SUNNER
tracking electronics

NCU. NETWORK CONTROL UNIT

Network Control Unit for Solar Trackers.

The NCU receives the atmospheric alarms detected by the HSU and communicates with the TCUs to send the trackers to the needed position. Also, it implements a gateway between the Sunner ecosystem of the solar plant and the SCADA to monitor the solar plant remotely.

- Designed for outdoor use.
- Main power 230 Vac electrical grid. (120 Vac version optional)
- Zigbee wireless or RS485 communication.
- Ethernet connection for remote control. (Fiber optic version optional)
- Sensor integration available

OPERATING

The NCU (Network Control Unit) is part of the Sunner ecosystem (HSU, TCU and NCU).
The NCU acts as a network coordinator. It receives the atmospheric alarms detected by the HSU and communicates with the TCUs to send the trackers to the needed position.
Also, it implements a gateway between the Sunner ecosystem of the solar plant and the SCADA system to monitor the solar plant remotely.
Its main features are:

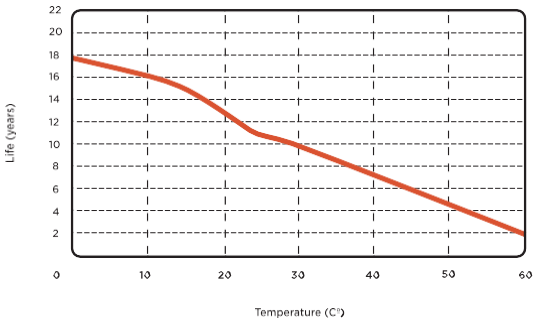
- **Zigbee wireless or RS485 communication with HSUs and TCUs.**
- **Ethernet communication with SCADA. (Fiber optic version optional)**
- **UPS Function**
- **Bluetooth app for easy installation**
- **Design for outdoor use, IP 65, IK07**
- **Wide ambient temperature range**
- **Power: 230 Vac (120 Vac versión optional)**
- **515x415x230 mm**

Power Supply

Main power:
- 230 Vac electrical grid
- External connector for 3G 2.5mm2 cable
- Easy field connection

Back-up battery: (in case of electrical grid loss)
- Lead Crystal – Rechargeable, Ref. AMC9014
- 24 V, 4Ah
- Wide temperature range
- Autonomy: 12h at 25 ºC

Battery life > 10 years at 25 ºC, depending on ambient temperature according to the following graph:



RTC (Real Time Clock)
Lithium – Non-rechargeable, Ref. CR 2032 MFR (1BL)
- Autonomy: > 4 years
- Shelf life: >10 years

Comunication

Remote communication with SCADA using Ethernet:
- Cable: RJ45 Cat 5E. LAN
- External connector for easy installation
- Protocol: Modbus / MQTT
- Encryption: TLS (optional for MQTT)

Communication with HSUs and TCUs using: (depending on version).
- Zigbee (wireless)
  - External RF antenna and 3 m RF cable included
  - Protocol: Modbus over Zigbee
- RS485 (cabled)
  - Protocol: Modbus RTU

Field installation using bluetooth (Wireless).
- Protocol: BLE
- App available for easy configuration
- Activation with internal button for safe configuration

Functionalities

-Establish the Zigbee network.

-Receive the atmospheric alarms from the HSU:
- Up to 3 different wind alarms. Highly configurable in the HSU.
- Sensor communication failure
- Snow alarm (can be used as flood alarm)

- Keep the alarms and positions of the TCUs

- Ask the TCUs to move to proper position depending on the HSU alarms.
- Wind alarm (configurable in the HSU)
- Snow alarm (configurable in the HSU)
- Maintenance position (the user can ask each group of trackers to move to maintenance position)

-Ask the TCUs to move to maintenance position manually.

-Real Time Clock.

-Periodic time synchronization using NTP with other NCUs, TCUs and HSUs.

-Send the information to the SCADA for real-time remote monitoring of the solar plant.

