

## Smart Sensor Hub

### SMARTBOX-8CH MODEL

#### INTRODUCTION

The SMARTBOX-8CH (Smart Sensor Hub) is a smart sensor interconnection unit designed to optimise field installations where sensors must be deployed at significant distances from the data acquisition system.

By concentrating up to eight smart Modbus sensors per enclosure on a single RS-485 bus, the amount of cabling required is significantly reduced, along with power losses and installation complexity (ducting, trays, junctions, etc.).

Each SMARTBOX-8CH (SB-8CH) provides power distribution, surge protection, optional optical isolation and RS-485 signal regeneration, with models available for passive use, active use with local power, active use with isolation, or long-range radio communication via LoRa/ZigBee. This flexibility allows the hub to match a wide range of site layouts, distances and power requirements while maintaining robust communication with the data logger.

#### FEATURES

##### Smart sensor hub for dataloggers

Connects and manages up to 8 smart Modbus sensors per box on a shared RS-485 bus, simplifying wiring and sensor interconnection across the site.

##### Multiple typologies for different distances

Four versions (SB-8CH-1/2/3/4) cover short runs near the station, extended cable distances and very long links up to 5 km line-of-sight using LoRa/ZigBee radio.

##### Integrated power distribution and protection

Provides sensor power (with automatic AC/DC switching on active models), configurable termination, built-in surge protection and, on isolated models, optical separation plus signal amplification/regeneration.

##### Rugged outdoor enclosure

Polycarbonate IP68 enclosure with IP66 cable glands and pressure compensator, rated from -40 °C to +85 °C (with specific ranges for power and radio modules), supplied with mast and wall mounting hardware.

##### Scalable architecture for complex sites

Multiple SMARTBOX-8CH units can be daisy-chained along the RS-485 bus, each concentrating its local sensors and adapting to local power and isolation needs, for a flexible and scalable network topology.

##### Environmental protection and reliability

All models include surge immunity per IEC-61000-4-5 and surge protection devices in accordance with IEC-61643-11 (Class 1 and 2), ensuring robust operation in electrically noisy and exposed environments.

#### CONFIGURATION & MEASUREMENT

##### Bus communication and protocols

SB-8CH hubs use RS-485 with Modbus RTU for cabled connections and Modbus over LoRa/ZigBee for radio links. Each box supports up to 8 Modbus sensors, or 7 sensors plus an extension module, depending on configuration.



- CONNECTS UP TO 8 SMART MODBUS SENSORS ON A SINGLE RS-485 LINE
- REDUCES CABLING, POWER LOSSES, AND INSTALLATION COMPLEXITY.
- FOUR VERSIONS TO COVER SHORT CABLES, LONG CABLES, ISOLATED LINKS AND RADIO LINKS UP TO 5 KM
- DISTRIBUTES POWER TO SENSORS AND INCLUDES SURGE PROTECTION; OPTIONAL OPTICAL ISOLATION AND SIGNAL REGENERATION
- RUGGED IP68 OUTDOOR ENCLOSURE WITH CABLE GLANDS AND MAST/WALL MOUNTING HARDWARE

## Technical Specifications

### SB-8CH-1: Passive, without isolation

Bus Com / Protocol	RS-485 / Modbus RTU
No. sensors	Up to 8 Modbus sensors.
	Up to 7 Modbus sensors + 1 Extension Module
Protection	IEC-61000-4-5 Surge immunity IEC-61643-11 (Class 1 & Class 2)

Operating temperature -40 °C to +85 °C

### SB-8CH-2: Active, without isolation

Bus Com / Protocol	RS-485 / Modbus RTU
No. sensors	Up to 8 Modbus sensors.
	Up to 7 Modbus sensors + 1 Extension Module
Protection	IEC-61000-4-5 Surge immunity IEC-61643-11 (Class 1 & Class 2)
	F.A.: Overload / Overcharge
Operating temperature	FA: -30 to +70°C Rest: -40 to +85°C

### SB-8CH-3: Active, with isolation and reconditioned signal

Bus Com / Protocol	RS-485 / Modbus RTU
No. sensors	Up to 8 Modbus sensors.
	Up to 7 Modbus sensors + 1 Extension Module
Isolation	Optical 1KVDC
Protection	IEC-61000-4-5 Surge immunity IEC-61643-11 (Class 1 & Class 2)
	F.A.: Overload / Overcharge
Operating temperature	FA: -30 to +70°C Rest: -40 to +85°C

### SB-8CH-4 – Active, with radio communication

Bus Com / Protocol	Modbus Over LORA/ZigBee
No. sensors	Up to 8 Modbus sensors.
	Up to 7 Modbus sensors + 1 Extension Module
Protection	IEC-61000-4-5 Surge immunity IEC-61643-11 (Class 1 & Class 2)
	F.A.: Overload / Overcharge
Operating temperature	FA and Radio: -30 to +70°C Rest: -40 to +85°C

### For all models

Protection Rating	Enclosure IP68. IP66 cable gland (includes pressure compensator)
Enclosure material	Polycarbonate UL-94 V0 (fire-retardant and self-extinguishing)
Outer dimensions	200 x 160 x 90 mm
Accessories	Mast and wall fixings, made from 6060 anodized aluminum

### SB-8CH-1: Passive, without isolation

Ideal for short distances (< 25 m) and low-power sensors (< 3 W). The datalogger's output power to the sensors (12–14 VDC) is distributed throughout the installation along with the RS-485 bus lines.



### SB-8CH-2: Active, without isolation

Suited to longer runs (< 100 m) with up to 20 W of power consumed by the sensors. Each unit includes its own 15/24 VDC power source and must be connected to the AC grid (85–305 VAC), powering local sensors independently of the station supply.



### SB-8CH-3: Active, with isolation and reconditioned signal

Designed for distances between 100 and 1200 m and total sensor power below 20 W. Each box includes triple optical isolation (power, input and output), a local 15/24 VDC supply and RS-485 signal amplification/regeneration, enabling the next hub to be placed up to 100 m away.



### SB-8CH-4 – Active, with radio communication

Intended for very long distances up to 5 km line-of-sight.

Each hub integrates a LoRa/ZigBee radio (868 MHz) and an independent power source with automatic AC/DC switching. In this architecture the METEODATA station acts as the hub and each SB-8CH-4 as an endpoint, with the number of sensors per box depending on distance and bandwidth requirements.



### Ordering Code

- SB-8CH-1 SmartBox SB-8CH-1, 25 m cable.
- SB-8CH-2 SmartBox SB-8CH-2, 15 or 24 VDC power supply, 25 m cable.
- SB-8CH-3 SmartBox SB-8CH-3, 15 or 24 VDC power supply, isolated, 25 m cable.
- SB-8CH-4 SmartBox SB-8CH-3, 15 or 24 VDC power supply, radio, 25 m cable.

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