

Basic Setup for the Current Probes Input Option

Meters with the Current Probes Input Option are compatible with clamp-on current probes. All current inputs on these meters are modified to accept 0-5 Vrms AC signals from a variety of clamp-on current probes. This option reduces the downtime required to install a meter. There are two Current Probe Input Option configurations:

- A. Meters calibrated and shipped with probes: the meter is pre-configured and calibrated at the factory with three Universal Technic 10A current probes, meeting IEC 1036 Class 1 accuracy levels which includes the meter and the current probes accuracy. The current probes can be used for monitoring 1A or 5A secondaries. Probe cable is 22 AWG (0.3 mm²) and two meters in length.
- B. Meters calibrated, but not with probes: this option allows you to order a meter that is calibrated for use with current probes. You then supply your own probes (as long as they match the input specifications of the meter) or select one of the several compatible models available from PML as accessories. Probes and probe cables must be compliant with IEC 61010-1 CATIII protection requirements and not require more than 220k Ohm of load impedance.

Whether basic setup is necessary depends on your Current Probe Input Option.

Basic Setup is NOT required:

If your ordering option includes PML supplied current probes and a meter factory-calibrated to match the current probe specifications (option "A" above). *If you have this ordering option, then this document does not apply to you.*

Basic Setup IS required:

If your meter ordering option does **not** include current probes that have been factory-calibrated with the meter (option "B" above). In this case, you need to set up the transformation ratio for the current probes you will be using. If energy readings *accuracy* is important, then you need to set up the phase angle specified by the current probe manufacturer. To learn how to do this setup, read the following instructions.

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Additional Information

- ◆ Your meter's technical documentation
- ◆ Technical note *Telnet and HyperTerminal Access to ACCESS Meters*

Telnet and HyperTerminal Access

To perform current probe basic setup, you need to access the meter Calibration menu in a Telnet or HyperTerminal session:

- ◆ Telnet: select Debug Parser > KAL? (Display Calibration Help Screen).
- ◆ HyperTerminal: select the KAL? (Display Calibration Help Screen).

Refer to the technical note titled *Telnet and HyperTerminal Access* for instructions on how to run a Telnet or HyperTerminal session.

To learn more about the Calibration menu, help, and commands refer to the section “Calibration Menu and the KCTSTP/KCTRD Commands” on page 4.

Current Probe Basic Setup

Basic setup for current probes involves programming the meter with the current probe transformation ratio, and if necessary, the phase angle provided by the current probe manufacturer (phase angle correction is necessary if energy readings *accuracy* is required). These parameters are saved to the meter as *User Defined 1* or *User Defined 2* and are activated on the meter with the meter front panel or software.

In the following example, we will set up a 9500 meter to match current probes that have a 300A primary rating, a 0.333V output, and a phase shift of 2° (as specified by the current probe manufacturer).

In a Telnet or HyperTerminal session, we will set up the parameters using the KCTSTP write command, and save this to the meter as *User Defined 1*. (Refer to the KCTSTP command in the “The Calibration menu contains the following calibration commands:” section).

Next, we will verify our setup with the KCTRD read command. Finally, with the meter front panel or software, we will access the Power Meter module *Current Probe* setup register, and select *User Defined 1*. This activates the meter with the parameters we have set in this example.

CAUTION

Before changing meter parameters, use the Calibration menu KCTRD read command to display the meter default settings. Print out the default settings, and store the printout so you can refer to the default settings later if required.

To perform current probe basic setup:

1. Connect the current probes to the meter (in this example we are using a 9500 meter). Refer to the meter *Installation and Basic Setup Instructions* for current probe installation instructions.
2. In a Telnet or HyperTerminal session, access the Calibration menu. Refer to the technical note titled *Telnet and HyperTerminal Access* for instructions on how to run a Telnet or HyperTerminal session.
3. Set up the current probe transformation ratio and the phase angle.

In this example, we will set up a split core CT with AC voltage output. The model is CT-300A-0.333V (Nominal Primary current 300A, Nominal secondary voltage 0.333V). The phase angle is < 2.0 degrees. This is saved to register group "User Defined 1" (1) and is the same for all phase current channels (44). Refer to the KCTSTP command in the section "The Calibration menu contains the following calibration commands:" on page 4.

To write these parameters to the meter, type in:

```
7500ION:\PORT_1>kctstp CT-300A-0.333V 300 0.333 2.0 1 44
```

Press Enter.

4. To read that the new parameters have been written to the meter, type in:

```
7500ION:\PORT_1>kctrd
```

Press Enter.

