SUNGATE

Installation Manual

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HISTORY CHANGES

VERSION	DATE	DESCRIPTION
1.0	August 12, 2019	Initial draft
1.1	September 27, 2019	Added Solis mini 4G Inverter Added link to online registration info
1.2	October 17, 2019	Use dedicated Solis mini 4G data cable
1.3	March 17, 2020	Typos
1.4	April 2, 2020	Added Solax X1, Solax X3 and Goodwe NS
1.5	May 25, 2020	Added MODbus labels on images Goodwe & Solax
1.6	September 14, 2020	Updated cables to definitive version. Updated photos for the different invertors. Added Isolator switch specifications and schematic.
1.7	September 17, 2020	C4A connect application for configuring the SUNGATE.
1.8	November 25, 2020	Corrections, relocation of chapter ”Installation Steps”, better images, Custom cables listing
1.9	April 2, 2021	Update installation steps.
1.10	April 9, 2021	Change document template
1.11	April 4, 2022	Update installation step Solaredge, add wifi monitoring option.

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TABLE OF CONTENTS

1. INTRODUCTION

This document describes the installation of the SUNGATE module, the XEMEX/Cast4All Inverter Monitoring solution.

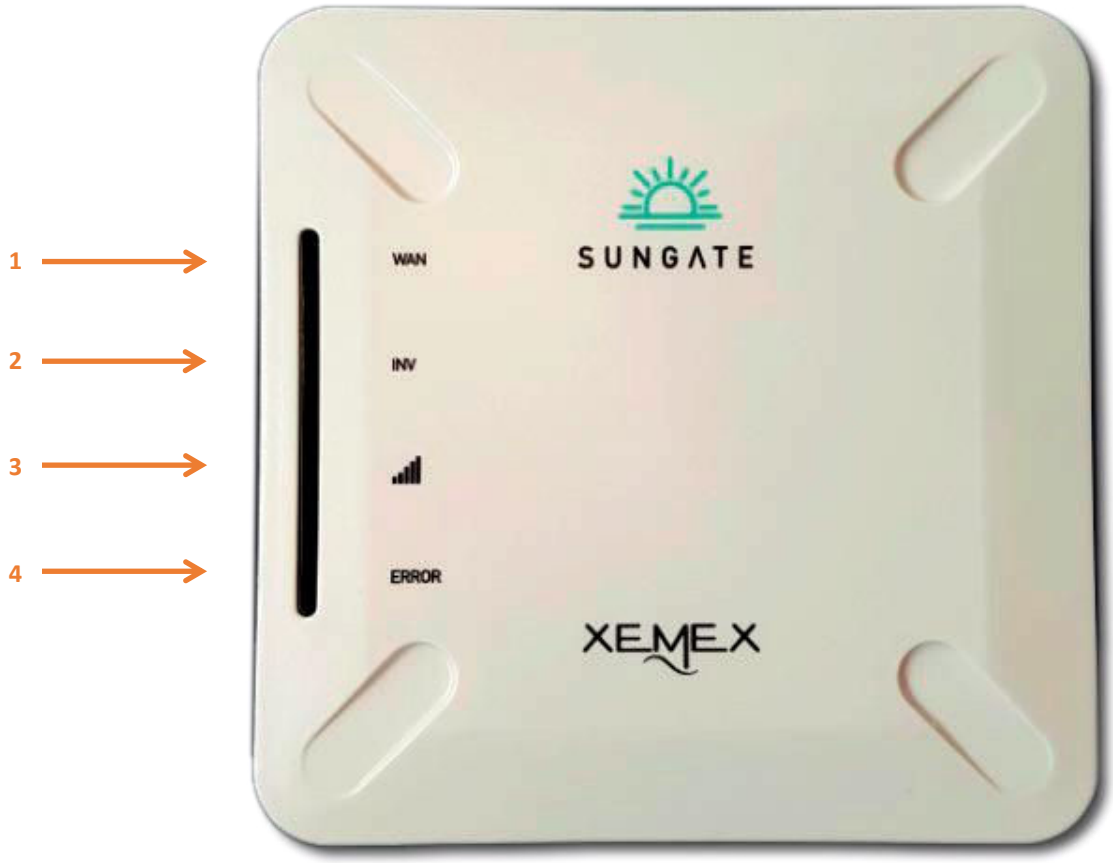
Important: this installation manual does not replace the inverter installation manual, i.e. also follow the installation and safety guidelines from the inverter manual!

