wireless	Manual	
Input source	Wireless 1	ADC 0/1	
Location ID	35A		

Configure

Communication

Unavailable	
Available	

<input checked="" type="checkbox"/>	EtherNet/IP	Operational	
<input checked="" type="checkbox"/>	Profinet #1	Operational	
<input checked="" type="checkbox"/>	Serial #1	Operational	
<input type="checkbox"/>	Serial #2	Operational	
<input type="checkbox"/>	TCP/IP client #1 (LAN)	Operational	
<input type="checkbox"/>	TCP/IP client #2 (LAN)	Operational	
<input type="checkbox"/>	TCP/IP client #3 (LAN)	Operational	

Applications

Station A	Wireless	Station B	Manual
(Checked means active)		(Checked means active)	
<input checked="" type="checkbox"/> Oxygen		<input checked="" type="checkbox"/> Oxygen	
<input type="checkbox"/> Slag Oxygen		<input type="checkbox"/> Slag Oxygen	
<input type="checkbox"/> Steel-Slag level		<input type="checkbox"/> Steel-Slag level	
<input type="checkbox"/> Temp-Carbon		<input type="checkbox"/> Temp-Carbon	
<input type="checkbox"/> Carbon		<input type="checkbox"/> Carbon	

Advanced

Telegrams	Checkmate
Equations	Wireless options
Bath level options	Parameters list

Comment

Base Caster SLS Profinet Registers/eip

Cancel Save

Home History Troubleshoot Settings User settings About System tools Presets Electro-Nite Log Out

Bath Level Options

- See section 8.6.4.2. for more information about bath level detection.
- Purpose: Provide feedback when the probe reaches the melt surface to support level estimation and immersion/depth control.
- How it works: Detection is based on a rapid temperature increase as the probe approaches the melt ("fast temperature rise").
- Fast temperature rise criteria: Detection occurs when either:
 - Temperature rise rate ≥ 1832 °F/s, or
 - Temperature increase ≥ 572 °F (above the start temperature)
- Adjust parameters for your process.
- Click <Done>.

Generic Profinet - Version 18 01-15-2026 03:44:19 PM Heraeus

Settings list Settings version overview **Bath level options**

Lance input	EtherNet/IP	
Station	Wireless	
	Wireless	Manual
Display lance position curve	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Temperature	Wireless	Manual	
Temperature rise detection threshold	1832	1832	F/s
Detection start temperature	180	180	F
Detection temperature threshold	572	572	F

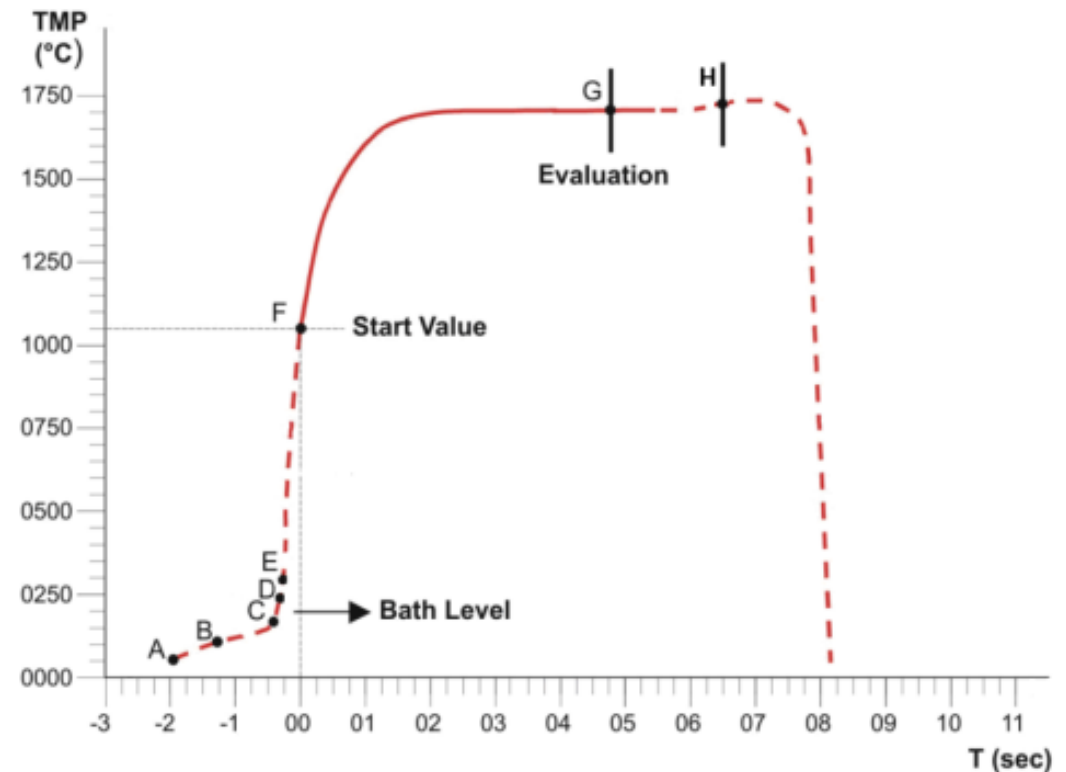
EMF Multilance or EAF	Wireless	Manual	
Search time	4	4	seconds
Temperature rise detection threshold combined (Q1)	27	27	F/s
Emf rise detection threshold combined (Q1)	350	350	mV
Evaluation method	Q1 + Q2	Q1 + Q2	
Emf rise detection threshold (Q2)	500	500	mV