-Send alarm to the SCADA in case of NCU back-up battery or electrical grid failure.

PARTS OF THE NCU KIT

The NCU kit includes the necessary elements for easy field installation.

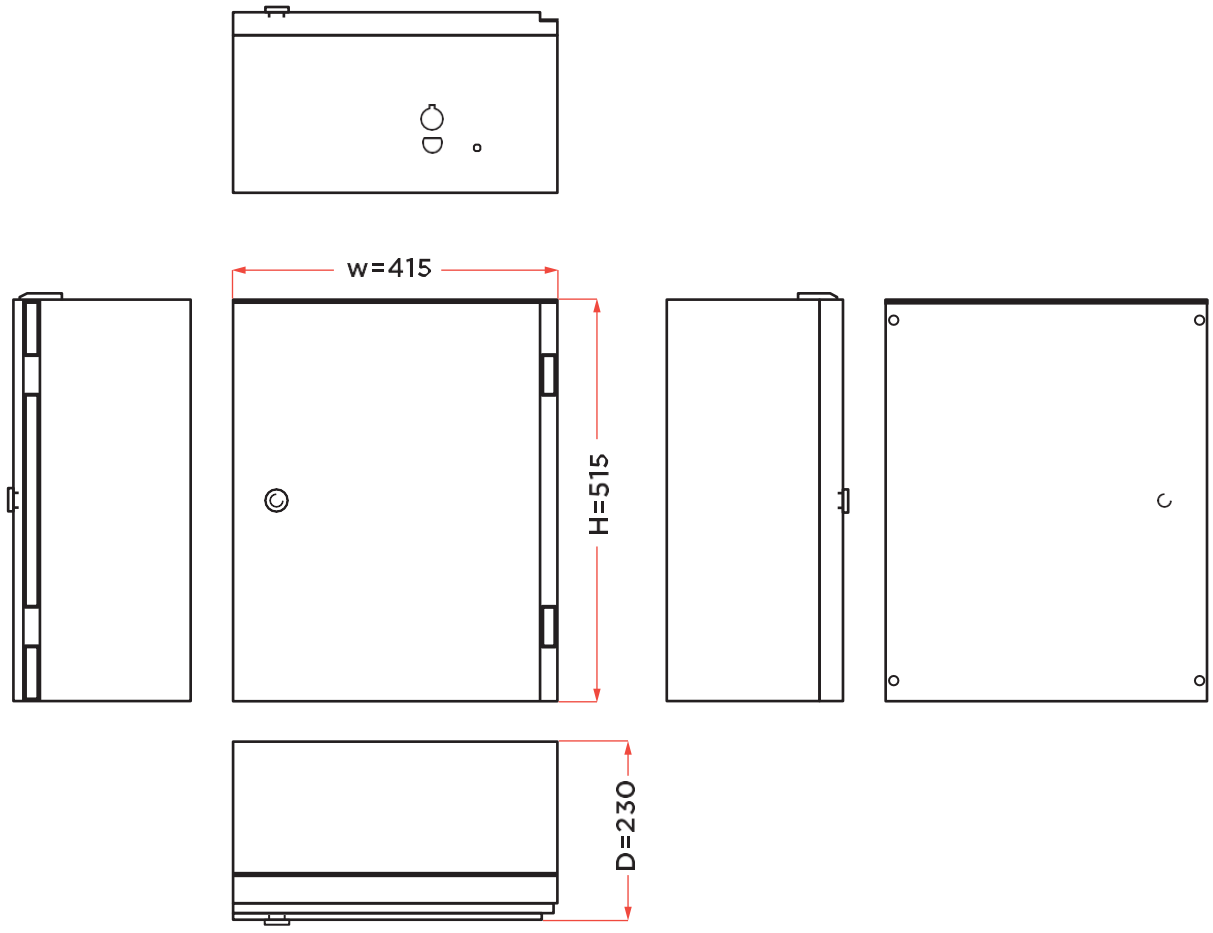
Parts of the NCU kit:
- NCU

- MOUNTING
• 4 wall mounting stainless steel brackets • 8 M8x20 srews • 1 key (for opening the NCU enclosure)