2. TERMINOLOGY LIST

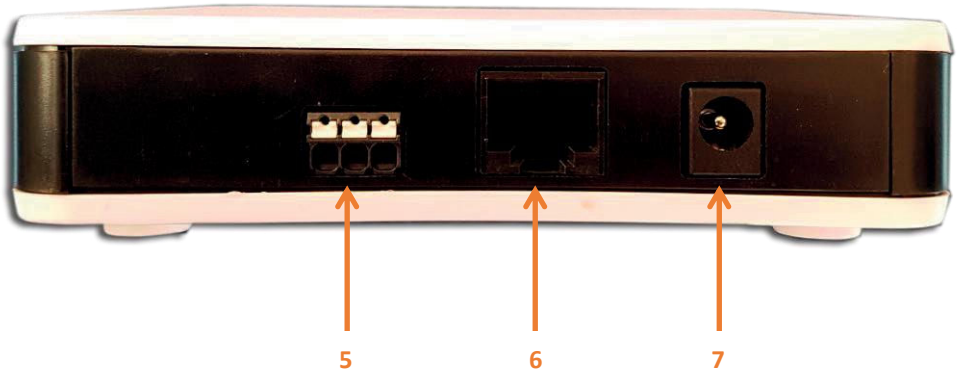
WAN	Wide Area Network
LED	Light Emitting Diode
INV	Invertor
RSSI	Received Signal Strength Indicator
DC	Direct Current
CON	Connector
GND	Ground
CSQ	Signal Quality
TH	Threshold
NC	Not connected

3. PRODUCT DESCRIPTION

3.1.TOP VIEW



3.2.SIDE VIEW



Number	Item	Short description
1	WAN LED	Feedback about WAN network status.
2	INV LED	Feedback about communication status with Inverter.
3	RSSI LED	Feedback about WAN signal strength.
4	ERROR LED	Feedback about error/alarm status.
5	RS-485 CON1	RS-485 connector 1 for connection to Inverter.
6	RS-485 CON2	RS-485 connector 2 for connection to Inverter.
7	DC CON	DC adapter connector.

3.3. LEDS

3.3.1. WAN LED

The WAN LED gives feedback about the WAN modem status:

Continuously off:	Searching for network
Blinking (1s):	Registered to the network
Continuously on:	IP assigned

3.3.2. INV LED

The INV LED gives feedback about the RS485 communication with the inverter (SUNGATE must have been configured for specific inverter).

Continuously off:	SUNGATE not powered
Blinking (1s):	Inverter does not respond (polled from SUNGATE every 5min)
Continuously on:	Inverter responds

3.3.3. RSSI LED

The RSSI (Received Signal Strength Indicator) LED gives feedback about the received CSQ:

Continuously off:	Below CSQ TH1
Blinking (1s):	Between CSQ TH1 and CSQ TH2
Continuously on:	Above CSQ TH2

Note:
TH1 = 9 by default, can be overridden by Config
TH2 = 19 by default, can be overridden by Config

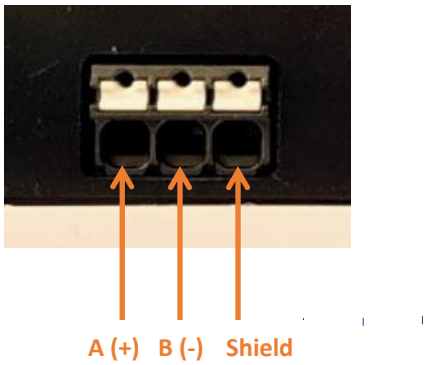
3.3.4. ERROR LED

The ERROR LED gives feedback about the alarm status register:

