

# DATASHEET

## TRAFFIC MANAGEMENT ACCESSORY

### CABINET PLC MODULE



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## 1 INTRODUCTION

The Cabinet PLC Module is an accessory that allows the user to connect up to four smartmicro sensors via Power-Line Communication (PLC) terminal blocks and then connect these sensors to the Traffic UI and the backbone via an Ethernet port.

The interface board can be used to provide power to the sensors, including surge and overvoltage protection for all connected sensors. The connected sensors can only be connected to the module with the use of a PLC J-Box

Due to the use of PLC, the Cabinet PLC Module can support cable lengths of up to 300m, allowing significant flexibility in the installation of the sensors. Furthermore, using PLC allows for easy wiring and installation as both power as well as communication is delivered to the sensors with a single cable.

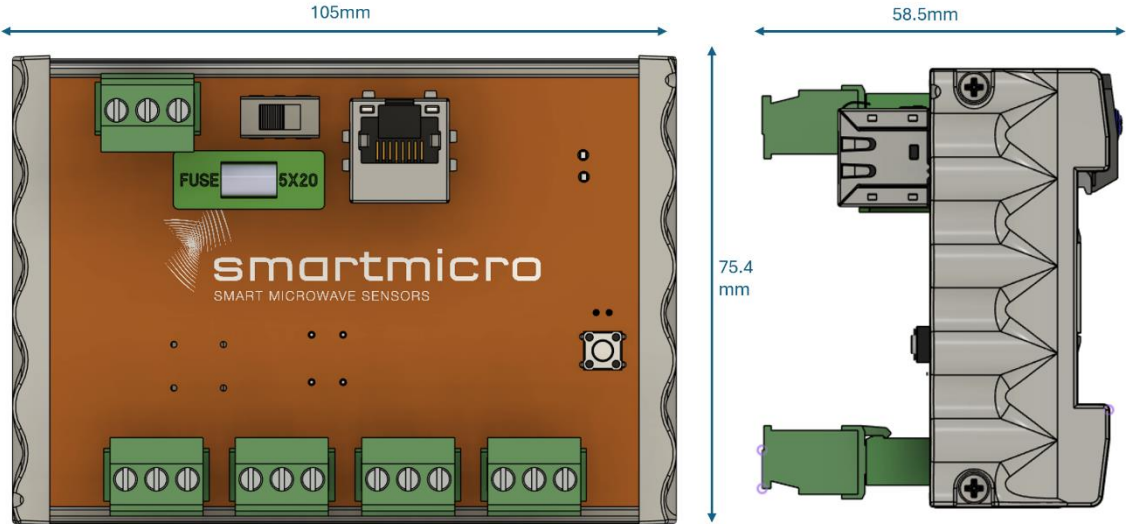
## 2 PRODUCT SPECIFICATIONS

The Cabinet PLC Module accepts an input voltage of 12-48VDC (0.5A). It is equipped with a Power LED that indicates when power has been provided, and a reset button that can be used to reset the module to its factory state. It is DIN-rail mountable, compact and light. It also complies with FCC as well as NEMA TS2 shock & vibration standards.

### 3 CHARACTERISTICS

Parameter	Details
<b>Mechanical</b>	
Weight	188g   6.63oz (including connectors)
Height	ca. 58.5mm   2.30in (including connectors)
Width	75.4mm   2.97in
Length	105mm   4.13in
<b>Electrical</b>	
Input voltage	12-48V(DC)
Power Consumption	1W
<b>Supported Cables</b>	
Supported conductor cross section range	0.5-1.5mm <sup>2</sup>   0.00775-0.02325in <sup>2</sup> / 26-16 AWG
Recommended cable	Advanced Digital Cable PVC/Nylon 18AWG, Part Number 6803SD or similar, shielded for best signal quality
	<b>Fehler! Verweisquelle konnte nicht gefunden werden.</b>
<b>Other</b>	
Norm	IEEE 1901-2020 'Nessum/FCW-OFDM' - ITU 9905 'CMSR' (a.k.a. Multihop)
Speed: Data Rate	< 90Mbps
Surge protection of power lines	Compliant to IEC 61000-4-2 (ESD) and IEC 61000-4-5 (power surges and lightning)
<b>Further Information</b>	
Operating temperature	-34...+74°C   -29...+165°F
Vibration	0.015 in DA (NEMA TS2 Standards)
Shock	10 g (NEMA TS2 Standards)

4 DIMENSIONS AND OUTLINE



## 5 PRODUCT CONNECTORS & PARTS

Each Cabinet PLC Module has connectors and parts, as seen and labelled in Figure 1, the description of which is provided in Table 1.