Undo Done

Home History Troubleshoot Settings User settings About System tools Presets Electro-Nite Log Out

Bath Level Detection Curve Landmarks A-H (SensorLab manual section 8.6.4.2)

- **A** - The temperature of the probe increases when it approaches the bath surface
- **B** – Bath level detection is enabled (**Detection start temperature**).
- **C + D** – The probe enters the bath (rapid temperature rise). **Bath level is detected here.**
 - C represents the slope of the temperature curve (Temperature rise detection threshold).
- **E** – Emergency stop position: the probe is stopped when this temperature (300°C) is reached if the previous attempt failed (**Detection temperature threshold**).
- **F** – The measurement curve is displayed on the screen.
- **G** – Temperature evaluation is complete. The instrument switches to END status (red light); the curve display stops and the probe rises.
- **H** – The probe leaves the bath (slight temperature rise while passing the slag layer). This is only visible for a fixed time measurement.



Save the changes

- Add comments to the “Comments” textbox to describe the changes made.
- Click <Save> to save the changes.

RemoveMe - Version 1 08-19-2024 09:51:43 AM Heraeus

Settings list Settings version overview

Basic

Customer	Heraeus Electro-Ni	
City	Pawleys Island	
Location	GM Office	
Temp. units	F	
Station	A	B
Name	Catfis	HandPole
Input source	Wireless 1	ADC 2/3
Location ID	10A	

Configure

Communication

Unavailable

Available

<input checked="" type="checkbox"/> EtherNet/IP	Operational	
<input type="checkbox"/> Profinet #1	Operational	
<input checked="" type="checkbox"/> Serial #1	Operational	
<input checked="" type="checkbox"/> Serial #2	Operational	
<input type="checkbox"/> TCP/IP client #1 (LAN)	Operational	
<input type="checkbox"/> TCP/IP client #2 (LAN)	Operational	
<input type="checkbox"/> TCP/IP client #3 (LAN)	Operational	

Applications

Station A (Checked means active)	Catfis	Station B (Checked means active)	HandPole
<input checked="" type="checkbox"/> Oxygen		<input checked="" type="checkbox"/> Oxygen	
<input type="checkbox"/> Slag Oxygen		<input type="checkbox"/> Slag Oxygen	
<input type="checkbox"/> Steel-Slag level		<input type="checkbox"/> Steel-Slag level	
<input type="checkbox"/> Temp-Carbon		<input type="checkbox"/> Temp-Carbon	
<input type="checkbox"/> Carbon		<input type="checkbox"/> Carbon	

