AYYEKA

Wavelet™ V2

Robust Industrial IoT Data Logger Edge Device

Data Sheet

Compatible
Connect any sensor to Ayyeka and any 3rd-party IoT platform

Cost-effective
Save time and money with plug-and-play installation

Cybersecure
Encryption, authentication and remote updates

Comprehensive
Encompassing all required equipment and services

Delivering decisions from field assets data

Ayyeka's Wavelet™ V2 is a ruggedized IP-68, battery-powered, wireless Industrial Internet of Things (IIoT) data logger edge device. The Wavelet™ is utilized to monitor and manage utility assets, enabling performance optimization and predictive maintenance. The Wavelet™ along with Ayyeka's end-to-end solution helps municipal and industrial operators increase efficiency, reduce downtime and failures, and improve compliance.

The Wavelet™ is designed for compatibility and interoperability to connect decision-makers with their critical assets. The device generates and securely transmits sensor data to Ayyeka's software platform, where it can be managed and integrated into third-party IoT applications, SCADA, data analytics, and GIS.

Through the creation and management of data from field assets, Ayyeka's solution transforms and adds intelligence to new and existing infrastructure networks alike.

Inputs & Outputs (Sensor Integration)

Sensor Ports	Supports up to 12 sensors using optional standard cable splitter (or more for serial inputs). Three ports: Port #1: 4 x analog input, 1 x digital input/output Port #2: 1 x RS485, 1 x RS232, 1 x SDI-12 Port #3: 2 x digital input/pulse counting/ output, 2 x digital input/output
Sensor Connections	External only, field attachable with M12 connectors
Serial Interfaces	RS485 SDI-12 RS232
Serial Protocols	Modbus RTU and Modbus ASCII SDI-12 Column Parser Custom (proprietary)
Serial Channels	Up to 16
Analog Channel	Up to 4 universal inputs (current and voltage sensing). The device supports a total range of 0-33 mA and 0-27.5V per channel. For analog voltage measurements accuracy: For voltage measurements: Maximum ±0.9% from full scale (27.5V) across the entire temperature range (-40˚C to +80˚C) Limiting the temperature range to -10˚C to +40˚C will improve the accuracy to ±0.5% (worst case). For analog current measurements: Maximum ±0.5% from full scale (33mA) in the entire temperature range (-40˚C to +80˚C) Limiting the temperature range to -10˚C to +40˚C will improve the accuracy to ±0.25% (worst case).
Digital Channels	Total of 5 dry contact, open drain digital I/O; combination of inputs and outputs, where: Maximum number of inputs is 5 Up to 2 pulse counting inputs with maximum pulse frequency is 39Hz Maximum input 2.8 VDC (for "wet" contact) - a pulse-converter can be used for inputs greater than 2.8 VDC Maximum number of outputs is 5 Output at 0V/2.8V Output: 3 at 0V/2.8V
Sensor Power Supply Output	4 x 12V, 250mA total Support 3.6 V to 3.9 V

Connectivity

Communication Network	4G with 3G/2G fallback Available modem technologies: Europe 2G: GSM 900, GSM 1800 3G: 2100 (B1), 1800 (B3), 900 (B8) 4G: 2100 (B1), 1800 (B3), 2600 (B7), 900 (B8), 800 (B20) North and South America 2G: GSM 850, GSM 900, GSM 1800, GSM 1900 3G: 850 (B5), 1700 (B4), 1900 (B2) 4G: 700 (B17), 700 (B13), 850 (B5), 1700 (B4), 1900 (B2) LoRaWAN (optional)
SIM Cards	Dual SIM, 3FF (micro)
Cellular Roaming	Two multi-network global roaming SIM cards, non-steered, failover and switching scenarios
Data Plan	Included with roaming in 180+ countries with FAI-Cloud (cloud-based solution)
Configuration and Upgrades	Remotely (over-the-air) Bluetooth Low Energy (BLE) with AyyekaGo mobile app USB PC connection
Data Transmission Profile	Periodic, Scheduled, Event-driven Dynamic IP address for every device session to significantly reduce attack vector
Antenna	External (recommended to use) Internal included (backup for external) Automatic switching between the two
Buil-in-GPS	included

Data

Cyber Security	TLS 1.3, including AES-256 data encryption Secured pairing key for secured connectivity
Data Storage	Internal encrypted storage on the device of 8 GB industrial-grade SD card, storing approx. 500 million sensor data samples.
Data Communication	Data Transmission: FAI-Cloud or FAI-Local (on-prem) - Azure IoT Hub - AWS IoT - MQTT broker (cloud or on-prem) multi-server data transmission is supported. Data Encoding: - Proprietary protocol buffers (Protobuf) - Sparkplug Authentication: mTLS authentication for Server-Wavelet secure connectivity
Time Synchronization	HTTPS, RTC, GPS and NTP server (cloud or on-prem)
Alarm Threshold	Up to four alarms for each data stream
System Health Check	Included

Power

Primary Power Supply	Internal lithium thionyl chloride (LiSOCl2) battery, 3.9 VDC 3A, field-replaceable, military-grade, non-rechargeable
Battery Capacity	32 Ah
External Power Supply Voltage Input	6-24 VDC with automatic power source switching
Operational Run Time	Up to 5+ years Actual battery lifetime depends on sensor power consumption, sampling and transmission frequency, cellular signal strength, and other factors
Battery Life Notification	On-board battery consumption measurement for battery life monitoring

Mechanical Enclosure

Dimensions (W x H x D)	13.2 cm x 16.5 cm x 7.3 cm 5.2 in x 6.5 in x 2.9 in
Weight	0.9 kg 2.0 lbs
Enclosure Material	UV-resistant, molded polycarbonate with ABS (UL 94V-0). All metallic objects of the enclosure (screws, washers, connectors, and so forth) are made of 316 stainless-steel.
Water and Dust Proof Rating	IP68 NEMA 6P
Operating Temperature Range	-40°C to +80°C -40°F to +176°F
Storage Temperature Range	-40°C to +80°C -40°F to +176°F
Internal Battery Temperature Range	-40°C to +85°C -40°F to +185°F
Relative Humidity Range	30-95%, with condensation The device has an internal humidity and temperature sensor for monitoring device health.
Elevation	-500 meters below sea level to +3,500 meters above sea level -1,640 feet to +11,483 feet
Led Indicator	Included

Certifications

Safety	EN 61010-1 2010 IEC 61010-1
FCC	FCC Part 15 Subpart B
EMC	EN 301 489-1 V2.1.1 2017 EN 301 489-7 V1.3.1 2005
Spurious Emissions	EN 301 511 V12.5.1 2017
Radiated Emissions	EN 301 908-1 V11.1.1 2016
IP68/NEMA 6P	EN 60529:1992+A2:2013 IEC 60529:1989/AM1:1999
RED	EN 18031:1
CE	EC Directive:/ Directive CEE: 2014/53/EU Approved
ATEX	Does not apply
HazLoc (cULus)	Does not apply
IECEx	Does not apply

Connecting to Software

Ayyeka Standard System Architectures	FAI-Cloud (cloud-based) FAI-Local (on-prem) FAI Lite
Cyber Security	TLS 1.3, including AES-256 data encryption Secured mTLS for online connectivity Secured pairing key for manual connectivity
Software Integration	REST API CSV
SCADA Integration	OPC-UA Connector DNP3 Connector CSV Generator (for SCADA and software integration)
AyyekaGo mobile app	iOS Android
IoT Software Platform	Web-based from desktop, tablet, or mobile device
Data Export Options	CSV (Reports)
Alarm Notification	SMS Email Voice