

Solar Module-Level Power Electronics

August 2018



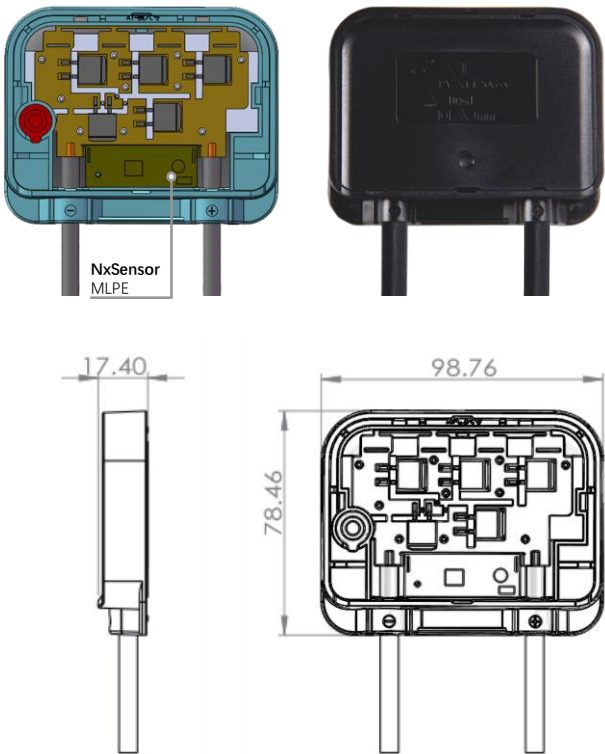
Product Catalog



Smart Junction Box

An innovative value-added junction box with integrated NxSensor MLPE device brings smart functionalities to a solar panel. It supports following features:

- Solar PV module-level monitoring
- NEC 2017 690.12 rapid shutdown
- Wireless communication via HOHWave™



Specifications

Mechanical & Environmental

Size (without cables)	98.8mm*17.4mm*78.5mm
Operating Temp.	-40°C to +75°C, RH < 85%
Storage Temp.	-40°C to +75°C, RH < 60%
IP Rating	IP68
Sealing Type	Potting

Electrical

Rated Voltage	1000V / 1500V
Rated Current	15A
Connectors	MC4 / MC4 compatible
Max. Input Voltage	90V

Monitoring

Voltage Range	7V to 60V, ±0.2V
Temperature Range	-40°C to +75°C, ±0.5°C
Sampling Rate	1 min. to 5 min.

Safety

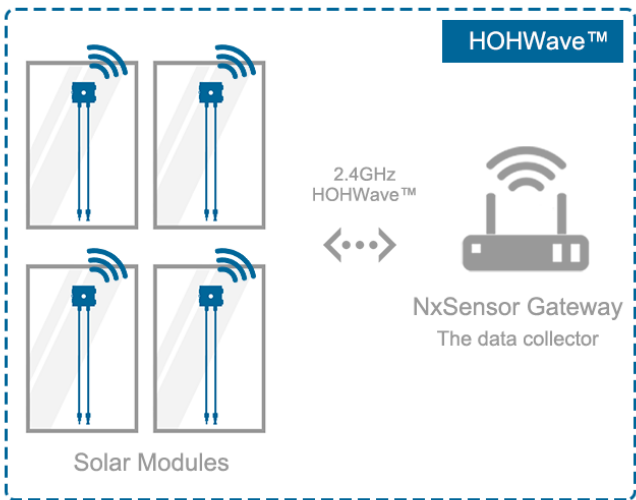
Rapid Shutdown	NEC 2017 690.12
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Wireless Radio

Radio	2.4GHz ISM band
Wireless Protocol	HOHWave™ MESH Network

Power

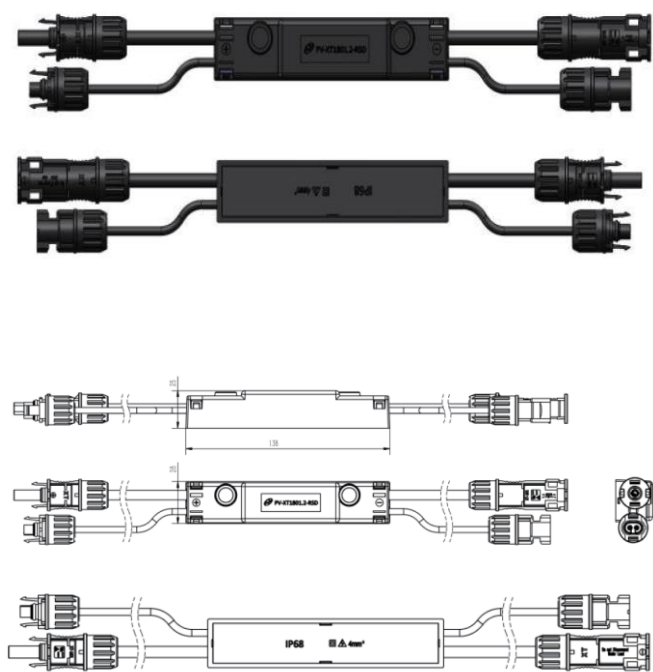
Power Consumption	< 50mW
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Add-on / Retrofit Box - X

