# PowerLogic™ ION7300 series

## Power and energy meter

Installation guide

## Danger

This symbol indicates the presence of dangerous voltage within and outside the product enclosure that may constitute a risk of electric shock, serious injury or death to persons if proper precautions are not followed.

## Caution

This symbol alerts the user to the presence of hazards that may cause minor or moderate injury to persons, damage to property or damage to the device itself, if proper precautions are not followed.

## Note

This symbol directs the user's attention to important installation, operating and maintenance instructions.

# Installation Considerations

Installation and maintenance of the ION7300 series meter should only be performed by qualified, competent personnel that have appropriate training and experience with high voltage and current devices. The meter must be installed in accordance with all local and national electrical codes.

## ⚠ DANGER

Failure to observe the following instructions may result in severe injury or death.

◆ During normal operation of the ION7300 series meter, hazardous voltages are present on its terminal strips, and throughout the connected potential transformer (PT), current transformer (CT), digital (status) input, control power and external I/O circuits. PT and CT secondary circuits are capable of generating lethal voltages and currents with their primary circuit energized. Follow standard safety precautions while performing any installation or service work (i.e. removing PT fuses, shorting CT secondaries, etc).

◆ The terminal strips on the meter base should not be user-accessible after installation.

◆ Do not use digital output devices for primary protection functions. These include applications where the devices perform energy limiting functions or provide protection of people from injury. Do not use the ION7300 series in situations where failure of the devices can cause injury or death, or cause sufficient energy to be released that can start a fire. The meter can be used for secondary protection functions.

◆ Do not HIPOT/Dielectric test the digital (status) inputs, digital outputs, or communications terminals. Refer to the label on the ION7300 series meter for the maximum voltage level the device can withstand.

## ⚠ CAUTION

Observe the following instructions, or permanent damage to the meter may occur.

◆ The ION7300 series meter offers a range of hardware options that affect input ratings. The ION7300 series meter's serial number label lists all equipped options. Applying current levels incompatible with the current inputs will permanently damage the meter. This document provides installation instructions applicable to each hardware option.

◆ The ION7300 series meter's chassis ground must be properly connected to the switchgear earth ground for the noise and surge protection circuitry to function correctly. Failure to do so will void the warranty.

◆ Terminal screw torque: Barrier-type (current, voltage, and relay terminal screws: 1.35 Nm (1.00 ft-lbf) max. Captured-wire type (digital inputs/outputs, communications, power supply: 0.90 Nm (0.66 ft.lbf) max.

# FCC Notice

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.

This Class A digital apparatus complies with Canadian ICES-003.

The Ringer Equivalence Number (REN) for the ION7300 series optional internal modem is 0.6. Connection to the ION7300 series internal modem should be made via an FCC Part 68 compliant telephone cord (not supplied). The ION7300 series cannot be used on a public coin phone service or party line services.

# Network Compatibility Notice for the Internal Modem

The internal modem in meters equipped with this option is compatible with the telephone systems of most countries in the world, with the exception of Australia and New Zealand. Use in some countries may require modification of the internal modem's initialization strings. If problems using the modem on your phone system occur, please contact Schneider Electric Technical Support

## Standards Compliance

158967

C   US

DIGITAL
POWER
METER
20SJ

UL LISTED

CE

N998

Made by Power Measurement Ltd.

Covered by one or more of the following patents:
U.S. Patent No's 7010438, 7006934, 6990395, 6988182, 6988025, 6983211, 6961641, 6957158, 6944555, 6871150, 6853978, 6825776, 6813571, 6798191, 6798190, 6792364, 6792337, 6751562, 6745138, 6737855, 6694270, 6687627, 6671654, 6671635, 6615147, 6611922, 6611773, 6563697, 6493644, 6397155, 6236949, 6186842, 6185508, 6000034, 5995911, 5828576, 5736847, 5650936, D505087, D459259, D458863, D443541, D439535, D435471, D432934, D429655, D427533.

# PowerLogic ION7300 Series Models

### Integrated Display Model

Comes with front infrared (IR) port.

### TRAN (transducer) Model

The TRAN model has no display. You can connect a Remote Modular Display unit (RMD) to the TRAN to display measurement values.

### RMICAN Model

An integrated display meter that is RMICAN-certified for revenue metering in Canada. RMICAN meters have different security options available, including a factory-sealed version.

# Available Options

| | | Option | | | |
|---|---|---|---|---|---|
| | | **Form Factor** | **Power Supply** | **COM** | **I/O** | **Security** |
| **Model** | **ION7300** | ◆ Integ. Display<br>◆ TRAN | ◆ Standard<br>◆ P24 | ◆ Standard (one RS-485 port)<br>◆ Ethernet<br>◆ Profibus | ◆ Standard (four digital outputs)<br>◆ four 0-1mA analog inputs<br>◆ four 0-20 mA analog inputs<br>◆ four 0-1mA analog outputs<br>◆ four 0-20 mA analog outputs | ◆ Standard[1]<br>◆ RMANSI[2]<br>◆ OFGEM[3] |
| | **ION7300 RMICAN** | ◆ Integ. Display only | ◆ Standard<br>◆ P24 | ◆ Standard only (one RS-485 port) | ◆ Same as ION7300 | ◆ RMICAN<br>◆ RMICAN sealed |
| | **ION7330** | ◆ Integ. Display<br>◆ TRAN | ◆ Standard<br>◆ P24 | ◆ Standard (two RS-485 ports)<br>◆ Ethernet<br>◆ Modem | ◆ Standard (four digital inputs and four digital outputs)<br>◆ Same analog options as ION7300 | ◆ Standard<br>◆ RMANSI<br>◆ OFGEM |
| | **ION7330 RMICAN** | ◆ Integ. Display only | ◆ Standard<br>◆ P24 | ◆ Same as ION7330 | ◆ Same as ION7330 | ◆ RMICAN[4]<br>◆ RMICAN sealed[5] |
| | **ION7350** | ◆ Integ. Display<br>◆ TRAN | ◆ Standard<br>◆ P24 | ◆ Same as ION7330 | ◆ Same as ION7330 | ◆ Standard<br>◆ RMANSI<br>◆ OFGEM |

### Notes

[1] Standard = front-panel password protected, no locking or sealing.

[2] RMANSI = ANSI C12.16 approved; meets ANSI C12.20 class 0.5 accuracy at 25°C (77°F). For 10 A current inputs only.

[3] Meets IEC 60687 Class 0.5 (for 5 Amps nominal). The OFGEM option is only available in the United Kingdom.

[4] Meets Industry Canada Locking Requirements (10 A current inputs only).

[5] Meets Industry Canada Locking Requirements and Factory Sealed (only for delivery to Canada).