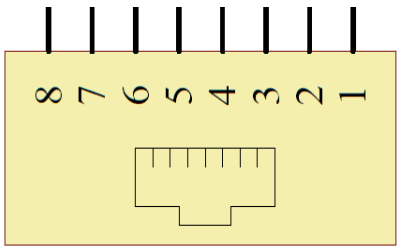
Continuously off:	No alarms set
Continuously on:	At least one alarm is set

3.4. CONNECTORS

3.4.1. RS-485 CON1 – PUSH IN TERMINAL

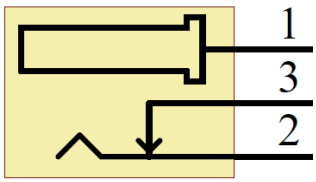


3.4.2. RS-485 CON2 – RJ45 CONNECTOR



Pin	Description
1	RS-485 A (+)
2	RS-485 B (-)
3	RS-485 A (+)
4	GND
5	GND
6	RS-485 B (-)
7	DC IN 6.5 V … 18 V (nominal 7 V)
8	DC IN 6.5 V … 18 V (nominal 7 V)

3.4.3. DC CON – POWER JACK



Pin	Description
1	+DC IN 6.5 V … 18 V (12 V nominal)
2	GND

3.5. Cable types

There are 4 cable types used to connect the SUNGATE to a specific invertor :

3.5.1. SolarEdge / Generic:

3.5.2. Solax X1 Mini:

3.5.3. Solax X1:

3.5.4. Solax X3:

4. INSTALLATION STEPS

Before SUNGATE installation make sure you have following mobile APPs installed:

- Cast4All Connect + request PIN code (see [7 CAST4ALL CONNECT])
- SetApp (SolarEdge config)

Step	Description	Remarks
1 (optional)	Test the Modem Signal quality Temporary power (adapter) the SUNGate and hold it on the envisioned installation place to test the received Signal Quality: Preferably, the Signal Strength LED should lit continuously. If not, try to move the SUNGATE to a place where the RSSI LED is continuously lit or at least blinks.	• Immediately after startup it can take a few minutes (< 5min) before the RSSI is actual. • RSSI is updated only once a minute ⇒ So, wait long enough and keep SUNGATE long enough in the same place before coming to conclusions
2	Connect the DC adapter	• Use adapter from within work switch
3	Connect the appropriate RS-485 data cable between the SUNGATE and the inverter.	• Use guidelines from chapter 3 for specific cable and connection info. • Also use guidelines from the inverter manual + follow safety instructions from inverter manufacturer!
4	Power the installation.	
5 (SolarEdge)	In case of SolarEdge -> Configure the inverter using SolarEdge SetApp	See document "**sunspec-implementation-technical-note.pdf** ", a guide from SolarEdge that explains how to enable & configure the SunSpec protocol on the second RS 482 interface (which is connected to the SUNGATE). Page 11, SolarEdge Device Configuration – Using SetApp ⇒ Configuration is done by using a mobile App from SolarEdge, called SetApp ⇒ Install SetApp from the PlayStore/AppStore ⇒ Start SetApp and follow the instructions it shows ⇒ Go to the Communication Settings. ⇒ Configure RS485-2 interface with the following parameters: > SunSpec (Non-SE Logger) > Device ID = 1 > Baudrate = 115200 baud **Optional:** ⇒ Configure wifi for monitoring on solaredge

		platform. > Monitoring communication > change connection type > wifi > Configure wifi > select correct network > enter wifi password > Wait for verification > disconnect device. IMPORTANT: if required the wifi-settings need to be configured after the RS485-2 interface. Otherwise the wifi will not work.
6	Configure the SUNGATE for the connected inverter using Cast4All Connect	• Start the Cast4All Connect App • Scan the SUNGATE's S/N label • Select "Update Configuration" • Select the inverter type • Select "> Submit" ⇨ Wait until the action is accomplished ⇨ After max .. min, the INV LED should be permanent on
7	Verify the installation using Cast4All Connect	
8	Installation complete	

