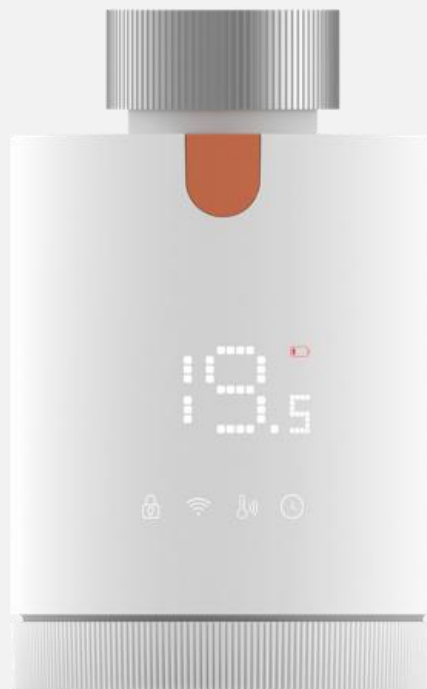




D1183B Technical Guide

FLOW

I. PRODUCT OVERVIEW	5
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1. Key Features.....	5
2. Product Diagram.....	6
3. Kit Description	7
4. Operating Environment and Certifications	7
5. Support and Integration Tools	8

II. PRODUCT INSTALLATION	9
---------------------------------	----------

1. Installation and Commissioning	9
— 01. Removing the Old Thermostatic Head	9
— 02. Check the valve's compatibility	9
— 03. Install the FLOW thermostatic head base	10
— 04. Power Supply	10
— 05. Automatic network connection (LoRaWAN products)	11
— 06. Initial motor calibration	12
— 07. Theft-proof mounting and colored tabs	13
— 08. Setting the Product Time	14
2. CASE+: Vandal-Resistant Housing	14
— 01. Installation	15

III. ANTI-THEFT DETECTION	16
IV. SETPOINT TEMPERATURE ADJUSTMENT AND USER LOCK	16
V. BOOST MODE	16
VI. ANTI-SEIZING FUNCTION	18
VII. ANTI-FREEZE MODE	19
VIII. OPEN WINDOW DETECTION	19
IX. TEMPERATURE MEASUREMENT AND CORRECTION OFFSET	21
X. AMBIENT TEMPERATURE MEASUREMENT WITH THE NODE ONE REMOTE SENSOR	22

XI. LOW AND CRITICAL BATTERY MODE	25
XII. HEATING SEASON MANAGEMENT (WINTER–SUMMER MODE)	27
XIII. CONTROL AND SCHEDULING	30
XIV. BUTTONS AND LEDS	34
1. Buttons	34
2. LEDs.....	36
XV. ACCESSING MEASUREMENTS VIA NFC	40
XVI. BATTERY LIFE	41
1. Estimate my product’s battery life	41
2. Factors Affecting Product Battery Life.....	41
XVII. NETWORK SETTINGS	42
1. LoRaWAN Settings.....	42
2. Network connection.....	43
— 01. LoRaWAN Products	43
3. General al description of messages.....	44
4. Message Definitions.....	44
— 01. Periodic data	44
— 02. General status for the FLOW head	46
— 03. General status of the NODE One remote sensor	48
— 04. Product Configuration	49
— 05. Configuring a daily profile	52
XVIII. PRODUCT CONFIGURATION AND REMOTE CONTROLS	54
1. Configurations related to measurements and control	54
2. -related settings: manual setpoint adjustment.....	55
3. Configurations related to automatic setpoint adjustment.....	55
4. Time Zone-Related Configuration	57

5.	Network and Data Transmission Settings	57
— 01.	Communication Protocol Configuration	57
6.	Commands related to fault conditions, control shutdown, and maintenance	57
XIX.	REMOTE PRODUCT CONFIGURATION VIA THE NETWORK	59

7.	List of “downlink” commands	60
XX.	PRODUCT CONFIGURATION VIA NFC	63

1.	Antenna Location NFC.....	63
2.	Download the mobile app	64
3.	Access to the TOUCH Android App Documentation.....	64
XXI.	MARKINGS	65
APPENDICES		66

1.	LoRaWAN Frame Evolution	66
— 01.	Product Configuration Frame	66
TRACKING CHANGES		66

I. Product Overview

1. Key Features

This document describes the technical operation of the FLOW thermostatic head, which is connected via LoRaWAN, battery-powered, and quickly configurable via NFC. The product is available in two versions: FLOW CORE and FLOW PRO. Both versions offer the same key features and differ only in their power source and the included accessories.



Specifications	FLOW CORE	FLOW PRO
POWER SUPPLY	2 AA 1.5V lithium batteries	4 AA 1.5V lithium batteries
MECHANICAL STRENGTH	Standard mounting base included RUG-compatible, reinforced mounting base	RUG-compatible reinforced mounting base included

Compatible accessories:

- **NODE One:** Remote temperature sensor that measures room temperature independently of the radiator. It improves the accuracy of temperature control and ensures a level of comfort that closely matches occupants' actual perception.
- **CASE+:** Protective cover for FLOW thermostatic heads. It prevents unauthorized tampering with the product and provides effective protection against intentional or accidental damage.
- **RUG:** Reinforced mounting base with integrated metal inserts. Designed for demanding environments, it significantly improves the installation's mechanical resistance to impacts and repeated stress.
- **ADAPT:** Adapter kit that makes FLOW thermostatic heads compatible with nearly 99% of thermostatic valves available on the market, thereby facilitating renovation and deployment projects.

2. Product Diagram

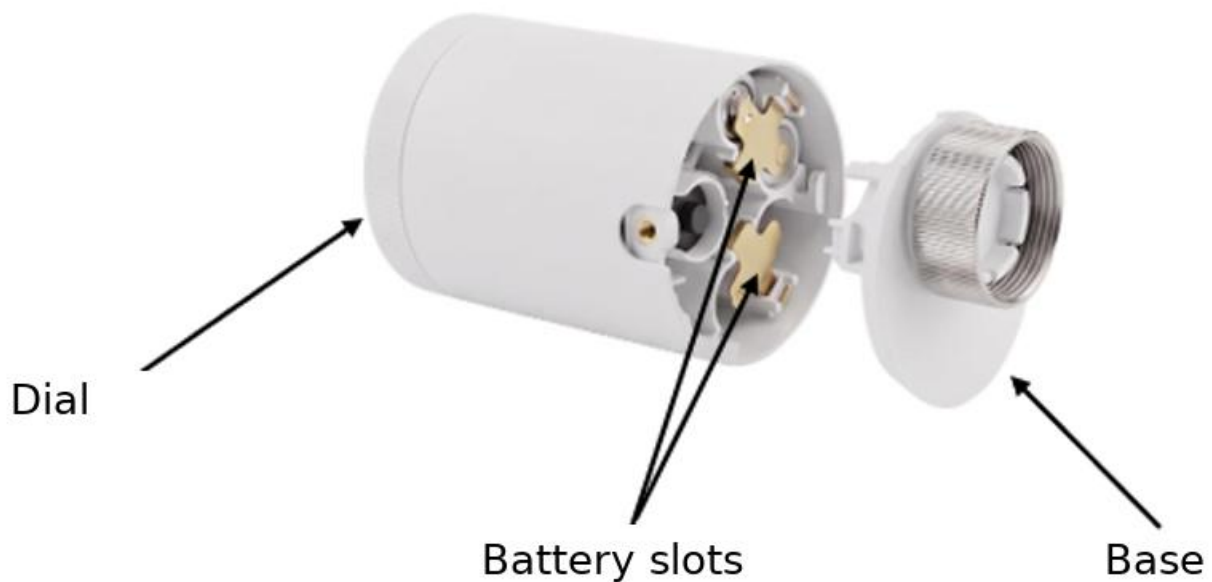
DIMENSIONS & WEIGHT

Diameter: 58 mm

Length: 91 mm

Weight:

- FLOW CORE: 190 g (batteries included)
- FLOW PRO: 220 g (batteries included)



3. Kit Description



1 FLOW thermostatic head



x 2 (FLOW CORE) or x 4 (FLOW PRO)



5 colored



marking tabs 1 anti-theft protection screw

4. Operating Environment and Certifications

PRODUCT USAGE CONDITIONS

- > Indoor environment
- > Temperature: -20°C to +60°C
- > Relative humidity: 0% to 99% RH (non-condensing)

CERTIFICATIONS

Applicable certifications and associated declarations of conformity are available on the Nexelec support website at support.nexelec.fr

5. Support and Integration Tools

Product documentation and tools can be found on our website at support.nexelec.fr

There you will find:

- > CODEC, JavaScript code for decoding messages:
<https://github.com/nexelec/Decoders>
- > Online message decoding tool:
<https://nexelec-support.fr/n/decoder/>
- > Online Downlink Calculator for Remote Product Reconfiguration: <https://nexelec-support.fr/n/downlink/>
- > VOLT: Online product battery life calculator:
<https://nexelec-support.fr/n/volt/>

If you have any questions, our support team can be reached by email at: support@nexelec.fr .

