

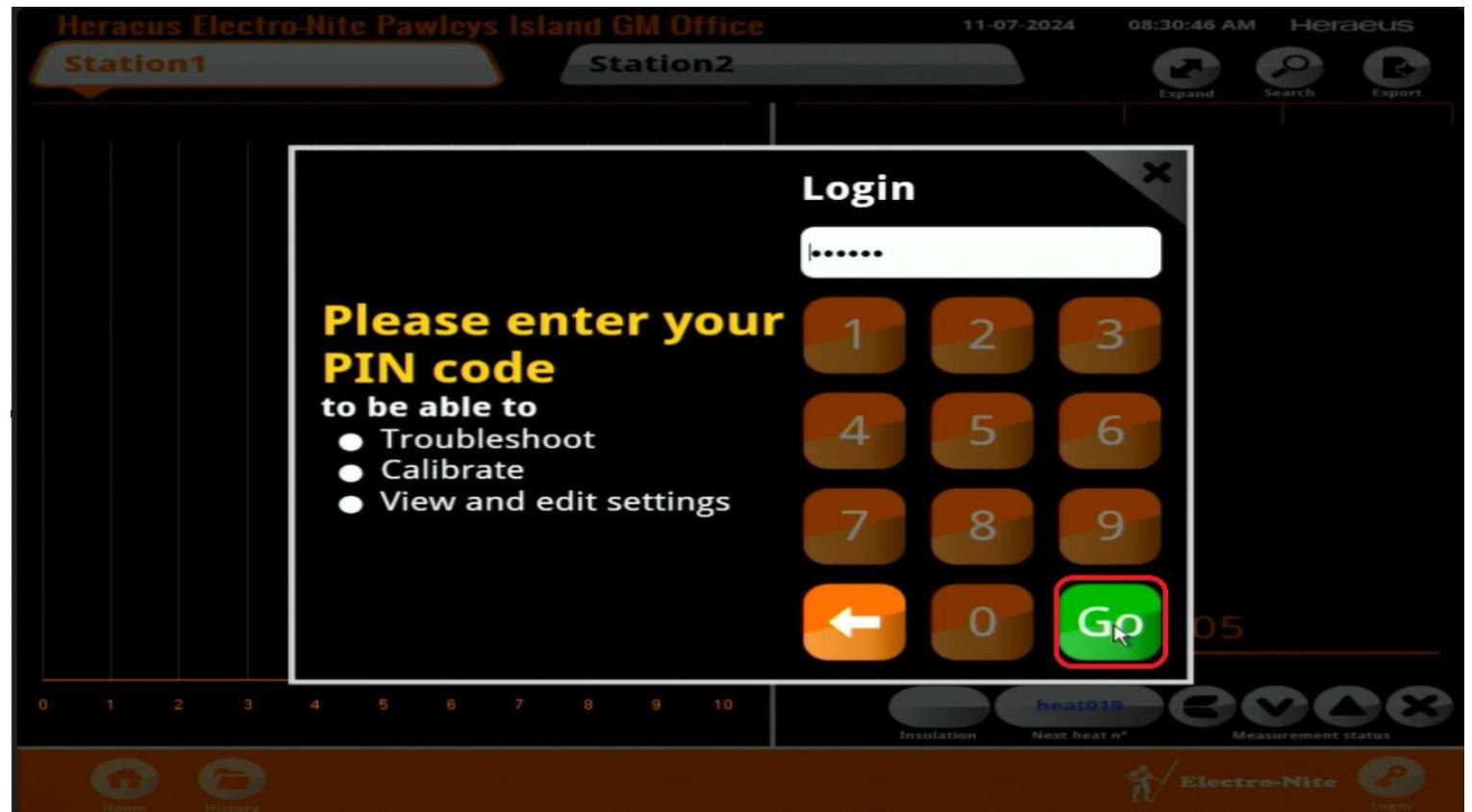
SensorLab Thermocouple (temperature-rise) Bath Level Detection

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 shows the 'Settings' screen of a software application. At the top, there are three status indicators: '08-19-2024', '09:18:16 AM', and 'Heraeus'. Below this is a table with columns: 'Act' (checkbox), 'Version no', 'Created on', 'Comment', and 'Preset'. The table is divided into sections: 'RemoveMe' (containing Version 1 and Version 0), 'Liberty Peoria' (listing versions 14 through 8), and 'EIP' (listing versions 25 through 20). The 'Version 1' row in the 'RemoveMe' section is highlighted with a red border, and its 'Edit' button in the sidebar is also highlighted with a red border. The sidebar on the right contains buttons for 'Activate', 'Edit' (highlighted), 'Delete', 'Compare', 'Export', 'Import', 'Set preset', 'Delete preset', 'Delete Meas.', 'Customer info', 'LAN settings', 'Set Date/Time', and 'Wireless Safety'. At the bottom, there is a navigation bar with icons for Home, History, Troubleshoot, Settings, User settings, About, System tools, and a logo for 'Electro-Nite'.

