



A6M+One Installation Guide

Three-phase - Transformer-coupled



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About the A6M+One

The Wattwatchers A6M+One billing solution provides NMI-certified billing data for applications such as solar PPAs, EV charger disaggregation, embedded networks, and microgrids, with an additional 6 circuits of performance monitoring capability.

The A6M+One delivers real-time monitoring, NMI-compliant billing and circuit-switching capability in a neat, DIN-rail mounted package:

- Two real-time, three-phase monitoring points (using the Auditor 6M)
- One NMI-compliant billing channel using the PMC-340B-B (this is the 'One')
- Two independent switching channels which can be used to control contactors

Important



The Current Transformers (CTs) supplied with the PMC-340B are 5A full-scale and can generate lethal voltages. To avoid this the CT clamps must be connected to the device **BEFORE** being clipped to a cable.

Installation of these CTs does not require shorting blocks if these procedures are followed:

INSTALLATION - first connect the CT cables before clipping on the CT
DE-INSTALLATION - first un-clip the CT before disconnecting the CT cables

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Help and support?

Need help with your installation? Lodge a support ticket via www.wattwatchers.com.au/support or email support@wattwatchers.com.au

- Use the onboarding tool to check the installation while the installer is on site
- Please make sure the metadata (circuit details) are complete
- Please quote one serial number per support request

Our team is available for urgent matters from 0900 to 1700, Monday to Friday, Sydney time on **02 8316 7540** (+61 2 8316 7540 from overseas)

Document Revision

Version	Author	Date	Changes
1.0	Jon Keeble	Dec 2018	Initial release
1.1	James Clements	Jan 2019	
1.3	Jon Keeble	7 May 19	CT install and de-install

1. Before you begin

Ideally, a site survey will have been conducted that identifies:

- The space required to fit the two meters and any contactors
- The dimensions of the cables or bus bars to be monitored
- The current ratings of the cables and bus bars to be monitored
- The need for accessories like external enclosures and high-gain antennas

Ensure you have the recommended equipment:

- Internet-connected smart device (e.g. smartphone, tablet, laptop)
- a login to onboarding.wattwatchers.com.au for configuration/validation
- a marker for numbering Current Transformers and cables during installation
- a hand-held clamp/multi-meter for checking current measurements
- An additional DIN-rail enclosure (in case there is no room on the existing rail)
- A spare three-phase breaker (10A or 16A) where an existing breaker is not available

Auditor 6M+One hardware checklist (box contents):

- Modbus-enabled A6M+One device
- Wiring tail—three phase
- PMC-340B-B three-phase transformer-coupled billing meter
- Billing CTs (typically 600A/5A to suit the circuit and cables or bus-bars)
- Monitoring CTs + green CT connector (where the A6M+One is for monitoring)
- Modbus cable

Check that:

- 9U (157.5mm) is available on the DIN rail for the A6M+One with PMC-340B-B35XAE
- The circuit cables fit through the CT openings
- There is space for the contactors if you are using the switching functions

2. Install the PMC-340B-B

The PMC-340B-B is a National Measurement Institute (NMI) pattern-approved, non-communicating, three-phase billing meter 5 DIN rail units wide (126mm).

PMC-340B-B LCD and Buttons

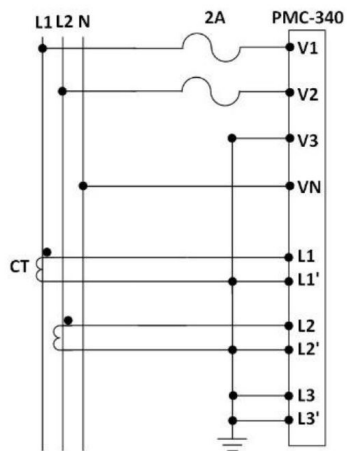
The PMC-340 front panel and display can be used as directed in the PMC-340 User Manual. Do not change the Modbus communications parameters. The PMC-340 is shipped with the front panel password set to the default 000.