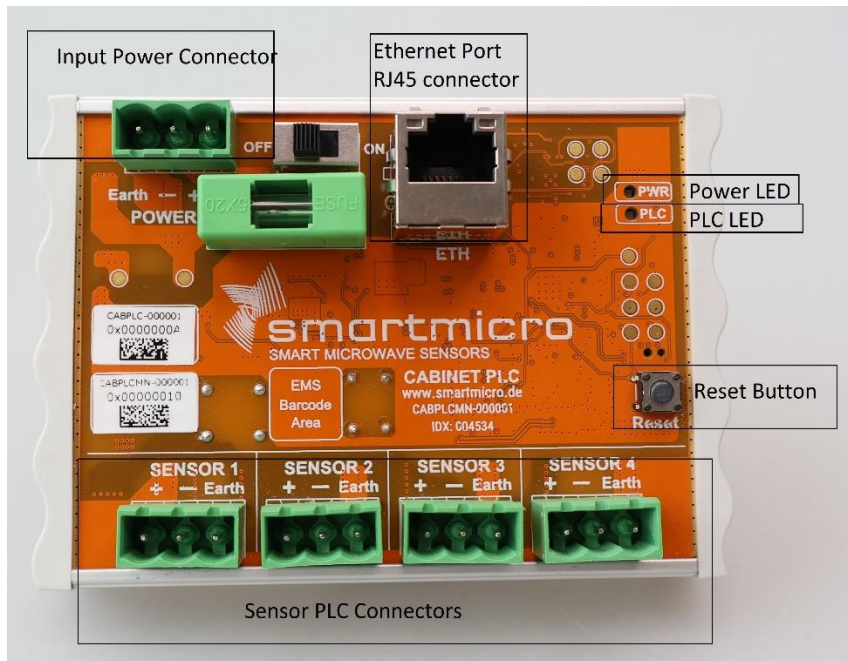


Figure 1: Cabinet PLC Module connectors

Connector/Part	Function	Notes
Input Power Connector	Cabinet Earth	The connector for the Cabinet PLC Module is not identical to that of the COM HUB family. Earth and '+' have been switched.
	Negative Power Supply (GND)	
	Positive Power Supply (VCC)	12-48V (DC)
Power LED	Indicates when power has been provided	
PLC LED	Indicates the presence or absence of PLC communication	Green LED - presence Red LED - Absence
Reset Button	Resets the module to its factory state	
Ethernet Port – RJ45 connector	Connects the sensors via ethernet to a PC or device of choosing	
Sensor PLC Connectors	4x Pluggable terminal blocks 5mm	Supported Cables AWG 24-12

*Table 1: Pinout Cabinet PLC Module*

## 6 WIRING RECOMMENDATION

A recommended cable between PLC J-Box and cabinet PLC module is Advanced Digital Cable PVC/Nylon 18AWG, Part Number 6803SD. In case you want to use another cable, please contact smartmicro for approval.

## 7 MATERIALS

All parts are made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. The PLC to ETH Converter must only be used inside cabinets. It is not water protected.

## 8 SENSOR FIRMWARE COMPATIBILITY

The Cabinet Module has been designed and tested to work with all sensors of the UMRR11, TRUGRD and TOPGRD family, provided that they use firmware with integrated tracking i.e. non satellite firmware. Satellite firmware usually come with the affix "satellite" in the firmware file name, and therefore this can serve as an indication of the incompatibility of the firmware.

## 9 SYSTEM CONFIGURATION

Like the COM HUB family, the Cabinet PLC Module typically acts as a Master, but does not possess additional features possessed by the COM HUB family such as Web UI and VPN functionality.

The typical system architecture is as depicted in Figure 2. Up to 4 sensors of any of the following family of sensors may be connected - UMRR11, TRUGRD and TOPGRD. The sensors must be connected via a PLC J-box. The module, and consequently the sensors, are to be powered by a single input power connector which is to be supplied with 48V DC. Via the RJ45 port, the sensors can then be connected via ethernet/LAN to the PC. The module then acts as a switch, allowing the sensors to connect to the Traffic UI, as if the sensors were connected directly over ethernet.

