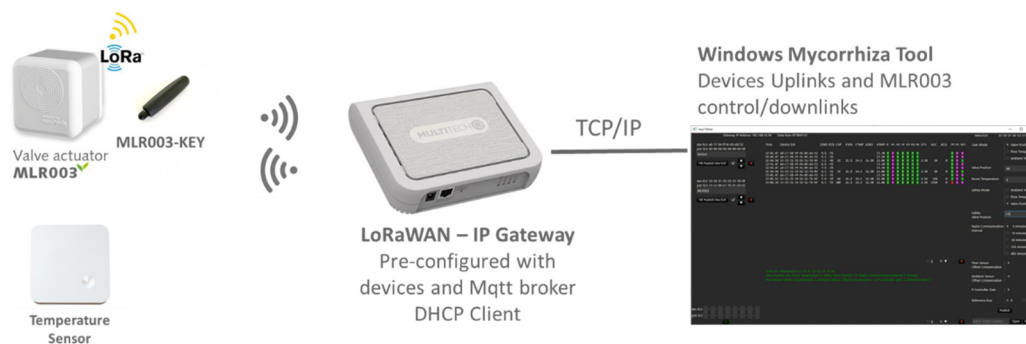


User Guide LoRaWAN Evaluation Kit

The plug-and-play LoRaWAN test kit provides a quick and easy operation of Micropelt's MLR003 radiator valve actuator together with a temperature sensor. The Kit includes:

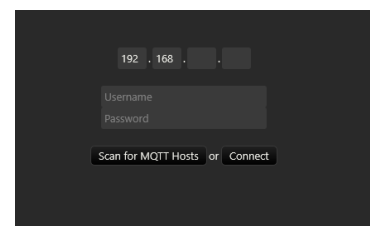
- 1x MLR003 868MHz SF7BW125 M30x1,5
- 1x MLR003-KEY (magnetic pen to operate MLR003)
- 1x Temperature Sensor ERS Lite 868MHz SF7BW125
- 1x IP Gateway (configured as DHCP client)
- 1x Mycorrhiza Tool

Both end-nodes are using LoRa 868MHz, SF7BW250. MLR003 comes with a magnetic key required to activate/deactivate. The TCP/IP gateway internal LoRa network server is pre-configured with end-node device credentials. Its internal Mqtt broker is configured to seamlessly connect with the Micropelt Mycorrhiza tool. This tool is used as an uplink sniffer to provide full data analysis for the selected end-nodes. It can also publish downlinks with user defined settings.



Setting up Mycorrhiza:

- Connect the Gateway to your local LAN network and connect the power supply
- Wait for a few minutes for the gateway to boot
- Start the Mycorrhiza executable tool on a Windows PC
- Enter the subnet 192-168-xx and scan for an MQTT host, or enter the full IP address if known
- Enter username and password and press connect to open the Mycorrhiza screen



Setting up MLR003 and Sensor:

- Mount the MLR003 on an M30x1,5 valve body
- Activate the MLR003 by briefly touching the magnet pen to the micropelt logo on the MLR003 back cover
- A first single beep (and 1x LED) will confirm successful device activation
- The following double beep (and 2x LED) confirms a successful join to the gateway
- The following triple beep (and 3x LED) confirms a successful reference run execution and activation
- Long beeps signal failed operations
- The temperature sensor does not need activation, its battery is already plugged-in and the device will appear on the Mycorrhiza tool with its respective DEVEUI



Mycorrhiza comes as an executable program for Windows PCs. Upon start, Mycorrhiza will ask you to connect with the gateway internal MQTT broker. Make sure that the DHCP client can obtain an IP address from the local network DHCP server. (IP address range 192.168.xxx.xxx). Device credential DEVEUI, JOINEUI and APPKEY for the MLR003 and the sensor are already registered in the LoRa network sever (LNS). Be aware that every downlink published (3.) will be queued in the Gateway MQTT broker and processed subsequently.