- CONNECTIONS
• Electrical grid connector • Ethernet connector • 3m long RF cable • RF antenna

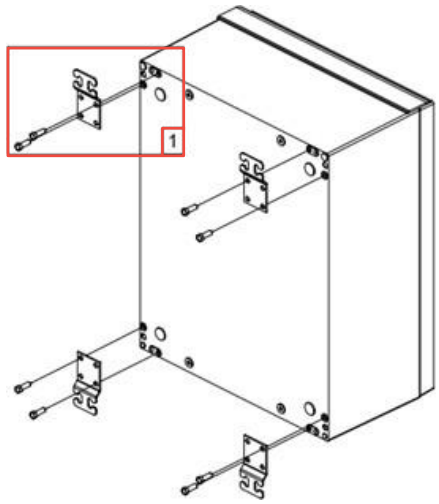
MOUNTING

Dimensions of the NCU enclosure:



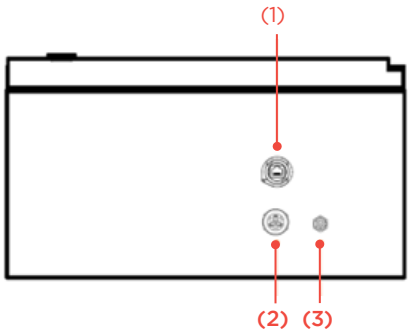
The unit must be placed on a vertical position with the connectors facing the ground.

Wall mounting stainless steel brackets and screws are included in the kit.
IMPORTANT User manual must be read before mounting.



CONNECTIONS

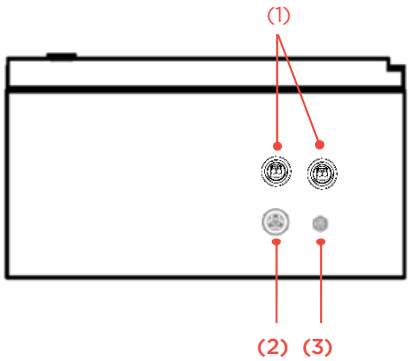
NCU ETHERNET:



Indicator	Interface	Connector	Cabling
(1)	Ethernet (SCADA)	Amphenol Socapex RJF RB 6 (included)	RJ45 Cat 5e. LAN cable
(2)	Power 230 Vac	Phoenix Contact Ref: 1047321 (included)	3G 2.5 mm2 cable
(3)	RF Antenna	-	RF RP SMA cable with antenna (included)

Connectors are located on the bottom side of the NCU.

NCU OPTIC FIBER:



Indicator	Interface	Connector	Cabling
(1)	(X2) Optic fiber (SCADA)	Amphenol FB-00RLFJ-TC7001 (included)	Optic fiber with LC connector
(2)	Power 230 Vac	Phoenix Contact Ref: 1047321 (included)	3G 2.5 mm2 cable
(3)	RF Antenna	-	RF RP SMA cable with antenna (included)

Connectors are located on the bottom side of the NCU.

The antenna must be placed on vertical position and in line of sight with the other HSU and TCU units to reach the best possible communications.
IMPORTANT User manual must be read before connecting.

