DTS 307

DIN – Rail Mounted, Indoor Rated Revenue Grade Electrical Sub-meter

MQ0052-16B

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1 PRODUCT OVERVIEW

The one revenue grade meter for all applications.

Your new DTS 307 energy sub-meter is one of the most versatile meters available on the market. The DTS 307 can operate in any environment, requires no external power source to operate, and works with all UL or ETL listed 333mV current transformers.

For ease of installation, the DTS 307 is designed to be compact and fit into most DIN-rail systems.

Some of the exciting features provided with the DTS 307 are

- Easy to attach pluggable terminals
- Modbus RTU or BACnet MS/TP depending on model
- Auto-topology Phase Detection and on-board CT Algorithms for automatic correction of reversed field mounted CTs

For remote configurability, your DTS 307 comes with our freely downloadable *DTS Config* software tool

The DTS 307 provides you very accurate data acquisition and is certified to ANSI C12.20 Class 0.5 Revenue Grade.

Also, if in the future, you decide to integrate renewable energy sources, the DTS 307 will conveniently operate as a Bi-Directional **NET** meter. Easily integrates with Building Automation Systems and Energy Monitoring Software.

Designed and Manufactured in the USA and complies with the Buy American Provisions of ARRA Section 1605.

Thank you for choosing Measurlogic and a meter from the DTS Family.

1.1 Supplied Items

Check that the meter and equipment matches your order specifications and has not been damaged during shipping. Verify that the following item(s) match with the corresponding model from the data sheet:

- Installation Guide
- DTS 307 power & energy meter
- 10-Pin green pluggable screw terminal connector for Voltage and Digital Input/Output
- 6-Pin green pluggable screw terminal connector for Current inputs
- 3-Pin green pluggable screw terminal connector for Remote RS-485 Communications

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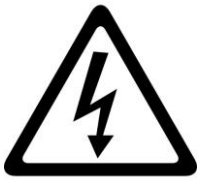
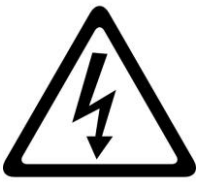
1.2 Document Conventions

SYMBOLS

	ATTENTION – PLEASE CONSULT THE INSTALLATION MANUAL
	WARNING – RISK OF ELECTRICAL SHOCK

1.3 Product Specification



WARNING

Verify that the model of DTS 307 that was shipped is used for the correct installation. Failure to use the correct CT's or connecting too high a voltage can result in permanent damage to the DTS Meter.

DTS 307 - Ax-xx-x-F-xx

1.3.1 Current Inputs

Current Inputs	Value	Description	Notes
A	3	333mV CT	Any 333mV CT is acceptable
	9	Unburdened CT	Only use the CT's that came with the unit

1.3.2 Service Type

Service Type	Value	Description	Neutral Required	Neutral Optional
F	N	(1P 2W, 1P 3W, 3P 4W) 120 – 277Vac L– N	•	
	2	(3P 3/4W) 208 – 240 Vac L– L		•

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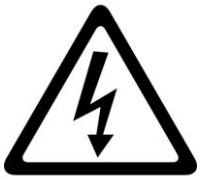
2 INSTALLATION

2.1 Safety Guidelines



WARNING

The following installation instructions are intended for qualified personnel only. To avoid the risk of electrical shock and personal injury, do not perform additional tasks not stated in this procedure unless you are qualified to do so.

Always adhere to the following safety guidelines:

- Only qualified personnel or **licensed electricians** should handle the installation. Input voltages to the DTS 307 can be hazardous.
- Follow all applicable local and national electric codes.
- Verify input voltage and current are within thresholds for the specific DTS 307 model. (See Product Specification on page 4)
- Use only UL or ETL listed current transformers. **ONLY USE CURRENT TRANSFORMERS THAT ARE SPECIFIED BY THE MODEL OF DTS 307. USE OF ANY OTHER CURRENT TRANSFORMER OTHER THAN THE ONE SPECIFIED BY THE DTS MODEL CAN RESULT IN PERMANENT DAMAGE TO THE DTS 307.**
- Avoid any electrostatic discharge prior to working on the DTS 307 by first touching a grounded structure prior to handling the DTS 307.
- Before applying power make sure that all current transformer and voltage connections are securely connected to the input terminals of the DTS 307.
- If the DTS 307 is installed incorrectly any built in safety features may no longer be functional.
- Before handling the DTS 307 ensure that all power running to the DTS 307 is removed.
- The DTS 307 is for indoor use only, and MUST be mounted in a NEC compliant enclosure suitable for the environmental conditions and locked with a **user supplied lock**.