The Box-X is an add-on junction box that contains NxSensor MLPE device. It is a retrofit approach to upgrade existing solar power systems with smart functionalities:

- Solar PV module-level monitoring
- NEC 2017 690.12 rapid shutdown
- Wireless communication via HOHWave™



Specifications

Mechanical & Environmental

Size (without cables)	138mm*28mm*25mm
Operating Temp.	-40°C to +75°C, RH < 85%
Storage Temp.	-40°C to +75°C, RH < 60%
IP Rating	IP68
Sealing Type	Potting / Rubber

Electrical

Rated Voltage	1000V / 1500V
Rated Current	15A
Connectors	MC4 / MC4 compatible
Max. Input Voltage	90V
Wiring	Connect in series between two PV panels

Monitoring

Voltage Range	7V to 60V, ±0.2V
Temperature Range	-40°C to +75°C, ±0.5°C
Sampling Rate	1 min. to 5 min.

Safety

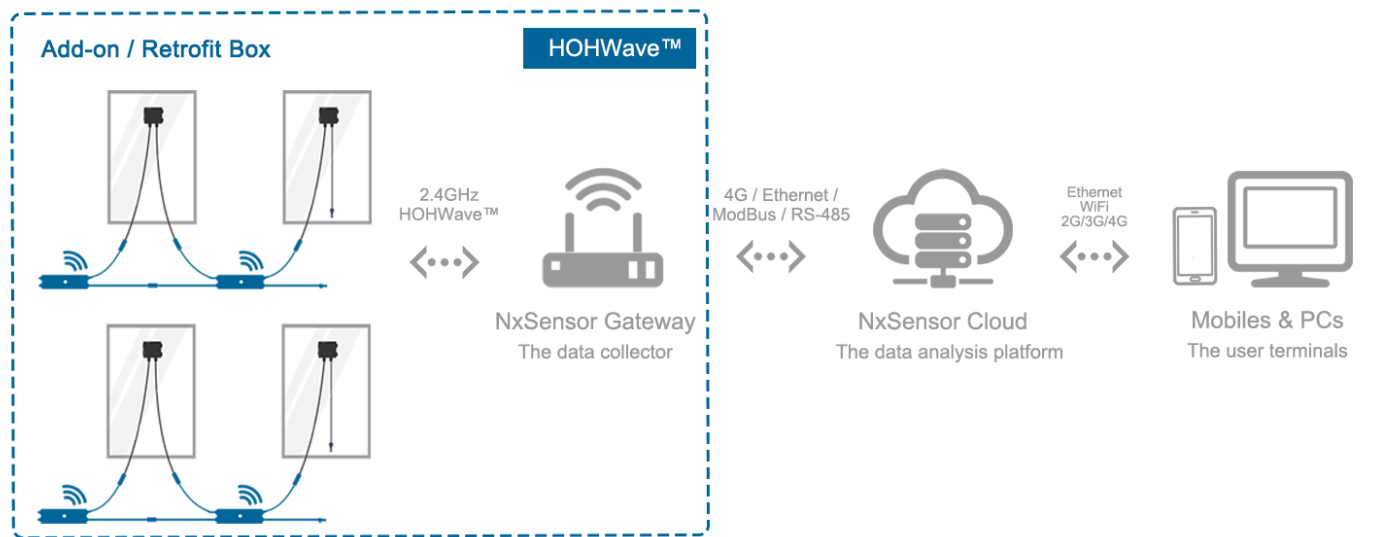
Rapid Shutdown	NEC 2017 690.12
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Wireless Radio

