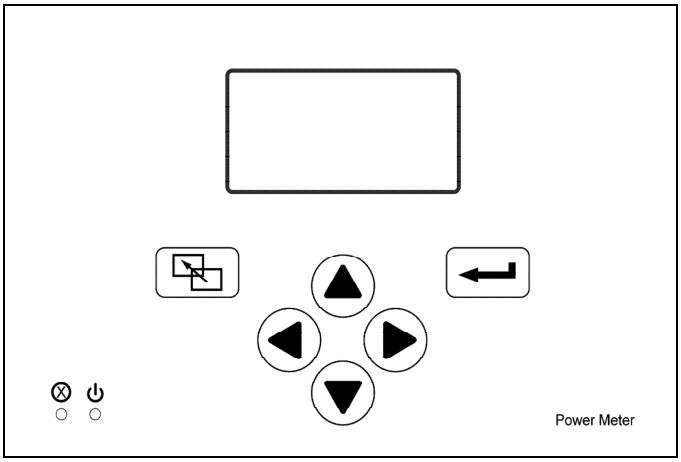
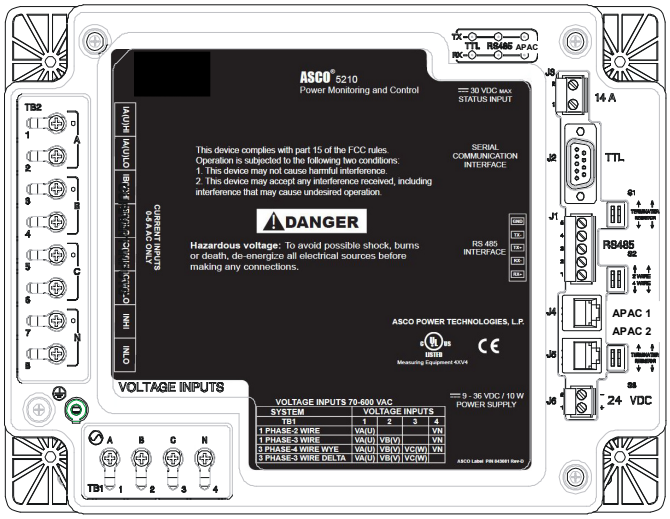



Front view




Rear view

**DANGER**

**To avoid possible shock, burns, or death, deenergize all electrical sources before making any connections to the Digital Power Meter.**

***NOTICE***

The protection provided by the equipment may be impaired if the Digital Power Meter is used in a manner not specified by ASCO Power Technologies.

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ASCO Power Technologies®
Florham Park, NJ 07932-1591
Call 1 800 800-2726 (ASC0) for sales or service

## General Information

The Catalog 5210 Digital Power Meter (DPM) collects real-time power system information from ASCO Power Control Systems and Automatic Transfer Switches (ASCO Series 300, 4000 Series, 7000 Series). The DPM provides measurement for voltage, current, active power, reactive power, apparent power, active energy, reactive energy, apparent energy, power factor, and frequency. The intended use of the DPM is in the standard metering applications.

The DPM has built in serial communication interfaces. ASCOBUS II and serial Modbus RTU protocols are available to communicate with ASCO Power Quest or other monitoring applications via the built-in RS485 port or through the use of ASCO Catalog 5150 Connectivity Module (Accessory 72E). The APAC interface is used for communication with ASCO Catalog 5140 Quad-Ethernet Module (Accessory 72EE).

The DPM includes a backlit graphic LCD display and membrane controls (keys). All monitoring and control functions can be done from the front of the unit for convenience and safety.

The DPM can accommodate the following three phase and single phase system types:

- Single phase – 2 wire system (1 ∅ – 2W)
- Single phase – 3 wire system (1 ∅ – 3W)
- Three phase – 3 wire Delta system (3 ∅ – 3W)
- Three phase – 4 wire WYE system (3 ∅ – 4W)

## Monitored & Calculated Data

The following computed parameters are available both on the local display and through the serial interface:

- Line–to–neutral voltages ($V_{AN}$, $V_{BN}$, $V_{CN}$)
- Line–to–neutral voltage average ($V_{AVE}$)
- Line–to–line voltages ($V_{AB}$, $V_{BC}$, $V_{CA}$)
- Line–to–line voltage average ($VL_{AVE}$)
- Current on each phase ($I_A$, $I_B$, $I_C$)
- Current in the neutral conductor ($I_N$)
- Average current ($I_{AVE}$)
- Active power, kW per phase and total ($W_A$, $W_B$, $W_C$, $W_T$)
- Reactive power, kVAR per phase and total ($VAR_A$, $VAR_B$, $VAR_C$, $VAR_T$)
- Apparent power, kVA per phase and total ($VA_A$, $VA_B$, $VA_C$, $VA_T$)
- kWhours importing, exporting and net ($kWh_{IMP}$, $kWh_{EXP}$, $kWh_{NET}$)
- kVARhours leading, lagging and net ($kVARh_{LEAD}$, $kVARh_{LAG}$, $kVARh_{NET}$)
- kVAhours net ($kVAh_{NET}$)
- Power factor (PF)
- Signal frequency (Hz)
- Total harmonic distortion (THD)
- Maximum kW demand (hourly, daily, monthly, yearly, etc.) with real-time clock

## Transfer Switch Position Input (optional)

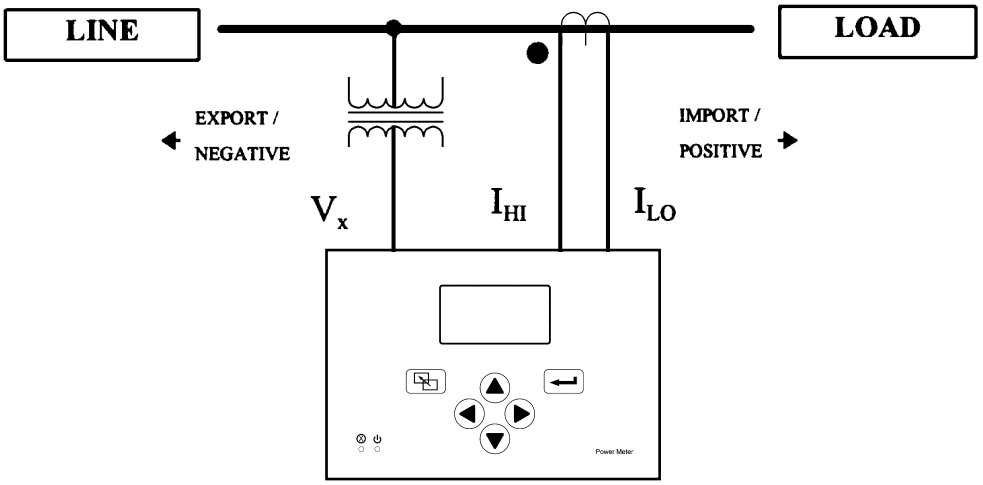
Used when the Digital Power Meter is providing measurement on the load terminal of a transfer switch.

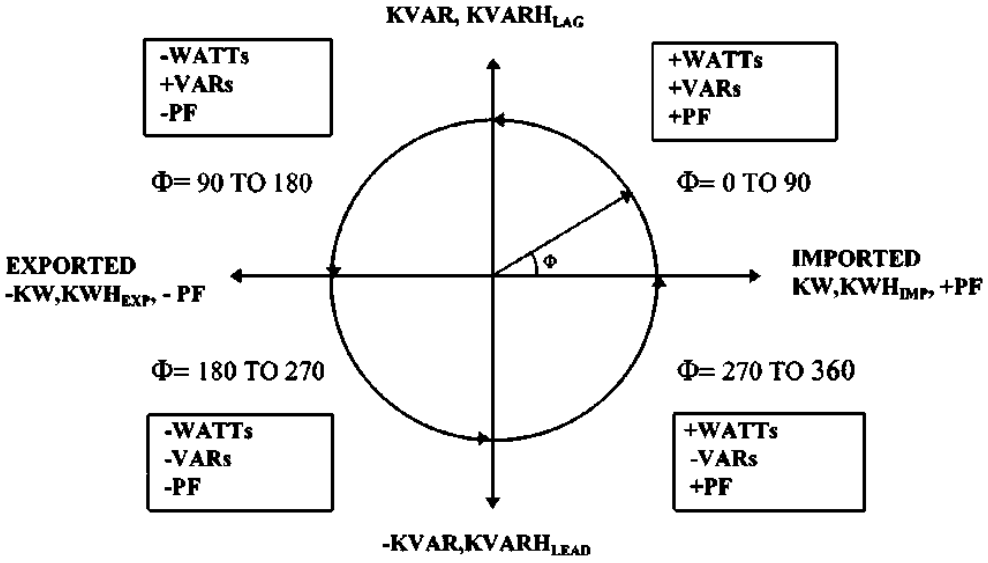
## Cleaning

The exterior of the Digital Power Meter should be cleaned by wiping the front panel of the display unit with a soft cloth and cleaning agents that are not alcohol based, and are non-flammable, non-explosive. All other servicing should be performed by authorized factory personnel.

## Measurement Conventions

The following diagrams show how the Digital Power Meter interprets and displays signed (+, –) values for power, power factor and energy parameters. Please note that the polarity of the Watts, VARs, Power Factor, energy import/export, and lag/lead readings can be reversed by reversing the polarity of the CTs connected to the DPM.




**DEFINITONS:**

Φ = (phase angle between voltage and current) = Φv - Φi
Φv = phase angle of voltage signal
Φi = phase angle of current signal

LAGGING Φ = ($0 < \Phi < 90°$) for positive power flow. To illustrate this condition, assume Φv = 0 and ($-90° < \Phi i < 0$). This results in ($0 < \Phi < 90°$), so it would be stated that Φi LAGS Φv for positive power flow.

LEADING Φ = ($-90° < \Phi < 0$) for positive power flow. To illustrate this condition, assume Φv = 0 and ($0 < \Phi i < 90°$). This results in ($-90° < \Phi < 0$), so it would be stated that Φi LEADS Φv for positive power flow.

## Measurement Specifications

- Temperature: 25 ˚C / 77˚F
- Frequency : 50.0 Hz or 60.0 Hz
- Current input : 2 % < $I_{FULL\ SCALE}$ < 125 %
- Sensing type: True RMS up to and including the 31st harmonic.

| Parameter (full scale) | | Accuracy (% full scale) | Display | |
|---|---|---|---|---|
| | | | Resolution | Range |
| Current (I) | 5.000 A | 0.25 % | 0.25 % | 0-55 000[1] |
| Voltage (V) | 120 V | 1.00 % | 1.00 % | 0-59 999[2] |
| | 600 V | 0.25 % | 0.25 % | 0-59 999[2] |
| Active Power (kW) (per element) | 3000 W | 0.25 % | 0.10 % | 0-99 999[3] |
| Reactive Power (kVAR) (per element) | 3000 VAR | 0.25 % | 0.10 % | 0-99 999[3] |
| Apparent Power (kVA) (per element) | 3000 VA | 0.25 % | 0.10 % | 0-99 999[3] |
| Active Energy (kWh) | | 1.00% of reading | 0.10 % | - 1,999,999,999 to +1,999,999,999 |
| Reactive Energy (kVARh) | | 1.00% of reading | 0.10 % | - 1,999,999,999 to +1,999,999,999 |
| Apparent Energy (kVAh) | | 1.00% of reading | 0.10 % | - 1,999,999,999 to +1,999,999,999 |
| Power Factor (PF) | | 1.00 % | 0.01 PF | -0.0 to 1.00 to+0,0 |
| Frequency (Hz) | | 0.25 % | 0.1 Hz | 40 to 100 Hz |
| Power (kW) | | 1.00% of reading | 1 kW | 1 to 32000 |
| Maximum Power Demand (kW) | | 1.00% of reading | last 15 min | 15 min to 13 months |
| | | | hourly | |
| | | | daily | |
| | | | monthly | |
| | | | last 30 days | |
| | | | last 13 months | |

NOTES:

[1] Reads in kA (i.e., 10.00 kA) for currents over 9,999 A.
[2] Reads in kV (i.e., 10.0 kV) for voltages over 9,999 V.
[3] Reads in MW, MVAR, MVA for readings over 9,999 k.

## FCC Class A Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Device Ratings

Input Signals

| | |
|---|---|
| Current (4): | 0 to 5 A ac nominal. 4000 V ac isolation, minimum<br>Burden: Less than 0.25VA per phase. |
| Voltage (3): | 70 to 600 V ac nominal, phase to phase. |
| Frequency: | 45 Hz to 65 Hz fundamental.<br>True RMS measurements up to and including the 31st harmonic. |
| Transfer Switch Position input: | 26 V dc maximum, >10 V dc = active, <1 V dc = inactive |
| AC Power Requirements: | minimum 70V L-L AC/103 mA / 7.2 VA with 50/60 Hertz |
| DC Power Requirements: | Optional backup power supply 9-36 V dc 10 watts<br>DC power supply should be UL Listed. |
| Interface (s): | Isolated TTL Interface (J2) – DB9-female connector<br>Isolated RS485 (J1) – 5 pin connector<br>APAC interface (J4 & J5) – RJ12 connector |
| Operating Temp.: | -4 º F to 158 º F (-20º C to 70º C) |
| Storage Temp.: | -22 ºF to 176 º F (-30º C to 80º C) |
| Measurement Category: | III |
| Pollution Degree: | PD 2 |
| Humidity: | Relative humidity 5% to 85%, non–condensing. |

## Applicable Standards

UL 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 1: General Requirements

CSA-C22.2 No. 61010-1, 2nd Edition, 2004-07, Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements

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**⚠ DANGER**

**To avoid possible shock, burns, or death, deenergize all electrical sources before making any connections to the Digital Power Meter.**

**Lethal voltages can result if current transformers are open circuited while carrying primary current. To avoid injury turn off primary circuit or short out CT secondary circuit.**

***NOTICE***

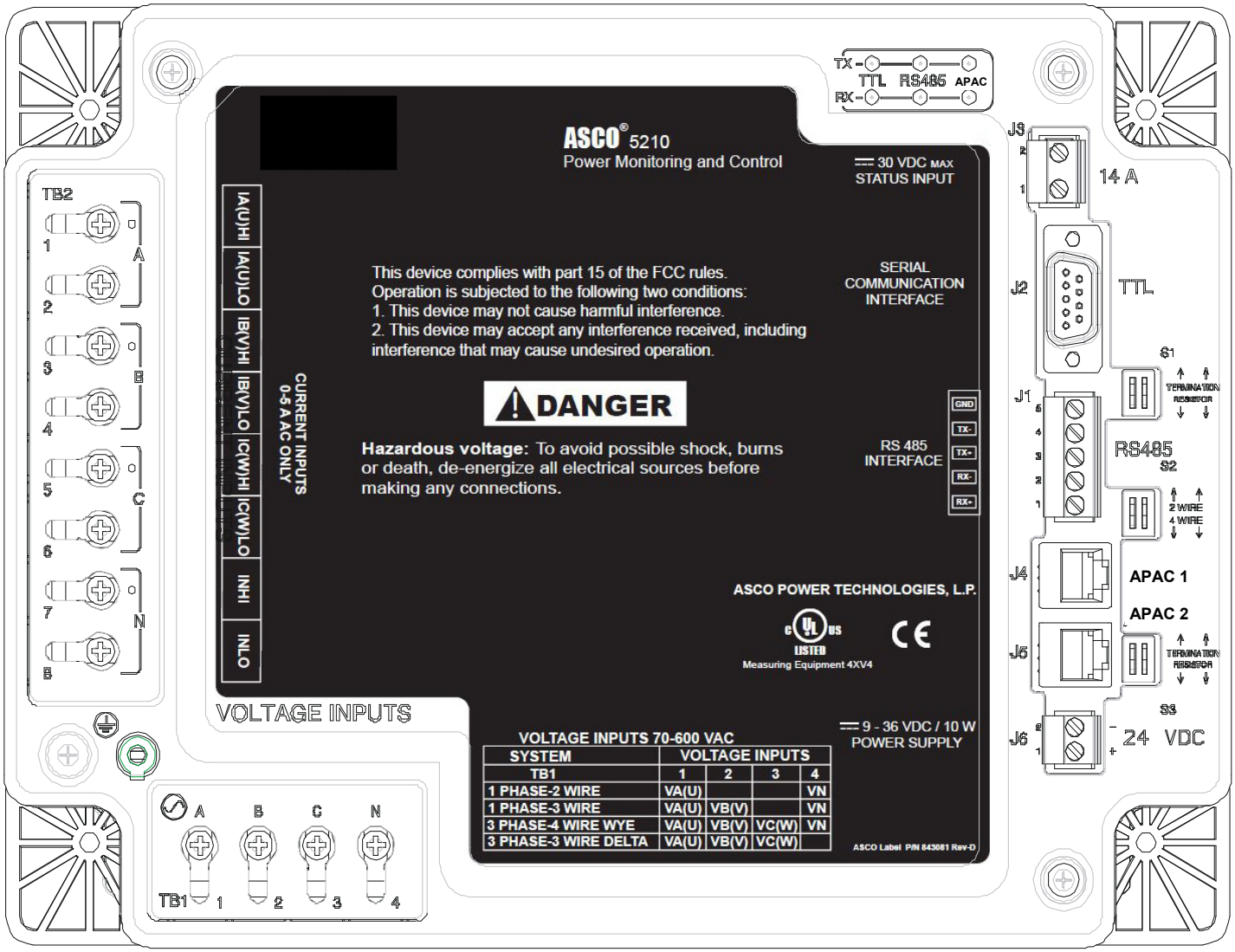
To prevent damaging the Digital Power Meter deenergize all power to the unit before you connect or disconnect all wiring to the terminal blocks.

# INSTALLATION

## Mounting

The Power Meter must be mounted to a flat surface inside a metal enclosure. Mount the Digital Power Meter to the inside of an enclosure door which has a 10" x 6" cut out so that the LCD display and membrane controls are accessible through the door (when closed).

See Appendix 2 for mounting drawing.




Back of Power Meter

## Connections

See Appendix 1 for connection diagrams. Make the appropriate connections as shown on the label on the Power Meter and on the wiring diagrams.

***NOTICE***

To prevent damaging the Digital Power Meter deenergize (turn off) all power to the unit before you connect or disconnect all wiring to the terminal blocks.

**Tightening Torque**

Tighten all Terminal Block connection terminals to 15 in–lb maximum.