II. Product Installation

1. Installation and Commissioning

The FLOW thermostatic head is designed to easily replace an existing thermostatic head. It can be installed without any work on the radiator's water circuit: if the radiator is already equipped with a compatible thermostatic valve, no water will leak during replacement.

Caution: If the radiator is not equipped with a thermostatic valve, installation requires replacing the existing head. This work must be performed by a qualified professional, such as a plumber.

— 01. Removing the Old Thermostatic Head

- Open the old thermostatic head fully by turning it to its maximum setting.
- Identify the mounting system:
 - Clamping nut (usually M30 × 1.5);
 - Mounting ring;
 - Manufacturer-specific adapter.
- Loosen the fastener by hand or with a suitable tool if necessary.
- Carefully remove the thermostatic head from the valve body.

Note: If the radiator is equipped with a thermostatic head, no water will be drained from the system or leak out during this procedure.

— 02. Check the valve's compatibility

- Check the connection type of the valve body.
- If the connection is the **M30 × 1.5** standard, the FLOW head can be installed directly.
- Otherwise, install the appropriate adapter (Nexelec **ADAPT** kit or equivalent) according to its instructions.

— 03. Install the FLOW thermostatic head base

- Check that the thermostatic valve stem moves freely.
- Position the FLOW head on the valve body or on the installed adapter.
- Screw on the mounting ring until it is fully tightened.



— 04. Power Supply

- The product is powered by non-rechargeable 1.5V AA lithium batteries. The product can be powered by two (FLOW CORE) or four batteries (FLOW PRO), depending on the application and desired battery life.
- To activate your product, insert the batteries*. The batteries must be inserted in the direction indicated on the product.

*: Do not mix battery types from different brands; when replacing the batteries, replace all of them with new ones



— 05. Automatic network connection (LoRaWAN products)

- Once powered on, the product initializes for approximately 5 seconds



- It automatically attempts to connect to the LoRaWAN network



- Successful connection: The “LoRa” icon remains **lit** for 5 seconds
- Join failure: “LoRa” icon **flashes** for 5 seconds

— 06. Initial motor calibration

The FLOW thermostatic head is ready to be installed on its mounting base.

As soon as FLOW is properly secured to its mounting base, a motor calibration procedure starts automatically. This process allows the head to identify the open and closed positions of the thermostatic valve to ensure optimal operation.

During the calibration phase, a scrolling light indicator appears on the product.

Calibration Result

Status	LED Display
Calibration successful	Setpoint temperature display
Calibration failed	F1
Head not mounted on its base	F2

Code F1 – Calibration failure

Verify that the thermostatic head is properly installed on its base and that the motor is able to fully actuate the valve stem. If necessary, use a suitable shim to ensure the head closes completely before restarting the calibration.

Code F2 – Head not mounted on its base

Make sure that FLOW is properly snapped into place and locked onto its mounting base.

If the initial calibration fails, a second attempt is automatically initiated.

If this second attempt also fails, a new calibration attempt is automatically performed every 24 hours until the operation is successful.

Restarting a Calibration

A new calibration can be triggered remotely:

- via a **LoRaWAN® downlink** command;
- via the **NFC** interface.

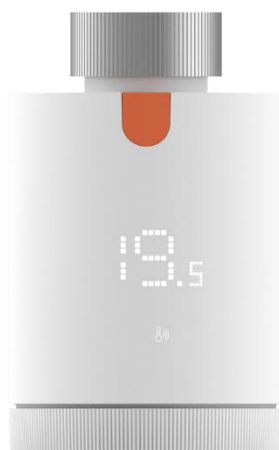
— 07. Theft-proof mounting and colored tabs

The FLOW thermostatic head can be secured using the included Phillips-head locking screw. Once installed, this screw prevents unauthorized removal of the thermostatic head and enhances the security of the installation.



FLOW also comes with a set of 5 colored tabs that make it easy to identify each thermostatic head. This feature is particularly useful when multiple units are installed in the same room or at the same site.

The use of color-coding simplifies operation and maintenance by allowing each unit to be quickly identified, thereby reducing service times and the risk of errors.



— 08. Setting the Product Time

FLOW uses the date and time to ensure the proper functioning of heating schedules as well as control optimization features, including automatic management of heating seasons (summer mode / winter mode).

When the product is connected to a LoRaWAN network, the date and time are automatically synchronized and kept up to date via the network. The transmitted time is in UTC format. The time zone can be configured via a LoRaWAN downlink command or using the NFC interface.

If there is no LoRaWAN connection, the date, time, and time zone can be configured manually via the NFC interface. In this case, it is recommended to check and, if necessary, reconfigure these settings after replacing the batteries.

When the date and time are not configured, time-dependent features—such as heating schedules and automatic seasonal management—are disabled. They are automatically reactivated as soon as a valid date and time are entered.

2. CASE+: Vandal-Resistant Housing

CASE+ enhances the mechanical protection of FLOW thermostatic heads in communal environments. Its design minimizes impacts, unauthorized tampering, and attempts at removal, while maintaining the visibility of the display and ensuring the proper functioning of the control system.



— 01. Installation

- Position the fixed part around the thermostatic head's clamping ring by first installing the lower part, then snapping on the upper part.



- Install the protective cover over the fixed part until it clicks into place.
- Complete the installation by tightening the supplied locking screw



III. Anti-Theft Detection

The product is equipped with a system that verifies whether or not it is installed on its mounting base. This feature ensures that the products have not been removed from their base. Whenever the product is inserted into or removed from its base, a LoRaWAN message is transmitted.

IV. Setpoint Temperature Adjustment and User Lock

The setpoint temperature can be adjusted using the adjustment knob, in 0.5 °C increments.

To view the currently set temperature, simply turn the dial: the set temperature will then appear on the screen for 5 seconds.

By default, the adjustment range is between 15 °C and 26 °C. This range can be expanded or restricted via the product's configuration settings (see the "Configuration" section).

It is also possible to disable manual temperature adjustment using the Child Lock feature. When this feature is enabled, any attempt to change the setpoint using the dial is prevented.

The behavior of the Child Lock in the event of a network connection loss is configurable. You can configure the system to automatically disable the local lock when the product is no longer connected to the network, allowing the user to regain manual control of the temperature.

V. BOOST Mode

BOOST mode allows you to quickly reach the desired temperature by fully opening the valve.

This feature must first be enabled in the product's settings. It can be enabled or disabled via NFC or a LoRaWAN downlink command. When the BOOST feature is disabled, pressing the main button does not trigger any action on the head and does not change the current operating mode.

When the function is enabled, pressing and holding the main button for 2 seconds activates BOOST mode. The message "UP" appears for 5 seconds to confirm that the command has been accepted.

While in BOOST mode:

- the valve remains fully open;
- normal thermostatic control is temporarily suspended;
- the product no longer controls the valve's position based on the measured temperature or the setpoint temperature;
- the BOOST status is indicated in the periodic data transmitted over the LoRaWAN network.

The activation duration is configurable between 10 and 120 minutes, in 10-minute increments. The default value is 30 minutes.

If the button is pressed again for 2 seconds while BOOST mode is already active, the full configured duration restarts from the moment the button is pressed again. Durations are not cumulative.

BOOST mode ends in one of the following cases:

- the configured duration has elapsed;
- the user changes and then confirms a new setpoint temperature using the dial.

When a setpoint change is confirmed during BOOST mode, the mode is immediately canceled. The new manual setpoint is applied and temporarily takes precedence over the setpoint from the weekly schedule.

At the end of BOOST mode—whether triggered by the user or by the expiration of the configured duration—thermostatic control resumes quickly and recalculates the valve position without waiting for the next normal periodic cycle.

VI. Anti-seizing function

To prevent the head actuator from seizing up during prolonged periods of inactivity, the product automatically performs a full exercise cycle once a month.

This function is active when the thermostat is inactive, specifically:

- outside the configured heating period;
- when the control has been deactivated by the user.

The anti-seizing cycle is performed automatically every month, provided that the product is properly installed on its base and that its condition allows for motor movement.

During the cycle, FLOW performs the following operations in sequence:

- fully closes the valve ;
- fully opens the valve ;
- return to the position it was in before the cycle began.