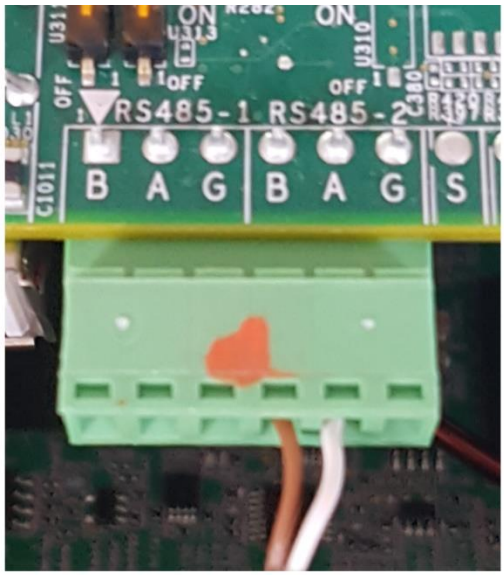
5. CONNECTION WITH PV INVERTERS

5.1. SOLAREDGE HD-WAVE

- Connect the SolarEdge inverter to the SUNGATE by the SolarEdge/Generic data cable :

- At the SUNGATE side, use RJ45 connector:

- At the SolarEdge inverter side, connect the data cable as follows:



- Plug the power jack, with black and red cable pair of the isolator switch, into the SUNGATE

5.2.SOLAX X1 Mini

(Tested with Solax Model X1)

- Connect the Solax X1 inverter to the SUNGATE by the Solax X1 Mini data cable:

- At the SUNGATE side, use RJ45 connector:

- At the Solax inverter side, connect using the RJ-45 connector:

- Plug the power jack, with black and red cable pair of the isolator switch, into the SUNGATE

5.3.SOLAX X1

(Tested with Solax Model X1)

- Connect the Solax X1 inverter to the SUNGATE by the Solax X1 data cable:

- At the SUNGATE side, use RJ45 connector:

- At the Solax inverter side, connect using the RJ-45 connector:

<todo>

- Plug the power jack, with black and red cable pair of the isolator switch, into the SUNGATE

5.4.SOLAX X3

(Tested with Solax Model X3)

- Connect the Solax X3 inverter to the SUNGATE by the Solax X3 data cable:

- At the SUNGATE side, use RJ45 connector:

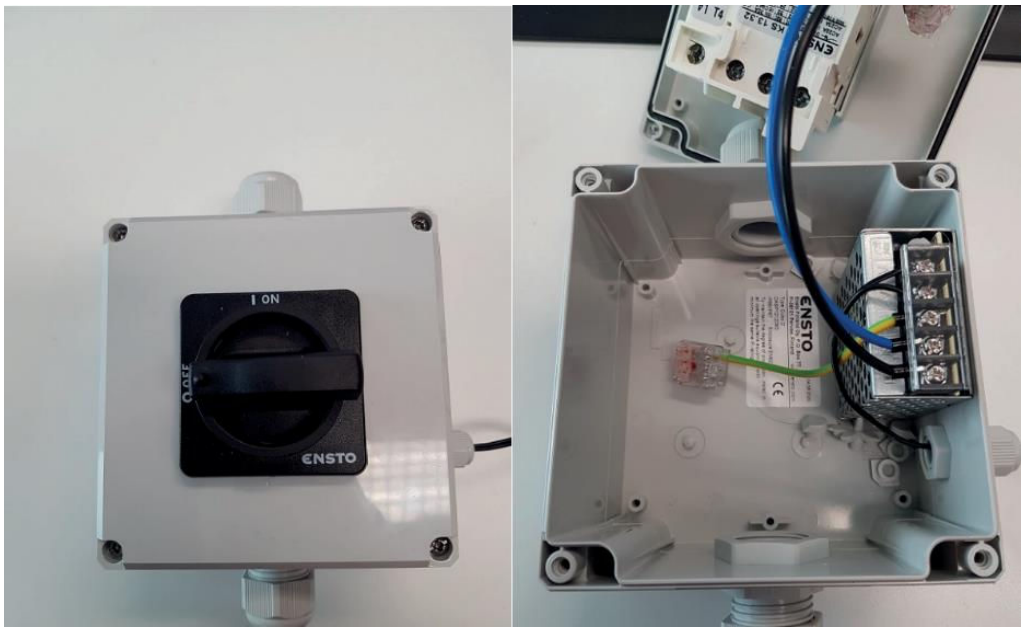
- At the Solax inverter side, connect using the RJ-45 connector:

