Data Sheet

AOS Edge Server Router for the Aclara kV2c meter family

The AOS Edge Server Router for Aclara kV2c meters (AOS ESR-M) delivers the latest in open, secure, embedded Linux edge computing along with both licensed and unlicensed wireless communications for advanced electricity metering, renewable energy management, demand response, load control, and the electrification of the automotive industry – AMI 2.0

The AOS ESR-M product includes multiple radios enabling both licensed and unlicensed wireless communications, making it a versatile network element in AMI 2.0 field area and premise networks. The on-board GNSS/GPS radio subsystem delivers Geolocation and UTC Stratum 1 Time services, making it a highly reliable local time source in next generation grid networks.

With its integrated IEEE 802.15.4 radio subsystem, the AOS ESR-M can serve as a Border Router, Router Node, or End Node in a Wi-SUN IPv6 mesh field area network. In addition, its IEEE 802.11 WLAN radio subsystem allows the AOS ESR-M to serve as a WLAN hotspot, enabling local secure communications with utility field tools and end customer devices, appliances, and vehicles.

AOS Edge Server Router for Aclara kV2c Meters

The AOS ESR-M product is available in North America (USA, Canada, Mexico) on the AT&T and Verizon LTE networks.

AOS is a distributed embedded operating system based on Linux and other open-source software, designed specifically to enable secure embedded edge computing. At the core of AOS is its oneM2M compliant Common Services Entity software (CSE).

The AOS CSE software runs in the cloud (known as a network infrastructure node, or IN-CSE) and on the AOS ESR-M device (known as a network middle node, or MN-CSE). AOS offers developers a comprehensive suite of oneM2M RESTful APIs that include the common service functions required for massive-scale device, application, and communications network management.

Application computing segmentation and strong access control security is implemented using Linux Containers with oneM2M Access Control Policies. Edge applications must be digitally signed to be downloaded, installed, and loaded. AOS has application management common service functions.

Hosted edge applications can use the AOS Metering Service APIs to get real-time meter read data (e.g., summation and instantaneous register reads) and control the meter's energy service switch.

The AOS SDK on GitHub includes an OpenFMB Meter Reading Profile protobuf adapter that support ANSI C12 PSEM and IEC DLMS/COSEM meters. When used with the AOS MQTT client service over TLS, edge applications can publish meter read data near real-time across the field area network devices enabling AMI 2.0 use cases such as distribution circuit segmentation, load balancing, demand response, renewable management and electric vehicle integration. The AOS Metering Service APIs also include support for the Federal Commission of Electricity of Mexico's SiNaMed specification (CFE GWH00-79).

AOS runs on the Qualcomm® MDM9206 modem chip on an ARM Cortex A7, 1.3GHz microcontroller with 256MB DDR Memory and 512MB Flash Storage. The AOS CSE Identity and Security common service functions utilize the Qualcomm® Trusted Execution Environment hardware and software security elements on the chip.

Radio Interfaces	Supported Radio Frequencies	TX Power	Data Rate
WI-SUN v1.x	902-928 MHz; 915-928MHz	30 dBm or less	128 Kbps
WIFI 802.11n	2400 MHz	20 dBm	330 Mbps
GPS / GNSS	1575-1610 MHz	-	-

Meter Interface	Interface Use	Logic Level
2X UARTs	ANSI C12.18 /.19 Communications	5V
6X GPIOs	Meter State and Event Signaling	5V
Pass through	Support for Aclara IO Cards (26 pin pass through header)	-

Power	Input Voltage	Power Outage Signaling
DC Power	20V, 8.5W	<100 msec 300mA max demand

Environmental Conditions	
-20 °C to +60°C	Specified operating range
-30 °C to +70°C	Limit range of operation
-45 °C to +80°C	Storage
up to 95% non-condensing	Humidity

Standards and Certifications	
EMC	ANSI C63.4-2014 with FCC Part 15 Subpart B/Class B, ICES-003 Issue 6 Class B CISPR 32:2015/Cor1:2016, Class B, and CISPR 11:2016 (Group 1) Class B
Industry and Safety	IEC 60068-2.78 IEC 62052-31:2015, Clauses 6, 7, 8, 9, 10, 11, 12 , and 27 ANSI C12.20, Tests 4, 5, 6, 7, 16, 17, 18, 19, 25, 25a, 26, 27, 28, 32, and 34
Security	AES-128/192/256 CTR, CCM, and GCM SHA-1/224/256/384/512 HMAC-SHA1/224/256/384/512 RSA with 1024/2048/3072 modulus ECDSA with P224, P256, P384, P521 PBKDF2
Electricity Metering	ANSI C12 Protocol Specification for Electronic Measurement (PSEM) IEC 62056-62/62056-53 (DLMS/COSEM) CFE GWH00-79 SiNaMed measurement protocol (SiNaMed)