Normal operation of the product then resumes without any changes to the configuration. The cycle is transparent to the user: it does not cause any changes to the display and does not, on its own, trigger the transmission of a LoRaWAN message.

The cycle is not executed when the motor is not calibrated or is already in motion, or when the battery status requires degraded operation to preserve battery life.

This periodic cycle helps maintain the proper functioning of the valve by preventing the piston from remaining stationary in a fixed position throughout the summer season. It thus limits the risk of jamming, reduces maintenance requirements, and helps preserve the device's power consumption performance over time.

VII. Anti-Freeze Mode

The freeze protection feature protects the system from excessively low temperatures that could cause the pipes or radiator to freeze.

When this function is enabled, FLOW monitors the ambient temperature. If the measured temperature falls below the configured anti-freeze threshold, the valve is activated to allow hot water to circulate and maintain a minimum temperature in the room.

The activation threshold is set to 7 °C by default. It can be configured between 0 °C and 31 °C via NFC or a LoRaWAN downlink command.

When the temperature rises sufficiently above the configured threshold, FLOW exits freeze protection mode and resumes its previous operation.

Activation of frost protection mode is automatically indicated in the periodic data transmitted over the LoRaWAN network.

This feature can be disabled. In this case, FLOW does not trigger any specific action when the temperature drops below the frost protection threshold. Disabling this protection should therefore be reserved for systems in which the risk of freezing is managed by another device.

Note: The anti-freeze protection feature should not be confused with the anti-freeze temperature mode that can be selected in a schedule. The schedule mode intentionally applies a low setpoint for a given period, whereas the anti-freeze protection feature acts as a safety measure when the temperature drops below the configured threshold.

VIII. Open Window Detection

The open-window detection feature helps limit energy loss when ventilation causes a rapid drop in room temperature.

FLOW measures the temperature every minute using its internal sensor. When the decrease observed between two consecutive measurements reaches or exceeds the configured threshold, the product assumes that a window is open.

By default, the trigger threshold is set to 1°C per minute. It can be configured between 0.1°C/min and 3 °C/min via NFC or a LoRaWAN downlink command.

Detection can only be triggered when:

- the open-window detection feature is enabled;

- thermal control is active;
- no error is preventing control;
- BOOST mode is inactive.

A gradual decrease over several minutes does not necessarily trigger the function: the decrease must reach the configured threshold between two consecutive measurements.

Behavior During Detection

As soon as an open window is detected:

- temperature control is temporarily paused;
- the valve is fully closed;
- the control mode transmitted in the LoRaWAN data changes to “open window”;

The valve remains closed for the entire duration of the detection. The control system no longer adjusts its position based on temperature or the setpoint.

End of detection

Detection ends as soon as one of the following conditions is met:

- the maximum pause duration has elapsed;
- the ambient temperature reaches or exceeds the setpoint;
- the temperature remains stable or rises for 10 consecutive minutes.

The maximum duration is set to 30 minutes by default and can be configured between 1 and 60 minutes.

To determine whether the temperature is rising sustainably, FLOW analyzes its change minute by minute. A drop in temperature resets the observation period. Short periods of stable temperature are tolerated, but prolonged stagnation is not considered a rise.

Upon detection:

- a periodic data frame is immediately transmitted;
- control resumes quickly, and the valve position is recalculated without waiting for the next normal periodic cycle.

Detection is also interrupted when the user performs an explicit action on the product, including:

- changing the setpoint temperature using the dial;
- activating BOOST mode by pressing and holding for 2 seconds;
- removing the product from its base.

If the setpoint is changed manually, the new value is immediately applied and temporarily takes precedence over the setpoint from the schedule.

The function can be completely disabled via NFC or a LoRaWAN downlink command. When disabled, rapid drops in temperature do not trigger automatic closure of the vanne.

IX. Temperature measurement and Correction Offset

FLOW includes a temperature sensor that measures the ambient temperature and controls the heating.

To adjust the measurement to the actual installation conditions, a temperature offset can be applied via the NFC interface or a LoRaWAN downlink command.

Using an offset may be appropriate when the temperature measured by the thermostatic head differs slightly from the temperature felt in the room. This situation can occur, for example, when the radiator is located in a niche, behind furniture, near a heat source, or in any configuration that could locally influence the measurement. The offset then allows the measured value to be adjusted to improve control accuracy and occupant comfort.

The offset does not improve the sensor's inherent accuracy, but it compensates for deviations caused by the installation environment.

In situations where the influence of the radiator or the environment is significant, the use of a NODE One remote temperature sensor is recommended. This allows the temperature to be measured at a location that is more representative of the actual room conditions and optimizes control performance (see the section "Temperature Measurement Using a Remote Sensor").

INTERNAL TEMPERATURE SENSOR SPECIFICATIONS

Characteristic	Value
Typical Accuracy	$\pm 0.4\text{ }^{\circ}\text{C}$
Maximum Accuracy	$\pm 0.6\text{ }^{\circ}\text{C}$
Resolution	$0.1\text{ }^{\circ}\text{C}$
Measurement range	$-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$

Measurement period

1 minute

X. Ambient Temperature Measurement with the NODE One Remote Sensor

To improve the representativeness of ambient temperature measurements, FLOW is compatible with NODE One, a remote temperature sensor. This solution allows you to control one or more thermostatic heads based on a measurement taken at a location that better reflects the perceived comfort in the room.

Using a remote sensor offers several advantages:

- elimination of the radiator's direct thermal influence on the measurement;
- freedom to position the sensor anywhere in the room (installation height, distance from windows, exterior walls, or any heat source);
- improved control accuracy and thermal comfort for occupants;
- the ability to pair a single NODE One sensor with multiple FLOW thermostatic heads.

To ensure optimal operation, the NODE One sensor must be installed in the same environment as the associated thermostatic heads, ideally in the same room and at a maximum distance of approximately 20 meters.

Operation

When NODE One is available and connected, FLOW automatically uses the temperature measured by the remote sensor to control the system.

If NODE One is unavailable (low battery, loss of communication, product removal, etc.), FLOW automatically switches to its internal temperature sensor to ensure uninterrupted operation.

Communication between NODE One and FLOW takes place directly on-site. Information regarding the sensor (measured temperature, battery level, connection status, and sensor ID) is then transmitted by FLOW over the LoRaWAN network.

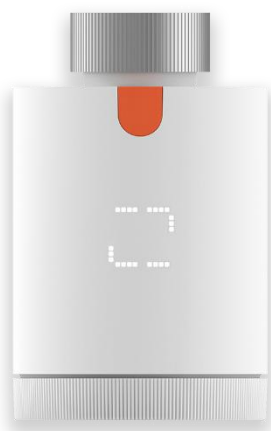
NODE One Sensor Specifications

Feature	Value
Typical Accuracy	$\pm 0.4\text{ }^{\circ}\text{C}$
Maximum Accuracy	$\pm 0.6\text{ }^{\circ}\text{C}$
Resolution	$0.1\text{ }^{\circ}\text{C}$
Measurement range	$-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$
Measurement interval	10 minutes

Pairing a NODE One sensor with FLOW

Pairing Procedure

- Install the FLOW thermostatic head on the radiator and insert the batteries.
- Activate FLOW's pairing mode by pressing the dial three times in a row: A running light will appear on the head's LEDs, indicating that FLOW is ready to pair.



- Place the NODE One sensor in its designated location before pairing it with a FLOW thermostatic head.
- Insert the battery into the NODE One sensor (Part Number CR2450).



- When powered on, NODE One automatically enters pairing mode for about 1 minute. The sensor's LED flashes during this phase.



- Wait for the pairing procedure to complete.
 - Pairing successful: The “NODE One” LED on FLOW remains lit steadily for 5 seconds.
 - Pairing failed: The “NODE One” LED on the FLOW flashes. In this case, move the two devices closer together if necessary and repeat the procedure.
- Note : If pairing fails, the Flow retains the previous pairing IDs.



Note: Once pairing is complete, FLOW automatically uses the temperature measured by NODE One to regulate temperature.

If you want to pair multiple thermostatic heads with the same NODE One sensor, set the second FLOW head to pairing mode. If the NODE One sensor was started less than a minute ago, pairing occurs instantly. Otherwise, put the NODE One device back into pairing mode by pressing its button.

XI. Low and Critical Battery Mode

FLOW continuously monitors its battery voltage to adjust its operation and preserve battery life when the power level becomes insufficient.

Low Battery Mode

When the battery voltage drops below 3000 mV, FLOW enters low battery mode.

A status message is transmitted to indicate this condition, and the low-battery icon appears on the screen when using the scroll wheel.

