TracXP™

Industrial Gas Solutions

by Macurco

Model TXP-WCR
WIRELESS CONTROLLER RECEIVER

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Revision: 1.2

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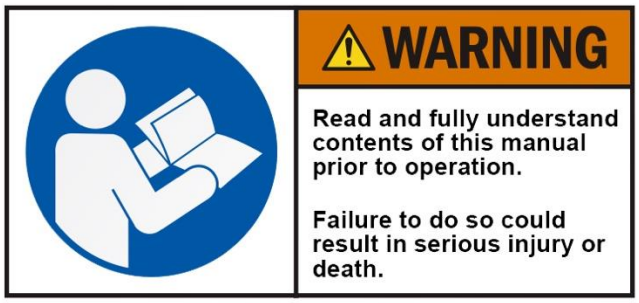
CHAPTER 1 – SAFETY INFORMATION

1.1 SAFETY INFORMATION – READ BEFORE INSTALLATION & APPLYING POWER



AVERTISSEMENT: Lire attentivement les instructions avant de metre en marche.

Users are responsible for correct translations of this manual into their native language

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CAUTION: FOR SAFETY REASONS THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

ATTENTION: POUR DES RAISONS DE SÉCURITÉ, CET ÉQUIPEMENT DOIT ÊTRE UTILISÉ, ENTRETENU ET RÉPARÉ UNIQUEMENT PAR UN PERSONNEL QUALIFIÉ. ÉTUDIER LE MANUE D'INSTRUCTIONS EN ENTIER AVANT D'UTILISER, D'ENTRETENIR OU DE RÉPARER L'ÉQUIPEMENT.

WARNING - EXPLOSION HAZARD
SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION
LA SUBSTITUTION DES COMPOSANTS PEUT PROVOQUER UNE ADAPTATION À LA CLASSE I, DIVISION 2.

IMPORTANT

The TXP-WCR Wireless Monitoring System described in this manual consists of anywhere from 1 to 32 TXP-WTA Transmitters sending data wirelessly to any number of TXP-WCR Controllers and/or TXP-WAR (Wireless Alarm Relays). Users should have a detailed understanding of the wireless systems' operating and maintenance procedures. Use the TracXP system only as specified in this manual, or detection of gases and the resulting protection provided may be impaired. Read the following **WARNINGS** prior to use.

WARNINGS

- Calibrate WTAs that communicate to the TXP-WCR wireless monitoring system with a known value of calibration gas after installation and a brief warm-up period (30 minutes recommended). Check calibration on a regular schedule (at least every 90 days). More frequent inspections are encouraged to spot problems such as dirt, oil, paint, grease or other foreign materials on the Sensor Housing filter.
- Do not paint any part of the WTA or corresponding components.
- Do not use the WTA if any enclosure is damaged or cracked or has missing components.
- Make sure covers, internal PCBs, and antenna connections are securely in place before operation.
- Use only a sensor element compatible and approve for use with the WTA.
- Periodically test for correct operation of the system's alarm events by exposing the WTA to a known value above the High Alarm set-point.
- Do not expose TracXP devices to electrical shock or continuous severe mechanical shock.
- Protect TracXP devices from dripping liquids and high-power sprays.
- Use only for applications described within this manual or approved by TracXP.

CHAPTER 2 – GENERAL DESCRIPTION

2.1 INTRODUCTION

The TracXP TXP-WCR (Wireless Controller Receiver) is available with 2.4GHz or 900MHz frequency to meet your communication requirements. Each TXP-WTA may be equipped with single or dual gas sensors and transmit two of the 32 maximum channel values to the controller and/or wireless alarm relay. There must always be only one TXP-WCR configured as a network's Server. Since it is often desirable to indicate readings and alarms in more than one location, multiple other controllers configured as Clients are easily added to the same wireless network, but only one may be configured as the Server. Each network's Server transmits Hopping Pattern and System ID settings only to Clients assigned to its network.

NOTE: "Channel "refers to each detector (sensor) input. For example, if a system has 8 dual transmitters with one H2S & LEL detector on each that is 16 channels. If each of the 8 transmitters has only one detector that is 8 channels.

Key Features

- 900 MHz or 2.4 GHz Radios
- Suited for 12VDC Solar Power Supplies
- Wi-Fi – Remote HMI Functionality
- Non-Volatile Memory – Retains Config. Values in Event of Power Outage
- Up to 26 FHSS Hopping Patterns
- 8 Programmable Relays
- 128X64 Pixel Graphic LCD / Magnetic Keypad
- Real-Time Clock & Calendar
- Multiple Antenna Options
- Non-Intrusive Magnetic Interface
- Event Logging
- Multiple Enclosure Wall Mount Options
- Openable Enclosure Door

2.2 SPECIFICATIONS

Input Power Requirements

- AC Power 100-240VAC 50/60Hz at .80-amp Max, 40 watts Max Steady-State
- 10-30VDC, 3 watts max (basic WCR with all relays energized)
  NOTE: The optional features described below increase power consumption:
  - AC primary power source connected to TB1 on the motherboard, TB3 terminals 1 and 2 on the motherboard provide a maximum of 24VDC 10 watts output power for powering auxiliary external devices such as relays, lights and monitors (see Figure 6-1).
  - Power consumed from TB3 must be included when calculating system power consumption.

IMPORTANT: TB3 ONLY PROVIDES 24VDC POWER WHEN AC IS PRIMARY POWER.

Some applications may require 24VDC power in excess of the 10 watts available from the controller motherboard power supply. An optional 50 watt rail mounted AC/DC supply, PN: 26-2900-0127-5, is available to increase 24VDC power (see Section 6.3).

Output

- 900MHz Power Adjustable From 10 mW to 1 watt
- 2.4GHz Output Set at 125 mW

Ambient Temperature Range

- -35 to 140 degrees F
- -25 to 60 degrees C

Humidity Range

- 0 TO 90% RH Non-Condensing.

Altitude

- Recommended up to 6,561 feet above sea level (2000 meters)

Housings/Installation Categories

- TXP-WCR/PY *NEMA 4X non-metallic polyester wall mount. DIV 2 Groups A, B, C, D; Category II and pollution degree 3; NEMA 4X; IP66
- TXP-WCR/PCS *NEMA 4 painted carbon steel wall mount. DIV 2 Groups A, B, C, D; Category II and pollution degree 3; NEMA 4; IP66
- TXP-WCR/SS *NEMA 4X stainless steel wall mount. DIV 2 Groups A, B, C, D; Category II and pollution degree 3; NEMA 4X; IP66
- TXP-WCR/XP *NEMA 7 wall mount for DIV 1 & 2 Groups B, C, D; includes 'O' Ring in door to satisfy NEMA 4 rating.

Relays

- The 8 standard Form C dry contact relays are functionally equivalent
  - 2 are on the Motherboard (see Figure 5-2)
  - 6 are on the Relay PCB (see Figure 5-3).
- Relays may be mapped to various alarm events as described in Section 4.6.1.
- All mechanical (dry contact) relays are rated at 5 Amp for 28 VDC and 250 ~VAC **RESISTIVE** loads.

IMPORTANT: APPROPRIATE DIODE (DC LOADS) OR MOV (AC LOADS) SNUBBER DEVICES SHOULD BE INSTALLED WITH INDUCTIVE LOADS TO PREVENT RFI NOISE SPIKES.
(A SNUBBER DEVICE IS USED TO SUPPRESS VOLTAGE TRANSIENTS)

2.3 DESCRIPTION OF TXP-WCR CLIENT / SERVER WIRELESS NETWORKS

All TracXP by Macurco wireless devices utilize a FHSS (Frequency Hopping Spread Spectrum) Client/Server network where multiple **Clients** synchronize their frequency hopping to a single **Server**.

- Each network's **Server** transmits a beacon at the beginning of every frequency hop.
- **Clients** with the same **Hop Channel** and **System ID** Menu settings listen for the **Server's** beacon and upon receiving it, synchronize their hopping with the **Server**.
- Controllers may be user configured as either **Clients** or **Servers** since many installations require more than one controller, but only one Server is allowed per network.
- Battery powered TXP-WTAs are always **Clients** because their radio is usually powered down and therefore unable to continuously broadcast beacons as required by the **Server**.
- When there are multiple controllers on the same network, the most centrally located is usually designated as the Server.
- Multiple wireless relays may be added to a wireless system to provide additional alarms, and/or function as repeaters for the alarm states of the sensor assemblies in the wireless network.

Each device on a TracXP Wireless network must have its **NETWORK ID** Menus configured to share the same **Hop Channel** and **Systems ID**.

To simplify this setup:

1. Wireless Transmitters, Controllers, and Relays are limited to 26 unique **Hop Channel** and **System ID** settings entered as "A" through "Z" in the **NETWORK ID** Menu.
2. All devices on the same network must have the same **Network ID** letter designated to communicate with each other (see the WTA manual*)*–this means it is possible to locate multiple networks within the same coverage area without interference.

IMPORTANT! THERE SHOULD NEVER BE TWO SERVERS WITH THE SAME NETWORK SETTINGS WITHIN THE SAME COVERAGE AREA BECAUSE INTERFERENCE BETWEEN THE TWO SERVERS WILL SEVERELY HINDER RF COMMUNICATION!

Correct planning and design of wireless systems are imperative for ensuring a successful installation.

CHAPTER 3 – PRODUCT DESCRIPTION

3.1 SYSTEM DIAGRAMS

Refer to the following diagrams for identification of system components that may be referred to

Figure 3-1 (NEMA 4 Enclosure / Steel Enclosure)

3.1.1 EXTERNAL SYSTEM DIAGRAM

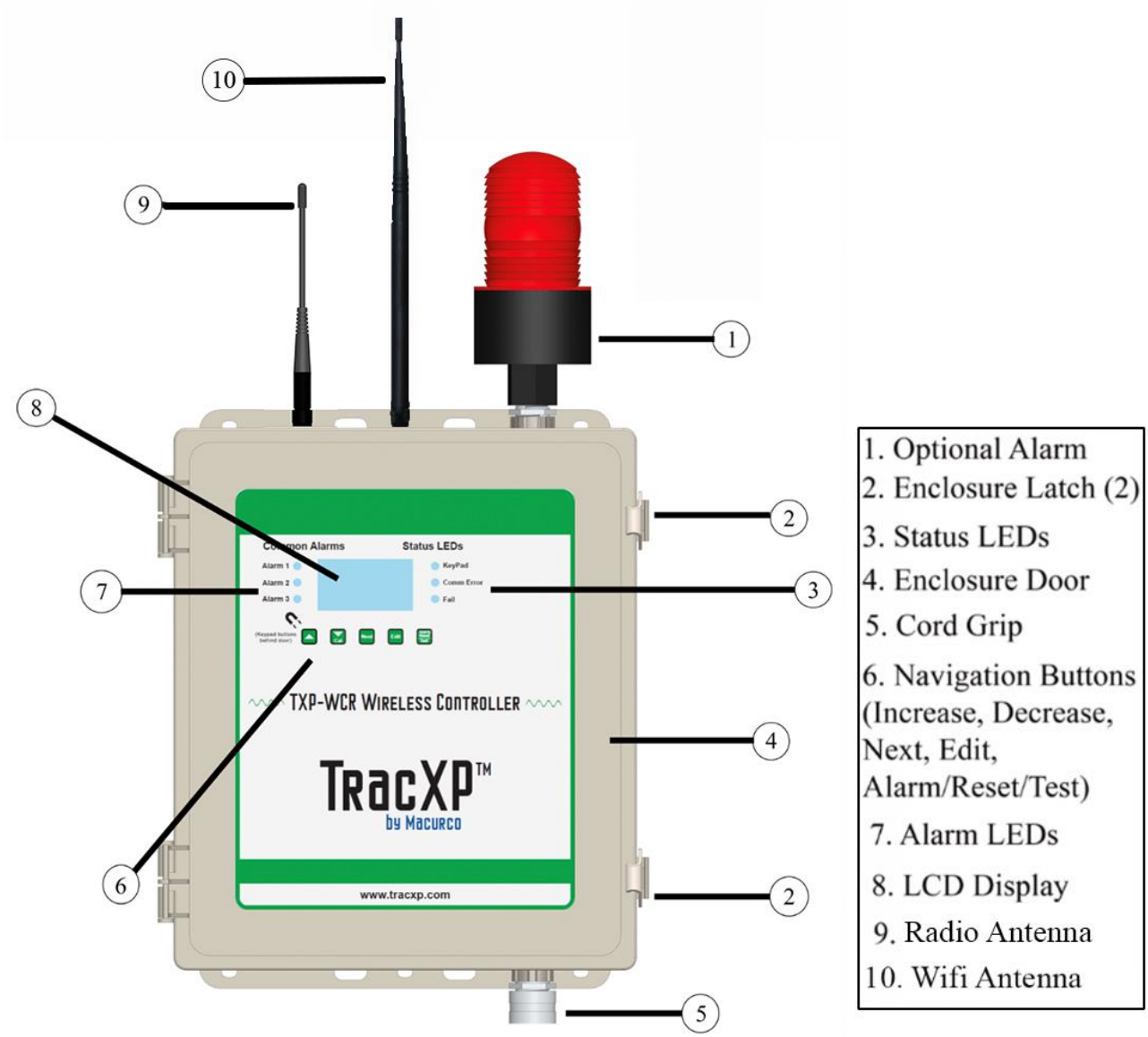


Figure 3-2 External System Diagram

3.1.2 INTERNAL SYSTEM DIAGRAMS

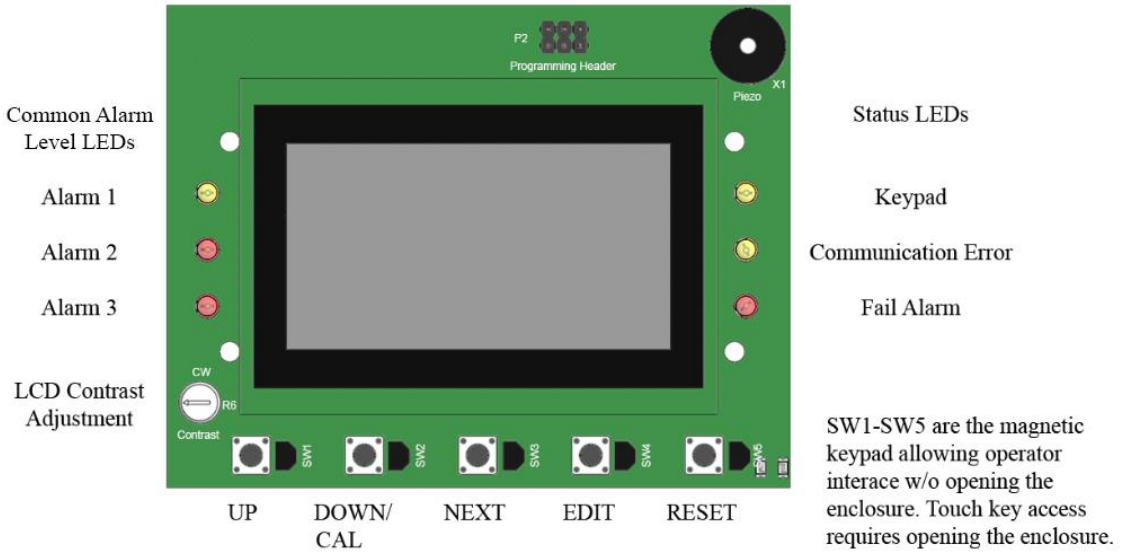
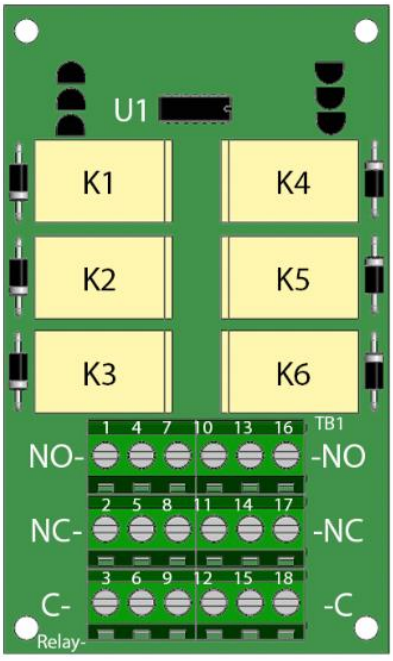


Figure 3-3 LCD Board



Note:
This board blocks access to the fuse and must be removed to replace a blown fuse.

