

MLR003 — LORCOM user guide

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Micropelt **MLR003** is an energy-harvesting LoRaWAN Class A radiator TRV (EU868). In LORCOM it is exposed as two profiles: **MLR003-ValvePosition** and **MLR003-TemperatureSetpoint**.

OEM product docs: micropelt.com · [wiki](#)

How LORCOM maps the device

All BACnet/Modbus points use **fPort 1** (application status uplink and control downlink).



diagram

Status points (rx)

Updated on each fPort 1 uplink (typically every radio interval; default 10 minutes after install settles).

Common fields (both profiles)

Point	Meaning
actualValvePosition	Valve openness 0-100 %
ambientTemperature	Corrected room/ambient degC (0.1 resolution)
flowTemperature	Valve-side / flow degC (0.1 resolution)
userMode	Numeric mode code 0-7
usedSetpointValue	Active setpoint (degC or % by userMode ; 0.1 resolution on temperature profile, integer % on valve profile)
battery	Energy storage voltage (V)
consumedCurrent	Average current consumed (mA)
generatedCurrent	Average current generated (mA)
status	Aggregate device status: 0=ok, 1=warning, 2=error
DB5	Raw status byte from uplink byte 5

Point	Meaning
DB9	Raw status byte from uplink byte 9

Additional field in temperature-setpoint profile

Point	Meaning
usedTemperature	Temperature used by the control loop degC (0.1 resolution)

DB5 bit mapping (byte 5)

Bit	Meaning when set
7	temperatureDropDetection
6	energyStorageLow
5	harvestingActive
4	ambientSensorFailure
3	flowSensorFailure
2	radioCommunicationError
1	weakRadioSignal
0	motorError

DB9 bit mapping (byte 9)

Bit	Meaning
7	operatingCondition
6	storageFullyCharged
5	zeroPercentError (zeroError in raw DB9)
4	calibrationOk
3..0	userMode value

status evaluation

Computed from DB5 and DB9 bits on each fPort 1 uplink.

Level	Value	Conditions
Error	2	Any of: ambientSensorFailure, flowSensorFailure,

Level	Value	Conditions
		radioCommunicationError, motorError (DB5), zeroPercentError (DB9 bit 5)
Warning	1	Any of: calibrationOk == 0 (DB9 bit 4 clear), weakRadioSignal, temperatureDropDetection (DB5), or energyStorageLow == 1 and harvestingActive == 0 (DB5)
OK	0	Everything else

Energy storage composite: energyStorageLow=1 with harvestingActive=0 raises warning; energyStorageLow=1 with harvestingActive=1 does not (device is actively harvesting).

Informational DB bits that do not directly set status: harvestingActive (except gating energy-storage warning), operatingCondition, storageFullyCharged.

Control points (tx)

Writes enqueue a LoRaWAN **downlink on fPort 1**. Prefer **unconfirmed** downlinks.

Note about use

BACnet/Modbus SEND control:

- Default **SEND** can be **4** (single-on-write-any): writing a TX point enqueues a downlink automatically.
- Use **SEND 2** (all-send-now) to push **all** TX params in one batch.
- To update **setpoint only**, write only **V0** (setValvePosition or setTemperatureSetpoint depending on profile). That sends a short (setpoint-only) downlink (see Downlink behavior).

MLR003-ValvePosition profile

Point	Use
setValvePosition	Direct valve % (0-100). Default 0
roomTemperature	External room degC from BMS (0-40; 0 = none; 0.1 resolution). Default 0
setRadioInterval	Minutes: 5, 10, 60, 120, or 480. Default 10
userMode	Control mode (0 = valve position). Default 0
safetyMode	

Point	Use
	Numeric mode (0 = valve, 2 = ambient). Default 2
setSafetyValue	Safety value (unit depends on safetyMode). Default 19
doReferenceRun	Trigger reference run now (boolean; byte 5 bit 7). Default 0; requires contiguous prefix through byte 5

MLR003-TemperatureSetpoint profile

Point	Use
setTemperatureSetpoint	Room setpoint degC (0-40). Default 19
roomTemperature	External room degC from BMS (0-40; 0 = none; 0.1 resolution). Default 0
setRadioInterval	Minutes: 5, 10, 60, 120, or 480. Default 10
userMode	Control mode (2 = ambient temperature setpoint). Default 2
safetyMode	Numeric mode (0 = valve, 2 = ambient). Default 2
setSafetyValue	Safety value (unit depends on safetyMode). Default 19
doReferenceRun	Trigger reference run now (boolean; byte 5 bit 7). Default 0; requires contiguous prefix through byte 5

userMode (tx)