# Before You Begin

Before installing the meter, familiarize yourself with the steps in this guide and read the safety precautions presented on the "Installation Considerations" page.
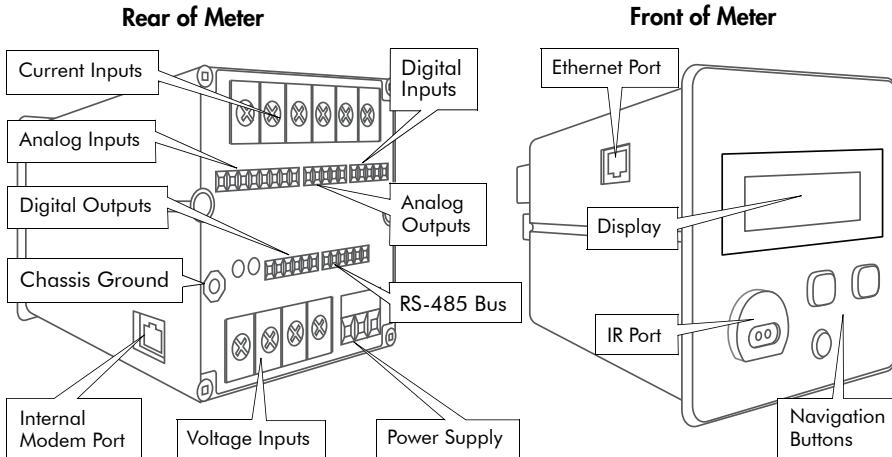
## ⚡ DANGER

Do not power up the meter until the current and voltage wiring is completed.
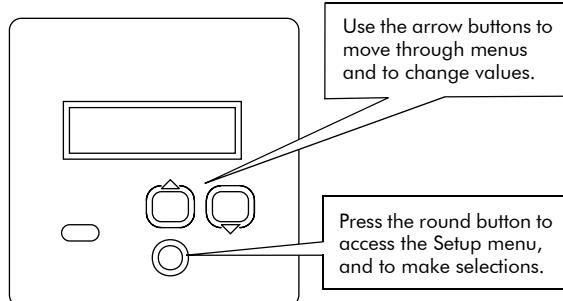
### Recommended Tools

◆ #1 Phillips screwdriver
◆ Precision flat-head screwdriver
◆ Wire cutters / stripper

# Meter Overview

**Rear of Meter**                                    **Front of Meter**

Current Inputs

Analog Inputs

Digital Outputs

Chassis Ground

Digital Inputs

Analog Outputs

RS-485 Bus

Internal Modem Port

Voltage Inputs

Power Supply

Ethernet Port

Display

IR Port

Navigation Buttons

## Using the Buttons

Use the arrow buttons to move through menus and to change values.
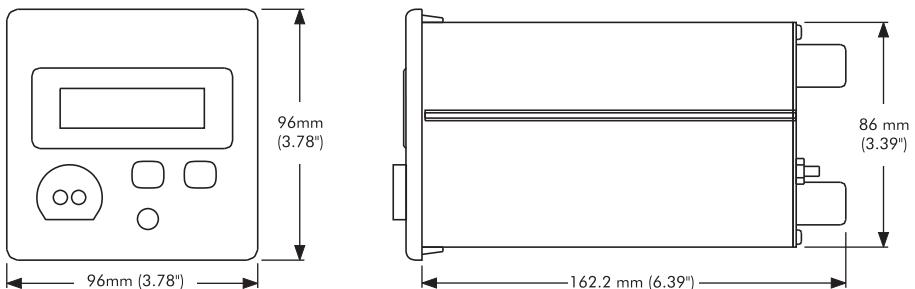
Press the round button to access the Setup menu, and to make selections.
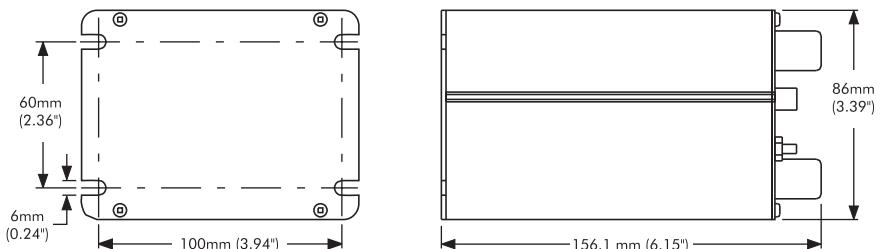
# Unit Dimensions

## Basic Model Dimensions

96mm (3.78")

96mm (3.78")

86 mm (3.39")

162.2 mm (6.39")

## TRAN Model Dimensions

60mm (2.36")

6mm (0.24")

100mm (3.94")

86mm (3.39")

156.1 mm (6.15")

## RMD Dimensions

96mm (3.78")

96mm (3.78")

86mm (3.39")

37.2mm (1.47")
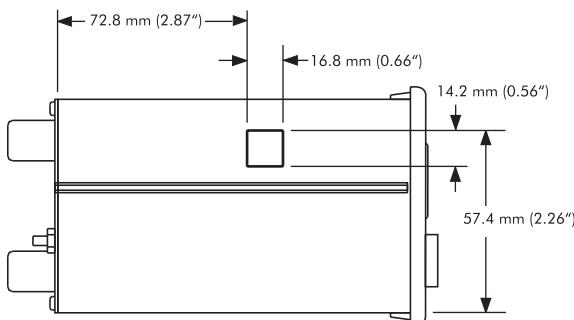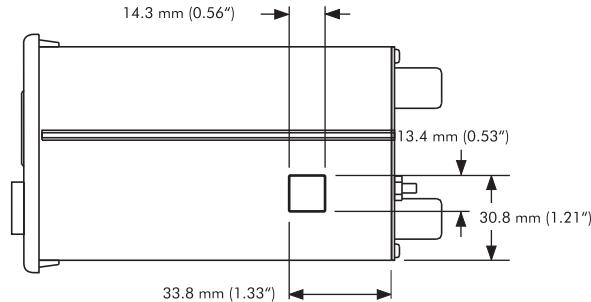
## Ethernet Port Location (if equipped)

72.8 mm (2.87")

16.8 mm (0.66")

14.2 mm (0.56")

57.4 mm (2.26")

### Internal Modem Port Location (if equipped)

14.3 mm (0.56")

13.4 mm (0.53")

30.8 mm (1.21")

33.8 mm (1.33")

# Additional Information

### GSKT Option

The GSKT (gasket) option helps to prevent moisture from penetrating air gaps between your ION7300 series meter and its mounting hole. See the *GSKT Option Installation Instructions* for more information.