## Power Supply Connections (TB1 andJ6) See *NOTICE* above.

**AC Power Supply (TB1) -** Connect the Phases A, B, C, and Neutral (if present) to terminal block TB1 as marked on the Power Meter. Refer to the labelling below the terminal block. Minimum AC input is 70V L-L AC and maximum AC input is 600V L-L AC with 50/60 Hertz frequency.

**DC Power Supply (J6) –** This is an optional but recommended backup dc power connection. If there is an AC power interruption, a DC power supply will allow communication with the Power Meter. Use a Class 1 power supply that is UL Listed. Connect the 0.3 amp. 24 volt dc power supply to terminal J6.1 (+) and terminal J6.2 (com) on Connector J6 marked on the Power Meter. Refer to the labelling below terminal block. The terminals accept 12-20 AWG stranded copper wire.

**⚠ DANGER**

**To avoid possible shock, burns, or death, deenergize all electrical sources before making any connections to the Digital Power Meter.**

**Lethal voltages can result if current transformers are open circuited while carrying primary current. To avoid injury turn off primary circuit or short out CT secondary circuit.**

## CT Connections (TB2) See DANGER above!

Connect the current transformers (CTs) with 5 amp rated secondary to the appropriate terminals marked Current Inputs on the Power Meter. Refer to the labelling above terminal block TB2. Note the shorting block requirements on the Wiring Diagram. The high side (X1 or dot) terminals are marked **0**.

## Voltage Connections (TB1) See DANGER above!

As described in the **AC Power Supply** section above, connect the system voltage (120 to 600 volts ac with 50/60 Hertz) to the appropriate terminals marked Voltage Inputs on the Power Meter. For system voltages above 600 volts ac use appropriate potential transformers (PTs).Refer to the labelling above terminal block TB3. Note the fusing requirements on the Wiring Diagram. (These input connections are same as the AC Power Supply Connections).

## Transfer Switch Position (J3)

This connection is used if the Digital Power Meter is connected to a transfer switch's load terminals that is closed when the transfer switch is connected to the Normal source. If used, connect an unused transfer switch auxiliary contact (Feature 14A) to the appropriate terminals marked N/E Input on the DPM J3 terminals 1 & 2. Refer to the ATS Operator's Manual and ATS wiring diagram for the location of Feature 14A contact. This connection to the DPM allows it to monitor and display the position of the transfer switch. It also allows the DPM to properly attribute Watts, VA, VARs, PF, and min./max. values to either the Normal or Emergency source. The *Source to Monitor* setting (page 3-4) must be set to *Load*.

## Ground Connection

The Power Meter is provided with a ground screw and ground wire with ring terminal (back lower left). Connect this ground wire to the inside grounded mounting stud.

When the Power Meter is mounted on an enclosure door, install a conductive strap between the enclosure and the door. This connection provides proper grounding which does not rely upon the door hinges.

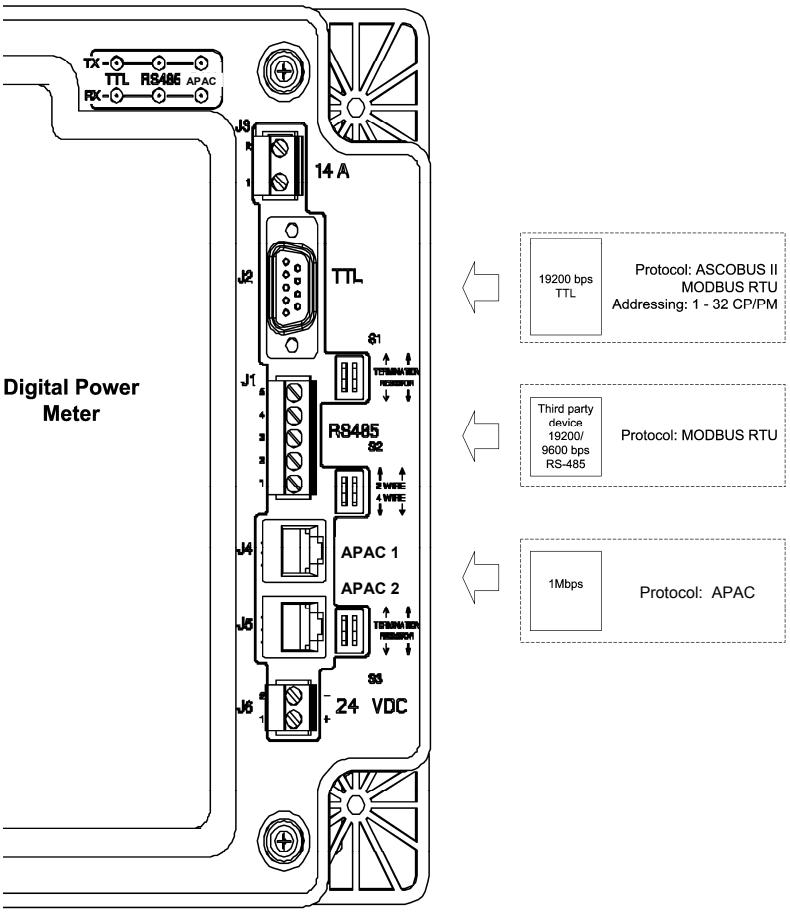
## Communication Network Connections

**RS–485 Port (J1)** - RS–485 Port is used to interface with Monitoring Systems or for networking with other Meters. J1 is used to connect the Power Meter directly to an RS–485 based communications network. Baud rates of 9600, 19200, 38400 and 57600 bps are supported on this interface.

**Accessory 72E (J2)** - Port Supports ASCObus II and serial Modbus protocols. A DB 9 female connector provides 24VDC power (max 100mA) to 5150 Connectivity Module (Acc. 72E).

The Connectivity Module (Acc. 72E) provides Ethernet access that allows user to view data from ASCO automatic transfer switches, Power Managers, and Digital Power Meters.

First, use ASCO cable 489672 (8 inch) or 489672–001 (4 foot) to connect the unit's serial communications interface connector J2 to the Acc. 72E Connectivity Module connector J2. Then, use only the recommended communication cable (see below) to connect the Acc. 72E Module to the RS-485 network. Connect the transmit and receive communication cable (twisted pairs) as shown on wiring diagrams in Appendix 1.



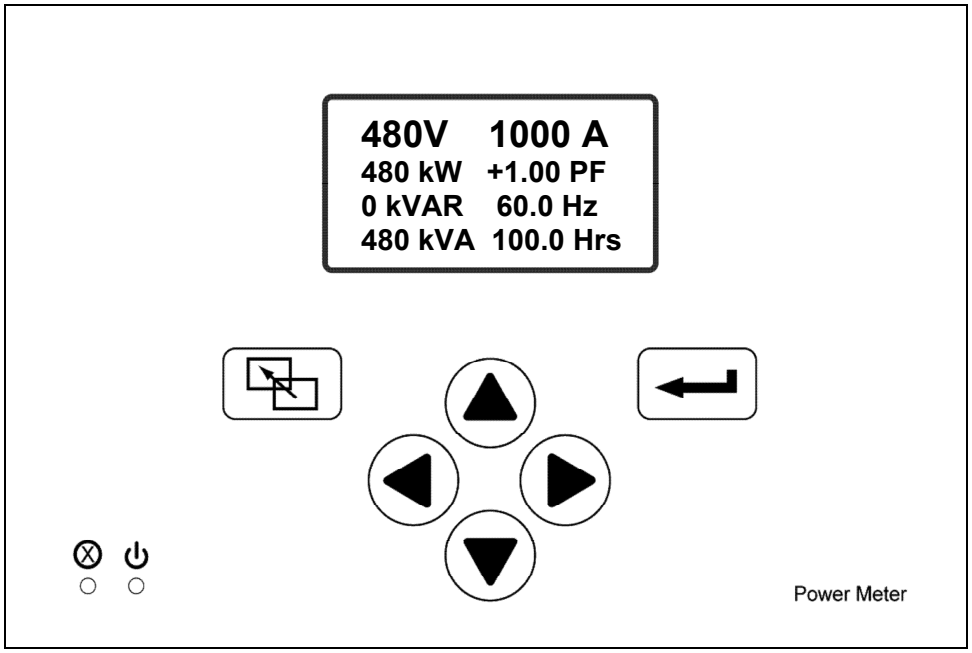

### Acceptable Communication Cable

| Type of Cable | Acceptable Manufacturer's Numbers |
|---|---|
| Standard $80^0$ C | Belden 9842, 9829, Alpha 6202C, 6222C |
| Plenum Rated | Belden 89729, 82729, Alpha 58902 |

**Accessory 72EE (J4, J5)** - Ports support the APAC interface for the Group G controller used on new Series 300 3ATS, 3ADTS, 3NTS, 3NDTS transfer switches.

## Control Overview

Six control buttons perform all monitoring and setting functions. Two levels of screens are used. The top level is the monitoring level and provides information about the power system. The lower level is the settings level. It may be necessary to enter a password to change a setting (see next page).




**Left–Right arrow key** The left and right arrow keys navigate through both levels of screens.

**Enter key** The enter key drops from the top level to the lower level settings screens. It also saves a new setting.

**Up–Down arrow keys** The up and down arrow keys modify a setting (setup parameter) while in the lower level screens.

**Escape key** The escape key ignores a change and returns to the top level.

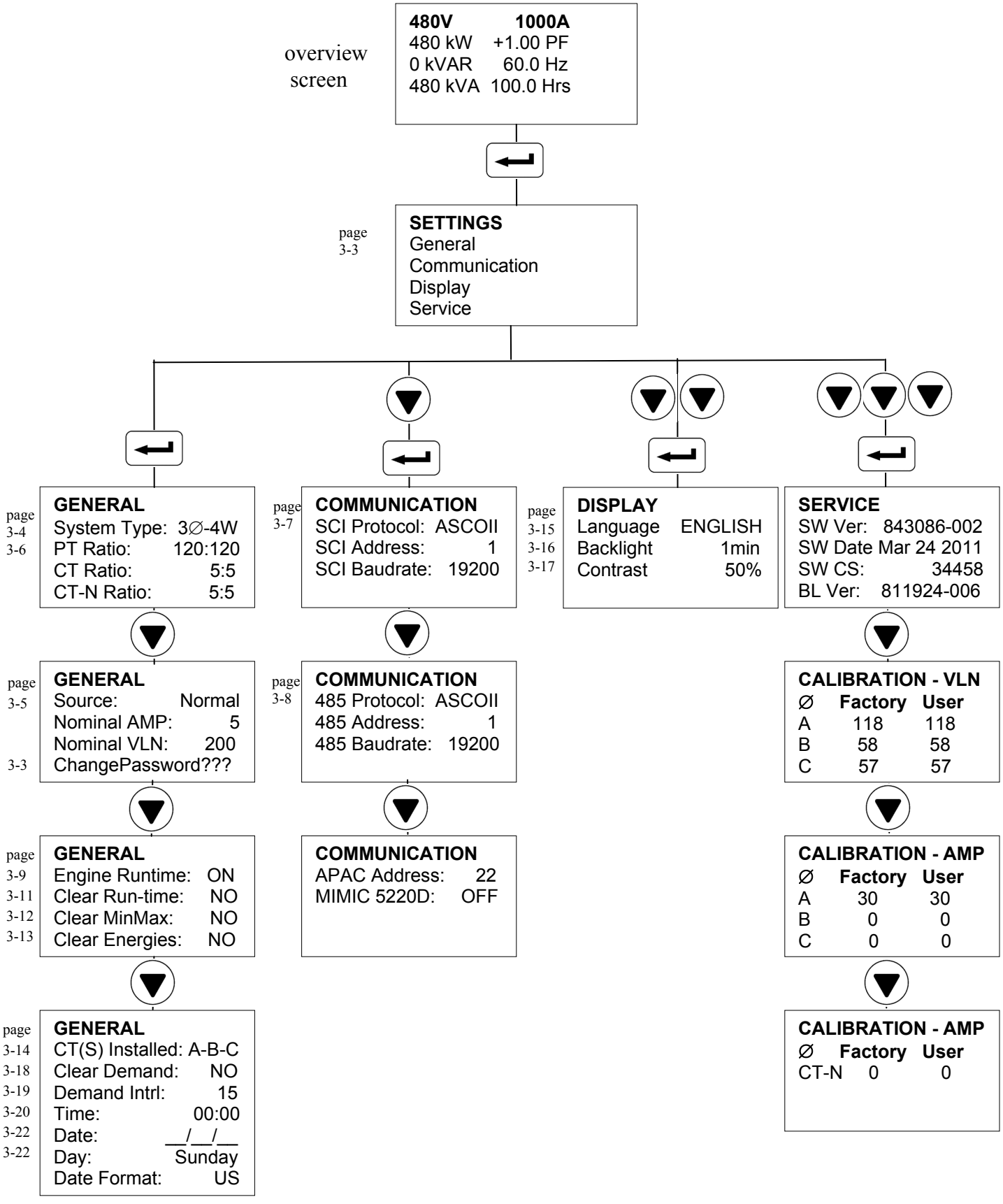
## Initial Setup

After installing the Digital Power Meter you must set these parameters:

- Password (required to change any setting)
- Type of electric system (3Ø-4W, 3Ø-3W, 1Ø-2W, 1Ø-3W)
- Source to be monitored (normal, emergency, load, other)
- Potential transformer (PT) and current transformer (CT) ratios
- Communication Port Settings
- Engine runtime(Enable or Disable)
- ATS Position (ON or OFF)
- Clear Run-time Engine Counter
- Clear Min max parameters
- Clear Energies
- CT Installed option (A, B, C or A-B-C)

If the Digital Power Meter is preinstalled as an ATS accessory, initial setup has already been done. You should set your password and clear the energy settings, however. Then go to Operation on page 4–1.

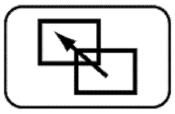
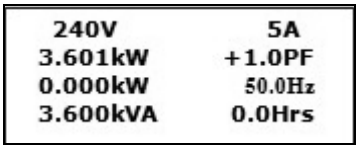
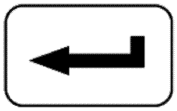
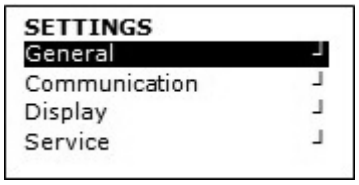
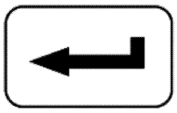
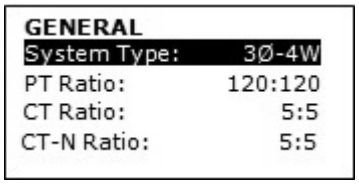
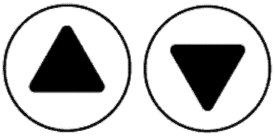
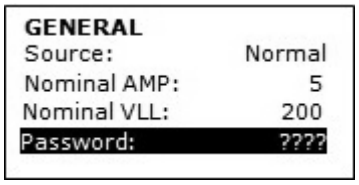
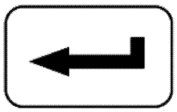
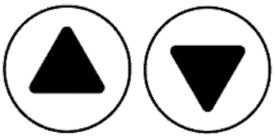
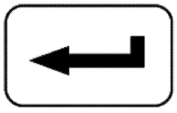
## Settings Screens Navigation



## Password Selection

NOTE: The initial password from the factory is **0000** which is the disabled password state.

The password can be alphanumeric. Select a four digit or letter password and record it here _ _ _ _
If incorrect password is entered you will see Invalid Password. Change the password as follows:

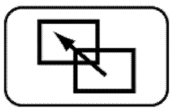
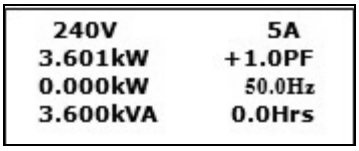
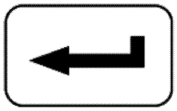
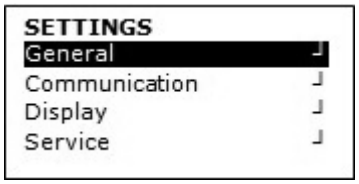
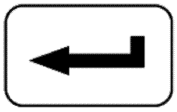
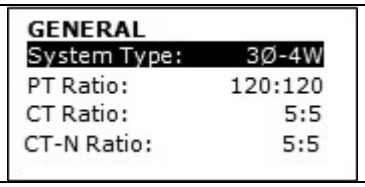
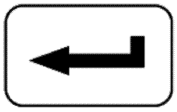
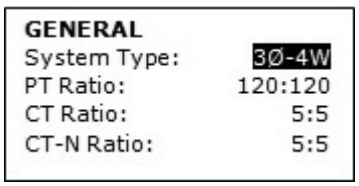
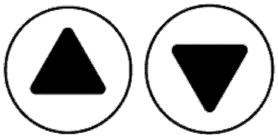
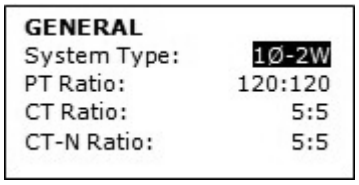
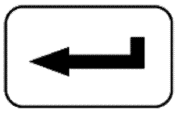
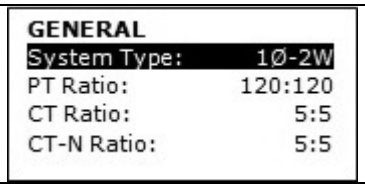
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen, if not already shown. |
| 2 |  |  | The **Settings** screen is displayed |
| 3 |  |  | Parameters under the **General** menu are shown |
| 4 |  |  | Press the up and down arrow keys until the **Password** option is highlighted. |
| 5 |  |  | Enter the old password to set a new password. The <u>first</u> digit is blinking |
| 6 |  |  | Press the up and down arrow keys until the correct <u>first</u> digit is displayed. |
| 7 |  |  | Press the right arrow key. Repeat steps 6 and 7 for the 2nd, 3rd, and 4th digits |
| 8 |  |  | In the same way (steps 6 and 7), enter the new password, then press the enter key to save it. |

Now press the  escape key to return to the top level display.

## System Type

Select the type of electrical system that the Digital Power Meter is connected to.