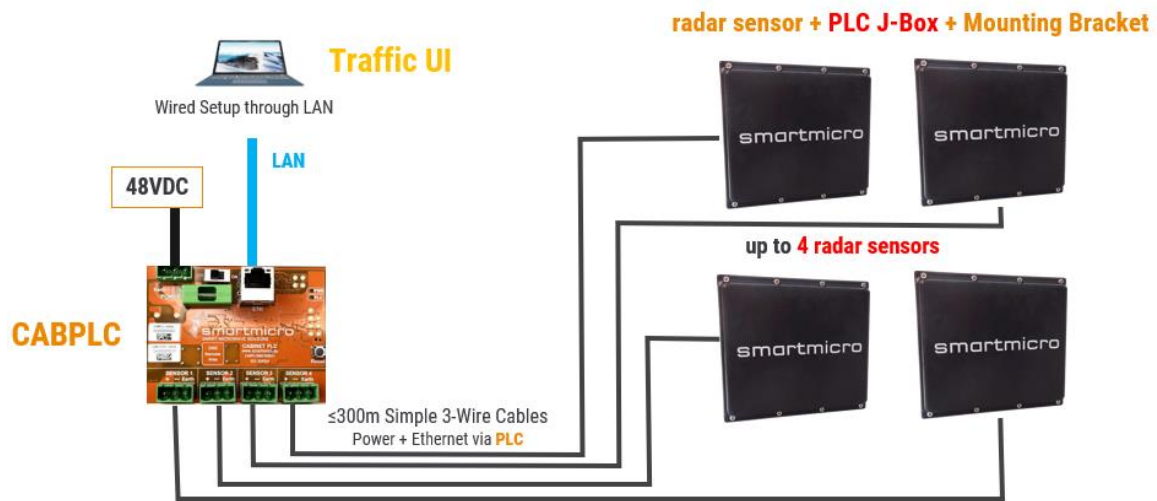


Figure 2: PLC Module System Architecture

## 10 TRAFFIC UI CONFIGURATION

The default IP address of the sensors is 192.168.11.11. The PC must be in the same Ethernet subnet as the sensors, in order to connect to the sensors in traffic. An example is provided in Figure 3, assuming the sensors are at the default IP of 192.168.11.11.

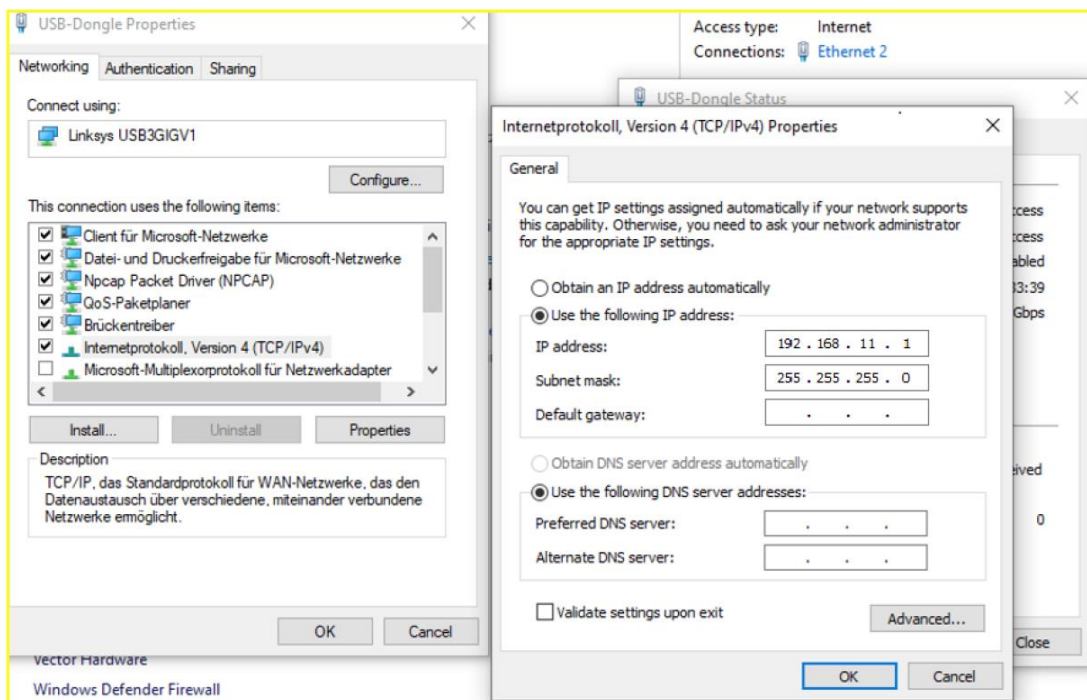


Figure 3: Setting the PC in the same subnet as the Cabinet PLC module

It must also be ensured that no two sensors have the same IP address. Before multiple sensor operation, each sensor can be connected individually to the Traffic UI to check, and if necessary, change the IP address of the sensor. In the Traffic UI Wizard, the sensor IP can be changed as highlighted in Figure 4.

