Smart Seismic System

For Elevator Control Applications

Operation and Installation Manual

DO NOT DISCARD

Liquid Crystal Display · **CR123A Batteries** · **Alarm Reset** · **Function Buttons** · **Trouble Reset** · **Water Sensor Pad Input** · **Low-Voltage Power Input Terminal** · **Water Alarm Signal Output** · **Ethernet Connection** · **Network Communication Module (Optional)** · **Remote Reset** · **Trouble - Latching Contacts** · **Alarm - Non-Latching Contacts** · **110VAC Power Input** · **Alarm - Latching Contacts**

INTRODUCTION

Your new earthquake monitoring system has been developed with you, the customer, in mind.

This industrial, user friendly system also requires very little maintenance when correctly installed by a qualified technician. Because of the many features implemented in this system, it is essential to fully understand its operation.

We strongly recommend that you read this manual thoroughly and familiarize yourself with the system and its operation.

Throughout this manual, refer back to the above figure to confirm the locations of named references.

FEATURES

- 3-axis vibration sensing
- Uses patented electronic earthquake detection technology
- Liquid Crystal Display provides user friendly interface
- Meets CSA B44.1, ASME A17.5
- Dry contact output:

- Max load (power factor = 1.0) 5A @ 30VDC or 250VAC
- Normally Open or Normally Closed
- Latching and non-latching
- Connection for remote reset of latching alarm contact

THE INSIDE PANEL
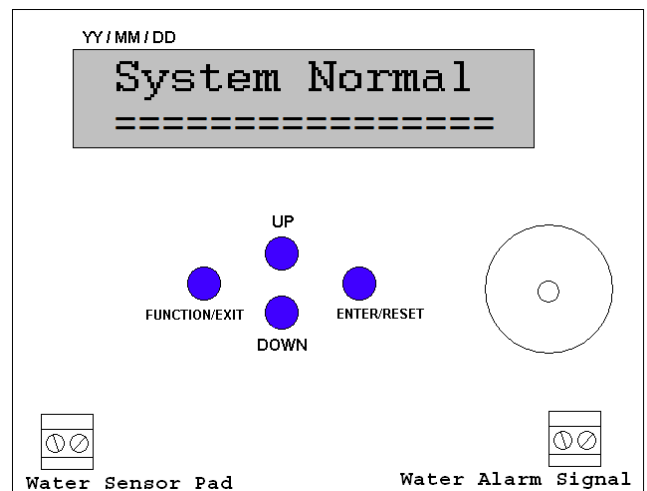
Function Buttons

Following is a brief description of the functions of each button:
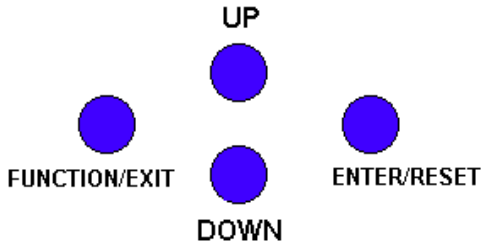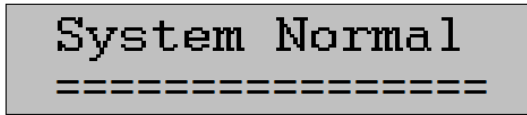
UP   Move the cursor to the next position on the display. Scroll to the next entry on a list

DOWN Move the cursor back to the previous position on the display

FUNCTION / EXIT   Toggle between Function menu and normal display. Return to Function menu from sub-menus.

ENTER / RESET   Choose the currently selected position on the display. Reset an alarm condition.

LCD Display

The LCD display is the primary means of visual feedback for this unit. When the unit is operating normally, the display will show "System Normal"

Relay Contact Terminal
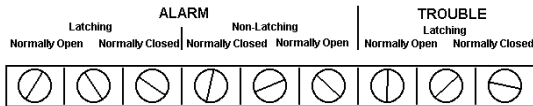
The 9-position screw-type terminal block along the bottom of the unit is for relay contact connections. There are 3 relays, each using 3-positions on the terminal block. The two outside relays are latching types. One represents an alarm condition; the other represents a "trouble" condition (e.g. level error). Once these relays are set, they will hold their position even if the power supply fails. They can be reset using the **RELAY CONTACT RESET** buttons. The relay in the middle is a non-latching type that also represents an alarm condition. This relay will automatically reset itself as soon as the alarm condition clears.

Each relay has 3 connections on the terminal block. The middle connection is common to both normally open and normally closed contacts. The contact on the left is for the normally open contact. The contact on the right is for the normally closed contact.
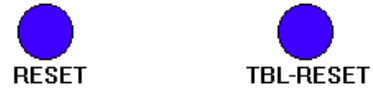
Latching Contacts

When a latching contact is in it's "alarm state", it will stay activated (even during a total power failure) until it is manually reset by pushing its corresponding reset button.

