ABB solar inverters

Programming for HECO compliance
TRIO-20.0/27.6-TL-OUTD-X-US-480

Contents

Power and productivity
for a better world™

1. Introduction

This instruction provides the method to reprogram the ABB TRIO-20.0/27.6-TL-OUTD-X-US-480 to the Hawaii Electric Company, Inc. (HECO) ultra-fast trip transient over-voltage requirements (TrOV-2) and frequency voltage ride through (FVRT) mitigation requirements as described in the document “Appendix IIA Full Ride Through Settings for O’ahu, Maui, Hawai’i” dated January, 2015. Details of these requirements are available on the HECO website at: http://www.hawaiianelectric.com/vcmcontent/StaticFiles/pdf/TrOVandFVRT_Public_Feb2015.pdf.

	Every operation performed on the TRIO-20.0/27.6-TL-OUTD-X-US-480 shown in this instruction must be performed following existing regulations and safety instructions and carried out in compliance with the instructions provided in the product manual located at http://www.abb.com/solarinverters/.

2. Parameter setting via inverter’s display

HECO requirement settings can be set via the TRIO’s LCD display using the service menu (accessible using the buttons on the inverter’s LCD panel) as shown in Figure 1 below. Note: to obtain the second level password, call ABB solar inverter post-sales technical support at 1-877-261-1374, 6 a.m. - 6 p.m. MST.

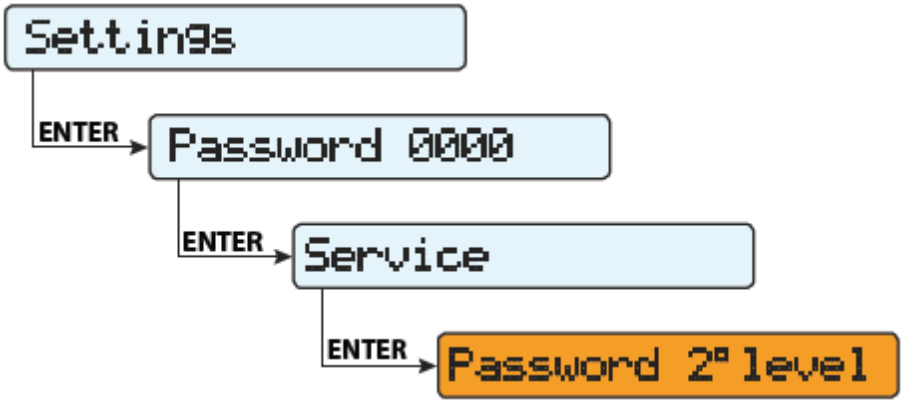

Figure 1 - Service menu

After entering the second level password, the list of inverter grid parameters can be accessed using the UP and DOWN buttons. Once the parameter indicated in the center column (Inverter parameter) of Table 1 below is highlighted, press ENTER. Then, use the UP/DOWN buttons to increase or decrease the parameter’s value. Select the new setting value shown in the right column. Once all settings have been changed, press ENTER to confirm.

HECO parameter	Inverter parameter	Setting value
OVR2	Set U>>	332.5V
UVR2	Set U<<	138.5V
OFR2	Set F>>	64Hz
UFR2	Set F<<	56Hz
OVR1	Set U>	304.7V
UVR1	Set U<	243.V
OFR1	Set F>	63Hz
UFR1	Set F<	57Hz
OVR2	Set time U>>	160ms (default value)
UVR2	Set time U<<	160ms (default value)
OFR2	Set time F>>	160ms (default value)
UFR2	Set time F<<	160ms (default value)
UVR1	Set time U<	20s
OVR1	Set time U>	920ms
OFR1	Set time F>	20s
UFR1	Set time F<	20s

Table 1 - inverter grid parameters and associated HECO settings

3. Parameter setting via software tool Aurora Manager Lite

Aurora Manager Lite is a free ABB software which communicates with the ABB TRIO inverter by reading the inverter data, settings and sending commands. Contact ABB solar inverter post-sales technical support at 1-877-261-1374 to obtain the software and any required password.

To use the Aurora Manager Lite software, it is necessary to connect a laptop PC to the inverter. The computer must communicate through an RS485 line using an RS485-to-USB adapter. ABB recommends the ABB Aurora Adapter in order to avoid compatibility issues; however, equivalent devices may be used. For details connecting the ABB Aurora Adapter to the inverter, refer to Appendix A: How to connect the laptop PC to the inverter on page 6 of this instruction.

For the procedure to access the Aurora Manager Lite software, refer to Appendix B: How to launch Aurora Manager LITE on page 7 of this instruction.

When multiple TRIO inverters are daisy chained, it is possible to change the parameters on all inverters connected in the chain at one time. Once the laptop PC is connected to the daisy chain, Aurora Manager Lite will scan for all inverters and list each by model and serial number on the left side of the screen. Verify that each inverter in the daisy chain is identified in the list. Refresh the list if necessary. All inverters in the daisy chain must be set to communicate through Aurora Protocol. If set to Modbus, each inverter will need to be changed to Aurora Protocol or individually updated to HECO parameters.