In this mode, all product features remain available, including thermal regulation and radio communications.

Critical Battery Mode

When the battery voltage drops below 2800 mV, FLOW enters critical battery mode.

A status message is then transmitted to indicate the critical battery condition. When using the scroll wheel, the low-battery icon appears and the message “Lo” is displayed on the screen.



To conserve the remaining battery life and ensure a minimum level of comfort, FLOW adjusts its operation:

- thermal regulation is disabled;
- the valve is set to a partial opening (30% by default, configurable value) to maintain a minimum temperature and limit the risk of freezing;
- periodic data messages are now transmitted only once a day;
- remote software updates (FUOTA) are disabled.

It is recommended that you replace the batteries as soon as the low-battery status appears to avoid entering critical battery mode and to preserve all of the product's features.

XII. Heating Season Management (Winter–Summer Mode)

FLOW allows you to define a heating period corresponding to the time of year during which the heating system is likely to supply heat to the radiators.

This feature can be used with both a central heating system and an individual boiler. It automatically adjusts the thermostatic head's operation to the periods during which heating is actually available.

For example, the heating season can be set from October 1 to April 30.

Winter Mode

During the heating season, FLOW operates in winter mode. In this mode, the product:

- normally regulates the room temperature based on the configured setpoint;
- applies the scheduled programs and associated operating modes (Comfort, Eco, Extended Absence, Frost Protection);
- enables advanced features such as open-window detection, Boost mode, or temporary setpoint changes;
- transmits its data at high frequency (every 10 minutes by default).

Summer Mode

Outside the heating season, FLOW automatically switches to summer mode. In this mode, the unit:

- deactivates temperature control and no longer attempts to reach a setpoint temperature;
- sets the valve to the opening percentage configured for operation when temperature control is disabled;
- maintains this fixed position as long as temperature control remains disabled, except during cycles related to protection or maintenance functions;
- keeps the anti-seizing function active, which periodically activates the thermostatic valve (once a month by default) to prevent the needle from seizing;

- reduces the frequency of its LoRaWAN communications to conserve battery life. Periodic data is transmitted every 30 minutes by default. This frequency can be increased if more frequent monitoring of the ambient temperature is required.

By default, the opening percentage when regulation is disabled is set to 100%. The valve is then fully open, which prevents the valve needle from being under stress during long periods of inactivity.

This percentage can be configured between 0% and 100% via NFC or a LoRaWAN downlink command:

- 0%: valve fully closed;
- 100%: valve fully open;
- 1 to 99%: fixed intermediate position.

Changing this setting does not reactivate thermostatic control. When control is reactivated, the algorithm automatically resumes control of the valve's position.

The anti-seizing function remains active in summer mode to periodically exercise the head mechanism. See section VI .Anti-seizing function .

Why set up a heating season?

The heating season setting prevents FLOW from attempting to regulate the temperature when the heating system is turned off and no heating energy is available.

Without this configuration, the head could continue to make adjustments to reach a setpoint temperature that cannot be achieved, resulting in unnecessary motor movement and additional battery consumption.

The heating season setting also helps optimize the product's LoRaWAN communications. In summer mode, the transmission frequency is reduced, which significantly lowers energy consumption related to radio communications and helps extend battery life.

Proper configuration of the heating season thus improves both the product's battery life and the lifespan of its mechanical components, while maintaining essential monitoring and preventive maintenance functions.

Recommendations

The start and end dates of the heating season should correspond as closely as possible to the heating system's typical operating periods.

In case of uncertainty, it is recommended to set a heating period that is slightly longer than the actual period during which the heating system is in operation. A period that is too long generally has little impact on the product's operation, whereas a period that is too short may disable the control system even while the heating is still available.

XIII. Control and Scheduling

FLOW includes a scheduling system that automatically adjusts the setpoint temperature based on the building's occupancy periods.

This feature allows you to:

- improve occupant comfort by automatically applying temperatures suited to different times of the day;
- reduce energy consumption by limiting heating during periods when the building is unoccupied;
- ensure continuous control even in the event of temporary network outages;
- simplify building operations through local (NFC) or remote (LoRaWAN downlink) configuration.

How It Works

FLOW automatically applies a setpoint temperature based on:

- the day of the week;
- the time of day;
- the configured temperature profile.

The programming is based on four temperature modes to which the user assigns a setpoint.

Configuring Temperature Modes

Setpoint temperatures can be set between 0 °C and 31 °C, in 0.5 °C increments.

Four operating modes are available:

- **Comfort Mode:** Use this mode when occupants are in the room and wish to maintain a comfortable temperature.
- **Eco Mode:** Recommended at night or during short absences (a few hours to two days).
- **Extended Absence Mode:** Intended for long-term absences, such as when going on vacation or when the premises are unoccupied for several days.
- **Frost Protection Mode:** Protects the building from freezing by maintaining a minimum temperature. Heating is activated only when the temperature drops below the configured threshold (7 °C by default).

Creating Daily Profiles

FLOW allows you to configure up to three typical daily profiles.

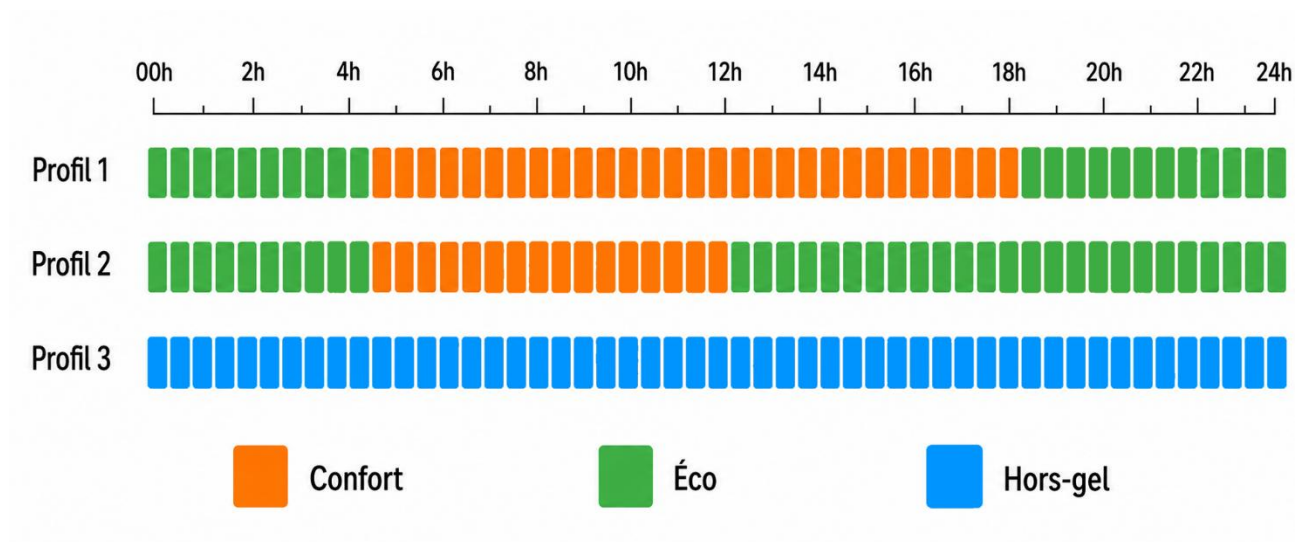
Each day is divided into 30-minute time slots. For each time slot, you can select one of four temperature modes:

- Comfort;
- Eco;
- Extended Absence;
- Frost Protection.

The profiles can, for example, correspond to:

- a weekday;
- a day with an exception (Wednesday during the school year, etc.);
- a weekend.

The image below shows an example of 3 daily profiles:



Assigning Profiles to Days of the Week

Each day of the week can be assigned one of the previously created profiles.

Example:

Day	Profile
Monday	Profile 1
Tuesday	Profile 1
Wednesday	Profile 2
Thursday	Profile 1
Friday	Profile 1
Saturday	Profile 3
Sunday	Profile 3

FLOW automatically applies the profile corresponding to the current day.

Temporary Setpoint Change

A manual temperature adjustment, made using the dial or via LoRaWAN downlink, is considered temporary.

The new setpoint remains active until the next change scheduled by the schedule, after which FLOW automatically resumes normal operation.

Date and Time

Schedules require a valid date and time to function.

When FLOW is connected to the LoRaWAN network, this information is automatically synchronized.

If the date or time is unavailable, the schedules are disabled, and FLOW applies a default setpoint temperature of 19.5°C (adjustable manually, via NFC, or via LoRaWAN downlink). Code F4 is then displayed on the product.

To restore schedule functionality:

- wait for automatic synchronization via the LoRaWAN network;

- or manually synchronize the date and time using the Touch app.