Warning:
For continued protection against fire, replace only with same type and rating of fuse.

K1, K2, K3, K4, K5, & K6 are programmable as described in Section 4.6.1

TB1 terminals 1, 4, 7, 10, 13, & 16 are Normally Open Contacts for K1-K6

TB1 terminals 2, 5, 8, 11, 14, & 17 are Normally closed Contact for K1-K6

TB1 terminals 3, 6, 9, 12, 15, & 18 are Common (pole) Contacts for K1-K6

Contacts are rated for 5-amp resistive loads. Arc suppression snubber devices should be used for switching inductive loads.

Figure 3-4 Relay Board

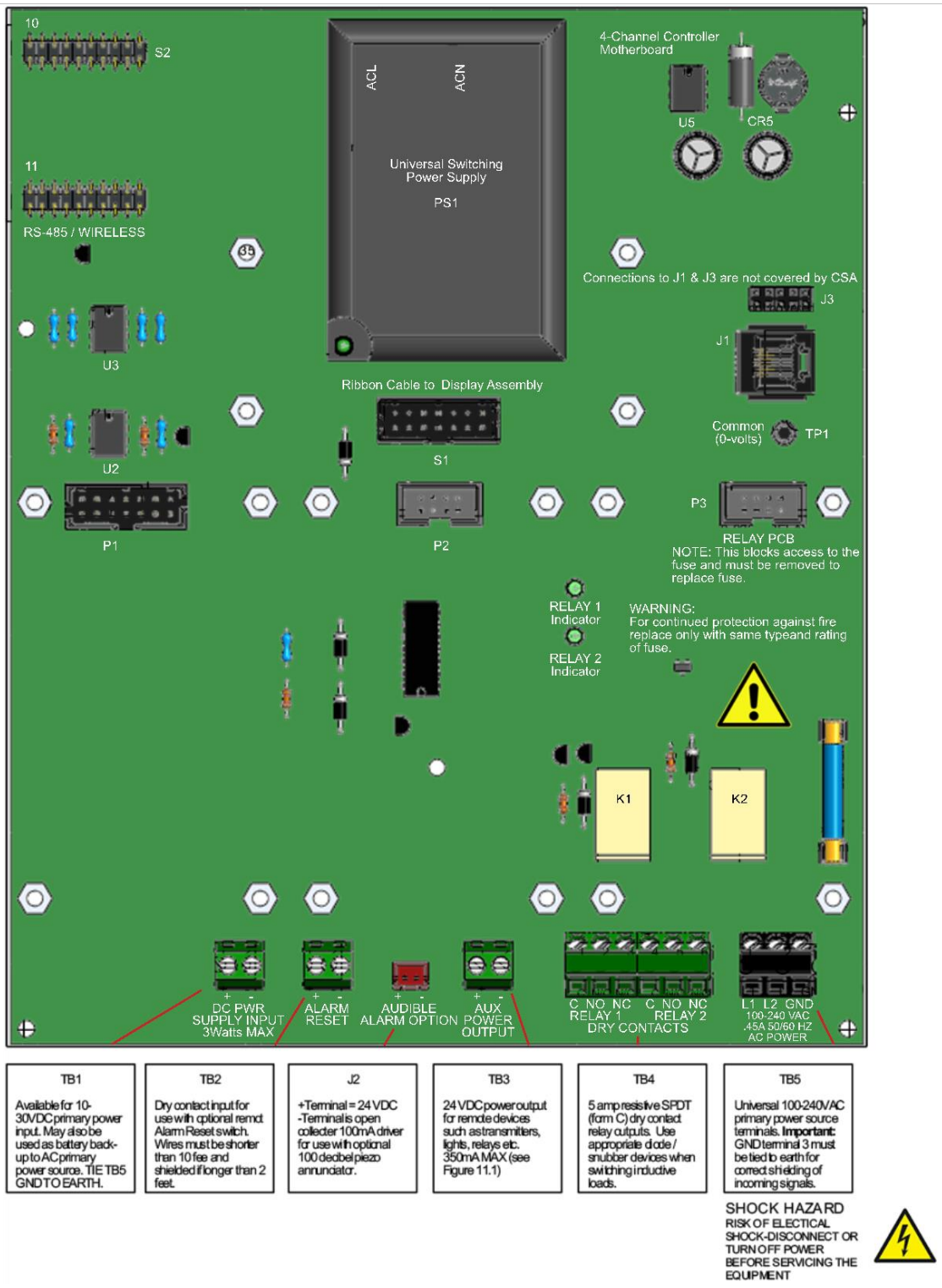


Figure 3-5 Motherboard

3.1.3 ASSEMBLY DIAGRAM

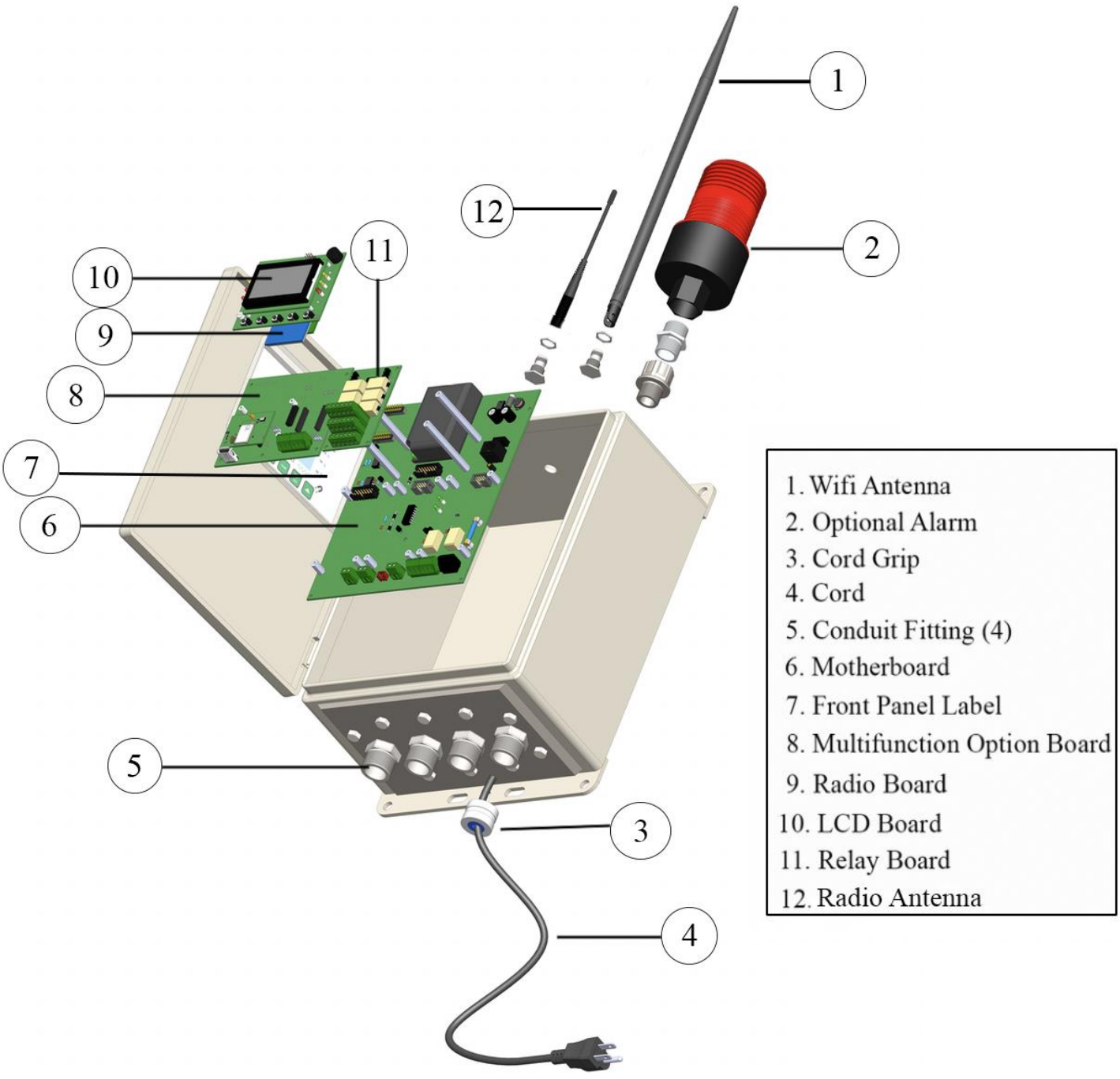


Figure 3-6 Assembly Diagram

3.2 TXP-WCR CONTROLLER DESCRIPTION

The TracXP TXP-WCR Controller is designed to display readings and control alarm-event relay switching for up to 32 TXP-WTA Transmitters.

From each WTA, the Controller receives the signals of:

- Fail
- Alarm 1
- Alarm 2
- Alarm 3
- Low Battery

The Controller maps the received signals to its eight programmable relays, while adding features such as:

- Latching / Failsafe
- Alarm Acknowledge
- Refresh.

A backlit 128 x 64-pixel graphic LCD shows monitored data as bar graphs and engineering units.

A piezo driver circuit for a local audible annunciator may also be mapped to the relays. Eight standard 5-amp alarm relays may be programmed to activate based upon various alarm combinations and channel zoning.

A Multi-Function module (see Chapter 5) may be integrated into any of the standard controller enclosures to add:

- Data logging
- A wired or wireless Modbus slave port
- A Wi-Fi port with Web-Server

The Wi-Fi feature allows remote HMI (Human Machine Interface) functionality via any web enabled device and allows responders to view real time and historical data on smart phones, tablets and PCs prior to entering a potentially hazardous area.

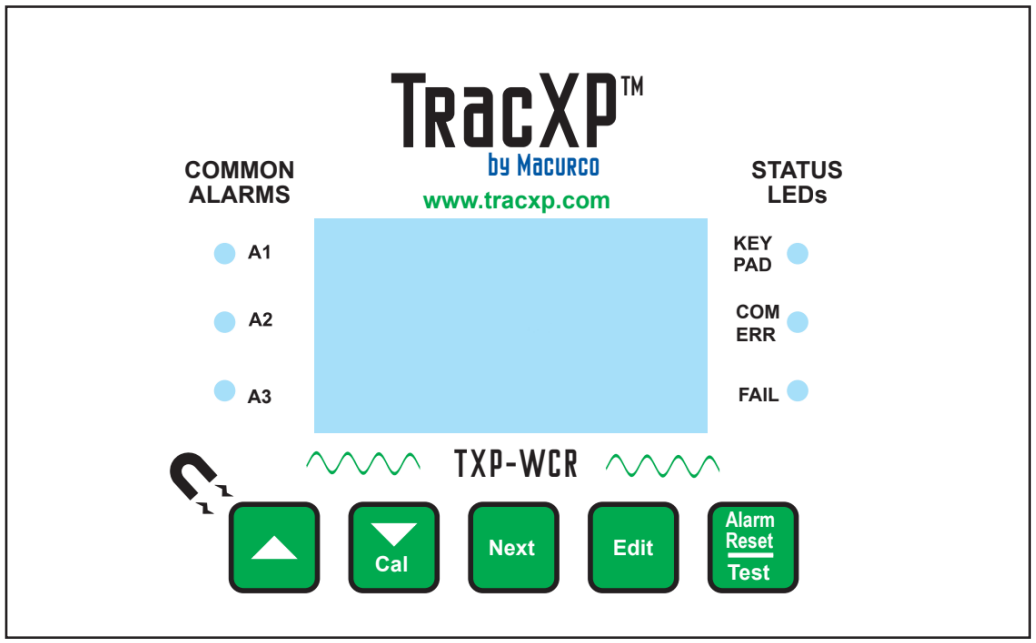


Figure 3-7 Front Panel

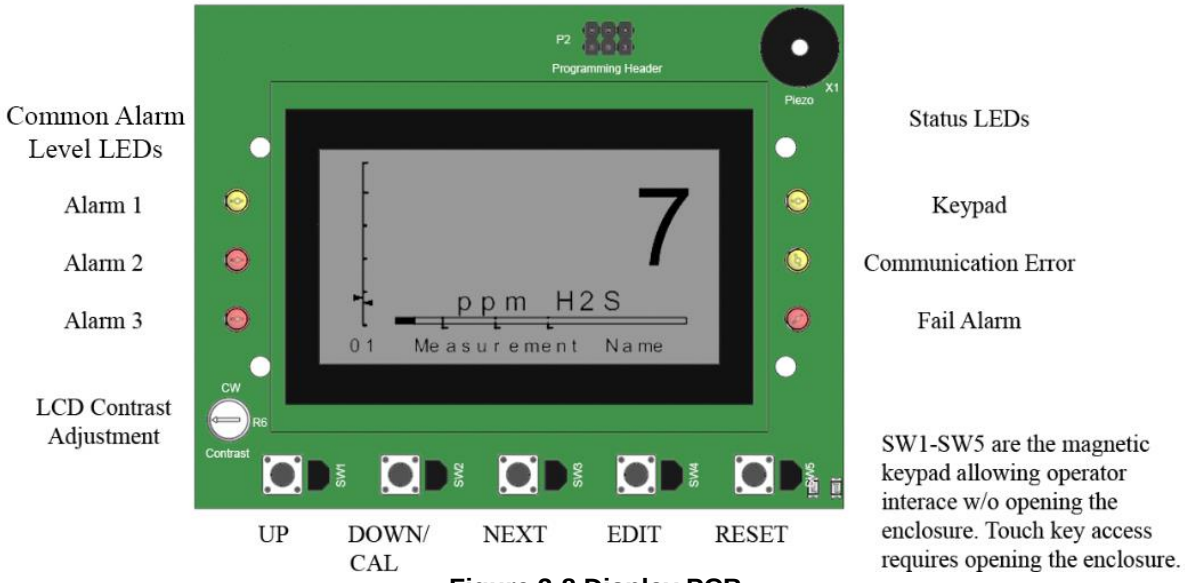


Figure 3-8 Display PCB

3.3 DATA DISPLAY SCREENS

When there are no channels with alarm conditions the controller displays **ALARM STATUS CLEAR**. When there are channels with alarms, the **ALARM STATUS CLEAR** screen is replaced by the **Channel Alarm Status** screen, which displays any active channel in alarm.