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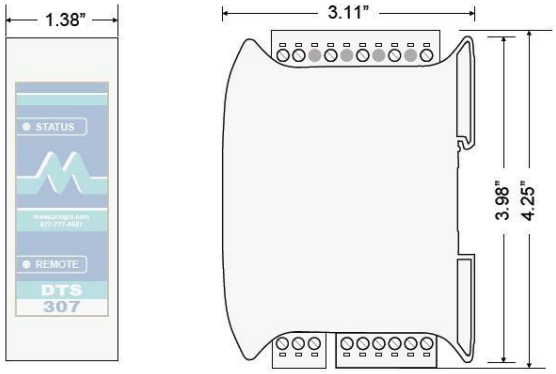
2.2 Product Dimensions



2.3 Mounting Requirements and Guidelines

ATTENTION

Make sure to follow the following mounting requirements and guidelines when mounting the DTS 307.

When mounting the DTS 307 make sure to follow these guidelines:

- Mount the DTS 307 as close as possible to the electrical panel being monitored.
- Make sure that there is at least 4" of clearance above and below the DTS 307 for wiring and connector clearance and ¼" of clearance on both sides for cooling.
- Position the DTS 307 such that the labeling can be read from the upright position.
- It is recommended that two separate conduits be run for voltage and current connections.
- Only UL or ETL rated conduits and glands should be used.
- Only UL or ETL rated Current Transformers should be used.
- 14 to 12 AWG wire should be used for the voltage and ground with 300V or 600V insulation depending on installation type.
- **User Supplied** UL or ETL certified 2A fast-blow fuses need to be installed between the Voltage inputs of the DTS 307 and panel being monitored. Recommended Littelfuse BLS002 or equivalent.
- Use the breaker guide below to determine the type of breaker to use for installation. The breaker is used to protect the wiring from the breaker panel to the fused inputs of the DTS 307.

BREAKER GUIDE	
Gauge of Wire	Recommended Breaker
14	15 Amp 600V 3-Pole Breaker
12	20 Amp 600V 3-Pole Breaker

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3 CONNECTING TO THE DTS 307

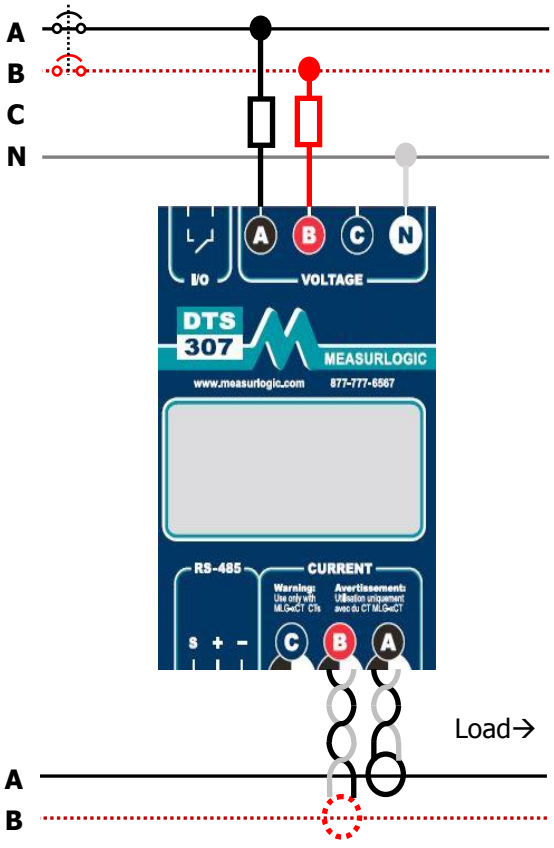
3.1 Wiring Voltage and Current Inputs

ATTENTION

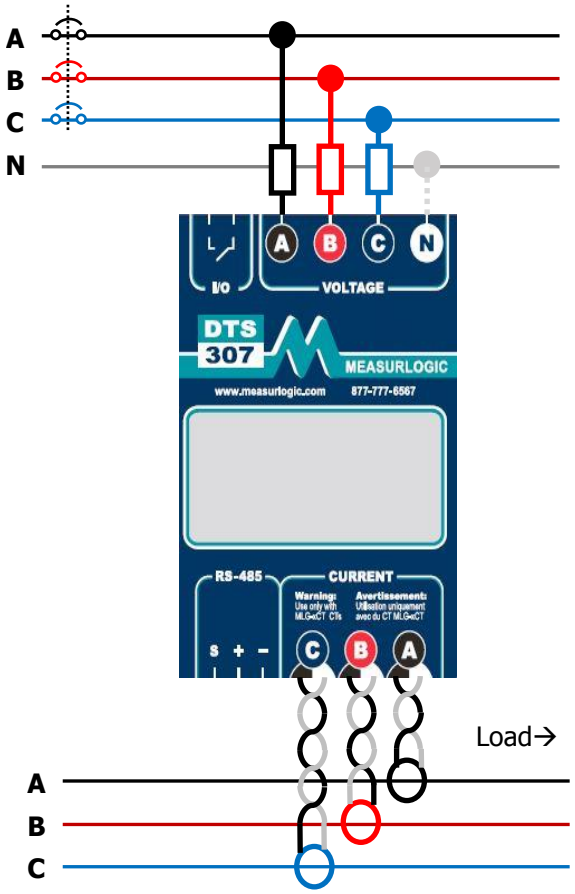
Make sure that your model of DTS 307 is approved for the following wiring guidelines.