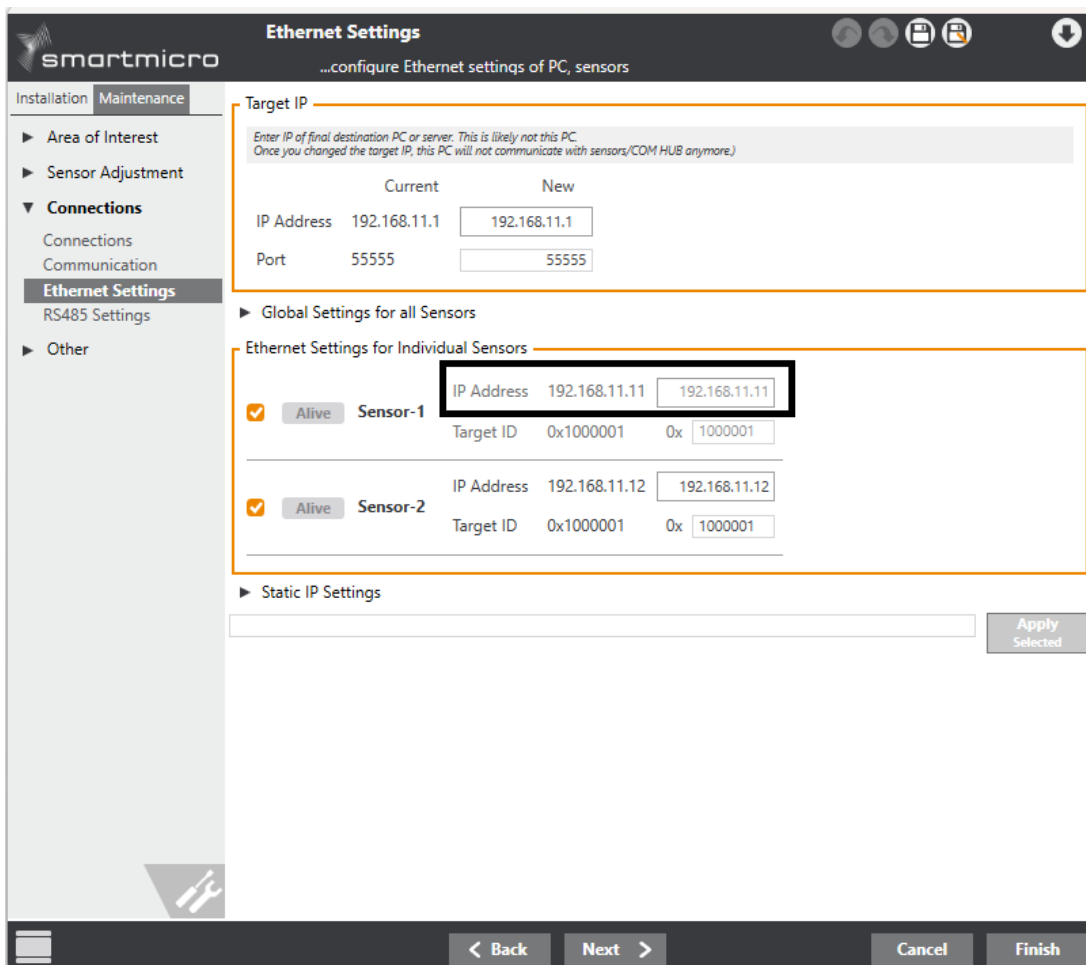


Figure 4: Changing the IP of the sensor

Once it is ensured that the connected sensors have different IPs and are in the same subnet of the PC, the sensors can be connected to in the usual manner in the Traffic UI.

In this example, two TRUGRD sensors with IPs 192.168.11.11 and 192.168.11.12 have been connected to the sensor in accordance with the system architecture seen in Figure 2.

In the Wizard, navigate to Sensor Positions>Auto Detect. The Hardware Monitor of the Traffic UI has also been activated. As can be seen and as is highlighted in Figure 5, the Traffic UI is able to detect the serial number, the Type and the antenna of the sensor, and the Hardware Monitor also

shows the IP of the sensors sending data. This indicates that both sensors function as intended. The user can then configure the sensors as required.

