

PowerLogic™ ION® Meter Demo Case with ION7650, PM750, PM870 meters

Introduction

This document is for internal use only. It describes the functionality of the demo case and explains the communications and wiring setup.

Case Contents

The demo case is made up of these items:

- carrying case
- power cable
- two Phoenix communications connectors (installed)
- two receptacle covers inserted in the monitored load receptacle
- this instruction sheet

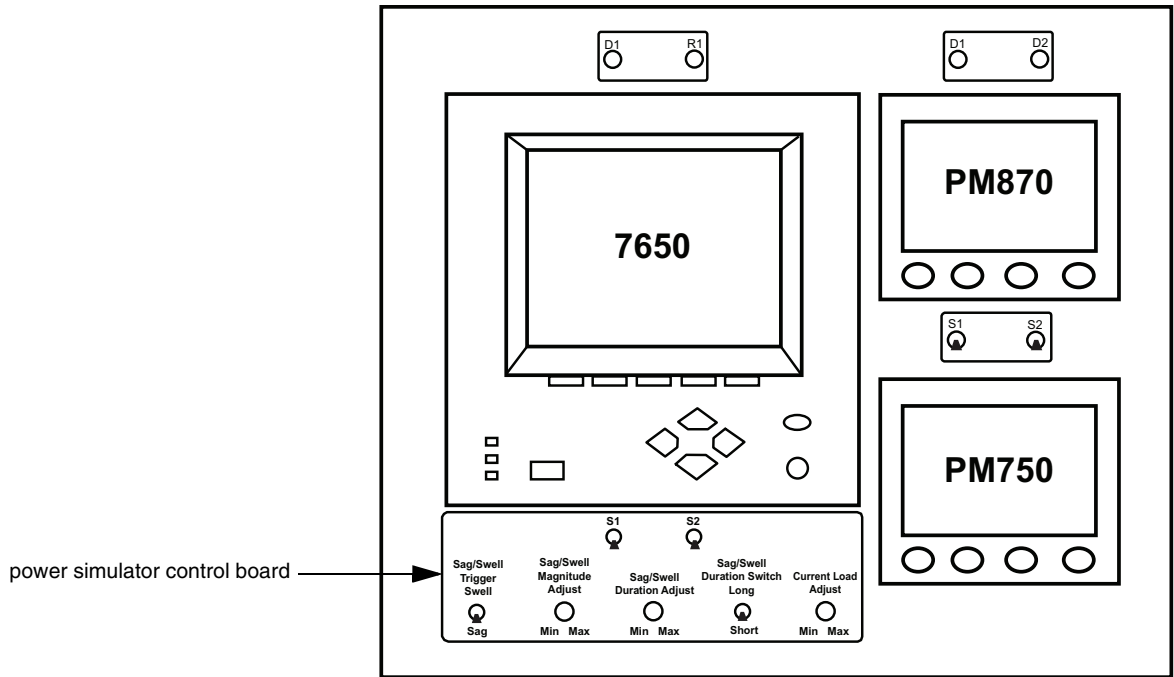
Figure 1: Demo Case and Carrying Case



Front Panel Orientation

This standard demo case consists of an ION7650, PM870, PM750 and a power simulator control board. The output of the power simulator is connected to the ION7650 and PM870 meters.

Figure 2: Front Panel



ION7650

Serial Number _____

Order Number __ M7650B1C0B5E0A0A or S7650B1C0B5E0A0A __

Inputs: S1 switch connected to digital input 1
S2 switch connected to digital input 2

Outputs: D1 light connected to digital output 1
R1 light connected to relay output 1

PM870

Serial Number _____

Order Number __ PM870MG or PM870 __

Inputs: S1 switch connected to digital input 1
S2 switch connected to digital input 2

Outputs: D1 light connected to digital output 1
D2 light connected to digital output 2

PM750

Serial Number _____

Order Number __ PM750MG or PM750 __

Inputs: N/A

Outputs: N/A

Power Simulator Controls

The ION7650 and the PM870 voltage inputs are connected to the power simulator outputs. The power simulator outputs approximately 33 Vac when powered by 120 Vac, and 60 Vac when powered by 220 Vac. The current load adjust dial ranges from 0 – 50 mA. Depending on the input voltage, use the settings in Table 1 to display realistic PT values.

