

# SAVeS Smart Vibration Sensor

Modern vibration monitoring for gas  
compressors & other critical equipment

## Operation Manual

ALTRONIC

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**WARNING:** Deviation from these instructions may lead to improper operation of the monitored machine which could cause personal injury to operators or other nearby personnel.

**WARNING:** The SAVeS must be configured prior to use.

**CAUTION:** Do NOT attempt to operate, maintain, or repair the SAVeS System until the contents of this document have been read and are thoroughly understood.

## 1.0 SAVeS System Description

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### 1.1 Overview

The Smart Altronic Vibration Sensor (SAVeS) System is a 32-bit microprocessor-based, non-mechanical vibration monitoring solution designed for application in both interior and exterior environments. It protects industrial engines, compressors, and associated equipment from damage caused by excessive vibration.

The SAVeS generates a signal on the 2-wire power line. Based on the generated signal, the SAVeS Detector can initiate a shutdown when conditions are reached. **NOTE:** The signal is only available on the 691816-3 model.

The SAVeS System is shipped with factory default X, Y, and Z vibration thresholds; however, as each application is unique, configuration must be performed. Configuration is accomplished through the iOS App or the Modbus; see section **6.0 Using and Understanding the iOS App** on page 5.

**Pending** The SAVeS system is CSA certified for Class I, Division 2, Group C & D hazardous locations.

### 1.2 System Components

The SAVeS System consists of two main parts: an engine-mounted SAVeS and a Detector.

- Smart Altronic Vibration Sensor (SAVeS) System:
  - 691816-1 – Full features, SAVeS only
  - 691816-1C – Full features, SAVeS only (with 6-Pin Mil Circular Connector)
  - 691816-3 – Requires Detector
- SAVeS Detector Module:
  - 691819
- Overwatch App (iOS only<sup>1</sup>)

## 2.0 System Setup

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### 2.1 Battery Installation (Optional)

#### 2.1.1 Battery Overview

The SAVeS System requires a 3V CR2032 button cell battery (included for 691816-1 and -1C models) to power the real time clock which allows for datalogging the raw acceleration data. When the SAVeS System is disconnected from the power source, the battery keeps the real time clock running which allows the system time to be kept for the next power up.

A standard CR2032 200 mAh will last approximately 14 years. **NOTE:** If the battery runs out, the date stamp on the Event History screen in the iOS App will default to 12/31/99, 11:41:00pm upon a power cycle.

#### 2.1.2 Installing and Replacing the Battery

**To access the battery compartment:** Disconnect the SAVeS System from the power source, if necessary. Remove the four flat head bolts to open the enclosure lid.

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<sup>1</sup> Android App in development.

**To install the battery:** Press the button cell battery into the battery compartment until the latch snaps into place to secure it.

**To replace the battery:** Pull the latch on the side of the battery compartment to raise the battery, then remove it.

## 2.2 Micro-SD Card Installation (Optional)

**NOTE:** It is highly recommended to install the CR2032 battery to use the real-time clock when logging data to an SD card.

### 2.2.1 Micro-SD Card (uSD) Overview

In addition to real-time data that may be viewed in the iOS App, the SAVeS can record data to a uSD card (optional) to facilitate prediction of potential failures and preventative maintenance. Data recording is off by default but may be turned on in the iOS App. In the App, the SAVeS can be set to record acceleration, velocity, or both. Acceleration and velocity log files are generated hourly, and data is saved to the uSD card in CSV format. The uSD card can fill quickly, especially when recording both acceleration and velocity data. When 90% full, the card will overwrite old data on a first-in, first-out basis.

The SAVeS system supports uSD cards up to 2TB. Altronic highly recommends SanDisk Industrial XI, MicroSDHC; FAT32 format with 32k block allocation.

### 2.2.2 Installing the Micro-SD Card and Retrieving Recorded Data

**To access the uSD card slot:** Disconnect the SAVeS System from the power source, if necessary. Remove the four flat head bolts securing the enclosure lid.

**To install the uSD card:** Insert the micro-SD card into the card slot on the PCB. Slide the uSD card slot lid away from the edge of the PCB to unlock the cage. Hinge the lid open and slide the uSD card in the lid with the gold connectors on the card facing the hinge and the gold connectors on the uSD card slot base.

**To retrieve recorded data:** Disconnect the SAVeS System from the power source. Remove the four flat head bolts securing the enclosure lid. Remove the uSD card and insert it into the card slot on the computer or SD card reader to retrieve data or reformat the card.

## 3.0 System User Interface

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### 3.1 SAVeS

The SAVeS has an E-Ink display that shows the iOS App QR code and shutdown values, a diagnostic LED, and a capacitive touch sense button.

