

Meter Troubleshooting Guide - NAM

Revision History

- Version 2.0, November 2023: Content update
- Version 1.0, January 2020: Initial release

Contents

Safety Precautions	1
Overview.....	2
Meter Configuration	2
Protocol	3
Modbus ID.....	3
Meter Function.....	4
CT Placement.....	4
CT Rating.....	6
Best Install Practices.....	6
Troubleshooting	7
3x6E - Meter Communication Error.....	7
3x6D – Meter RGM CT Error.....	7
Improper Monitoring Portal Data	7



WARNING

The following troubleshooting steps require you to work inside the inverter. Never install the cable communication between the inverter and the meter, or any other hardware while the AC power is connected to the inverter. Failure to disconnect AC power can result in injury or death. Never open the inverter if it is raining or expose the inverter to moisture. Always follow your company's safety protocols when working inside the inverter.

Safety Precautions

For safety purposes, please perform all the following steps before removing any covers:

1. Turn the inverter off by moving the P/1/0 switch to the **0 (OFF)** position and wait for V_{DC} on the inverter to drop below 50V.

To verify that V_{DC} has dropped below 50V:

- **Inverters via SetApp:** Connect to SetApp>Inverter's **Status** page>DC voltage field
- **Inverters with an LCD screen:** A message is displayed letting you know that V_{DC} is lowering and not to disconnect. Once V_{DC} drops below 50V the message no longer appears.



NOTE

(NAM only): If the DC does not reach a safe level, turn off the DC Disconnect (DCD) switch and measure the voltage with a voltmeter.

2. (NAM only): Turn the DCD switch to the OFF position.
3. Turn OFF the AC circuit breaker before working inside the inverter.



CAUTION

If the Inverter's AC circuit breaker trips on-site, do not power on the AC circuit breaker before investigating the inverter for any internal damage, such as debris or thermal damage. If any damage is found, take photos, and contact <https://www.solaredge.com/us/support>.

Overview

This guide is intended to identify and troubleshoot common problems found when installing and configuring a SolarEdge Energy Modbus Meter. For installation guidelines, see the [SolarEdge meter installation guide](#).



NOTE

The following guide helps to identify common meter installation and configuration issues only. Additional onsite maintenance may be required depending on the issue. This guide should not replace contacting SolarEdge Technical Support for troubleshooting and/or Return Merchandise Authorization (RMA) purposes.

Meter Configuration

To enable meter-level data on the Monitoring portal, the correct meter must be installed. SolarEdge offers multiple types of meters that enable improved production data and/or import, export, and self-consumption level on the Monitoring portal.

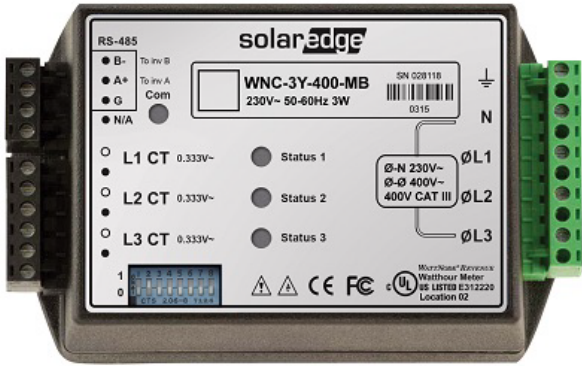

The meter itself and the inverter connected to the meter are configured. When installing or troubleshooting a meter, verify the configuration as outlined:

- Configuration at the meter:
 - Modbus ID dip switches
- Configuration at the inverter:
 - Modbus ID #
 - Meter function
 - Meter protocol

	Internal Meter	External Meter
Features	<ul style="list-style-type: none"> • Pre-installed with select inverters • Production level data is revenue grade • Select models can provide revenue grade level production data as well as import and export data 	<ul style="list-style-type: none"> • Used for import and export level data, as well as site-level production data • External meters are available in both revenue and non-revenue grade types
Recommended Configuration NOTE: Based on the installation of the meter, the recommended settings may differ. Please refer to the installation guide for further details.	<ul style="list-style-type: none"> • Modbus ID: 1 • Protocol: SE • Function: Inverter Production, Production + Import + Export 	<ul style="list-style-type: none"> • Modbus ID: 2 or 3 • Protocol: WN or SE • Function: Inverter Production, Site Production, External Production, Consumption, Import + Export

Protocol

The meter protocol is dependent on the type of meter installed at the site. See the table below to identify the protocol based on the meter model.