The PM750 voltage input is connected to the input voltage of the demo case. Therefore, the sag/swell features of the power simulator controls do not affect the PM750.

Table 1: Suggested PT and CT settings

Demo Case Input Voltage	120 Vac	220 Vac
PT Primary	436	807
PT Secondary	120	120
CT Primary	2500	2500
CT Secondary	5	5

Figure 3: Power simulator control panel

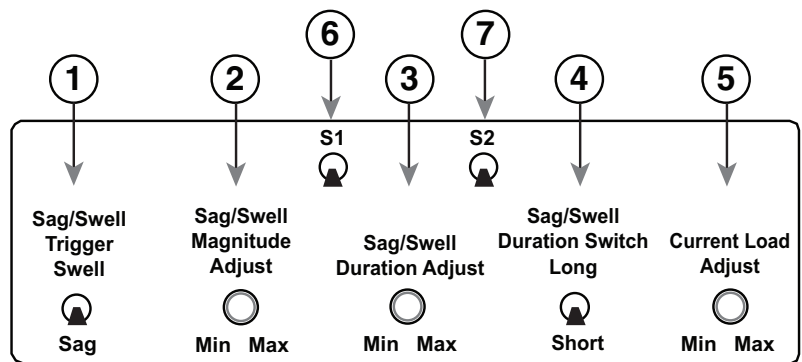


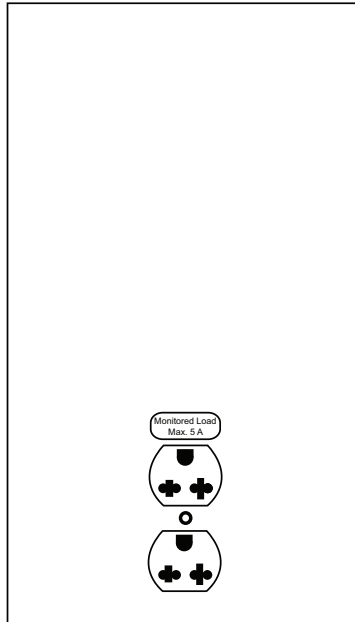
Table 2: Power simulator control panel operation

①	Sag/Swell Trigger	To generate a swell, push the switch up. To generate a sag, push the switch down. NOTE: The sag or swell duration is NOT controlled by how long the switch is held in the up or down position.															
②	Sag/Swell Magnitude Adjust	Turn this dial to adjust the size of the power quality event. When the dial is set to the maximum (Max), the generated sag or swell will be at its largest deviation from nominal. A swell will be above nominal and a sag below nominal.															
③	Sag/Swell Trigger Duration Adjust	Turn this dial to adjust the timed length of the power quality event. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Switch Position</th> <th>Adjust Position</th> <th>PQ Duration – approx.</th> </tr> </thead> <tbody> <tr> <td>Short</td> <td>Min.</td> <td>0.0004 secs. (0.4 ms)</td> </tr> <tr> <td>Short</td> <td>Max.</td> <td>0.150 secs (150 ms)</td> </tr> <tr> <td>Long</td> <td>Min.</td> <td>0.010 secs (10 ms)</td> </tr> <tr> <td>Long</td> <td>Max</td> <td>0.400 secs (400 ms)</td> </tr> </tbody> </table>	Switch Position	Adjust Position	PQ Duration – approx.	Short	Min.	0.0004 secs. (0.4 ms)	Short	Max.	0.150 secs (150 ms)	Long	Min.	0.010 secs (10 ms)	Long	Max	0.400 secs (400 ms)
Switch Position	Adjust Position	PQ Duration – approx.															
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Long	Min.	0.010 secs (10 ms)															
Long	Max	0.400 secs (400 ms)															
④	Sag/Swell Trigger Duration Switch	Use this switch to increase the duration of the power quality disturbance.															
⑤	Current Load Adjust	Turn this dial to change the load current applied to the meters. NOTE: When the load is connected to the monitored load receptacle, the current load adjust dial has little effect on the load reading.															
⑥⑦	7650 S1 and S2	S1 switch connected to digital input 1 S2 switch connected to digital input 2															

Monitored Load

Figure 4 shows the monitored load receptacle, which is located on the right side of the demo case.

