

DTS DC3 – RJ-45 Ethernet Meter

This Quick Start Guide is to familiarize the user with the connection and configuration of the DTS DC3 DIN rail mounted DC voltage, current, power & energy meter for use with:

Voltage Options up to 1000Vdc

**Current Sensor Inputs
20mA Hall Effect or mV Shunt**

**Ethernet Communications
Modbus TCP and BACnet/IP**



Applicable DTS DC3 Models

DTS DC3 Model #	Measurlogic Part #	Description
DTS DC3-T4-EB-A-3	DTSDC-0046	<ul style="list-style-type: none"> • 400Vdc Input • 3 x mV Shunt (Configurable for 50mV to 100mV Output) • 24Vdc Aux Powered • Modbus TCP and BACnet/IP Ethernet
DTS DC3-T10-EB-A-3	DTSDC-0024	<ul style="list-style-type: none"> • 1000Vdc Input • 3 x mV Shunt (Configurable for 50mV to 100mV Output) • 24Vdc Aux Powered • Modbus TCP and BACnet/IP Ethernet
DTS DC3-J4-EB-A-3	DTSDC-0020	<ul style="list-style-type: none"> • 400Vdc Input • 3 x 20mA Hall Effect (Configurable for Unidirectional or Bidirectional) • 24Vdc Aux Powered • Modbus TCP and BACnet/IP Ethernet
DTS DC3-J10-EB-A-3	DTSDC-0036	<ul style="list-style-type: none"> • 1000Vdc Input • 3 x 20mA Hall Effect (Configurable for Unidirectional or Bidirectional) • 24Vdc Aux Powered • Modbus TCP and BACnet/IP Ethernet

If you do not see your specific meter model number above please contact Measurlogic Inc. at 303-805-5252 or info@measurlogic.com.



ATTENTION

For more information please use the DTS DC3 installation guide
<https://www.measurlogic.com/product/dts-dc/>



This Quick Start Guide is designed to familiarize the user with the connection and configuration of the DTS DC3 DIN rail mounted DC voltage, current, power & energy meter. Different models are available with mV Shunt or 20mA Hall Effect current sensor inputs, and Ethernet Modbus TCP and BACnet IP communications.

Supplied Items

Check that the meter and equipment match your order specifications and has not been damaged during shipping. The following component(s) are included in the package:

- **The DTS DC3 power meter.** Check input ranges, output configuration and auxiliary power supply (if applicable) on the label of the unit. For a more detailed explanation of the part number please download the latest version of the DTS DC3 datasheet from: <https://www.measurlogic.com/product/dts-dc/>
- The necessary green connector plugs are fitted to the DTS meter.

Connecting the DTS DC3

Wiring Voltage and Current Inputs



The DTS DC3 accepts a DC voltage input directly up to 1000Vdc (**model dependent**). The current inputs are model dependant. Special care must be taken in connecting the DTS DC3 with shunt connections so as to avoid ground loop or accuracy issues. Refer to the appropriate wiring diagrams supplied with the meter.

If there are any questions, please contact Measurlogic before applying any measured or auxiliary power to the unit.

Input wiring terminals are clearly indicated and located on the upper side of the DTS DC3 label. The Current and Voltage terminal strips are pluggable to allow easy replacement of the DTS DC3, if required. **Removing the terminal strip should only be done once all power has been removed from the DTS DC3.** Input wiring terminals accept up to 2.5 mm² (12 AWG) wire. The wires are connected by means of screw terminals that clamp down onto the input wires. The voltage input requires fusing (NOT INCLUDED) and should be rated at 2A fast. Please check with local code requirements to ensure correct installation.

Wiring Optional Auxiliary Power Input (AUX)



The DTS DC3 meter is powered from a DC auxiliary input in the following (**model dependent**) ranges. See the label of the unit for more information on which input range it has fitted. The Auxiliary Power inputs require fusing (NOT INCLUDED) and should be rated at 2A fast.

