

SMARTBOX-8CH MODEL (Smart Sensor Hub)



The smart sensor interconnection hub, namely **SMARTBOX-8CH**, designed by GEONICA, permits optimizing installation of the METEODATA filed instrumentation system with its sensors at sites where there are considerable distances between the smart sensors and the data acquisition system. This solution notably reduces the amount of cable used for sensor interconnections, and the loss of energy and complexity of installation, ducting, etc.

SMARTBOX-8CH, hereinafter **SB-8CH**, permits having a single RS-485 bus which runs through the different sensor locations at the installation site, and when the sensor type or field conditions require it. This unit provides power supply (automatic AC/DC switching), optical separation

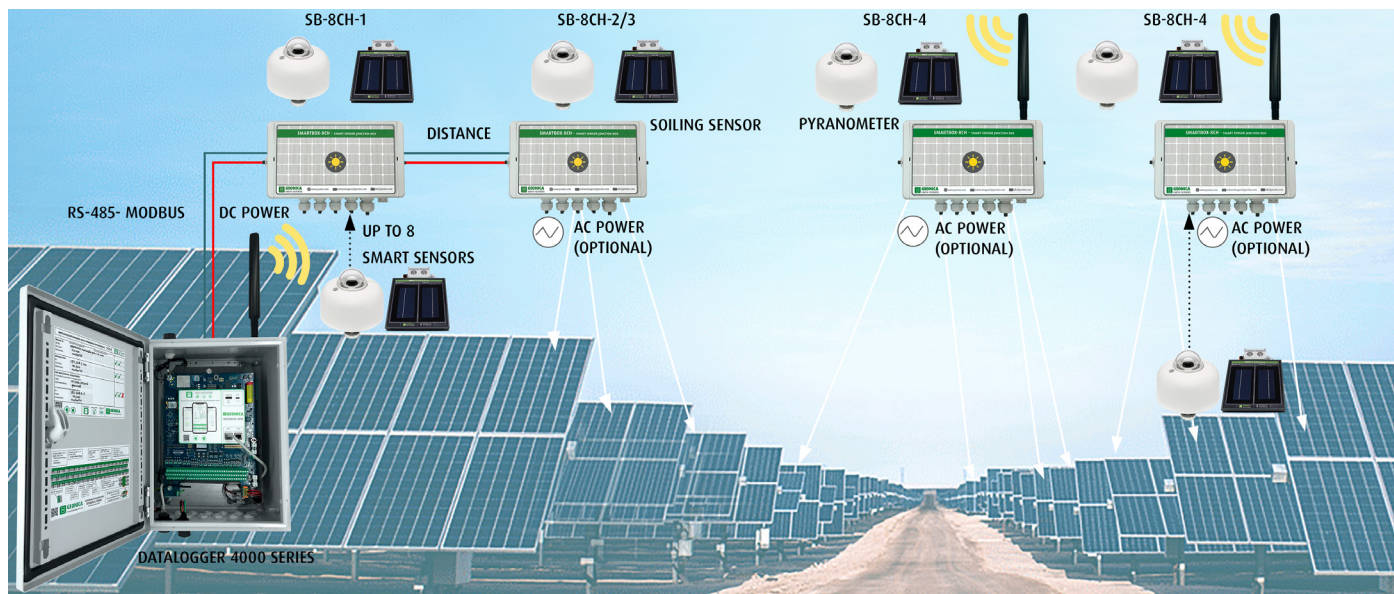
with bus extension and amplification/regeneration of the RS-485 signal, configurable terminal resistance at both ends and "SURGE" protection, already integrated for all the connected sensors. The different **SB-8CH** sensor junction boxes are connected to the site RS-485 bus integrating up to 8 smart sensors each. Communication between the different sensors connected to each SB-8CH and the METEODATA metering system is carried out through the Modbus RTU protocol.

Alternatively, for installations that require sensors to be located even further from the METEODATA station, **SB-8CH** features a wireless radio solution.