- 3Ø-4 Wire (WYE)
- 3Ø-3 Wire (Delta)
- 1Ø-3 Wire
- 1Ø-2 Wire

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | **System Type** is blinking. |
| 5 |  |  | Press the up and down arrow keys and select the desired **System Type**. |
| 6 |  |  | Press the enter key to save the setting. |

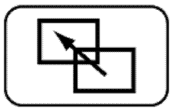
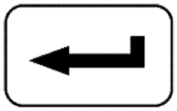
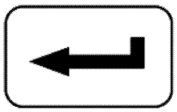
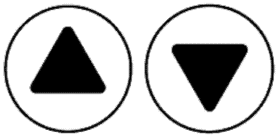
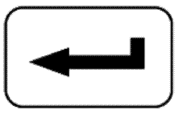
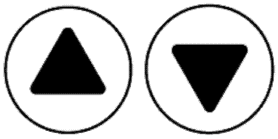
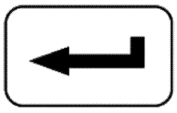
Now press the  escape key to return to the top level display.

## Source to Monitor

Select the type of power source that the Digital Power Meter (DPM) is monitoring. This setting affects the manner in which Watts, VA, VARS, PF, and Min./Max. values are displayed by attributing them to the correct source.

- **Normal** typically used when DPM is connected to the Normal source terminals of a transfer switch.
- **Emergency *** typically used when DPM is connected to the Emergency source terminals of a transfer switch.
- **Load *** typically used when DPM is connected to the load terminals of a transfer switch (N or E sources).
  To utilize this setting an auxiliary contact indicating that the transfer switch is connected to the Normal source (Feature 14A) must be connected to the Power Meter (page 2-2).
- **Other** typically used when DPM is providing monitoring of a non-specific source such as a distribution feeder.
  The effected values will be displayed without reference to a Normal or Emergency source.

* When set to ***Emergency***, the Engine Run-Time display (page 4-3) may be enabled, page 3-8.

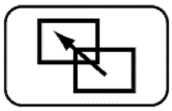
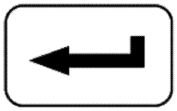
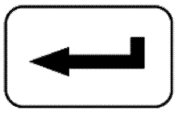
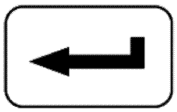
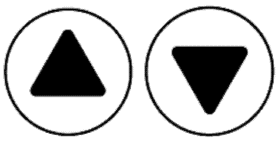
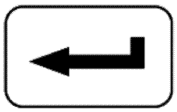
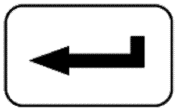
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 240V 5A<br>3.601kW +1.0PF<br>0.000kW 50.0Hz<br>3.600kVA 0.0Hrs | Displays the overview screen if not already shown. |
| 2 |  | SETTINGS<br>General<br>Communication<br>Display<br>Service | The **Settings** screen is displayed. |
| 3 |  | GENERAL<br>System Type: 3Ø-4W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Parameters under the **General** menu are shown. |
| 4 |  | GENERAL<br>Source: Normal<br>Nominal AMP: 5<br>Nominal VLN: 200<br>Change Password: ???? | Press the up and down arrow keys until the **Source** option is highlighted. |
| 5 |  | GENERAL<br>Source: Normal<br>Nominal AMP: 5<br>Nominal VLN: 200<br>Change Password: ???? | **Source** is blinking. |
| 6 |  | GENERAL<br>Source: Emergency<br>Nominal AMP: 5<br>Nominal VLN: 200<br>Change Password: ???? | Press the up and down arrow keys and select the desired **Source** mode. |
| 7 |  | GENERAL<br>Source: Emergency<br>Nominal AMP: 5<br>Nominal VLN: 200<br>Change Password: ???? | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## PT and CT Ratios

Select the ratios for the Potential Transformers (PTs) and Current Transformers (CTs) connected to the DPM as follows:

- **PT Ratios** based on system voltage, ratio is __:120, max. is 28200:120 (up to 600 V direct input use 120:120)
- **CT Ratios** based on ampere rating, ratio is __:5, adjustable from 5 to 55000 amperes in 5 ampere increments
- **CT-N Ratio** based on ampere rating, ratio is __:5, adjustable from 5 to 55000 or *OFF*.
  The use of a current transformer on the neutral conductor is optional. Setting to *OFF* when not used will remove the CT-N value from the display when viewing the phase voltage and currents, page 4-2.

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 240V 5A<br>3.601kW +1.0PF<br>0.000kW 50.0Hz<br>3.600kVA 0.0Hrs | Displays the overview screen if not already shown. |
| 2 |  | SETTINGS<br>General<br>Communication<br>Display<br>Service | The **Settings** screen is displayed. |
| 3 |  | GENERAL<br>System Type: 1Ø-2W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Press the up and down arrow keys until the **PT Ratio** option is highlighted. |
| 4 |  | GENERAL<br>System Type: 1Ø-2W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | **PT Ratio** is blinking. |
| 5 |  | GENERAL<br>System Type: 1Ø-2W<br>PT Ratio: 200:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Press the up and down arrow keys and select the desired PT Ratio. |
| 6 |  | GENERAL<br>System Type: 1Ø-2W<br>PT Ratio: 200:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Press the enter key to save the setting. |
| 7 |  | GENERAL<br>System Type: 1Ø-2W<br>PT Ratio: 200:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Repeat steps 5 and 6 for the **CT Ratio** and **CT-N Ratio** . |

Now press the  escape key to return to the top level display.

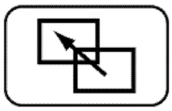
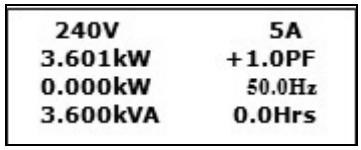
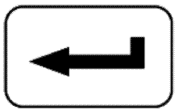
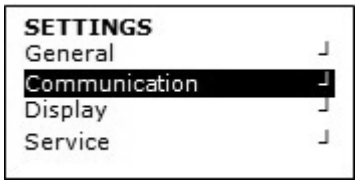
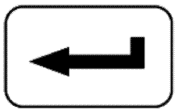
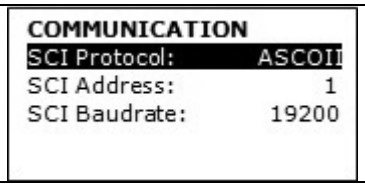
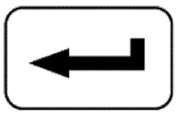
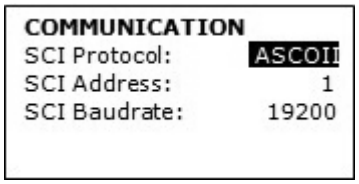
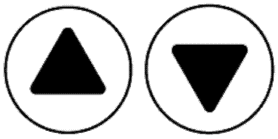
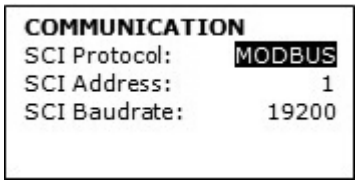
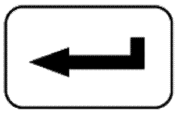
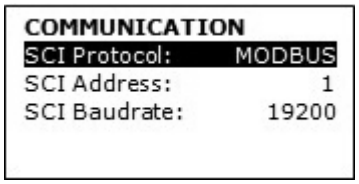
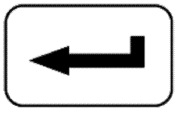
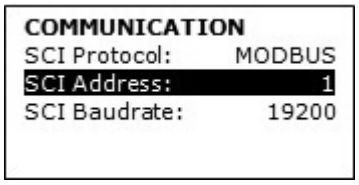
## Serial Communication Interface (SCI) port J2

If the Digital Power Meter is connected to a communications network via the SCI (J2) port, select the appropriate protocol, baud rate, and address for the port as follows:

**Protocol**

- **ASCOII** – Enters the Digital Power Meter in an ASCO emulation mode when used on ASCO ATSs and *PowerQuest* devices.
- **Modbus RTU**– Choose this selection when the Digital Power Meter is to be used on a network that communicates via the Modbus RTU protocol. Contact ASCO Power Technologies to obtain a document detailing the corresponding Modbus protocol Register map definitions.

**Baud Rate** 9600 or 19200 bps **Address** 1–239 (unique for each Digital Power Meter)

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. Press the up and down arrow keys until the **Communication** option is highlighted. |
| 3 |  |  | Press the up and down arrow keys until the **SCI Protocol** option is highlighted |
| 4 |  |  | **SCI Protocol** is blinking. |
| 5 |  |  | Press the up and down arrow keys and select the desired protocol. |
| 6 |  |  | Press the enter key to save the setting. |
| 7 |  |  | Repeat steps 5 and 6 for the **SCI Address** and **SCI Baud Rate**. |

Now press the  escape key to return to the top level display.

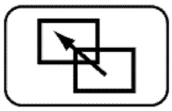
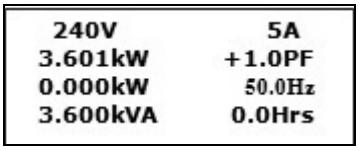
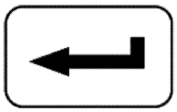
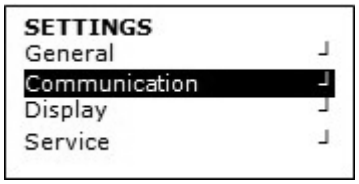
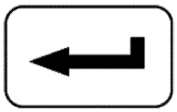
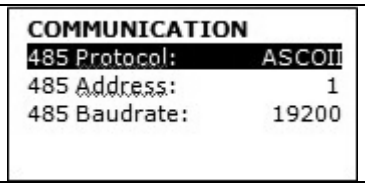
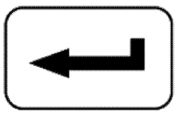
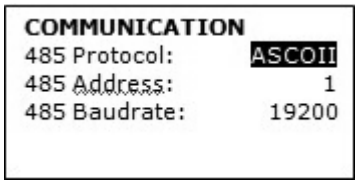
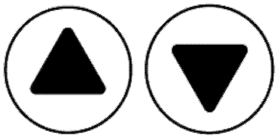
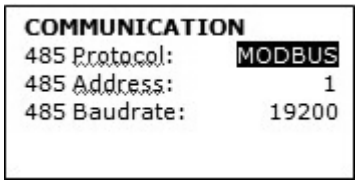
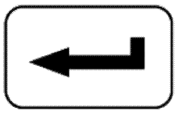
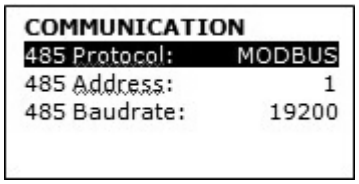
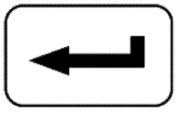
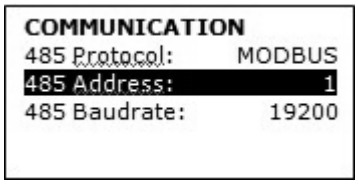
## RS485 Serial Communication Interface port J1

If the Digital Power Meter is connected to a communications network via the RS485 (J1) port, select the appropriate protocol, baud rate, and address for the port as follows:

**Protocol**

- **ASCOII** – Enters the Digital Power Meter in an ASCO I/O Module emulation mode when used on ASCO ATSs and *PowerQuest* devices.
- **Modbus RTU**– Choose this selection when the Digital Power Meter is to be used on a network that communicates via the Modbus RTU protocol. Contact ASCO Power Technologies to obtain a document detailing the corresponding Modbus protocol Register map definitions.

**Baud Rate** 9600, 19200, 38400, 57600 bps **Address** 1–239 (unique for each Digital Power Meter)

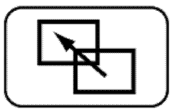
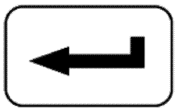
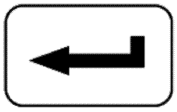
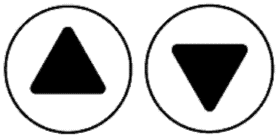
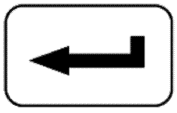
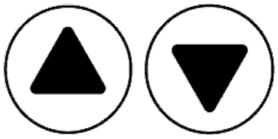
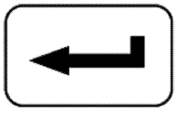
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. Press the up and down arrow keys until the **Communication** option is highlighted. |
| 3 |  |  | Press the up and down arrow keys until the **485 Protocol** option is highlighted. |
| 4 |  |  | **485 Protocol** is blinking. |
| 5 |  |  | Press the up and down arrow keys and select the desired protocol. |
| 6 |  |  | Press the enter key to save the setting. |
| 7 |  |  | Repeat steps 5 and 6 for the **485 Address** and **485 Baud Rate**. |

Now press the  escape key to return to the top level display.

## Engine Runtime Counter

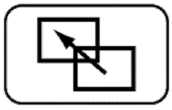
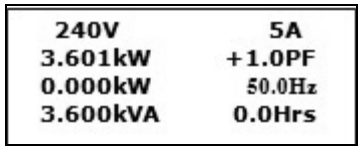
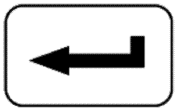
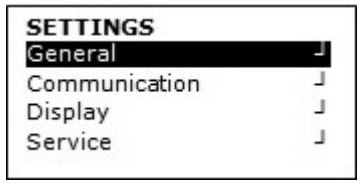
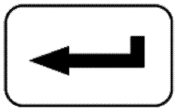
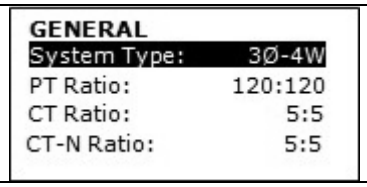
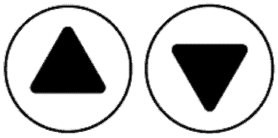
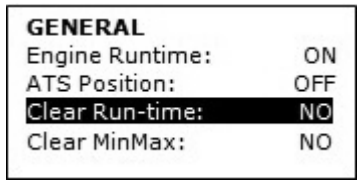
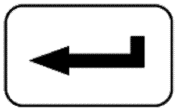
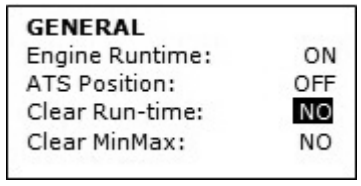
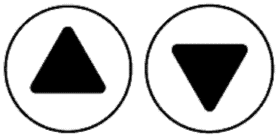
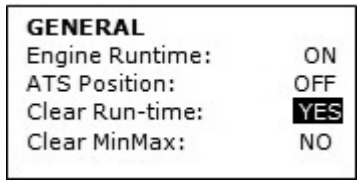
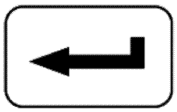
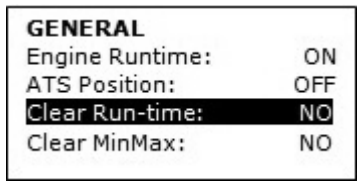
When the **Engine Runtime** setting is set to *ON* and the Emergency source is monitored, the *Engine Run-time* display, page 4-3, will provide totalized hours of engine operation. For the Engine Run-Time display to be operational the Digital Power Meter (DPM) must be used as follows:

- **DPM connected to the Emergency source terminals of a transfer switch**
  Engine Runtime setting must be set to *ON*, Source to Monitor setting, page 3-4, must be set to *ON*
  In this case the Runtime hours are totalized whenever at least 70 V L-L is present on the Voltage Inputs (TB1).
- **DPM connected to the Load terminals of a transfer switch**
  Engine Runtime setting must be set to *ON*, Source to Monitor setting, page 3-4, must be set to *Load.*
  The *ATS Position*, page 3-9, must be set to *ON* and an auxiliary contact from the transfer switch must be connected to the DPM, page 2-2.

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 240V 5A<br>3.601kW +1.0PF<br>0.000kW 50.0Hz<br>3.600kVA 0.0Hrs | Displays the overview screen if not already shown. |
| 2 |  | SETTINGS<br>General<br>Communication<br>Display<br>Service | The **Settings** screen is displayed. |
| 3 |  | GENERAL<br>System Type: 3Ø-4W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Parameters under the **General** menu are shown. |
| 4 |  | GENERAL<br>Engine Runtime: OFF<br>ATS Position: ON<br>Clear Run-time: NO<br>Clear MinMax: NO | Press the up or down arrow keys until the **Engine Run Time** option is highlighted. |
| 5 |  | GENERAL<br>Engine Runtime: OFF<br>ATS Position: ON<br>Clear Run-time: NO<br>Clear MinMax: NO | **Engine Run Time** is blinking. |
| 6 |  | GENERAL<br>Engine Runtime: ON<br>ATS Position: ON<br>Clear Run-time: NO<br>Clear MinMax: NO | Press the up or down arrow keys and select **ON**. |
| 7 |  | GENERAL<br>Engine Runtime: ON<br>ATS Position: ON<br>Clear Run-time: NO<br>Clear MinMax: NO | Press the enter key to save the setting. |

## Clear Engine Runtime Counter

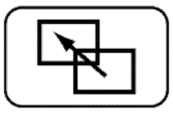
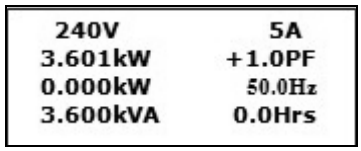
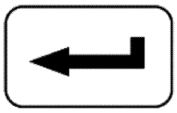
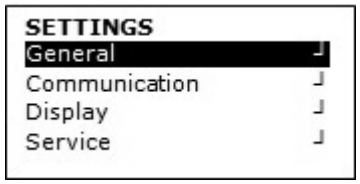
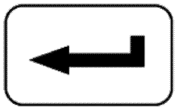
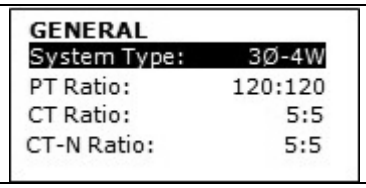
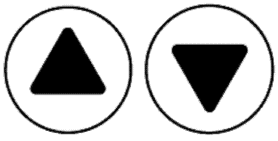
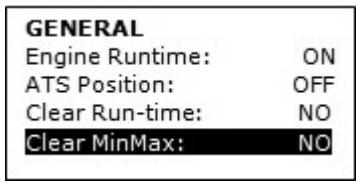
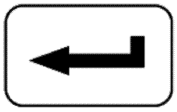
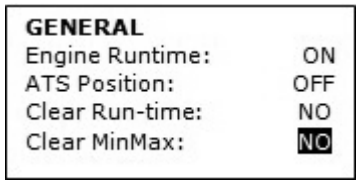
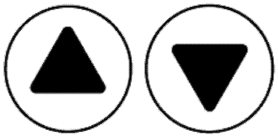
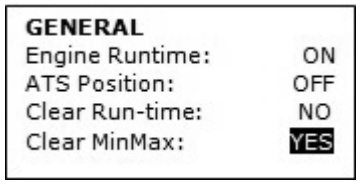
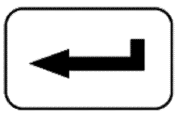
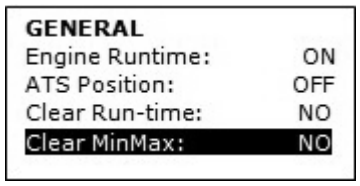
The Engine Runtime Counter can be reset as follows

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until the **Clear Run Time** option is highlighted. |
| 5 |  |  | **Clear Run Time NO** is blinking. |
| 6 |  |  | Press the up and down arrow keys and select **YES**. |
| 7 |  |  | The run time counter will be cleared and **NO** is shown again. |

Now press the  escape key to return to the top level display.