- 12 Vdc **OR** 24 Vdc **OR** 48 Vdc

Note: It is important to pay attention to the polarity when using a DC power supply. See label above for a reference to the polarity. Incorrect connection **will** damage the DTS DC3.

Meter Connection Wiring Diagrams



WARNING

The Voltage and Current Connections are extremely important for the DTS DC3 meter.

Please refer to the appropriate wiring diagram that was supplied with the meter.

These are also available in the "Technical" section of the DTS DC3 webpage

at <https://www.measurlogic.com/product/dts-dc/>

Incorrect wiring will damage the meter and void the warranty

[DTS DC3 connection diagram RS-485 or Ethernet – shunt configuration \(325.9 Kb\) \[PDF\]](#)

[DTS DC3 connection diagram RS-485 or Ethernet – 4-20mA HE2 or HE4 model hall effect sensors \(393.7 Kb\) \[PDF\]](#)

[DTS DC3 connection diagram RS-485 or Ethernet – Positive Ground Topology \(-48Vdc Telecom example\) \(444.6 Kb\) \[PDF\]](#)

[1500 Vdc DTS DC3 connection diagram RS-485 or Ethernet – 4-20mA HE2 or HE4 model hall effect sensors \(392.9 Kb\) \[PDF\]](#)

Please contact Measurlogic if the above links do not work or if you have any further questions!

Digital Inputs and Outputs (Digital I/O)

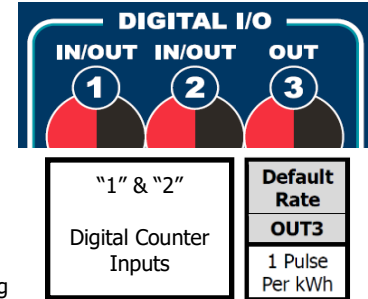
The default DTS DC3 meters indicated above are fitted with 2 x digital inputs and a pulse output as standard. They are grouped together with a single 6 way pluggable terminal.

Wiring the Digital Pulse Output

The single digital output – marked “OUT 3” is pre-configured to function as a pulse corresponding to measured kWh. **The default pulse rate is 1 Pulse per kWh.** This is user configurable to a different rate, if required, using our [DTS Config software configuration tool](#)

Digital Output (Marked 3)

- The digital output is a **potential-free NO (Normally Open) solid state relay** output.
- **The maximum switching voltage is 50Vdc** and the maximum switching current is 100mA.
- The relay closure pulse width is 100ms. The minimum time between any two pulses is 100ms.
- **The default pulse rate is 1 pulse per kWh.** This can be changed using DTS Config.
- A suitable wire gage is 18-22 AWG. For longer distances (>100ft) use 18 AWG.



Wiring the Digital Inputs

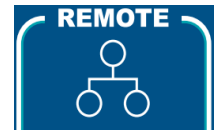
The two digital inputs – marked “IN/OUT 1” and “IN/OUT 2” are pre-configured to function as general counters. The counter value will match the number of contact closures on its particular input. Any scaling of these counters, if required, needs to be done in the Master application / device. The digital inputs can also function as level status inputs.

Digital Inputs (Marked 1, 2)

- The digital inputs accept dry contacts or NPN open collector inputs.
- A suitable wire gage is 18-22 AWG. For longer distances (>100ft) use 18 AWG.

Ethernet Communications

The DTS DC3-xx-EB-A-x models provide ethernet communications through a standard Ethernet RJ45 jack marked as “REMOTE” on the same side of the DTS DC3 meter as the “DIGITAL I/O” plug.