Advanced

Telegrams Checkmate

Equations Wireless options

Bath level options Parameters list

Comment

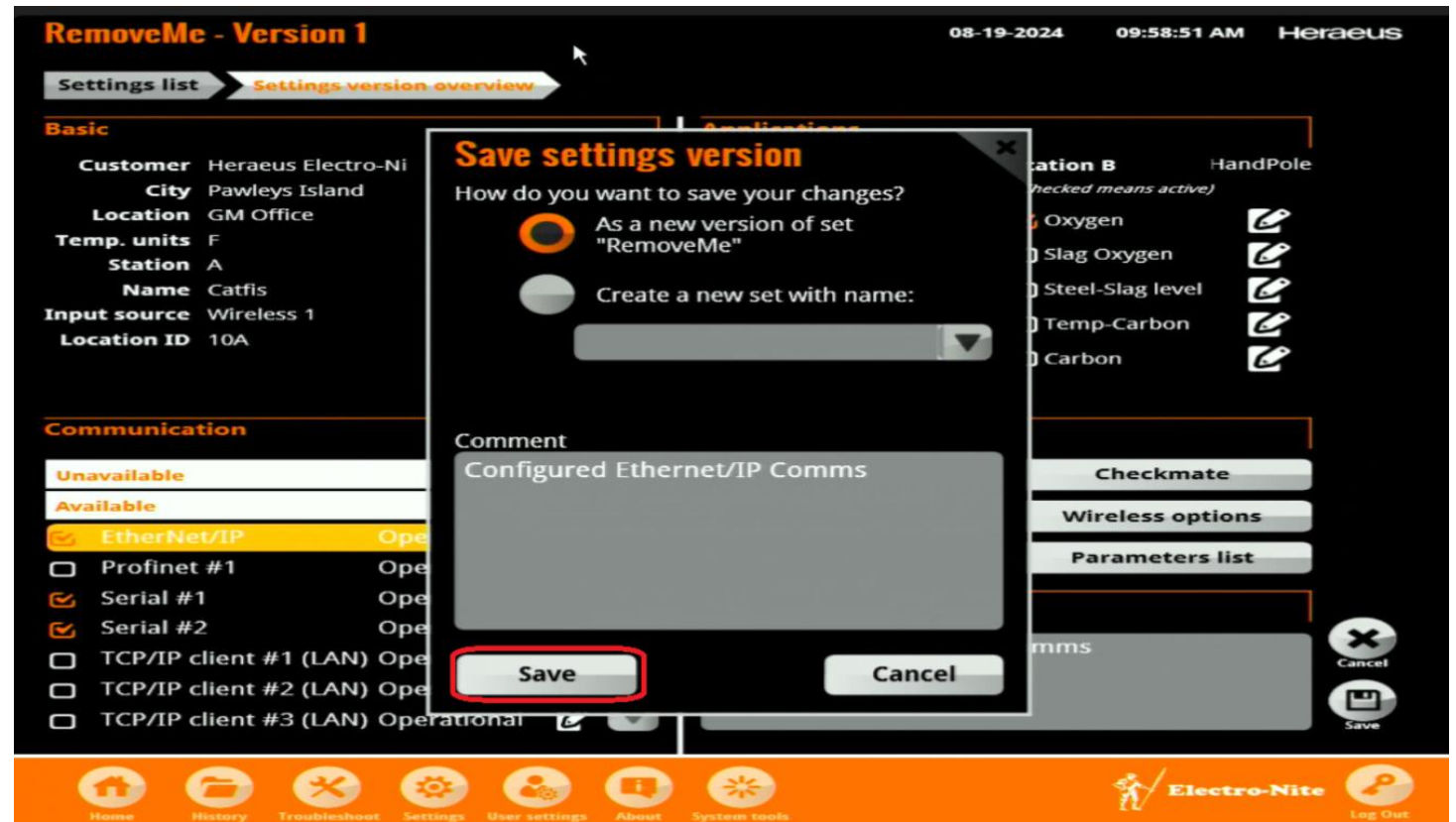
Configure EtherNet/IP Comms

Cancel Save

Home History Troubleshoot Settings User settings About System tools Electro-Nite Log Out