Figure 4: Monitored load receptacle



The meters in the case will monitor the load from a device that is plugged into this receptacle. The measured current values of the meters will be affected.

To avoid blowing the internal power input fuse, only connect equipment that is rated under 150 W to the monitored load receptacle.



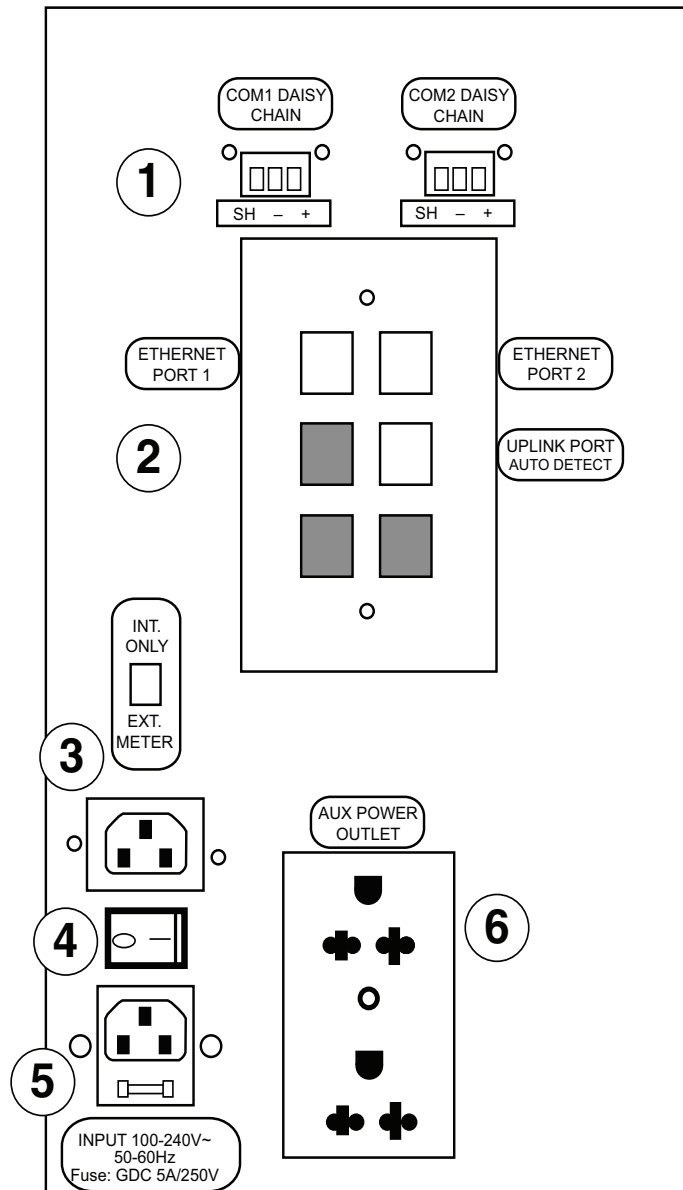
NOTE: When the load is connected to the monitored load receptacle, the current load adjust dial has little effect on the load reading.

Communications and Expansion

The left side of the demo case contains connections for:

- communications to the meters
- support of additional meters to be added to the system
- input (for power cord)
- auxiliary power

Figure 5: Left side of demo case



The sections that follow provide detailed information about the numbered items in Figure 5.

COM1 and COM2 Daisy Chain

The green Phoenix connectors installed on COM1 or COM2 are used to connect the serial daisy chain of the ION7650 (see ① in Figure 5).

For more about serial connections, see “Serial Communications” on page 7.

Ethernet Connections

All Ethernet-enabled meters in the demo case are connected to an Ethernet switch built into the case. You can use the remaining ports of the Ethernet switch to connect to another meter or computer (see ② Figure 5).



NOTE: All ports on the Ethernet switch have cross-over auto-detection. You can use straight or cross-over cables.

Internal or External Meter Switch

This switch allows an external meter to be connected to the power simulator in the demo case (see ③ in Figure 5). Plug the external meter into the receptacle directly under it and set the switch to external meter (EXT METER). For the wiring diagram, see “Connecting an External Meter to the Power Simulator” on page 9.

