



USER MANUAL

- Longo programmable controller
LPC-2.DB2
Debug module

Version 2



Written by SMARTEH d.o.o.
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User Manual

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STANDARDS AND PROVISIONS: Standards, recommendations, regulations and provisions of the country in which the devices will operate, must be considered while planning and setting up electrical devices. Work on 100 .. 240 V AC network is allowed for authorized personnel only.

DANGER WARNINGS: Devices or modules must be protected from moisture, dirt and damage during transport, storing and operation.

WARRANTY CONDITIONS: For all modules LONGO LPC-2 - if no modifications are performed upon and are correctly connected by authorized personnel - in consideration of maximum allowed connecting power, warranty of 24 months is valid from the date of sale to the end buyer, but not more than 36 months after delivery from Smarteh. In case of claims within warranty time, which are based on material malfunctions the producer offers free replacement. The method of return of malfunctioned module, together with description, can be arranged with our authorized representative. Warranty does not include damage due to transport or because of unconsidered corresponding regulations of the country, where the module is installed.

This device must be connected properly by the provided connection scheme in this manual. Misconnections may result in device damage, fire or personal injury.

Hazardous voltage in the device can cause electric shock and may result in personal injury or death.

NEVER SERVICE THIS PRODUCT YOURSELF!

This device must not be installed in the systems critical for life (e.g. medical devices, aircrafts, etc.).

If the device is used in a manner not specified by the manufacturer, the degree of protection provided by the equipment may be impaired.

Waste electrical and electronic equipment (WEEE) must be collected separately!

LONGO LPC-2 complies to the following standards:

EMC: EN 303 446-1 V1.2.1, EN 303 446-2 V1.2.1, EN 61131-2:2017,
•EN IEC 61000-6-3:2021, EN 301 489-1 V2.2.3, EN 301 489-17 V3.3.1

Smarteh d.o.o. operates a policy of continuous development. Therefore we reserve the right to make changes and improvements to any of the products described in this manual without any prior notice.

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Longo programmable controller LPC-2.DB2

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1 ABBREVIATIONS

Sorted by order of appearance in document:

LED Light emitting diode





2 DESCRIPTION

The LPC-2.DB2 module is a dedicated debugging tool designed for use with Smarteh main modules and operator terminals. This module facilitates debugging and real-time data monitoring, providing developers with valuable insights into controller operation.

The LPC-2.DB2 module establishes a communication bridge between a personal computer and a Smarteh device.

LPC-2.DB2 module is used for debugging LPC-2.main modules LPC-2.MC9, LPC-2.MM1, LPC-2.MM2, LPC-2.MM3 and operator terminals LPC-3.GOT.111, LPC-3.GOT.131, LPC-3.GOT.112, LPC-3.GOT.012, LPC-3.GOT.002.





3 FEATURES

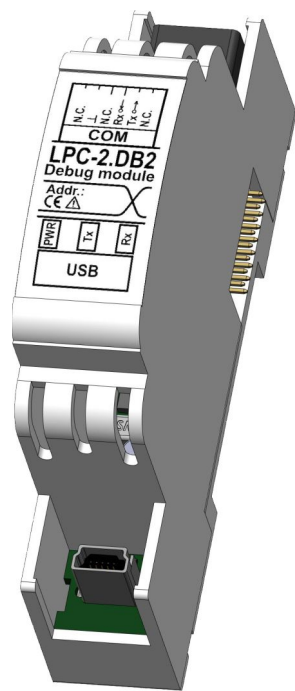


Figure 1: LPC-2.DB2 debug module

Table 1: Features
Debugging LPC-2.MC9, LPC-2.MM1, LPC-2.MM2, LPC-2.MM3, LPC-3.GOT.111, LPC-3.GOT.131, LPC-3.GOT.112, LPC-3.GOT.012, LPC-3.GOT.002
Standard DIN EN50022-35 rail mounting
3 diagnose LEDs