Visual Indication

When schedules are enabled, the Schedule icon appears for 5 seconds after each use of the dial.

When a setpoint temperature is set manually (via the dial, downlink, or NFC), it temporarily overrides the one defined in the schedule. In this case, the “Schedule” icon flashes when the dial is turned.



XIV. Buttons and LEDs



1. Buttons

Button	Actions triggered	LED
Rotation wheel – rotation	- Displays the current setpoint temperature, with a temporary 500 ms lockout on setpoint changes. - Changes the setpoint temperature in 0.5°C increments - New setpoint locked after 5 seconds without turning the dial	Setpoint temperature
Dial – 3x push	NODE One pairing	Crawler
Dial – Long press > 10 sec	Enable/Disable Child Lock	Enable:



Deactivation:



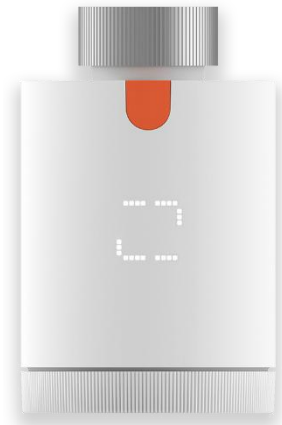
Dial – Press for 2
seconds

Enable BOOST



Reset button – press once

Initiate a LoRaWAN Join



Reset button – press and hold for more than 3 seconds

reset for :
- Restores default settings
- Connection with NODE ONE remote sensor removed

/

Generally, the LEDs remain off and only light up following an event, such as pressing a button or turning the dial. No LED activates without user action, including during a product restart, a link check, or a periodic join.

2. LEDs

LED	LED Status	Product Status
Padlock icon 	On for 5 seconds	Scroll wheel rotation AND "Child Lock" mode active
	Off	Standard mode
LoRa icon 	On for 5 seconds	Device connected to the LoRaWAN network
	Flashing for 5 seconds	Product not connected to the LoRaWAN network
	Off	Standard mode
NODE One icon 	On for 5 seconds	FLOW connected to a NODE ONE sensor
	Flashing for 5 seconds	No NODE ONE sensor connected
	Off	Standard mode

s battery icon			Critical battery mode
	On for 5 seconds	Low battery mode	
	Off	Standard mode	
Clock icon 	On for 5 seconds	Scheduling mode enabled	
	Off	Standard mode	
Numbers	Number 		Temperature setpoint
			Product initialization in progress



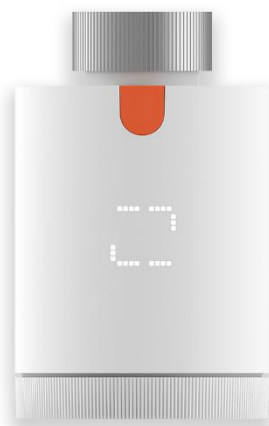
- Motor calibration
- Manual LoRaWAN pairing (via button press or NFC)
- Pairing with NODE ONE sensor in progress



Control disabled

Base detected

When the product is placed on its base, a LoRaWAN message is sent and motor calibration is automatically initiated.



Base not detected

When the product is removed from its base, error code F2 is displayed. A LoRaWAN message is also sent, and temperature control is paused.



ERROR CODES

Code displayed on the FLOW LEDs	Details
F1	Calibration error—Check that the thermostatic head is properly installed on its base and that the motor is able to fully actuate the valve stem
F2	Calibration error – head not mounted on its base
F3	Defective internal temperature sensor in the head. Contact support: support@nexelec.fr
F4	Product date and time are not synchronized: device has switched to degraded mode. Please wait for the product to connect to the LoRaWAN network or use the Touch app to resynchronize the product's date and time.

XV. Accessing Measurements via NFC

The NFC TOUCH app provides access to the product's operating and diagnostic information, including:

- > Product status information:
 - Software and hardware versions
 - Status of the temperature sensor, battery, and motor



XVI. Battery life

1. Estimate my product's battery life

An online calculation tool is available: <https://nexelec-support.fr/n/volt/>

It allows you to estimate the battery life of products based on transmission modes, network settings, etc. You can also access it by scanning or clicking on the QR code:



2. Factors Affecting Product Battery Life

Several factors influence a product's battery life:

The number of motor movements

Each time the motor adjusts the head opening and maintains the set temperature, it consumes energy. The more frequently the motor operates, the higher the energy consumption. Repeated changes to the set temperature can therefore reduce the product's battery life.

Data transmission frequency

Data transmission via LoRaWAN is also a significant source of energy consumption. By reducing the frequency of communications, it is possible to significantly increase the product's battery life. During the summer, if temperature monitoring is not essential, the frequency of data transmission can be lowered to maximize the product's battery life.

LoRaWAN Network Coverage Quality (LoRaWAN Products Only)

LoRaWAN technology incorporates an optimization mechanism called ADR (Adaptive Data Rate), which automatically adjusts radio parameters based on the quality of the connection to

the network. In an environment with excellent radio coverage, a product can consume up to twenty times less energy than a device installed in an area with poorer coverage. Network coverage quality is therefore a key factor in maximizing the product's battery life

Network Settings

1. LoRaWAN Settings

LoRaWAN Protocol Version: Product compatible with versions 1.0.4

Regional Parameters: Product compatible with parameter RP002 1.0.4

Profile: Class A (RX2SF9 or RX2SF12)

Available Frequencies: EU868

Join type: OTAA

AppEUI: 0x70B3D540F70CE4D2

DevEUI: Unique identifier for each product. Information available on the label and provided upon delivery of the product.

AppKey: Security key unique to each product. Information provided upon delivery of the product.

Application port (uplink/downlink): 56

ADR: Yes

2. Network connection

— 01. LoRaWAN Products

AUTOMATIC CONNECTION UPON POWER-UP

When powered on, the product automatically makes two attempts to connect to the LoRaWAN network. If either attempt is successful, the product immediately transmits its configuration and status.

COMMISSIONING STRATEGY IN THE EVENT OF AN INITIAL FAILURE

If the initial connection attempts fail, the product implements a reconnection strategy. The interval between attempts doubles with each subsequent attempt:

- 1st attempt: 20 minutes after power-on;
- 2nd attempt: 40 minutes after the first;
- 3rd attempt: 80 minutes after the second;
- and so on, following the same pattern.

After these successive attempts, if the network remains inaccessible, the product will automatically attempt to reconnect once a day.

SCHEDULING A NEW REMOTE NETWORK CONNECTION

A new connection attempt can be scheduled remotely via a downlink command. This feature is particularly useful when changing LoRaWAN network servers. When the request is registered, the “Deferred Network Connection” field is automatically set to 1 in the configuration message returned by the device.

PERIODIC NETWORK CONNECTION CHECK

Every day, when sending the “Product Status” message, the product performs a network connection check using the standard LoRaWAN “LinkCheck” command. If no response is received after three consecutive checks, the product automatically initiates a new network connection procedure in accordance with the reconnection strategy described above.

3. General al description of messages

The different types of messages sent are described below:

Function Details	Message Index	Message Transmission	Configurable
Periodic Data	0x01	Periodic and on event	Yes
General head status	0x02	Periodic (24-hour) and event-driven	No
General status of the NODE One remote sensor	0x03	Periodic (24-hour) and on event	No
General configuration of the head	0x04	Periodic (7 days) and on change	No
Daily profile configuration #1	0x05	7-day periodic and on change	No
Daily Profile Configuration #2	0x06	7-day cycle and on change	No
Daily Profile Configuration #3	0x07	7-day cycle and on change	No

4. Message Definitions

— 01. Periodic data

Measurements taken by the product are transmitted in a message structured according to the following format:

Offset	Size (bits)	Data	Description	Valid Range	Scale	Unit
0	8	Product type	FLOW	FLOW CORE: 0xD2 FLOW PRO: 0xD6		
8	4	Message Type	Periodic Data		0x01	
12	4	Version	Message version		1	
16	10	Ambient temperature	Temperature in °C, in 0.1°C increments, offset 30°C (e.g., 0 = -30°C, 300 = 0°C, 1000 = 70°C)	0–1000 1023: Error	-30 to 70	°C
26	6	Setpoint temperature	Temperature in °C, in 0.5°C increments (e.g., 0 = 0°C, 36 = 18°C, 62 = 31°C)	0–62 63: Error	0–31	°C
32	2	Measurement source: ambient temperature	Source of the ambient temperature measurement	0: Internal sensor in the head 1: NODE ONE remote probe 2–3: RFU		