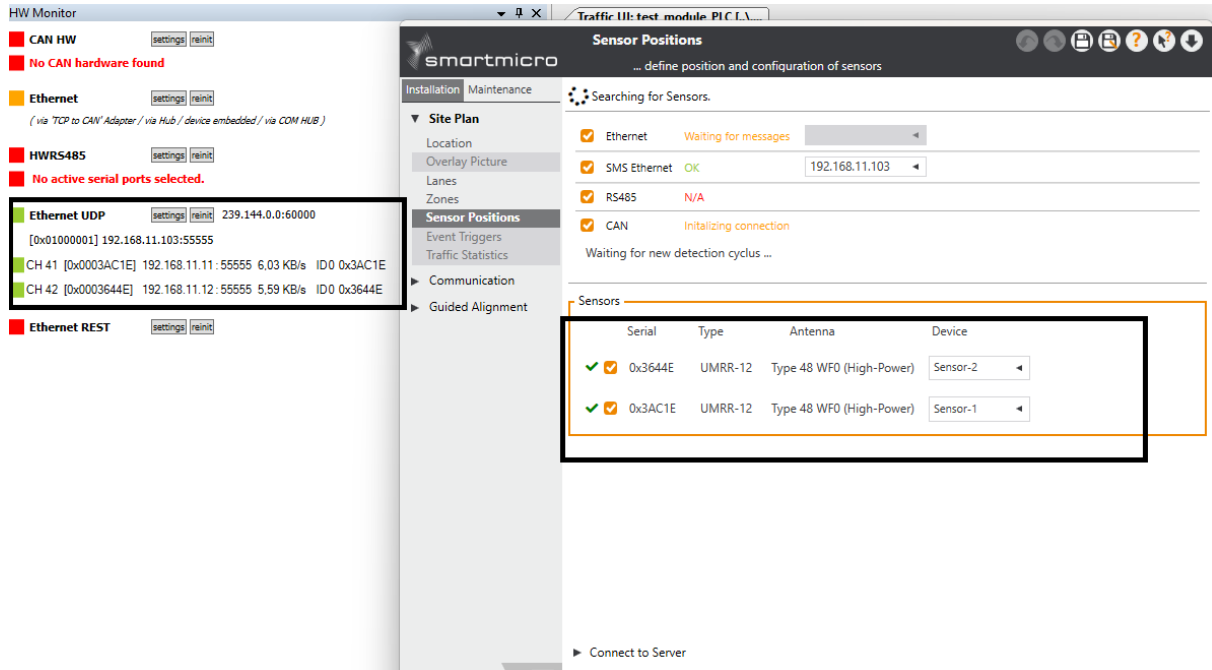


Figure 5: Sensors connected via the PLC module being detected by the sensor

## 11 COMPLIANCES<sup>1</sup>

The cabinet PLC module complies with the following EU directives:

- RED 2014/53/EU
- EMC 2014/30/EU
- Safety 2014/35/EU
- RoHS 2011/65/EU
- EC 1907/2006 REACH

Applied standards:

- Spectrum Usage:
  - o EN 300 328 V2.2.2
- EMC:
  - o EN 301 489-1 V2.2.3
  - o EN 301 489-17 V3.2.4
  - o EN IEC 61000-6-2:2005
  - o EN IEC 61000-6-3:2007+A1:2011 + AC:2012
- Health and Safety:
  - o EN 62311: 2008
  - o EN 62368-1: 2014 + AC: 2015

According to the surge protection, the cabinet PLC module complies also with the following regulations:

- IEC 61000-4-2 (ESD)
- IEC 61000-4-4 (fast transients)
- IEC 61000-4-5 (Surges)

Regarding operating conditions like temperature, vibration etc., the cabinet PLC module will be tested and certified by independent test labs to comply with:

- NEMA TS-2

Regarding spectrum usage, this sensor model will be tested and certified by independent test labs (formally approved by a test lab or notified body):

- EU RED directive
- EU EMC directive

<sup>1</sup> Pending

- 47 CFR FCC Part 15 B
- 47 CFR FCC Part 15 C Section 15.247
- ICES 003
- RSS-247

**Note:** This statement of compliance means that the Cabinet PLC Module allows operation compliant to the listed standards. However, not all standards are certified through test labs. Formal frequency approval or registration is not accomplished for all countries. In certain countries or regions, a customer-specific local frequency approval is reasonable. smartmicro supports customers throughout this process.

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