



AOS ESR-M

Product Overview

Revision 1.0

www.Aetheros.com

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FCC COMPLIANCE

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

FOR COUNTRY CODE SELECTION USAGE (WLAN DEVICES)

Note: The country code selection is for non-US model only and is not available to all US model. Per FCC regulation, all WiFi product marketed in US must fixed to US operation channels only.



! DANGER

WARNINGS AND CAUTIONS

Electrical equipment contains hazardous voltages and may cause death, serious personal injury, or equipment damage.

Always de-energize and ground the equipment before maintenance. Maintenance should be performed only by qualified personnel. The use of unauthorized parts in the repair of the equipment or tampering by unqualified personnel will result in dangerous conditions which will cause severe personal injury or equipment damage. Follow all safety instructions contained herein.

IMPORTANT

The information contained herein is general and not intended for specific application purposes. It does not relieve you of responsibility to use sound practices in application, installation, operation, and maintenance of the equipment purchased. Aetheros reserves the right to make changes in the specifications shown herein or to make improvements at any time without notice or obligations. Should a conflict arise between the general information contained in this publication and the contents of drawing or supplementary material or both, the latter shall take precedence.

QUALIFIED PERSON

For the purpose of this manual, a qualified person is one who is familiar with the installation, configuration, or operation of the equipment and the hazards involved. In addition, the person is:

- trained and authorized to de-energize, clear, ground, and tag circuits and equipment in accordance with established safety procedures;
- trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc. in accordance with established safety practices; and
- trained in rendering first aid.

Any work on or near energized meters, meter sockets, or other metering equipment presents the danger of electrical shock. All work on these products must be performed by qualified industrial electricians and metering specialists only. All work must be done in accordance with local utility safety practices and procedures.

BEFORE YOU START

Read and thoroughly understand this guide before installing and operating the unit. Save these instructions for later use and reference.

The procedures in this document must be strictly adhered to. Any deviation from these could cause irreversible damages to the meter and could lead to property damage, personal injury, and/or death. Installation of the meter must be carried out by qualified personnel only.

SAFETY PRECAUTIONS

Follow all safety precautions and instructions in this guide.

Only qualified personnel should work on the meter. Maintenance personnel should be familiar with the technology and the hazards associated with electrical equipment.

- Never work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, isolate or disconnect all hazardous live circuits and sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of back feed.
- Turn off all power supplying the equipment in which the meter is to be installed before installing and wiring the meter.
- Operate only from the power source specified on the installed power supply module.
- Beware of potential hazards and wear personal protective equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.
- All electronic components within the meter are susceptible to damage from electrostatic discharge. To prevent damage when handling this product use approved static control procedures.
- Hazardous voltages can cause shock, burns or death. To prevent exposure to hazardous voltages, disconnect and lock out all power sources before servicing and removing components.
- If the meter is used in a manner not specified in this manual or referenced documentation, then the protection provided by the equipment may be impaired.
- Changes or modifications made to the unit not authorized by Aetheros could void the warranty.

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1 INTRODUCTION

The purpose of this document is to provide a brief product overview of the AOS ESR-M product, and to describe the steps for the installation of the AOS ESR-M product with a supported electric meter.

This document is intended for extensively trained and qualified metering personnel, industrial electricians, and metering specialists only. It is not intended to replace the extensive training necessary to install or remove meters from service.

Any work on or near energized meters, meter panel, or other metering equipment presents the danger of electrical shock. All work on these products must be performed by qualified industrial electricians and metering specialists only.

All work must be done in accordance with local utility safety practices and procedures.

1.1 Additional Documentation

For information on the remote operation, management, and control of the AOS ESR-M product please refer the Aetheros PolicyNet User Guide v5.5 document.

1.2 Support

If you have a question, an issue, or would like to speak with Aetheros Support personnel, please contact Aetheros using one of the following methods.

1.2.1 Technical Support

Email support@Aetheros.com.