Note: CTs should be connected to the same panel as the voltage connections.

3.1.1 Wiring Examples



Single Phase 2/3 Wire



3-Phase with Optional Neutral (Model Dependent)

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3.2 Connecting Multiple Loads

The DTS 307 allows for ease and flexibility when monitoring multiple branches. The DTS 307 allows multiple CT sensors to be connected in parallel via the quick connect terminals.

When using parallel CT sensors, the following guidelines must be followed to ensure accurate measuring.

- All CT sensors must have a 333mV output.
- All CT sensors must be of the same manufacturer/model number and current rating.
- A full set of CT sensors must be used for each load.
- The pair of wires from the CT sensor to the green pluggable screw terminal must be twisted.
- All CT sensors must be terminated at the green pluggable screw terminal.
- A maximum of 3 loads can be monitored at once (Contact Measurlogic if more than 3 loads must be monitored).
- The measured phase current will be the total current across all the loads on that phase.
- The CT primary rating for the DTS 307 must be set to the **CT rating * Number of CT sets.**
- The example below shows how to calculate the service current for figure 3.2.1.

Service Current for Figure 3.2.1	
Number of CT Sensor Sets	2
CT Rating	100 Amps
CT Primary	200 Amps

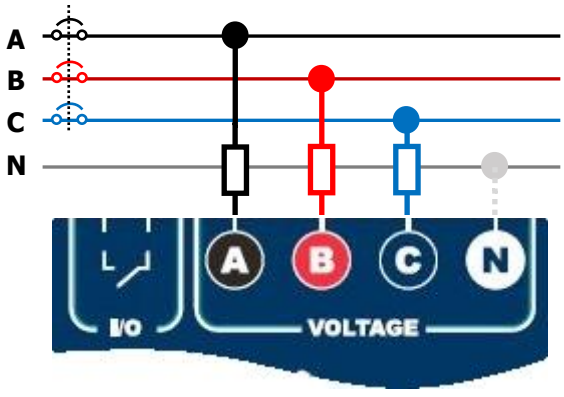
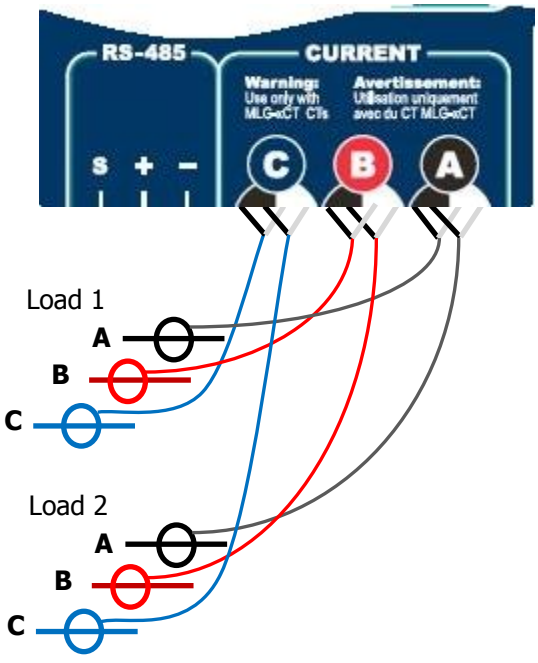


Figure 3.2.1



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4 Maintenance and Service

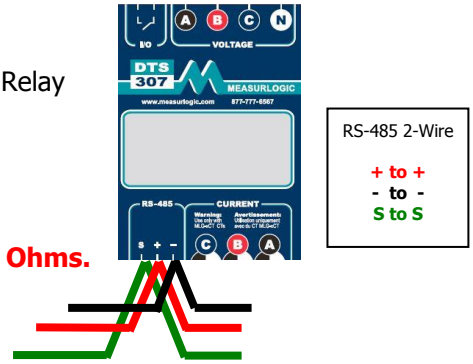
WARNING

There are NO other user serviceable parts in the DTS 307, and no regular maintenance is required. If additional maintenance is needed, please contact Measurlogic Inc.

5 DTS 307 COMMUNICATIONS INTERFACE

The DTS 307 has 3 exclusive options for outputting data **depending on the model ordered**:

- Modbus RTU over RS-485 2-Wire
- BACnet MS/TP over RS-485 2-Wire
- kWh Energy Pulse Output through a Potential-Free Normally Open Solid State Relay (N.O. SSR)



5.1 RS-485 2-Wire Communications

The RS-485 is a Daisy Chained Bus terminated at both ends with 120 Ohms. DO NOT use a STAR or RING configuration.