4 INSTALLATION

4.1 Connection scheme example

Figure 2: Connection scheme for debugging LPC-2.MC9

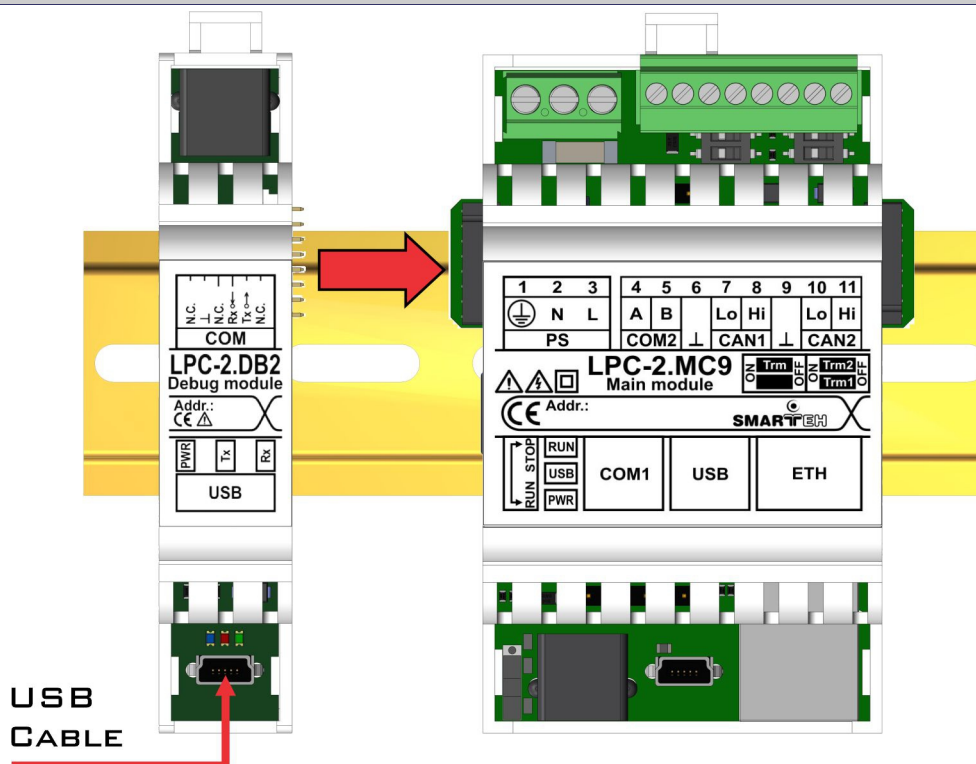


Figure 3: Connection scheme for debugging LPC-2.MM1, LPC-2.MM2, LPC-2.MM3

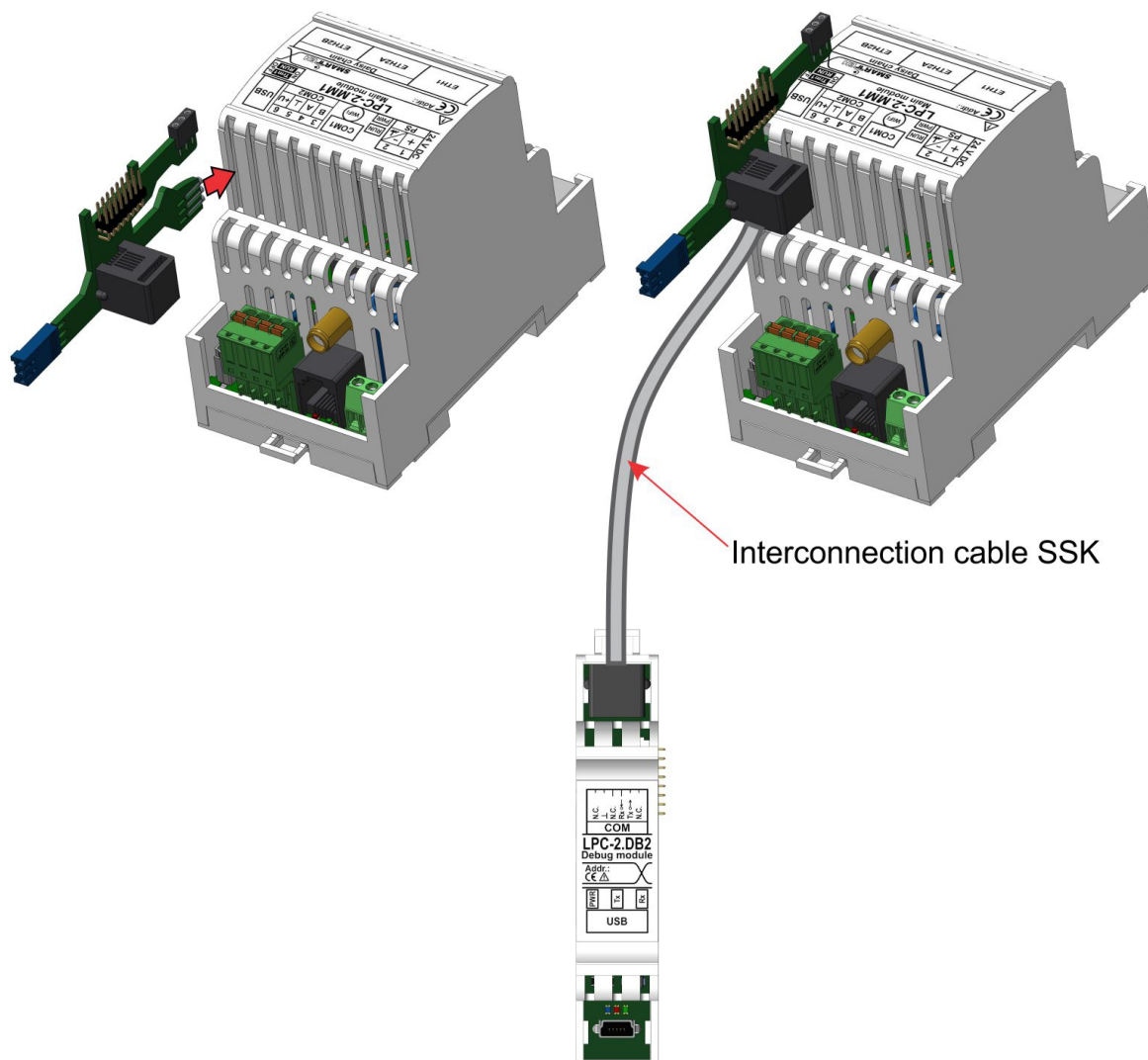


Figure 4: Connection scheme for debugging LPC-3.GOT.111, LPC-3.GOT.131, LPC-3.GOT.112