#### 3.1.1 E-Ink Display

By default, the E-Ink display shows the Altronic logo. When the capacitive touch sense button is tapped, the device QR code will be displayed to facilitate connection with the iOS App. During a shutdown event, the screen shows "SHUTDOWN", and the X, Y, and Z values at shutdown. The E-Ink display is retentive, so it will show the last screen upon loss of power.

#### 3.1.2 Diagnostic LED

The status indicator LED on the face of the SAVeS is multipurpose. It contains several status colors and flash frequencies:

- **Normal Status:** LED flashes green at 1 Hz (one time per second).
- **Booting:** LED breathes white at 4 Hz (four times per second).
- **Alarm Status:** LED flashes yellow at 1 Hz (one time per second).
- **Shutdown Status:** LED flashes red at 1 Hz (one time per second).
- **BLE Active:** LED flashes at 2 Hz (two times per second).
- **No Power:** LED is off.

### 3.1.3 Capacitive Touch Sense Button

A multifunctional capacitive touch sense Mode Switch button is present on the face of the SAVeS.

- Tap the button to show the device QR code on the E-Ink display.
- Press and hold the button for 4 seconds to reset the device after a shutdown event.



Figure 1

## 3.2 SAVeS Detector<sup>2</sup>

The Detector relay time adjustment wheel will blink when the SAVeS is in a shutdown state. It will be solid when the SAVeS is in alarm or normal state.

## 4.0 Description of the SAVeS Outputs and Detector Relay

### 4.1 SAVeS

#### 4.1.1 Alarm and Shutdown Output<sup>3</sup>

The SAVeS System contains both an alarm and shutdown output. The alarm output activates an open drain output. The shutdown output activates a solid state relay (SSR) which has form C (N/C) break-before-make contacts which are isolated from the power supply.

The open drain output is rated at 28 VDC, 100 mA. The SSR is rated at 60 VDC, 500 mA.

- **Alarm:** The alarm output is non-latching. Vibration levels that reach user-defined alarm thresholds will trigger an alarm condition. After 5 consecutive seconds with no alarm, the alarm is cleared automatically.
- **Shutdown:** The shutdown output is latching. A shutdown condition will trip the output SSR, which is a normally closed switch that opens for a shutdown condition. Vibration levels that meet user-defined shutdown thresholds will trigger a shutdown condition.

#### 4.1.2 4-20 mA Output<sup>3</sup>

The 4-20 mA is a 4-20 mA current source output. It requires an external loop resistance to ground. It's a 3-wire configuration requiring power and ground to be wired in addition to the 4-20 mA output. A 4 mA current corresponds to 0.0 inches/second, while a 20 mA current corresponds to 2.0 inches/second. There is an additional over-velocity region of 0.5 inches/second (24 mA).

By default the SAVeS will intelligently pick the axis with the highest velocity; however, the user can select the axis through the Altronic Overwatch App or the Modbus. See section 6.4.5 Configuring the 4-20 mA Output<sup>4</sup> on page 7 for instructions on configuring the 4-20 output in the App.

### 4.2 SAVeS Detector<sup>2</sup>

The SAVeS Detector only has a shutdown output. When the Detector receives the shutdown signal from the SAVeS, the relay output is switched. The signal continues until the shutdown event is cleared from the SAVeS. There is no remote shutdown clear in two-wire applications.

## 5.0 Alarm / Shutdown Conditions and Events

An alarm or shutdown is triggered when the vibration level reaches the set X, Y, or Z threshold. The threshold units are inches per second (IPS). The response time of the SAVeS to alarm or shutdown is < 0.3 seconds. The Detector adds an additional 1.5–2 seconds of delay when configured properly.

The SAVeS System is shipped with factory default vibration alarm thresholds: X = 0.2, Y = 0.2, Z = 0.2; and shutdown thresholds: X = 0.45, Y = 0.45, Z = 0.45. However, as each application is unique, configuration must be performed before using the SAVeS System. See section 6.0 Using and Understanding the iOS App on page 5 for application-specific configuration instructions via the iOS App.

<sup>2</sup> Not applicable for 691816-1 model.

<sup>3</sup> Not applicable for 691816-3 model

## 5.1 Alarm Events

When an alarm event is triggered, the diagnostic LED on the face of the SAVeS flashes yellow at 1 Hz. Alarm events will auto-clear when the vibration level drops below the set threshold for 5 seconds

## 5.2 Shutdown Events

SAVeS generates a signal on the 2-wire power lines. The SAVeS Detector switches a relay (N/C or N/O) when a shutdown is detected. These relays can be used to trigger a shutdown or notify the rest of the system that excessive vibration has occurred.

When a shutdown event is triggered, the diagnostic LED on the SAVeS flashes red and the timer adjust wheel on the detector will blink. Shutdown events are latching and must be cleared manually by the operator.

