Setup Wireless Communication between a Solar Inverter and an Energy meter using DatamaxLoRa Terminals

Introduction

The Datamax LoRa terminal is a small, low power “outstation” style device that comes with RS232 and RS485 connectivity. This makes it possible to use Lora radio to create wireless link between solar devices with RS232 or RS485 comms interface. This application note details how to set up wireless communication between a SolarEdge SE3000 Inverter and a SolarEdge energy meter SE-WND-3Y400 using two DatamaxLora terminals and RS485 interface. Although the application note is using SolarEdge products as an example, the method can be applied to other solar products with similar situations.

Set up LoRa Terminals

The aim of the setup is to make the two LoRa terminals able to talk to each other. In order to do this, the terminals must have the same Network ID, Working Frequency, and Radio Data Rate.
DatamaxLoRa Application Note

Please follow the steps below to configure the LoRa terminal device:

1. Connect the power cable and the provided serial cable to the phoenix connector come with the LoRa terminal device;
2. Connect the serial port (DB9 interface) to a PC serial port (a USB-Serial converter is required if your PC doesn’t come with a serial port). Once connected, power on the device. The device power LED should be lit;
3. Launch the LoRa configuration tool software on PC and open the serial port in use;
4. Once the port is opened successfully, click “Load Params” to get current device configurations:
5. Under Network settings, choose a PAN ID for the device. This PAN ID will also be used in the 2nd device.
6. Choose a working frequency for the Lora radio, e.g. 922MHz. This frequency will be used by both terminals.
7. Set up the device ID for the current terminal and put the device ID of the 2nd terminal in the Transport Address:
In the above setting, the current terminal has the Device ID of 301 and the 2nd terminal has the Device ID of 302.

8. Under System settings, set the Work Mode to “TRNS” (transparent mode).

9. Under Serial Port settings, choose the baud rate suitable for the solar device. For Solar Edge device, it is 9600 baud. Parity and Stop bit will also need to set properly if required.

10. Once all being configured, click “Write Params” to save the settings.

11. Reboot the device to let new settings to take effect.

12. All the settings in the 2nd terminal device should be the same as those in the 1st device except the Device ID and Transport Address. The screenshot below shows the sample configuration of the 2nd terminal device:

In this setup, the current Device ID is 302 and the Transport Address becomes 301.

Once both devices are configured, they are able to communicate each other.
Connect LoRa Terminal to the Solar Inverter

The SolarEdge SE3000 inverter comes with an RS485 interface on its communication board. The picture below shows the location and pinouts of the RS485 interface:

![RS485 Interface Diagram]

On the LoRa terminal, the RS485 interface is on the phoenix terminal pin 6 (Data+) and 7(Data-):

![LoRa Terminal RS485 Interface]

Use cable to connect the RS485 interface on inverter and LoRa terminal device by joining A, B, and Ground. The cable suitable for the connection should be minimum 3-wire shielded twisted pair with 24-20 AWG in size.
For proper RS485 communication, the SE3000 needs to be configured as a Master and enables Slave Detect. Please refer to the SolarEdge Solar Inverter installation manual for details.

A power supply will also need to be arranged for LoRa terminal.

**Connect LoRa Terminal to the Solar Inverter**

The SolarEdge energy meter SE-WND-3Y400 also comes with an RS485 interface for communication with inverters.

Similar to solar inverter, the energy meter can be connected to a LoRa terminal via the RS485 interface as shown below:

A power supply will also need to be arranged for LoRa terminal. Once the connections are correctly built on both inverter and meter, a LoRa wireless link will be up when the system is powered on.

Proper configuration will be required for the inverter to communicate with the energy meter properly. The SolarEdge Meter Installation Guide provides details on how to set up the inverter for proper communication.

**Verify Meter Communication**

If the communications between inverter and meter are successful, the inverter communication status screen will be able to show the following:
The above information shows that a meter is successfully connected to RS485-1 port:

- **Dev**: the type of device configured to this port. MTR indicates a meter.
- **Prot**: the communication protocol

### = 1: Indicates that the connection to the meter is successful.

Also the meter status screen will display the consumption data obtained from the meter:

Because no CT was connected in this application setup, the total energy was showing zero here.