Act	Version no	Created on	Comment	Preset
<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	

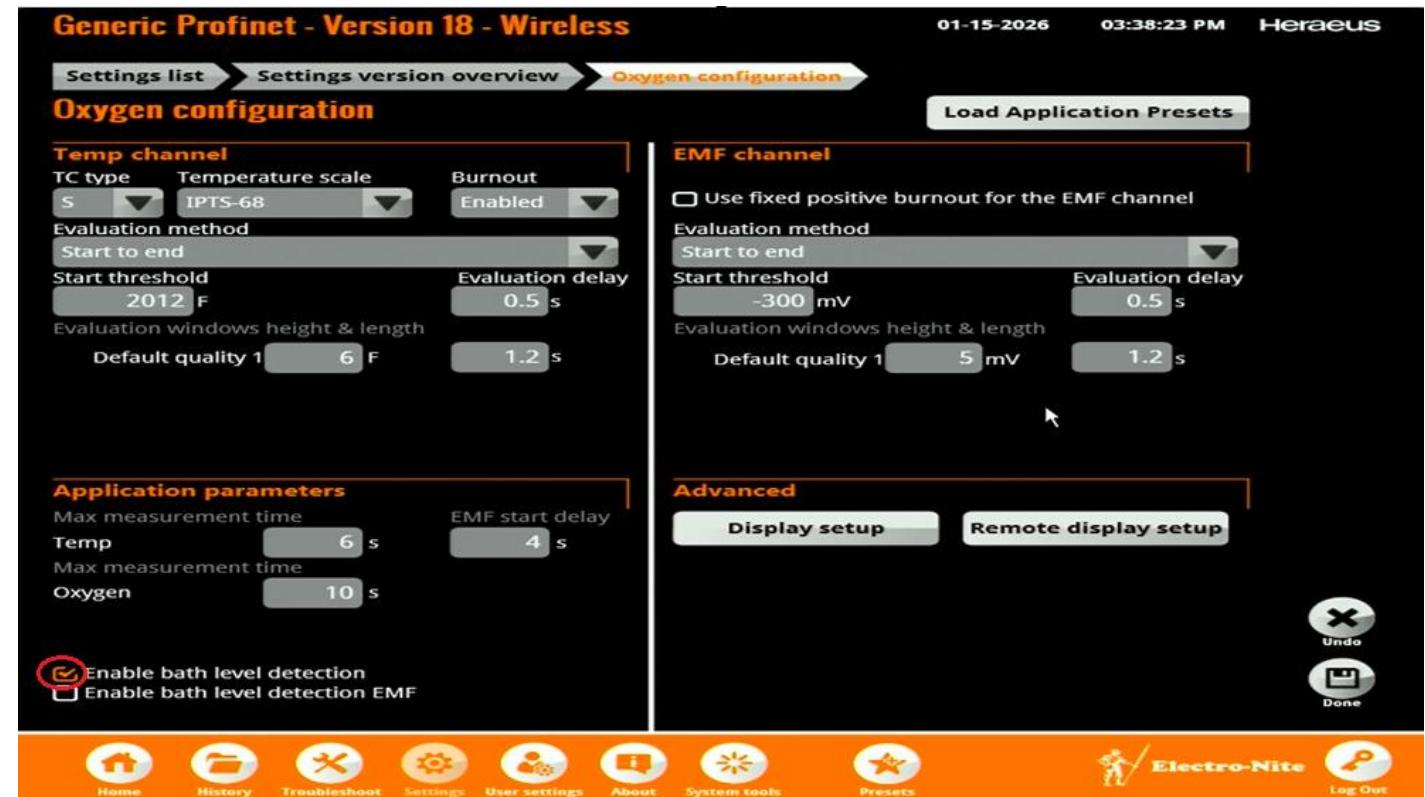
Settings Overview – Navigate to Oxygen Configuration

- 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.



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.



