

DTS 310 333mV/5A – RJ-45 Ethernet Meter

This Quick Start Guide is to familiarize the user with the connection and configuration of the DTS 310 DIN rail mounted single / 3 phase power & energy meter for use with:

- 333mV, Flexible Rogowski Coil or 5A current sensor inputs
- Modbus TCP or BACnet/IP Ethernet communications.



Applicable DTS 310 Models

DTS 310 Model #	Measurlogic Part #	Description
DTS 310-34-EB-A-4	D310-0084	<ul style="list-style-type: none"> • 208V-480V 3ph 3 or 4 wire • 333mV / Rogowski CTs • Self-powered • Modbus TCP and BACnet/IP Ethernet
DTS 310-36-EB-A-3	D310-0118	<ul style="list-style-type: none"> • 208V-600V 3ph 3 or 4 wire • 333mV / Rogowski CTs • 24Vdc auxiliary powered • Modbus TCP and BACnet/IP Ethernet
DTS 310-54-EB-A-4	D310-0094	<ul style="list-style-type: none"> • 208V-480V 3ph 3 or 4 wire • 5A CTs • Self-powered • Modbus TCP and BACnet/IP Ethernet
DTS 310-56-EB-A-3	D310-0114	<ul style="list-style-type: none"> • 208V-480V 3ph 3 or 4 wire • 5A CTs • 24Vdc auxiliary 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 310 installation guide
<https://www.measurlogic.com/product/dts-310/>



This Quick Start Guide is designed to familiarize the user with the connection and configuration of the DTS 310 DIN rail mounted single / 3 phase power & energy meter with 333mV/Rogowski Coil current sensor inputs and RS-485 serial Modbus RTU or BACnet MS/TP 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 310 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 310 datasheet from: <https://www.measurlogic.com/product/dts-310/>
- The necessary green connector plugs are fitted to the DTS meter.

Connecting the DTS 310

Wiring Voltage and Current Inputs



The DTS 310 accepts voltage inputs directly up to 480V or 600V 3 phase L-L (model dependent) or through PTs (potential transformers) for higher voltages. Three phase currents are measured via "safe" **333mV or Flexible Rogowski CTs or 5A CTs** (current transformers). Check the model number of the DT 310 as connection of any other CT than these outputs could cause damage to the instrument. **If there are any questions, please call Measurlogic before powering up the unit.** Please refer to **Application/Connection Examples** for information on wiring conventions.

Input wiring terminals are clearly indicated and located on the upper side of the DTS 310 label. The Current and Voltage terminal strips are pluggable to allow easy replacement of the DTS 310, if required. Removing the terminal strips should only be done once power has been removed from the DTS 310. Input wiring terminals accept 2.5 mm² (12 AWG) wire. The wires are connected by means of screw terminals that clamp down onto the input wires. The voltage/PT inputs require fuses, not included, (see diagrams below) and should be rated at 1A 600Vac. Measurlogic can provide an [in-line fuse kit](#) as an option if required.

Wiring Optional Auxiliary Power Input (AUX)



Self-powered DTS 310 meters are powered from the input voltage between Phase A & Phase B or between Phase A & Neutral (depending on model number), so no additional auxiliary power supply is needed. DC Auxiliary powered DTS 310 meters can also be ordered, with the following DC voltage options being available. (Fuses not included with meter but are offered as an option). Please see the blue label on the actual meter for details about the power supply option that is fitted to the meter.

- 12 Vdc **OR** 24 Vdc **OR** 48 Vdc (default is 24Vdc)

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 310.