- Plug the power jack, with black and red cable pair of the isolator switch, into the SUNGATE

6. ISOLATOR SWITCH

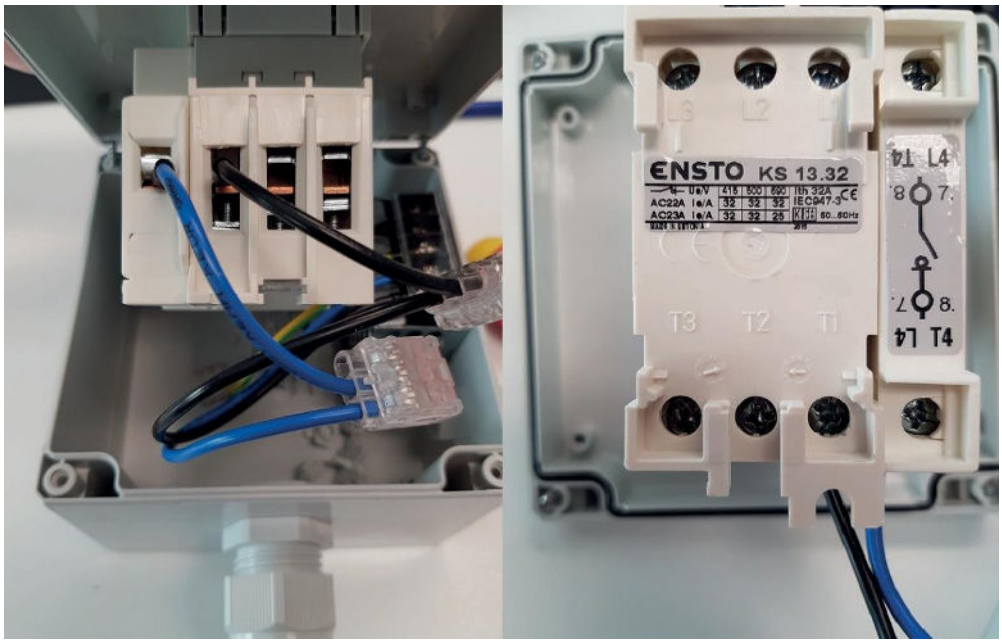
6.1. DESCRIPTION

The housing is a 120 x 122 x 86 mm cube, made of ABS plastic. The rotary switch (on/off) is padlockable. The cable glands on the top and bottom of the cube are made of polyamide (PA6) with a minimum and maximum diameter of 11mm and 17mm. The small cable gland on the right side is also made of the same polyamide (PA6), but has a minimum and maximum diameter of 3mm and 6mm.
The screws are combination slotted/Phillips screws. Corner covers are supplied to finish the product, but are optional.