## Clear Min Max Parameters

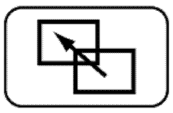
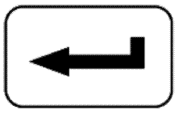
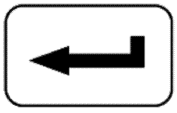
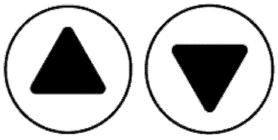
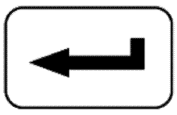
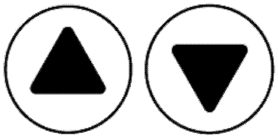
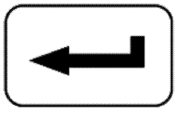
The Digital Power Meter maintains a record of minimum and maximum of various parameters since the last CLEAR Operation. These records can be cleared as follows:

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until the **Clear MinMax** option is highlighted. |
| 5 |  |  | **Clear MinMax NO** is blinking. |
| 6 |  |  | Press the up and down arrow keys and select **YES**. |
| 7 |  |  | The min max parameters will be cleared and **NO** is shown again |

Now press the  escape key to return to the top level display.

## Clear Energies

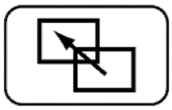
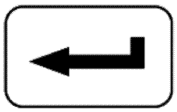
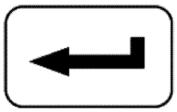
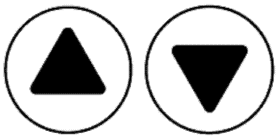
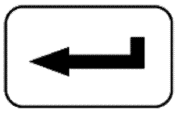
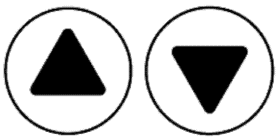
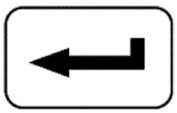
The energy registers include values for kWh (kilowatt hours) and kVARh (kiloVAR hours), both displayed as shown on page 4-2. These registers are updated on approximately one second intervals and stored into non-volatile (EEPROM) memory storage on 15 minute intervals. Clear the energy registers in non-volatile memory as follows:

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 240V 5A<br>3.601kW +1.0PF<br>0.000kW 50.0Hz<br>3.600kVA 0.0Hrs | Displays the overview screen if not already shown |
| 2 |  | SETTINGS<br>General<br>Communication<br>Display<br>Service | The **Settings** screen is displayed |
| 3 |  | GENERAL<br>System Type: 3Ø-4W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Parameters under the **General** menu are shown. |
| 4 |  | GENERAL<br>Clear Energies: NO<br>CT(S) Installed: A-B-C | Press the up and down arrow keys until the **Clear Energies** option is highlighted. |
| 5 |  | GENERAL<br>Clear Energies: NO<br>CT(S) Installed: A-B-C | **Clear Energies** **NO** is blinking. |
| 6 |  | GENERAL<br>Clear Energies: YES<br>CT(S) Installed: A-B-C | Press the up and down arrow keys and select **YES**. |
| 7 |  | GENERAL<br>Clear Energies: NO<br>CT(S) Installed: A-B-C | The Energies will be cleared and **NO** is shown again. |

Now press the  escape key to return to the top level display.

## CT(s) Installed Option

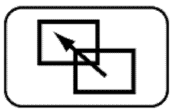
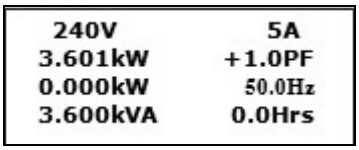
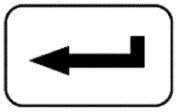
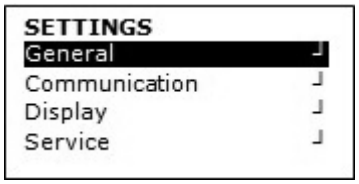
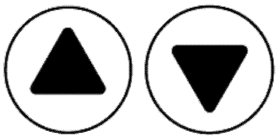
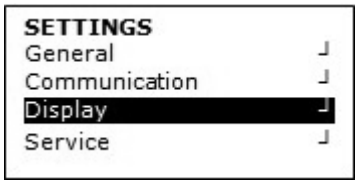
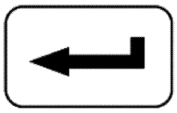
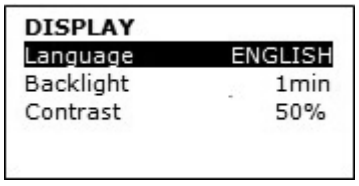
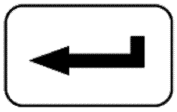
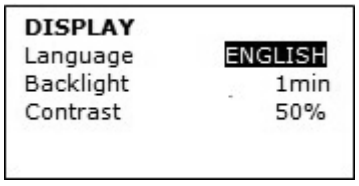
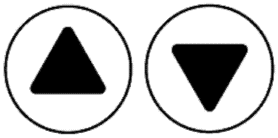
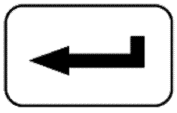
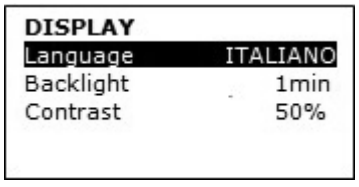
The *CT(s) Installed* setting is only displayed when the *System Type* setting, page 3-3, is set to 3∅-3W or3∅-4W. This setting is required for the Digital Power Meter to correctly display measured and calculated electrical values by indicating which phases have current transformers installed.
Typical three phase systems have three current transformers (one per phase). Alternatively, a single current transformer may be installed on a user selected conductor when balanced loads are present on the three phase system being monitored. The CT(s) Installed setting must be set to indicate the phase(s) that current transformers are installed on as follows: *A-B-C* for typical three phase systems with unbalanced loads, or *A*, *B*, or *C* for three phase systems with balanced loads.

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 240V 5A<br>3.601kW +1.0PF<br>0.000kW 50.0Hz<br>3.600kVA 0.0Hrs | Displays the overview screen if not already shown. |
| 2 |  | SETTINGS<br>General<br>Communication<br>Display<br>Service | The **Settings** screen is displayed. |
| 3 |  | GENERAL<br>System Type: 3Ø-4W<br>PT Ratio: 120:120<br>CT Ratio: 5:5<br>CT-N Ratio: 5:5 | Parameters under the **General** menu are shown. |
| 4 |  | GENERAL<br>Clear Energies: YES<br>CT(S) Installed: A-B-C | Press the up and down arrow keys until the **CT(s) Installed** option is highlighted. |
| 5 |  | GENERAL<br>Clear Energies: YES<br>CT(S) Installed: A-B-C | **CT(s) Installed** option is blinking. |
| 6 |  | GENERAL<br>Clear Energies: YES<br>CT(S) Installed: A | Press the up and down arrow keys and select the desired option. |
| 7 |  | GENERAL<br>CT(S) Installed: A | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## Language Selection

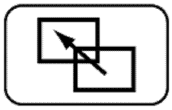
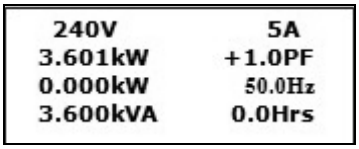
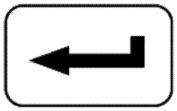
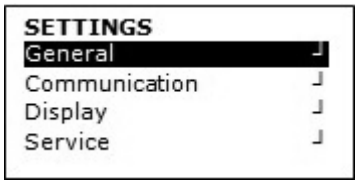
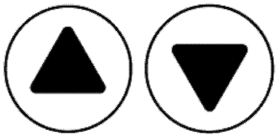
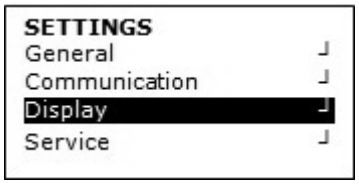
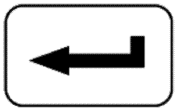
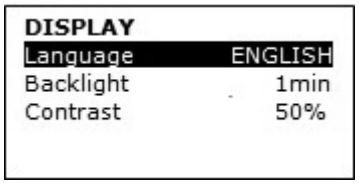
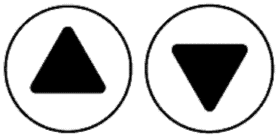
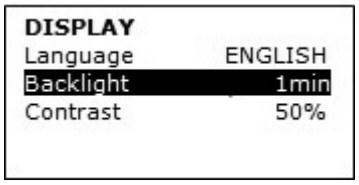
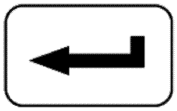
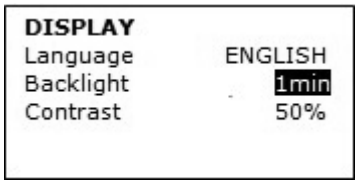
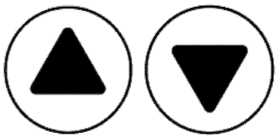
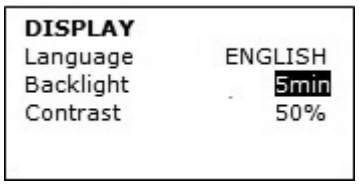
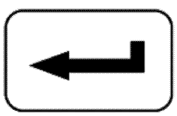
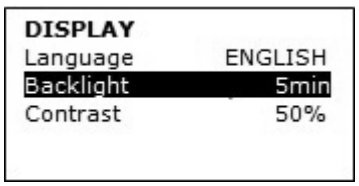
The Digital Power Meter supports English, Spanish, Italian, French, German, Portuguese, Russian, Korean, and Chinese languages for display of screens and Menu Navigation in its normal runtime. The required language can be selected by navigating to the Display Settings Menu.

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Press the up and down arrow keys until **Display** is highlighted. |
| 4 |  |  | Select the **Language** option. |
| 5 |  |  | **Language** option is blinking. |
| 6 |  |  | Press the up and down arrow keys and select the desired language option. |
| 7 |  |  | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## Backlight Time Selection

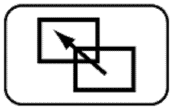
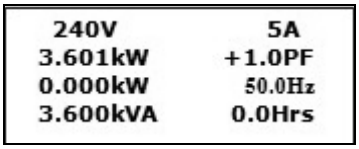
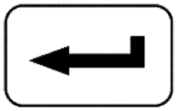
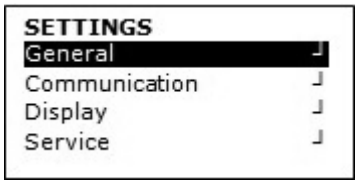
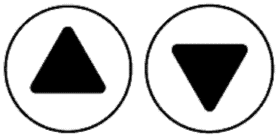
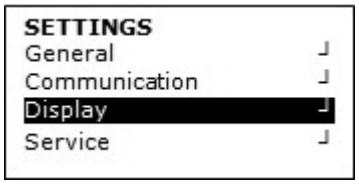
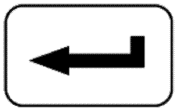
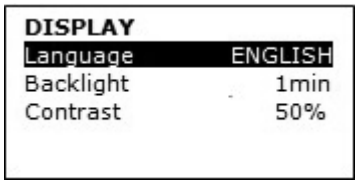
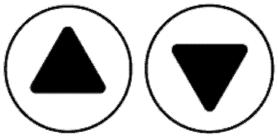
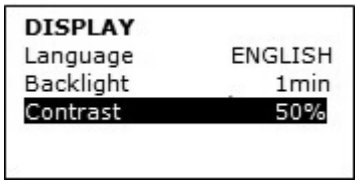
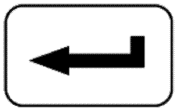
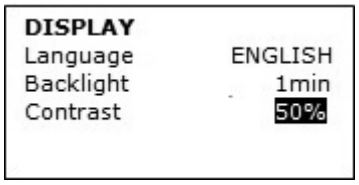
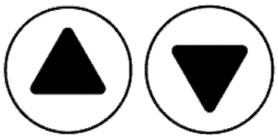
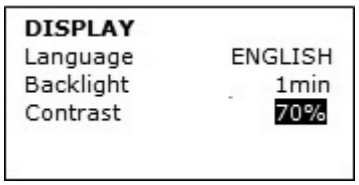
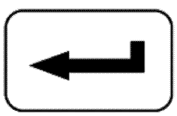
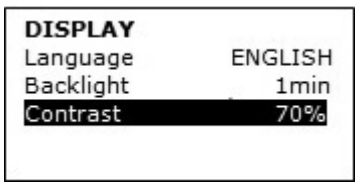
The Backlighting setting determines the length of time the display backlight stays on when the Digital Power Meter is unattended (no key activity). Select OFF, ON (continuous), or 1 to 1999 minutes. Set Backlighting as follows:

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the Overview Screen if not already shown |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Press the up and down arrow keys until **Display** is highlighted. |
| 4 |  |  | Press the up and down arrow keys until **Backlight** is highlighted. |
| 5 |  |  | Select the **Backlight** option. |
| 6 |  |  | **Backlight** option is blinking. |
| 7 |  |  | Press the up and down arrow keys and select the desired option. |
| 8 |  |  | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## Contrast Selection

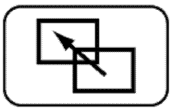
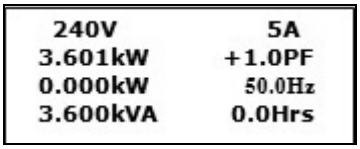
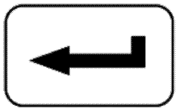
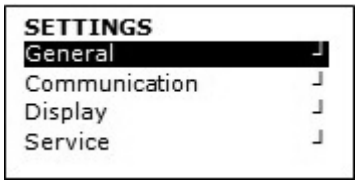
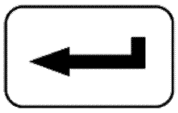
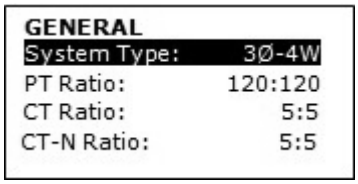
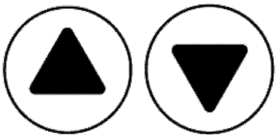
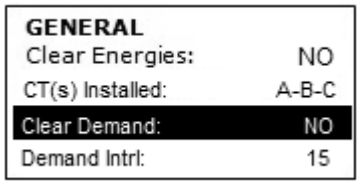
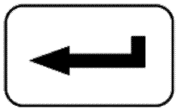
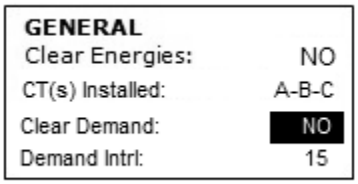
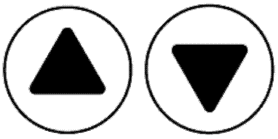
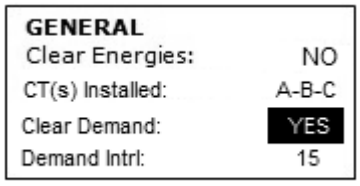
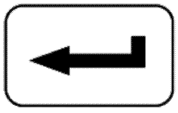
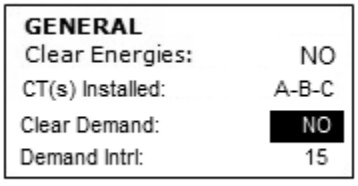
The Digital Power Meter allows configuration of Contrast percentage of the LCD Display. The Contrast can be set to a value between 0 and 100 in steps of 10. Contrast can be configured by navigating to the Display Settings Menu.

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Press the up and down arrow keys until **Display** is highlighted. |
| 4 |  |  | Press the up and down arrow keys until **Contrast** is highlighted. |
| 5 |  |  | Select the **Contrast** option. |
| 6 |  |  | **Contrast** option is blinking. |
| 7 |  |  | Press the up and down arrow keys and select the desired percentage. |
| 8 |  |  | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## Clear Demand Option

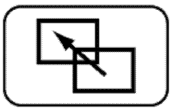
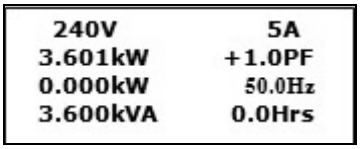
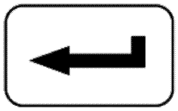
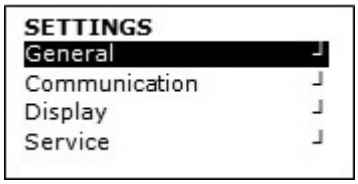
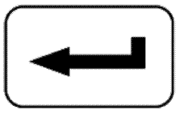
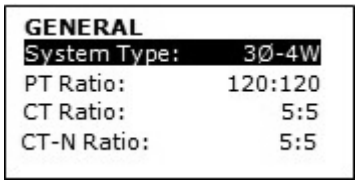
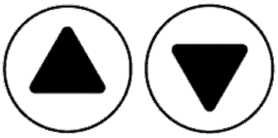
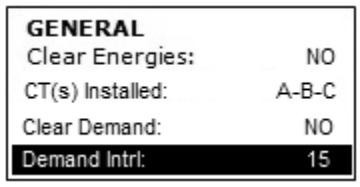
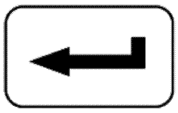
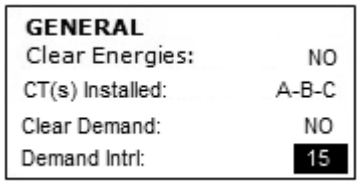
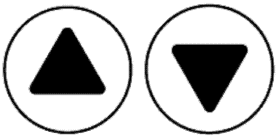
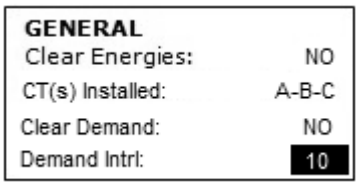
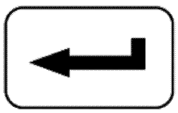
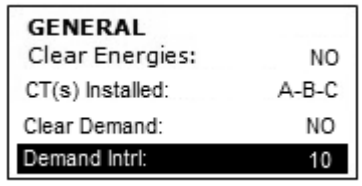
The Digital Power Meter has an option to clear the current instantaneous demand (instantaneous power) and maximum demand (YES/NO) for that particular month. This option can be set as follows:

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until **Clear Demand** is highlighted. |
| 5 |  |  | **Clear Demand NO** is blinking. |
| 6 |  |  | Press the up and down arrow keys and select **YES**. |
| 7 |  |  | Press the enter key. The Demand will be cleared and **NO** is shown again. |

Now press the  escape key to return to the top level display.