Once the laptop PC is connected to the inverter, click on the **Setup** tab as shown in Figure 2 below.

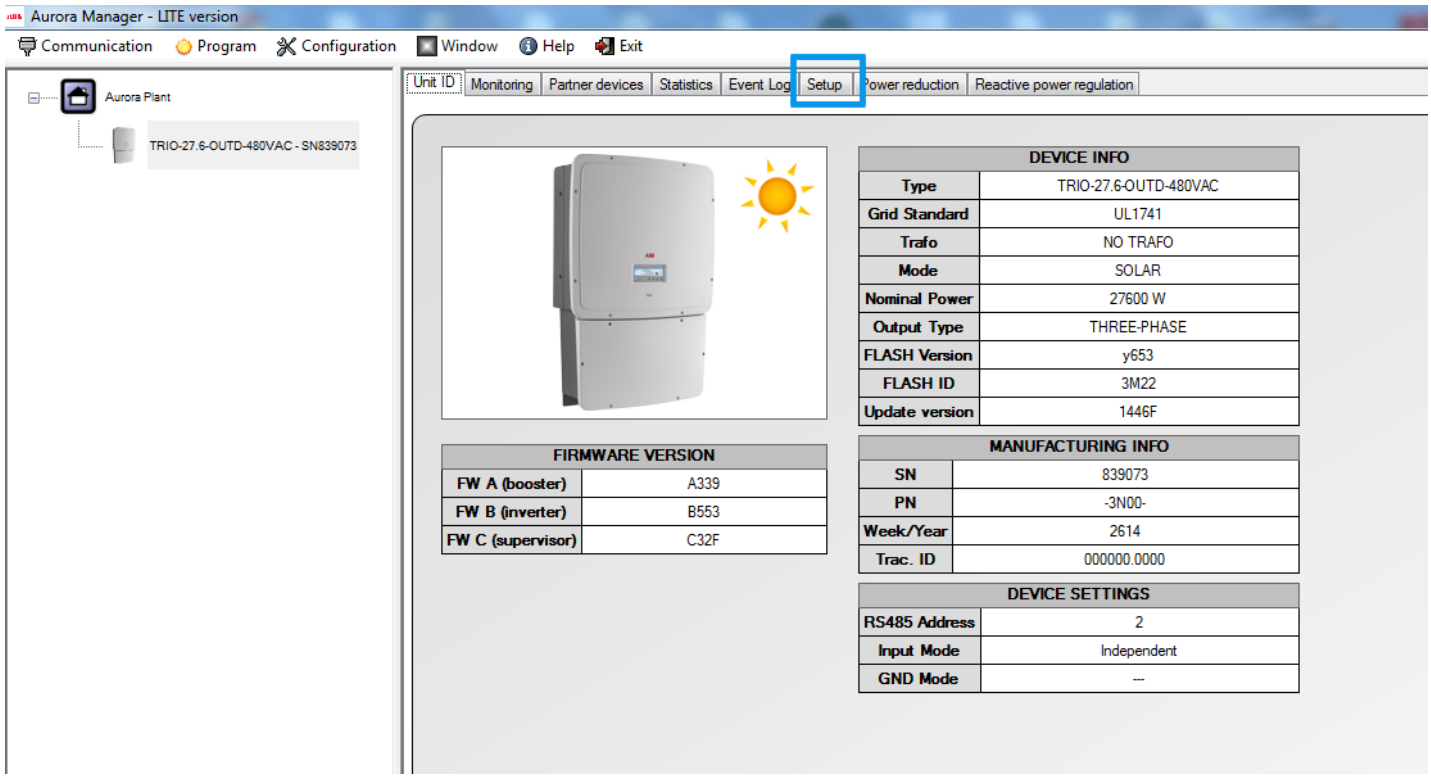

Figure 2 - Click on the Setup tab

Next, click on the **AC side** tab, then the **Grid protection** tab, as shown in Figure 3 below. Voltage and Frequency grid parameters are all now accessible.