WattNode Protocol Meter	SolarEdge Protocol Meter
	

Modbus ID

The Modbus ID of the meter is determined by the DIP switches on the meter itself. WattNode meters have a series of switches on the front of the meter, while SolarEdge protocol meters have three ID switches on the side.

WattNode Protocol Meter	SolarEdge Protocol Meter
<ul style="list-style-type: none"> • ID is set by the switches on the front of the meter • 7 DIP switch may need to be UP for termination (if getting 3x6E with the 7 termination switch UP, switch it DOWN) • For models without DIP switches, the Modbus ID is either 1 (internal meter) or 2 (external meter) 	<ul style="list-style-type: none"> • ID is set by the three switches on the side of the meter • Recommended switch orientations: <ul style="list-style-type: none"> • ID1: 1 UP, 2 DOWN, 3 DOWN • ID2: (default): 1 DOWN, 2 UP, 3 DOWN • ID3: 1 UP, 2 UP, 3 DOWN <p>To view a full list of DIP switch orientations, see the meter installation manual</p>

Meter Function

The meter function depends on what type of power you are looking to measure and display on the monitoring dashboard.

Inverter Production	Reports meter level production data for a single inverter.
Site Production	Reports meter level production data for multiple inverters.
External Production	Reports meter level production data for any third-party generation devices, such as a battery or generator. NOTE: This is only necessary for third-party, non-compatible generation devices that would otherwise not show on the Monitoring platform. Compatible third-party devices show data on the Monitoring platform without the need for a meter.
Consumption	Reports meter level consumption data for the site.
Import + Export	Reports meter level data for energy imported from the utility and exported to the utility.
Production + Import + Export	Reports meter level production data for a single inverter, as well as energy imported and exported to and from the utility. This function is only available on select model inverters.

CT Placement

The function of the meter is also dependent on the location of the current transformers (CT). If the CTs are installed in the incorrect location, the meter measures power and energy incorrectly, and the monitoring portal does not reflect the correct data. Refer to the table below for suggested CT installation locations based on the meter function. Additionally, all CTs should be installed in the same orientation, with the source arrow label pointing toward the correct source (inverter for production, utility for consumption/import and export).

All SolarEdge branded CTs are compatible with all compatible SolarEdge meters. For a list of compatible third-party CTs, see: https://knowledge-center.solaredge.com/sites/kc/files/se_alternate_current_transformer_selection_na.pdf



NOTE

The recommended CT placements below may differ depending on your installation, service entry, and service modules installed on-site. While SolarEdge Technical Support can recommend the CT placement location, the electrician on site must verify the CTs are installed in the correct location, and that the data read by the meter is correct before leaving the site.

Meter Function	CT Install Location
Inverter Production (RGM pre-installed in DC Disconnect)	A single CT is pre-installed on the L1 AC conductor in the inverter or DC disconnect. NOTE: Do not change the placement of the pre-installed production CT unless advised by SolarEdge Technical Support.
Inverter Production (External meter)	CTs should be installed on the L1 and L2 conductors in a place where only a single inverter can be measured. Example: Between the DC disconnect and AC disconnect/breaker for the inverter.
Site Production	CTs should be placed in a location where all inverters tie together on the AC side of the system. Example: A sub-panel where all inverters are tied together.
External Production	CTs should be placed on the AC conductors in a location between the third-party generation device and where it ties into the AC panel. Example: On the third-party device's conductors at its AC input/output or anywhere between the device and the panel it is tied to, without being tied to additional AC devices at the location.
Consumption	CTs should be placed on the AC conductors on either the line or load side of the main panel of the site. Example: On the AC conductors between the main panel's main breaker, and the breakers for the loads, or above the main breaker, before any potential loads or line side taps.
Import + Export	CTs should be placed on the AC conductors on the line side of the site before any loads on site. Example: On the AC conductors coming from the utility meter, before any loads, including any line side taps that may be installed for the inverter or other loads on site.