Press the **NEXT** key to:

- Display the **Event Log** screen, which displays various status changing events as discussed in Section 4.9.

Press the **NEXT** key again to:

- Display the **Eunits/Bar Graph** screen, shown in Figure 3-10, to observe incoming WTA broadcasts one channel at a time, which allows scrolling past all active channels with the UP/DOWN keys.

  NOTE: "Eunit" (Engineering unit) is a unit of measurement like 'PPM' or '% LEL'.

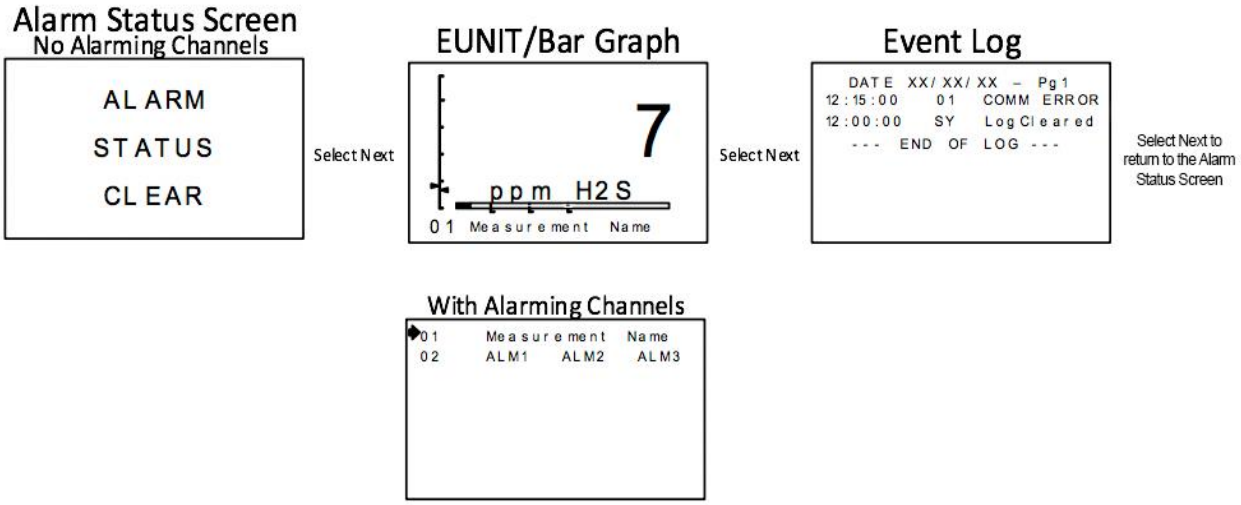


Figure 3-9 Data Displays

3.3.1 EUNIT/BAR GRAPH SCREEN AND COMM ERROR TIME LINE

The controller EUNIT/Bar Graph screen in Figure 3-10 consists of:

- Large digital value with Engineering Units
- Horizontal bar graph with A1, A2 and A3 levels indicated across the bar
- 16-character **Measurement Name** field for user ID of this WTA's location
- The crucial Vertical **Comm Error Time Line** on the left edge of the screen

The UP/DOWN keys scroll this screen through all active channels one at a time.

The vertical Comm Error Time Line on the far left of this screen is divided into five segments, from bottom to top.

- Each segment equals one WTA Wakeup Timer interval from the WTA providing data to this controller channel (see the WTA manual).

The arrow on the right side of the Time Line slides up the line as time goes by for the current channel being observed.

- Every time the WTA broadcast packet is received on this channel, the pointer resets to the bottom of the time line.
- If the pointer reaches the top of the time line the TXP-WCR Controller will raise a Comm Error for this channel.

NOTE: If the wireless link between the WTA and this channel is functioning properly the pointer should never exceed the 1st Wakeup Timer line segment.

The arrow on the left side of the Time Line slides up the line as time goes by in a similar manner to the other arrow.

- This pointer represents the channel which is furthest along it's time line for all of the monitored channels.
- Useful in determining if any channels have missed a transmission without having to cycle through observing all of the channels.

NOTE: If the arrow on the left-hand side has not passed the first segment, all of the monitored channels have received their latest transmission.

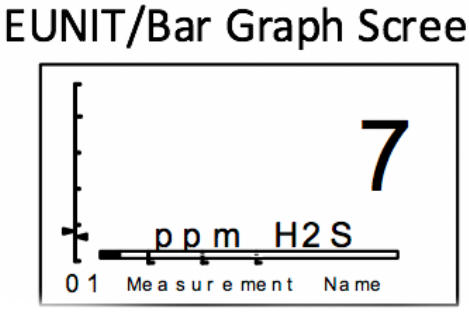


Figure 3-10 EUNIT/Bar Graph Screen

The EUNIT/Bar Graph screen has flashing alarm icons for A1, A2, and A3. The Menu Item in the System Menu Controls if the readings display or block negative values. The number in the bottom left indicates the channel currently being displayed. Use UP/DOWN to cycle through channels to be displayed. The Vertical Comm Error Time Line on the far left of the screen is divided into five segments from bottom to top. Each segment equals one WTA Wakeup Timer from the WTA providing data to this WCR channel. The entire time line is equal to 5 times the Wakeup Timer value.

3.3.2 ALARMS STATUS CLEAR SCREEN

The **ALARM STATUS CLEAR** screen indicates:

- There are no alarm conditions among the active channels.
- The Wireless Monitoring System is performing normally.

The **NEXT** key moves from this screen to the **Event Log** screen.

3.3.3 CHANNEL ALARM STATUS SCREEN

The Channel Alarm Status screen shows all active channel numbers but causes any with an alarm condition to flash.

1. Use the UP/DOWN keys to point to a channel in alarm.
2. EDIT brings up that channel's EUNIT/Bar Graph screen to provide more detailed information about the alarm.
3. The pointer will automatically go to the first alarming channel when entering this screen.

NOTE: If no Channel is in an alarm state this screen will not be displayed, and the Alarms Status Clear screen will be displayed in its place.

3.3.4 EVENT LOG SCREEN

The **Event Log** screen shows time and date stamped alarm events in a first in first out 99 event buffers. The **Clear Event Log** menu allows erasing of all events. The **Event Log** displays several different types of events:

1. Comm Error in and clear
2. Alarms in and clear
3. Relays energized and de-energized
4. Low battery
5. Calibration Mode
6. Warm up
7. Power up
8. Local acknowledge
9. Cold Boot
10. RMT Ready
11. Network Configuration
12. Disabled
13. RMT Initialization
14. System locked and unlocked
15. Log Cleared
16. Push to Test
17. Remote acknowledge
18. Remote Configuration
19. Missing sensor
20. Relay Configuration

When one of the previous events occurs, a new line will be displayed on the **Event Log** showing the time of the occurrence, the channel it occurred on (or SY if it is a system occurrence) and the type of event. For more detailed information refer to Section 4.9.

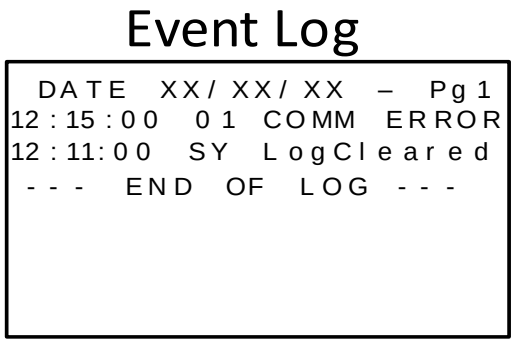


Figure 3-11 Event Log Screen

CHAPTER 4 – TXP-WCR CONTROLLER OPERATION

4.1 OPERATOR INTERFACE

The TXP-WCR Controller's graphic LCD and 5-button keypad serve as its operator interface. The keypad is accessed non-intrusively through the WCR door using the handheld magnetic wand or, if in an unclassified area, by opening the door and using the pushbutton keys below the display.
The Keys are identified as UP, DOWN, NEXT, EDIT and RESET.

To use the non-intrusive interface with the magnetic wand a "swiping" motion of the magnet is used instead of pressing a key. In this manual, a "swipe" means: hold the magnet directly over the key's target, close to or against the WCR's door, and in the same motion move the magnet away from the target. Each "swipe" equals one press of the key, and swipes may be done rapidly to move through fields with many options. It is ok to touch the door with the magnet but be careful not to "swipe" too close to one of the other keys and activate it by mistake.

To access all controller configuration parameters entered with this operator interface:

1. Access the SETUP menus by pressing EDIT from the "Alarm Status" screen.
2. To exit the Setup mode, press NEXT, or wait 5 minutes without pressing additional keys.

During the Setup mode:

- Alarm relays and front panel alarm LED indicators remain active.
- A SECURITY menu offers a password feature to prevent tampering with controller menus.

NOTE: Controllers only display the readings and alarm events which are created at the TXP-WTA. Channel Alarm decision making occurs inside the TXP-WTA.

4.2 SETUP MENU CONFIGURATION

Channel menus:

- Affect only the specific channel selected (see Section 4.5).

System menus:

- Related to features not specific to any channel (see Section 4.6).

To select the desired menu:

1. Scroll with UP/DOWN
2. Press EDIT to enter each menu

NOTE: Set date and time before updating other settings.

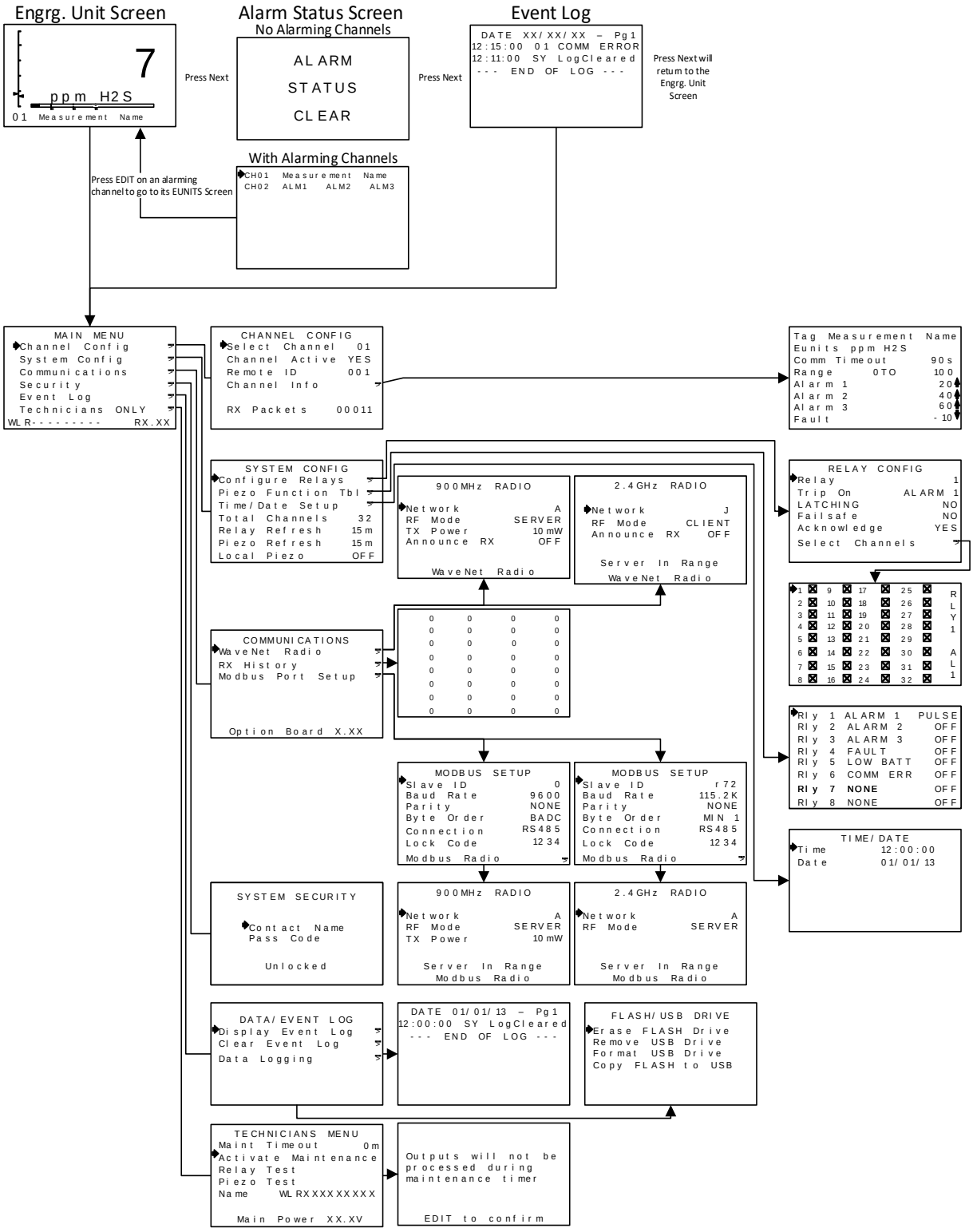


Figure 4-1 Menu Tree

4.3 CHANGING MENU VARIABLES USING THE KEYPAD

After entering the menu:

1. Use the UP/DOWN keys and control a pointer to indicate a selected variable.
2. Press the EDIT key to access simple YES/NO or ON/OFF entries.
   - Others have many ASCII character possibilities including: ABCDEFGHIJKLMNOPQRSTUVWXYZ [\]^_`abcdefghijklmnopqrstuvwxyz blank space !"#$%&`()*+,-./0123456789:;<=>?@. (Notice the often-used *blank* character is located after lower case z and before the exclamation point (!))
3. Press EDIT to place a cursor under the item.
4. Use the UP/DOWN keys to scroll through each allowed entry.
5. Press the NEXT key to move the cursor to the next position within a field.
6. Press EDIT when the field is complete to clear the cursor and load the field into non-volatile memory where it is retained indefinitely.
   - Without a cursor present, the NEXT key closes open menus in reverse order and returns the LCD to the data display.