Radio	2.4GHz ISM band
Wireless Protocol	HOHWave™ MESH Network

Power

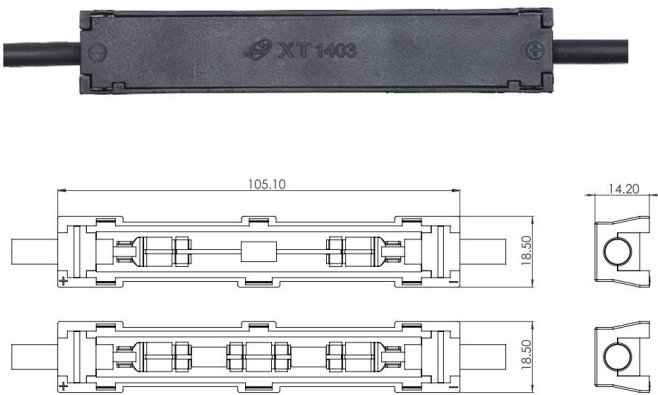
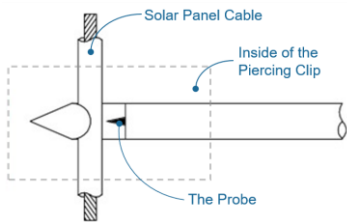
Power Consumption	< 50mW
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Add-on / Retrofit Box - M

The Box-M has a pair of piercing clips that could be easily attached to any solar panels. It is a fast and cost effective way to upgrade existing solar power systems with NxSensor MLPE functionalities. It supports:

- Solar PV module-level monitoring
- Wireless communication via HOHWave™
- Fast & easy wiring & connection



Specifications

Mechanical & Environmental

Size (without cables or clips)	105.1mm*18.5mm*18.5mm
Operating Temp.	-40°C to +75°C, RH < 85%
Storage Temp.	-40°C to +75°C, RH < 60%
IP Rating	IP68
Sealing Type	Potting / Rubber

Electrical

Rated Voltage	1000V / 1500V
Rated Current	15A
Connectors	MC4 / MC4 compatible
Max. Input Voltage	90V
Wiring	Connect in parallel across a PV panel. (monitoring, no RSD)

Monitoring

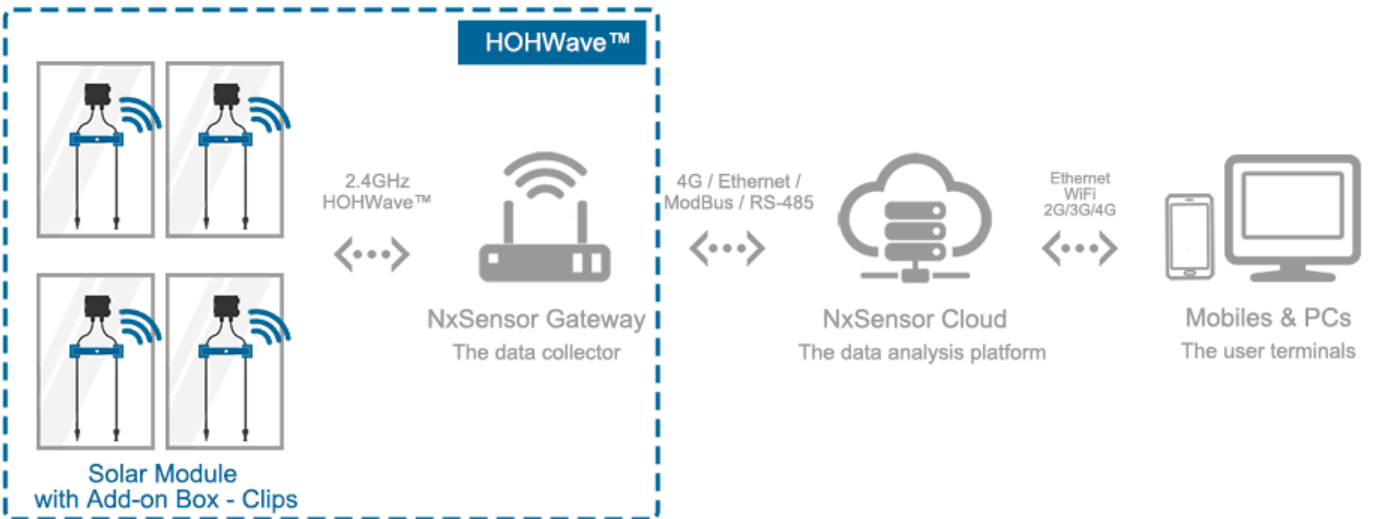
Voltage Range	7V to 60V, ±0.2V
Temperature Range	-40°C to +75°C, ±0.5°C
Sampling Rate	1 min. to 5 min.

Wireless Radio

Radio	2.4GHz ISM band
Wireless Protocol	HOHWave™ MESH Network

Power

Power Consumption	< 50mW
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Gateway

The gateway manages the data transmission and logging of your solar assets by wirelessly communicating with NxSensor smart junction boxes and add-on / retrofit boxes.