Navigate to Bath Level Options



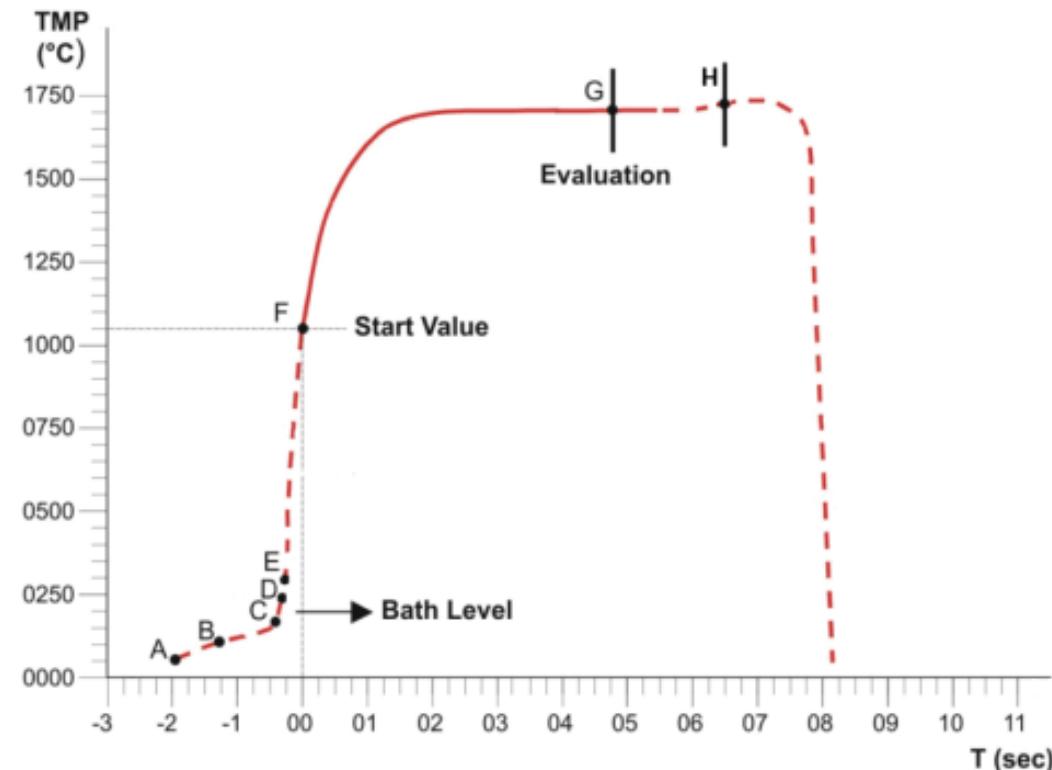
Bath Level Options

- 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 $\geq 1832 \text{ }^{\circ}\text{F/s}$, or
 - Temperature increase $\geq 572 \text{ }^{\circ}\text{F}$ (above the start temperature)
- Adjust parameters for your process.
- Click <Done>.



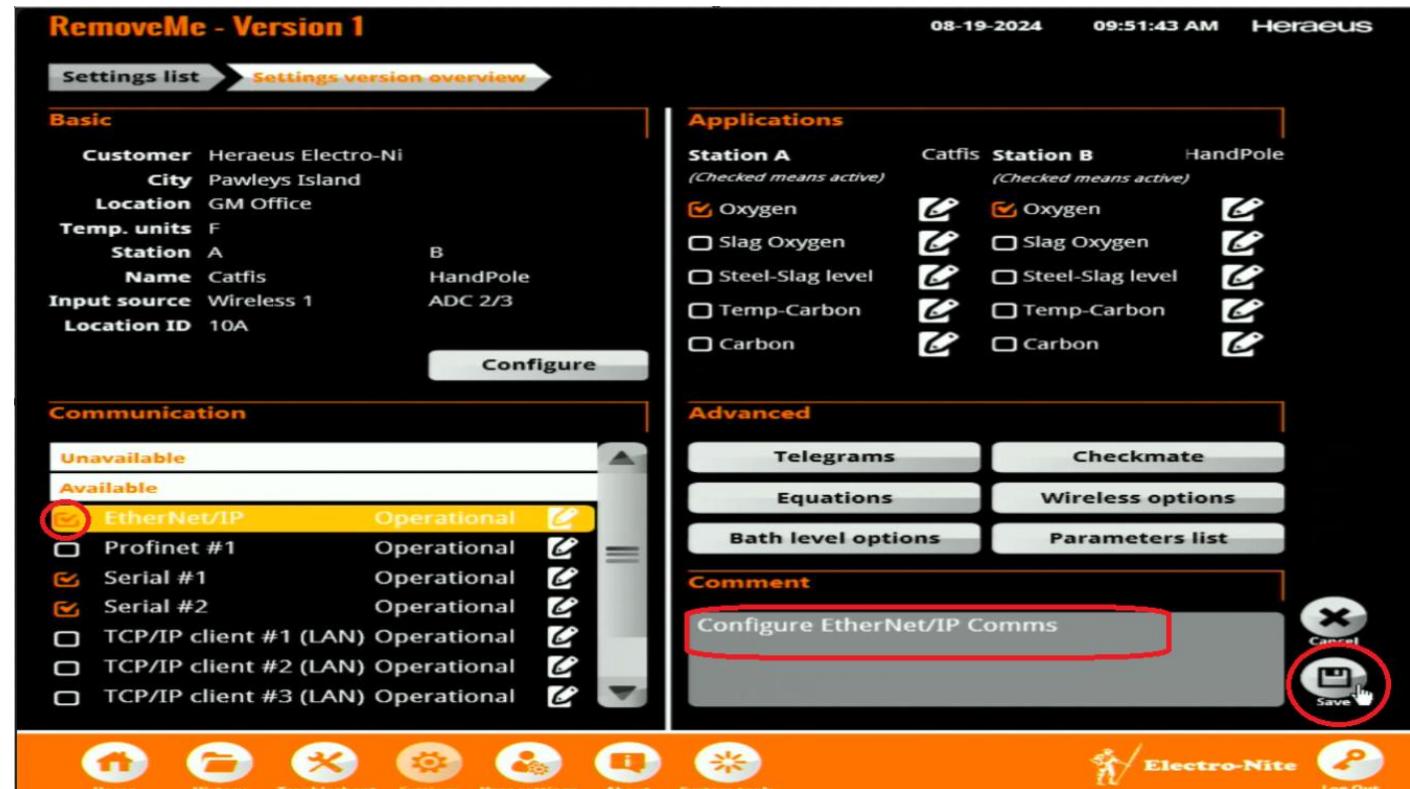
Bath Level Detection Curve Landmarks A-H (SensorLab manual section 8.6.4.2)