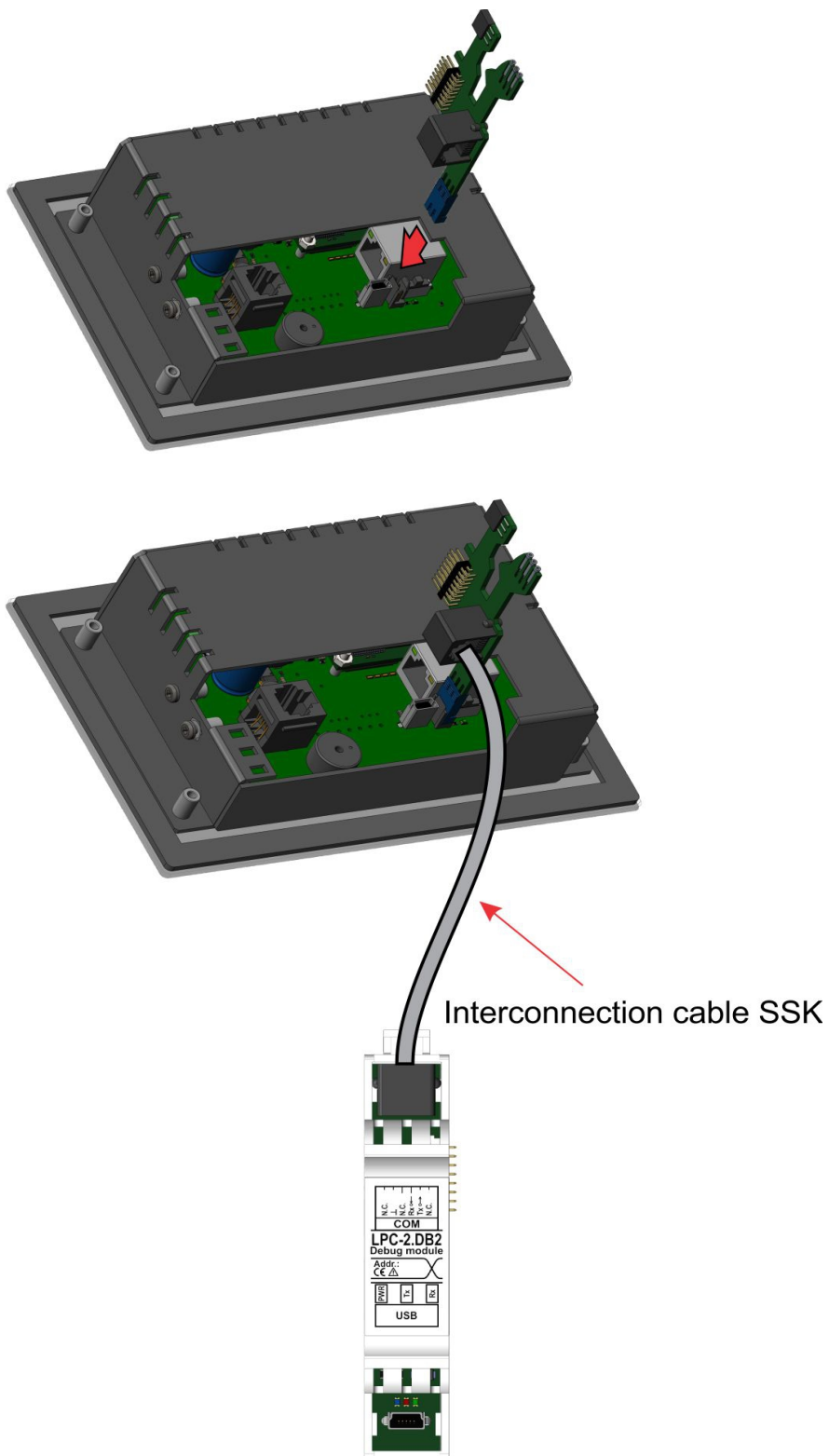


Figure 5: Connection scheme for debugging LPC-3.GOT.012, LPC-3.GOT.002

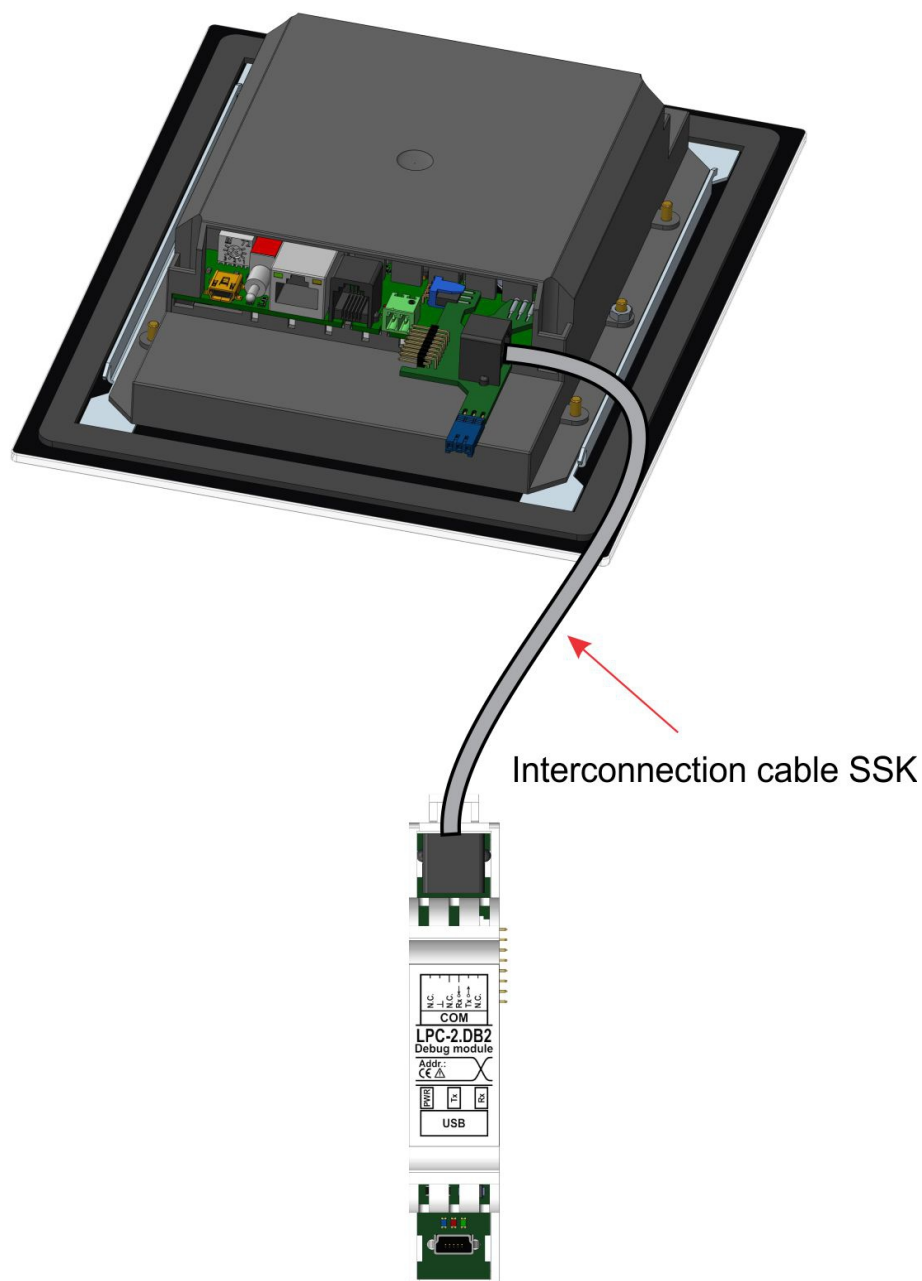


Figure 6: Connection scheme

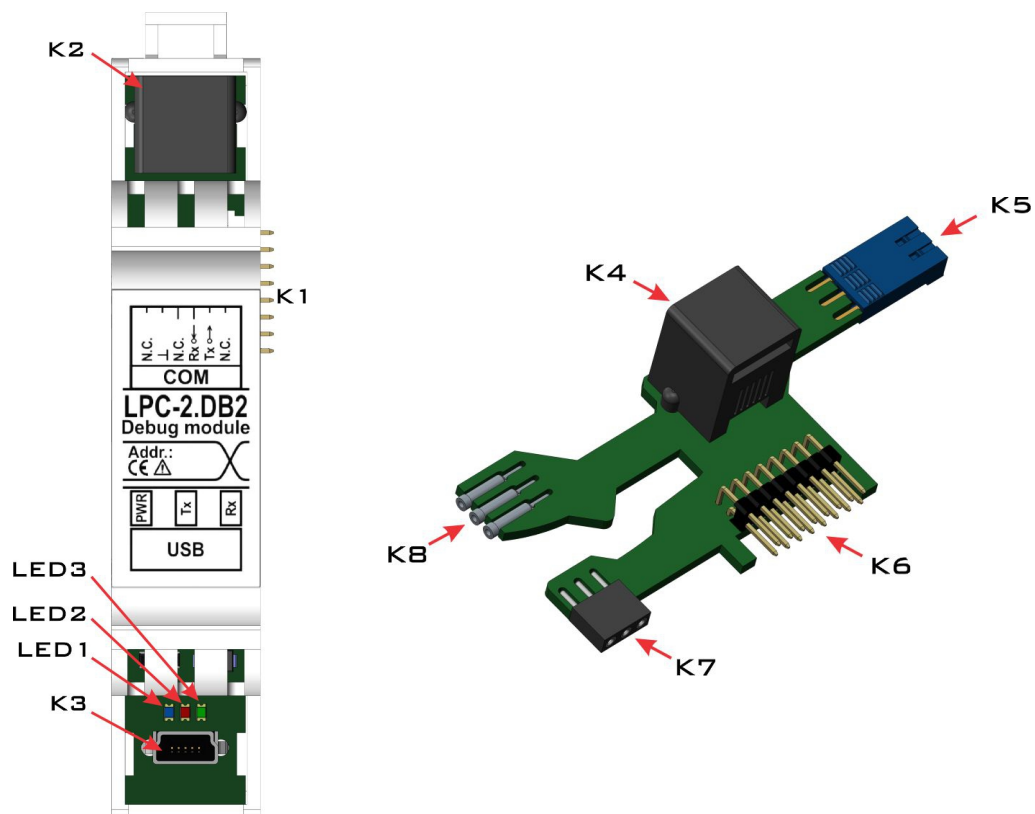


Table 2: K1

Internal BUS	Data transfer	Connection to controller
--------------	---------------	--------------------------

Table 3: K2