4.4 MAIN MENU

The MAIN MENU is the entry level screen to the following menus:

1. **Channel Config.**
2. **System Config.**
3. **Communications**
4. **Security**
5. **Event Log**
6. **Technicians ONLY**

To reach the MAIN MENU group shown in Figure 4-2:

Press EDIT with any data display present.

To reach an additional menu listed above:

- Use the UP/DOWN keys to move the pointer to the desired menu.
- Press the EDIT key.

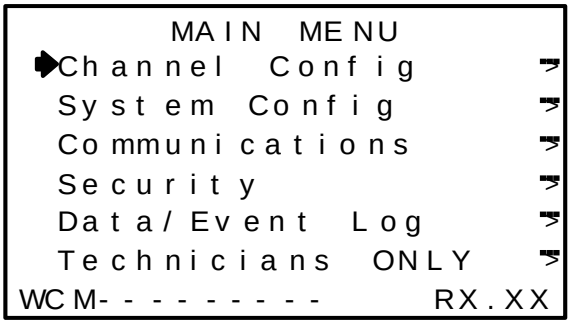


Figure 4-2 Main Menu

4.5 CHANNEL CONFIG MENU GROUP

The **CHANNEL CONFIG** menu shown in Figure 4-3 allows configuration of variables specific to the selected channel.

To select a channel to be affected:

1. Press the **EDIT** key.

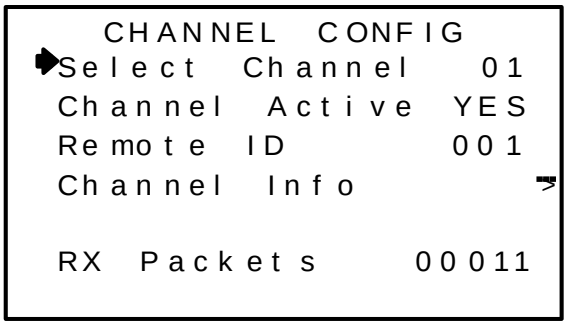


Figure 4-3 Channel Config Menu

4.5.1 CHANNEL ACTIVE

Channel Active is a YES/NO field that allows temporarily deactivating channels. Channels that may be deactivated are limited to the number of **Total Channels** designated in the System Config menu group (see Section 4.6.4).

To permanently remove a channel:

- Adjust the **Total Channels** down to reflect the number of TXP-WTAs communicating to this controller.

4.5.2 REMOTE ID

Selecting **Remote ID** allows the user to change which WTA is assigned to this controller channel.

- Remote ID numbers are limited to 1-32 but any of these may be assigned to any of the 32 controller channels.
- Remote ID numbers are useful for arranging which controller channels are used to display specific TXP-WTAs.
    - For example, dual gas TXP-WTAs have consecutive Remote IDs, it might be desirable to separate these at the controller in order to keep same gas types together on its readout.

4.5.3 CHANNEL INFO

CHANNEL INFO data is received and broadcasted to the TXP-WCR Controller at every WTA:

- power up
- channel edit
- routinely upon expiration of the **TX Config Timer** described in the TXP-WTA manual.

Modification of the parameters on this screen may only be done at the Wireless Transmitter broadcasting to this channel.

4.5.4 RX PACKETS

RX Packets displayed at the bottom of the **CHANNEL CONFIG** screen is a counter incremented each time a new data packet is received from the WTA.

Displaying the **RX HISTORY** screen in the **COMMUNICATIONS** menu group can reset it to zero by: *Note:* Pressing **Alarm Reset** button (see Section 4.7.2).

4.5.5 BATT 3.6V

The battery voltage of the WTA broadcasting to this channel is also displayed at the bottom of the **CHANNEL CONFIG** screen. The nominal value is 3.6 volts, and TXP-WTAs trip their **Low Batt** alarm at < 3.3 volts.

4.6 SYSTEM CONFIG MENUS

The **SYSTEM CONFIG** menus shown in Figure 4-4 allows configuration of variables for the controller unrelated to any specific channel.

This includes programming how the relays and audible piezos function, the total number of channels, and the time and date.

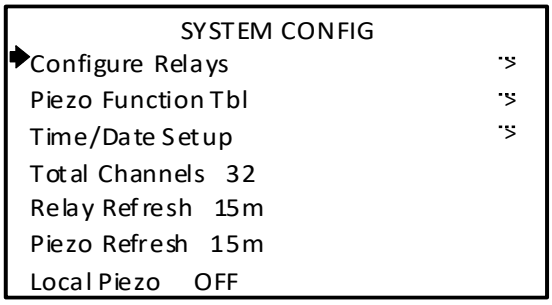


Figure 4-4 System Config Menu

4.6.1 CONFIGURE RELAYS

The **RELAY CONFIG** screen shown in Figure 4-5 allows sophisticated programming of each of the eight relays.

To select the relay to be configured:

1. Point to the Relay menu
2. Press EDIT.

- **Trip On** controls what conditions will cause the relay to activate. These may be
  - **A1**
  - **A2**
  - **A3**
  - **Fault**
  - **Low Battery** (from a WTA)
  - **Comm Error**
  - **Remote Edit** (someone is modifying the WTA's settings)
  - **Channel Disable** (a controller channel has been disabled by an operator)
  - **None** (this relay is not used and will never activate).
- **Latching** determines either manual or automatic alarm reset operation.
  - **YES,** requires a manual Alarm Reset button press to unlatch the relay even though an alarm condition no longer exists.
  - **NO** allows this relay to automatically reset after the alarm condition clears.
- **Failsafe** is an ON/OFF field where ON causes the relay to energize when the condition is not present.
  - When the **Trip On** condition becomes true the relay de-energizes.
  - **Failsafe** is often utilized when it is desirable for loss of power to indicate the alarm condition.
- **Acknowledge** is an ON/OFF field with ON typically used when the relay controls an audible device and it is desirable to silence the horn audible while troubleshooting the alarm.
  - Applying an Alarm Reset causes the relay to return to its inactive state even though the alarm condition remains in effect.
  - The **Relay Refresh** menu (see Section 4.6.5) may be used to re-activate acknowledged relays.

- **Select Channels** brings up a check box (see Figure 4-6) screen for assigning which of the Active Channels are assigned to this relay.
    - This allows creating Zones among the active channels.

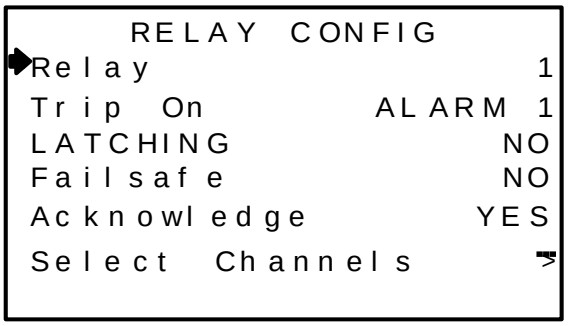


Figure 4-5 Configure Relays Menu

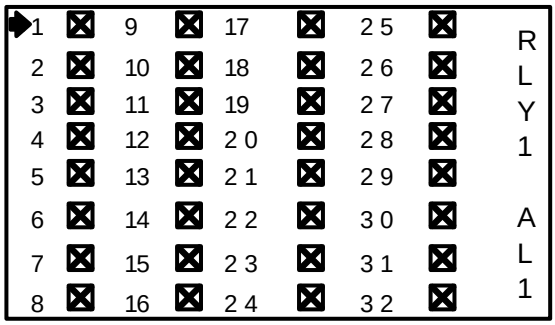


Figure 4-6 Select Channels Screen

4.6.2 PIEZO FUNCTION

The **Piezo FUNCTION** group determines behavior of the optional 100dB locally mounted piezo, related to the eight relays.

Choices are:

- **OFF,**
- **Chirp,**
- **Pulse,** and
- **Steady**.

NOTE: All settings are set to OFF by default.

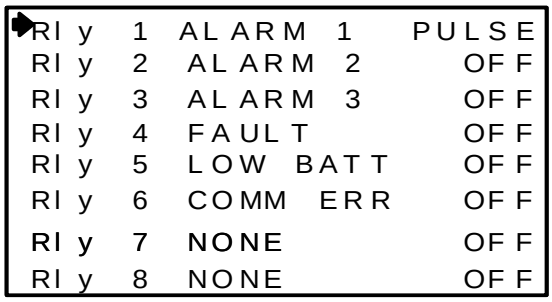


Figure 4-7 Piezo Functions

4.6.3 TIME/DATE SETUP

The **Time** and **Date** menus are for setting the correct time and date of the 24-hour clock and calendar. Time of day must be entered in 24-hour mode. For example, 6:00:00 PM is indicated as 18:00:00.

NOTE: Set date and time before updating other settings.

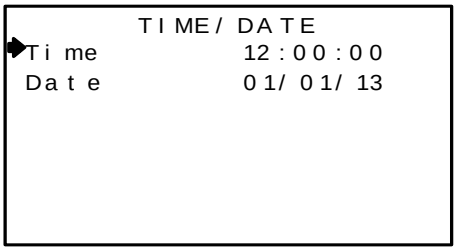


Figure 4-8 Time/Date Menu

4.6.4 TOTAL CHANNELS

Total Channels may be 1-32 and limits the maximum number of active channels. For example, if this menu is set for 10, then only 10 channels are available in the CHANNEL CONFIG menus discussed in Section 4.5.1.

4.6.5 RELAY REFRESH

Key Qualities

- May be set from 0-120 minutes with 0 turning the Refresh function OFF.
- Each relay may be set to allow **Acknowledge** (see Section 4.6.1) which means an **Alarm Reset** deactivates the relay even though the alarm condition still exists.
- **Refresh** will re-activate the relay after this timer expires. This feature is useful for silencing audible devices, and then automatically activating them again if the alarm condition remains after a period of time.

4.6.6 PIEZO REFRESH

Key Qualities

- May only be set from 1 to 60 minutes and may not be turned OFF.
- **Piezo Refresh** only affects the optional 100dB locally mounted piezo, which connects to the Audible Alarm connector on the motherboard (see Figure 5-2). This piezo is always Acknowledgeable.

4.6.7 LOCAL PIEZO

Local Piezo is an ON/OFF field where ON causes the tiny piezo on the TXP-WCR Controller Display PCB to mimic the larger piezo wired to the motherboard. This can be useful for testing operation of the louder device even though it is disconnected.

NOTE: The Local Piezo always chirps as keys are depressed.

4.7 COMMUNICATIONS

The **Communications** / **TXP-WCR Radio** menus shown below in Figure 4-9 allow setting Network ID, Server / Client and viewing a history of how many successful wireless messages have been received by each channel. Figure 4-10 shows the TXP-WCR Radio Menus for both operating frequencies.

NOTE: Lines 3 & 4 ("Modbus" and "WiFi") will only be displayed with multi-function options.

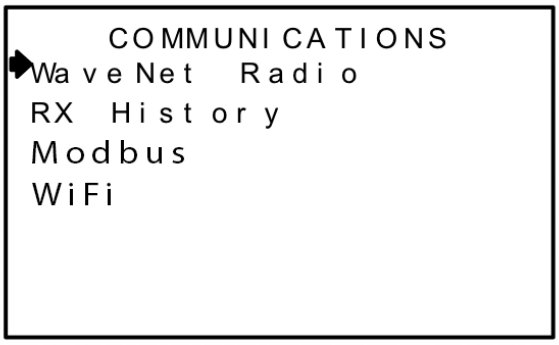


Figure 4-9 Communication Menus

4.7.1 TXP-WCR RADIO MENUS

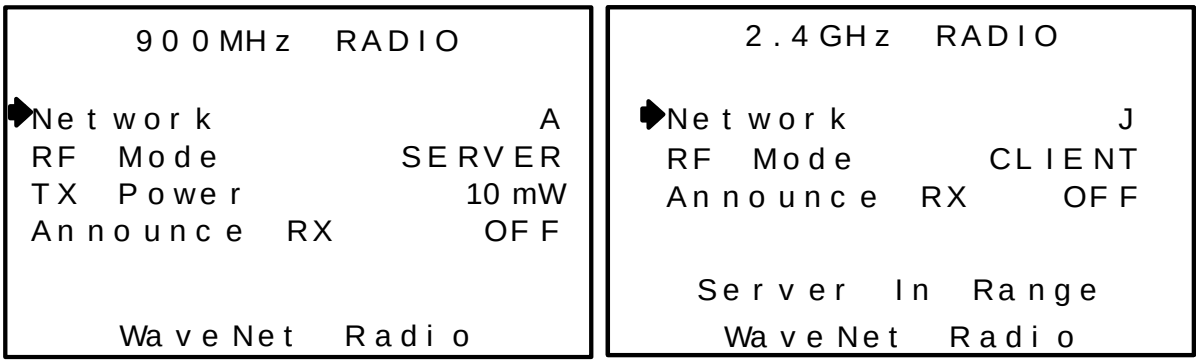


Figure 4-10 Radio Menus

4.7.1.1 NETWORK

TracXP wireless devices utilize the **Network** setting to assign up to 26 unique hopping patterns. To simplify system setup, **Network** is entered using letter designators A through Z:

- A = [Hop Channel 1, System ID 1]
- Z = [Hop Channel 26, System ID 26]
- M – Z = Encrypted Networks (When selected, data will be encrypted via proprietary methods to ensure that only devices on that network which hold the encryption key will be able to decipher the data being transmitted)

A TXP-WTA will not indicate Server In-Range status or communicate with any TXP-WCR/TXP-WAR operating on a different **Network**. This feature allows multiple TXP-WCR wireless systems to be located within range of each other without interference.

2.4GHZ used in EU countries:

- Hop channels on 2.4 GHZ models may be set between 1 and 26.
- Hop channels A-R include EU "low band" frequencies 2406 – 2435MHZ.
- Hop channels S-Z include EU "high band" frequencies 2444 – 2483.5MHZ.

IMPORTANT: EXPLORE WHAT FREQUENCIES ARE APPROPRIATE FOR THE FINAL LOCATION OF ANY WIRELESS SYSTEM.

4.7.1.2 RF MODE

RF Mode determines if the controller is a Server or a Client.

Specifications

- ONLY ONE SERVER IS ALLOWED PER WIRELESS NETWORK ID.
- Numerous controllers may share the same Network ID but only one may be the Server.
- Networks with multiple controllers should have the most centrally located unit designated as the Server (see Section 2.2).

4.7.1.3 TX POWER

The **TX Power** menu is only available on 900MHz systems and allows the setting of the **TX Power** for the radio. The settings for this are:

- 10mW
- 200mW
- 400mW
- 1W

2.4GHZ variation: The TX Power menu is not available in 2.4GHZ models and is fixed at 125mW conducted.

4.7.1.4 ANNOUNCE RX

The **Announce RX** setting is set to off by default. When **Announce RX** is turned on, the local Piezo mounted on the Display PCB will BEEP every time a packet of information is received from a TXP-WTA.