- **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.



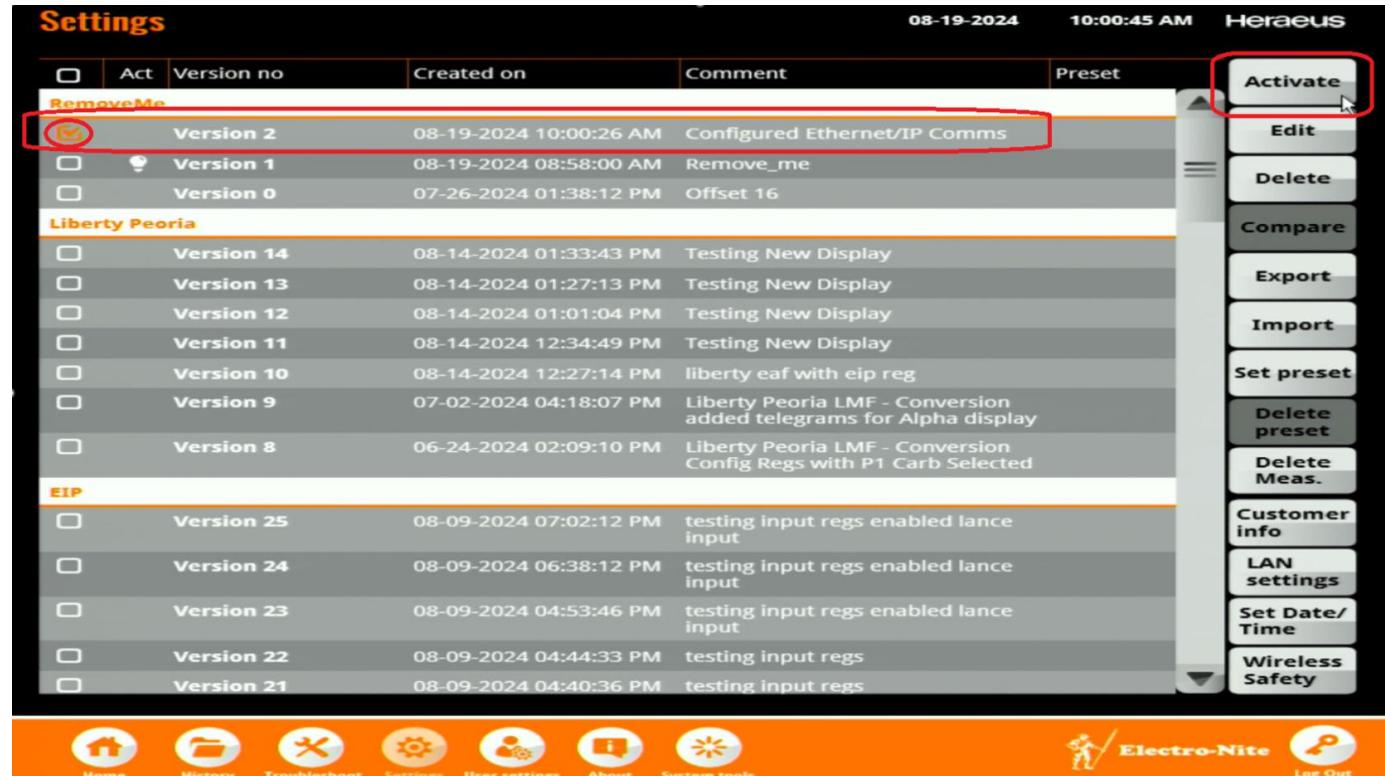
Save to Set

- 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**.