### 5.2.1 Resetting After a Shutdown Event

Shutdown events are latching and the SAVeS must be reset manually by the operator. To clear a shutdown event:

- Press and hold the **PCAP button** for 4 seconds on the SAVeS; OR
- Tap the **Reset Button** on the dashboard in the Overwatch App.



## 6.0 Using and Understanding the iOS App

### 6.1 App Overview


The Altronic Overwatch iOS App may be used to view and share real-time vibration data and alarm and shutdown event history, set event threshold levels, configure Modbus settings, and enable and customize data recording via an onboard uSD card (not included).

### 6.2 Home Screen

The Home screen has two buttons (see *Figure 2*):

- **Tap to Connect**  button: Tap to open the Scan screen to connect a SAVeS device to the iOS App.
- **Demo**  button: Tap to open demo mode.

### 6.3 QR Code Scan Screen

Press the **Tap to Connect**  button on the Home screen to open the QR Code Scan screen. The Scan screen has the following user interface elements (see *Figure 3*):

- **Back button**: Tap to return to the Home screen.
- **QR Code Scanner Frame**: Center the QR code on the SAVeS E-Ink display inside the frame to scan the code and connect the device to the App.

#### 6.3.1 Connect the SAVeS Device to the iOS App

1. Press the **Mode Switch button** on the SAVeS to show the QR code on the E-Ink display.
2. Center the device QR code inside the QR code scanner frame to connect the device to the iOS App.
3. When the device is connected, the Dashboard will open automatically. A window will appear to prompt joining the device Wi-Fi network.

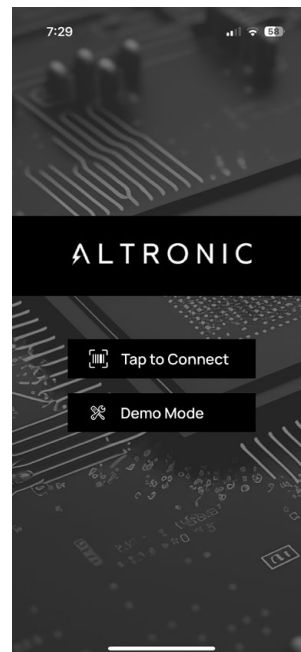


Figure 2



Figure 3

## 6.4 Dashboard

When first connected to a SAVeS device, the Dashboard will open automatically. Tap the **Dashboard** button in the navigation menu to return to the Dashboard from the Trends or Event History screens. The Dashboard has the following user interface elements (see Figure 4):

- **Top Menu Bar:** The menu bar at the top of the Dashboard screen has three buttons:
  - **Disconnect button:** Tap to return to the Scan screen to connect to a different SAVeS device.
  - **Settings** button: Tap to open the data logging settings popup. See Figure 5.
  - **Share** button: Tap to share a screenshot of the Dashboard.
- **Device Status:** Shows the current SAVeS status, ● (Normal), ● (Alarm), or ● (Shutdown).
- **Device Status Refresh** button: Tap to refresh the device status.
- **X Y, and Z Axis Vibration Levels:**
  - **Current Value:** Shows the real-time vibration level in IPS.
  - **Alarm Threshold:** Shows the set threshold for an alarm event.
  - **Shutdown Value:** Shows the set threshold for shutdown event.
  - **Edit > button:** Tap to open the threshold configuration popup to set the alarm and shutdown thresholds for the selected axis.
- **Refresh** button: Syncs the SAVeS data with the App.
- **Device Information:**
  - **Version:** Shows the SAVeS device firmware version.
  - **Location:** Shows the location data for the iOS device.
- **Navigation Menu:** Has three buttons and is fixed at the bottom of the Dashboard, Trends, and Event History screens:
  - **Dashboard** button: Tap to go to the Dashboard.
  - **Trend** button: Tap to go to the Chart screen.
  - **Events** button: Tap to go to the Events History screen.

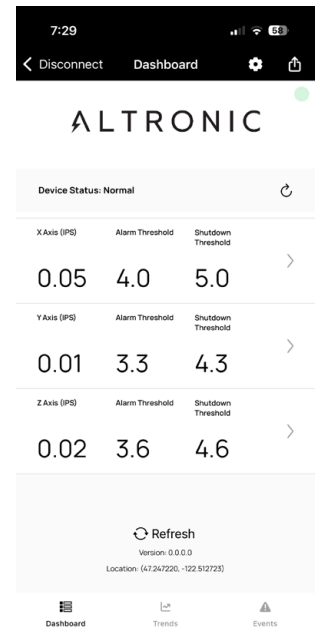


Figure 4

### 6.4.1 Configuring Alarm Thresholds and Shutdown Values

To set alarm and shutdown thresholds (see Figure 5):

1. On the Dashboard, tap the **Edit > button** to the right of the X, Y, or Z axis to open the alarm/shutdown configuration popup window.
2. In the popup, move the sliders to set the alarm threshold and shutdown values.
3. Tap the dropdown list at top-right to choose from the axis label options, no label (will keep the default label "X Axis," "Y Axis," or "Z Axis"), vertical, axial, or horizontal.
4. Tap the **Submit button** to save changes to the SAVeS device.