## Demand Interval Option

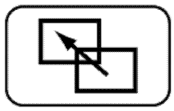
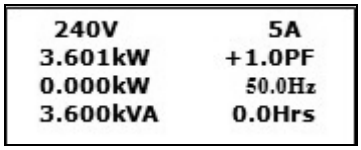
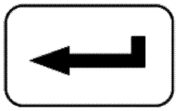
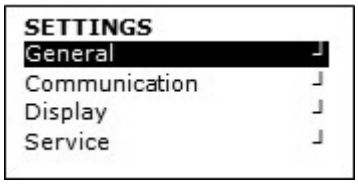
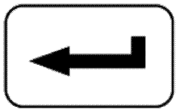
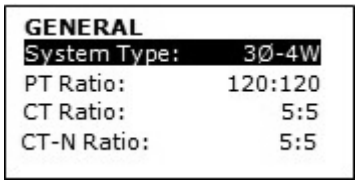
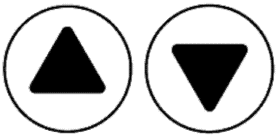
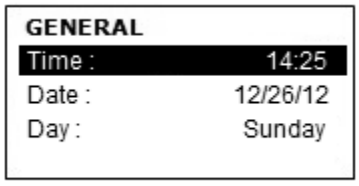
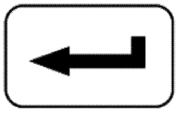
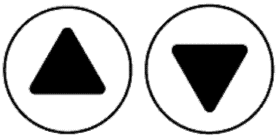
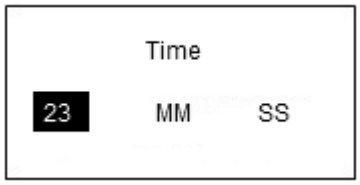
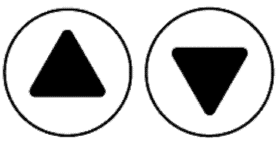
The Digital Power Meter has an option to configure the Demand Integration period (1 to 15). This option can be set as follows:

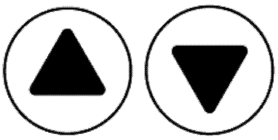
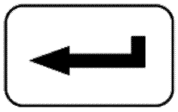
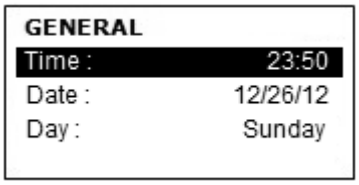
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until **Demand Intrl** is highlighted. |
| 5 |  |  | **Demand Intrl 15** is blinking. |
| 6 |  |  | Press the up and down arrow keys and select the desired interval. |
| 7 |  |  | Press the enter key to save the setting. |

Now press the  escape key to return to the top level display.

## Time Option

The Digital Power Meter has an option to configure the real time clock time setting. This option can be set as follows:

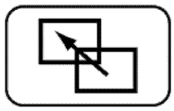
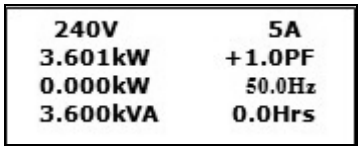
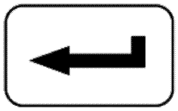
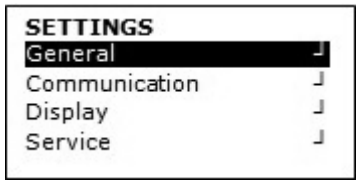
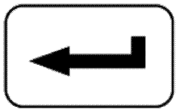
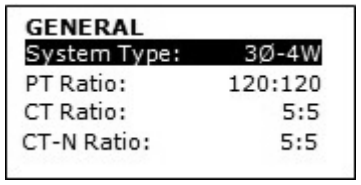
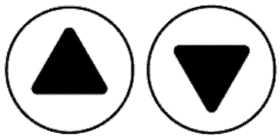
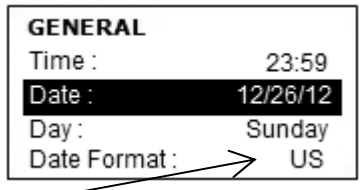
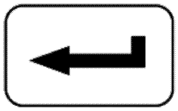
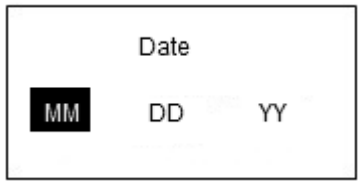
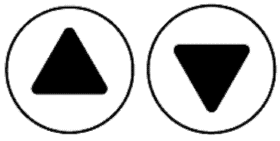
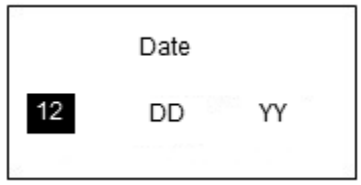
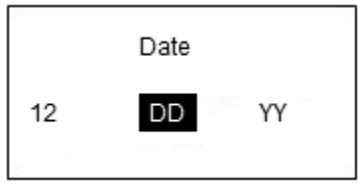
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until **Time** is highlighted. |
| 5 |  |  | **HH** (hours) is blinking. |
| 6 |  |  | Press the up and down arrow keys and select the current hour. |
| 7 |  |  | Press the right arrow key. **MM** (minutes) is blinking. |
| 8 |  |  | Press the up and down arrow keys and select the current minute. |

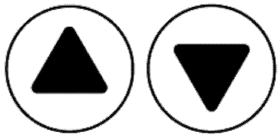
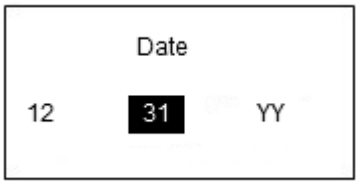
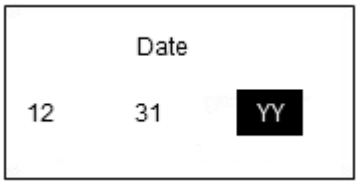
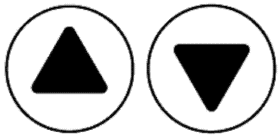
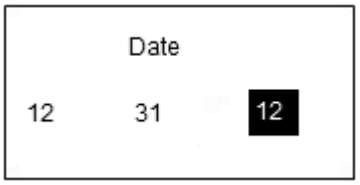
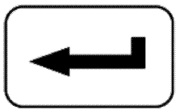
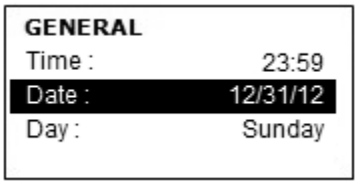
| | | | |
|---|---|---|---|
| 9 |  |  | Press the right arrow key. **SS** (seconds) is blinking. |
| 10 |  |  | Press the up and down arrow keys and select the current second. |
| 11 |  |  | Press the enter key to save the time setting. |

Now press the  escape key to return to the top level display.

## Date Option

The Digital Power Meter has an option to configure the real time clock date setting. This option can be set as follows:

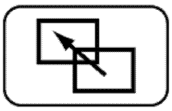
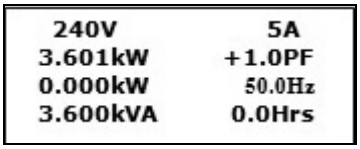
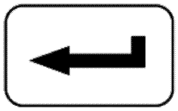
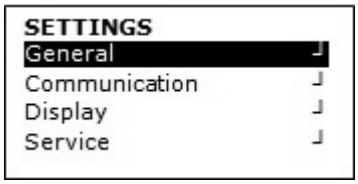
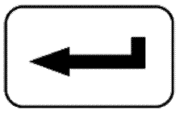
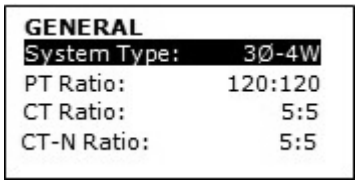
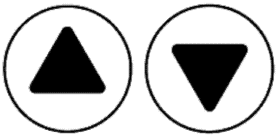
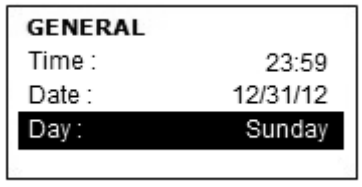
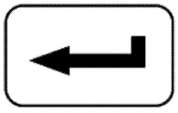
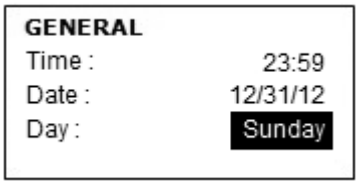
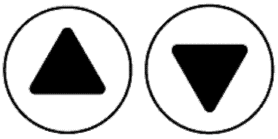
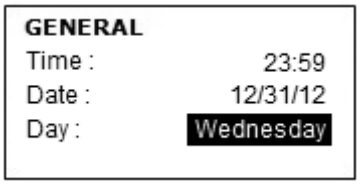
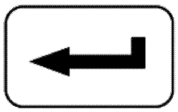
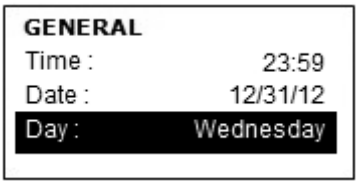
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until **Date** is highlighted. |
| **Date Format** can be set for **US** (MM DD YY), **EU** (DD MM YY), or **ISO** (YY MM DD). The setting process is similar but in different month, day, year order. US format is shown here. | | | |
| 5 |  |  | **MM** (month) is blinking. |
| 6 |  |  | Press the up and down arrow keys and select the current month. |
| 7 |  |  | Press the right arrow key. **DD** (day of the month) is blinking. |

| | | | |
|---|---|---|---|
| 8 |  |  | Press the up and down arrow keys and select the current day of the month. |
| 9 |  |  | Press the right arrow key. **YY** (year) is blinking. |
| 10 |  |  | Press the up and down arrow keys and select the current year (last two digits). |
| 11 |  |  | Press the enter key to save the date setting. |

Now press the  escape key to return to the top level display.

## Day of the Week Option

The Digital Power Meter has an option to configure the real time clock day of the week setting. This option can be set as follows:

| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  |  | Displays the overview screen if not already shown. |
| 2 |  |  | The **Settings** screen is displayed. |
| 3 |  |  | Parameters under the **General** menu are shown. |
| 4 |  |  | Press the up and down arrow keys until **Day** is highlighted. |
| 5 |  |  | The day of the week is blinking. |
| 6 |  |  | Press the up and down arrow keys and select the current day of the week. |
| 11 |  |  | Press the enter key to save the date of the week setting. |

Now press the  escape key to return to the top level display.

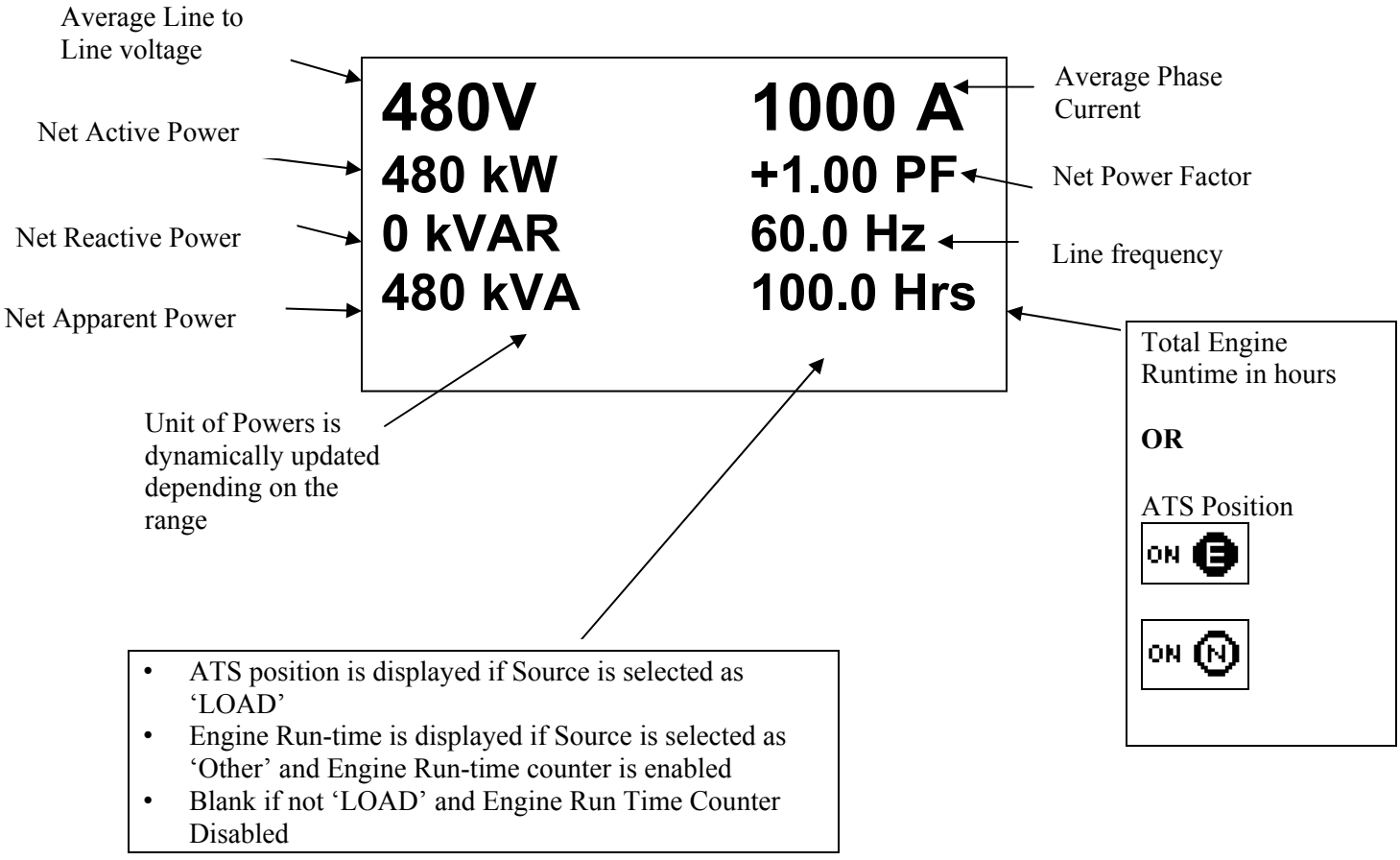
## Operation

From the top level display the Digital Power Meter can show the following information about the electrical power system:

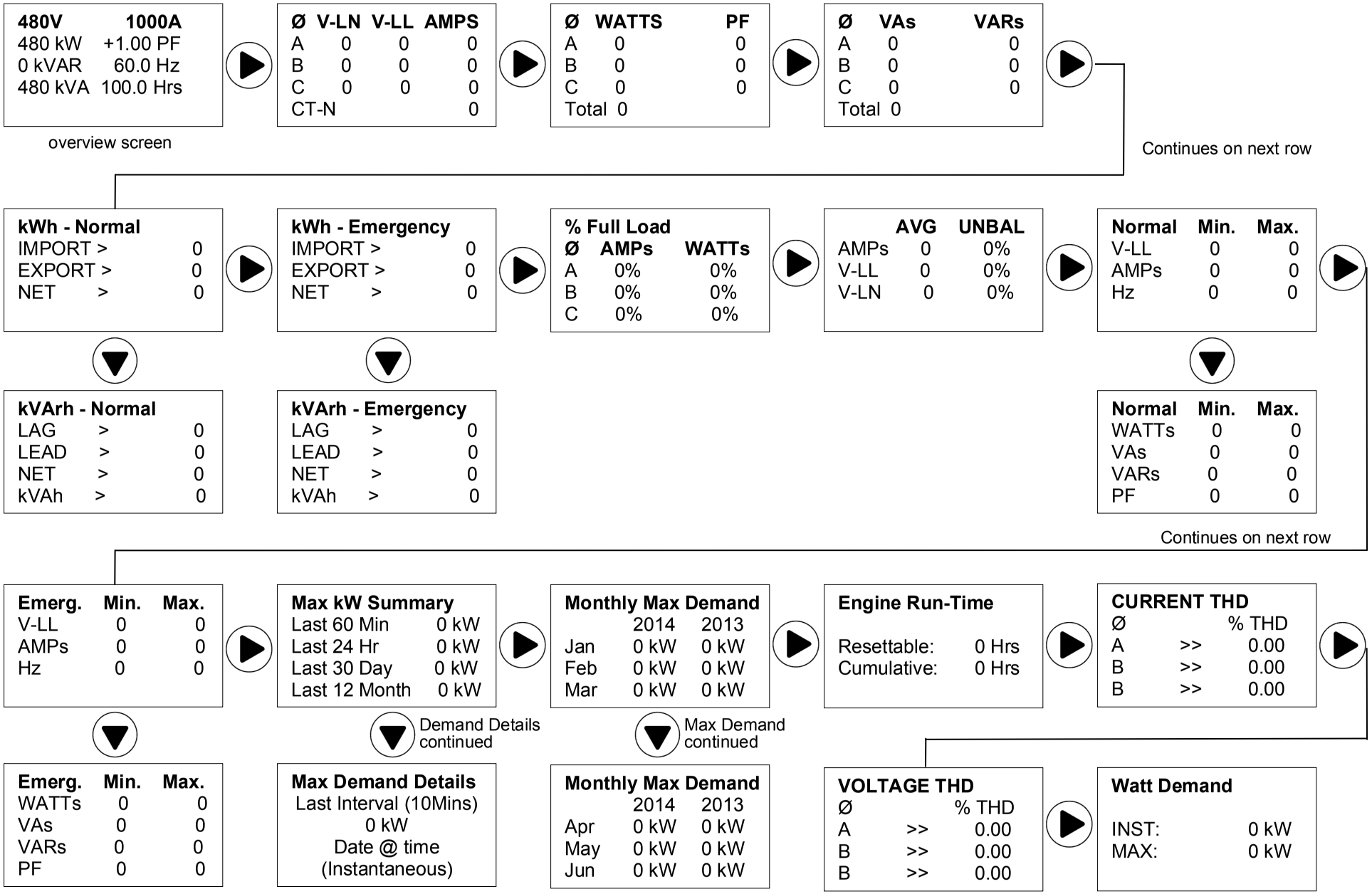
- System totals (kW, kVAR, kVA, PF, Hz, position of ATS)
- Current and Voltage (line–to–neutral & line–to–line) – all phases
- Power (kW), kVARs, kVA, & PF (power factor) – all phases
- Average current & voltage (line–to–neutral & line–to–line)
- Unbalance % amps & voltage (line–to–neutral & line–to–line)
- Neutral current (if neutral is connected to Digital Power Meter)
- kW hours (imp, exp, net) for Normal & Emergency sources
- kVAR hours (lag, lead, net) for Normal & Emergency sources

Data is updated approximately every second.