Power Switch

The ON/OFF switch on the demo case turns off all power to the demo case including the meters, Ethernet switch, and power simulator (see ④ in Figure 5).

Input Power and Fuse

The demo case can accept voltage input ranging from 100–240 Vac (50–60 Hz) (see ⑤ in Figure 5). The 5 A fuse is also located here.

Replacing a Blown Fuse

Before replacing the fuse, determine why the fuse was blown. Eliminate the cause of the overload.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, BURN, OR ARC FLASH

- Unplug the power cord from the power source and remove any loads on the outlets before replacing the fuse.
- Do not attempt to service the demo case except for replacing the fuse.

Failure to follow these instructions will result in death or serious injury.

To replace the fuse, unplug the input power cord from the demo case and pry open the fuse holder with a screwdriver. Replace the fuse only with 250 V, 5 A, Type 5 mm x 20 mm, fast-acting fuse.

Auxiliary Power Receptacle

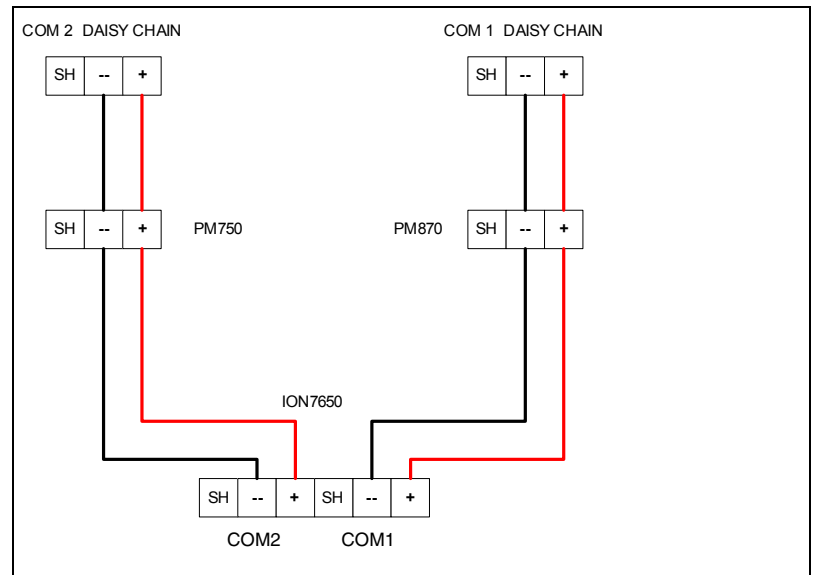
The AUX POWER OUTLET can be used to power additional meters, portable computers, or other electronic devices (see ⑥ in Figure 5). This power receptacle is not monitored by the meters and does not affect the power simulator load current. To avoid blowing the fuse, do not exceed 3 A to power additional devices through the AUX POWER OUTLET.

<h2>CAUTION</h2>
MISMATCHED VOLTAGE
<ul style="list-style-type: none">• The voltage on the auxiliary power outlet and the input power receptacle is the same.• Any load connected to the auxiliary outlet must have the same voltage rating as the input power.
Failure to follow these instructions can result in equipment damage.

Serial Communications

The ION7650 has two serial ports. The ION7650 COM2 is connected to the PM750 and then to the external Phoenix connector. The ION7650 COM1 is connected to the serial port of the PM870 and then to the external Phoenix connector.