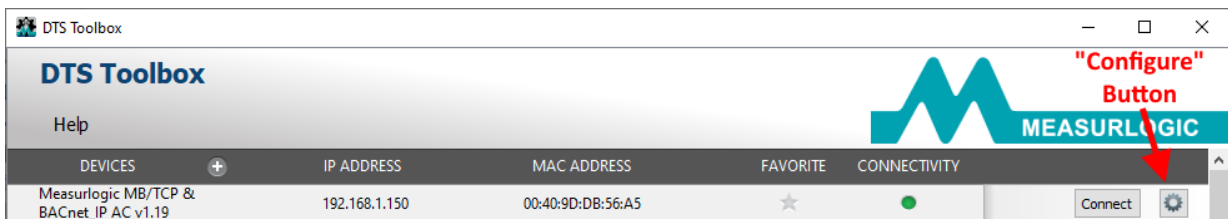
Modbus TCP **and** BACnet/IP protocols are loaded by default into the DTS DC3 meters. The DTS DC3 meter can be addressed simultaneously from a Modbus and BACnet Master application.

The SNMP and DNP3 Ethernet protocols are also available as options. Please discuss with Measurlogic.

Setting the correct IP address

For correct communications from the Modbus or BACnet Master to the DTS DC3 meter it must be on the same sub-net.

- Each DTS DC3 has a globally unique MAC address that is clearly marked on a label next to the RJ-45 jack.
- By default, the meter is set to a static **IP address of 192.168.1.150.**
- The default **Modbus address and BACnet Device ID** is set to **100.**
- Connect the DTS DC3 to a local ethernet switch using a CAT5e or higher cable.
- Connect the laptop with DTS Toolbox to the same switch using a CAT5e or higher cable.
- Download the [latest version of DTS Toolbox here](#).
- **DTS Toolbox** shows the IP Address, MAC Address of connected DTS Ethernet meters (even if they do not match the network).
- The IP address can be changed to an IP Address on the local network using the **DTS Toolbox** utility. Press the “Configure” icon.



Connecting the DTS DC3 meter to DTS Config

Now that the DTS DC3 is connected to the correct sub-net the Current Sensor Type and rated current of the attached CT must now be configured using [DTS Config, our software configuration and monitoring tool](#). This section will show you how to connect the DTS DC3 meter to DTS Config.



ATTENTION

- The DTS DC3 **MUST** be setup by the user using [DTS Config](#) to match the attached CT Type as well as the attached CT rating.

- Connect the DTS DC3 to a local ethernet switch using a CAT5e or higher cable.
- Connect the laptop to the same switch using a CAT5e or higher cable.
- Once DTS Config is downloaded, installed, and started select the "TCP" radio button in the "Connection Settings" dialog box.
- Enter the IP address you set using DTS Toolbox.
- The default Modbus address should be set to 100.
- Press "Connect".
- You should now have a "live" monitor page showing real-time values.

Configuring the Electrical Settings using DTS Config

DC Current Sensor Output Types

Different model numbers of the DTS DC3 are required depending on the Current Sensor Output Type:

- DTS DC3-**J**x-SB-A-x For 20mA Hall Effect Sensors
- DTS DC3-**T**x-SB-A-x For mV Shunts Sensors

The Current Sensor Output Range, Sensitivity and Rated Current (Amperage) of the Sensor must be configured using DTS Config.



ATTENTION

Ensure that the model number of your DTS DC3 meter matches your Current Sensor Output Type.