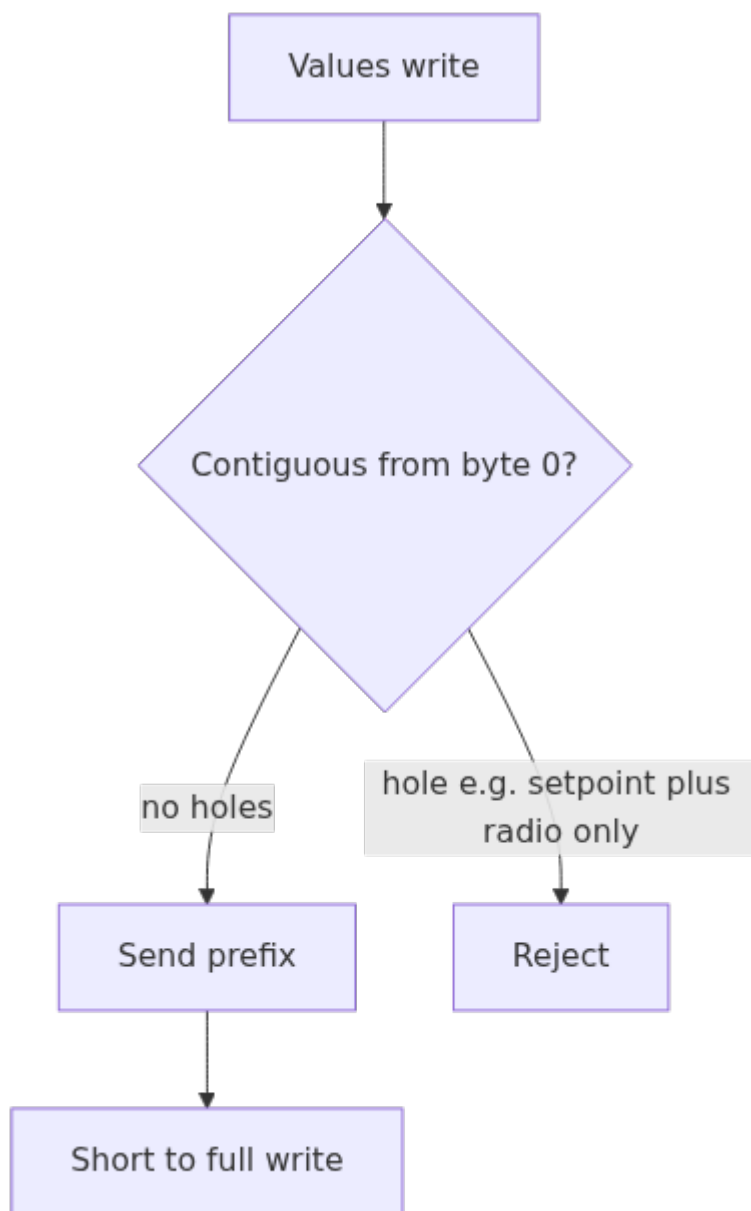
Code	Meaning	Typical profile default
0	Valve position control	ValvePosition profile
2	Ambient temperature setpoint	TemperatureSetpoint profile

Include `userMode`, `setRadioInterval`, and `safetyMode` together when writing through the radio/modes group. Setpoint-only writes infer control mode from the setpoint key (`setValvePosition` → 0, `setTemperatureSetpoint` → 2). Multi-field writes still need a contiguous prefix (no holes); omitted fields use their defaults only when they fall within that contiguous write.

Downlink behavior

Control fields are ordered. A write may omit a trailing suffix, but must include every lower field. LORCOM sends only that contiguous prefix.

Byte	Keys
0	setTemperatureSetpoint or setValvePosition
1	roomTemperature
2	setSafetyValue
3	setRadioInterval, userMode, and safetyMode (all required)
4	reserved
5	doReferenceRun



diagram

Write	Result
Only <code>setTemperatureSetpoint</code>	Setpoint-only downlink
Only <code>setValvePosition</code>	Setpoint-only downlink
Setpoint + <code>roomTemperature</code>	Two-field downlink
Through safety / radio / modes	Full control group
Through <code>doReferenceRun</code>	Full write including reference run (bytes 0-3 required)
Setpoint + <code>setRadioInterval</code> without room/safety	rejected

Within the radio/modes group, `setRadioInterval`, `userMode`, and `safetyMode` must all be present in the write. Lower fields cannot be skipped.

Control examples

Set temperature setpoint to 21 degC

Write `setTemperatureSetpoint = 21`.

Set valve to 50 %

Write `setValvePosition = 50`.

Set temperature setpoint 21 degC and room temperature 19 degC

Write `setTemperatureSetpoint = 21` and `roomTemperature = 19`.

Set temperature setpoint 21 degC and radio every 5 minutes

Write contiguous prefix through the radio/modes group, e.g. `setTemperatureSetpoint = 21`, `roomTemperature = 0`, `setSafetyValue = 19`, `setRadioInterval = 5`, `userMode = 2`, `safetyMode = 2`.

Not exposed in LORCOM

These Micropelt fPorts are not mapped to BACnet/Modbus (config / advanced):

fPort	Topic
2	Version (REV / HW / FW)
3-8	Motor range, SF, OPD/SH, TDD, PID, flow offset
9-11	External sensor expiry, room temp-only, beep

fPort	Topic
15	On / off / recalibration

Further reading

- [Micropelt Homepage wiki](#)
- Vendor manuals index: [README.md](#)