### Terminal Cover Option

This option covers the terminal strips on the meter's base so they are not accessible after installation. See the *Terminal Cover Option Retrofit Instructions* for more information.
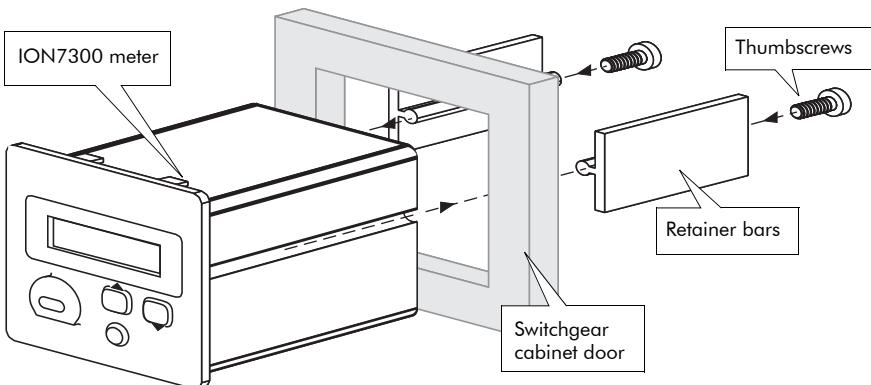
# Step 1: Mount the Meter

Once installed, no cleaning of the device is necessary.

| Mounting Location | Indoor |
|---|---|
| Pollution Degree | 2 |
| Altitude | Less than 2000 m (6561 ft) above sea level |
| Operating Range | See "Power Supply Specifications" on page 21 |
| Display Operating Temperature | Base Unit: -20°C (-4°F) to 60°C (140°F) |
| Storage Temperature | -30°C (-22°F) to +85°C (185°F) |
| Relative Humidity | 0 to 95% non-condensing |

## Mounting the Basic Model

1. Fit the unit into the cutout [DIN standard 92 X 92 mm or 3.6" X 3.6"] then slide the supplied slide bars into the grooves on either side of the unit.

2. Insert the thumbscrews in the back of the meter and tighten them until the slide bars securely anchor the unit to the cabinet door. Do not overtighten.



## Mounting the TRAN Model

The TRAN base unit can be mounted three different ways:

◆ Flush against any flat surface. The unit provides four slots on its mounting flange for this purpose. It can be mounted in whichever orientation is most convenient.

◆ Attached to any standard DIN rail (if the TRAN unit was purchased with the optional DIN rail mount).

◆ Installed in a cutout. To install a TRAN this way, follow directions for mounting a basic model (see above). Once installed, connect the optional RMD to the TRAN using the cable provided.
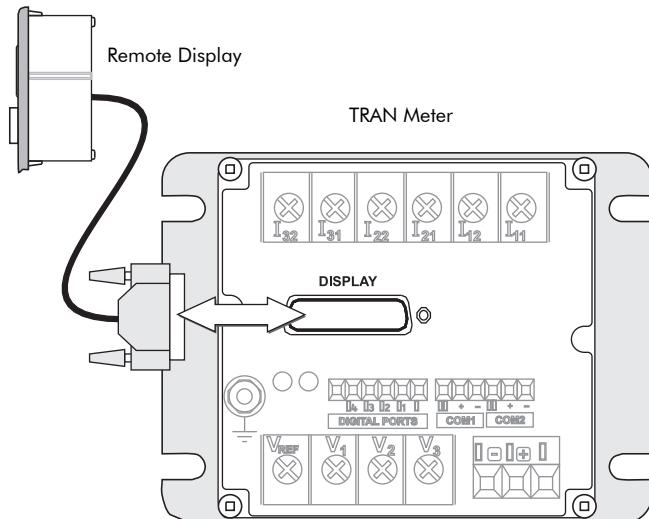
## Mounting the RMD (if equipped)

1. Insert the RMD into the panel cutout.
2. Hand-tighten the securing screws on each cable connector.
3. Connect the chassis ground lug on the RMD to the switchgear earth ground for the noise and surge protection circuitry to function correctly.

### Remote Modular Display Connections

| | |
| --- | --- |
| Connector Type | DB25 |
| Wire | 1.8 m (6 ft.) cable |

### Connecting the RMD to the TRAN Unit



📝 **NOTE**

Only use cable supplied by Schneider Electric to connect the RMD.

# Step 2: Wire the Chassis Ground

Wire the meter's ground terminal ⏚ to the switchgear earth ground using a 14 AWG (2.1 mm$^2$) or larger wire.
Connect the power supply G (ground) terminal to the same point as the meter ⏚ terminal.
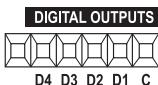
⚠ **CAUTION**

Do not use metal door hinges as a ground path.
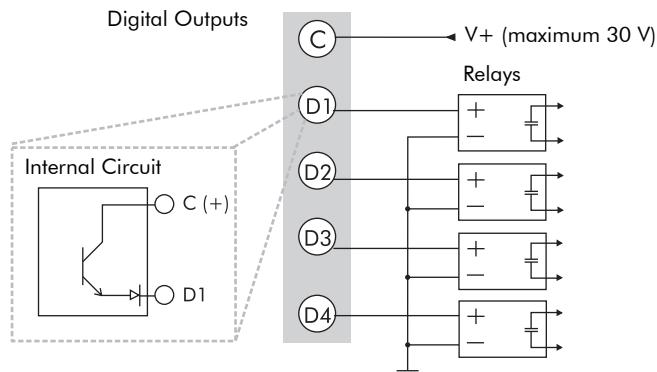
# Step 3: Wire the Digital and Analog I/O

## Digital Output Connections

**DIGITAL OUTPUTS**

D4  D3  D2  D1  C

| | |
|---|---|
| Output Type | Form A Solid State |
| Outputs | D1, D2, D3, D4 |
| Wire | 28 to 16 AWG (0.1 to 1.3 mm$^2$) |
| Connector Type | Captured wire |
| Signal Type | Continuous or pulse |
| Max. Load Voltage | 30 V |
| Max. Forward Current | 80 mA |
| Isolation | Optical |

### Typical Form A Application



**NOTE**
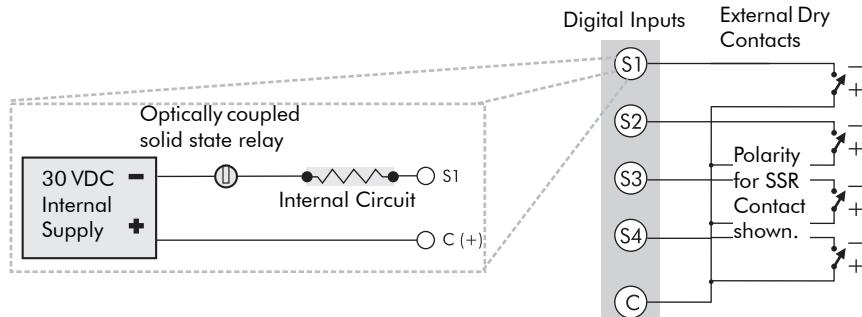
Use only Schneider Electric approved external relays.

## Digital Input Connections (if equipped)

**DIGITAL INPUTS**

S1  S2  S3  S4  C

| | |
|---|---|
| Input Type | Self-excited (internal 30 VDC supply) |
| Inputs | S1, S2, S3, S4 |
| Application | Dry contact sensing |
| Wire | 28 to 16 AWG (0.1 to 1.3 mm$^2$) |
| Connector Type | Captured wire |
| Min. Pulse Width | 25 milliseconds |
| Max. Transition Rate | 40 transitions per second (20 Hz) |