5. With the meter front panel or software, activate the current probe parameters set in step 3:
 - ◆ Meter front panel: select *Basic Setup > Current Probe > User Defined 1*.
 - ◆ Designer software: access the Power Meter module *Current Probe* setup register and set it to *User Defined 1*.

Calibration Menu and the KCTSTP/KCTRD Commands

The Calibration menu lets you access setup registers in the meter Factory module. With the read/write commands KCTRD and KCTSTP, you can program the meter with parameters appropriate for your current probes.

Calibration Menu and Help

The Calibration menu contains the following calibration commands:

TERMINAL COMMANDS	
KRD	Read All RMS Calibration Constants
KFRD	Read All Force Levels
KFSRD	Read All Full Scale Values
KCTSTP <tag> <I> <V> <phase angle> <u> <ch>	Write Setup for External CT
KCTRD	Read Setup of External CTs
KD	Read Power Meter Module Diagnostics

Description of KCTSTP and KCTRD Calibration Commands

The command KCTSTP writes all current probe setup registers. The command KCTRD reads all current probe setup registers.

KCTSTP <tag> <I> <V> <phase angle> <u> <ch>

Write the external current probe setup registers

Description:

This command writes to non-volatile registers containing the external current probe parameters

Arguments:

<tag> the current probe model or name tag, maximum of 15 characters; **do not leave spaces** between characters

<I> the RMS value of the nominal primary current of the current probe

<V> the nominal RMS value of the secondary nominal voltage of the current probe

<phase angle> current probe's phase angle in degrees for constant phase compensation

<u> selected register group: 1-User Defined 1, 2-User Defined 2

<ch> selected current channel(s): 4-6 (4=I1;5=I2;6=I3), 44 (44 = ALL PHASE CURRENT CHANNELS: I1,I2,I3)

Example:

Set up a split core CT with AC voltage output model CT-300A-0.333V (Nominal Primary current 300A, Nominal secondary voltage 0.333V, phase angle < 2.5deg, constant phase compensation (2)), saved to register group "User Defined 1" (1) same for all phase current channels (44)

7500ION:\PORT_1>kctstp CT-300A-0.333V 300 0.333 2.5 1 44
executing CAL command

FACTORY PARAMETERS SET FOR EXTERNAL CT(s).

Factory Default:

```
-----
Phase|Probe| Inom | Vnom | Pha(I) curve coefficients | Probe Name Tag
  |comp| [A] | [V] |   a   |   b   |   c   |
-----
PH A 01  0010.0  1.000  000.00000  000.00000  000.00000  CT-10A-1V
PH B 01  0010.0  1.000  000.00000  000.00000  000.00000  CT-10A-1V
PH C 01  0010.0  1.000  000.00000  000.00000  000.00000  CT-10A-1V
-----
```

User Defined 1:

```
-----
Phase|Probe| Inom | Vnom | Pha(I) curve coefficients | Probe Name Tag
  |comp| [A] | [V] |   a   |   b   |   c   |
-----
PH A 02  0300.0  0.333  002.50000  000.00000  000.00000  CT-300A-0.333V
PH B 02  0300.0  0.333  002.50000  000.00000  000.00000  CT-300A-0.333V
PH C 02  0300.0  0.333  002.50000  000.00000  000.00000  CT-300A-0.333V
-----
```

User Defined 2:

```
-----
Phase|Probe| Inom | Vnom | Pha(I) curve coefficients | Probe Name Tag
  |comp| [A] | [V] |   a   |   b   |   c   |
-----
PH A 00  0001.0  1.000  000.00000  000.00000  000.00000  none
PH B 00  0001.0  1.000  000.00000  000.00000  000.00000  none
PH C 00  0001.0  1.000  000.00000  000.00000  000.00000  none
-----
```

KCTRD

Read all current probe setup registers

Description:

This command lists the content of all current probe setup registers. There are three identical groups of registers: Factory Default (configured in the factory), User Defined 1, User Defined 2 (both for user configuration).

Each group contains the following probe parameters:

Primary Nominal Current, Secondary Nominal Voltage, Probe Name Tag (character string). Additionally, if the meter was ordered with factory calibrated current probes, then the Factory Default register group contains probe phase compensation coefficients.

For meters equipped with Current Probe Input Option, but not ordered with factory calibrated current probes, all register groups should contain zero values, except for Nominal Current and Voltage, which are set to 1.0 by default.

For meters **NOT** equipped with Current Probe Input Option, all register groups should contain zero values, except for Nominal Current and Voltage, which are set to 1.0 by default.

Arguments:

None