SmartBox-8CH-1/2/3/4	SmartBox-8CH-1: Passive, without isolation.	SmartBox-8CH-2: Active, without isolation.	SmartBox-8CH-3: Active, with isolation.	SmartBox-8CH-4: Active, with radio.
Bus Com / Protocol	RS-485 / Modbus RTU			Modbus Over LORA/ZigBee
No. sensors	Up to 8 Modbus sensors. Up to 7 Modbus sensors +1 Extension Module (Doc. 9722.0104)			
Distance	< 25 m	< 200 m	> 200 m	< 5 Km LoS
Max. Consumption permitted for connected sensors	< 3 W	< 20 W	< 20 W	< 20 W
Power source	-	20 W 15/24 VDC	20 W 15/24 VDC	20 W 15/24 VDC
Connection to power grid	-	85 – 305 VAC	85 – 305 VAC	85 – 305 VAC
Isolation	-	-	Optical 1KVDC	-
Protection	IEC-61000-4-5: Surge immunity IEC-61643-11 (Class 1 & Class 2)	IEC-61000-4-5: Surge immunity IEC-61643-11 (Class 1 & Class 2) F.A.: Overload / Overcharge	IEC-61000-4-5: Surge immunity IEC-61643-11 (Class 1 & Class 2) F.A.: Overload / Overcharge	IEC-61000-4-5: Surge immunity IEC-61643-11 (Class 1 & Class 2) F.A.: Overload / Overcharge
Operating temperature	-40 °C to +85 °C	FA: -30 to +70°C Rest: -40 to +85°C	FA: -30 to +70°C Rest: -40 to +85°C	FA and Radio: -30 to +70°C Rest: -40 to +85°C
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			

SMARTBOX-8CH typology

SB-8CH is compatible with an array of installation requirements through its different typologies. The specific model choice will depend on the distance to the METEODATA station, the type and number of sensors to be connected to each box, and the optical isolation requirements of the installation.



SB-8CH-1: Passive, without isolation

The ideal solution for short distances (< 25 m) and low power consumed in the SMARTBOX (< 3 W).

- The METEODATA power supply is distributed throughout the site in conjunction with the RS-485 bus lines. In each SMARTBOX-8CH-1, this external voltage (12-14 VDC) is used to power the connected smart sensors.
- Over long distances, the voltage drop from the METEODATA station power supply is an important factor. Therefore, this type of distribution is recommended when the sensors are located less than 25 meters from the station.

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

This is the ideal solution for even longer distances (between 200 and 1200 m) and power consumed by the connected items under 20 W.

- Each SB-8CH-3 of this type includes an optical isolator that implements a triple insulation (Power, Input and Output) and a local power source (15/24 VDC).
- The optical isolator also amplifies and regenerates the RS-485 signal, permitting extending the communication distance with the METEODATA.
- This type of SMARTBOX allows the next item in the RS-485 bus to be located at a distance of up to 200 m away.

SB-8CH-2: Active, without isolation

This is the ideal solution for longer distances (< 200 m) and power consumed by the connected items under 20 W.

- Each SB-8CH-2 includes its own power source (15/24 VDC) to power the associated sensors and must be connected to the power grid. This allows locating this type of SMARTBOX-8CH at a distance of up to 200 meters from the station (the furthest unit in the bus).
- The availability of an independent power source in each unit permits powering the sensors associated with each SB-8CH-2 up to a maximum consumption of 20 W.

SB-8CH-4: Active, with radio communication

This is the ideal solution for very long distances (less than 5 km LoS) and power consumed by the connected items under 20 W.

- Each SB-8CH-4 includes a LORA/ZigBee radio to transmit the information collected by the connected smart sensors. This type of link covers distances of up to 5 Km (868MHz).
- With respect to the Radio architecture, the METEODATA station performs the function of the HUB, and each SB-8CH-4 will implement the ENDPOINT role. In this type of radio-link configuration, the SB-8CH may manage fewer sensors depending on the distance to the HUB (METEODATA station) or the project band width requirements.
- Each SB-8CH-4 includes its own independent power source with automatic AC/DC switching capacity, or both concurrently.

REVISION	EDITED	REVIEWED	DATE	AFFECTED SECTIONS	VERSIONS
1	P.V.	L.L.	11/2/2022	New features	Not applicable



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