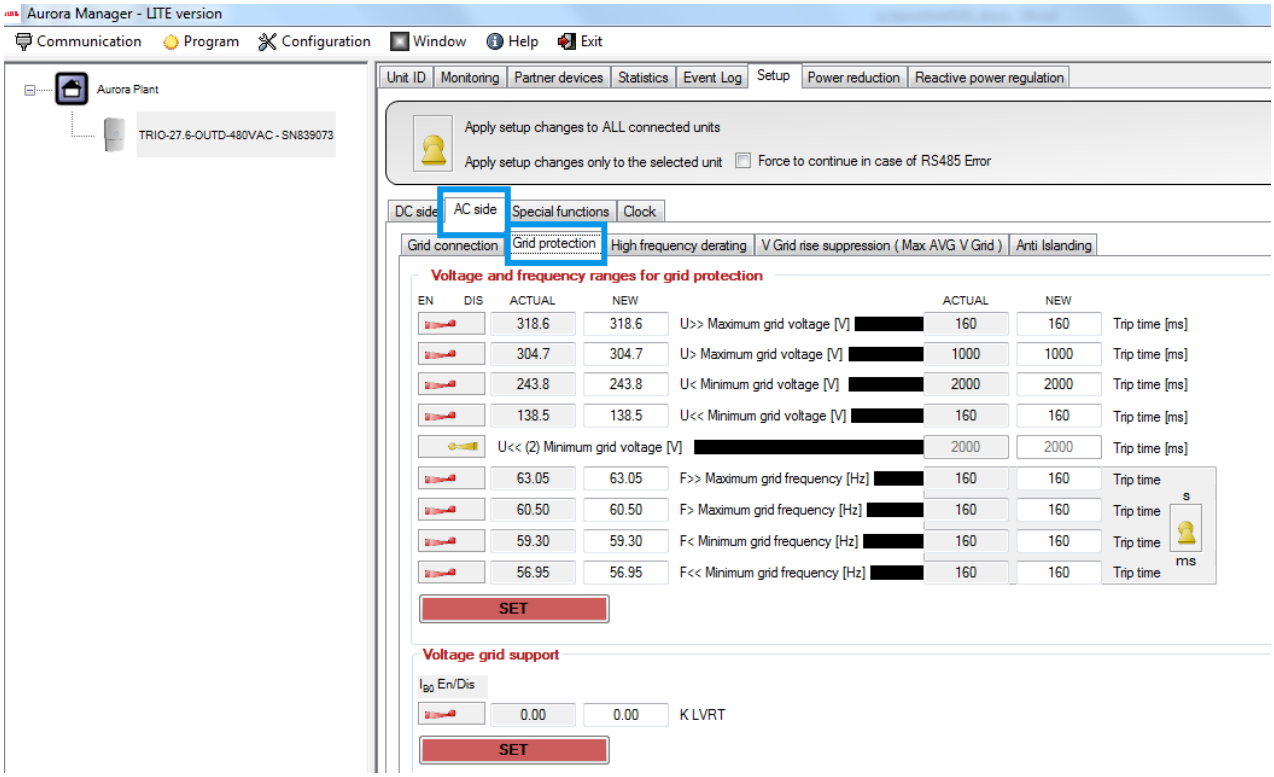

Figure 3 - Click on the AC side tab, then the Grid protection tab

To set the HECO parameters outlined in Table 1 on page 2 of this instruction, the boxes in the **New** columns must be changed as shown in Figure 4 below:

