

## Compact, flexible, real-time electricity monitoring and control for the IoT edge

### Features

- Real-time energy monitoring for up to six (6) electrical circuits, with cellular communications (4G/3G) embedded in the device. Options for switching control and Modbus to support data acquisition and control of limited third-party devices.
- Sophisticated measurements on two timeframes: Short Energy - instantaneous measurements typically transmitted every 5-30 seconds (configurable), and Long Energy every 5 minutes.
- Resilient 5-minute data delivery supported by up to 25 days of on-device logging capacity.
- Multi-carrier communications that auto-select the strongest locally-available telecommunications network.
- Compact and DIN-rail mounted - 2 poles (35mm wide).
- Class 1.0 accurate (+/-1%) four-quadrant energy measurement for applications up to 600A using split-core current transformers.
- RESTful API provides easy access to monitoring data and switching functionality, for use in third-party platforms.
- Over-the-air (OTA) device management includes firmware upgrades and remote correction of common installation errors.
- Comes with Wattwatchers software tools for streamlining installation and operations: fleet management, onboarding and dashboard.

### Applications

- Suitable for residential, commercial and industrial monitoring in single-phase, multi-phase and mixed-phase environments, with or without solar.
- Solar monitoring and DER integration.
- Home energy management.
- Commercial and industrial sub-metering.
- Asset-level monitoring (supporting analytics).
- Utility services.



## Technical Summary

Monitoring channels	Six channels for monitoring which are reported individually and can be configured to monitor one, two or three phases. Long Energy and Short Energy measurements are made on each channel.
Energy measurements - Long Energy	Long Energy data is logged. The following measurements are made in each 5-minute interval: real and reactive energy, min/max voltage, min/max current, power factor
Energy measurements - Short Energy	Short Energy data is composed from instantaneous measurements that can be configured over-the-air from 5-295 secs <sup>1</sup> . The standard setting is 30 seconds and includes: real and reactive energy, voltage, current, frequency, power factor.
Data Logging	Up to 25 days on-device logging of Long Energy 5-minute data for 6 channels. Nonvolatile storage with automatic recovery from communications outages.
Communications	3G/4G LTE Pentaband Three regional variants available covering Australia/Asia, Europe/Middle East and US/North America. Automatic switching between supported carriers for the best performance.
Network Carrier	Multi-network SIM operates in more than 130 countries. In Australia, Telstra, Optus and Vodafone are supported.
Power Supply	Built-in power supply for operation at 80-265V AC
Standard inclusions	6-circuit monitoring, power supply, 4G/LTE with multi-network SIM. 3G-4G antenna, pre-wired power tails, current transformer connector, serial number labels, Quick Start Guide.
Antenna	Standard direct connect multiband antenna with SMA connector included. Optional: additional external antennas as required e.g. to extend outside metal meter box.
Current sensing	Split-core current transformers available in 60A, 120A, 200A, 400A, 600A.
Configuration	Fast installation configuration and verification with the Wattwatchers Onboarding application.
Real-time data access	All measurement data is available in real-time from the Wattwatchers RESTful API for use in the applications of your choice. Some measurements are visible in Wattwatchers applications and third-party software applications.
Device management	The Wattwatchers Fleet, Onboarding and Device Management services support a comprehensive range of services including: <ul style="list-style-type: none"> <li>• Remote device configuration for installers or remote support teams</li> <li>• Fleet health monitoring and access to data for diagnostics and analysis</li> <li>• Firmware updates and configurable reporting rate managed by Wattwatchers</li> </ul>
Modbus Master option	Isolated Modbus RTU for communication with other Modbus 'slave'/follower devices. Contact <a href="mailto:sales@wattwatchers.com.au">sales@wattwatchers.com.au</a> for the current list of Modbus device drivers.
Switching option	Up to three independent voltage-free contacts rated up to 100mA 240V AC with zero-crossing control to minimize inductive stress on contactors. Switch control is performed through the Wattwatchers API.

More information at: [wattwatchers.com.au](http://wattwatchers.com.au)

Some information may be subject to change without notice

<sup>1</sup>Non-standard configuration may incur additional charges

## Electrical Specifications

### Power supply characteristics

Input-voltage characteristics	Measured voltage	80-265V AC
	Permissible overload	1.15 nominal voltage for up to 1 minute
Power consumption		1.2W Single Phase (Through P1/N terminals)
Power tails	Cabling	600V 18AWG 7/0.25mm <sup>2</sup> tinned annealed copper bunch. The conductors comply with UL758, UL1015 105C and CSA C22.2 Number 127.