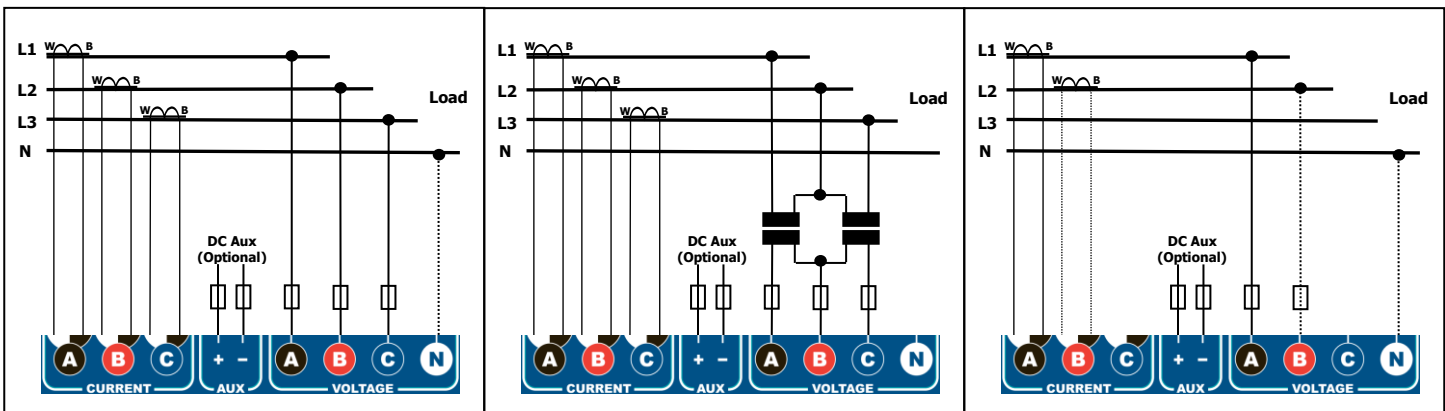
The following connection diagrams depict some examples of typical applications. Other connection configurations are possible. (Consult Measurlogic)

Application/Connection Examples

3 Phase, 3 Wire/ 4 Wire (low voltage)

3 Phase, 3 Wire(2 Potential Transformers & 3 CTs)

1 Phase, 2 or 3 Wire



Digital Inputs and Outputs (Digital I/O)

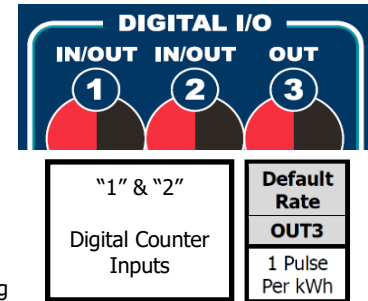
The default DTS 310 meters indicated above are fitted with 2 x digital inputs and a pulse output as standard. They are grouped together with a single 6 way pluggable terminal.

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 310-xx-EB-A-x models provide ethernet communications through a standard Ethernet RJ45 jack marked as “REMOTE” on the same side of the DTS 310 meter as the “DIGITAL I/O” plug.



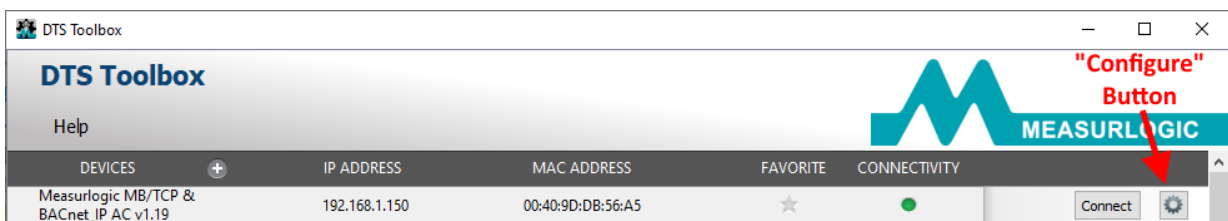
Modbus TCP **and** BACnet/IP protocols are loaded by default into the DTS 310 meters. The DTS 310 meter can be addressed simultaneously from a Modbus and BACnet Master application.

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 310 meter it must be on the same sub-net.

- Each DTS 310 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 310 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 310 meter to DTS Config

Now that the DTS 310 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 310 meter to DTS Config.