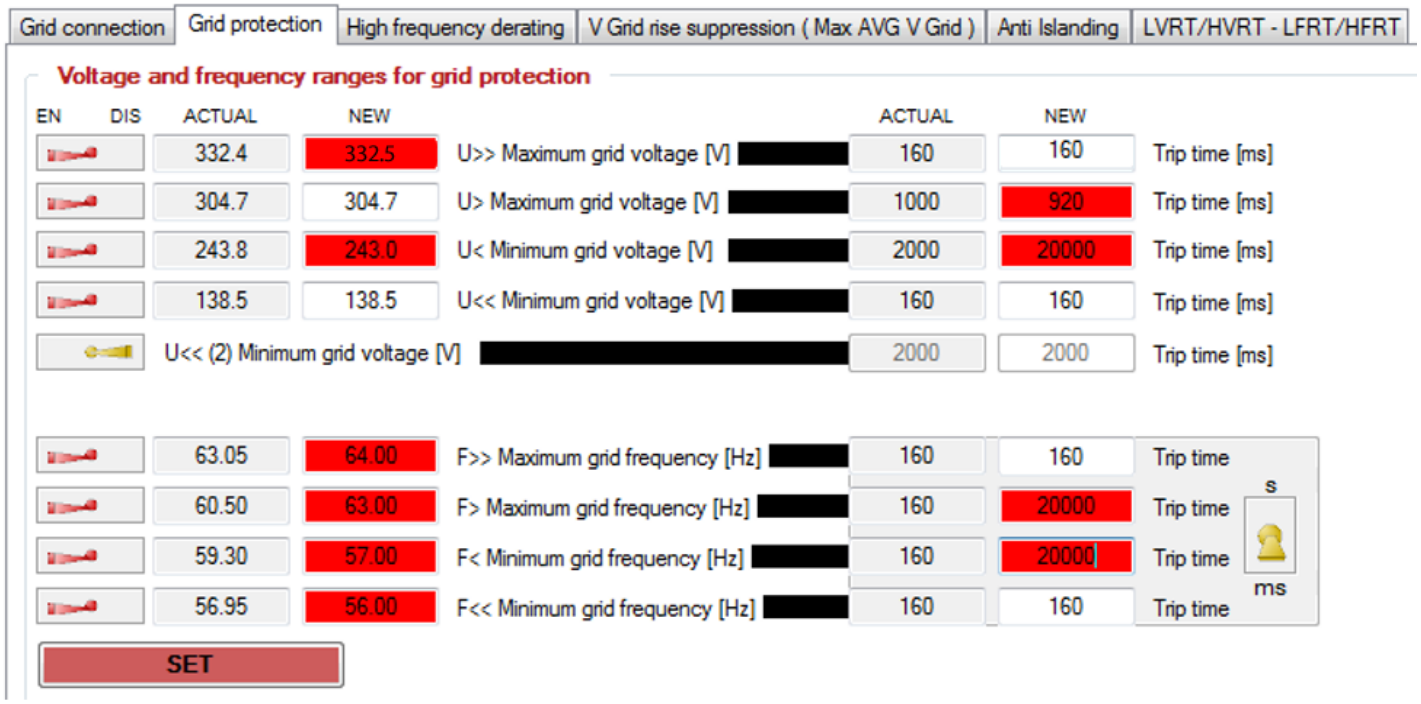

Figure 4 - Change information in the New columns

Rather than changing the settings for each individual TRIO inverter in a daisy chain configuration, select **Apply setup changes to ALL connected units** at the top of the screen, as shown in Figure 5 below.

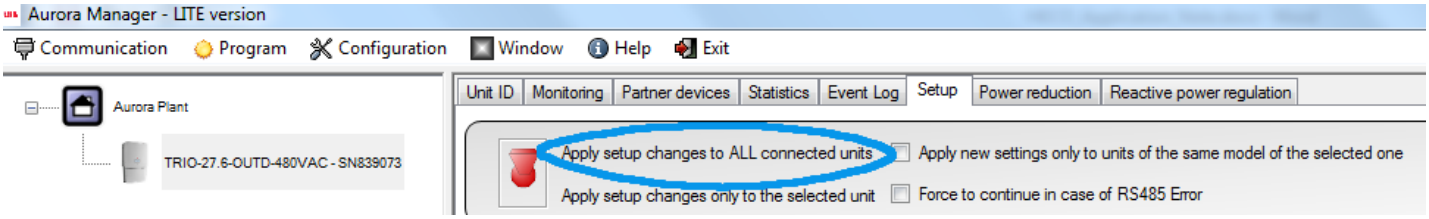

Figure 5 - Apply setup changes changes to ALL connected units

Appendix A: How to connect the laptop PC to the inverter

Figure 6 - Communication board showing RS485 PC/SERV port above and terminal block below

To use the Aurora Manager LITE software, connect the laptop PC to the inverter on the RS485 PC/SERV port of the communication board using an USB-RS485 Adapter (the ABB PVI-USB-RS232_485 Converter is recommended). The following steps must be performed:

- Switch OFF the inverter using the DC disconnect
- Remove the wiring box cover by unscrewing the six (6) lateral screws
- Remove the mylar cover on the communication board
- Connect the RS485 cables on the PC/SERV port (see top blue rectangle box in Figure 6 above) using an RJ45 plug, or the terminal block (see bottom blue rectangle box in Figure 6 above) by wiring the GND COM, PC +T/R and PC –T/R as shown in Figure 7 below.