WARNING

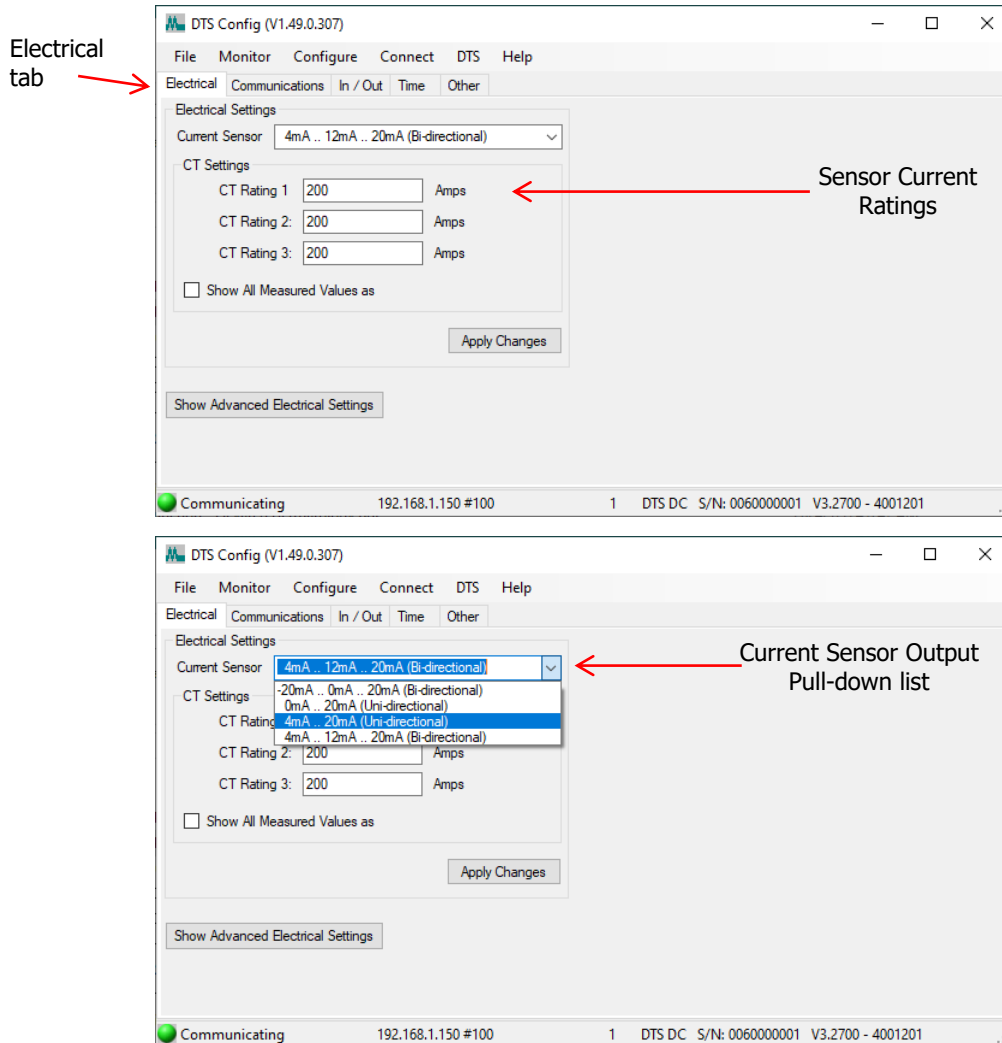
Please refer to the wiring diagram that was supplied with the meter
Incorrect wiring will damage the meter and void the warranty

20mA Hall Effect Sensors

The **DTS DC3-Jx-SB-A-x** meters are compatible with the following current sensors **ONLY**:

- **20mA Hall Effect Sensors** – This type of current sensor has a 20mA output and may be capable of measuring unidirectional or bidirectional currents. It is an active device so does need to be powered. A Hall Effect sensor is isolated from the line it is measuring. The current rating (Amperage) of the Sensor must be specified when ordering and cannot be changed in the field.

Select "Configure" from the menu. The Current Sensor settings can be found in the "Electrical Settings" tab. The screenshots show the layout of the latest version of DTS Config. The screen layout for previous versions of DTS Config may differ.