K2.1	N.C.	Not connected
K2.2	GND	Ground
K2.3	N.C.	Not connected
K2.4	Rx •←	Data receive input
K2.5	Tx •→	Data send output
K2.6	N.C.	Not connected



**Table 4: K3**

K3.1	VCC	Power supply input
K3.2	D-	Data -
K3.3	D+	Data +
K3.4	ID	May be N/C, GND or used as an attached device presence indicator (tied to GND with resistor)
K3.5	GND	Ground

Table 5: Adapter connectors

K4	LPC-2.DB2
K5	LPC-3.GOT.111, LPC-3.GOT.131, LPC-3.GOT.112
K6	LPC-2.MC9
K7	LPC-3.GOT.012, LPC-3.GOT.002
K8	LPC-2.MM1, LPC-2.MM2, LPC-2.MM3

Table 6: LEDs

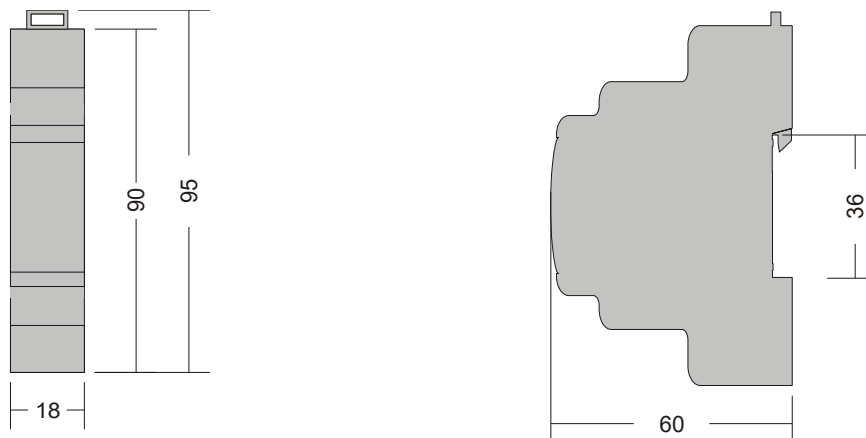
LED1	Blue, DB2 status	OFF: No power supply ON: OK
LED2	Red, DB1 Tx packet status	Blinking ON: Transmitting Tx packet
LED3	Green, DB1 Rx packet status	Blinking ON: Receiving Rx packet