PMC-340B-B Billing CTs

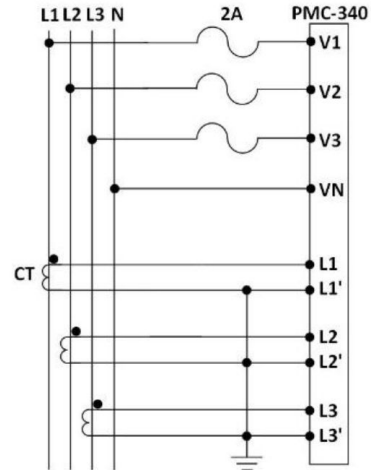
The billing CTs provided with the PMC-340B are labeled 600A/5A, and are incompatible with the Auditor 6M. Likewise, the Auditor CTs (labeled 100mA) must only be used with the A6M

PMC-340B-B CT Installation

Connect the billing CTs and phase voltages to the PMC-340B as per the diagrams and table below, according to whether two phases or three phases are present.



2Phase, 3Wire, 2CTs



3Phase, 4Wire, 3 CTs

Connect the PMC-340B as summarised below for three-phase

CT Connections	PMC-340B-B
Phase A (L1)	L1 to L1'
Phase B (L2)	L2 to L2'
Phase C (L3)	L3 to L3'
Common connection	L1' to L2' to L3' to Neutral

Voltage Connections	PMC-340B-B
Phase A (L1)	Terminal 1
Phase B (L2)	Terminal 2
Phase C (L3)	Terminal 3
Neutral	Terminal 4

The PMC-340B-B Modbus settings are preconfigured, and must not be changed.

Modbus Device ID	100
Baud Rate	9600
Serial Configuration	8E1

3. Auditor 6M Installation

Three-Phase Voltage Connections

- The voltage connections are labeled on the Auditor: P1, P2, P3, N.
- Connect voltage phases to P1, P2, and P3. Connect neutral to N.
- Use three-phase wiring tails if they were provided with your Auditor.

Current Transformers

- Only Wattwatchers-supplied CTs are supported
- CTs of different size can be interchanged in the field in sets of three eg. channels 1-3, 60 Amps; channels 4-6, 400 Amps
- CT size must be updated using the onboarding tool
- Directional arrows for CT placement are imprinted on the CTs.

CT sizes and opening aperture widths

Size (amps)	Opening Width (mm)
60	10
120	16
200	22
400	25
600	36

Current Transformer Connections

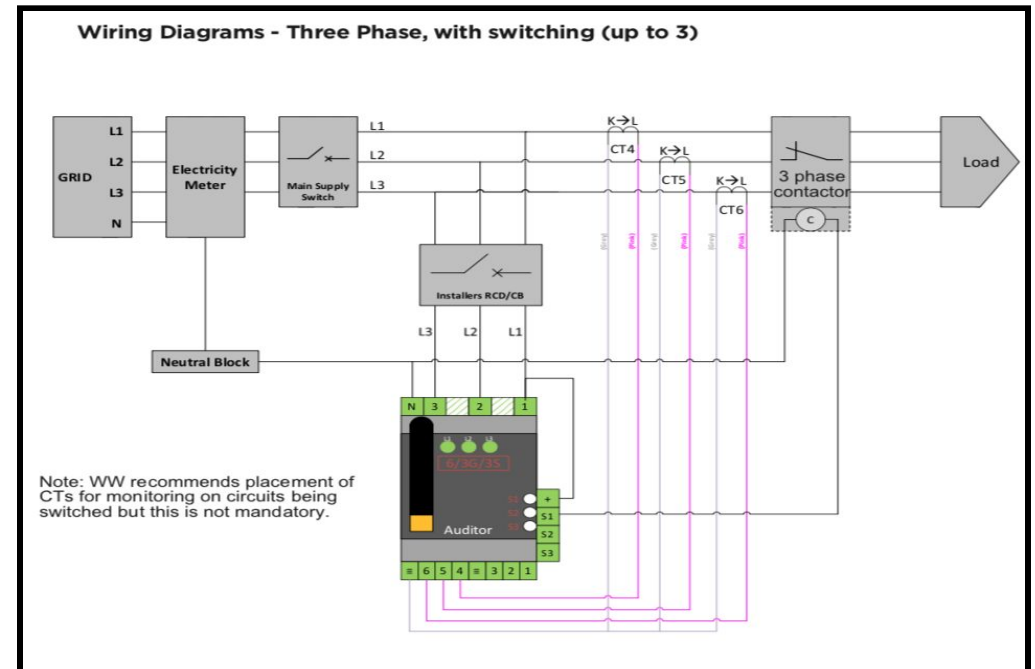
- The CT connections are labeled: ≡, 6+, 5+, 4+, ≡, 3+, 2+, 1+
- The white wires connect to terminals labeled “≡” (three wires in each terminal)
- The pink wires connect to the terminals labeled “+”

Current Transformer Orientation

- For grid monitoring: the arrow is from the grid
- For solar monitoring: the arrow is from the inverter
- For load monitoring: the arrow is towards the load
- CTs must be installed on the correct phase

Place CT connected to ...	On cables connected to ...
1+ and 4+	P1
2+ and 5+	P2
3+ and 6+	P3

It is acceptable to use less than six CTs.