TECHNICAL FEATURES

Enclosure

Dimensions (LxWxH)	515x415x230 mm
Weight	15 kg
Material	FG reinforced polyester
Mounting system	8 screws M8
IP protection	65
IK protection	07
UV protection	protected

Electrical Features

Input Voltage	230Vac ±10% 60Hz
Input Current, nominal	0,4 Aac
Input Current, max. (Internal AC power socket for maintenance in use)	16 Aac
Power consumption	60W max

Interfaces

Power input

Connector reference	Phoenix Contact ref. 1047321
Wire gauge	2,5 mm2
3G cable diameter	6 - 9 or 8 – 13 mm

Ethernet communications

RJ45 Connector reference	Amphenol RJF RB 71
Cable specification	RJ45 Cat6 LAN Cable SSTP

Internal AC power socket (inside the enclosure)	**230 Vac, 16A, 2P+E**

Environmental

Operation Temperature	-25 to +55 ºC
Storage Temperature	-20 to 60 ºC
Max. Relative Humidity	85%
Max. Installation Altitude	2000

Back-up Battery

Type	Lead Crystal
Capacity	4 Ah
Voltage	24 Vdc
Full charge time	8 h
Typical autonomy (at 25 ºC)	12 h

Wireless Communications with field network (HSUs and TCUs)

(Depending on version)

Interface	Zigbee
Protocol	Modbus over Zigbee
Signal Range	• Up to 60 m (indoor, urban) • Up to 1200 m (outdoor/ RF line-of-sight)
Transmit power	+8 dBm
Receiver sensitivity	-103 dBm
External antenna connector	RP-SMA
Max transceivers on bus (2 gateways)	200 devices

Wired Communications with field network (HSUs and TCUs)

(Depending on version)

Interface	RS485
Protocol	Modbus RTU
Bus cable length	< 1200 m
Encryption	N/A

Wired Communications with SCADA

Interface	Ethernet RJ45
Protocol	Modbus / MQTT
Encryption	TLS (optional for MQTT)
Signal range (Fiber optic output version optional)	<100 m

Wireless Communications for installation and maintenance

Interface	Bluetooth
Protocol	BLE
Signal range	<5 m

Electrical protections (inside the NCU)

Differential Switch	A9R21225 Schneider Electric	230 Vac, 25A, 30mA, 10kA
Surge protection device	DE PS5 Direct-Electro	Type 2 (IEC61643-1), protection level 1kV, capacity (x5) 5kA 8/20µs
Magnetothermal (Power socket protection)	239103 Eaton	16A, C - curve, 6kA
Power socket	A9A15310 Schneider Electric	230 V AC, 16 A
Magnetothermal (NCU protection)	278754 Eaton	6A, C - curve, 10kA
Uninterruptible Power Supply (UPS)	2907160 Phoenix Contact	24 V DC, overvoltage category II (EN 61010-1)

Standard compliance

EMC	IEC 61000-6-2:2016 IEC 61000-6-4:2018
SE	IEC 61010-1:2010/AMD2016
Ingress Protection	IP65
Impact Protection	IK07

Indicators

LED 1 and 2	Flashing alternatively – NCU operating system is working correctly. OFF – NCU operating system is not working
LED 3	ON - NCU is powering up Flashing - NCU is powered up OFF - NCU is OFF or sutting down

Switches

Power button	Push it to turn ON or OFF the NCU operating system.
10 Maintenance switches	The user can configure 10 groups of trackers to send them to maintenance position manually.
Bluetooth button	Push it to activate Bluetooth for easy installation. After installation, it will be automatically deactivated.

SECURITY AND LABELING

• Please, read the installation guide before installing the unit, improper use of the unit can damage it permanently.

• Label symbols meaning:

IP65 IP protection degree

CE compliance

REFERENCES

Reference	Description
1133015010	NCU 230 ETH
1133015019	NCU 230 OPTIC FIBER
1133015018	NCU+HSU ETH

*For other references, please contact us.

DISCLAIMER. Installation Instructions and Warranty Policy

Users are advised that failure to strictly adhere to the installation guidelines outlined in this manual will result in the nullification of the associated warranty provided by IED. Any damage or malfunction arising from non-compliance with the specified instructions releases IED from liability. It is the user's responsibility to follow the instructions accurately to maintain warranty coverage. IED reserves the right to deny warranty claims for products that have been improperly installed or operated.

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All dimensions and sizes are approximate.
Specifications and prices are subject to change without notice.