As the default screen, the following screen shows the overview of the system

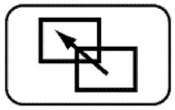


## Operation Screens Navigation



Following are the screens for a 3Ø, 4–Wire wye system and monitored source is Load. Engine Runtime Counter is assumed to be ON and ATS Position is assumed to be OFF. Screens may be different for other electrical systems or other monitored sources.

NOTE: The values of various parameters in the following screens are only for demonstrative purpose and do not reflect the actual calculations.

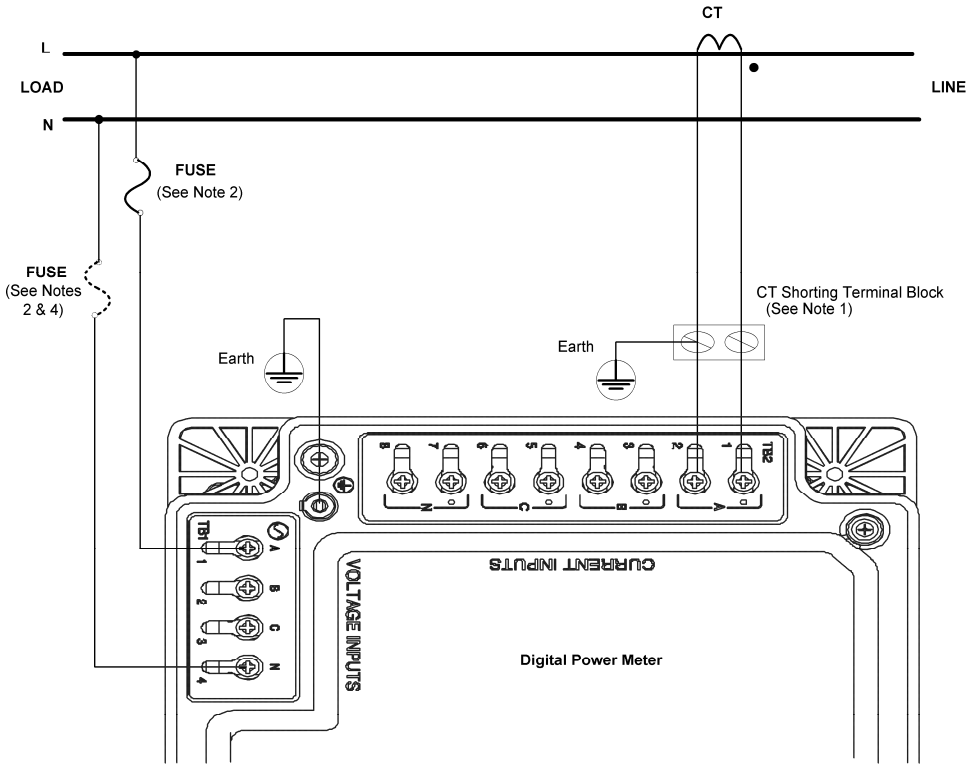
| Step | Press | Display Shows | Comment |
|---|---|---|---|
| 1 |  | 480V 2000A<br>2880kW +1.00PF<br>0kVAr 50.5Hz<br>2880kVA 0.0Hrs | Overview screen shows V, A, kW, PF, kVAR, kVA, Hz, generator hours, and ATS position. |
| 2 |  | Ø V-LN V-LL AMPS<br>A 59.9k 59.9k 29.9k<br>B 59.9k 59.9k 29.9k<br>C 59.9k 59.9k 29.9k<br>CT-N 29.9k | Shows voltage (line to neutral, line to line) and current on all phases. |
| 3 |  | Ø WATTs PF<br>A 0.000k 0.00<br>B 0.000k 0.00<br>C 0.000k 0.00<br>Total 0.000k | Shows active power (kW) and power factor (PF) on all phases and total. |
| 4 |  | Ø VAs VARs<br>A 0.000k 0.000k<br>B 0.000k 0.000k<br>C 0.000k 0.000k<br>Total 0.000k 0.000k | Shows apparent (VA) and reactive power (VAR) on all phases and total. |
| 5 |  | kWh - Normal<br>IMPORT > 0.000<br>EXPORT > 0.000<br>NET > 0.000 | Shows the power usage (kWH) imported, exported, and total for the normal source. |
| 6 |  | kVArh - Normal<br>LAG > 0.000<br>LEAD > 0.000<br>NET > 0.000<br>kVAh > 0.000 | Shows Reactive and Apparent Energy for the normal source |
| 7 |  | kWh - Emergency<br>IMPORT > 0.000<br>EXPORT > 0.000<br>NET > 0.000 | Shows the power usage (kWH) imported, exported, and total for the emergency source. |
| 8 |  | kVArh - Emergency<br>LAG > 0.000<br>LEAD > 0.000<br>NET > 0.000<br>kVAh > 0.000 | Reactive and Apparent Energy for Emergency Source |

| | | | |
|---|---|---|---|
| 9 |  | **% Full Load**<br>Ø AMPs WATTs<br>A 0% 0%<br>B 0% 0%<br>C 0% 0% | % Full Load |
| 10 |  | AVG UNBAL<br>AMPs 0.0 0%<br>V-LL 0 0%<br>V-LN 0 0% | Shows average current and voltage (line to line, line to neutral) and percent unbalanced. |
| 11 |  | **Normal Min. Max.**<br>V-LL 0 0<br>AMPs 0 0<br>Hz 0 0 | Shows the minimum and maximum voltage, current, and frequency for the normal source. |
| 12 |  | **Normal Min. Max.**<br>WATTs 0 0<br>VAs 0 0<br>VARs 0 0<br>PF 0.00 0.00 | Shows the minimum and maximum kW, VA, VAR, and PF for the normal source. |
| 13 |  | **Emerg. Min. Max.**<br>V-LL 0 0<br>AMPs 0 0<br>Hz 0 0 | Shows the minimum and maximum voltage, current, and frequency for the emergency source. |
| 14 |  | **Emerg. Min. Max.**<br>WATTs 0 0<br>VAs 0 0<br>VARs 0 0<br>PF 0.00 0.00 | Shows the minimum and maximum kW, VA, VAR, and PF for the emergency source. |
| 15 |  | **Max kW Summary**<br>Last 60 Min 0 kW<br>Last 24 Hr 0 kW<br>Last 30 Day 0 kW<br>Last 12 Month 0 kW | Shows the load demand in the past 60 min, 24 hours, 30 days, and 12 months. |
| 16 |  | **Max Demand Details**<br>Last Interval (10Mins)<br>0 kW<br>Date @ time<br>(Instantaneous) | Shows more load demand details in past 10 minutes, 60 minutes, 24 hours, 30 days, and 12 months. Press the down arrow for the next interval. |
| 17 |  | **Monthly Max Demand**<br>2014 2013<br>Jan 0 kW 0 kW<br>Feb 0 kW 0 kW<br>Mar 0 kW 0 kW | Shows a comparison of monthly load demand this year versus last year. Press the down arrow for the next three months. |

| | | | |
|---|---|---|---|
| 18 |  | **Engine Run-time**<br>Resettable: 0.0Hrs<br>Cumulative: 0.0Hrs | Shows the total hours of operation for the generator (run time counters). |
| 19 |  | **CURRENT THD**<br>Ø % THD<br>A >> 0.00<br>B >> 0.00<br>B >> 0.00 | Shows the Total Harmonic Distortion for each current per phase. |
| 20 |  | **VOLTAGE THD**<br>Ø % THD<br>A >> 0.00<br>B >> 0.00<br>B >> 0.00 | Shows the Total Harmonic Distortion for each voltage per phase. |
| 21 |  | **Watt Demand**<br>INST: 0 kW<br>MAX: 0 kW | Shows the maximum watt demand over a configured interval.<br>Inst: watt demand for most recent interval.<br>Max: highest watt demand of any interval since last reset. |
| 22 |  | **POWER METER**<br>ASCO Power Tech, L.P.<br>Copyright(C), 2008<br>www.ascopower.com | Logo Screen |

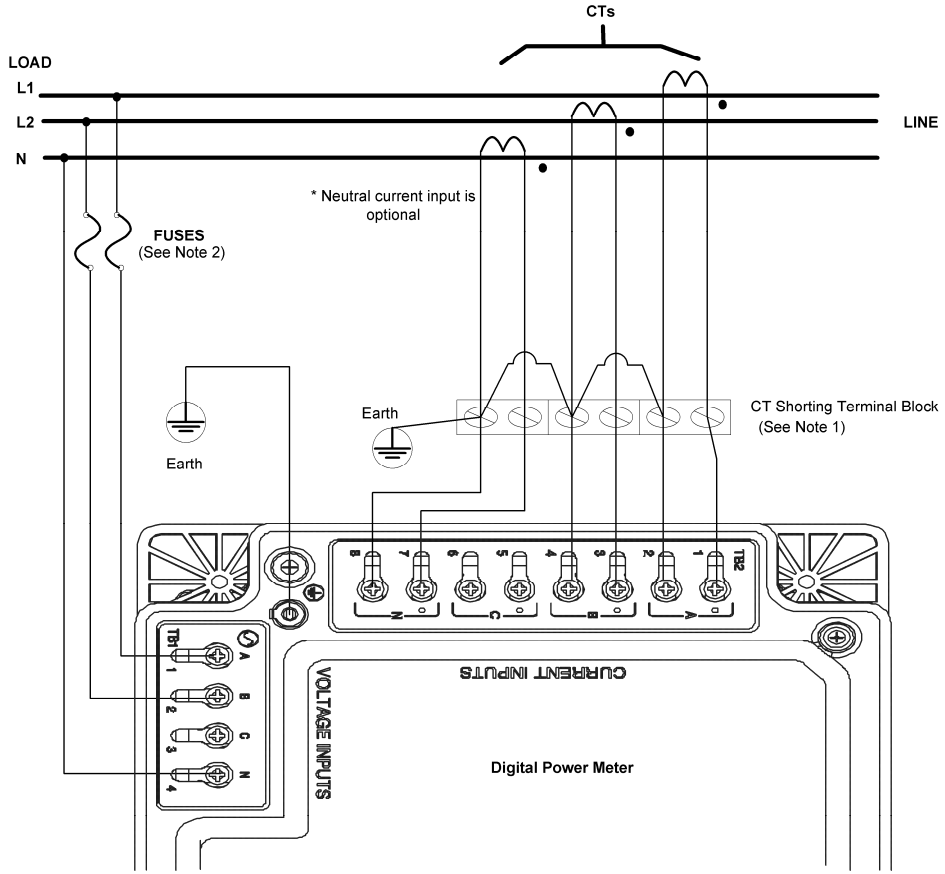
Press the right arrow again to return to the overview screen.

## 2 Wire Single Phase
## Input Voltage < 600 V ac (L-L), no external PTs




Setting: 1∅ – 2 Wire
PT Ratio: 120:120
See notes 1, 2, 3.

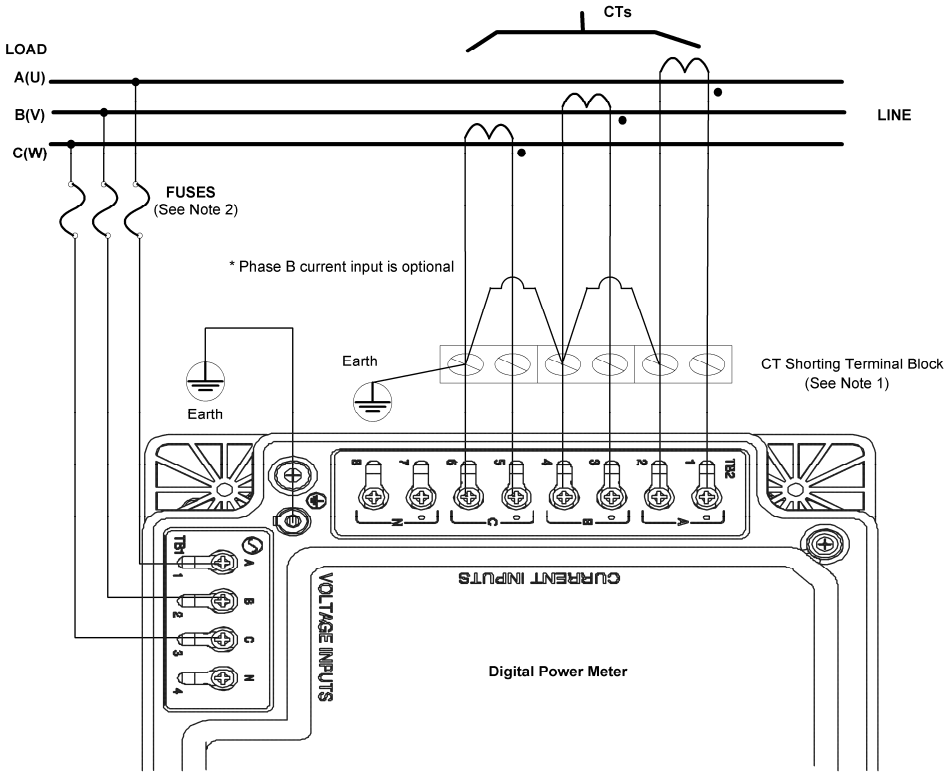
## 3 Wire Single Phase
## Input Voltage < 600 V ac (L-L), no external PTs




Setting: 1∅ – 3 Wire
PT Ratio: 120:120
See notes 1, 2, 3.

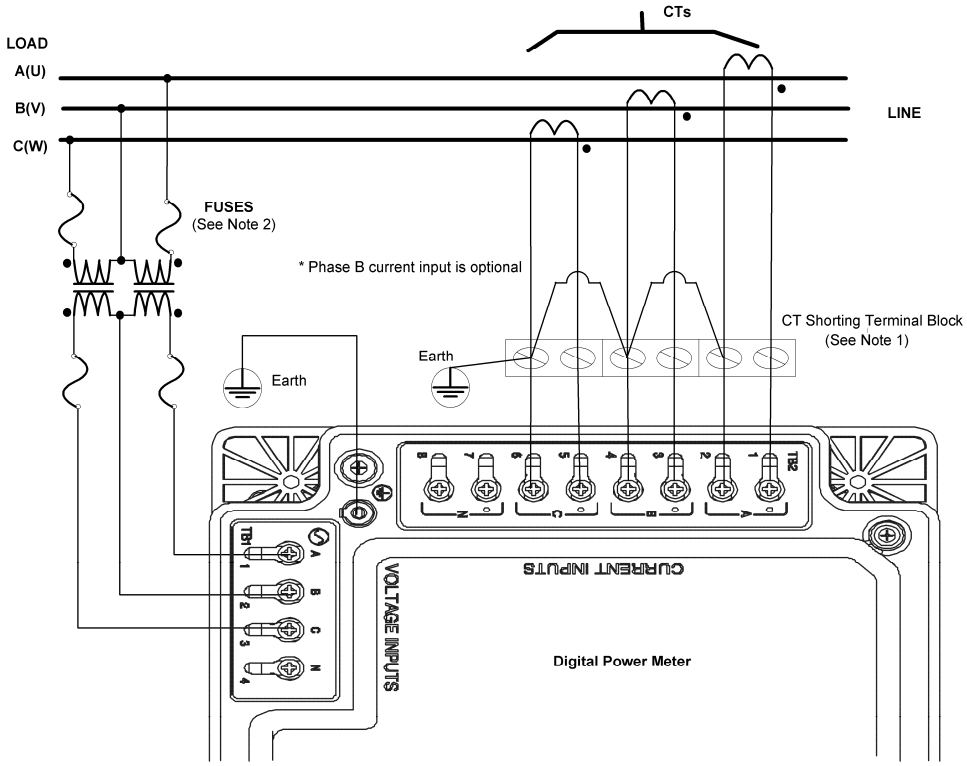
Notes:
1. A shorting terminal block is required at the CT location.
2. Voltage inputs require 1 A 600 V slow-blow fuses.
3. Use UL rated 14 to 20 AWG copper wire for making the connection.
4. Fuses(s) should be installed on all "hot" voltage inputs.

### 3 Wire Delta System
### Input Voltage < 600 V ac (L-L), no external PTs




Setting: 3∅ – 3 Wire Delta
PT Ratio: 120:120
See notes 1, 2, 3, 4, 5.