4. Connect the Modbus cable

Install the Modbus cable to the PMC-340B-B and the A6M. A two-core, double-insulated cable is supplied, to be cut to the required length.

One end of the cable is stripped and connects to screw terminals on the PMC-340B. These connections must be torqued to 0.45 Nm. The other end is terminated in a three-pin Terminal Block connector at the A6M+One.

PMC-340B-B	Auditor6M
Screw terminal 11	Terminal A-
Screw terminal 12	Terminal B+

5. Connect the switching outputs

(Skip if you are not using switching)

- The two switching outputs are labeled 1 and 2.
- The common power for all three switches is labeled Δ .
- Connect P1 to Δ in order to power the switches.
- Connect each switch output you require to a contactor and terminate the contactor coil on neutral.
- For single-phase contactors, the contactors can be wired Normally Closed (NC) by using R1 and R2 or Normally Open (NO) by using 1 and 2.
- For three-phase contactors, the contactors can only be NC.
- Implement a CT to monitor each circuit that is switched.

6. Use the onboarding tool

Configure Device Logout

Device Serial Number: D704206228385

Energy Metadata Comms Switches **+ Modbus**

Modbus device: PMC-340B

	Volts	Current	PF
CH 1	237	0.12	0.30 ⓘ
CH 2	235	1.00	0.74
CH 3	234	2.12	0.60

07:45:04 PM 5 mins

The onboarding tool onboarding.wattwatchers.com.au is used by the installer to record details of the installation and check that the installation is correct.

- The login credentials are provided by your Wattwatchers representative.
- Auditor data updates at 5 seconds, the PMC340 data at 5 minutes.
- The power factor is a very useful indicator that the CTs are installed on the correct phase and in the correct orientation: **does the reported PF match the expected PF.**
- The expected PF varies with what is being measured.

7. Validate installation

Three green solid indicators identify the connection status. When the installation is completed successfully, all three green lights on the front of the Auditor will be on.

L1	L2	L3	Explanation
Off	Off	Off	Powered off
Blinking	Off	Off	Powering on
Solid	Off	Off	Powered on – connecting to mobile network
Solid	Blinking	Off	Searching for SIM
Solid	Solid	Off	SIM found
Solid	Solid	Blinking	Waiting for servers
Solid	Solid	Solid	Connection complete

Auditor Switch and Modbus Indicators

If...	Indicator is...	Then the...
S1	Off Red Blue	The feature is not enabled Switch is OFF Switch is ON
S2	Off Red Blue	The feature is not enabled Switch is OFF Switch is ON
MB	Red (blinks every 5 seconds) Green (blinks off every 5 minutes)	PMC-340 not detected PMC-340 is detected

Validating that your installation is correct

If...	Then...	Otherwise...
Circuit current rating is less than the CT rating.	The correct size CTs are installed.	Use a larger CT.
Install data shows three voltages around 240V, less than 265V.	The voltage connections are good.	Check the voltage connections to P1, P2, P3 are three phases.
Three-phase solar inverter circuits that have equal current and PF=1.	Solar CTs are installed correctly.	Check CT wiring, phase and orientation.
With the solar inverter turned off, PF is +ve and expected value on all circuits.	Grid and load CTs are installed correctly.	Ensure the CT phase and orientation is correct. CTs on the wrong phase may cause negative PF readings. Where there is solar operating, Grid circuits show -ve PF if there is "feed-in".
Current measured with tongs meters matches the reported.	The Auditor is configured correctly.	Use onboarding tools to change the CT to the correct size.
Default phase allocation is ok for this installation.	Multiple single-phase loads are being monitored.	Email Support with pairing channel and phase e.g. CH1/P1.
A CT is used to monitor one of multiple parallel conductors for a connection	Email Support with pairing channel, phase and CT size e.g. CT1/P1 400A.	