- Internet connection via cellular network
- Wireless mesh network via HOHWave™
- Access 500+ nodes of NxSensor MLPES
- External interfaces for RSD controlling
- Plug & play, easy of setup and installation



Specifications

Mechanical & Environmental

Size (main body)	105mm*130mm*28mm
Operating Temp.	-30°C to +70°C
IP Rating	IP65
Weight (main body)	0.45 kg

Wireless Connectivity

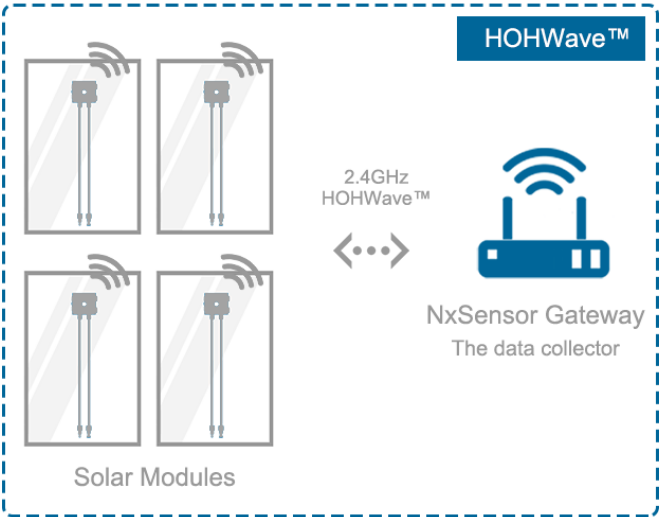
Radio	<ul style="list-style-type: none">• 2.4GHz ISM band• Cellular LTE
2.4GHz Wireless	HOHWave™ MESH Network
Antenna	2.4-2.5GHz SMA Male * 2
Network Capacity	500+ nodes per gateway
Message Length	Max. 64-byte length
Throughput	100 uplink messages / 1 min.
Max. RF distance	500m with multi-hop action
Protocol	MQTTS, HOHWave™

Interface

RS485 / Modbus	Connect with inverters
ON / OFF signal	Rapid shutdown controlling

Power

Power Consumption	< 3W
Power Source	9-24VDC or 110-240VAC (e.g. a small solar panel.)



Monitoring Software

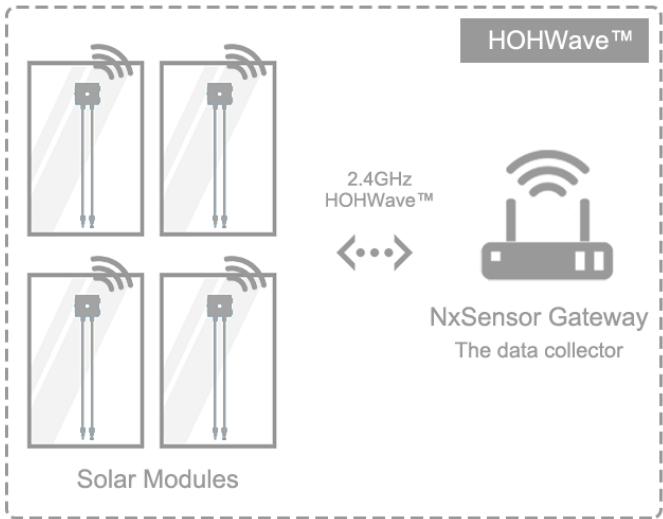
By monitoring each individual solar panel's performance, NxSensor software provides the most accurate digitized information of your solar power system. You can identify hidden issues and schedule O&M activities.

- Real-time data & remote monitoring
- Data visualization for your solar plant
- Powerful alert notification capability
- Periodic performance report / analyst
- RFID-based solar asset management



Specifications

Supported Web Browsers	<ul style="list-style-type: none">• Google Chrome• Mozilla Firefox• Apple Safari• Opera 11.0 above• Internet Explorer 9.0 above
System Configuration	Logical (electrical connection) and physical locations of solar panels in a PV system
User Access	Selective permission levels for users and administrators
Data Storage	Storage of every complete time series data set collected from a sensor since system startup.
Data Visualization	<ul style="list-style-type: none">• Viewing of individual time series and trend charts• Viewing of customizable PV system heat maps• Intelligent single-point or time-averaged baselining
Data types	<ul style="list-style-type: none">• Module voltage• Module temperature• Module power• String Current (coming soon)
Alarms and Notifications	<ul style="list-style-type: none">• On-screen health icons with warnings and alarms for low performance or exceedances• Email notification of warnings and alarms
Performance Report	Daily, weekly, monthly
Safety and Rapid shutdown	<ul style="list-style-type: none">• Indicator• Controlling (coming soon)





About NxSensor

NxSensor is a technology start-up company making intelligent MLPEs, sensors, controllers and providing digital transformation solutions for solar power systems.

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