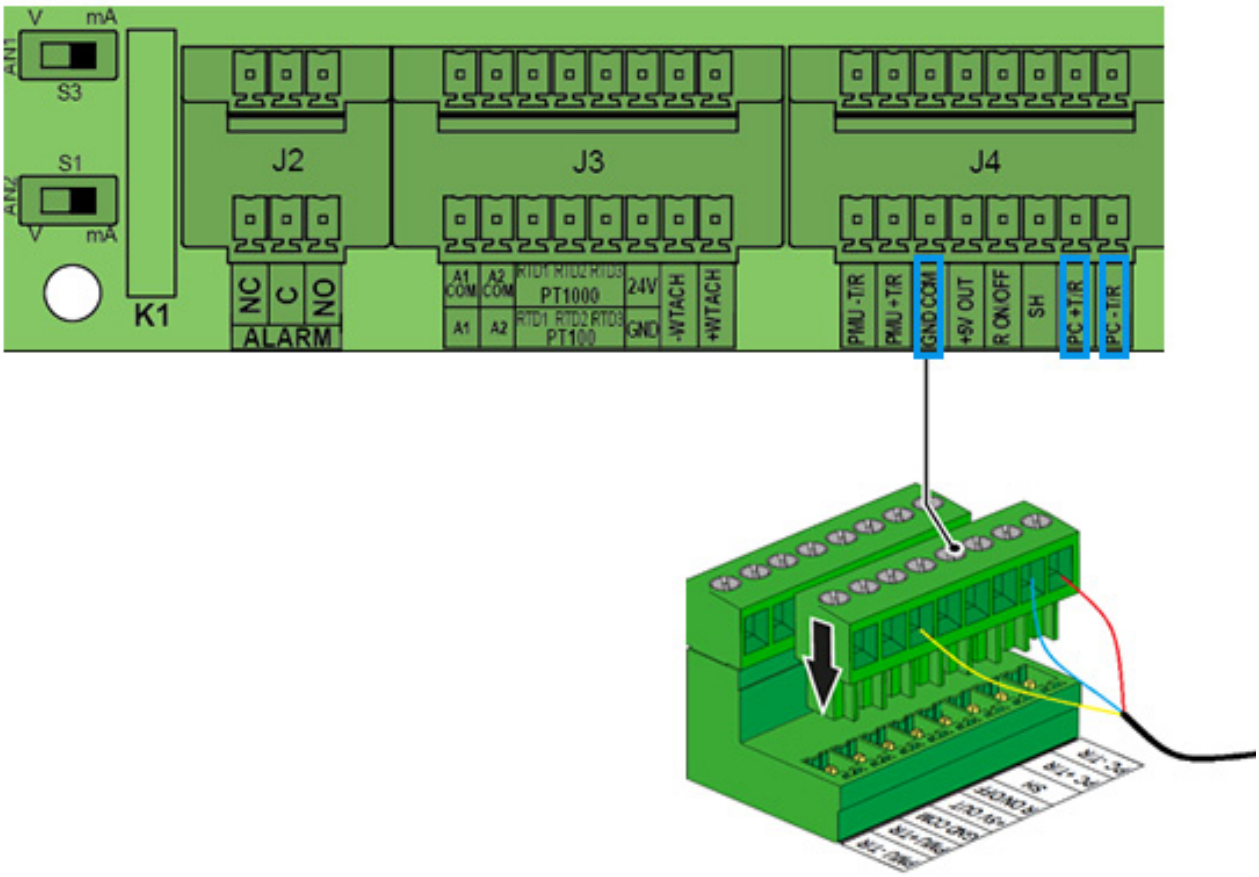

Figure 7 - Connect the RS485 cable wires as shown

Appendix B: How to launch Aurora Manager LITE

Aurora Manager LITE software is available at no cost from ABB and allows the installer or customer to monitor the plant, as well as change inverter settings.

To launch this software, once the inverter is connected to a laptop PC as described in Appendix A, access the COM settings as shown in Figure 8 below:

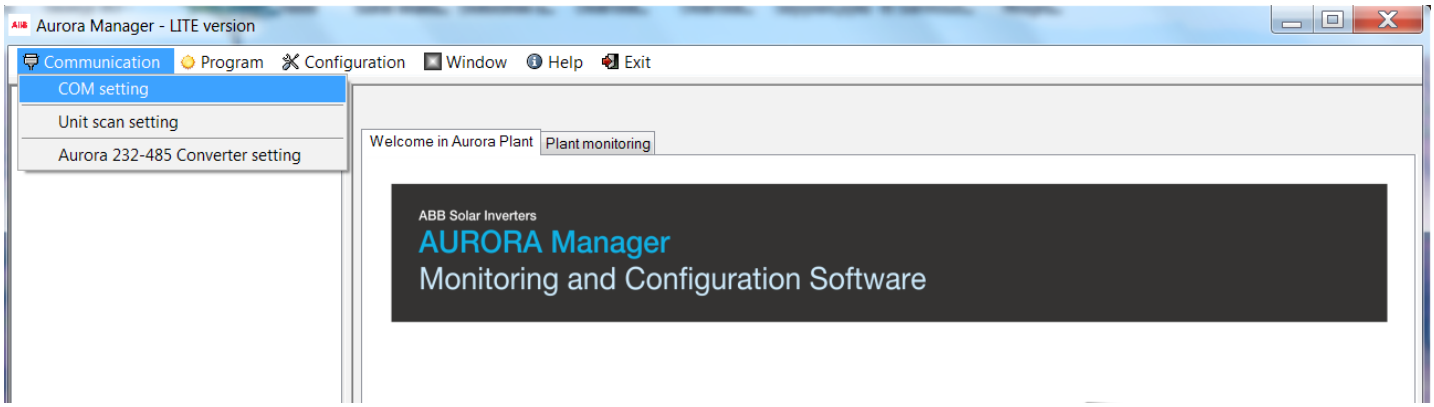

Figure 8 - Launch Aurora Manager LITE software

To determine which COM port to use, once the inverter is connected to the laptop PC through the adapter, this can be determined by opening the computer's Control Panel and clicking on the **Device Manager** tab and then on the **Ports (COM & LPT)** tab, as shown in Figure 9 below.