**Typical Digital Input Application**

Digital Inputs    External Dry Contacts

Optically coupled solid state relay

30 VDC Internal Supply

Internal Circuit    S1

C (+)

S1
S2
S3
S4
C

Polarity for SSR Contact shown.
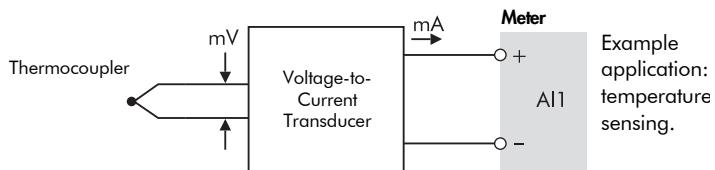
# Analog Input Connections (if equipped)

ANALOG INPUTS

+ AI1 −   + AI2 −   + AI3 −   + AI4 −

| Specification | 0-20 mA (scalable to 4-20 mA) Option | 0-1 mA Option |
|---|---|---|
| Input Impedance | 25 Ω | 475 Ω |
| Maximum Source Impedance | 500 Ω | 10 kΩ |
| Accuracy | ±0.3% of full-scale | |
| Inputs | AI1, AI2, AI3, AI4 | |
| Connectors | Phoenix captured-wire | |
| Update Rate | 1 Hz | |
| Channel to Channel Isolation | None | |
| Max. Common Mode Voltage | 30 V | |
| Standards Compliance | IEC 61000-4-4 fast transient test with capacitive clamp (4 kVp-p@2.5 kHz for 1 min) | |

**Typical Analog Input Application**

mV    mA    **Meter**

Thermocoupler

Voltage-to-Current Transducer

+
AI1
−

Example application: temperature sensing.
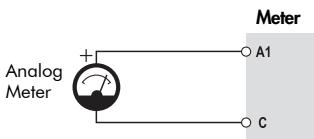
# Analog Output Connections (if equipped)

ANALOG OUTPUTS

A1  A2  A3  A4  C

| Specification | 0-20 mA (scalable to 4-20 mA) Option | 0-1 mA Option |
|---|---|---|
| Max. Load Drive Capability | 500 Ω | 10 kΩ |
| Accuracy | ±0.3% of full-scale | |
| Outputs | A1, A2, A3, A4 | |
| Connectors | Phoenix captured-wire | |
| Channel to Channel Isolation | None | |
| Max. Common Mode Voltage | 30 V | |
| Standards Compliance | IEC 61000-4-4 fast transient test with capacitive clamp (4 kVp-p@2.5 kHz for 1 min.) | |
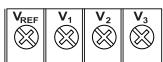
### Typical Analog Output Application

Meter

Analog Meter

+

○ A1

○ C

Example application: driving an analog meter with the DC current output.

# Step 4: Wire the Voltage and Current Inputs
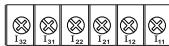
## Voltage Input Specifications

$V_{REF}$  $V_1$  $V_2$  $V_3$

| Terminal Type | Barrier |
|---|---|
| Connector Type | Ring or split-ring |
| Wire | 14 to 12 AWG (2.1 to 3.3 mm$^2$) |
| Inputs | V1, V2, V3, Vref |
| Rated Inputs[1] | ◆ 50 - 347 L-N (87 - 600 L-L) VAC RMS (3-phase systems) <br> ◆ 50 to 300 L-N (100 to 600 L-L) VAC RMS (single-phase systems) |
| Overrange | + 25% |
| Installation Category | III (Distribution) |
| Overload | 1500 VAC RMS continuous |
| Dielectric Withstand | 3250 VAC RMS for one second (non-recurring) |
| Impedance | > 2 MΩ/phase (phase-vref) |

[1] Accuracy may be affected if the voltage on V1 falls below 50.

# Current Input Specifications

| Terminal Type | Barrier |
|---|---|
| Connector Type | Ring or split-ring |
| Wire | 14 to 12 AWG (2.1 to 3.3 mm$^2$) |
| Inputs | I1, I2, I3 |
| Rated Inputs | 10 A RMS (+ 20% maximum, 300 V RMS to ground) |
| Installation Category | III (Distribution) |
| Overload | 20 A continuous |
| Dielectric Withstand | 500 A for one second (non-recurring) |
| Burden | 0.0625 VA @ 10 Amps |

## Using Current Transformers

The meter is compatible with CTs that have 5 Amp nominal, 10 Amp full-scale secondaries.

| Compliance | UL3111-1; and IEC 61010-1, Pollution Degree 2, Overvoltage Category III |
|---|---|
| Primary CT Rating | Equal to current rating of the power feed protection device.[1] |
| Secondary CT Burden Capacity | > 3 VA |
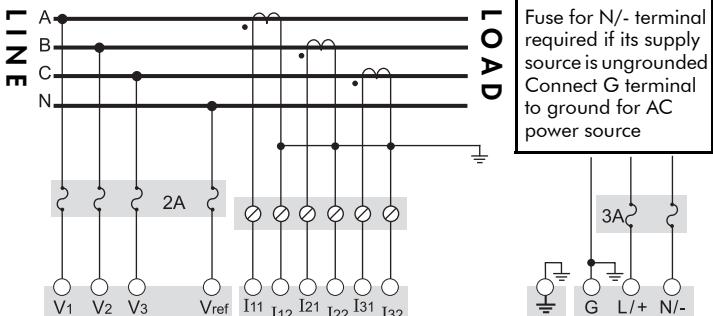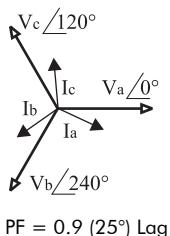
[1] If the peak anticipated load is considerably less than the rated system capacity, you can improve accuracy and resolution by selecting a lower rated CT.

📓 **NOTE**

Refer to the *ION7300 Series User Guide* for Revenue Metering CT and PT selection.