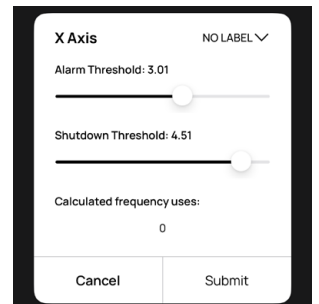


Figure 5

**NOTE:** Since the velocity calculations continuously run, even with no vibration, it is normal for a non-zero value to be displayed for "Primary Frequency for Velocity."

### 6.4.5 Enabling and Customizing Data Recording

By default, data recording is off. To enable it (see Figure 6):

1. Tap the **Settings** button at the top of the Dashboard to open the Device Settings popup.
2. Tap the toggles to enable or disable acceleration and velocity data recording.
3. Tap the **Submit button** to save changes to the SAVeS device.

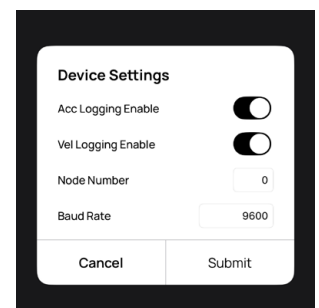



Figure 6


#### 6.4.4 Configuring the Modbus<sup>4</sup>

To adjust the Modbus settings (see *Figure 7*):

1. Tap the **Settings**  button at the top of the Dashboard to open the Device Settings popup.
2. Tap the **Baud Rate** field to select options from the drop down.
3. Tap the **Node Number** field to enter a node number (1-255).
4. Tap the **Submit** button to save.

#### 6.4.5 Configuring the 4-20 mA Output<sup>4</sup>


By default the 4-20 mA output is set to Auto. To adjust the axis (see *Figure 8*):



1. Tap the **Settings**  button at the top of the Dashboard to open the Device Settings popup.
2. Tap the **4-20 mA Output Axis** dropdown list to select the desired option.
3. Tap the **Submit** button to save.

#### 6.4.4 Sharing the Dashboard

Tap the **Share**  button at the top of the Dashboard to share a screenshot of the dashboard.

### 6.5 Trend Screen

When connected to a SAVeS device, tap the **Trend**  button in the navigation menu to open the Trends screen, which has the following user interface elements (see *Figure 9* and *Figure 10*):

- **Top Menu Bar:** The menu bar at the top of the Trends screen has three buttons:
  - **Disconnect** button: Tap to go to the Scan screen to connect to a different SAVeS device.
  - **Share**  button: Tap to share a screenshot of the chart.
- **Real-time Chart:** Shows the real-time vibration data and/or thresholds according to the selected filters. The chart orientation will auto-adjust based on the phone/tablet screen orientation.
  - **Solid red line:** Current X Axis vibration level.
  - **Solid green line:** Current Y Axis vibration level.
  - **Solid blue line:** Current Z Axis vibration level.
  - **Dashed red lines:** Shutdown threshold for each axis.
  - **Dashed yellow lines:** Alarm threshold for each axis.
- **Filter:** Tap the Edit  button to open the filter popup. Select from the available options (current vibration by axis, alarm threshold by axis, and shutoff threshold by axis) to populate the chart.
- **Autoscroll toggle:** Tap to enable or disable autoscroll. When autoscroll is enabled, the chart will scroll, updating in real-time to show changing vibration levels for the selected axes. When disabled, the chart will show a snapshot of the current vibration values.