		Temperature measured by the internal sensor in the head	Temperature in °C, offset 30°C (e.g., 0 = -30°C, 300 = 0°C, 1000 = 70°C)	0–1000	-30–70	°C
34	10			1023: Error		
44	3	Setpoint Temperature Change	Source of the setpoint temperature change	0: No change 1: Change via schedule 2: Manual change via , dial, or 3: NFC 4: Downlink 5: Product time not up to date: Switch to degraded mode (forced control at 19.5°C) 6..7: RFU		
47	13	Motor position	Instantaneous motor position in micrometers (µm), where 0 corresponds to the motor fully retracted.	0–7,000	0 - 7,000	µm
60	7	Valve opening percentage	Valve opening percentage	0–100	0 – 100	%
67	4	Control Mode	Current control mode	0: Control OFF 1: Continuous control (Schedule disabled or setpoint temperature changed manually) 2: Comfort mode 3: Eco mode 4: Frost protection mode 5: Extended Absence Mode 6: BOOST mode 7: Open Window Mode 8: Low Battery Mode 9–15: RFU		

— 02. General status for the FLOW head

This message is sent when the product is powered on, repeated daily, and sent immediately when any of the following information changes:

- > Overall product status
- > Anti-tamper detection status
- > Motor calibration status
- > Pending membership request status
- > Interconnection status with NODE One

LORAWAN EU868

Offset	Size (bits)	Data	Description	Valid Range	Scale	Unit
0	8	Product type	FLOW	FLOW CORE: 0xD2 FLOW PRO: 0xD6		
8	4	Message Type	General status of the FLOW thermostatic head	0x02		
12	4	Version	Message version	0		
16	8	Hardware version	Hardware version	0–250	0-250	-
24	8	Software version	Software version	0–250	0–25.0	-
32	10	Battery voltage, slot 1	Battery voltage, slot 1	0–1,000	0–5000	mV
				1021: batteries missing 1022: Reserved 1023: Error		
				0–1000	0–5000	mV
42	10	Battery voltage, slot 2	Battery voltage, slot 2	1021: No batteries 1022: Reserved 1023: Error		
52	2	Battery level	General battery level	0: High (>50%) 1: Reserve 2: Low 3: Critical (<1%)		
54	1	Overall Product Status	Overall product status	0: Functional print head 1: Defective print head		
55	2	Anti-tear detection status	Anti-tear detection status	0: Base not detected on the head 1: Base detected on the head 2: Head currently removed from its base 3: Head currently installed on its base		
57	3	Motor calibration status	Motor calibration status	0: Calibration completed successfully 1: Calibration failed 2: Calibration not performed—FLOW not mounted on its base		

				3: Calibration erased after FLOW was removed from its base		
				4: Reserved		
60	13	Motor stroke	Motor stroke in micrometers	0 – 7000	0–7000	μm
				8191: Error		
73	10	FLOW activation time counter	Cumulative FLOW activation time	0–1000	0–1000	Months
				1023: error		
83	24	Date	Date stored in the product, expressed as the number of minutes since January 1, 2026	0–16777215	0–16777215	Minutes
107	1	Interconnection status with NODE One	Is the head interconnected with a NODE One remote sensor?	0: No NODE One connected to FLOW 1: NODE One sensor connected to FLOW		

— 03. General status of the NODE One remote sensor

This message is transmitted only when a NODE One sensor is paired with the FLOW thermostatic head.

It is sent in the following cases:

- > When FLOW is powered on
- > Each time a new pairing is established with a NODE One remote sensor
- > Once a day
- > Immediately when any of the following information changes:
 - Detection status of the rear mount of the NODE One remote sensor
 - Status of the temperature sensor on the connected NODE One probe
 - Battery level of the NODE One probe

Offset	Size (bits)	Data	Description	Valid Range	Scale	Unit
0	8	Product type	FLOW	FLOW CORE: 0xD2 FLOW PRO: 0xD6		
8	4	Message Type	General status of the NODE One sensor connected to FLOW		0x03	
12	4	Version	Message version		0	
16	24	Interconnection ID with the NODE One remote sensor	ID of the NODE One sensor connected to FLOW	0: No NODE One connected 1 – 16,777,215: Interconnection ID between FLOW and NODE One		
40	2	NODE One rear mount detection status	Is NODE One positioned on its docking station?	0: Base not detected on NODE One 1: Base detected on NODE One 2: NODE One just removed from its base 3: NODE One has just been placed on its base		
42	1	NODE One Temperature Sensor Status	NODE One temperature sensor status	0: Sensor is working 1: Sensor defective		
43	2	NODE One battery level	Battery level of the connected NODE One sensor	0: High (>50%) 1–2: Reserve 3: Critical (<1%)		
45	10	NODE One battery voltage	Battery voltage of the connected NODE One sensor	0–1000 1021: batteries missing 1022: Reserved 1023: Error	0– 5,000	mV
55	8	Number of NODE ONE	Number of frames received by FLOW from the NODE One	0–255	0 - 255	Frames

		frames received by FLOW	sensor over the past 24 hours			
63	8	Radio link quality between FLOW and NODE One	Absolute value of the RSSI of the last NODE One frame received by FLOW.			
			Value expressed in dBm, without the negative sign Ex: 50 corresponds to -50 dBm			
			0–255		0 → -255	dBm

— 04. Product Configuration

A message confirming the current configuration of the head is sent in the following cases:

- > When the head is powered on
- > After each reconfiguration
- > Every 7 days
- > After a request to connect to the LoRaWAN network

Version 3 of the frame fully retains the structure of Version 2. The existing fields retain the same order, format, and meaning.

Version 3 adds only one additional field at the end of the frame, namely:

- Activation of the LoRaWAN FUOTA mode

Refer to Appendix 1 for details of the frame change : Appendices 1. LoRaWAN Frame Evolution

Offset	Size (bits)	Data	Description	Valid Range	Scale	Unit
0	8	Product Type	FLOW	FLOW CORE: 0xD2 FLOW PRO: 0xD6		
8	4	Message Type	FLOW Configuration		0x04	
12	4	Version	Message Version		2	
16	3	Reconfiguration source	Source of the reconfiguration process	0: NFC 1: Application downlink 2: Product startup 3–4: Reserved 5: Periodic transmission (every 7 days) 6: Manual action on the product		

				7: Reserved		
19	2	Reconfiguration Status	Results of the reconfiguration process	0: Complete success 1: Partial success 2: Total failure 3: Reserved		
21	3	Periodic Frame Transmission Period – Control ON	Period for transmitting periodic frames when control is enabled	1–6	10–60	Minutes
24	8	Periodic Frame Transmission Interval – Control OFF	Period for transmitting periodic frames when control is disabled	1–144	10– 1440	Minutes
32	1	Child Lock enabled	Enabling the child lock feature	0: Disabled 1: Enabled		
33	1	Child lock behavior in the event of network loss	Child lock behavior when the head unit is disconnected from the LoRaWAN network	0: “Child lock” function remains active when FLOW is disconnected 1: “Child lock” function automatically disabled when FLOW is disconnected		
34	1	Enabling general control	General control status	0: Disabled 1: Enabled		
35	6	Minimum temperature adjustable via the dial	Minimum temperature adjustable via the dial, resolution 0.5°C	0 – 62 63: Error	0 – 31	°C
41	6	Maximum temperature adjustable via the dial	Maximum temperature adjustable via the dial, resolution 0.5°C	0 – 62 63: Error	0 – 31	°C
47	1	Activate anti-freeze function	Activate the anti-freeze function	0: Disabled 1: Enabled		
48	6	Anti-freeze mode temperature threshold	Activation threshold for frost protection mode, resolution 0.5°C	0 – 62	0–31	°C
54	1	Open Window Detection	Enabling the open window detection feature	0: Disabled 1: Enabled		
55	5	Temperature difference for open window detection	Temperature difference that triggers open-window detection, resolution 0.1°C	1–30	0.1 – 3.0°C	°C/min
60	6	Pause duration for open-window detection control	Duration of control pause after an open window is detected	1–60	1–60	Minutes

