



PPA Operation Recommendations

1. **Direct input connections**

1.1 Always connect current first. This limits the chance of accidentally connecting voltage terminals to current input that will destroy the current shunt.

1.2 Use short 4mm link cables to our stackable 4mm current connectors, to tap-off Vhi on a single-phase connection and both Vhi + Vlo on a three-phase connection. This technique reduces the need for long voltage cables to the load. [\[See PPA wiring and connection diagrams\]](#)

2. **External input connections**

NOTE: These terminals are Touchproof BNC connector type because they are isolated from ground. Safety BNC connectors should always be used, both because metal BNC connectors will gradually damage the nylon BNC connectors and because a metal BNC will be a voltage hazard when connecting to a resistive shunt that is at line potential.

2.1 **NEVER** connect to direct input (4mm or screw terminal) and External (safety BNC) at the same time! This may destroy the PPA External input or Sensing device connected to it. Do not use switching or multiplexing either.

2.2 Ext Current – Used in conjunction with voltage shunts or voltage output current transformers.

Range Menu - **SHUNT**

Enter the resistance value of the shunt being used or the equivalent resistance value of a voltage output CT.

For example, with a 1000A to 1V CT, the **SHUNT** value would be 0.001 (1 milli Ohm)

Range Menu - **SCALE FACTOR**

This can be used in place of the 'shunt' to enter ratio scaling (e.g. 1000 for a 1000:1 ratio) or to reflect the number of turns on a CT

3. **Always check frequency**

AC power measurement is periodic, therefore stable, and accurate measurements require correct frequency detection, and this should always be confirmed before making further measurements. Frequency reference options are in the acquisition **ACQU** menu and default frequency detection setting is Phase 1 voltage.

4. **Bandwidth**

While the default frequency range is 'wide' i.e. full instrument bandwidth, initial measurement setup is usually better with 'low' bandwidth selected.

(Low bandwidth of most PPA models is 200kHz, appropriate for most applications and wider than the default bandwidth of most power measurement products). Bandwidth options are in the **COUPLING** menu

5. **Application menus**

To simplify instrument configuration in more complex applications, 'mode' options are available in the **APP** menu.

Sub-menus in **PWM** mode include 'frequency filter'.

This filter is used to optimise drive frequency detection only and will not reduce the measurement bandwidth.

A filter frequency should be selected that is above the maximum drive frequency and below the carrier frequency.

6. **Star - Delta configuration**

After connecting the input channels in either Star or Delta configuration ([shown in our connection guide](#)) the associated setting should be defined in the PPA.

From the **POWER** Menu, select 'conversion', then click the right arrow key to open an options list, and select 'star-delta' for a Star connection or 'delta-star' for a Delta connection.

(star-delta type A is direct conversion and type B is back calculated from Delta $\sqrt{3}$) [PPA4500 & 5500 only]

7. **Program memory**

The **PROG** menu provides non-volatile program memory that can be stored and recalled.

Location '0' is factory default, location '1' is loaded on power up (factory default if left empty), then memories 2 to 99 allow users to store any configuration for later recall. [PPA5500 has 999 memory locations]

8. **Firmware**

Installed firmware and calibration date details are presented on the PPA display by pressing the 'SYS key followed by the left arrow ◀ key.

It is good practice to ensure the latest firmware available from the [N4L Resources](#) site is installed.

NOTE: Firmware download has restrictions, so where firmware download may be required, please contact N4L to confirm options BEFORE making any firmware change.