Non-Latching Contact

The Non-Latching contact is a fail-safe contact. It defaults to its "alarm state" when the system loses main power. It must be manually reset when the unit is turned on and after any earthquake alarm. If the system suffers a total power failure (mains power off, battery depleted), it will revert to its fail-safe alarm state.

Relay Contact Reset Buttons

These buttons only affect the latching relay contacts. Pressing either of these buttons will not alter the display on the LCD or mute the audible alarm. Press the **ALARM** button to reset the latching alarm contacts. Press the **TROUBLE** button to reset the latching trouble contacts. If the contacts are set, they will make a clicking sound when the reset button is pressed. Pressing the reset button while the contacts are already reset will have no effect.

Remote Alarm Reset Terminal
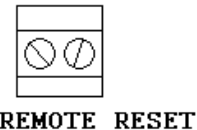
Connecting a normally open switch or contact to this terminal will allow the latching alarm contact to be reset remotely. Activating a switch or contact connected to this terminal will have exactly the same effect as pressing the relay contact– **RESET** button. The switch or contact used should be rated to switch a 100mA load @ 12VDC.

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Power Input Terminal – Low Voltage

PWR-IN
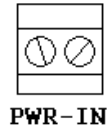
This terminal is for connecting an external power supply, if desired. AC or DC supplies are both acceptable, but *must not exceed* 24VDC or 24VAC$_{PK}$. The polarity is corrected internally, so the polarity of the connection is not important. This terminal is pre-connected at the factory to the DC output of the AC power supply.

> **IMPORTANT:** Disconnect the wires from this terminal before connecting an external low-voltage power supply. Failure to do so may damage the device or the external power supply.

Power Input – 110VAC

An internal AC power supply allows the device to draw power directly from a main AC supply (110V 60Hz). The power supply is protected internally with overload and thermal shut down. The output from the power supply is pre-wired to the low-voltage power input terminal on the sensor. See Appendix A for details on connecting this device to mains power.

INSTALLATION

To install the product:

1. Unlock (if necessary) and remove the lid.

2. Attach the 4 mounting tabs to each corner of the enclosure using the screws provided. They may be placed vertically or horizontally.

3. Use screws or bolts to mount the box securely to a load-bearing wall or support. It may be installed in a vertical or– horizontal position as long as one primary axis (X, Y or Z as shown below) is as close to true vertical as possible. The self-calibration routine will automatically detect the vertical axis and compensate for minor deviations from level.
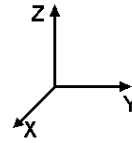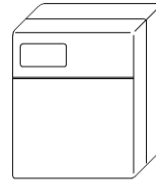
4. Make connections from the equipment control panel to relay contact outputs. Note the markings on the circuit board.
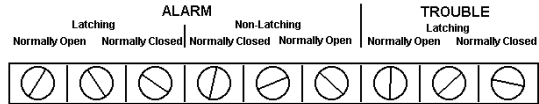
> Apply tightening torque of 5.5 in-lbs. to terminal block. Use 60-degree rated copper wire.

The "Trouble" relay will activate as a warning that something is wrong with the system and that it needs to be looked at. It should be connected to a visual and/or audible indicator on the control panel. The alarm relays activate when an alarm condition occurs. The latching relay will remain active until it is reset. The non-latching relay will automatically reset when the disturbance that caused the alarm condition ends. It should be noted that the latching contacts could be in either a set (latched) or reset (unlatched) state. When power is first applied to the system, both relay contact reset buttons should be pressed to place the relays in the reset state. These relays can be reconfigured through the function menu.

5. If Remote Alarm Reset is to be used, connect a normally open switch or relay contact to the **REMOTE ALARM RESET** terminal. Use a switch or relay contact rated to switch a 100mA load @ 12VDC.

6. If using AC main power, make sure the internal wiring from the power supply is connected to the low-voltage power input (PWR-IN), then refer to Appendix A for detailed instructions.

> **WARNING:** Do not connect a 110Vac supply directly to the low-voltage power input terminal. This will damage the unit and may cause personal injury.

> **WARNING:** Installer must provide a means for disconnecting AC power.

> *CAUTION: BONDING BETWEEN CONDUITS MUST BE PROVIDED.*

ATTENTION : LES CONDUITS DOIVENT ÊTRE RELIÉS PAR LA MASSE

If using an external low-voltage power supply, disconnect the pre-wired connection from the Low-Voltage Power Input Terminal (PWR-IN) and wire external source to this terminal. External source may be AC or DC 12~24V.

7. Plug in the battery

8. Press both the alarm and trouble relay contact reset buttons to ensure that the latching contacts are in their unlatched state.

9. Connect the RJ-45 "Ethernet Connection" (see figure page 3) on the Smart Seismic System to a local Ethernet port using Cat 5e network cable.