2 PRODUCT OVERVIEW

2.1 AOS ESR-M Description

The Aetheros Edge Server Router for smart meters (AOS ESR-M) product provides the latest in open standards-based secure edge computing and communications for the next generation smart electricity grids. Its multiple radio interfaces support both licensed and unlicensed wireless communications, making it a versatile router/gateway server in utility field area and premise area wireless networks. The AOS ESR-M is designed to be plugged into and powered by a supported smart meter (e.g., Landis+Gyr E355 or Genus GACE01 meters)

The AOS ESR-M comes with the Aether Operating System (AOS). Leveraging the oneM2M.org and OMA SpecWorks specifications, AOS offers developers an open and extensible oneM2M IoT Service Layer and Security framework enabling the rapid development and deployment of embedded edge IoT Applications within the smart meter network

Our Aetheros PolicyNet AMI HES software for mission critical, large-scale, AMI 2.0 network deployments is bundled with the AOS ESR-M product.

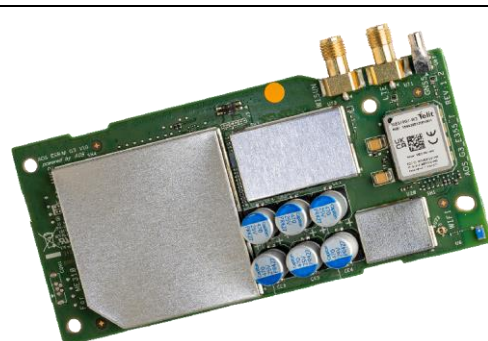


Figure1 – AOS ESR-M Motherboard (front)



Figure 2 – AOS ESR-M in Enclosure with view of the Meter Interface & Antenna connectors

2.2 AOS ESR-M Functionality

Radio Interfaces	Supported Radio Frequencies	TX Power	Data Rate
LTE Cat M1	LTE Bands: 3 and 28 (external antenna; SMA connector)	23 dBm	1 Mbps
Wi-SUN v1.x	915-928 MHz (external antenna; SMA connector)	29.3 dBm	128 Kbps
WiFi 802.11n	2400 MHz (internal chip antenna)	20 dBm	330 Mbps
GPS / GNSS	1575-1610 MHz (external antenna; MMCX connector)	-	-

Meter Interface	Interface Use	Logic Level
2X UARTs	ANSI C12.18 /.19, ANSI C12 PSEM/IP, IEC DLMS/COSEM	5V
3X GPIOs	Meter State and Event Signaling	5V

Power Information	
DC Power	Input Voltage: 14 V 10W
Outage Last Gasp	AOS ESR-M power supply provides ~200 msec full power for Outage Last Gasp messaging on power outage events

Environmental Conditions	
-40 °C to +85°C	Specified operating range / Storage
up to 95% non-condensing	Humidity

Standards and Certifications	
Regulatory, Safety, Emissions, GSMA	US CFR Title 47 Part 15, Telecommunications, Part 15.247 Emissions: AS/NZS 4268:2017 (2400 to 2482.5 MHz only) Safety: AS/NZS 62368.1:2022 EMC: CISPR 32:2015/Cor1:2016, Class B, and CISPR 11:2016 (Group 1) Class B GSMA: TS.51 and TS.24 Environmental: EN IEC 62311:2020
Industry	AS 62053.11:2023, Section 9 (EMC Testing) ANSI C12.20, Tests 4, 5, 6, 7, 16, 17, 18, 19, 25, 25a, 26, 27, 28, 32, and 34
Meter Protocols	ANSI C12.18/.19 IEC DLMS/COSEM

Smart Meters Supported	
Landis+Gyr	E355 meters
Genus	GACE01 meters

4. Professional installation instruction

4.1 Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

4.2 Installation location

The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

4.3 External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

4. Installation procedure

4.1 Meter Installation Steps

4.1.1 Open electric meter panel door and de-energize the electrical service to the meter.

4.1.2 Remove the top cover of the electric meter (discard seal wire).

4.1.3 Install Aetheros 3-in-1 External Antenna to the meter box, and attached the LTE, WiSUN, and GNSS antenna cables to the AOS ESR-M device.

4.1.4 Plug the AOS ESR-M 20 pin male connector into the Meter's 20 pin female connector, and install the meter top cover over the AOS ESR-M.

4.1.5 Reseal the top cover of the electric meter

4.1.6 Re-energize the electrical service to the meter.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.