Figure 6: Serial connections

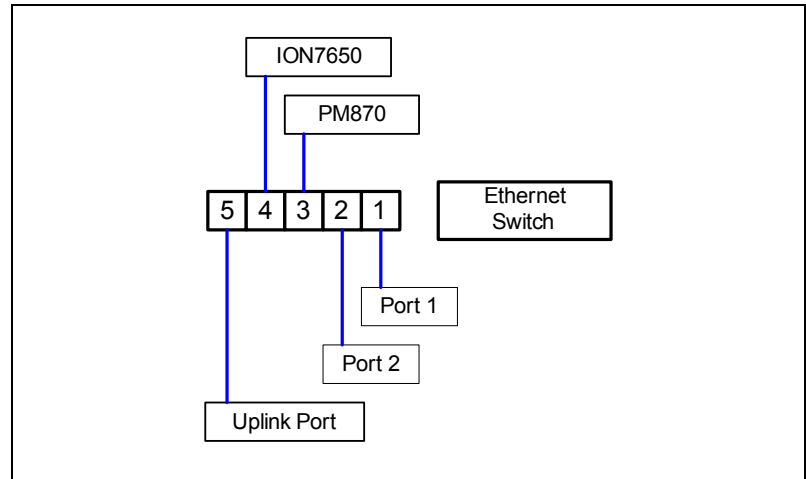


NOTE: The Phoenix connector manufacturer's part # is MSTB2.5/3-ST-5.08

Ethernet Communications

The demo case is equipped with an internal 5-port Ethernet switch. The ION7650 and PM870 are connected to the switch. The PM750 does not have Ethernet capability. The remaining Ethernet ports are available on the side panel (see 2 in Figure 5).

Figure 7: Ethernet communications layout



NOTE: All the ports on the Ethernet switch have cross-over auto-detection. Either straight or cross-over cables will work.

Viewing the PM870 meter web pages requires a user name and password.

The default user name is: Administrator

The default password is: Gateway

The ION7650 web pages do not require passwords.

Connecting an External Meter to the Power Simulator

You can add an external meter to the demo case system by using one of the serial or Ethernet connections on the left side of the demo case. In addition to communications, the meter can also be connected to the internal power simulator. The following diagrams show how the external power simulator connector is wired to accommodate an additional meter.

Looking at the side of the case, the external power simulator connector looks as follows:

Table 3: External power simulator connection

Location Name	Connection to External Meter
I Out	I 11 and V REF
I Return	I 21
Voltage Point	V1

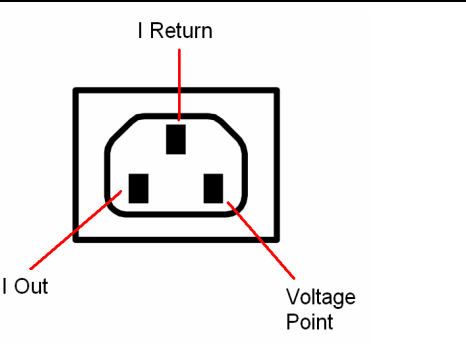
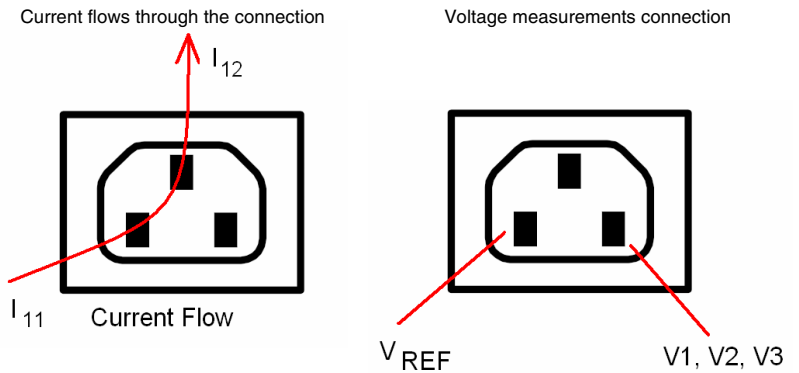


Figure 8: Current flow and voltage connection



Use a power cable extender to connect to the external meter connection point.