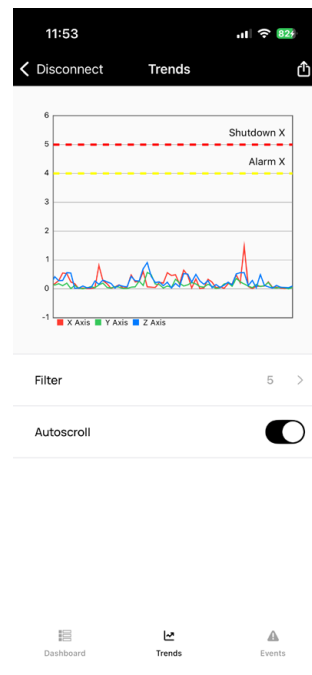


Figure 9

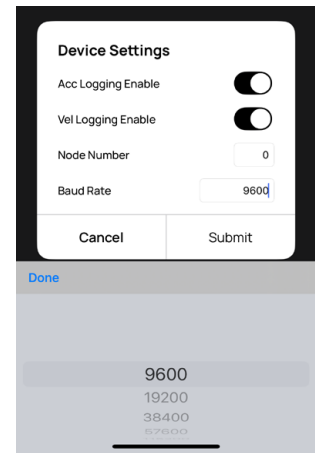


Figure 7

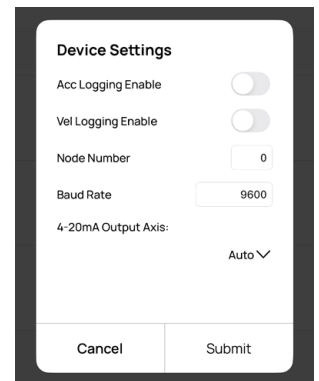


Figure 8

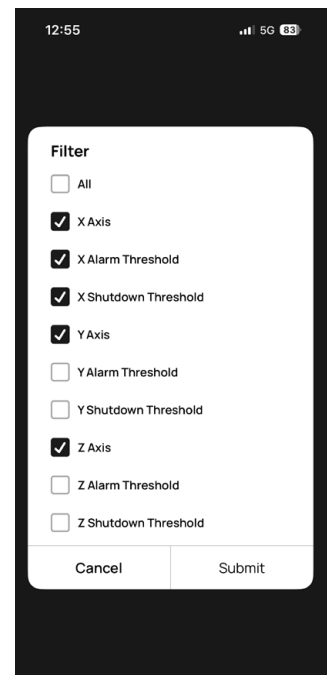








Figure 10

<sup>4</sup> Not applicable for 691816-3 model.

## 6.6 Event History Screen

When connected to a SAVeS device, tap the **Events**  button to open the Event History screen. The Event History screen has the following user interface elements (see *Figure 11* and *Figure 12*):

- **Top Menu Bar:** The menu bar at the top of the Event History screen has two buttons:
  - **Disconnect button:** Tap to go to the Scan screen to connect to a different SAVeS device.
  - **Share  button:** Tap to share a screenshot of the event history screen.
- **Toggles:** Tap to adjust the events shown onscreen. Both alarm and shutdown events are shown by default.
  - **Alarm  Toggle:** Tap to show/hide alarm events.
  - **Shutdown  Toggle:** Tap to show/hide shutdown events.
- **Event History:**
  - Alarm  or shutdown  event icon
  - Local date/time
  - Values for X, Y, and Z
  - Thresholds for X, Y, and Z

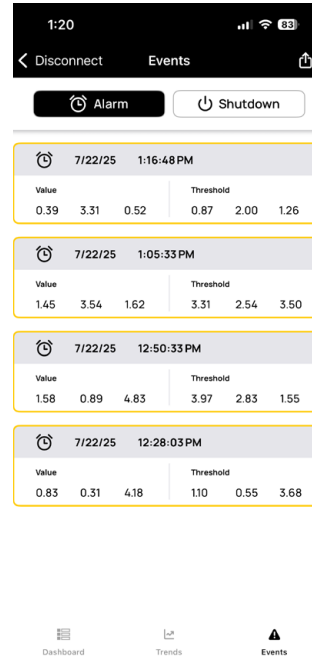


Figure 11

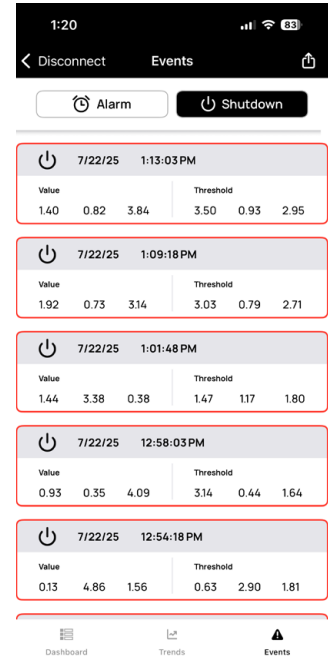


Figure 12

### 6.6.1 Populating the Event History Screen

Both alarm and shutdown events are shown by default. Tap the **alarm** or **shutdown toggle** to add or remove events from the event history.

## 7.0 Troubleshooting Guide

Issue	Possible Solution
SAVeS is powered and in normal operation, but the detector is showing a shutdown condition.	Verify wiring is correct and 47 Ohm resistor is inserted in the appropriate terminal block.
Detector relay is switching on and off constantly.	Adjust the orange timer relay toward the "+".
SD card data log time stamp is not accurate.	Verify CR2032 battery is installed and then connect with the Overwatch App.