4.2 Mounting instructions

Figure 7: Housing dimensions



Dimensions in millimeters.



All connections, module attachments and assembling must be done while module is not connected to the main power supply.

Mounting instructions for debugging purpose:

1. Switch off main power supply.
2. Mount LPC-2.DB2 module to the provided place inside an electrical panel (DIN EN50022-35 rail mounting).
3. Mount other LPC-2 modules (if required). Mount each module to the DIN rail first, then attach modules together through K1 and K2 connectors.
4. Make connections as show in connection schemes.
5. Blue LED1 should turn on.

Dismount in reverse order. For mounting/dismounting modules to/from DIN rail a free space of at least one module must be left on the DIN rail.

NOTE: LPC-2 main module should be powered separately from other electrical appliance connected to LPC-2 system. Signal wires must be installed separately from power and high voltage wires in accordance with general industry electrical installation standard.





4.3 Module labeling

Figure 8: Label

Label (sample):

XXX-N.ZZZ
P/N: AAABBBCCDDDEEE
S/N: SSS-RR-YYXXXXXXXXXX
D/C: WW/YY

Label description:

1. **XXX-N.ZZZ** - full product name.
 - **XXX-N** - Product family
 - **ZZZ** - product
2. **P/N: AAABBBCCDDDEEE** - part number.
 - **AAA** - general code for product family,
 - **BBB** - short product name,
 - **CCDDD** - sequence code,
 - **CC** - year of code opening,
 - **DDD** - derivation code,
 - **EEE** - version code (reserved for future HW and/or SW firmware upgrades).
3. **S/N: SSS-RR-YYXXXXXXXXXX** - serial number.
 - **SSS** - short product name,
 - **RR** - user code (test procedure, e.g. Smarteh person xxx),
 - **YY** - year,
 - **XXXXXXXXXX** - current stack number.
4. **D/C: WW/YY** - date code.
 - **WW** - week and
 - **YY** - year of production.

Optional

1. **MAC**
2. **Symbols**
3. **WAMP**
4. **Other**



5 OPERATION

The LPC-2.DB2 module connects to the PC via a standard USB interface, which creates a virtual serial port. A terminal emulator application (e.g., PuTTY, Tera Term) is required to display the data stream. The terminal emulator must be configured to connect to the virtual serial port created by the LPC-2.DB2 module. The correct COM port number and speed must be selected.

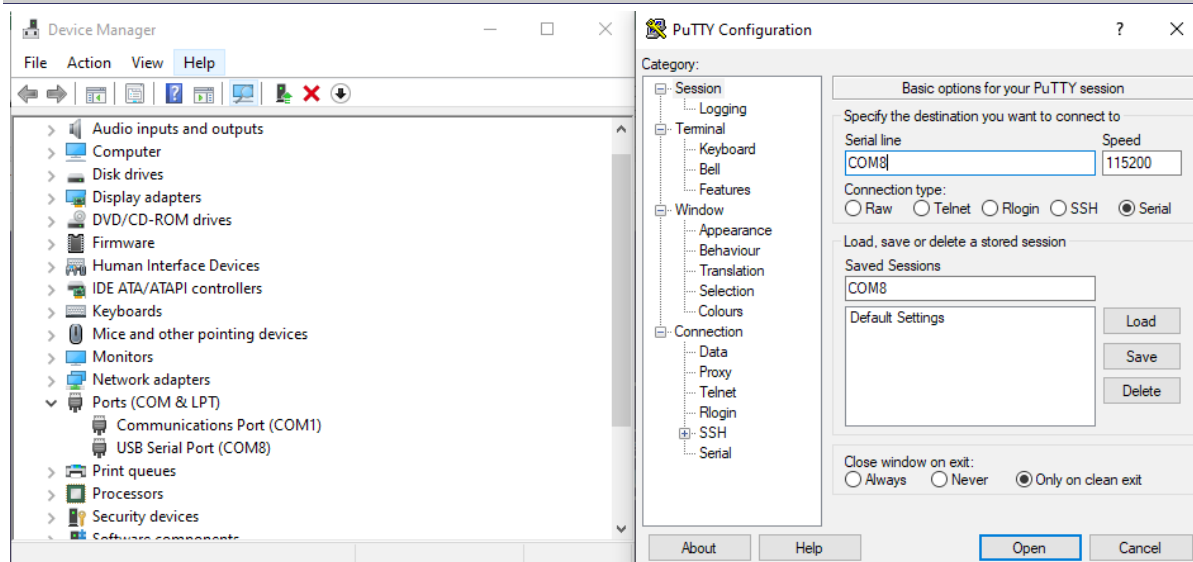
Once the connection is established and the software is running, the terminal emulator displays real-time data transmitted from the Smarteh controller.