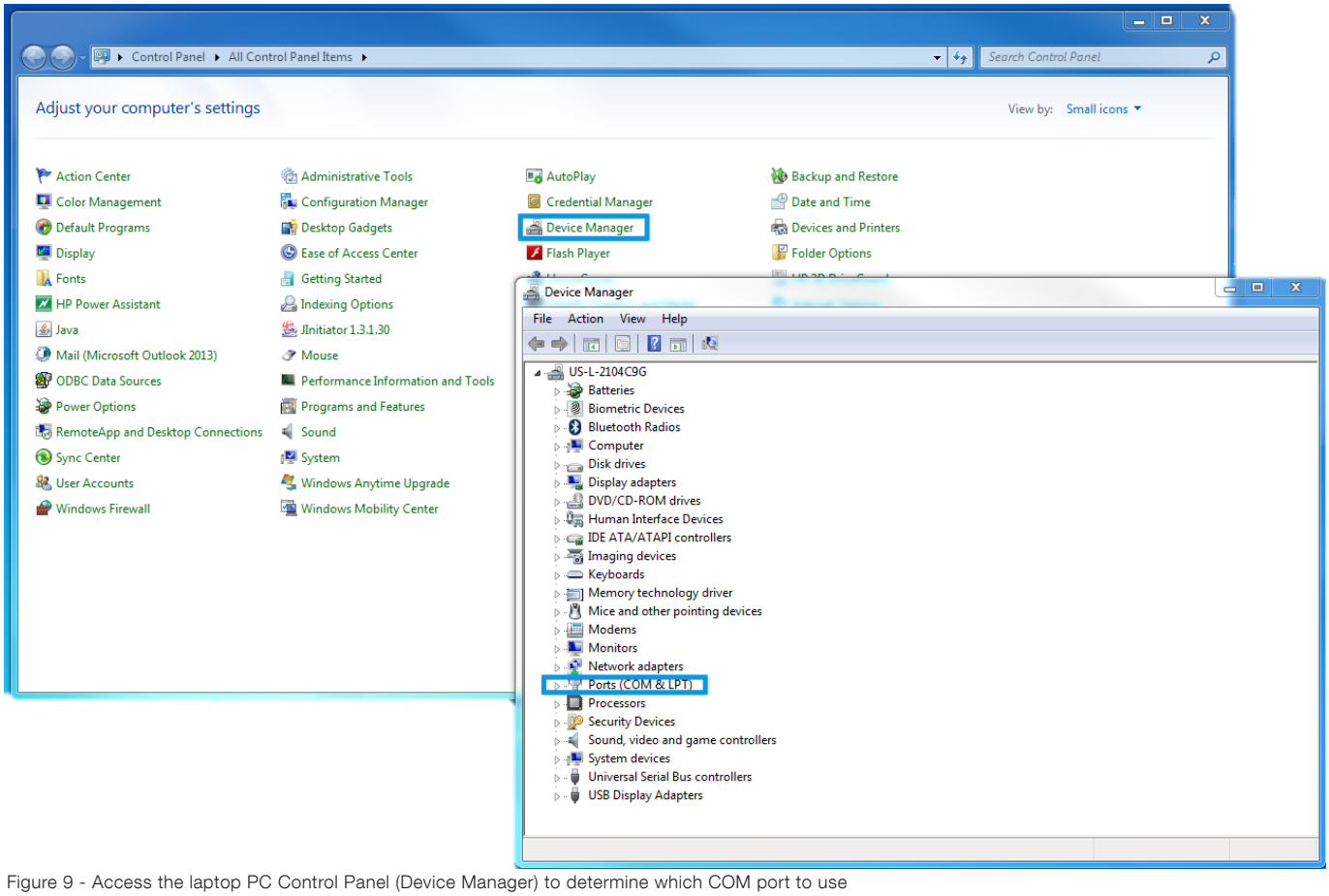

Figure 9 - Access the laptop PC Control Panel (Device Manager) to determine which COM port to use

This action will provide a list of active COM ports, which should include the RS485/USB adapter and list its associated COM port number (typically the associated COM is the one with the highest number). Baud rate remains 19200. See Figure 10 below.

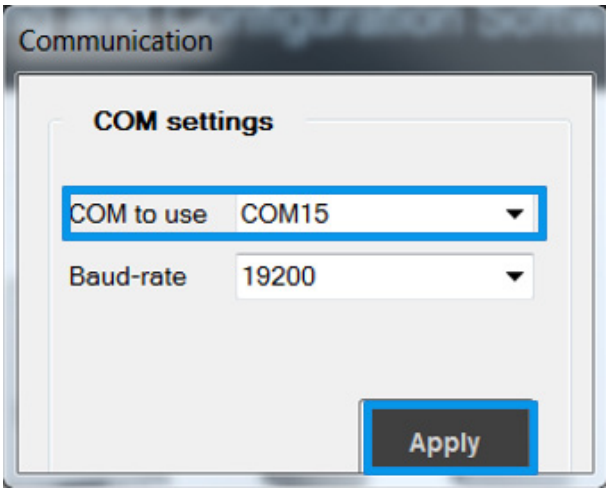

Figure 10 - List of active COM ports

By clicking on Apply and then OK, the COM settings are confirmed.

At this point on the main screen, it is possible to scan for inverters connected to the laptop PC, as shown in Figure 11 below.