## 8.0 System Maintenance

**WARNING:** Do not attempt to repair the SAVeS. The SAVeS must be returned to Altronic for repair and service.

The SAVeS System requires no regular maintenance or recalibration.

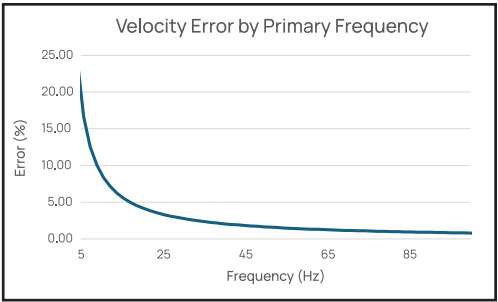
# 9.0 Updating Firmware and Software

Firmware upgrades are announced via Product Change Notice (PCN).

**To upgrade:** Power down the SAVeS and remove the micro-SD card. Download the latest (or desired) .bin version from the [Altronic Github](#). Save the .bin file to the root directory of the SAVeS uSD card. Reinstall the uSD card, and then power on the SAVeS. After 1 minute the SAVeS will be updated to the new firmware.

# 10.0 Specifications

Frequency Range	5-500Hz
Velocity Tolerance <sup>5</sup>	±2% at 40Hz
Acceleration Tolerance	±4 mG
Maximum Peak Acceleration	.64 G max
Power Required <sup>6</sup>	9-32VDC, 0.1A nominal, 0.7 A peak
Ambient Operating Temperatures <sup>7</sup>	-40 °C to +85 °C (-40 °F to +185 °F)



# 11.0 Modbus

The SAVeS is equipped with a Modbus RS-485 interface. The settings are configured through the iOS app. See section 6.4.4 **Configuring the Modbus** on page 7.

Register	Label	Key	ReadOnly / ReadWrite	Type
1	Reserved	Reserved 0001	ReadWrite	BOOL
2	Reserved	Reserved 0002	ReadWrite	BOOL
3	Reserved	Reserved 0003	ReadWrite	BOOL
4	Reserved	Reserved 0004	ReadWrite	BOOL
5	Reserved	Reserved 0005	ReadWrite	BOOL
6	Reserved	Reserved 0006	ReadWrite	BOOL
7	Reserved	Reserved 0007	ReadWrite	BOOL
8	Reserved	Reserved 0008	ReadWrite	BOOL
9	Reserved	Reserved 0009	ReadWrite	BOOL
10	Reserved	Reserved 0010	ReadWrite	BOOL
11	Reserved	Reserved 0011	ReadWrite	BOOL
12	Reserved	Reserved 0012	ReadWrite	BOOL
13	Reserved	Reserved 0013	ReadWrite	BOOL
14	Reserved	Reserved 0014	ReadWrite	BOOL
15	Set RTC	SET_RTC	ReadWrite	BOOL
16	Get RTC	GET_RTC	ReadWrite	BOOL
17	Reserved	Reserved 00017	ReadWrite	BOOL
18	Reserved	Reserved 00018	ReadWrite	BOOL
19	Log Accelerometer Data	LOG_ACC_DATA	ReadWrite	BOOL
20	Log Velocity Data	LOG_VEL_DATA	ReadWrite	BOOL

<sup>5</sup> Velocity accuracy is dependent on both quality and location of mounting. See Velocity Error by Primary Frequency chart.  
<sup>6</sup> When used with the 691819 Detector Module, input voltage is 18-32 VDC.  
<sup>7</sup> E-Ink will not work properly at extents of operating temperature, but will recover when temperature is back in its acceptable range.