66	7	FLOW internal temperature offset	Offset applied to the internal temperature measurement of the print head, resolution 0.1°C	0–100	-5 to +5°C	°C
73	7	Control tolerance	Tolerance between the setpoint temperature and the ambient temperature	1 – 99	0.1 – 9.9	°C
80	6	"Comfort" mode temperature	Setpoint temperature in comfort mode, resolution 0.5°C	0 – 62 63: Error	0–31	°C
86	6	"Eco" mode temperature	Setpoint temperature in Eco mode, resolution 0.5°C	0 – 62 63: Error	0–31	°C
92	6	"Extended Away" Mode Temperature	Setpoint temperature in "extended absence" mode, resolution 0.5°C	0 – 62 63: Error	0–31	°C
98	7	Head opening percentage in low-battery mode	Percentage of head opening in low-battery mode	0–99	0–99	%
105	4	Protocol and Region	Network protocol and deployment region	01: LR-EU868 02-13: Reserved -12h/+14h 0: UTC-12		
109	5	Time Zone	Time zone	... 12: UTC ... 26: UTC+14		
114	1	Deferred network connection	Pending network connection request	0: No scheduled re request 1: Scheduled connection request		
115	2	NFC status	Status of the NFC configuration interface	0: Discoverable 1: Not discoverable 2-3: Reserved		
117	14		Reserved			
131	1	Activation of the heating period	Heating period on/off	0: Disabled 1: Enabled		
132	4	Heating Start Date	Month	1-12	1-12	Month
136	5	Heating Start Date	Day	1–31	1-31	Days
141	4	Heating End Date	Month	1–12	1-12	Month
145	5	Heating End Date	Day	1–31	1-31	Days
150	1	Enabling Schedules	Enable/Disable Schedules	0: Disabled 1: Enabled		
151	16	Weekly schedule	[15..14] Profile associated with Monday [13..12] Profile associated with Tuesday	0: Profile 1 1: Profile 2 2: Profile 3		

			[11..10] Profile associated with Wednesday [9..8] Profile associated with Thursday [7..6] Profile associated with Friday [5..4] Profile associated with Saturday [3..2] Profile associated with Sunday [1..0] Not used			
167	16	Downlink Fcnt	Downlink Fcnt causing the product to reconfigure			
183	1	BOOST Function Activation	Option to enable BOOST mode via the FLOW button	0: Disabled 1: Enabled		
184	7	BOOST mode activation duration	BOOST mode activation duration	10–120	10–120	minutes
191	7	Percentage of valve opening when control is disabled	valve opening percentage when control is disabled	0–100	0–100	%
192	1	Activation of the LoRaWAN FUOTA mode	Status indicating whether a Firmware Update Over-the-Air (FUOTA) is in progress.	0: FUOTA mode inactive 1: FUOTA mode active		

— 05. Configuring a daily profile

A message confirming the configuration of the heating profiles is sent in the following cases:

- > When the head starts up
- > After each reconfiguration
- > Every 7 days if scheduling mode is enabled and only during the heating period

Up to three daily profiles can be configured. Each profile is transmitted in the following format:

Offset	Size (bits)	Data	Description	Valid Range	Scale	Unit
0	8	Product Type	FLOW	FLOW CORE: 0xD2 FLOW PRO: 0xD6		
8	4	Message Type	Daily Profile Configuration	0x05: Daily profile #1 0x06: Daily profile #2 0x07: Daily profile #3		
12	4	Version	Message version		0	

16	3	Reconfiguration source	Source of the reconfiguration process	0: NFC 1: Application downlink 2: Product startup 3–4: Reserved 5: Periodic transmission (every 7 days) 6–8: Reserved
19	2	Reconfiguration Status	Result of the reconfiguration process	0: Complete success 1: Partial success 2: Total failure 3: Reserved
21	2	1st 30-minute time slot	Temperature during the time slot 12:00 a.m. – 12:30 a.m.	0: Above-freezing temperature 1: Comfort temperature 2: Eco temperature 3: Long-absence temperature
23	2	^{2nd} 30-minute time slot	Temperature for the time slot 12:30 a.m. – 1:00 a.m.	0: Above-freezing temperature 1: Comfort temperature 2: Eco temperature 3: Long-absence temperature
...				

XVIII. Product Configuration and Remote Controls

The product can be configured to best meet the needs of each installation. This configuration can be performed in two ways:

- > Locally, using a smartphone or tablet via the NFC TOUCH app;
- > Remotely, via the LoRaWAN connection interface

1. Configurations related to measurements and control

Configuration Type	Default value	Possible configuration
Offset for FLOW's internal temperature measurement	0	-5°C – +5°C
General control activation	Enabled	Enabled Disabled
Setpoint temperature	19.5°C	0–31°C
Tolerance between setpoint temperature and room temperature	0.5 °C	0.1 °C – 9.9°C
Enabling open-window detection	Enabled	On Off
Temperature difference that triggers open window detection	1 °C/min	0.1–3.0 °C/min
Duration of control pause after an open window is detected	30 minutes	1 – 60 minutes
Activation of the anti-freeze function	On	On Off
Frost protection mode activation threshold	7°C	0–31°C

2. -related settings: manual setpoint adjustment

CONFIGURATION TYPE	DEFAULT VALUE	POSSIBLE SETTING
Child Lock Activation	Disabled	Enabled Disabled
Child Lock Behavior in the Event of Network Loss	Child lock automatically deactivated in the event of a network outage	Automatic deactivation of the child lock Settings remain unchanged
Option to activate BOOST mode by pressing a button	Enabled	Enabled Disabled
BOOST mode activation duration	30 minutes	10–120 minutes
Minimum temperature adjustable via the dial	7°C	0–31°C
Maximum temperature adjustable via the dial	23° C	0–31°C

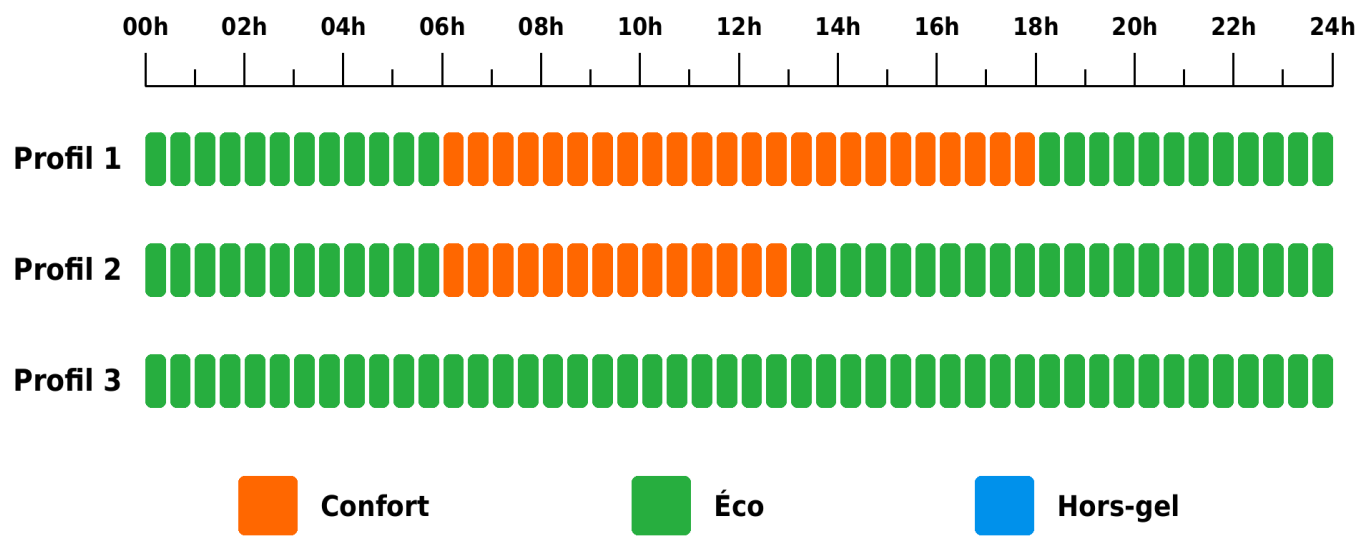
3. Configurations related to automatic setpoint adjustment

CONFIGURATION TYPE	DEFAULT VALUE	POSSIBLE SETTING
Built-in heating period	Disabled	Enabled Disabled
Heating Start Date	October 1	January 1 – December 31
Heating end date	April 30	January 1 – December 31
Setpoint temperature in comfort mode	19.5°C	0 – 31° C
Setpoint temperature in eco mode	15°C	0–31°C
Setpoint temperature in "Away" mode	12°C	0–31°C
Setpoint temperature for "frost protection" mode	7°C	0–31° C
Enable/Disable Schedules	Disabled	Enabled Disabled

Default Schedule Settings

When the schedule function is enabled, the default configuration below is automatically applied.

This configuration can be modified at any time to suit the installation’s needs, either locally via the NFC Touch app or remotely via LoRaWAN downlink.