## 4-Wire Wye, 3-Element, Direct Connection Diagram

$V_c \angle 120°$

$I_c$  $V_a \angle 0°$
$I_b$
$I_a$

$V_b \angle 240°$

PF = 0.9 (25°) Lag

LINE

A
B
C
N

LOAD

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

2A

3A

V1  V2  V3  Vref  I11  I12  I21  I22  I31  I32

G  L/+  N/-
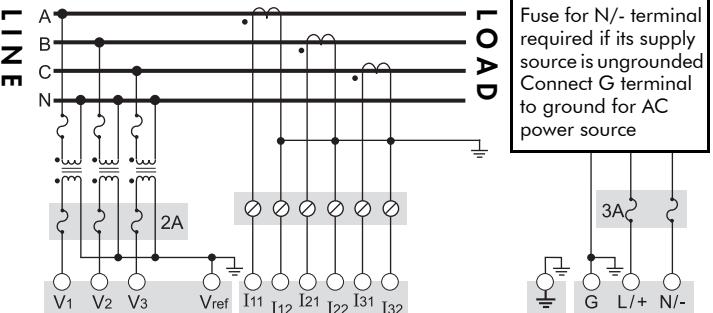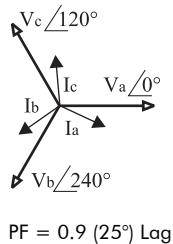
347 V L-N or 600 V L-L max.
VOLTS MODE = 4W-WYE
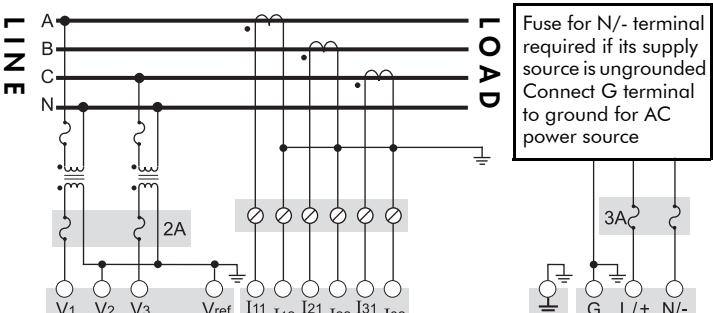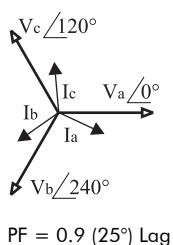
## 4-Wire Wye, 3-Element, 3 PT Connection Diagram

$V_c \angle 120°$

$I_c$  $V_a \angle 0°$
$I_b$
$I_a$

$V_b \angle 240°$

PF = 0.9 (25°) Lag

LINE

A
B
C
N

LOAD

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

2A

3A

V1  V2  V3  Vref  I11  I12  I21  I22  I31  I32

G  L/+  N/-

Use PTs for voltages over 347 L-N or 600 V L-L
VOLTS MODE = 4W-WYE

## 4-Wire Wye, 2½-Element, 2 PT Connection Diagram

$V_c \angle 120°$

$I_c$  $V_a \angle 0°$
$I_b$
$I_a$

$V_b \angle 240°$

PF = 0.9 (25°) Lag

LINE

A
B
C
N

LOAD

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

2A

3A

V1  V2  V3  Vref  I11  I12  I21  I22  I31  I32

G  L/+  N/-
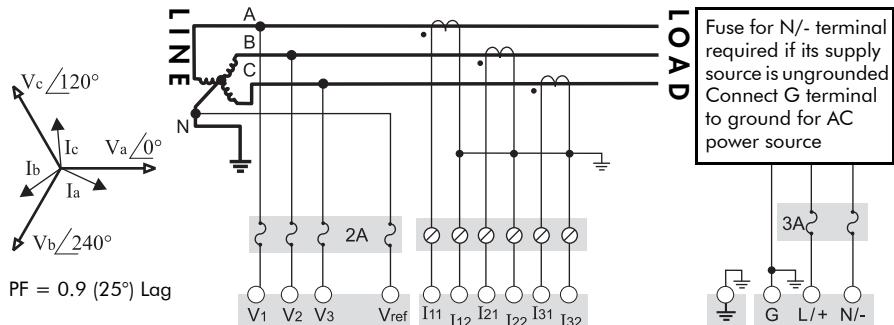
Phase B voltage (V2) is derived from phase A and C voltages.
Use PTs for voltages over 347 L-N or 600 V L-L
VOLTS MODE = 3W-WYE
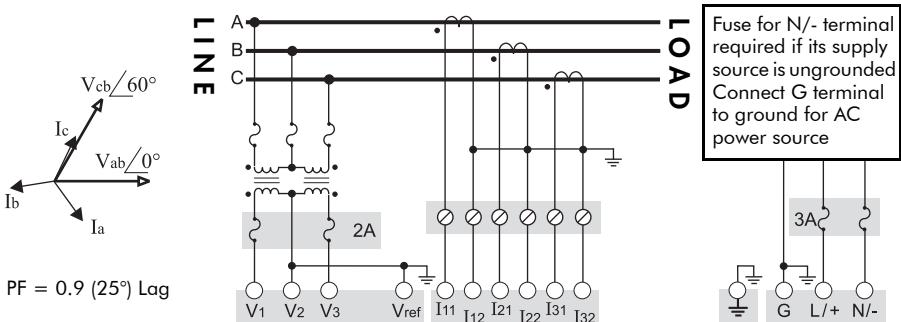
# 3-Wire Grounded Wye, 3-Element, Direct Connection Diagram

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

$V_c \angle 120°$

$I_c$  $V_a \angle 0°$

$I_b$

$I_a$

$V_b \angle 240°$

PF = 0.9 (25°) Lag

$V_1$  $V_2$  $V_3$  $V_{ref}$  $I_{11}$  $I_{12}$  $I_{21}$  $I_{22}$  $I_{31}$  $I_{32}$  2A

3A  G  L/+  N/-
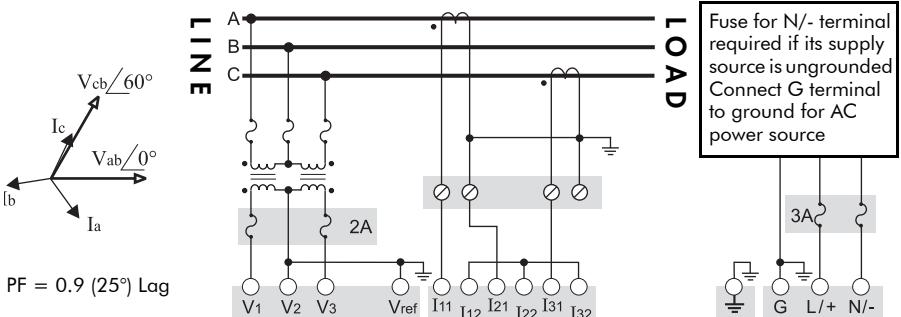
The configuration requires that the transformer secondary star-point is grounded. The phase-to-ground voltages must be within the meter's range.
VOLTS MODE = 4W-WYE

# 3-Wire Delta, 2½-Element, 2 PT & 3 CT Connection Diagram

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

$V_{cb} \angle 60°$

$I_c$

$V_{ab} \angle 0°$

$I_b$

$I_a$

PF = 0.9 (25°) Lag

$V_1$  $V_2$  $V_3$  $V_{ref}$  $I_{11}$  $I_{12}$  $I_{21}$  $I_{22}$  $I_{31}$  $I_{32}$  2A