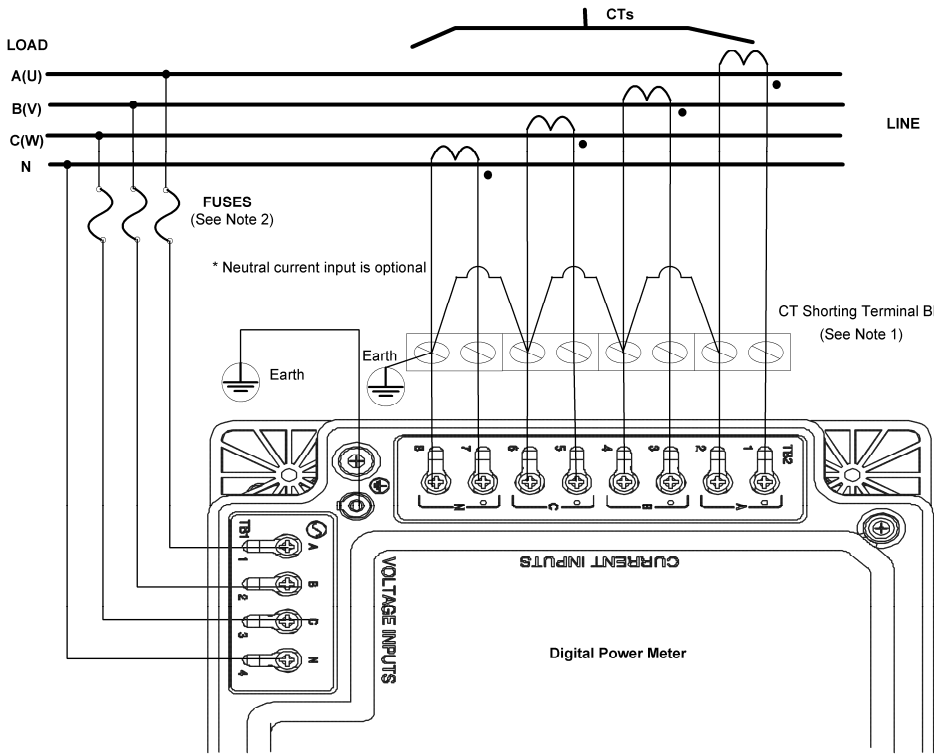
### 3 Wire Delta System with required PTs
### Input Voltage > 600 V ac (L-L), external PTs




Setting: 3∅ – 3 Wire Delta
PT Ratio: Primary Rating :120
See notes 1, 2, 3, 4, 5.

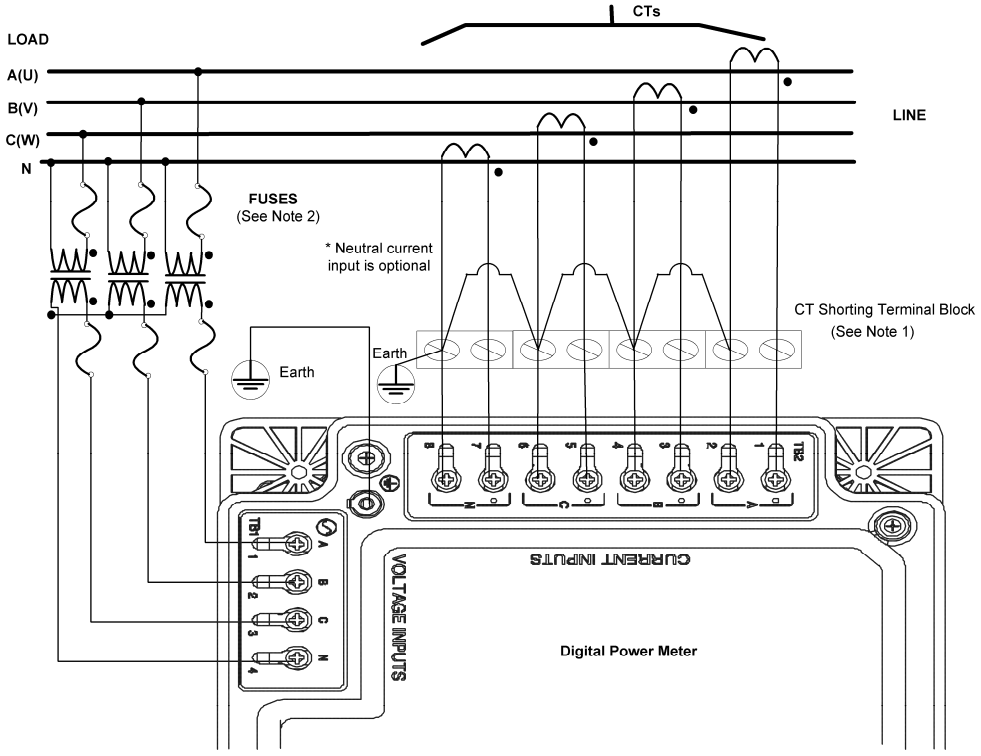
Notes:
1. A shorting terminal block is required at the CT location.
2. Voltage inputs require 1 A 600 V slow-blow fuses.
3. Use UL rated 14 to 20 AWG copper wire for making the connection.
4. European convention for phase marking, UVW, shown in parenthesis next to A, B, C markings.
5. Use this wiring configuration for balanced loads only.

## 4 Wire WYE System
## Input Voltage < 600 V ac (L-L), no external PTs




Setting: 3∅ – 4 Wire WYE
PT Ratio: 120:120
See notes 1, 2, 3, 4.

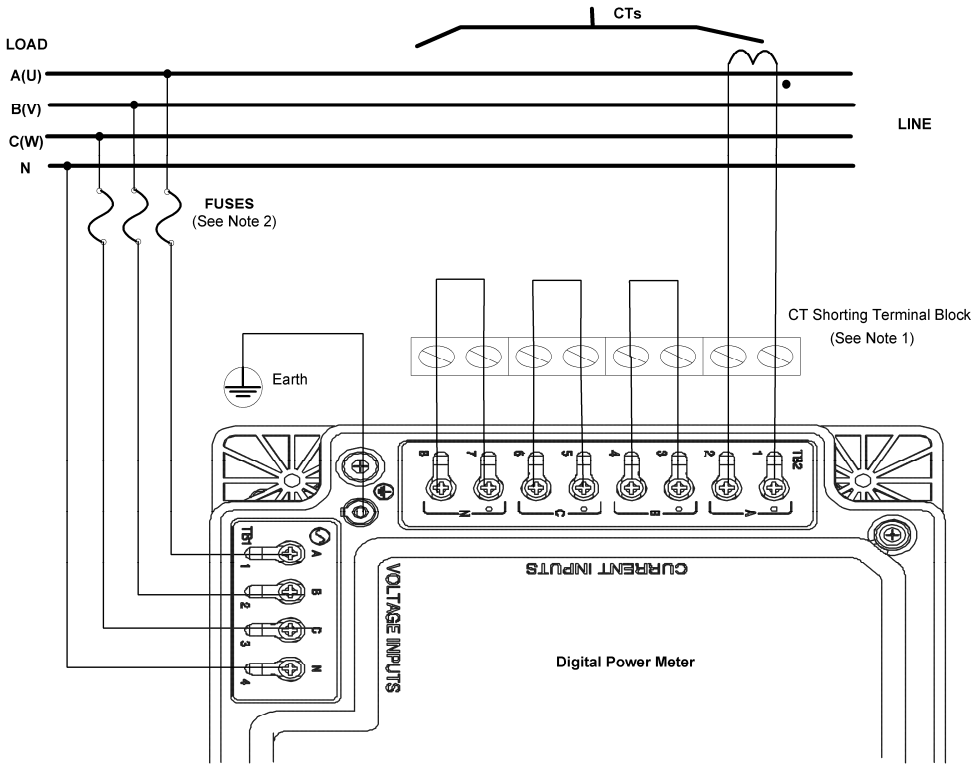
## 4 Wire WYE System with required PTs
## Input Voltage > 600 V ac (L-L), external PTs




Setting: 3∅ – 4 Wire WYE
PT Ratio: Primary Rating :120
See notes 1, 2, 3, 4.

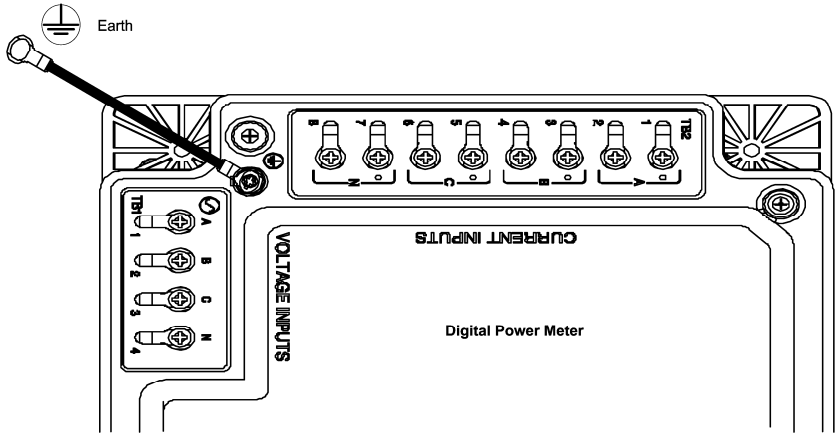
Notes:
1. A shorting terminal block is required at the CT location.
2. Voltage inputs require 1 A 600 V slow-blow fuses.
3. Use UL rated 14 to 20 AWG copper wire for making the connection.
4. European convention for phase marking, UVW, shown in parenthesis next to A, B, C markings.

## 4 Wire WYE System with 1 Phase Current
## Input Voltage < 600 V ac (L-L), no external PTs



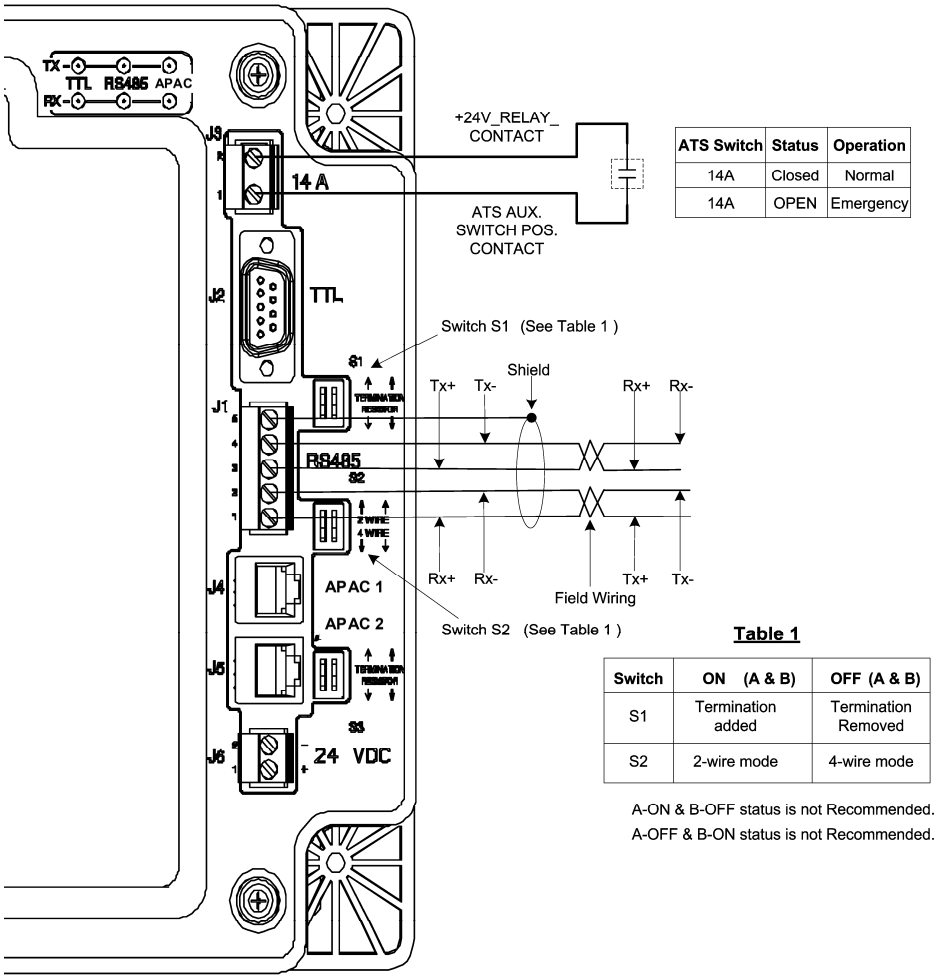

Setting: 3∅ – 4 Wire WYE
PT Ratio: 120:120
See notes 1, 2, 3, 4.

## Ground Connection




Notes:
1. A shorting terminal block is required at the CT location.
2. Voltage inputs require 1 A 600 V slow-blow fuses.
3. Use UL rated 14 to 20 AWG copper wire for making the connection.
4. European convention for phase marking, UVW, shown in parenthesis next to A, B, C markings.

## RS485 4-Wire Mode
## & ATS auxiliary contact connection



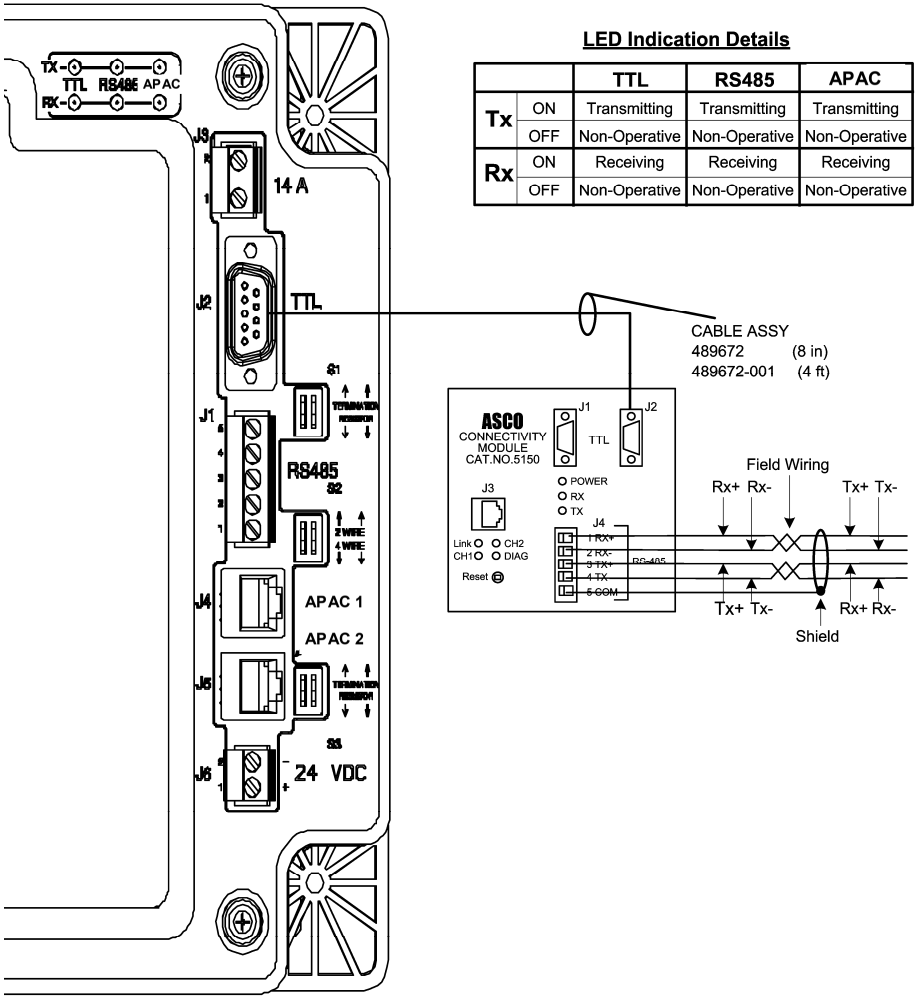

| ATS Switch | Status | Operation |
|---|---|---|
| 14A | Closed | Normal |
| 14A | OPEN | Emergency |

**Table 1**

| Switch | ON (A & B) | OFF (A & B) |
|---|---|---|
| S1 | Termination added | Termination Removed |
| S2 | 2-wire mode | 4-wire mode |

A-ON & B-OFF status is not Recommended.
A-OFF & B-ON status is not Recommended.

