

# E-DAQ<sub>v1</sub>



**Compact industrial signal acquisition and processing unit designed for monitoring electrical signals from industrial equipment**

The device acquires analog voltage and current measurements, performs embedded signal processing and feature extraction, and streams both raw and processed data to external systems

Channels	Sampling Rate	Feature Output	Interfaces	Mounting
2 Analog	250Hz / 1kHz / 2kHz	40 Hz	WiFi (MQTT), USB	Magnetic

## Key Features

- ✓ Dual-channel analog signal acquisition
- ✓ WiFi (MQTT) or USB data streaming
- ✓ Bluetooth configuration and diagnostics
- ✓ Magnetic mounting for rapid installation
- ✓ Embedded signal processing and feature extraction
- ✓ Plug-and-deploy integration with existing equipment

## Measurement Specifications

<b>Input Channels</b>	2
<b>Channel 1 Range</b>	0 – 60 VDC
<b>Channel 2 Range</b>	0 – 400 mVDC
<b>ADC Resolution</b>	16-bit
<b>Raw Sampling Rate</b>	250 Hz / 1 kHz / 2 kHz
<b>Feature Output Rate</b>	40 Hz
<b>Output Signals</b>	8 (4 per channel)

**Note:** Supported device configurations provide raw sampling and transmission rates of 250 Hz, 1 kHz, or 2 kHz. Processed feature output remains 40 Hz across all configurations.

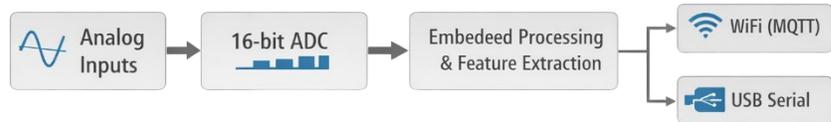
## Connectivity

<b>WiFi Standard</b>	IEEE 802.11 b/g/n (2.4 GHz)
<b>WiFi Security</b>	WPA2-PSK
<b>Messaging Protocol</b>	MQTT
<b>USB Interface</b>	Serial communication
<b>Bluetooth</b>	Configuration & provisioning
<b>IP Configuration</b>	DHCP or static IP
<b>Network Priority</b>	Wired preferred, WiFi fallback

**Note:** Static IP support: The device supports user-configured static IP addressing for deployment in private or NAT-restricted industrial networks. If static configuration is disabled, the device automatically obtains an address via DHCP.

## Signal Output

The device transmits both raw sampled signals and extracted feature signals. Processed feature signals summarize the electrical signal characteristics derived from the sampled measurements.



In typical deployments Channel 1 is used for current sensing (low-voltage signal from an induction sensor).

Field	Description
current	Instantaneous current measurement
voltage	Instantaneous voltage measurement
current_range	Difference between max and min CH values within the processing window
voltage_range	Difference between max and min voltage values within the processing window
current_std	Standard deviation of current within the processing window
voltage_std	Standard deviation of voltage within the processing window
current_score	Instantaneous bandwidth metric derived from the current signal spectrum
voltage_score	Instantaneous bandwidth metric derived from the voltage signal spectrum
score	Combined signal score computed from voltage and current bandwidth metrics

## Data Integration

### MQTT Transmission

Messages are transmitted at **20 Hz**  
Each message contains **2** samples  
Effective feature update rate: **40 Hz**

#### Topic format:

```
sensor/<equipment_id>/1/10/40
```

#### Example:

```
sensor/1/1/10/40
```

#### MQTT Payload:

```
[  
  [timestamp, current, voltage, current_range,  
    voltage_range, current_std, voltage_std,  
    current_score, voltage_score, score],  
  [timestamp, current, voltage, current_range,  
    voltage_range, current_std, voltage_std,  
    current_score, voltage_score, score]  
]
```

### USB Serial Transmission

USB interface transmits both processed feature data (if configured) and raw data streams (by default). Processed data uses the same format as MQTT.

#### Raw data format:

```
R[timestamp,current,voltage]
```

#### Raw data example:

```
R[1712250210.123456,125.34,23.42]
```

**Note:** Raw signal measurements are accessible only through the USB serial interface.

**Note:** Processed feature signals may be transmitted via MQTT (WiFi) or USB serial, depending on device configuration.

**Product variants:** AutoMetrics can provide device variants with different signal sets, sampling rates, or data formats to support specific integration requirements.

**Device identification:** The MQTT topic uses the device equipment ID. This identifier and additional device information can be viewed using the Bluetooth debug interface.

**Note:** Example Python scripts for data acquisition and MQTT integration are available upon request.

## **Power Input**

<b>AC Input Range</b>	85–264 VAC, 47–63 Hz
<b>DC Input Range</b>	120–370 VDC
<b>Power Connector</b>	IEC 60320 C14 inlet
<b>Protective Earth</b>	Connected to chassis

## **External Interfaces**

<b>Power Input</b>	IEC 60320 C14 appliance inlet
<b>V-Input (Ch 1)</b>	High Voltage measurement input
<b>I-Input (Ch 2)</b>	Low Voltage measurement input
<b>USB Port</b>	Serial data interface

## **Environmental Specifications**

Device is intended for indoor industrial environments.

<b>Operating Temperature</b>	-25 °C to +70 °C
<b>Protection Rating</b>	IP00

## **Mechanical Specifications**

<b>Enclosure Type</b>	Industrial electronics enclosure
<b>Mounting</b>	Surface / panel mount
<b>Magnetic Mounting</b>	Integrated magnets for metal surfaces
<b>Weight</b>	~550 g (1.21 lb)

## **Device Status & Diagnostics**

Device status and network information are accessible through the Bluetooth configuration interface using the debug command. The following information is available:

Device ID (equipment ID)	IP address configuration	WiFi signal strength (RSSI)
Network interface (Ethernet/WiFi)	Broker connection status	Real-time network diagnostics

## **Regulatory Compliance**

### **CONTAINS:**

**FCC ID:** 2AC7Z-ESP32WROOM32E

**IC:** 21098-ESPWROOM32E

This device complies with Part 15 of the FCC Rules. Operation is subject to 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.

## **Manufacturer**



**AutoMetrics**

**AutoMetrics Manufacturing Technologies Inc.**  
3600 Steeles Ave E, Markham, Ontario L3R 9Z7  
Canada

+1 (778) 899-7035

[connect@autometrics.ca](mailto:connect@autometrics.ca)

[www.autometricstech.com](http://www.autometricstech.com)