ATTENTION

- The DTS 310 **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 310 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 Current Sensor Type and Rated Current of the CT

The Current Sensor Type, Sensitivity and Rated Current (Amperage) of the CT must be configured using [DTS Config](#).



ATTENTION

The Correct CT type must be connected to the correct DTS 310 model. Incorrect connection **will** damage the DTS 310 and might also damage the CT.

The **DTS 310-3x-EB-A-x** meters are compatible with the following current sensors **ONLY**:

- 333mV Output CTs** – This type of current sensor is internally burdened so that the voltage output is 333mV for the current rating as specified on the CT itself. The current rating (Amperage) of the CT must be specified when ordering and cannot be changed in the field.
 - Use DTS Config to configure the Current Sensor Type as "333mV".
 - The Rated Current (Amperage) of the CT as it appears on the CT label **MUST** be configured in the DTS 310 Meter.
- Rogowski Coil CTs** – This is a flexible CT. Measurlogic DTS meters can accept Rogowski Coil CTs directly **without** the need for an external integrator. The sensitivity of this type of current sensor is specified in milli-volts (mV) per 1000A at 60Hz. Different models of Rogowski Coils have different sensitivities, which must be selected from the pull-down menus in DTS Config and set accordingly. The CT Rating (Amperage) that is set does not affect the current measurement values. We recommend that you set the CT Rating in the meter to the panel rating, or the expected nominal current being measured.
- Rogowski Coil CTs (with an external integrator)** – Measurlogic DTS meters can accept Rogowski Coil CTs directly connected to the DTS 310 meter, so an external integrator module is NOT required. However, if the system already has an external integrator module installed, then the output of the integrator will be 333mV for the current specified on the integrator label. For such systems, the DTS 310 meter must be configured for a "333mV" input. The Rated Current (Amperage) as it appears on the integrator label **MUST** be configured in the DTS 310 Meter.