3A  G  L/+  N/-
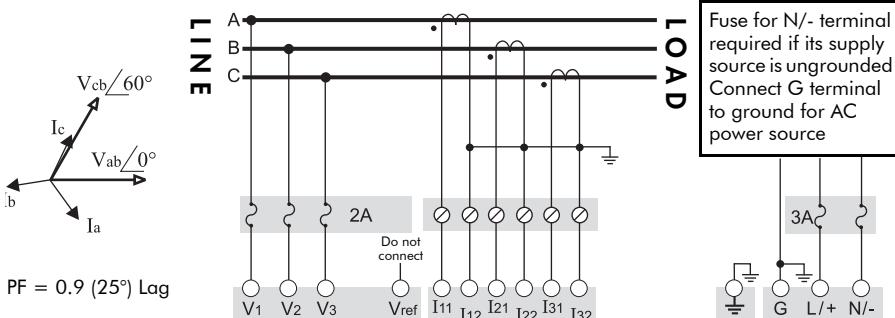
Use PTs for voltages over 600 V L-L
VOLTS MODE = DELTA

# 3-Wire Delta, 2-Element, 2 PT & 2 CT Connection Diagram

Fuse for N/- terminal required if its supply source is ungrounded Connect G terminal to ground for AC power source

$V_{cb} \angle 60°$

$I_c$

$V_{ab} \angle 0°$

$I_b$

$I_a$

PF = 0.9 (25°) Lag

$V_1$  $V_2$  $V_3$  $V_{ref}$  $I_{11}$  $I_{12}$  $I_{21}$  $I_{22}$  $I_{31}$  $I_{32}$  2A

3A  G  L/+  N/-
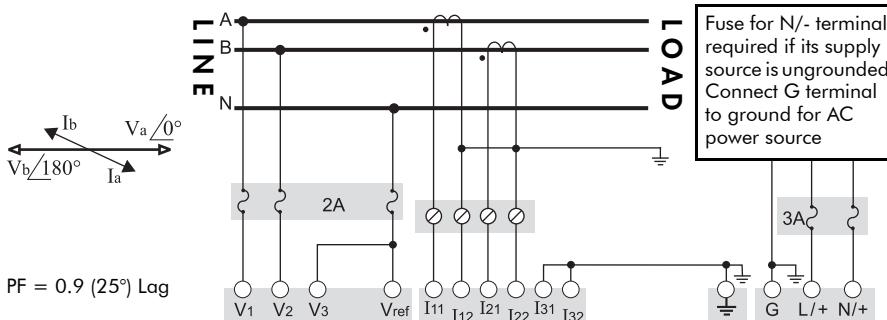
Use PTs for voltages over 600 V L-L
VOLTS MODE = DELTA

## 3-Wire Delta Direct Connection

L I N E

A
B
C

L O A D

Fuse for N/- terminal required if its supply source is ungrounded
Connect G terminal to ground for AC power source

$V_{cb} / 60°$
$I_c$
$V_{ab} / 0°$
$I_b$
$I_a$

PF = 0.9 (25°) Lag

2A

Do not connect

3A

$V_1$  $V_2$  $V_3$  $V_{ref}$  $I_{11}$  $I_{12}$  $I_{21}$  $I_{22}$  $I_{31}$  $I_{32}$

G  L/+  N/-

600 V L-L max.
VOLTS MODE = DIRECT DELTA

## Single Phase Connection Diagram

L I N E

A
B
N

L O A D

Fuse for N/- terminal required if its supply source is ungrounded
Connect G terminal to ground for AC power source

$I_b$  $V_a / 0°$
$V_b / 180°$  $I_a$

PF = 0.9 (25°) Lag

2A

3A

$V_1$  $V_2$  $V_3$  $V_{ref}$  $I_{11}$  $I_{12}$  $I_{21}$  $I_{22}$  $I_{31}$  $I_{32}$

G  L/+  N/+
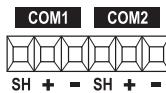
For this configuration ONLY, the 208 V line-to-line voltage inputs can be used with 240 V line-to-line systems.
VOLTS MODE = SINGLE

### Using Potential Transformers

| System Mode | Voltage Range | Requires PTs |
|---|---|---|
| Wye | 120 V L-N or 208 V L-L | no |
| | 277 V L-N or 480 V L-L | no |
| | 347 V L-N or 600 V L-L | no |
| | over 347 V L-N or 600 V L-L | yes |
| Single Phase | 120 V L-N or 240 V L-L | no |
| | 277 V L-N or 554 V L-L | no |
| | over 277 V L-N or 554 V L-L | yes |
| Delta | up to 600 V L-L | no |
| | over 600 V L-L | yes |

# Step 5: Wire the Communications

## RS-485 Specifications (COM1 and COM2)
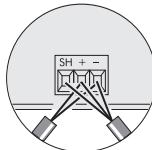
| Connector Type | Captured wire |
|---|---|
| Wire | Shielded twisted pair RS-485 cable, 22 AWG (0.33 mm$^2$) or larger |
| Maximum Cable Length | 1219 m (4000 ft) |
| Maximum Devices (per bus) | 32 |
| Input | Optically isolated |
| Compliance | ANSI/IEEE C37.90-1989 surge withstand and fast transient tests |

📓 **NOTE**

COM2 port is unavailable on ION7300 meters.
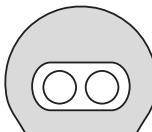
### RS-485 Connection

Connect SH at one end only.

| Marking | Terminal Function |
|---|---|
| SH | RS-485 Shield (electrically connected to chassis ground) |
| + | RS-485 Data Plus |
| - | RS-485 Data Minus |

## Infrared Connection (COM3)
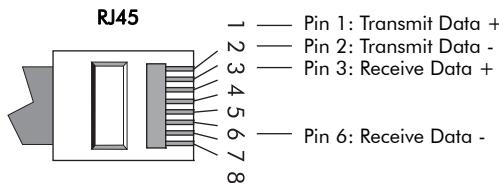
The infrared serial communications port can be used for energy pulsing or communication with Schneider Electric power monitoring software.

This port is compatible with an ANSI Type II magnetic optical communications coupler.

Connect the coupler to the port on the front of the meter.

## Ethernet Connection (if equipped)

RJ45

Pin 1: Transmit Data +
Pin 2: Transmit Data -
Pin 3: Receive Data +

Pin 6: Receive Data -

| Wire Type | High quality Category 3 or 5 UTP (CAT 5 unshielded twisted pair recommended) cable |
|---|---|
| Connector Type | RJ45 modular |
| Type (10 Base-T) | IEEE 802.3 10Base-T for 10 Mbps base band CSMA/CD LANs |
| Data Rate | 10 Mbps |
| Supported Protocols | ION, Modbus RTU[1], Modbus/TCP[1] |
| Isolation | Transformer isolated to 1500 VAC RMS |

[1] The unit ID for Modbus RTU and Modbus/TCP over Ethernet is 100.

### NOTE
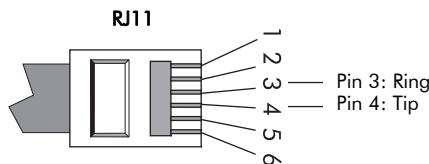
On ION7330 and ION7350 meters with the Ethernet card, COM2 is hardwired for EtherGate only, and cannot be used for serial communication.