4.7.2 RX HISTORY

RX History is provided as a wireless network diagnostics tool.

Key Qualities

- It counts how many broadcasts are received by each channel.
- It always displays 32 channels regardless of how many active channels the controller is configured for currently.

To reset all 32 totals to zero:

1. Enter the screen
2. Press the Alarm Reset key

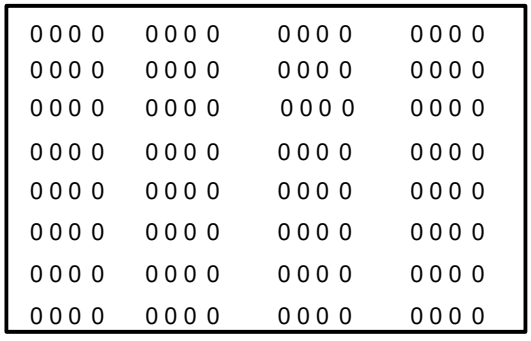


Figure 4-11 RX History

4.8 SECURITY

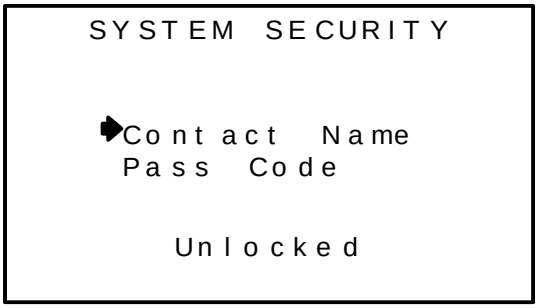


Figure 4-12 Security Menu

The **SECURITY** menu in Figure 4-12 requires the 4-digit **Pass Code** prior to altering menus.

Specifications

- Entering a Pass Code and locking the menu locks the entire menu database until the correct **Pass Code** is entered.
- **Contact Name** is a 12-character ASCII field available for displaying a phone # or name of person who knows the **Pass Code**.
- Lost **Pass Codes** may be recovered by entering the locked security menu and pressing the **UP**, **DOWN** and **NEXT** keys at the same time and holding them for **5 seconds**.
- The 4-digit code appears near the bottom of the screen.

4.9 DATA/EVENT LOG

4.9.1 EVENT LOG

The **Clear Event Log** menu allows erasing of all events.

The **Display Event Log** shows Time & Date stamped alarm events in a first-in-first-out 99-event buffer and displays several different types of events:

	Event	Abbreviation
1	Communication Error in and clear	COMM ERROR, COMM OK
2	Alarms in and clear	Alarm1 IN, Alarm2 IN, Alarm 3 IN, Fault IN, Alarm1 OUT, Alarm2 OUT, Alarm3 OUT, Fault OUT
3	Relays energized and de-energized	Relay1 CLR, Relay2 CLR, Relay3 CLR, Relay4 CLR, Relay5 CLR, Relay6 CLR, Relay7 CLR, Relay8 CLR, Relay1 SET, Relay2 SET, Relay3 SET, Relay4 SET, Relay5 SET, Relay6 SET, Relay7 SET, Relay8 SET
4	Low battery	LOW BAT
5	Cal Mode	CAL MODE
6	Warm up	WARM UP
7	Power up	POWER UP
8	Local acknowledge	LOCAL ACK
9	Cold Boot	COLD BOOT
10	RMT Ready	RMT READY
11	Net Configuration	NET CONFIG
12	Disabled	DISABLED
13	RMT Initialization	RMT INIT
14	System locked and unlocked	SYS LOCKED, UNLOCKED
15	Log Cleared	LogCleared
16	Push to Test	PushToTest
17	Remote acknowledge	Remote ACK
18	Remote Configuration	RMT CONFIG
19	Missing sensor	MIS SENSOR
20	Relay Configuration	RLY CONFIG

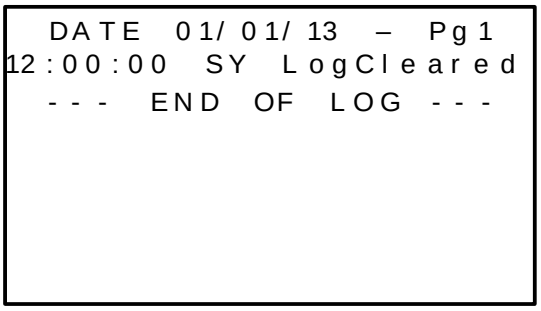


Figure 4-13 Display Event Log Pages

4.9.2 DATA LOG (OPTIONAL)

When the optional Multi-Function Board with Data Logging Capabilities is installed, this menu (Figure 4-14) is available, and performs the following functions:

1. **Erase FLASH drive** – Erases the onboard FLASH of the Multifunction Board
2. **Remove USB drive** – Allows safe removal of any attached USB drive
3. **Format USB drive** – Reformats any attached USB drive
4. **Copy FLASH to USB** – Copies the information from the onboard FLASH memory to any installed USB drive

For a more detailed description of the Data Logging capabilities of the Multi-Function Option Board refer to Chapter 5.

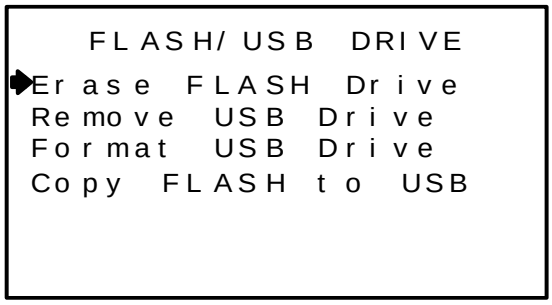


Figure 4-14 Flash/USB Drive Menu

4.10 TECHNICIANS ONLY

WARNING: USERS OF THIS MENU MUST HAVE A DETAILED UNDERSTANDING OF ITS FUNCTION.

In order to prevent accidental modification of these items, user may access the **TECHNICIAN** menu in Figure 4-15 by:

1. Entering **the special key sequence of four consecutive UP keystrokes**.

Maint Timeout and **Activate Maintenance** are options designed specifically to work together.
To disable alarms and relays:

2. Select **Activate Maintenance** all alarms will not be processed, and relays are disabled.

To set a time which causes maintenance mode to be exited after a specified amount of time has passed:

3. Select **Maint Timeout**–this is very helpful in preventing inadvertently disabling alarms for extended periods of time.

Relay Test allows each of the 8 relays to be energized manually. This is helpful for ensuring relays are set up properly.

The **Piezo Test** cycles the Piezo on and off when selected until another key is selected.

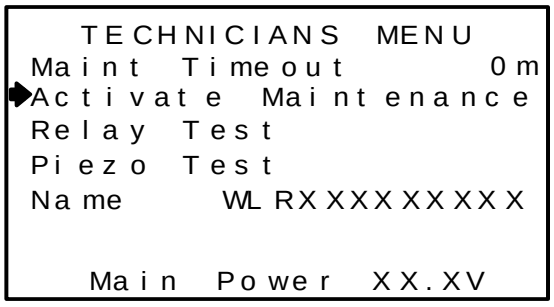


Figure 4-15 Technicians Only Pages

CHAPTER 5 – TXP-WCR CONTROLLER MULTI-FUNCTION OPTION

NOTE: USB Drive references will only be displayed if a flash drive is inserted in the controller.

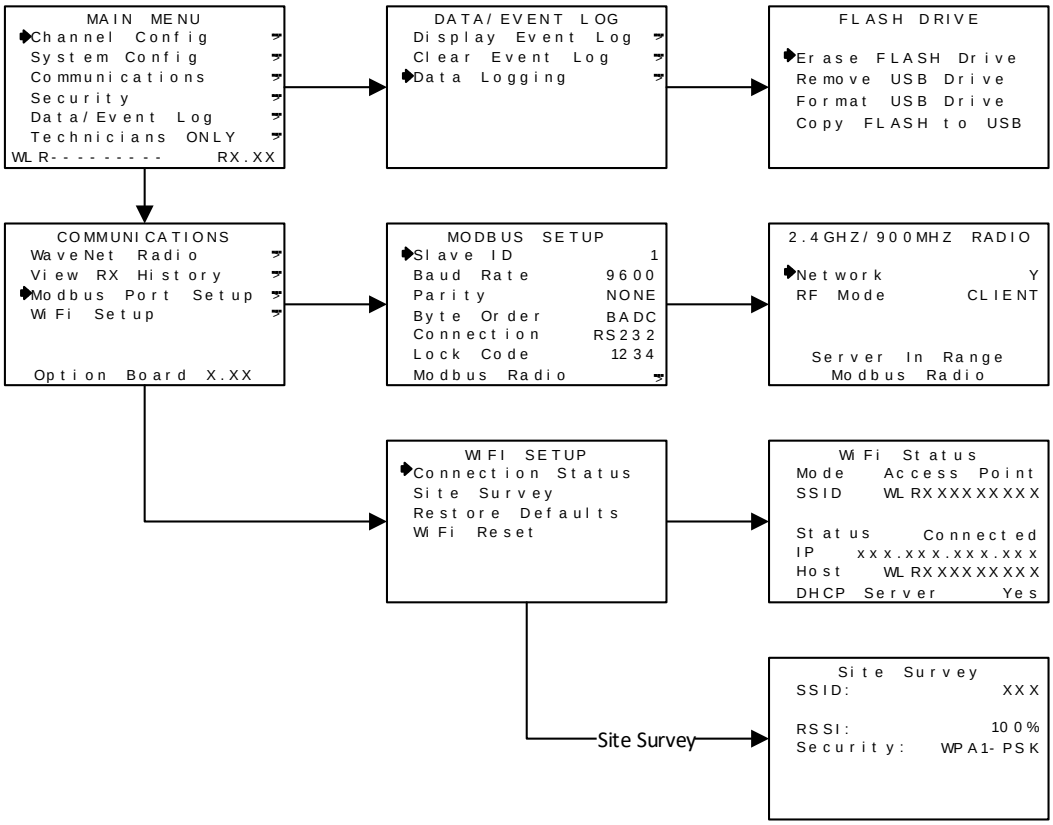


Figure 5-1 Multi-Interface Option Board Menus

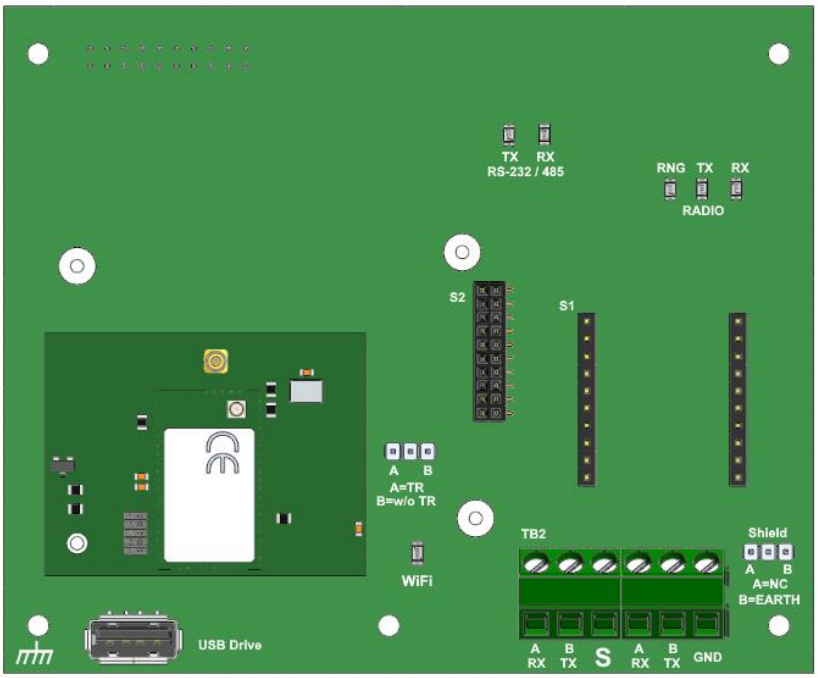


Figure 5-2 Multifunction Option Board

5.1 MODBUS COMMUNICATIONS MENU

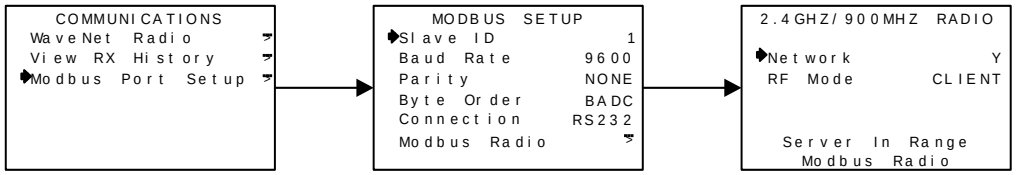


Figure 5-3 Modbus Communication Menu

The **MODBUS SETUP** menu allows setting of the system's Modbus port. It may function as a wired **Modbus Slave** or wireless **Modbus Slave.**

- **Wired Modbus Slave**
  - Allows the communication port to be polled by any **Modbus Master** device using the Modbus RTU protocol.
- **Wireless Modbus Slave**
  - Allows the communication port to be polled by any **Modbus Master** device using the Modbus RTU protocol.
  - May be used to transfer TXP-WCR Controller data to a Modbus *master* device such as a PC, PLC, DCS or even other TracXP Controllers.
  - Addressable which allows many TXP-WCR controllers to be connected to a single RS-485 cable.
  - A converter is available to make this port also compatible with Ethernet TCP/IP networks.

The entire Modbus database register list is documented in Section 5.1.1.

5.1.1 MODBUS REGISTER SUMMARY

The following table identifies the available Modbus RTU register locations.