Meter Function	CT Install Location
Production + Import + Export	Production CT: Pre-installed production CT is pre-installed on the L1 conductor in the inverter or DC disconnect. NOTE: Do not change the placement of the pre-installed production CT unless advised by SolarEdge Technical Support. Import and Export CTs: CTs should be placed on the AC conductors on the line side of the site before any loads on site. Example: On the AC conductors coming from the utility meter, before any loads, including any line side taps that may be installed for the inverter or other loads on site.

CT Rating

The rating of the current transformers used on site must either be the same or higher than the maximum current on the conductors being measured. For Import, Export, and Consumption functions, the CTs must be rated the same as the AC service on site. When measuring production, the CTs must be rated the same or higher than the maximum current possible within the inverter and/or inverter sub-panel.



NOTE

The recommended CT placements below may differ depending on your installation, service entry, and service modules installed on site. While SolarEdge Technical Support can recommend the CT placement location, it is up to the electrician on site to verify the CTs are installed in the correct location, and that the data read by the meter is correct before leaving the site.

Best Install Practices

SolarEdge highly recommends verifying meter installations and making sure the meter is reading power properly before leaving the site. This reduces the need for additional on-site troubleshooting due to improper installation.

- Meter readings can be found on the inverter while on site.
 - **SetApp Inverter:** Connect to the inverter using SetApp and navigate to Status. The Energy Modbus Meter section shows their status, lifetime energy, and current power.
 - **LCD Enabled Inverter:** Use the button(s) on the inverter to cycle screens until the meter status is shown. This screen shows the meter status, current power, and lifetime energy.



NOTE

Import and Export show on different status screens on the inverter.

- Make sure each CT is on the same phase as the corresponding AC conductor, such as **CT1 = L1, CT2 = L2**. If the CT is placed on a different phase than the corresponding AC conductor, data is not calculated by the meter correctly.
- Verify all CTs are in the correct orientation.
- Verify the meter measurements in the inverter menus when it is both producing and not producing.
 - **Production:** Values should be the same as the inverter (a slight difference in W may be seen, which is normal unless error **3x6D** is flagging).
 - **Import + Export:** There should only be export seen when the inverter is producing more than the site is using. Turn the P/1/0 switch to the **0 (OFF)** position, then check the import + export values on the inverter. If showing export when the inverter is not producing, one or more CTs are in the wrong orientation.

Troubleshooting

3x6E - Meter Communication Error

3x6E indicates the inverter is unable to communicate with the configured meter. To troubleshoot this error code, review the following steps:

- Verify that the meter is wired correctly to AC, and is getting proper AC voltage
- Verify that there is proper communication wiring between the meter and the inverter
- Verify that the Modbus ID DIP switches are set correctly to the ID of the inverter
- Verify that the meter is [configured](#) correctly at the inverter, specifically the ID# and the protocol
- Verify that no additional meters were configured in the inverter menus; Only one meter should be set up for each physical meter on site. If there is only one meter installed on site, but the configuration is showing multiple meters configured, remove the extra meter from the configuration.

3x6D – Meter RGM CT Error

3x6D means there is a major variance in production readings between the inverter and meter. This error should only apply to meters that are pre-installed in the inverter.

- Verify that all meters on site are configured correctly at the inverter – Improper configuration of an externally installed meter could cause the inverter to think it is an internal production RGM
- Verify that the pre-installed CT has not been removed or modified
- If the issue is on an internal meter, or if you believe 3x6D is showing in error, take photos of the inverter, DC disconnect, meter, and CT and contact <https://www.solaredge.com/us/support>

Improper Monitoring Portal Data

Improper data on the monitoring portal is often due to improper installation of the CTs and/or configuration of the meter.

- Verify that the CTs are installed correctly on their corresponding phases, such as CT1 on L1 and CT2 on L2.
- Verify that the CTs are in the correct orientation – The source arrow should point toward the source of the power being measured
- Verify the proper configuration in the menus, including the programmed CT rating
- If no apparent issues are seen on site, take photos of the meter install, CT placement, and inverter and contact <https://www.solaredge.com/us/support>



NOTE

The SolarEdge monitoring dashboard does not support self-consumption data on the dashboard when an inverter with a battery is set to Time of Use.