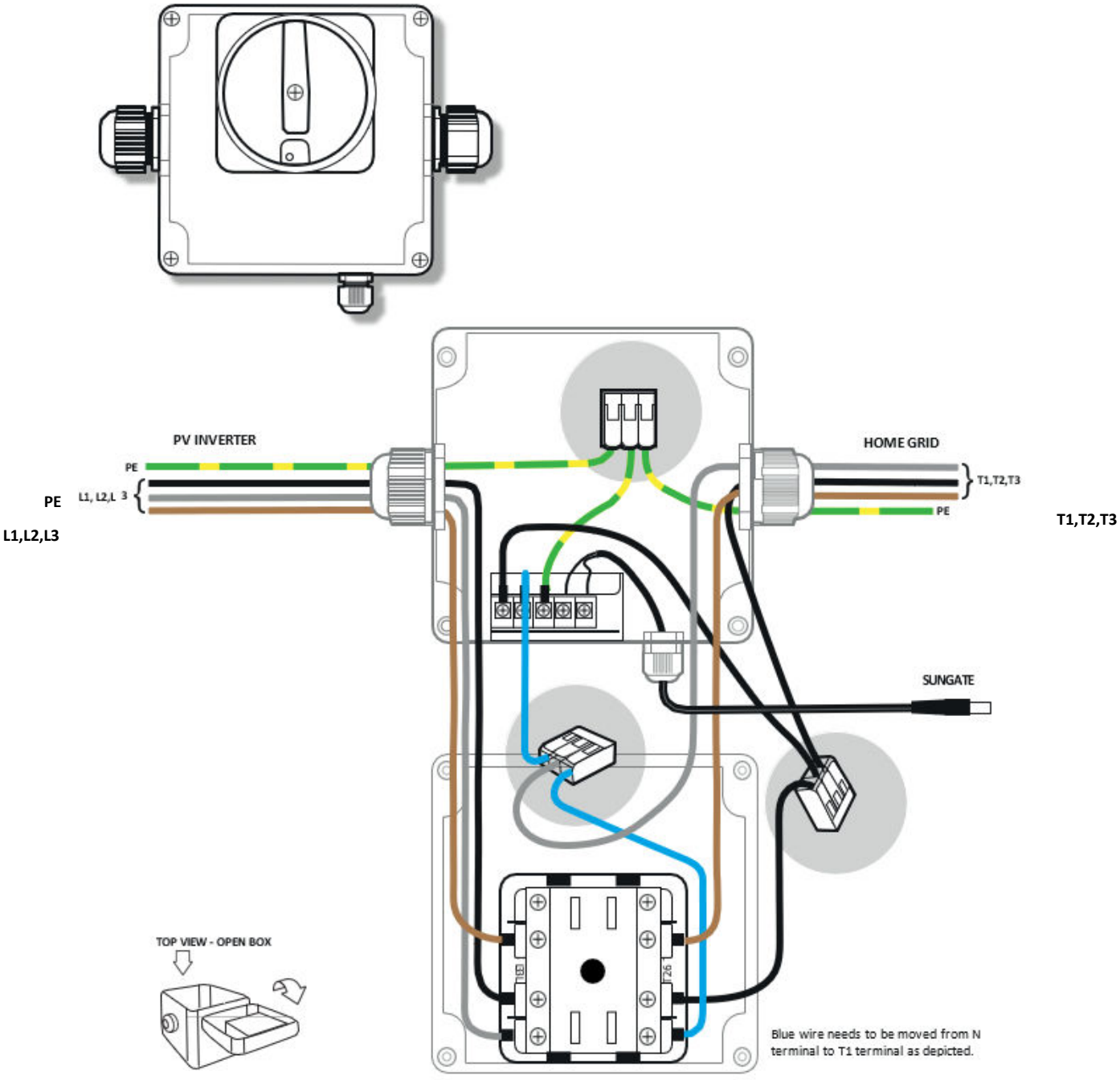
Inside the isolator switch are the transformer and the power cable (1.5m) for the SUNGATE. It also contains the Ensto load breaker switch type KS 13.32, which is an EN 60947-3 certified load breaker switch (3x 32 A), with a maximum cut-off current of 6 kA.

Additionally, an extra pole (32 A) has been mounted on the left side of the switch in order to facilitate a star-delta network.
The following section will show schematics of the internal wiring for different networks.