10. Proceed with Initial Set Up in the next section

11. Replace and lock the lid.

PIT WATER DETECTOR

This device includes a detection circuit for detecting water in the elevator pit. Connect the wires from the water sensor pad to the water sensor pad terminal located on the lower left of the main interface board (with LCD and buttons).

The output signal relay for the pit water detector is located on the lower right side of the main interface board.

INITIAL SET UP

To turn on the system, connect power to the power input terminal.

The display will cycle through its initialization routine and will display the brand name, model number, model name. The system will also perform an automatic calibration, and self-test. Results of the self-test will be shown on the display ("OK" or "FAIL").

Once the initialization routine is complete, the following is displayed;

```
Press Enter btn
to reset relay
```

Since the middle non-latching alarm relay contact defaults to a fail-safe "off" position when the power is first turned on, this message reminds the user to push the enter button to reset the relay before the system is ready.

When the Enter button is pressed, the relay will reset and the display will return to its normal display.

FUNCTIONS

This section describes the various functions available by pressing the **FUNCTION/EXIT** button. Use the **UP** and **DOWN** buttons to move the blinking cursor to a menu item, then hit the **ENTER/RESET** button to choose the selection.

Test

```
Main Menu
1> Test
```

The test function performs a basic test on the system to ensure it is functioning correctly. If the system is functioning correctly, the unit will trigger an "Earthquake Alarm". Use this function in the field to test the response of connected equipment.

Alarm Setting

```
Main Menu
2>Alarm Setting
```

To change the alarm setting, press Up or Down, then press ENTER to select your new alarm setting. The factory default setting is NORM. To make the unit slightly less sensitive, select LOW, or to make it slightly more sensitive, select HIGH.

Network Status

```
Main Menu
3> Net Status
```

Your 2600 Seismic Sensor comes equipped with a network communication module. This function will show you the current network status of the device. Press the Up or Down buttons to cycle through the following:

- Device IP Address
- MAC Address
- Gateway IP Address
- IP Mask
- Primary DNS IP Address
- Secondary DNS IP Address

BACKUP BATTERY

This device uses 2 CR123A lithium non-rechargeable batteries for backup power.   .

ALERT MODES

Earthquake Alarm

This system goes into alarm whenever the acceleration exceeds the threshold set by the setup function. If a seismic disturbance occurs, large enough to create an alarm condition, the system will activate its alarm relays and sound an audible alarm. The phrase *Earthquake Alarm* will flash on the display as shown below.

```
Earthquake
  Alarm
```

Pressing the **ENTER/RESET** button will clear the alarm on the display and stop the beeping.

To reset the latching relay contact, push the **ALARM RELAY CONTACT RESET** button or close a normally open contact connected to the **REMOTE RESET** terminal.

Water Alarm

This system also includes a Pit Water detection circuit. If water is detected at the sensor pad, the device will sound an audible alarm and the phrase *Water Alarm* will flash on the display as shown.

```
  Water
  Alarm
```

The Water Alarm Signal Output (refer to figure on page 3) contacts will close.

Pressing the **ENTER/RESET** button will clear the alarm on the display, stop the beeping, and reset the Water Alarm Signal Output.

Self-check Error

A trouble condition occurs when the system finds a fault during one of its self-checks. When this happens, the Trouble relay activates and the message below flashes on the display.

```
Self-check
  Error
```

Pushing the ENTER button while the unit displays "Self-check Error" will attempt to automatically correct the error.

The display will clear automatically when the fault is no longer detected. In each case, the relay contact can only be reset by pushing the **TROUBLE RESET** button (refer to figure on page 3).

ROUTINE MAINTENANCE

Sensor Analysis & Calibration

The seismic sensor automatically performs self-diagnosis and auto-calibrates at regular intervals throughout the life of the unit. As a result, the sensor does not require routine follow-up calibration.

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EMAIL NOTIFICATION

Your 2600 Seismic Sensor comes equipped with a network communication module. It can be configured to automatically send an email notification for any of the following conditions:

- Earthquake Alarm
- Water Detected Alarm
- Low (or missing) battery
- Self-check Error

Configuring Email Settings

To configure the device to send emails, you will need:

- The IP Address of the S-Box (See the Network Status Function on page 6)
- A web browser (Chrome, Firefox, Safari, etc.) running on a laptop, tablet, smartphone, or computer connected to the same LAN (or WiFi) as the Smart Seismic System
- The internet address and port number for the email (SMTP) server you will use to send emails.
- The email account username and password for sending emails
- The email address where you wish email notifications to be sent.

Step by Step

1. Open a web browser window on your computer (laptop, notebook, tablet, smartphone)

2. Type the IP address of the Smart Seismic System into the address bar of the web browser. A "Welcome to S-Box" page will load.