Configuring 20mA Hall Effect Sensors

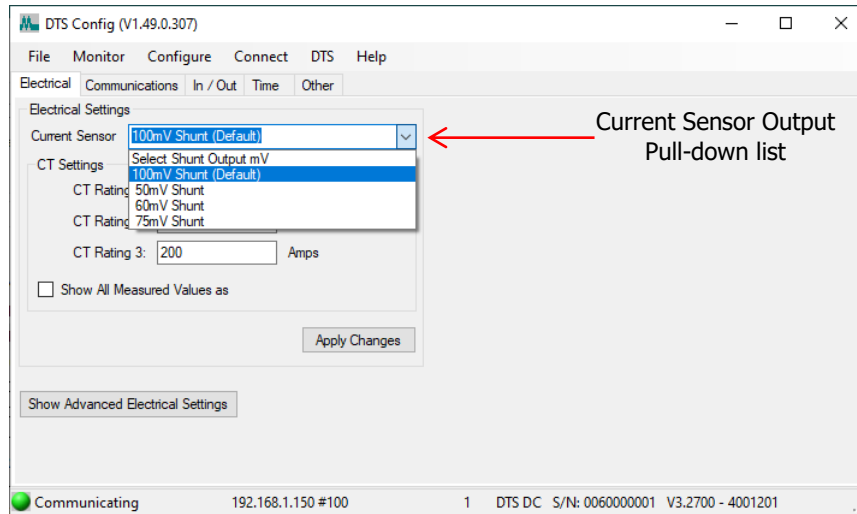
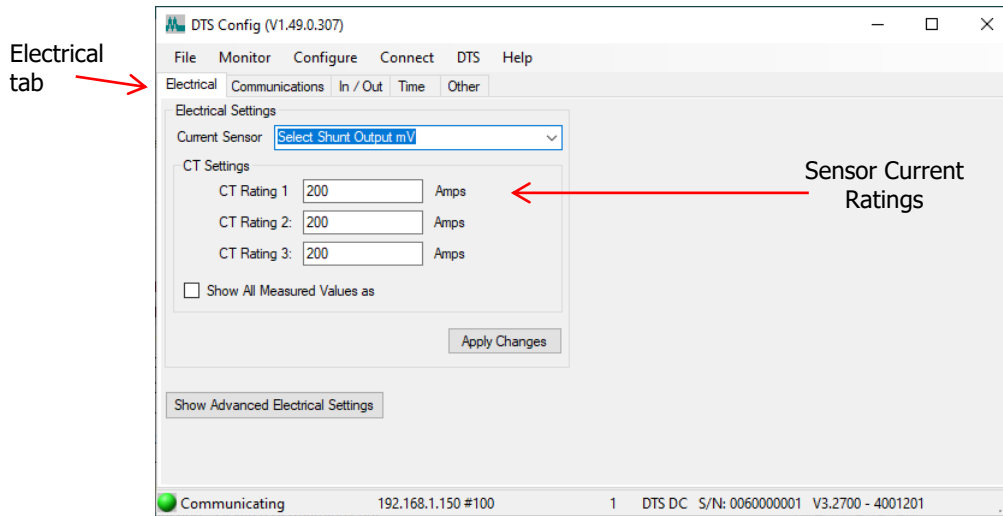
- Set the Sensor Rating (Amperage) of the Sensors that are being used.
- Ensure that the "Current Sensor" shows the Current Sensor Output Range.

mV Shunt Sensors

The **DTS DC3-Tx-SB-A-x** meters are compatible with the following current sensors **ONLY**:

- mV Shunts** – This type of current sensor has a mV output voltage that is proportional to the current flowing through the shunt. The most common output voltages are 100mV and 50mV. A shunt should never be used at more than 66% of its rated current, so please factor that in when sizing your shunt. The current rating (Amperage) of the Sensor must be specified when ordering and cannot be changed in the field.

Select "Configure" from the menu. The Current Sensor settings can be found in the "Electrical Settings" tab. The screenshots show the layout of the latest version of DTS Config. The screen layout for previous versions of DTS Config may differ.



Configuring mV Shunt Sensors

- Set the Sensor Rating (Amperage) of the Sensors that are being used.
- Ensure that the "Current Sensor" shows the Current Sensor Rating (in mV).