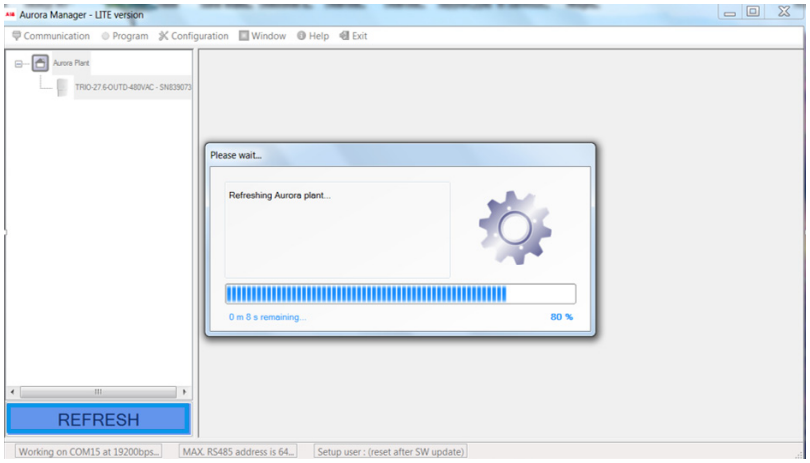

Figure 11 - Scan for inverters connected to the laptop PC

Once the inverter(s) are found, select an inverter, and additional TAB selections will appear, as shown in Figure 12.

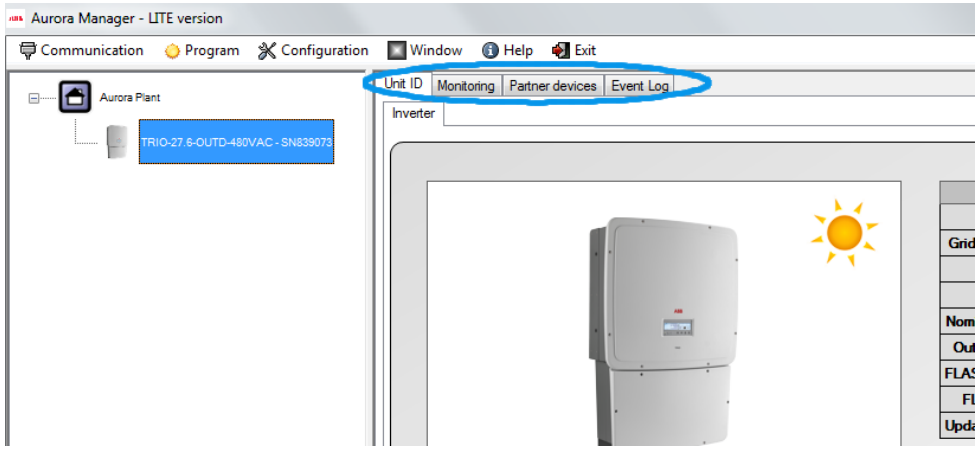

Figure 12 - Additional TAB selections will appear

From the **Configuration** drop-down menu, click on **Set-up area access**, as shown in Figure 13 below.

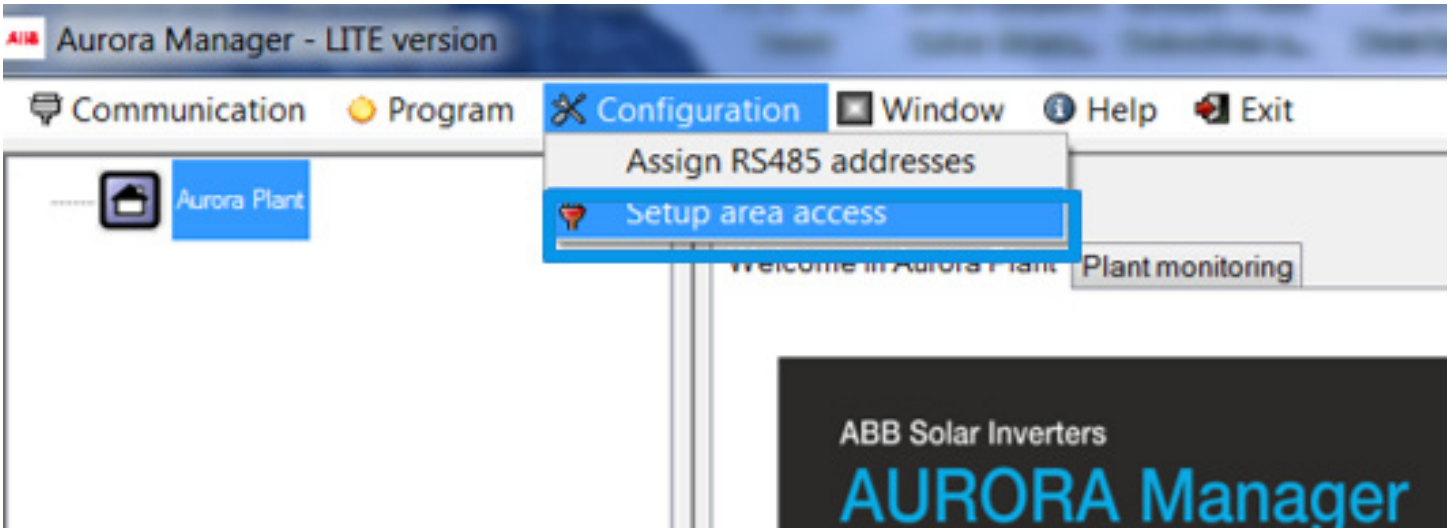

Figure 13 - Access the Setup area access

The following menu will appear, as shown in Figure 14 below.