Register Name	Register	Number of Values	Number of Registers Per Value	Description
Input Registers				
Read with function code 4				
MBREG_CH1_BINARY_OUTPUT	31001 - 31032			Unsigned integer 800-4000
MBREG_VERSION	32002			Integer (version multiplied by 100)
CONTROLLER_NAME	32005 - 32010			12 character ASCII name
Relay States				
RELAY_1_STATE	32100 -32107	8	1	0 = Not Energized, 1 = Energized
Channel Data				
BATTERY_VOLTAGE	33001 - 33064	32	2	32 floating points
FLOAT Value	33065 - 33128	32	2	32 floating points
VALUE_STRING	33129 - 33224	32	3	6 character ascii values
COMM_STATUS	33225 - 33256	32	1	0 = OK, 1 = Error, 2 = Connecting,4 = Waiting for config
SENSOR_LIFE	33257 - 33288	32	1	0-100% Integer
COMM_TIMEOUT	33289 - 33320	32	1	
Channel Flags				
A1_STATUS	33449 - 33480	32	1	0 = No Alarm, 1 = Alarm
A2_STATUS	33481 - 33512	32	1	0 = No Alarm, 1 = Alarm
A3_STATUS	33513 - 33544	32	1	0 = No Alarm, 1 = Alarm
FAULT_STATUS	33545 - 33576	32	1	0 = No Fault, 1 = Fault
IN CAL	33577 - 33608	32	1	0 = Normal, 1 = In Cal
LOW_BATTERY	33609 - 33640	32	1	0 = Battery Ok, 1 = Low Battery
IN CAL_PURGE	33641 - 33672	32	1	0 = Normal, 1 = In Cal Purge
IN WARMUP	33673 - 33704	32	1	0 = Normal, 1 = In Warmup
EDIT_MODE	33705 - 33736	32	1	0 = Normal, 1 = Edit Mode Active
MISSING_SENSOR	33737 - 33768	32	1	0 = Normal, 1 = Missing Sensor
CAL_ERROR	33769 - 33800	32	1	0 = Normal, 1 = Cal Error
DATA_ERROR	33801 - 33832	32	1	0 = Normal, 1 = Data Error
CHANNEL_STATUS	33833 - 33864	32	1	0 = Normal, 1 = Any of the Following States: Low Battery, In Cal, In Cal Purge, Warmup, Edit Mode, Cal Error, Data Error

Channel Flag Bit Field Registers:

Bit0 = Channel 1, Bit31 = Channel 32
These should be read as 32bit unsigned integers. Byte order will affect these registers.
0 = State Inactive, 1 = State Active

PACKED_A1_STATUS	34000	1	2
PACKED_A2_STATUS	34002	1	2
PACKED_A3_STATUS	34004	1	2
PACKED_FAULT_STATUS	34006	1	2
PACKED_LOW_BATT	34008	1	2
PACKED_CAL	34010	1	2
PACKED_CAL_PURGE	34012	1	2
PACKED_WARMUP	34014	1	2
PACKED_EDIT_MODE	34016	1	2
PACKED_MISSING_SENSOR	34018	1	2
PACKED_CAL_ERROR	34020	1	2
PACKED_DATA_ERROR	34022	1	2
PACKED_CHANNEL_STATUS	34024	1	2
PACKED_CHANNEL_ENABLE	34026	1	2
PACKED_COMM_ERROR	34028	1	2

Register Name	Register	Number of Values	Number of Registers Per Value	Description
Holding Registers				
Read with function code 3				
ALARM_RESET	40001			Write 1 to Reset. Function code 6
DATE_YEAR	40020	1	1	Unsigned integer
DATE_MONTH	40021	1	1	Unsigned integer
DATE_DAY	40022	1	1	Unsigned integer
TIME_HOUR	40023	1	1	Unsigned integer
TIME_MINUTE	40024	1	1	Unsigned integer
TIME_SECOND	40025	1	1	Unsigned integer
RELAY_REFRESH_TIME	40026	1	1	Unsigned integer (Minutes)
CHANNEL_COUNT	40027	1	1	Unsigned integer (1 - 32)
PIEZO_REFRESH	40028	1	1	Unsigned integer (Minutes)
PIEZO_ENABLE	40029	1	1	0 = Not Enabled, 1 = Enabled
Serial Port Registers				
COM1_MODE	40034	1	1	TBD
COM1_BAUDRATE	40035	1	1	0 = 9600, 1 = 19200, 2 = 38400,3 = 57600, 4 = 115200
COM1_PARITY	40036	1	1	0 = None, 1 = Even, 2 = Odd
COM1_SLAVE_ID	40037	1	1	Unsigned integer
COM1_BYTE_ORDER	40038	1	1	0 = ABCD, 1 = CDAB, 2 = BADC, 3 = DCBA
COM1_PORT_TYPE	40039	1	1	0 = RS-485, 1 = RS-232, 3 = Disabled
Radio Port Registers				
COM2_MODE	40040	1	1	TBD
COM2_BYTE_ORDER	40041	1	1	0 = ABCD, 1 = CDAB, 2 = BADC, 3 = DCBA
SERIAL_RADIO_NETWORK	40042	1	1	1 = Network A... 26 = Network Z
SERIAL_RADIO_TX_POWER	40043	1	1	0 = 10mW, 1 = 200mW, 2 = 400mW, 3 = 1W
SERIAL_RADIO_MODE	40044	1	1	1 = Server, 2 = Client
LOCK_CODE	40046	1	1	Unsigned integer, 4 digits
PIEZO_RLY1	40050	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY2	40051	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY3	40052	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY4	40053	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY5	40054	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY6	40055	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY7	40056	1	1	0 = Disabled, 1 = Enabled
PIEZO_RLY8	40057	1	1	0 = Disabled, 1 = Enabled
WiFi/Network Configuration				
WIFI_IP_ADDRESS	40100 - 40101	1	2	4byte IP Fields
WIFI_GATEWAY	40102 - 40103	1	2	4byte IP Fields
WIFI_NETMASK	40104 - 40105	1	2	4byte IP Fields
IP_ADDRESS	40106 - 40107	1	2	4byte IP Fields
DHCP_START	40108 - 40109	1	2	4byte IP Fields
DHCP_END	40110 - 40111	1	2	4byte IP Fields
DHCP_SERVER	40120	1	1	0 = Not Enabled, 1 = Enabled
DHCP_CLIENT	40121	1	1	0 = Static IP, 1 = DHCP Client
WIFI_BAND	40122	1	1	0 = 802.11BG, 2 = 802.11B, 3 = 802.11G
WIFI_MODE	40123	1	1	0 = Access Point, 3 = Client
WIFI_CHANNEL	40124	1	1	0-13
WIFI_TX_POWER	40125	1	1	0-16dBm

Register Name	Register	Number of Values	Number of Registers Per Value	Description
WiFi/Network Configuration Continued				
WIFI_DATA_RATE	40126	1	1	0 = 1Mbps, 1 = 2Mbps, 2 = 5Mbps,3 = 11Mbps, 4 = 24Mbps, 5 = 36Mbps,6 = 48Mbps, 7 = 54Mbps
WIFI_BROADCAST_SSID	40127	1	1	0 = Not Enabled, 1 = Enabled
WIFI_AUTH_MODE	40128	1	1	0 = Open/Shared, 1 = Open, 3 = Shared,5 = WPA/PSK, 7 = WPA2/PSK
WIFI_ENCRYPT	40129	1	1	0 = None, 1 = WEP, 2 = TKIP, 3 = AES
WIFI_KEY_LENGTH	40131	1	1	0 = None, 1 = 64bit, 2 = 128bit
WIFI_KEY_FORMAT_WEP	40132	1	1	0 = ASCII, 1 = Hex
WIFI_KEY_FORMAT_WPA	40133	1	1	0 = Passphrase, 1 = Hex
WIFI_DHCP_CLIENT	40134	1	1	0 = Disabled, 1 = Enabled
WIFI_ENABLED	40135	1	1	0 = Disabled, 1 = Enabled
SSID	40200 - 40215	1	16	32 character ASCII
HOST_NAME	40224 - 40232	1	8	16 character ASCII
Channel Configuration				
CH1_TAG	40401 - 40656	32	8	16 character ASCII
CH1_UNITS	40657 - 40816	32	5	10 character ASCII
CH1_ENABLE	41000 - 41031	32	1	0 = Disabled, 1 = Enabled
CH1_RTU_ID	41032 - 41063	32	1	Integer
CH1_DISP_DP	41064 - 41095	32	1	Integer
CH1_ZERO_VALUE	41096 - 41159	32	2	32bit Floating point
CH1_SPAN_VALUE	41160 - 41223	32	2	32bit Floating point
CH1_A1_SETPOINT	41224 - 41287	32	2	32bit Floating point
CH1_A2_SETPOINT	41288 - 41351	32	2	32bit Floating point
CH1_A3_SETPOINT	41352 - 41415	32	2	32bit Floating point
CH1_FAULT_LEVEL	41416 - 41479	32	2	32bit Floating point
Relay Configuration				
RLY1_TRIP	42000 - 42007	8	1	0 = Low Trip, 1 = High Trip
RLY1_LATCH	42008 - 42015	8	1	0 = Not Latching, 1 = Latching
RLY1_FAILSAFE	42016 - 42023	8	1	0 = Not Failsafe, 1 = Failsafe
RLY1_ACKNOWLEDGE	42024 - 42031	8	1	0 = Not Enabled, 1 = Enabled
Relay enable flags for each channel				
RLY1_CH1	42200 - 42207	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH2	42208 - 42215	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH3	42216 - 42223	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH4	42224 - 42231	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH5	42232 - 42239	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH6	42240 - 42247	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH7	42248 - 42255	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH8	42256 - 42263	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH9	42264 - 42271	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH10	42272 - 42279	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH11	42280 - 42287	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH12	42288 - 42295	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH13	42296 - 42303	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH14	42304 - 42311	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH15	42312 - 42319	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH16	42320 - 42327	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH17	42328 - 42335	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH18	42336 - 42343	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH19	42344 - 42351	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH20	42352 - 42359	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH21	42360 - 42367	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH22	42368 - 42375	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH23	42376 - 42383	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH24	42384 - 42391	8	1	0 = Not Enabled, 1 = Enabled

Register Name	Register	Number of Values	Number of Registers Per Value	Description
Relay enable flags for each channel Continued				
RLY1_CH25	42392 - 42399	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH26	42400 - 42407	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH27	42408 - 42415	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH28	42416 - 42423	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH29	42424 - 42431	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH30	42432 - 42439	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH31	42440 - 42447	8	1	0 = Not Enabled, 1 = Enabled
RLY1_CH32	42448 - 42455	8	1	0 = Not Enabled, 1 = Enabled

5.2 WIRELESS MODBUS OPTION

NOTE: Having multiple controllers with Wi-Fi connected will cause problems with connection to Wi-Fi and the webpage. Only one can be completed at a time.

5.2.1 WIRELESS MODBUS SLAVE MODE

Wireless MODBUS allows one or many controllers to function as wireless Modbus *slaves* by:

1. Selecting **Wireless MODBUS** in the **COMM SETUP** menu (see WTA manual).

These wireless networks require a Modbus *master* such as:

- a DCS,
- HMI, or
- another TracXP Controller equipped with our compatible radio modem.

As in all TracXP wireless networks:

- One transceiver must be designated as Server and all others as Clients.
- No special configuration is required by the *master* or *slave* since this is a standard Modbus network.
- Radios must have the same **Hop Channel** and **System ID** settings to communicate.

The entire controller Modbus database, including registers and supported Function Codes, is documented in Section 5.1.

5.3 WIFI COMMUNICATIONS OPTION

The Wi-Fi Communications option provides a webpage interface for viewing and editing the wireless system information–including all alarms and set points from the TXP-WTA being monitored.

Any web-enabled device with Wi-Fi capabilities may be used to access the controller's webpage.

To connect:

1. Search for the SSID of the controller in your device's WiFi connection menu and connect to it.
2. Open your device's web browser and enter the controller's IP address in your device's address bar. The Default IP address is "**192.168.001.101**"
3. On the next login menu, the user name is "admin" and the password is "controller32".

5.3.1 TXP-WCR CONTROLLER WIFI MENUS

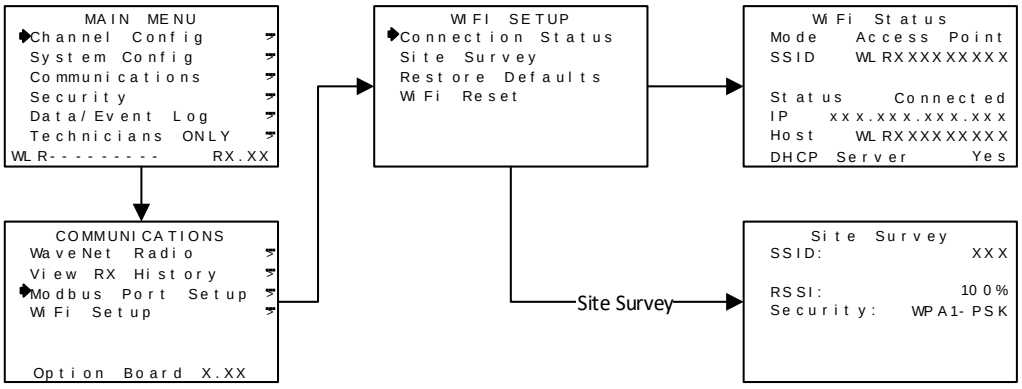


Figure 5-4 Wi-Fi Menu Tree

When accessing the controller via Wi-Fi, there are two modes of operation:

1. Controller as an Access Point
2. Controller as a Client.

By default, the controller will be set to Access Point. To change the controller to Client mode: Refer to Section 5.3.2.

Wi-Fi Menus

- **Connection Status** provides all of the Wi-Fi settings needed to access the controller's webpage.
- **Mode** displays whether the controller is set to Access Point or Client.
- **SSID** is the identification number of the Wi-Fi network for the controller.
- **Status** shows the current status of the Wi-Fi module.
- **IP** shows the IP Address for the webpage and is entered in the browser's address bar to view the controller on a web-enabled device.
- **Host** shows the host network for the controller. When acting as an Access Point this will match the SSID, and when acting as a Client it will display the SSID of the Host network.
- **DHCP Server** is a protocol which, when enabled, allows the host Server to assign the IP address to the device.
  *NOTE: All fields in the **Connection Status** menu can only be viewed on the TXP-WCR Controller and can be edited from the webpage (Section 5.3.2)*

- **Site Survey** surveys the area for any available host networks and is useful in determining which network to use as the host network when connecting multiple TXP-WCR Controllers to a single Access Point. This will display the SSID of available networks in the area, the RSSI (signal strength) and the type of security protocol.
  - To cycle through the available networks:
    1. Select **EDIT**.
- **Restore Defaults** restores the Wi-Fi module to the default settings.
  NOTE: After replacing a PCB with WiFi, defaults must be restored.

- **Wi-Fi Reset** resets the Wi-Fi module.

5.3.2 WEBPAGE MENUS

The main page for the TXP-WCR's Controller Webpage is the **Status Page**.

On this page, every active channel (1-32 channels) is displayed with their:

- **Channel Number**,
- **Measurement Name,** and
- **Measurement Reading**.

When no alarm condition is present:

- The display box for that channel is Green (Figure 5-4).

When a channel is in Alarm 1:

- The display box is yellow.

When a channel is in Alarm 2:

- The display box is red (Figure 5-5).

The relay display boxes indicate whether or not the relay is energized.

When the relay is **not** energized:

- The display box is white.

When the relay is energized:

- The display box is red.

NOTE: Any relay in Fail-safe mode will be shown in red during normal operations, and white when the alarm condition is present.