- Use 18-22 AWG, 2-core, shielded, twisted pair cable
- When fitted with **Modbus RTU**, unless otherwise stated through correspondence prior to ordering or specified on the label of the DTS 307 unit, the default communications parameters are as follows:
    - Modbus Address: 100, Baud Rate: 9600, Parity: None, Data Bits: 8, Stop Bits: 1. This is notated as **9600, N, 8, 1 #100**.
- Modbus parameters can be changed either through **DTS Config** or by writing to specific registers in the meter. Please see the **Modbus Map** document or section 7 for **DTS Config**.
- When fitted with **BACnet MS/TP**, unless otherwise stated through correspondence prior to ordering or specified on the label of the DTS 307 unit, the default communications parameters are as follows:
    - Device Object ID: 100, MAC Address: 100, Baud Rate: 38400, Parity: None, Data Bits: 8, Stop Bits: 1. This is notated as **38400, N, 8, 1 #100**.
- BACnet parameters must be changed via the BACnet interface.

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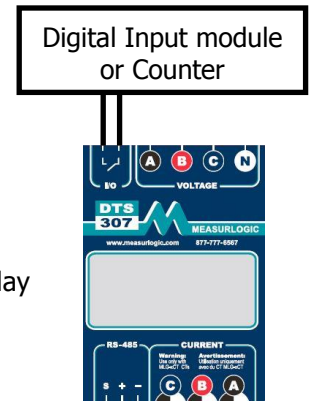
5.2 kWh Pulse Output (Model Dependent)



- The DTS 307 comes with a Digital I/O port that can be configured for pulse outputs.
- The DTS 307 will pulse at 1kWh by default but can be changed using DTS Config.
- The relay closure of each pulse will last for 100ms (pulse width) with a minimum delay of 100ms between any two pulses.

6 LED Definitions

The DTS 307 is equipped with 2 LEDs useful for diagnostics and troubleshooting – **STATUS** and **REMOTE.**

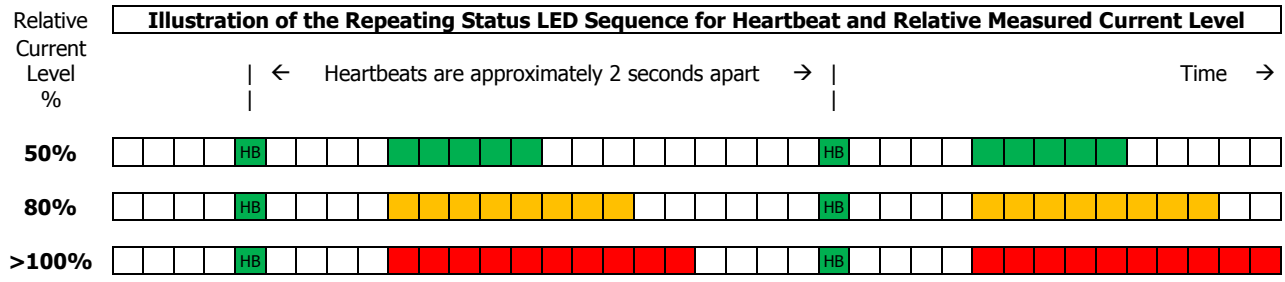
6.1 Status LED

- The **STATUS** LED consists of a repetition of **two flashes** and shows whether the measured power is being consumed/imported or generated/exported, as well as the magnitude of the total current.
- The **First Flash** is the "heartbeat" and indicates that the meter is ON and the direction of energy:

Green – Energy is being consume/imported

Orange – Energy is being generated/exported

- The Color and Length of the **Second Flash** indicates the "total current level" for all the measured phases relative to the total service current:
  - GREEN for 5-80% of total service current
  - ORANGE for 80-100% of total service current
  - RED for >100% of total service current



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6.2 Remote LED

- The **REMOTE** LED is a communications indicator which is present on all meters fitted with an RS-485 serial port.
- The LED will flicker GREEN when the DTS 307 receives data on the BUS and AMBER when the DTS 307 transmits data in response.

Green – Data being received

Amber – Data being transmitted

7 INSTALLATION OF DTS CONFIG AND MONITORING SOFTWARE

- **DTS Config** is a program used to easily monitor and configure meters from the DTS family from your local PC or across the LAN.
- Download the latest version of DTS Config from http://www.measurlogic.com/software. Alternatively, an e-mail can be sent to info@measurlogic.com to request the latest version of DTS Config.
- Unzip the **DTSConfigSetup** file and double click the **setup.exe** file to begin the installation process.
- Follow the instructions on the screen.

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