21	Clear Shutdown	CLEAR_SHUTDOWN	ReadWrite	BOOL
22	Alarm Event 1 Status	ALARM_EVENT_1_STATUS	ReadWrite	BOOL
23	Alarm Event 2 Status	ALARM_EVENT_2_STATUS	ReadWrite	BOOL
24	Alarm Event 3 Status	ALARM_EVENT_3_STATUS	ReadWrite	BOOL
25	Alarm Event 4 Status	ALARM_EVENT_4_STATUS	ReadWrite	BOOL
26	Alarm Event 5 Status	ALARM_EVENT_5_STATUS	ReadWrite	BOOL
27	Alarm Event 6 Status	ALARM_EVENT_6_STATUS	ReadWrite	BOOL
28	Alarm Event 7 Status	ALARM_EVENT_7_STATUS	ReadWrite	BOOL
29	Alarm Event 8 Status	ALARM_EVENT_8_STATUS	ReadWrite	BOOL
30	Alarm Event 9 Status	ALARM_EVENT_9_STATUS	ReadWrite	BOOL
31	Alarm Event 10 Status	ALARM_EVENT_10_STATUS	ReadWrite	BOOL
32	Alarm Event 11 Status	ALARM_EVENT_11_STATUS	ReadWrite	BOOL
33	Alarm Event 12 Status	ALARM_EVENT_12_STATUS	ReadWrite	BOOL
34	Alarm Event 13 Status	ALARM_EVENT_13_STATUS	ReadWrite	BOOL
35	Alarm Event 14 Status	ALARM_EVENT_14_STATUS	ReadWrite	BOOL
36	Alarm Event 15 Status	ALARM_EVENT_15_STATUS	ReadWrite	BOOL
37	Alarm Event 16 Status	ALARM_EVENT_16_STATUS	ReadWrite	BOOL
38	Alarm Event 17 Status	ALARM_EVENT_17_STATUS	ReadWrite	BOOL
39	Alarm Event 18 Status	ALARM_EVENT_18_STATUS	ReadWrite	BOOL
40	Alarm Event 19 Status	ALARM_EVENT_19_STATUS	ReadWrite	BOOL
41	Alarm Event 20 Status	ALARM_EVENT_20_STATUS	ReadWrite	BOOL
42	ShutDn Event 1 Status	SHUTDOWN_EVENT_1_STATUS	ReadWrite	BOOL
43	ShutDn Event 2 Status	SHUTDOWN_EVENT_2_STATUS	ReadWrite	BOOL
44	ShutDn Event 3 Status	SHUTDOWN_EVENT_3_STATUS	ReadWrite	BOOL
45	ShutDn Event 4 Status	SHUTDOWN_EVENT_4_STATUS	ReadWrite	BOOL
46	ShutDn Event 5 Status	SHUTDOWN_EVENT_5_STATUS	ReadWrite	BOOL
47	ShutDn Event 6 Status	SHUTDOWN_EVENT_6_STATUS	ReadWrite	BOOL
48	ShutDn Event 7 Status	SHUTDOWN_EVENT_7_STATUS	ReadWrite	BOOL
49	ShutDn Event 8 Status	SHUTDOWN_EVENT_8_STATUS	ReadWrite	BOOL
50	ShutDn Event 9 Status	SHUTDOWN_EVENT_9_STATUS	ReadWrite	BOOL
51	ShutDn Event 10 Status	SHUTDOWN_EVENT_10_STATUS	ReadWrite	BOOL
52	ShutDn Event 11 Status	SHUTDOWN_EVENT_11_STATUS	ReadWrite	BOOL
53	ShutDn Event 12 Status	SHUTDOWN_EVENT_12_STATUS	ReadWrite	BOOL
54	ShutDn Event 13 Status	SHUTDOWN_EVENT_13_STATUS	ReadWrite	BOOL
55	ShutDn Event 14 Status	SHUTDOWN_EVENT_14_STATUS	ReadWrite	BOOL
56	ShutDn Event 15 Status	SHUTDOWN_EVENT_15_STATUS	ReadWrite	BOOL
57	ShutDn Event 16 Status	SHUTDOWN_EVENT_16_STATUS	ReadWrite	BOOL
58	ShutDn Event 17 Status	SHUTDOWN_EVENT_17_STATUS	ReadWrite	BOOL
59	ShutDn Event 18 Status	SHUTDOWN_EVENT_18_STATUS	ReadWrite	BOOL
60	ShutDn Event 19 Status	SHUTDOWN_EVENT_19_STATUS	ReadWrite	BOOL
61	ShutDn Event 20 Status	SHUTDOWN_EVENT_20_STATUS	ReadWrite	BOOL