NOTE: Defaults settings for web page access are as follows:

IP: 192.168.1.101
Username: admin
Password: controller32

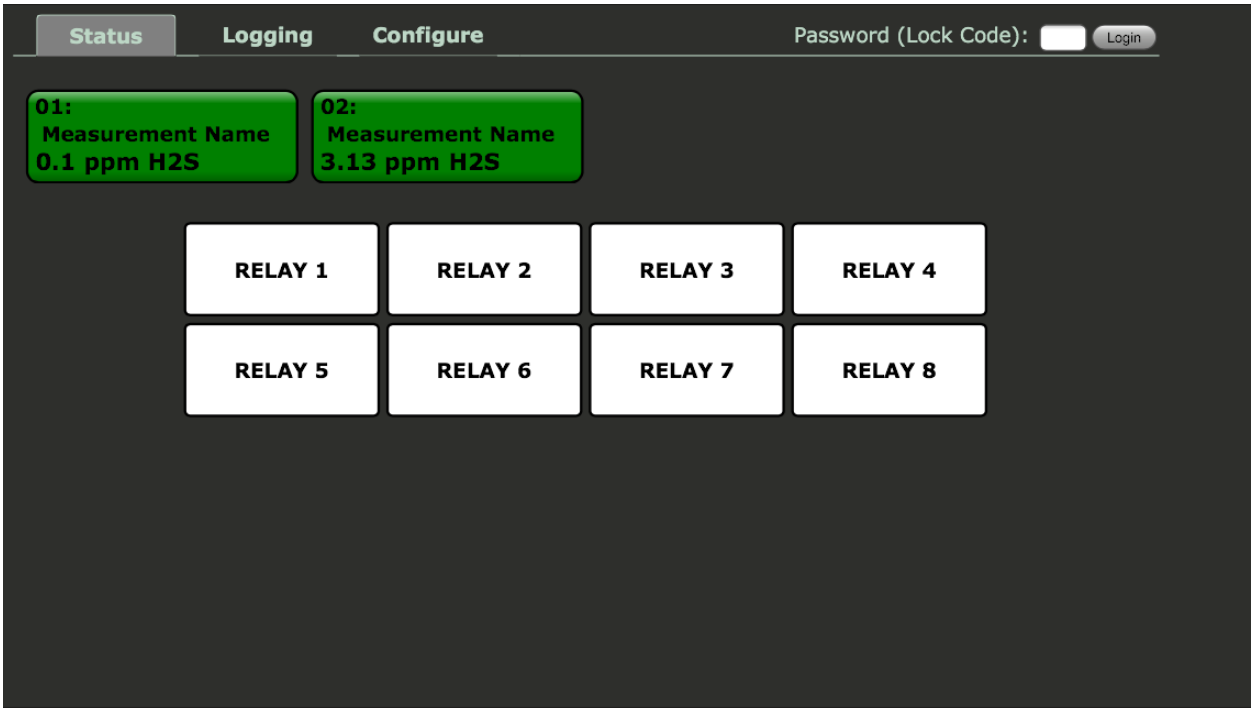


Figure 5-5 Webpage Status Screen (No Alarms)

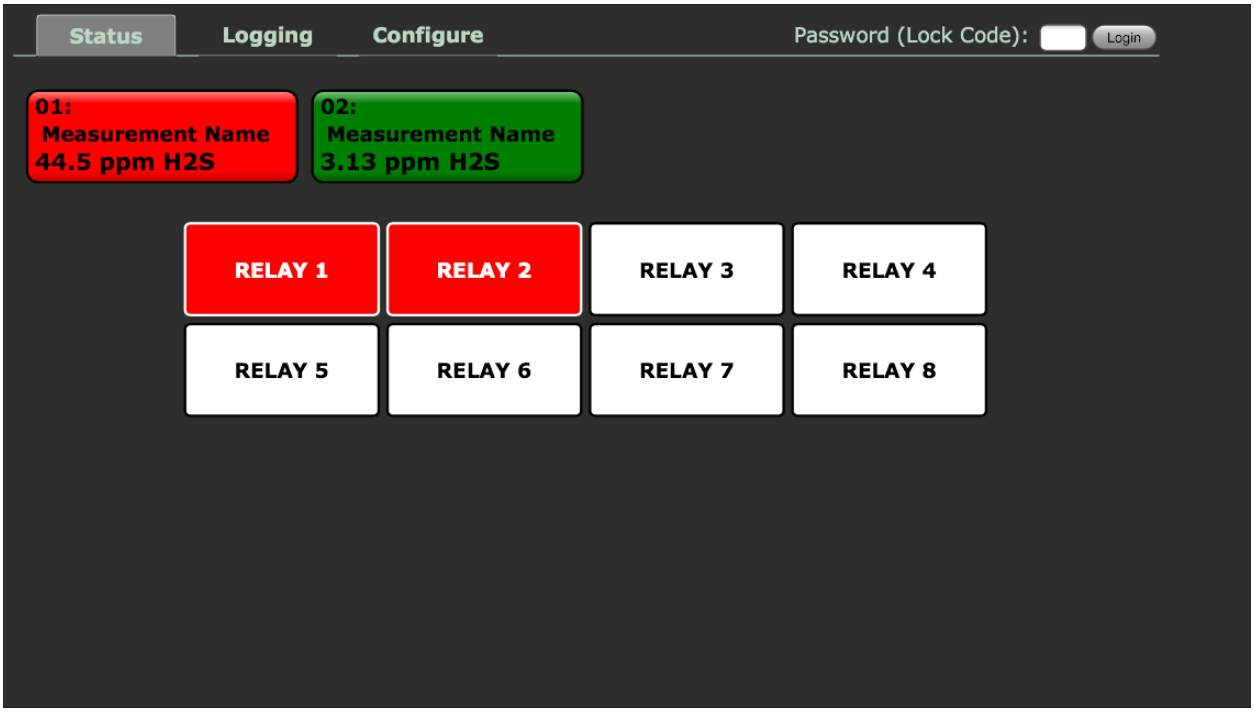


Figure 5-6 Webpage Status Screen (With Alarms)

To reach the following Configuration Menus:

1. **Enter the Password (Lock Code): 1234 and click Login in the upper right of the webpage.**
2. **Select the Configure tab at the top of the window.**
3. **Select the desired menu.**

The **Relay Config Menu** (Figure 5-6) allows the user to change or view the settings for all 8 configurable relays of the controller.

To select the **Relay** to configure:

1. Use the drop-down menu in the upper left-hand corner.
2. Select what the relay will trip on.
3. Select **Latching**, **Failsafe** and/or **Acknowledge** options.

To provide zoning features, the Relay can be mapped to the desired channels using:

1. **Selected Channels** matrix on the right side of the screen.

To update the relay configuration:

1. Select the **Save** button at the bottom of the screen.

For detailed descriptions of the various relay settings, refer to Section 4.6.1.

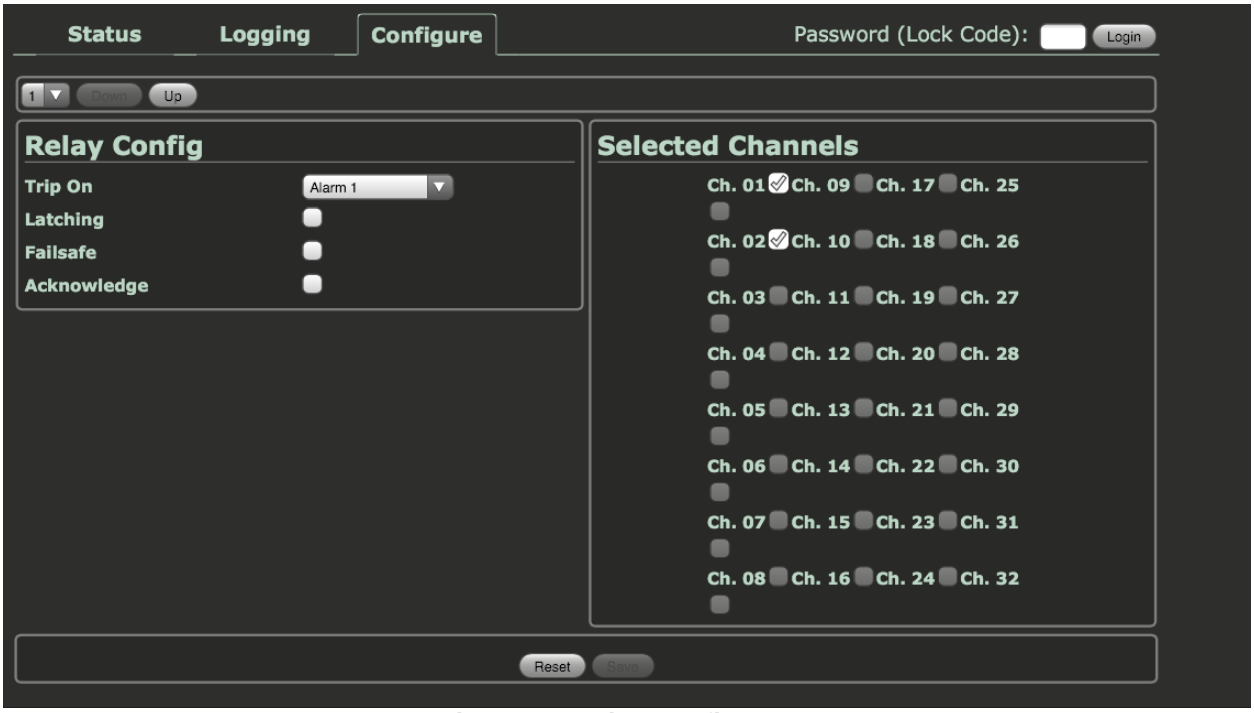


Figure 5-7 Relay Config Menu

The **Channel Config Menu** allows the user to activate or deactivate a channel using the **Channel Active** check box and/or change the channel's **RTU ID** number.

To select and edit the channel:

1. Use the drop-down box in the upper left corner of the screen.
2. The **Channel Info** is then displayed in the Channel Info window on the right side of the screen.
3. To save any changes select the **Save** button at the bottom of the screen.

For a detailed description of the Channel Config Menu options refer to Section 4.5.

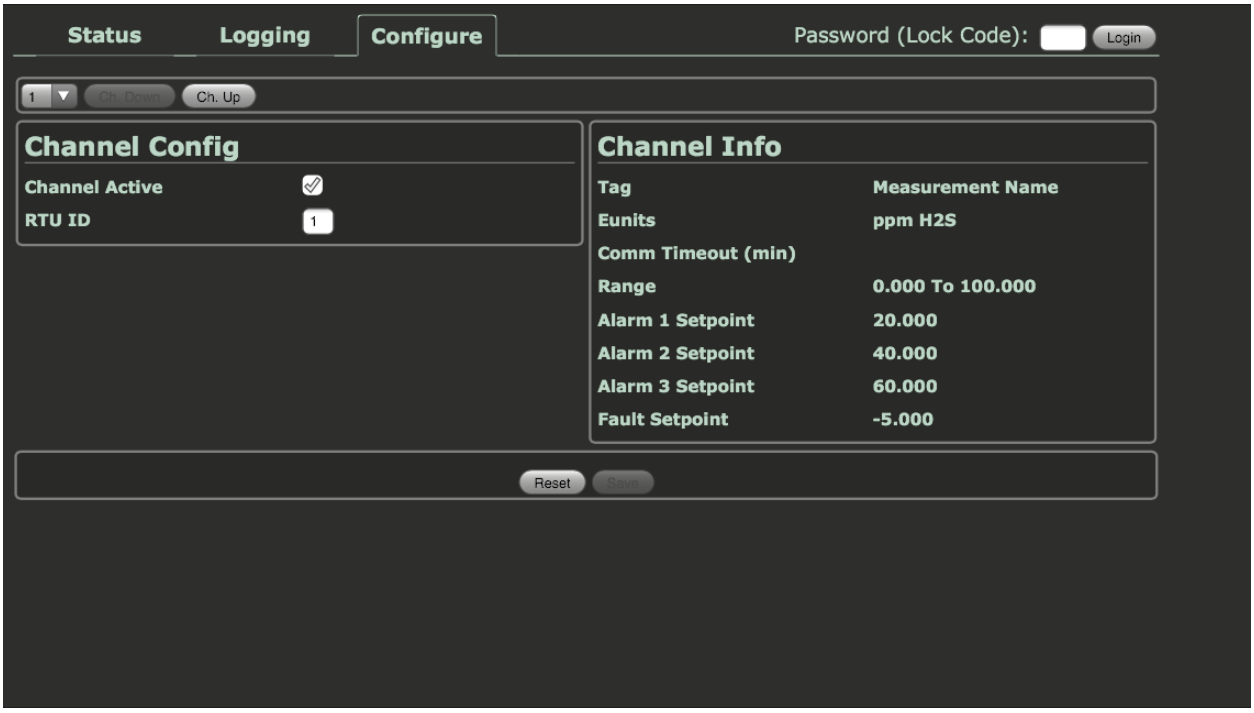


Figure 5-8 Channel Config Menu

The **System Config Menu** (Figure 5-9) allows the user to:

- set the number of active channels,
- set the time and date,
- relay refresh,
- piezo refresh timers and enable/disable the local piezo, and
- complete the piezo function table as in Section 4.6.2.

For a more detailed description of the **System Config Menu** options refer to Section 4.6.

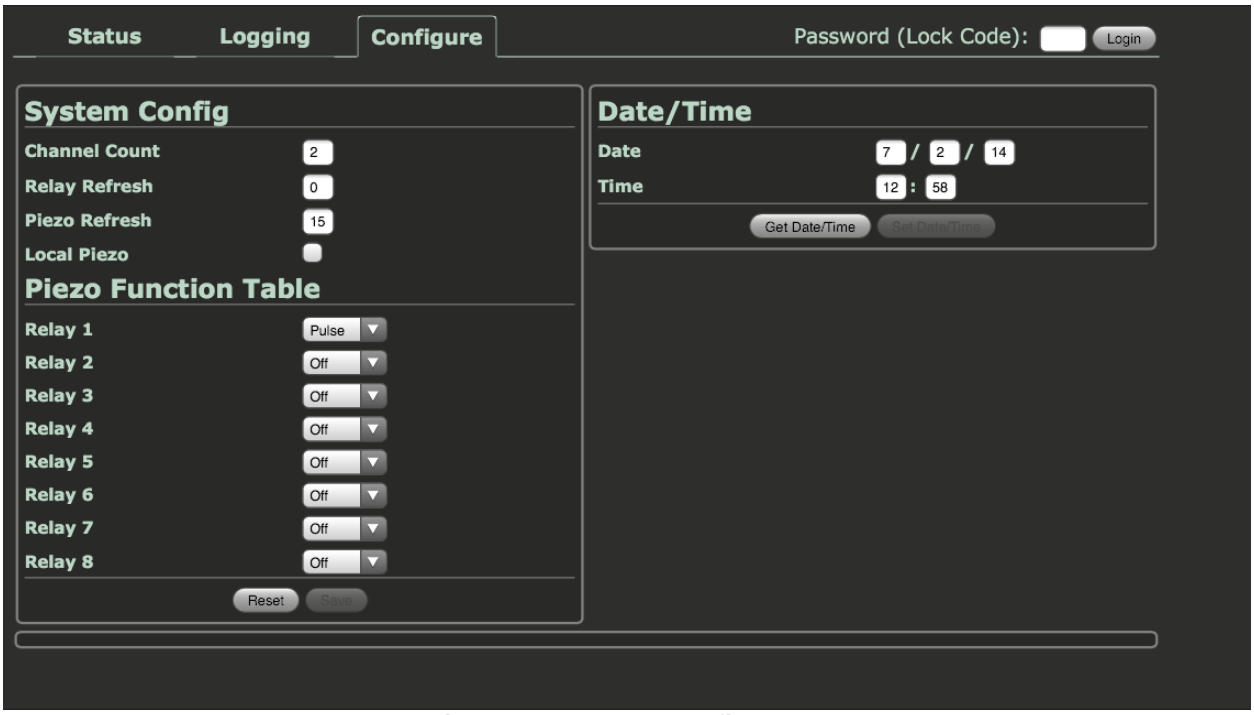


Figure 5-9 System Config Menu

WARNING: CHANGING WI-FI CONFIGURATION WILL RESET THE NETWORK AND THIS PAGE WILL BECOME TEMPORARILY INACCESSIBLE. IF THE NEW SETTINGS ARE INVALID, THE NETWORK WILL NOT RESTART. IN THIS CASE, RESTORE DEFAULTS FROM THE WI-FI SETTINGS MENU ON THE CONTROLLER.