ATTENTION

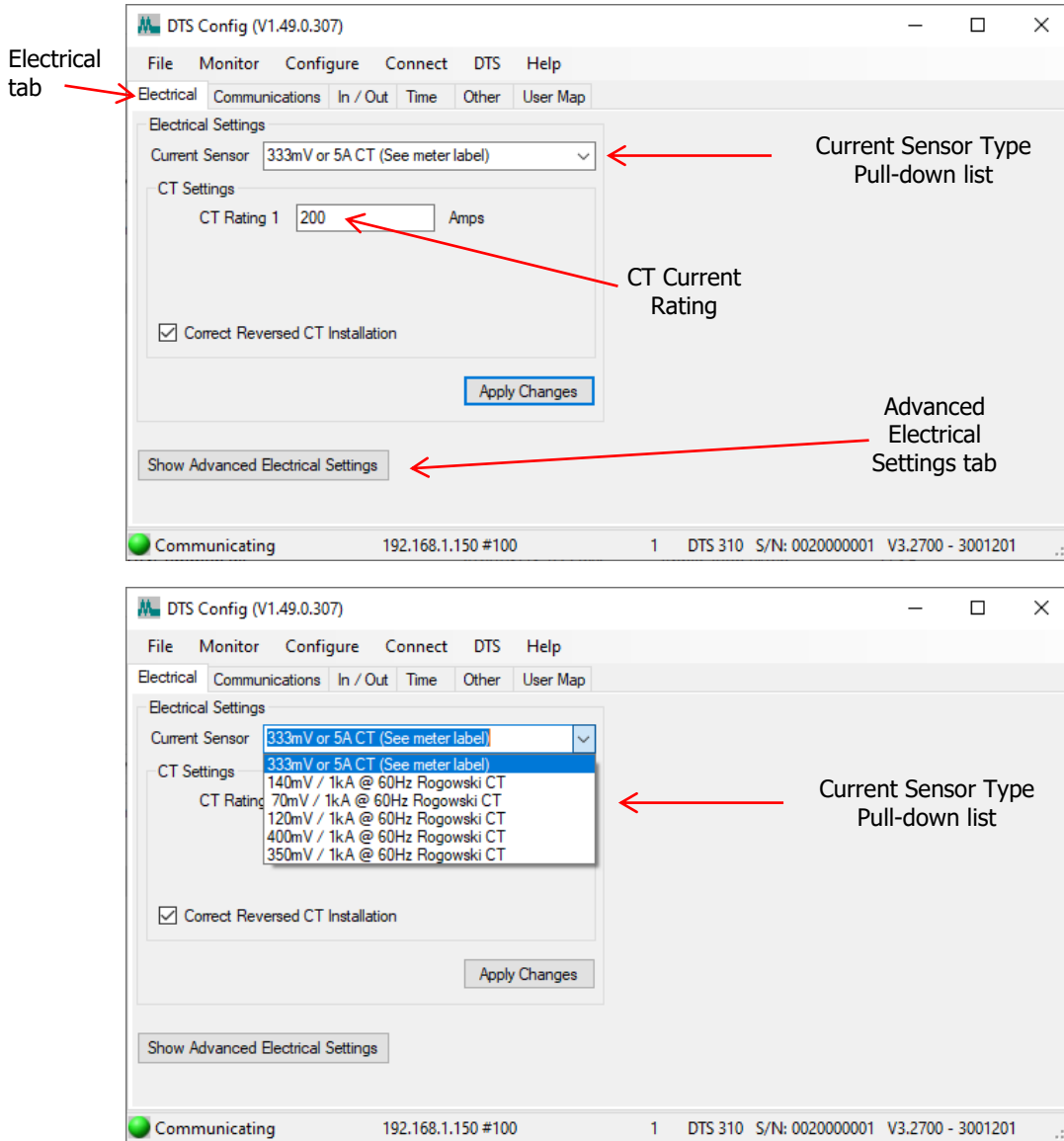
If multiple CTs per phase are required, please consult our document "**Using Multiple CT Sets with DTS Meters**" in the "Technical" section of the DTS 310 webpage at <https://www.measurlogic.com/product/dts-310/>

The **DTS 310-5x-EB-A-x** meters are compatible with the following current sensors **ONLY**:

- 5A Output CTs** – This type of current sensor should be installed with shorting blocks to avoid damage to the CT in the event of open secondary wiring. The current rating (Amperage) of the CT must be specified when ordering and cannot be changed in the field. This Rated Current (Amperage) of the CT as it appears on the CT label **MUST** be configured in the DTS 310 Meter.
DO NOT connect 5A Output CTs to a meter with 333mV current inputs.

Configuring the Electrical Settings using DTS Config

Select "Configure" from the menu. The Current Transformer 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 333mV output CTs

- Set the CT Rating (Amperage) of the CTs that are being used.
- Ensure that the "Current Sensor" type selected shows "333mV CT".

Configuring Rogowski Coil CTs

- Set the CT Rating (Amperage) to the panel rating, or the expected nominal current being measured. This value does not affect the current measurement values.
- Select a Rogowski Coil output option from the "Current Sensor" drop down list that matches the output of the Rogowski Coils being used, as this directly affects the current measurement values.

Configuring 5A Secondary CTs

- Set the CT Rating (Amperage) of the CTs that are being used.
- Ensure that the "Current Sensor" type selection shows "5A CT".

Voltage(L-L) Primary and Secondary settings

The voltage primary and secondary setting are in the "Advanced Electrical Settings".

- **Low Voltage Applications:** Do NOT change the Voltage(L-L) Primary and Secondary settings. These two numbers MUST be the same values for correct low voltage operation. The ratio of these two numbers must be 1:1.
- **Medium or High Voltage Applications (with external PTs):** The Voltage(L-L) Primary and Secondary settings MUST be set according to the primary and secondary ratings of the external PTs.