The screenshot shows the Mycorrhiza application window. The interface includes a table of device data, a sidebar with configuration options, and a main display area. Annotations are as follows:

- 1. Enable Sniffer view for DevEUI.** Points to the 'Fill Publish Dev EUI' checkbox in the sidebar.
- 2. Select DevEUI for Downlink message.** Points to the 'dev EUI' field in the sidebar.
- 3. Push to publish Downlink for selected DevEUI.** Points to the 'Publish' button at the bottom right.
- 4. Operating mode Flow temperature: ValveTMP = 30C Setpoint Flow TMP = 29C ValvePos change = steps of 15%** Points to the 'Flow Temperature' field in the sidebar.
- Sniffer window: Move cursor to payload topic for description.** Points to the 'Sniffer' window at the top right.
- Downlink section** Points to the 'Downlink' section in the sidebar.
- Create your own batch script file for subsequent downlink processing.** Points to the 'Batch Script Location' field at the bottom right.

The main table displays the following data:

Time	Device EUI	Port	LSNR	RSSI	CVP	VSRV	VTMP	ASRV	ATMP	ES	HA	ASF	VDF	RCE	RSS	ME	STV	ACC	ACG	OFF	SFC	RRC
19:44:38	30-31-36-33-65-39-70-19	1	10.0	-59	100	0.0	3.0	0.00	0.00	0	1	1	0	0	0	2.68	2550	0	1	0	0	
19:45:05	30-31-36-33-65-39-70-19	1	8.2	-60	100	0.0	3.0	0.00	0.00	0	1	1	0	0	0	2.68	2550	0	1	0	0	
19:47:41	30-31-36-33-65-39-70-19	1	9.0	-56	100	0.0	3.0	0.00	0.00	0	1	1	0	0	0	2.68	2550	0	1	0	0	
19:48:19	30-31-36-33-65-39-70-19	1	8.5	-59	100	0.0	3.0	0.00	0.00	0	1	1	0	0	0	2.58	2550	0	1	0	0	
19:48:55	30-31-36-33-65-39-70-19	1	10.0	-57	50	27.5	30.5	27.75	24.75	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:05	30-31-36-33-65-39-70-19	1	8.0	-59	50	27.5	30.5	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:15	30-31-36-33-65-39-70-19	1	11.5	-59	50	27.5	30.5	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:25	30-31-36-33-65-39-70-19	1	10.0	-59	50	27.5	30.5	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:35	30-31-36-33-65-39-70-19	1	9.5	-56	50	27.5	30.5	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:45	30-31-36-33-65-39-70-19	1	7.5	-59	50	27.5	30.5	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:49:55	30-31-36-33-65-39-70-19	1	8.2	-60	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:05	30-31-36-33-65-39-70-19	1	10.0	-61	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:15	30-31-36-33-65-39-70-19	1	10.0	-57	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:25	30-31-36-33-65-39-70-19	1	7.8	-57	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:35	30-31-36-33-65-39-70-19	1	9.0	-57	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:45	30-31-36-33-65-39-70-19	1	7.5	-59	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:50:55	30-31-36-33-65-39-70-19	1	10.0	-61	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:05	30-31-36-33-65-39-70-19	1	9.5	-61	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:15	30-31-36-33-65-39-70-19	1	10.0	-52	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:25	30-31-36-33-65-39-70-19	1	7.8	-55	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:35	30-31-36-33-65-39-70-19	1	10.0	-59	50	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:45	30-31-36-33-65-39-70-19	1	10.0	-61	35	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:51:55	30-31-36-33-65-39-70-19	1	9.5	-58	20	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:52:05	30-31-36-33-65-39-70-19	1	8.2	-59	5	27.0	30.0	28.00	25.00	0	0	0	0	0	0	2.68	2550	0	0	1	1	
19:52:15	30-31-36-33-65-39-70-19	1	9.2	-59	0	27.0	30.0	27.75	24.75	0	0	0	0	0	0	2.68	2550	0	0	1	1	