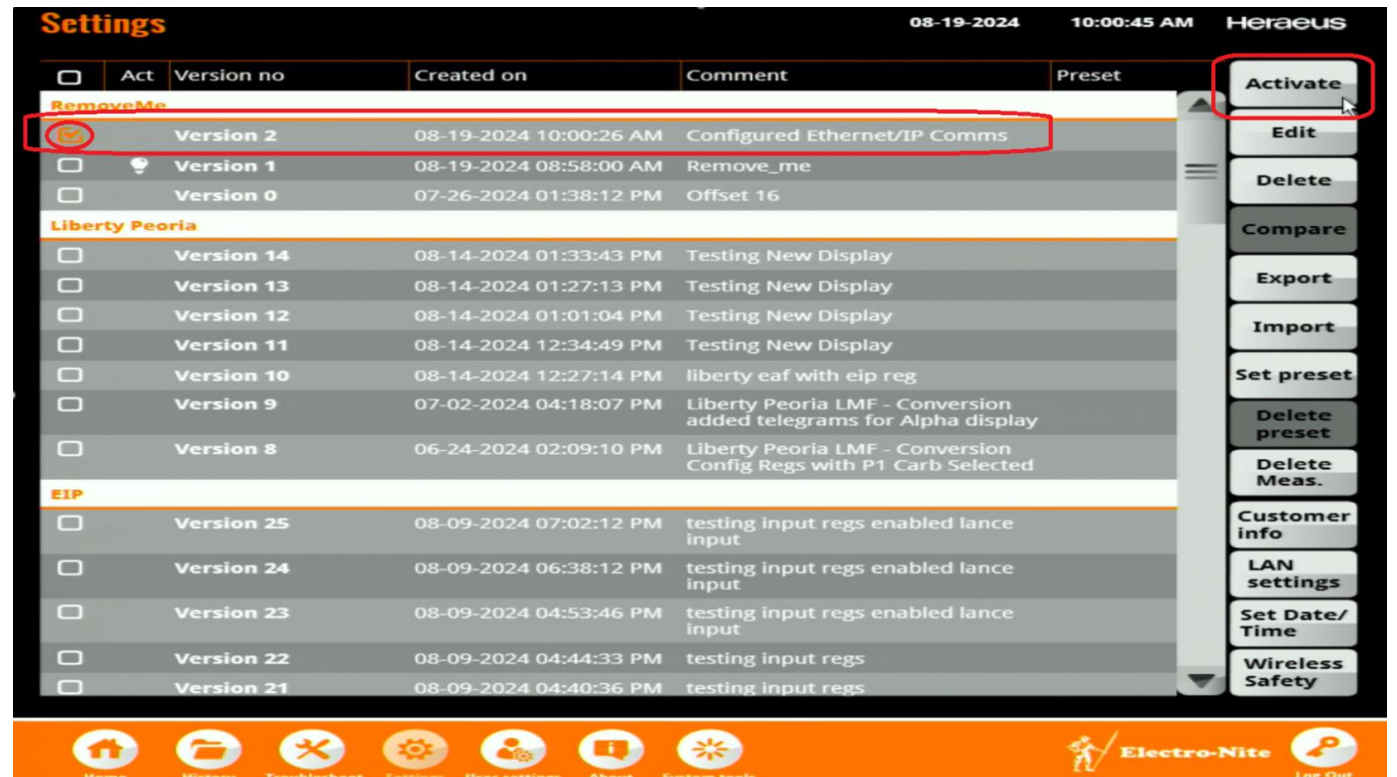
Save to Set

- Click <Save> to save the new program in the same set of programs as the program you started with.
- The original program will not be affected by this action.



Activating the New Program

- The program with the Bath Level configuration has been saved but not activated.
- The current activated program is still the original program with the light bulb indicator displayed beside it.
- To activate the new program, check the checkbox on the new program that was just created and click the <Activate> button.
- This will activate the new program.



Summary

- **Thermocouple Bath Level Detection is a temperature-rise algorithm.** Bath level is detected when the probe's temperature rises rapidly as it enters the melt.
- **Correct configuration is required before the status can be trusted.** In *Bath level options* → *Temperature*, set the **Detection start temperature** and the detection thresholds (slope / temperature) for your process.
- **Detection criteria:** In this example, "Fast temperature rise" is met when the **slope is 1832°F/s or more** or the **temperature threshold of 572°F** is exceeded; when enabled in the active settings set, **bath level is found** and shown.
- **Customer monitoring method:** Use **digital I/O** when available; otherwise, monitor the **Bath Level status bit**.
 - The bit goes active when bath level is detected and is reset after the measurement completes.
- **Operational intent:** Use the bath level detection feedback to support **melt-surface level estimation**.