Figure 9: Power cable extender

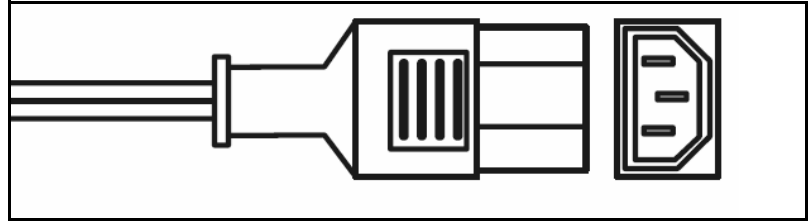


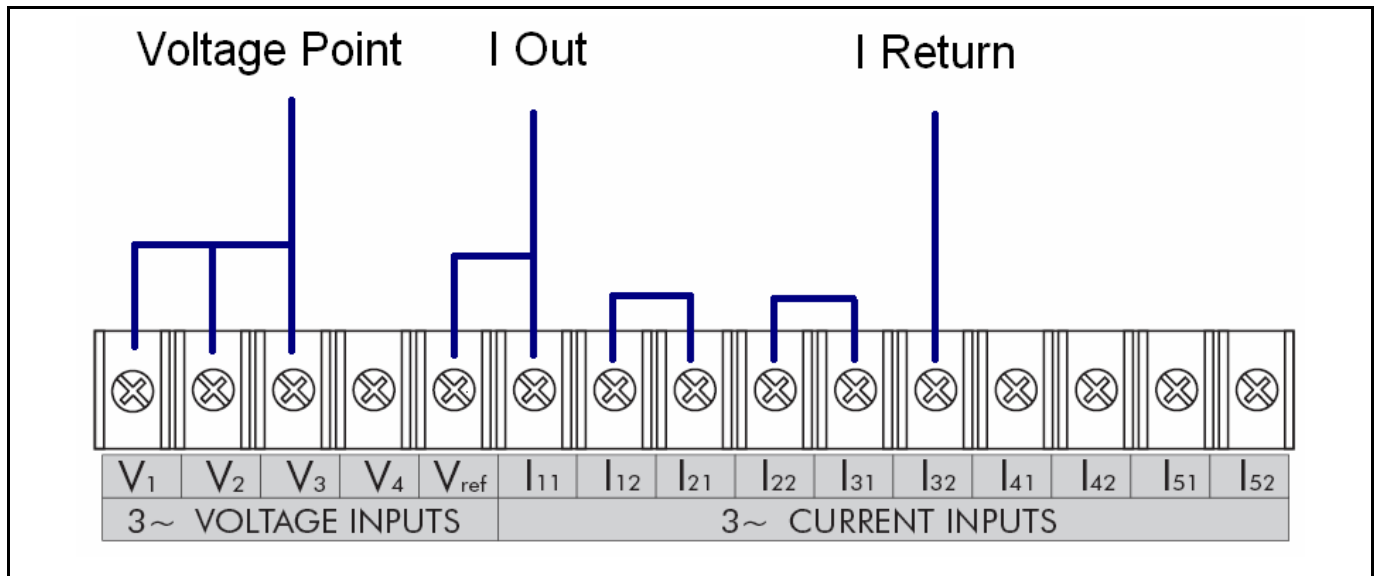
Table 4: Power cable extender connections

Connection		Standard color
I Out	Neutral	White colored wire
I Return	Ground	Green colored wire
Voltage Point	Line	Black colored wire



NOTE: Always check the color code with an ohmmeter before completing the connections.

Figure 10: External meter wiring example



After the external meter is connected and the switch is set to EXT METER, all the meters in the system will be connected to the power simulator at the same time. Any sag/swell event will be sent to all meters. Any current adjustments will be seen by all the meters.



NOTE: To activate the connector, use a small screwdriver to slide the switch towards Ext Meter.

Troubleshooting

Symptom	Possible Solution
Demo Case has no power	<ul style="list-style-type: none">• Ensure that the power cable is tightly connected.• Check that the power switch is in the ON position (located on the left side of the case).• Check that the power input fuse (located underneath the input power connector) is in place and not blown.
Meters measure no current	Ensure the slider switch is in "Int. Meter" mode If "Ext. Meter" mode is being used, check the wiring on the external meter
Current Load Adjust dial does not change current load	Check to see if external load is connected. The internal load is quite small. If an external load is applied, the current adjust has little impact.
Meter measures no Vll voltage	This is normal operation because of the single phase power simulator. Please look for Vln values instead.
Unable to contact an Ethernet device	<ul style="list-style-type: none">• Check that the IP address of meter is configured correctly.• Check that the subnet mask setting is configured correctly.
Unable to contact a serial device	<ul style="list-style-type: none">• Verify the protocol setting on all devices in the daisy chain.• Check the unit ID setting on all devices in the daisy chain.• Check the baud rate setting on all devices in the daisy chain.

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