Day	Profile
Monday	Profile 1
Tuesday	Profile 1
Wednesday	Profile 2
Thursday	Profile 1
Friday	Profile 1
Saturday	Profile 3
Sunday	Profile 3

4. Time Zone-Related Configuration

CONFIGURATION TYPE	DEFAULT VALUE	POSSIBLE SETTING
Time Zone	UTC +1	UTC-12 UTC+14

5. Network and Data Transmission Settings

— 01. Communication Protocol Configuration

CONFIGURATION TYPE	DEFAULT VALUE	POSSIBLE SETTINGS
Geographic region	EU868	EU868
Interval for transmitting periodic data when control is active	10 minutes	10–60 minutes
Period for transmitting periodic data when control is inactive	30 minutes	10–1,440 minutes

6. Commands related to fault conditions, control shutdown, and maintenance

VALVE POSITION WHEN CONTROL IS DISABLED

The “Valve Opening Percentage When Control Is Disabled” parameter defines the fixed position adopted by the valve when general control is stopped.

It is applied in the following situations, among others:

- manual deactivation of control;
- operation outside the heating period, when automatic seasonal control is enabled.

The value can be set between 0% and 100%. Its default value is 100%.

This parameter should not be confused with the opening percentage in critical battery mode, which serves a different purpose and has its own configuration value.

When the control is reactivated, the fixed position is abandoned and the thermostatic algorithm resumes control of the valve.

CONTROL TYPE	DEFAULT VALUE	PARAMETER
Valve opening percentage in low-battery mode	30%	0–99%
Percentage of valve opening when control is disabled	100%	0–100% 0%: completely closed 1–99%: partially open 100%: fully open
NFC Interface Accessibility	Discoverable	Discoverable Not discoverable
Calibration request	-	-
Product restart	-	-
Restart the product and restore factory settings	-	-
Request to connect to the network	-	Timeout before connection attempt 10–10,080 minutes*

* In NFC mode, this setting cannot be changed, and the network connection request is immediate.

XIX. Remote product configuration via the network

The product can be reconfigured remotely by sending a downlink in response to a message transmitted by the product.

The downlink must be transmitted on port 56.

Once the reconfiguration is complete, the product automatically sends a message containing its updated configuration.

The downlink frame is structured as follows:

- > The first byte is the header: **0x55**
- > The following bytes are used to reconfigure the product in the following format:
Command ID + DATA

Note: Downlink features are subject to change in future versions. To ensure compatibility with future updates, NEXELEC recommends sending Command IDs in ascending order, from the lowest value to the highest.

7. List of “downlink” commands

ID	Length (Bytes)	Range	Values	Description
0x01	0	-	-	Request to force the product configuration to be sent
0x0A	1	0/1	0: disabled 1: enabled	Enabling/Disabling the NFC Interface
0x1C	2	1–1008	10–10080 minutes	Delayed Network Connection Command Configuration of the time before connection in minutes
0x4A	1	1	1	Product restart command
0x4B	1	1	1	Factory Reset Command
0x63	1	0–26	UTC-12 .. UTC+14	Time Zone Configuration
0x72	1	0–100	-5°C to +5°C	Offset for FLOW’s internal temperature measurement
0x73	1	0/1	0: disabled 1: enabled	Enable/disable the open window detection feature
0x74	1	1–30	0.1°C – 3.0°C	Temperature difference that triggers an open window detection
0x75	1	1–60	1–60 minutes	Duration of control pause after an open window detection
0x76	1	0/1	0: disabled 1: enabled	Enable/Disable Child Lock
0x77	1	0–62	0–31°C	Minimum temperature adjustable via the dial
0x78	1	0–62	0–31°C	Maximum temperature adjustable via the dial
0x79	1	0/1	0: disabled 1: enabled	General activation/deactivation of control
0x7A	1	0/1	0: Disabled 1: enabled	Enabling/Disabling the Frost Protection Function
0x7B	1	0–62	0–31°C	Setpoint temperature for frost protection mode
0x7C	1	0–62	0–31°C	Setpoint temperature for comfort mode
0x7D	1	0–62	0–31°C	Setpoint temperature in eco mode
0x7E	1	0–62	0–31°C	Setpoint temperature for "Extended Absence" mode
0x7F	1	0/1	0: disabled 1: enabled	Enable/Disable Integrated Heating Period
0x80	2			Start date of the heating period
	Byte 1	1–12	1: January .. 12: December	Month
	Byte 2	1–31	1–31	Days
0x81	2			End date of the heating period

	Byte 1	1–12	1: January .. 12: December	Month
	Byte 2	1–31	1–31	Days
0x82	2			Weekly Schedule
	Byte 1	0–2	[7..6]: Monday Profile [5..4]: Tuesday Profile [3..2]: Wednesday profile [1..0]: Thursday Profile	0: Profile 1 1: Profile 2 2: Profile 3
	Byte 2	0–2	[7..6]: Friday Profile [5..4]: Saturday Profile [3..2]: Sunday Profile [1..0]: Not used	
0x83	12			Daily Profile 1
	Byte 1	0–3	[7..6]: Temperature for the 12:00 a.m.–12:30 a.m. time slot [5..4]: Temperature for the 12:30 a.m.–1:00 a.m. time slot .. [1..0]: Temperature for the 1:30 a.m.–2:00 a.m. time slot	0: Above-freezing temperature 1: Comfort temperature 2: Eco temperature 3: Extended absence temperature
	Byte 2		[7..6]: Temperature for the 2:00–2:30 time slot [5..4]: Temperature for the 2:30–3:00 time slot .. [1..0]: Temperature for the 3:30–4:00 time slot	
	...			
0x84	12	Same format as daily profile 1		Daily profile 2
0x85	12	Same format as daily profile 2		Daily Profile 3
0x86	1	1–6	10–60 minutes	Interval for sending periodic data when control is enabled
0x87	1	1–144	10–1,440 minutes	Period for sending periodic data when control is disabled
0x8A	1	0–62	0–31°C	Setpoint temperature
0x8B	1	0–99	0–99%	Percentage of thermostatic valve opening in low-battery mode

0x8C	0	-	-	Request to calibrate the thermostatic head motor
0x90	1	0/1	0: disabled 1: enabled	Enable/Disable BOOST Mode
0x91	1	10–120	10–120 minutes	BOOST Mode Duration
0x93	1	0/1	0: disabled 1: enabled	Child lock behavior in the event of a network loss
0x94	1	1–99	0.1°C – 9.9°C	Tolerance between the setpoint temperature and the current temperature
0x95	1	0/1	0: disabled 1: enabled	Enabling/Disabling Schedules s
0x98	1	0–100	0–100%	Percentage of thermostatic valve opening when control is disabled

Examples

Example 1:

- > Enable the child lock function

Frame structure

Byte	Value	Info
0	0x55	Header
1	0x76	Child Lock ID Activation
2	0x01	Value to enable the function

XX. Product configuration via NFC

The product includes an NFC interface that enables communication with a smartphone running the NFC TOUCH app.

This interface allows you to:

- > Configure the product according to the use case
- > View the latest measurement data
- > Update the product's software

The NFC interface can be enabled or disabled remotely by sending a LoRaWAN downlink.

When the NFC interface is disabled, the product's NFC memory is no longer detectable by a smartphone. This prevents any local reconfiguration of the product after deployment.

1. Antenna Location NFC

The NFC antenna on the head is located near the LEDs. To establish a connection, position the smartphone's NFC antenna opposite this area, then hold the phone close until the product is detected. The NFC interface can still be used even when the product is turned off.



The NFC interface can also be used directly through the packaging, without opening it.



2. Download the mobile app

The NFC TOUCH app, designed for reconfiguring products, is available on Android and iOS.

It can be used with a smartphone or tablet equipped with an NFC interface.

3. Access to the TOUCH Android App Documentation

Documentation for the TOUCH app is available on the support website.

Link: <https://support.nexelec.fr/fr/support/solutions/articles/80000951635-application-nexelec-touch-android-ios->

XXI. Markings



LoRaWAN QR Code Format

LW:D0:70B3D54012345678;1234567890ABCDEF;FFFF0520;SX520LS23-0000AA0000

Schema ID: D0

AppEUI: 70B3D54012345678

DevEUI: 1234567890ABCDEF

Owner Token: FFFF0520

Serial Number: SX520LS23-0000AA0000



Appendices

1. LoRaWAN Frame Evolution

— 01. Product Configuration Frame

Bits	Version 3	Version 2	Version 1
Bits 0–182	Present	Present	Present, same as V2
Bits 183 to 197	Present	Added in V2	Missing
Bit 198	Added in V3	Missing	Missing

Tracking Changes

Document revision	Details	Date
A	Created	March 26, 2025
B	- Addition of a field to the product configuration frame to indicate whether LoRaWAN FUOTA mode is enabled.	July 24, 2026