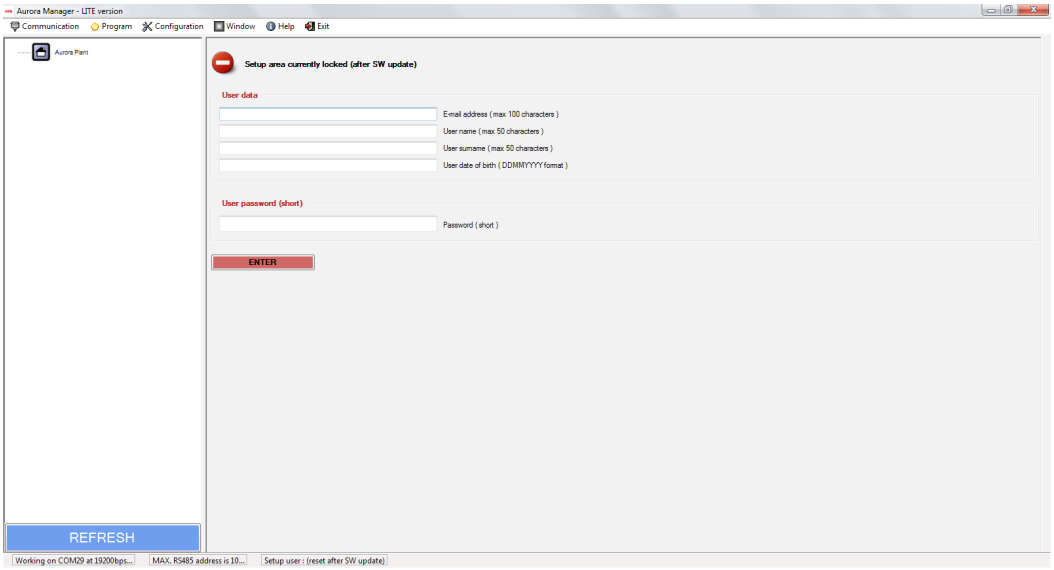

Figure 14 - Setup menu

Fill in all fields, and finish by inserting the PASSWORD obtained from ABB solar inverter post-sales technical support and then clicking OK to confirm. New features will be available in the software. Press the REFRESH button and click on any inverter icon in the list, and new TABs will then appear, as shown in Figure 15 below. These new tabs are available for all inverters listed and are to be used to change the iinverter parameters as discussed in section 3 - Parameter setting via software tool Aurora Manager Lite on page 3 of this instruction.

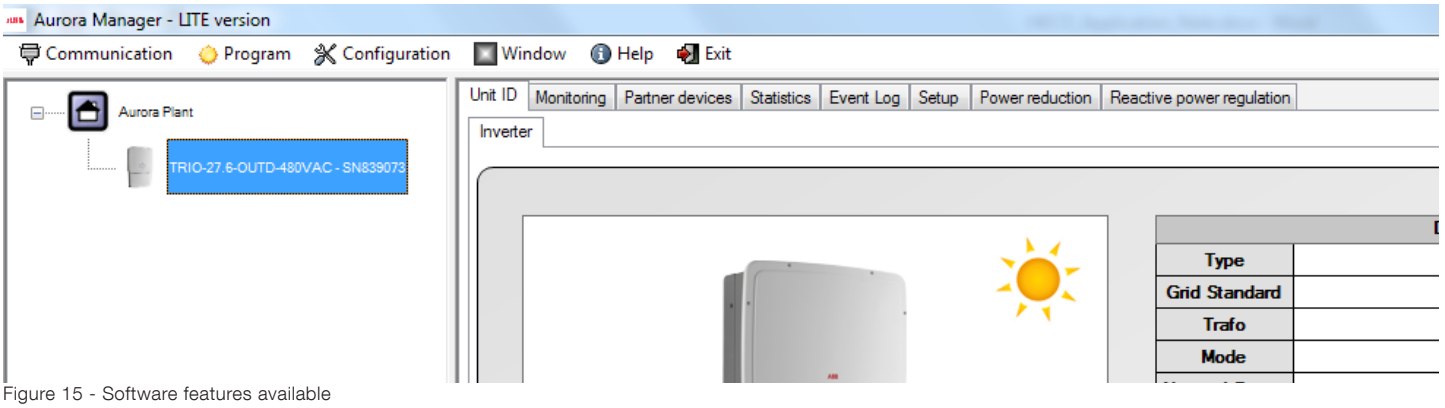

Figure 15 - Software features available

EN BCM.00362.0AP_REV AA 24 JuLY 2015

For more information please contact:
www.abb.com/solarinverters

Power and productivity
for a better world™