6.2.SCHEMATICS

SWITCH POLYPHASE DELTA NETWORK



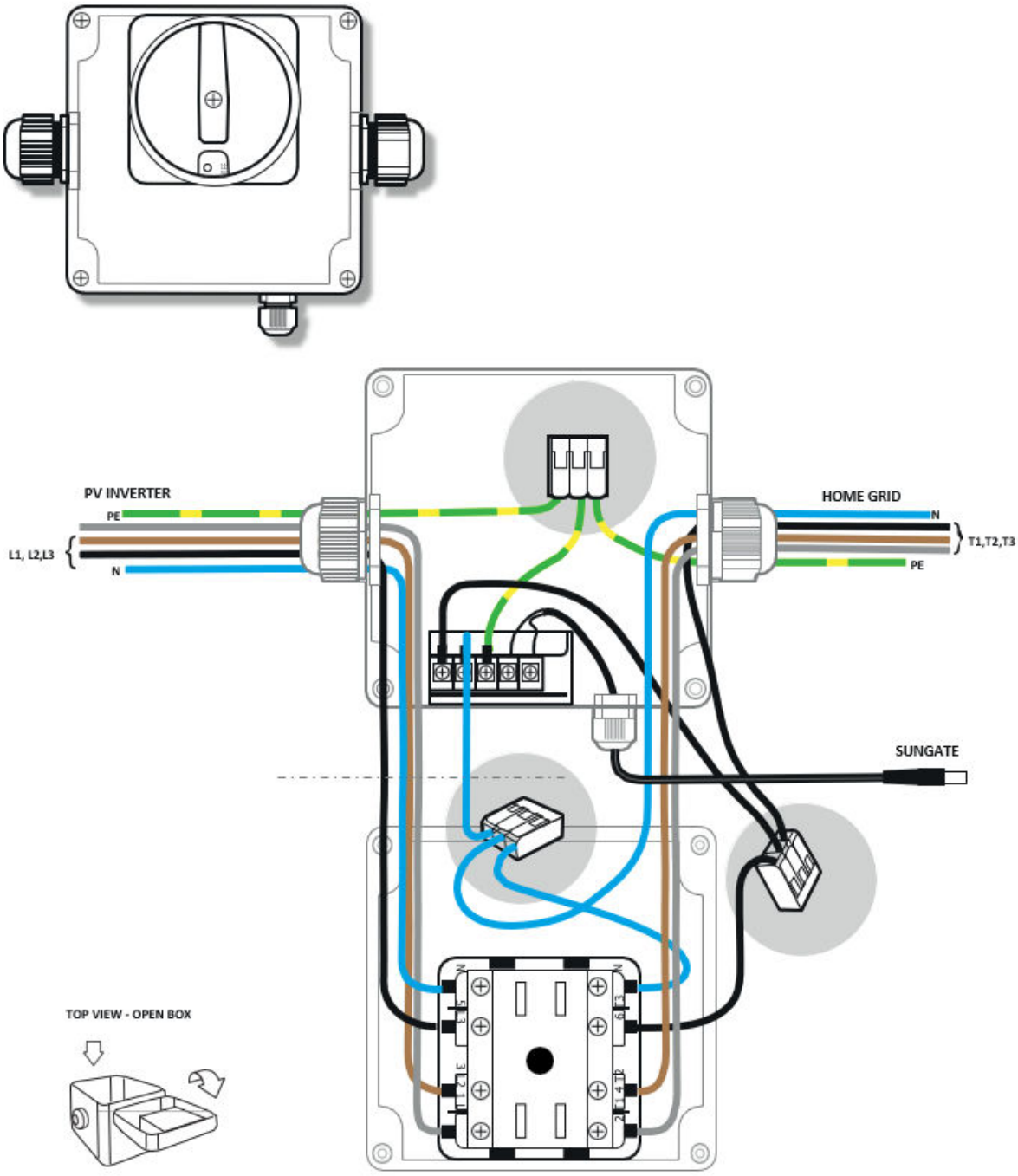
PE

L1,L2,L3

T1,T2,T3

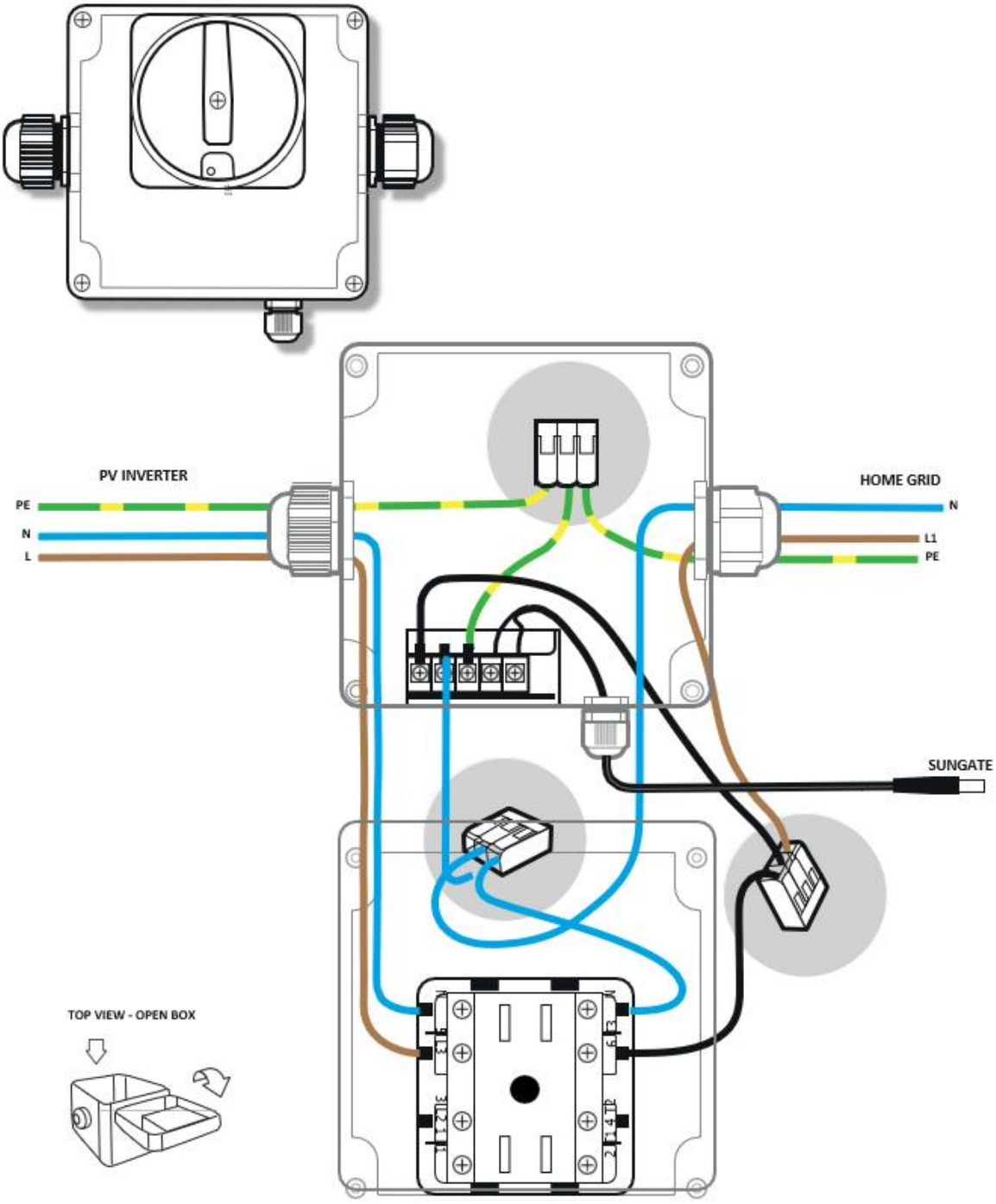
Standard colours in fixed wiring follow the international standard IEC 60446. Installations or household wiring from before 2006 may be based on old colour standards.

SWITCH POLYPHASE STAR NETWORK



Standard colours in fixed wiring follow the international standard IEC 60446. Installations or household wiring from before 2006 may be based on old colour standards.

SWITCH SINGLE PHASE WIRING



Standard colors in fixed wiring follow the international standard IEC 60446. Installations or household wiring from before 2006 may be based on old color standards.

7. CAST4ALL CONNECT

7.1. INTRODUCTION

Cast4All Connect, is an application developed by Cast4All, that is used to configure the SUNGATE. You can download the application on your smartphone from the Play Store on Android or the Apple Store on IOS. You can always find more detailed information about this app on their site.

7.2. QUICK USE GUIDE

Once you have downloaded the app, you will need to ask your contractor for a 5-digit login code. This code will be needed every time you log in.

When the login code has been accepted, you will see a list of different meter types with their associated company.
The button below this list, “Scan module” will allow you to use the camera on your smartphone to scan the barcode of a meter. The app will then try to verify the SUNGATE. You can also manually enter the number underneath the barcode (LDN).

When the verification of the SUNGATE is completed successfully, you can use the app to test the connection, attach a location/owner to the SUNGATE and other actions

End Of Document.