**Ethernet TCP/IP Service Ports**

| Protocol | Port |
|---|---|
| ION | 7700 |
| Modbus RTU | 7701 |
| Modbus/TCP | 502 |
| EtherGate (COM2) | 7802 |

The meter supports a single connection at a time, to one of these three IP Service Ports: ION (Port 7700), Modbus/TCP (Port 502), or Modbus RTU (Port 7701). At the same time, connections to EtherGate (Port 7802), WebMeter, and email messaging can be made.

# Internal Modem Connection (if equipped)



RJ11

Pin 3: Ring
Pin 4: Tip

| Connector Type | RJ-11 |
|---|---|
| Wire Type | FCC Part 68 compliant telephone cord (two male RJ-11 ends) |
| Data Rate | 19.2 kbps |
| Supported Protocols | ION, Modbus RTU, Modbus/TCP |

**NOTE**
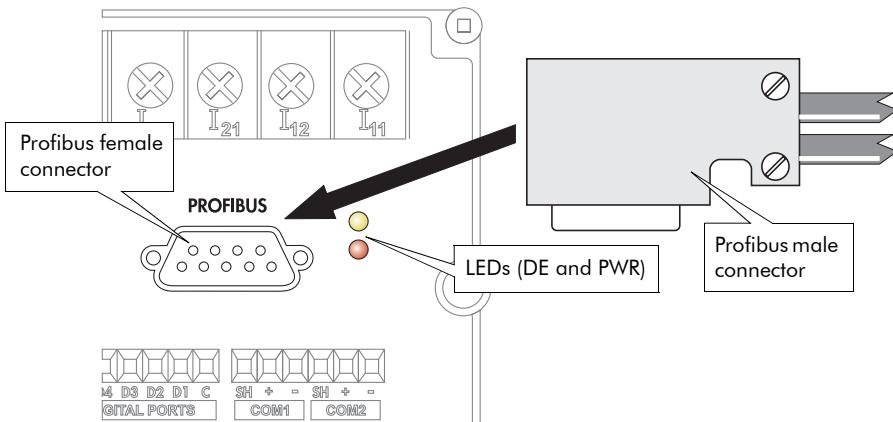
On meters with the modem option, the internal modem is hardwired to COM1, and that communications port is permanently set to ModemGate. If you want to connect another meter with an internal modem to the ION7300 series, you must connect it in a serial loop using COM2. COM1 cannot be used, as the two modems (internal modem in the ION7300 series and internal modem in the serial loop connected meter) conflict during communication.

# Profibus Connections (if equipped)
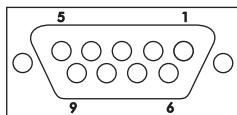
| Connector Type | 9-pin |
|---|---|
| Data Rate | 12 Mbps |

**NOTE**

The Profibus option is only available on ION7300 meters.

**Profibus Female Connector (located on meter)**



| Pin Number | Profibus Function |
| --- | --- |
| 1 | N/A |
| 2 | N/A |
| 3 | B-line |
| 4 | RTS |
| 5 | Isolated GND |
| 6 | Isolated Vcc |
| 7 | N/A |
| 8 | A-line |
| 9 | N/A |

**NOTE**

The Profibus Master file (.GSD file) is included on a floppy disk with the meter. This file must be installed on your Profibus Masters before the meter can communicate with the Profibus network.

# Step 6: Wire the Power Supply

**Power Supply Specifications**
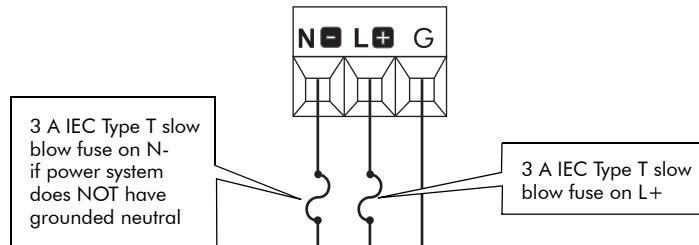
| Specification | Standard AC / DC power supply | P24 Option |
| --- | --- | --- |
| Rated Inputs | AC: 95 - 240 VAC ±10% (47 - 440 Hz) DC: 120 - 310 VDC ±10% | 20 - 60 VDC ±10% |
| Maximum | 0.2 Amp worst case loading (12 W) at 100 VAC at 25°C (77°F) | 0.6 Amp worst case loading (12 W) |
| Connector Type | Captured wire | Captured wire |
| Wire | 18 to 14 AWG (0.8 to 2.1 mm$^2$) | 18 to 14 AWG (0.8 to 2.1 mm$^2$) |
| Installation Category | II | II |

**NOTE**

If the meter is used to perform control functions or monitor power quality and power disruption events, an Uninterruptable Power Supply (UPS) should be used to ensure constant supply power.

**Power Supply Connections**



3 A IEC Type T slow blow fuse on N- if power system does NOT have grounded neutral

N ■ L ✚ G

3 A IEC Type T slow blow fuse on L+

# Step 7: Power Up the Meter

Before you apply power to the meter, ensure that ground is securely connected and that the supply voltage is within the allowed range of the meter's power supply. Power up the meter.

# Step 8: Set Up the Meter Using the Front Panel

Before the meter can operate and communicate correctly, the meter's Power Meter module and Communications modules must be properly configured. Use the Quick Setup Menu.

### Using the Quick Setup Menu

1. Access the menu by pressing the round button twice while the meter is displaying power system data.

2. Scroll down the Setup menu and highlight QUICK SETUP. Press the round button to select.

3. Use the arrow buttons to scroll the list of registers until you highlight the setting you want to change. Press the round button to edit the value of the register.

4. Change the value of the register using the arrow buttons either by selecting a new value from a menu, or changing the digits of a number Press the round button to save the new setting to the register.

5. Once you make a change to any setup register, the meter will prompt you for a password. Once you have entered the password, confirm the change of the register by selecting YES when prompted.