### Energy measurement specifications

Energy measurements	Short Energy	Configurable from 5-295 seconds Push to server - best efforts delivery (QOS0); Standard setting is 30 seconds; Short Energy contents: real energy, reactive energy, voltage, current, frequency, power factor.
	Long Energy	5 minute interval data - QOS1 delivery under normal communications operation - logged on device; Long energy contents: real energy, reactive energy, min/max voltage, min/max current, power factor.
	Internal logging	Up to 25 days on-device logging for Long Energy of 6 channels; Data stored in non-volatile memory and transmitted automatically when communications are restored.
	Voltage	Single Phase Two Wire (1P2W), Two Phase Three Wire (2P3W) or Three Phase Four Wire (3P4W) systems. 80-265V, 0.1V resolution.
Measurement accuracy	Current	Split-core Current Transformers
	Active energy	Class 1 based on IEC 62053-21
	Reactive energy	Class 2 based on IEC 62053-23
	Frequency	45 to 65 Hz, 0.01 Hz resolution
Input-current characteristics	Standard CT ratings	60A, 120A, 200A, 400A, 600A
	Internal burden	2.7 ohms
	Full Scale	100 mA
	CT Connections	Not isolated (Neutral referenced)

## Communications

Cellular communications	Type	3G, 4G LTE - See regional variants table
	SIM	Factory-fitted internal micro-SIM.
	Auto-carrier selection	Automatically selects the best compatible network based on signal strength at the installation location.
	Global carrier support	Support for more than 130 countries. Please contact <a href="mailto:sales@wattwatchers.com.au">sales@wattwatchers.com.au</a> for more detail. In Australia: Telstra, Optus, Vodafone.
Hardware	Antenna	SMA connector. Supplied with direct-connect multi-band antenna. Optional external antennas can be used to boost signal strength.

## Regional Variants

AUS	Australia, NZ Korea Taiwan Philippines	3G 4G	UMTS/HSPA+: Tri-Band 850/900/2100MHz LTE (AU): Quad-Band 700/850/900/1800MHz
US (AT&T) (not currently available)	US	3G 4G	Tri-Band UMTS: 850, 1700/2100 (AWS) and 1900MHz Quad-Band LTE: 700, 850, 1700/2100 (AWS) and 1900 MHz
E-REL2	EMEA	3G 4G	Dual-Band GSM: 900 and 1800MHz Dual-Band UMTS/HSPA+: 900, 2100 MHz Penta-Band LTE: 700, 800, 900, 1800, 2100 MHz

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## Mechanical characteristics

Weight		0.3 kg
IP degree of protection		IP50 (front display) when installed in switchboard
Dimensions		89 x 77 x 35 mm (2 DIN poles)
Mounting		35mm DIN rail (TS35)
Connections	Voltage	6 positions/4 connection 5.08 mm pitch FCI part 20020007-H061B01LF
	Current	8-way 3.81mm pitch FCI part 20020004-D081B01LF

## Environmental and safety conditions

Ambient operating temperature		-10 °C to +55 °C
Installation / pollution category		III / 2
Electromagnetic immunity	Electrostatic discharge	Level III (IEC 61000-4-2)
	Immunity to radiated fields	Level III (IEC 61000-4-3)
	Immunity to fast transients	Level IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
Safety		Certified for Level III environment (meter and distribution boards)

## Certifications

Responsible Supplier Number	E5258
Safety	AS/NZ 60950.1:2015
	EN 60950-1:2006
	UL 61010.1 (2003)
Emissions	AS/NZS CISPR 22 (2009+Amt1 2010) FCC Part 15B
Immunity	CISPR 24: 2010, CISPR 32:2015
FCC ID	QIPELS61
Related spurious emissions	AS/NZS 4268:2008 +A1:2010 C 8.2 and 9.1 EN 300 328 with reports FCC sDoC 47 CFR Part15, Subpart B
ARPANSA RP3	AS/NZS 2772

## Options

**Switching (+3SW)** - 3 switching outputs can be used to directly control contactors or trigger events in other equipment.

Switching channels	Number	3 independent switching channels controlled via API and Wattwatchers applications
	Electrical rating	Up to 240V AC nominal 100mA per switching output
	Type	Voltage-free zero-crossing control to minimise inductive stress on contactors
Power Supply	External connection	240V AC connected to switching common terminal

**Modbus RTU Master (MB)** - For data acquisition and control of third-party devices - drivers must be created to support equipment.

Modbus	Type	Modbus RTU RS-485 using SELV wiring to external meters, solar inverters and other Modbus slave devices.
	Master	Operates as a Modbus master for compatible devices. Capable of communicating with 1 slave device.
	Auto-detection	The Auditor automatically detects and establishes communications with supported devices upon physical connection.
	Isolation	Optically isolated.

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# A6M-4G Datasheet