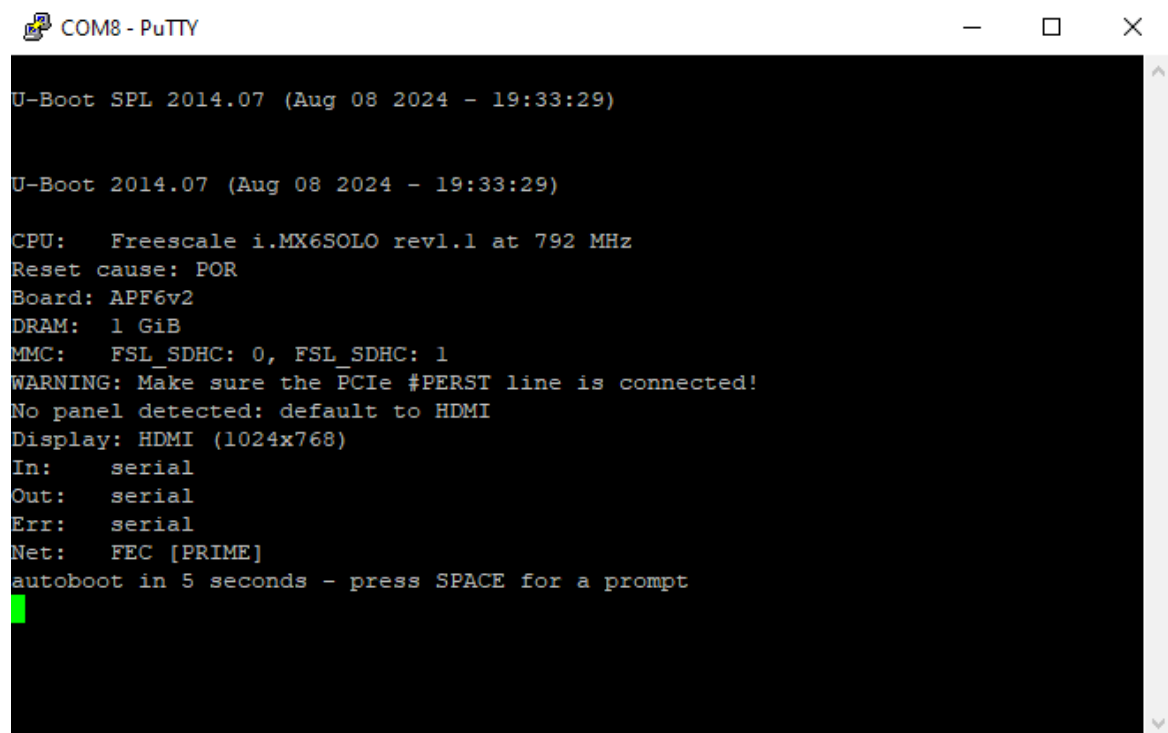
Terminal emulator settings

Connection type: Serial

Speed: 115200

Figure 9: Terminal emulator configuration (Putty)