# Configurable Settings from the Quick Setup Menu

| Menu | Setting | Description | Range (Values) | Default |
|------|---------|-------------|----------------|---------|
| **Power Meter** | Volts Mode | The power system's configuration – WYE, DELTA, etc. | 4W-WYE<br>DELTA<br>SINGLE<br>DEMO<br>3W-WYE<br>DIRECT-DELTA | 4W-WYE |
| | PT1 (Primary) | The Potential Transformer's primary winding voltage rating | 1 to 999,999,999 | 347 |
| | PT2 (Secondary) | The Potential Transformer's secondary winding voltage rating | 1 to 999,999,999 | 347 |
| | CT1 (Primary) | The Current Transformer's primary winding current rating | 1 to 999,999,999 | 5 |
| | CT2 (Secondary) | The Current Transformer's secondary winding current rating | 1 to 999,999,999 | 5 |
| | V1 Polarity | The polarity of the Potential Transformer on V1 | Normal or Inverted | Normal |
| | V2 Polarity | The polarity of the Potential Transformer on V2 | Normal or Inverted | Normal |
| | V3 Polarity | The polarity of the Potential Transformer on V3 | Normal or Inverted | Normal |
| | I1 Polarity | The polarity of the Current Transformer on I1 | Normal or Inverted | Normal |
| | I2 Polarity | The polarity of the Current Transformer on I2 | Normal or Inverted | Normal |
| | I3 Polarity | The polarity of the Current Transformer on I3 | Normal or Inverted | Normal |
| **Comm 1** | COM1 Unit ID | Every meter on an RS-485 network must have a unique Unit ID number | 1 to 9999 | From serial number[1] |
| | COM1 Baud Rate[2] | The data rate, in bits per second | 1200, 2400, 4800, 9600, 19200 | 9600 |
| | COM1 Protocol | The communications protocol | ION, ModemGate[3], Modbus RTU, DNP 3.00, Factory | ION |
| **Comm 2** | COM2 Unit ID | Every meter on an RS-485 network must have a unique Unit ID number | 1 to 9999 | From serial number[1] |
| | COM2 Baud Rate[2] | The data rate, in bits per second | 1200, 2400, 4800, 9600, 19200 | 9600 |
| | COM2 Protocol | The communications protocol | ION, EtherGate[4], Modbus RTU, DNP 3.00, Factory | ION |
| **Infrared Comm** | IR1 Unit ID | The Unit ID for the Infrared port | 1 to 9999 | From serial number[1] |
| | IR1 Baud Rate | The data rate, in bits per second, for the Infrared port | 1200, 2400, 4800, 9600, 19200 | 9600 |
| | IR1 Protocol | The communications protocol for the Infrared port | ION, Modbus RTU, DNP 3.00, Factory, Infrared I/O | ION |

| Menu | Setting | Description | Range (Values) | Default |
|------|---------|-------------|----------------|---------|
| Ethernet | ETH1 IP Address | The Network IP Address of the meter - see your Network Administrator | 000.000.000.000 to 999.999.999.999 | none |
| | ETH1 Subnet Mask | Used if subnetting applies to your network- see your Network Administrator | 000.000.000.000 to 999.999.999.999 | none |
| | ETH1 Gateway | Used in multiple network configurations- see your Network Administrator | 000.000.000.000 to 999.999.999.999 | none |
| | ETH1 SMTP Server | Sets the IP Address for the SMTP Mail Server that is configured to forward mail from the meter | 000.000.000.000 to 999.999.999.999 | none |
| | ETH1 SMTP Connection Timeout | Sets the minimum time that the meter waits for a connection to an SMTP server | 0 to 9999 | 60 seconds |
| Profibus Comm | CM4 PB Address[5] | Unique ID for Profibus network. | | 126 |
| Sag/Swell[7] | Swell Lim | The limit a monitored voltage must exceed in order for the meter to classify it as an overvoltage condition[6] | 0 to 9999 | 106 |
| | Sag Lim | The limit a monitored voltage must fall below in order for the meter to classify it as an undervoltage condition[6] | 0 to 999 | 88 |
| | Nom Volts[8] | The primary power system voltage (L-L voltage for Delta systems, and L-N voltage for Wye systems) | 0 to 9,999,999 | 0 |

## Notes

[1] The factory set Unit ID for this port is based on the serial number of the meter. For example: Serial number: PABC-0009A263-10; Unit ID: 9263.

[2] All devices connected to the each port must communicate at the same baud rate as this port.

[3] ModemGate is available on ION7330 and ION7350 meters with an internal modem.

[4] EtherGate is available on ION7330 and ION7350 meters with Ethernet.

[5] Profibus protocol is an option on ION7300 meters. You can only change the Profibus address via the front panel, not through software.

[6] The ANSI C84.1 1989 standard recommends a temporary overvoltage limit of 106% for Range B voltage levels, and a temporary undervoltage limit of 88% for load voltages and 92% for the service entrance.

[7] Sag/Swell is available on ION7350 meters.

[8] The Nom Volts setup register MUST be set to your primary power system voltage, or the Sag/Swell feature will not properly function.

# Additional Menus

◆ **Clear Functions**: allows you to reset cumulative parameters, such as Peak Demand, Min/Max and Energy.

◆ **Adv Meter Setup**: access to every ION register in the meter.

◆ **Display Setup**: allows you to change display settings such as Contrast, Backlight Timeout and Auto Scroll.

◆ **Screen Setup**: allows you to change data displayed on the display screens.

◆ **Nameplate Info**: displays information about the meter options, such as Serial Number, Battery Life and Meter Firmware Revision.

◆ **Security**: allows you to modify the meter's password.

◆ **Diagnostics**: provides information to assist with meter installation and troubleshooting.

# Navigating Menus

Each menu has a title displayed at the top of the display screen and menu items displayed below the title.

| Button | Function |
|---|---|
| | Scrolls up through menu items. |
| | Scrolls down through menu items. |
| | Selects a highlighted item. Select RETURN to go back to the previous screen. |

# Editing Registers

For numeric registers, the ▲ cursor indicates the number being edited.

```
CM2 Unit ID
  00123
     ▲
```

For enumerated registers, the current value of the register will be displayed in the list with an asterix (*) on either side.

```
CM2 Protocol
 *EtherGate*
    ION
```

## Password Security

The password is required when you make a change to a register. The password is factory set at '00000' (5 zeros).

| Button | | Function |
|---|---|---|
|  | | ◆ Numeric Register: Increases value of register.<br>◆ Enumerated Register: Moves up in list. |
|  | | ◆ Numeric Register: Decreases value of register.<br>◆ Enumerated Register: Moves down in list. |
|  | Press and hold for 1 second | Moves the position of the cursor ▲ to the right. |
|  | Press and hold for 1 second | Moves the position of the cursor ▲ to the left. |
|  | | Enters the new value. |

### NOTE
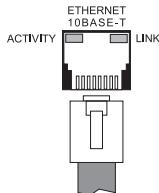
After you enter the new value by pressing the round button, a verification screen appears. Select YES to confirm the change or NO to cancel the change and return to the previous screen.

# Step 9: Verify Meter Operation

L1 and L2 LEDs are located on the meter backplate.

◆ L1 is factory-configured to pulse once for every 1.8 Wh of energy measured.

◆ L2 blinks slowly to indicate CPU operation. It blinks rapidly to indicate communications through one of its serial ports. If the L2 LED does not blink once the meter is installed, contact Technical Support.

## Verifying Ethernet Communications

Two LEDs, Activity and Link, are next to the Ethernet port on the side of the meter.

◆ LINK remains on while an Ethernet carrier is present; if this LED is off, the Ethernet connection cannot be established.

◆ ACTIVITY blinks to indicate Ethernet traffic.

## Verifying Profibus Communications

Two LEDs are adjacent to the Profibus port on the meter's backplate.

◆ DE indicates communications between the Profibus Master and the meter have been established.

◆ PWR is on to show that the meter is powered.

**PowerLogic™ ION7300 series**
with WebMeter™

**Installation guide**

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