3. Click on "Configure Email" on the left-hand side menu.

4. If you are prompted for a username and password, enter:

   - Username: **admin**
   - Password: **microchip**

5. Enter your email server information into the fields provided

6. Enter the email address where email notifications will be sent in the field labeled "To:"

7. If you want to send a copy of the email to another address, enter it in the field labeled "CC:" Otherwise, leave this field blank.

8. When you have finished entering your information, click the "Save SMTP Config" button

9. Click on "Test Email" on the left-hand side menu

10. Review your email settings to make sure they are correct.

11. Click the "Test Email Settings" button to send a test email. If the test is successful, you will get a notification on the screen, and you will receive an email at the email address specified in step 6.

TECHNICAL SPECIFICATIONS & APPROVALS

Technical Specifications

Sensor:	3-axis, solid state accelerometer. Detects vertical (P wave) and horizontal (S wave) accelerations
Frequency Response:	0.5 to 15Hz. Software filtered
Alarm Threshold:	0.1G
Diagnostics:	Self-diagnosis at startup, reset, and periodically during operation
Power:	110Vac 60Hz (0.5A Max)

OR

12~24v AC/DC External Low-voltage supply
Battery Backup: 2x CR123A

Dry Contact Rating:	5A @ 250VAC (General Purpose)
	5A @ 30VDC (Resistive)
Operating Temperature Range:	-25ºC (-13ºF) to +40ºC (+104ºF)
Relative Humidity:	0~99%
Inputs:	2-position, screw-type terminal for remote reset of latching contact
Outputs:	3-position, screw-type barrier strip for alarm latching dry contact (NC, common, NO)
	3-position, screw-type barrier strip for alarm non-latching dry contact (NC, common, NO)
	3-position, screw-type barrier strip for trouble latching dry contact (NC, common, NO)

Approvals

This product meets following standards:

- CAN/CSA B44.1
- ASME A17.5
- CAN/CSA No22.2 No. 14
- UL 508A

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APPENDIX A: POWER SUPPLY CONNECTIONS

This model has a built-in power supply able to draw power directly from a main AC supply (110V 60Hz). The power supply is protected internally with overload and thermal shut down. The output from the power supply is pre-wired to the low-voltage power input on the sensor.

Connecting the 110VAC Power Supply

WARNING: Risk of electric shock. All electrical connections must be performed by a qualified electrician in accordance with all applicable codes and ordinances. Failure to follow this warning could result in property damage, personal injury, or death.

NOTE: Power must be provided through an external disconnect switch or circuit breaker that is clearly marked and accessible by the operator of this equipment.

1. **DISCONNECT POWER** at breaker switch.

2. Run the wires through the one of the knockout holes on the bottom of the box. **Do not use rigid conduit.**

WARNING: If metal-jacketed (armored) cable is used, or if metal knockout/conduit fittings are used, the knockout/conduit fittings must be of the "bonding" type, with built-in ground terminals (e.g. Thomas & Betts Bonding Locknut). These terminals must be tied to the main ground terminal on the enclosure. Fittings are not included. Failure to follow this warning could result in property damage, personal injury, or death.

3. Use wire nuts, or other approved (code-compliant) hardware to connect the live (black) supply wire to the black wire on the included plug-in pigtail connector. Connect the neutral (white) supply wire to the remaining wire (red or white) on the plug-in pigtail connector

4. Plug the connector onto the 2-pin terminal on the internal supply. Note the polarity of the connector. The black wire should be on the left, connected to the pin marked "L".

5. Connect the Ground wire to the ground terminal

Suggested replacement part for plug-in terminal

Housing – Amp/Tyco : 1-1123722-3
Contacts – Amp/Tyco : 1123721-2

Wire – Any UL / CSA recognized 18AWG 300V VW-1

External Low-Voltage Supply (12~24V Max)

Alternatively, an external low-voltage power supply may be connected directly to the Low-Voltage Power Input terminal (labeled PWR-IN on the circuit board), after disconnecting the two wires that are pre-wired at the factory.

External low-voltage power supply may be AC or DC, minimum 12V, maximum 24V

CONTACT INFORMATION

ADAMS Elevator Equipment Co.   Telephone: 312-610-8500
Chicago, IL, USA

LIMITED WARRANTY

The manufacturer warrants to the original purchaser that this product will be free from defects in material and workmanship under normal use and services for a period of one (1) year from the date of purchase. The manufacturer's liability is limited to the replacement of the product provided that proof of purchase date is presented to the manufacturer. This warranty is void if the product has been damaged by accident, tampering, misuse, abuse, lack of reasonable care for the product or used in applications not in accordance with this User's Guide. This warranty is in lieu of all other express warranties, obligations or liabilities. The manufacturer shall have no liability for any personal injury, property damage or any special incidental, contingent or consequential damage of any kind.

QMI Manufacturing, Inc. – Coquitlam, BC, Canada

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