62	Reserved	Reserved 0062	ReadWrite	BOOL
63	Reserved	Reserved 0063	ReadWrite	BOOL
64	Reserved	Reserved 0064	ReadWrite	BOOL
65	Alarm Event 1 Acc Status	ALARM_EVENT_1_ACC_STATUS	ReadWrite	BOOL
66	Alarm Event 2 Acc Status	ALARM_EVENT_2_ACC_STATUS	ReadWrite	BOOL
67	Alarm Event 3 Acc Status	ALARM_EVENT_3_ACC_STATUS	ReadWrite	BOOL
68	Alarm Event 4 Acc Status	ALARM_EVENT_4_ACC_STATUS	ReadWrite	BOOL
69	Alarm Event 5 Acc Status	ALARM_EVENT_5_ACC_STATUS	ReadWrite	BOOL
70	Alarm Event 6 Acc Status	ALARM_EVENT_6_ACC_STATUS	ReadWrite	BOOL
71	Alarm Event 7 Acc Status	ALARM_EVENT_7_ACC_STATUS	ReadWrite	BOOL
72	Alarm Event 8 Acc Status	ALARM_EVENT_8_ACC_STATUS	ReadWrite	BOOL
73	Alarm Event 9 Acc Status	ALARM_EVENT_9_ACC_STATUS	ReadWrite	BOOL
74	Alarm Event 10 Acc Status	ALARM_EVENT_10_ACC_STATUS	ReadWrite	BOOL
75	Alarm Event 11 Acc Status	ALARM_EVENT_11_ACC_STATUS	ReadWrite	BOOL
76	Alarm Event 12 Acc Status	ALARM_EVENT_12_ACC_STATUS	ReadWrite	BOOL
77	Alarm Event 13 Acc Status	ALARM_EVENT_13_ACC_STATUS	ReadWrite	BOOL
78	Alarm Event 14 Acc Status	ALARM_EVENT_14_ACC_STATUS	ReadWrite	BOOL
79	Alarm Event 15 Acc Status	ALARM_EVENT_15_ACC_STATUS	ReadWrite	BOOL
80	Alarm Event 16 Acc Status	ALARM_EVENT_16_ACC_STATUS	ReadWrite	BOOL
81	Alarm Event 17 Acc Status	ALARM_EVENT_17_ACC_STATUS	ReadWrite	BOOL
82	Alarm Event 18 Acc Status	ALARM_EVENT_18_ACC_STATUS	ReadWrite	BOOL
83	Alarm Event 19 Acc Status	ALARM_EVENT_19_ACC_STATUS	ReadWrite	BOOL
84	Alarm Event 20 Acc Status	ALARM_EVENT_20_ACC_STATUS	ReadWrite	BOOL
85	Shutdn Event 1 Acc Status	SHUTDOWN_EVENT_1_ACC_STATUS	ReadWrite	BOOL
86	Shutdn Event 2 Acc Status	SHUTDOWN_EVENT_2_ACC_STATUS	ReadWrite	BOOL
87	Shutdn Event 3 Acc Status	SHUTDOWN_EVENT_3_ACC_STATUS	ReadWrite	BOOL
88	Shutdn Event 4 Acc Status	SHUTDOWN_EVENT_4_ACC_STATUS	ReadWrite	BOOL
89	Shutdn Event 5 Acc Status	SHUTDOWN_EVENT_5_ACC_STATUS	ReadWrite	BOOL
90	Shutdn Event 6 Acc Status	SHUTDOWN_EVENT_6_ACC_STATUS	ReadWrite	BOOL
91	Shutdn Event 7 Acc Status	SHUTDOWN_EVENT_7_ACC_STATUS	ReadWrite	BOOL
92	Shutdn Event 8 Acc Status	SHUTDOWN_EVENT_8_ACC_STATUS	ReadWrite	BOOL
93	Shutdn Event 9 Acc Status	SHUTDOWN_EVENT_9_ACC_STATUS	ReadWrite	BOOL
94	Shutdn Event 10 Acc Status	SHUTDOWN_EVENT_10_ACC_STATUS	ReadWrite	BOOL
95	Shutdn Event 11 Acc Status	SHUTDOWN_EVENT_11_ACC_STATUS	ReadWrite	BOOL
96	Shutdn Event 12 Acc Status	SHUTDOWN_EVENT_12_ACC_STATUS	ReadWrite	BOOL
97	Shutdn Event 13 Acc Status	SHUTDOWN_EVENT_13_ACC_STATUS	ReadWrite	BOOL
98	Shutdn Event 14 Acc Status	SHUTDOWN_EVENT_14_ACC_STATUS	ReadWrite	BOOL
99	Shutdn Event 15 Acc Status	SHUTDOWN_EVENT_15_ACC_STATUS	ReadWrite	BOOL
100	Shutdn Event 16 Acc Status	SHUTDOWN_EVENT_16_ACC_STATUS	ReadWrite	BOOL
101	Shutdn Event 17 Acc Status	SHUTDOWN_EVENT_17_ACC_STATUS	ReadWrite	BOOL
102	Shutdn Event 18 Acc Status	SHUTDOWN_EVENT_18_ACC_STATUS	ReadWrite	BOOL

103	Shutdn Event 19 Acc Status	SHUTDN_EVENT_19_ACC_STATUS	ReadWrite	BOOL
104	Shutdn Event 20 Acc Status	SHUTDN_EVENT_20_ACC_STATUS	ReadWrite	BOOL
105	Spare	SPARE_00105	ReadWrite	BOOL
106	Spare	SPARE_00106	ReadWrite	BOOL
107	Spare	SPARE_00107	ReadWrite	BOOL
108	Spare	SPARE_00108	ReadWrite	BOOL
109	Spare	SPARE_00109	ReadWrite	BOOL
110	Spare	SPARE_00110	ReadWrite	BOOL
111	Spare	SPARE_00111	ReadWrite	BOOL
112	Spare	SPARE_00112	ReadWrite	BOOL

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