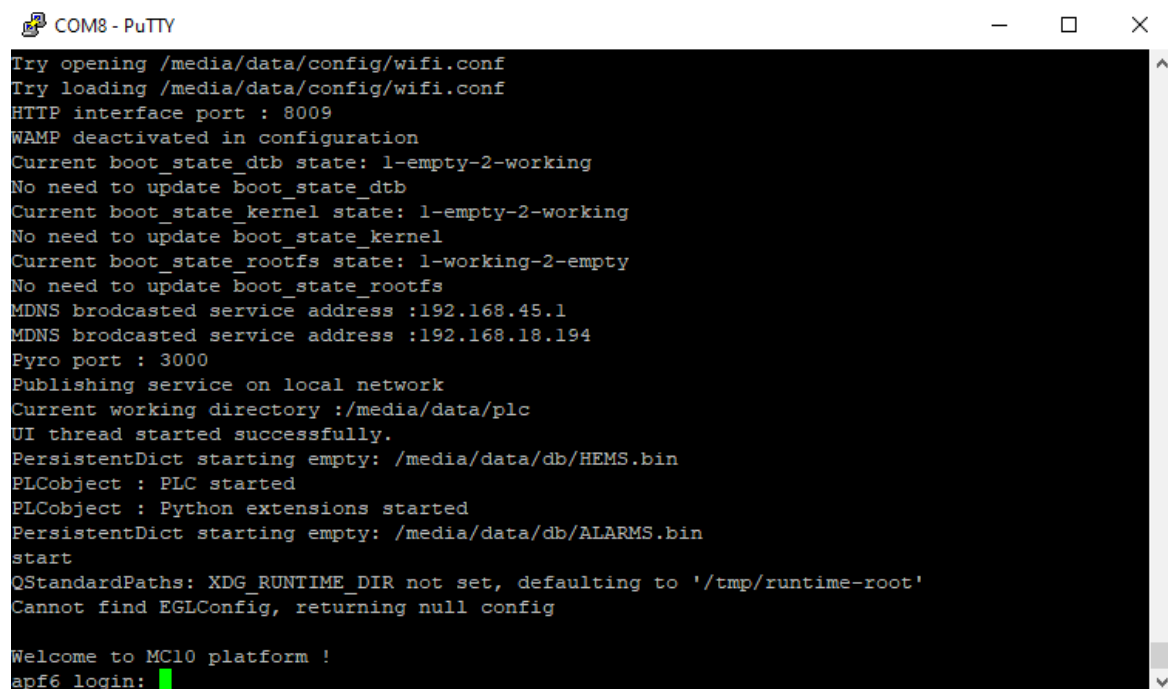


**Figure 10: Terminal emulator output**

```
COM8 - PuTTY
U-Boot SPL 2014.07 (Aug 08 2024 - 19:33:29)

U-Boot 2014.07 (Aug 08 2024 - 19:33:29)

CPU:   Freescale i.MX6SOLO rev1.1 at 792 MHz
Reset cause: POR
Board: APF6v2
DRAM:  1 GiB
MMC:   FSL_SDHC: 0, FSL_SDHC: 1
WARNING: Make sure the PCIe #PERST line is connected!
No panel detected: default to HDMI
Display: HDMI (1024x768)
In:     serial
Out:    serial
Err:    serial
Net:    FEC [PRIME]
autoboot in 5 seconds - press SPACE for a prompt
█
```

Figure 11: Terminal emulator output

```
COM8 - PuTTY
Try opening /media/data/config/wifi.conf
Try loading /media/data/config/wifi.conf
HTTP interface port : 8009
WAMP deactivated in configuration
Current boot_state_dtb state: 1-empty-2-working
No need to update boot_state_dtb
Current boot_state_kernel state: 1-empty-2-working
No need to update boot_state_kernel
Current boot_state_rootfs state: 1-working-2-empty
No need to update boot_state_rootfs
MDNS broadcasted service address :192.168.45.1
MDNS broadcasted service address :192.168.18.194
Pyro port : 3000
Publishing service on local network
Current working directory :/media/data/plc
UI thread started successfully.
PersistentDict starting empty: /media/data/db/HEMS.bin
PLCobject : PLC started
PLCobject : Python extensions started
PersistentDict starting empty: /media/data/db/ALARMS.bin
start
QStandardPaths: XDG_RUNTIME_DIR not set, defaulting to '/tmp/runtime-root'
Cannot find EGLConfig, returning null config

Welcome to MC10 platform !
apf6 login: █
```





6 TECHNICAL SPECIFICATIONS

Table 7: Technical specifications

Power supply	from USB
Power consumption	0.5 W
Connection type K2	RJ-12 6/4
Connection type K3	mini B type
Dimensions (L x W x H)	90 x 18 x 60 mm
Weight	40 g
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Maximum altitude	2000 m
Mounting position	vertical
Transport and storage temperature	-20 to 60 °C
Pollution degree	2
Protection class	IP 30





7 SPARE PARTS

For ordering spare parts following Part Numbers should be used:

LPC-2.DB1 Debug module	
LPC-2.DB1	P/N: 225DB217G02001
Interconnection cable	
SSK	P/N: 203SSK05001001
USB cable	
USB A - B mini cable 2 m	P/N: 440USBAB200001





8 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
03.04.25	2	Chapter 4 <i>Operation</i> added.
05.06.24	1	The initial version, issued as <i>LPC-2.DB2 UserManual</i> .





9 NOTES