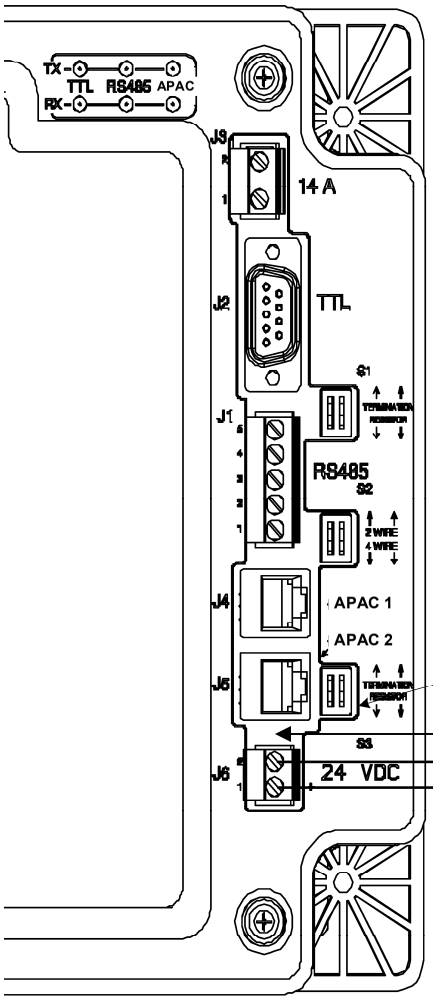
## TTL Interface with Connectivity Module & LED Indication Details




**LED Indication Details**

| | | TTL | RS485 | APAC |
|---|---|---|---|---|
| Tx | ON | Transmitting | Transmitting | Transmitting |
| | OFF | Non-Operative | Non-Operative | Non-Operative |
| Rx | ON | Receiving | Receiving | Receiving |
| | OFF | Non-Operative | Non-Operative | Non-Operative |

## DC Power Supply & APAC Interface Details




**APAC Details**

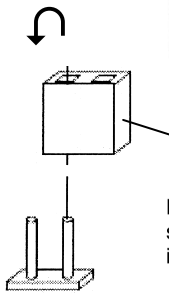
| Connector | Pin No. | Signal |
|---|---|---|
| J4 & J5 | 1 | COMMON |
| | 2 | 24V |
| | 3 | CANL |
| | 4 | CANH |
| | 5 | 24V |
| | 6 | COMMON |

**Table 2**

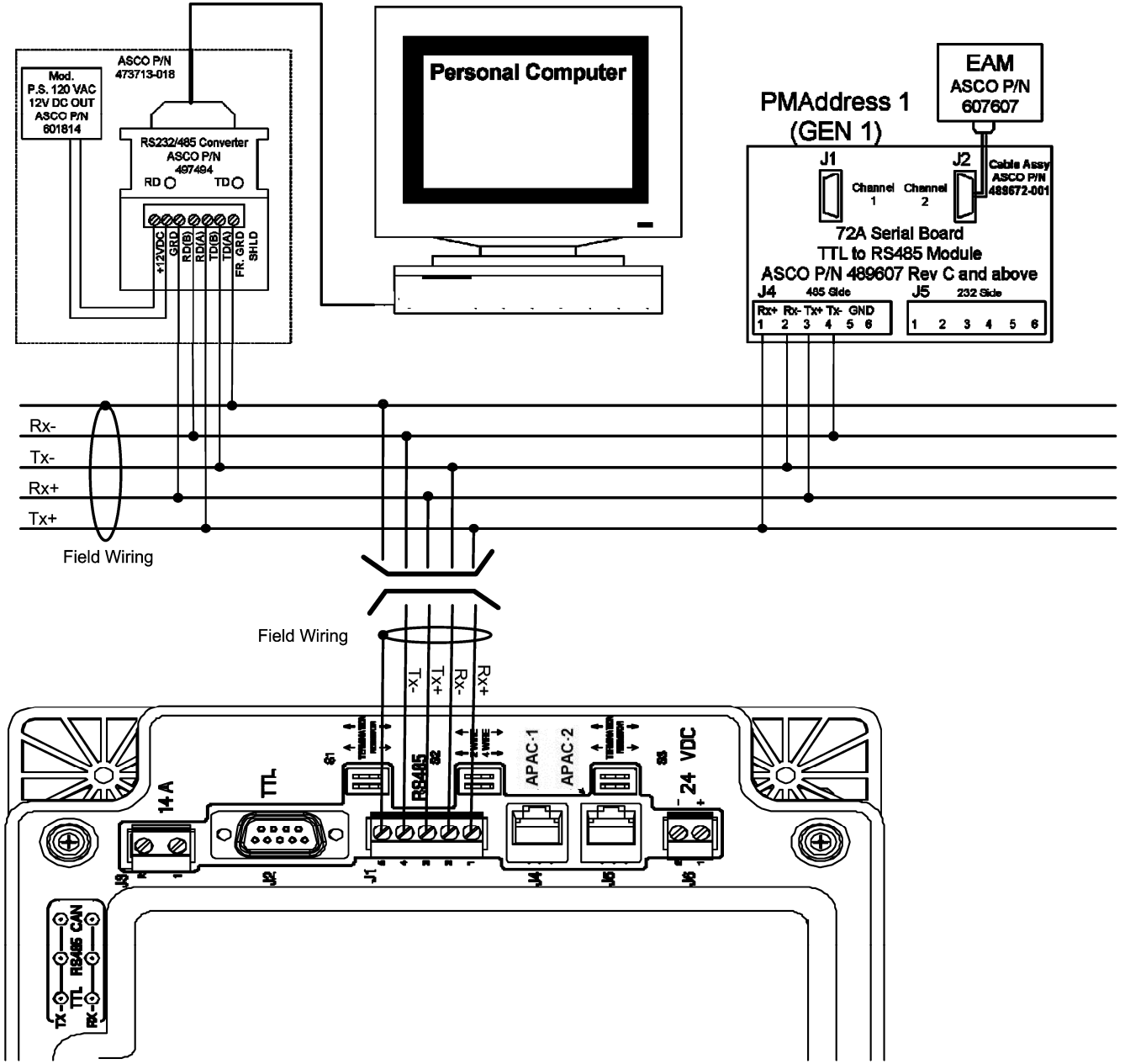
| Switch | A | B | Status |
|---|---|---|---|
| S3 | OFF | OFF | Termination Removed |
| | ON | ON | Termination added |

A-ON & B-OFF status is not Recommended.
A-OFF & B-ON status is not Recommended.

JP1 NOTE: For cases where the DPM stands alone and the DPM powers the Connectivity Module, JP1 jumper must be installed.



**Serial Data Entry Connection Diagram**



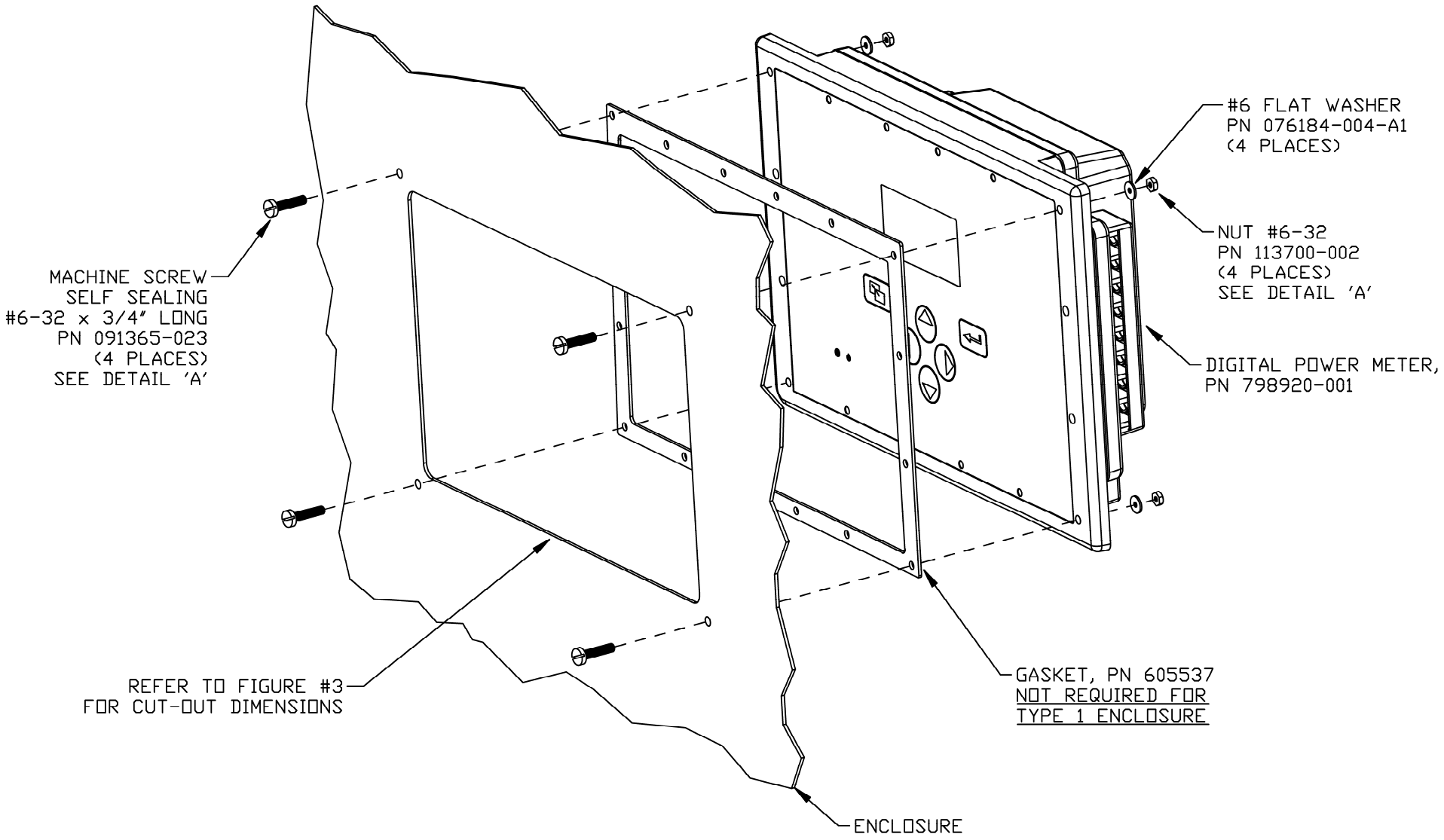
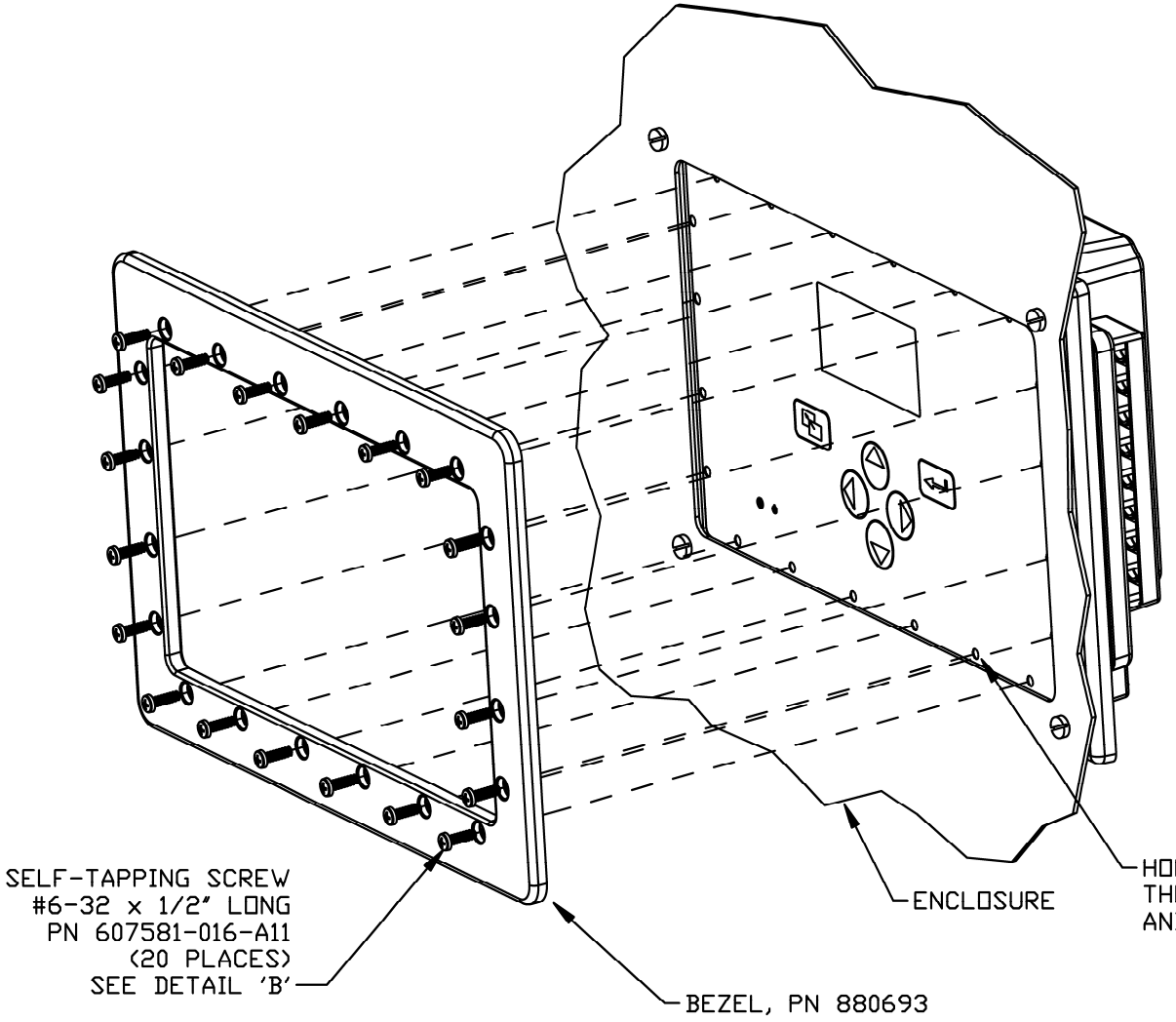



FIGURE #1

DIGITAL POWER METER INSTALLATION FOR TYPE 1, 3R, 4, & 12 ENCLOSURES

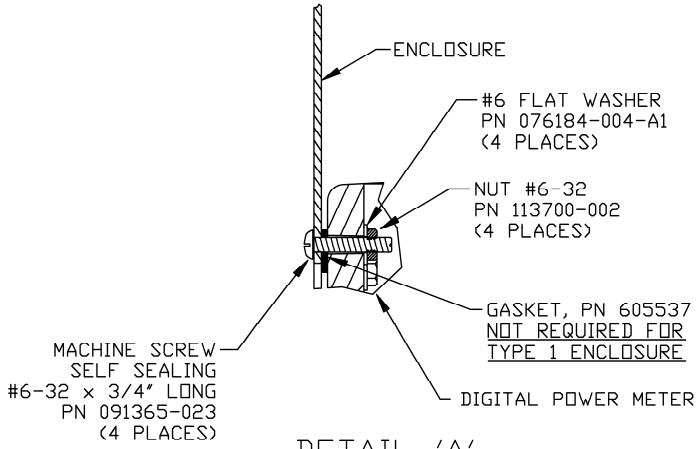



NOTES:

1. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN inch [mm].
2. MOUNT DIGITAL POWER METER TO ENCLOSURE AS INDICATED IN FIGURE #1. OVERLAY THE BEZEL INTO THE CUTOUT. USING THE BEZEL AS A TEMPLATE PUNCH THE 20 HOLES INTO THE MEMBRANE THAT CORRESPOND WITH THE HOLES IN THE BEZEL.
3. IF THE METER IS TO BE MOUNTED IN AN EXISTING ASCO SUPPLIED ENCLOSURE, THE METER CUT-OUT AND PEM MOUNTING STUDS MAY ALREADY EXIST IN THE ENCLOSURE.

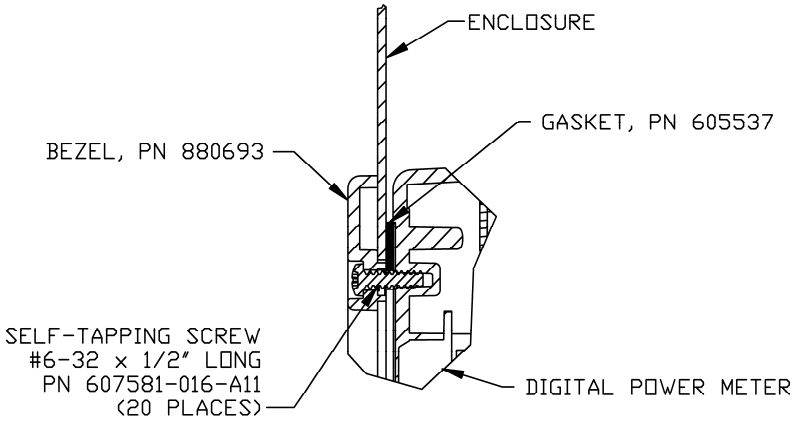
FIGURE #2

BEZEL INSTALLATION FOR TYPE 3R, 4, & 12 ENCLOSURES
(REFER TO NOTE 2)




DETAIL 'A'

DIGITAL POWER METER MOUNTING
FOR TYPE 1, 3R, 4, & 12 ENCLOSURES




DETAIL 'B'

BEZEL MOUNTING FOR TYPE 3R, 4, & 12 ENCLOSURES

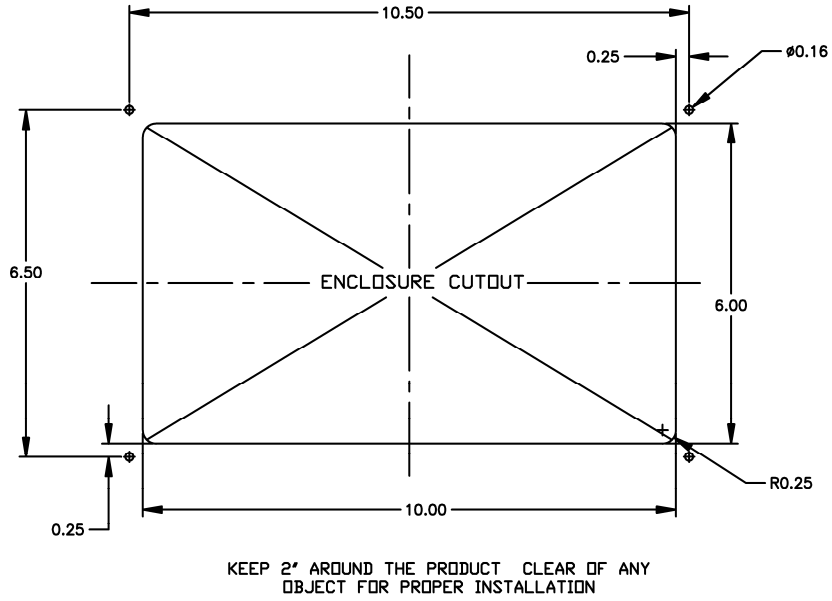



FIGURE #3

CUT-OUT DIMENSIONS FOR DIGITAL POWER METER
(REFER TO NOTE 3)

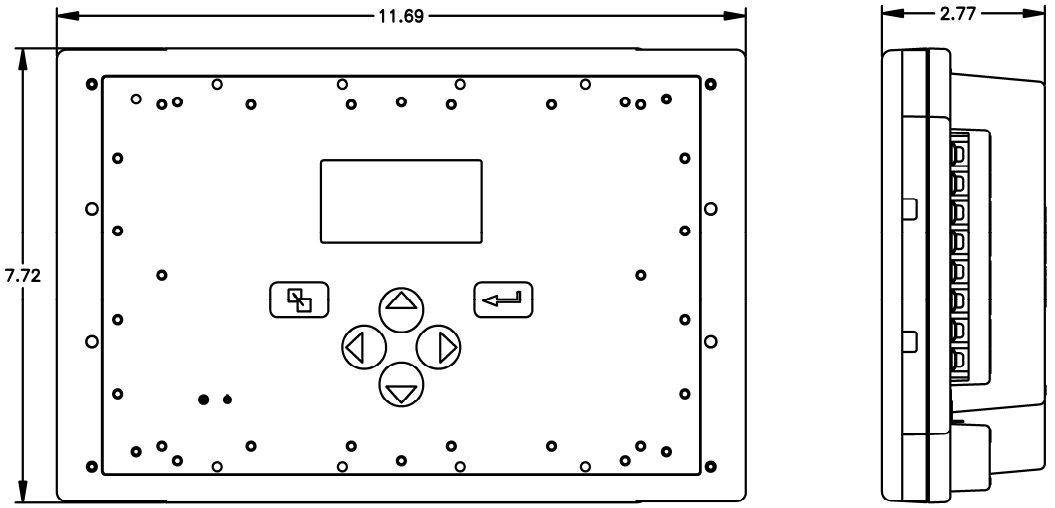



FIGURE #4

DIGITAL POWER METER DIMENSIONS

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