The Wi-Fi Config Menu may only be changed from the webpage (Figure 5-10) and allows the user to:

- Configure the Wi-Fi network for the controller as an Access Point or Client.

To view available Access Points:

1. A site survey must first be conducted from the TXP-WCR Controller.
2. Once the SSID of the desired access point is known the Wi-Fi mode may be switched to Client and the settings for the Access Point network entered in the appropriate fields.

An advantage to configuring multiple TXP-WCR Controllers to a single access point is that they can each be read using their unique IP address, however, only one Wi-Fi connection is necessary.

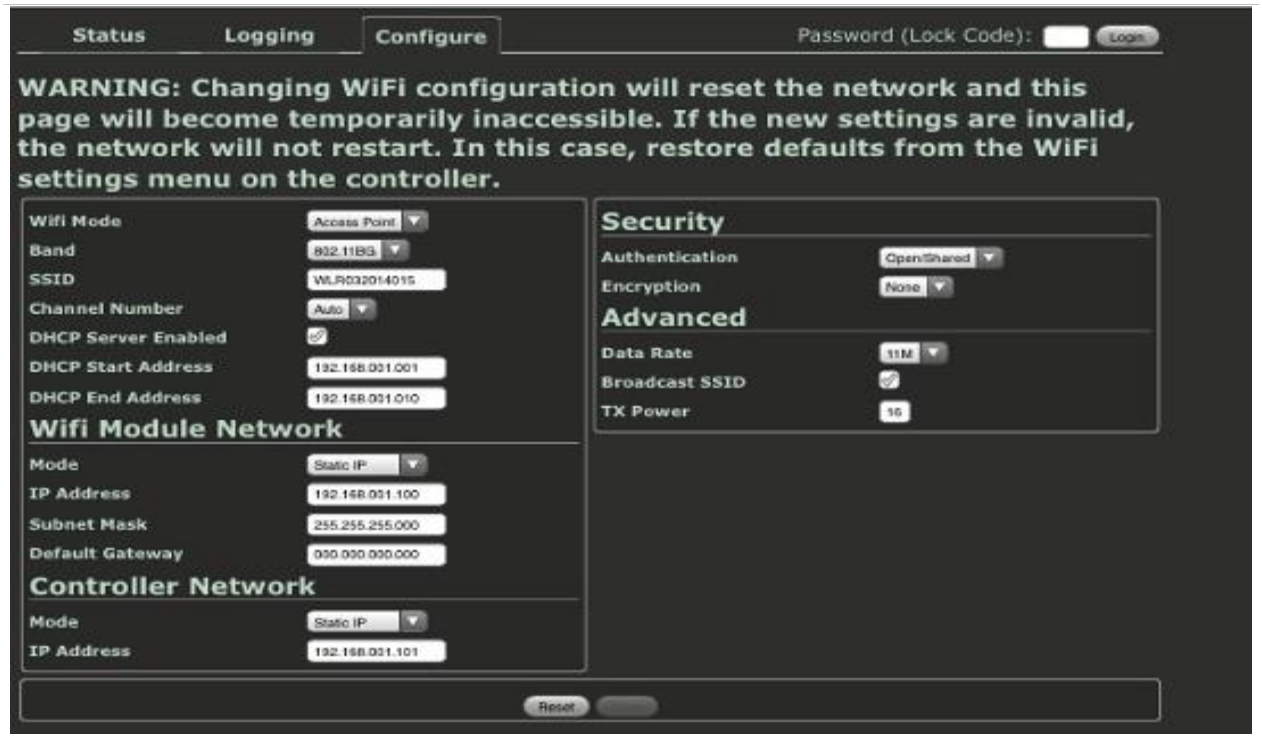


Figure 5-10 Wi-Fi Config Menu

The Serial Config Menu (Figure 5-11) allows the user to:

- Update the serial configuration settings.
- Set the Modbus radio settings for the controller.

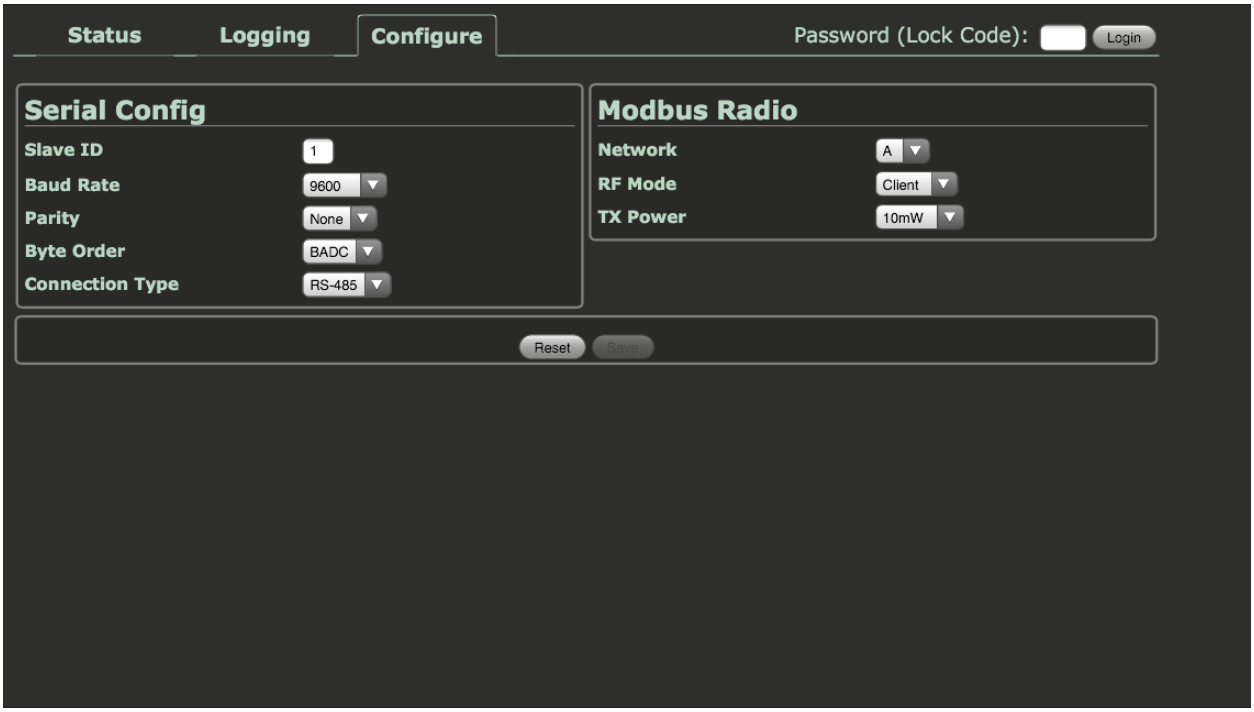


Figure 5-11 Serial Config Menu

5.4 DATA LOGGING AND USB OPTION

The Multi-Function Board (MFB) comes with onboard Flash memory for logging detailed data for the TXP-WCR Controller including channel readouts and events.

The data log files can be:

1. Copied from the Flash to a USB device.
2. Read as CSV files on a computer.
3. Read on a device via the webpage if the MFB is equipped with the Wi-Fi option.

NOTE: The YEAR in the file structure viewed on a flash drive is not a valid date. Folders must be saved to a computer HDD.

5.4.1 DATA LOGGING FILE STRUCTURE

The Data Logging File structure is shown in Figure 5-12 below.

1. Select the file for the TXP-WCR Controller to be viewed.
2. The files are then stored by year, month and finally as individual CSV files for each day and the alarm log.
3. Opening the CSV file shows the list of readings for each channel for that day up to the point where the data log was uploaded to the memory device.

The data logger logs channel reading:

- Every 30 seconds when in alarm.
- Every five minutes when not in alarm.

The CSV files have a column for the time of the log and each active channel at that time and its reading. Each month has an evt.csv file which displays any events for that month.

For a detailed description of events see Section 4.9.1.

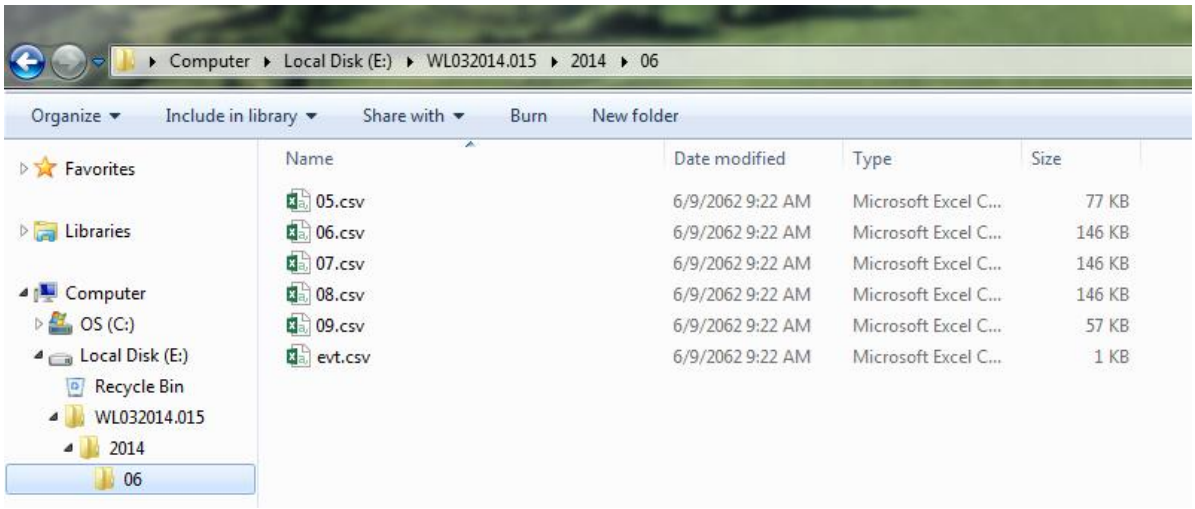


Figure 5-12 Data Logging File Structure

5.4.2 TXP-WCR CONTROLLER DATA LOGGING MENUS

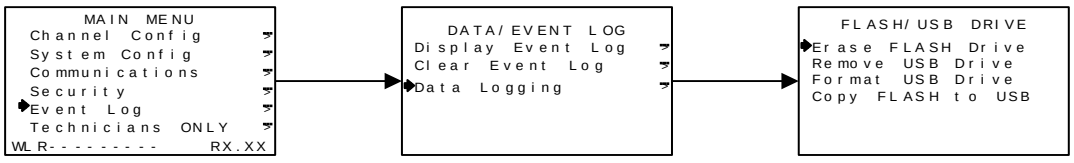


Figure 5-13 Data Logging Menu Tree

5.4.3 WEBPAGE DATA LOGGING MENUS

To access the data logs via the webpage (see Figure 5-13):

1. Select the Logging tab at the top of the screen.
2. Select the desired controller, year, month and then either the event or day CSV file.
3. Select UP to move back.
4. Select REFRESH to update the files.

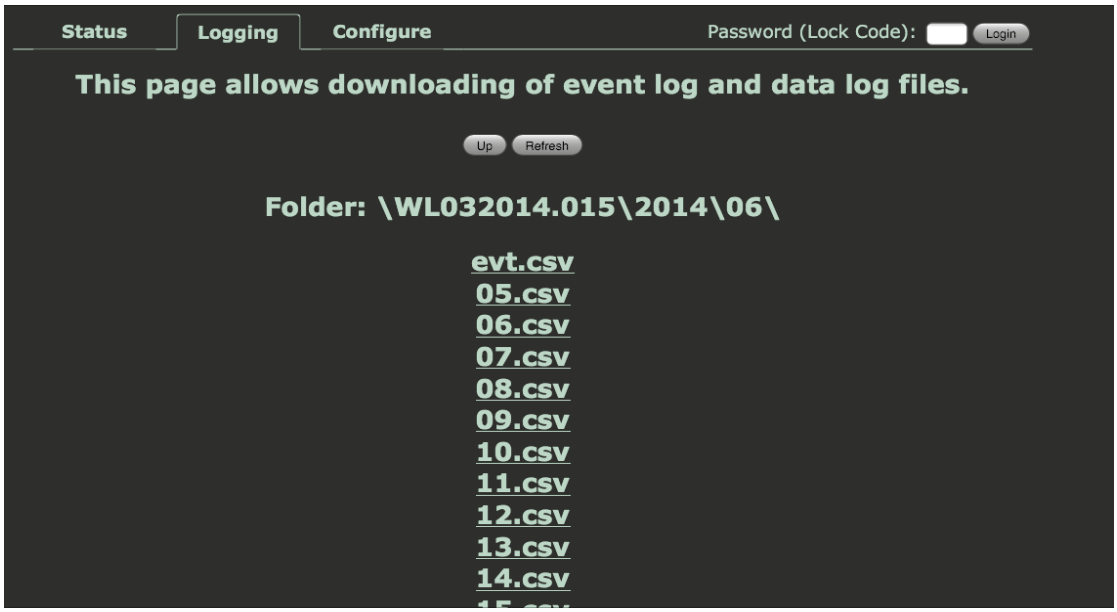


Figure 5-13 Webpage Data Logging Menu

CHAPTER 6 – CONTROLLER PCBS

6.1 MOTHERBOARD INTERFACE PCB

The controller motherboard shown below in Figure 6-2 is the interface between the Display / CPU assembly and all other system I/O devices.

Assembly

- The Display / CPU assembly attaches to the motherboard with 4-standoffs and connects via ribbon cable to S1.
- The optional Multi-Function option plugs into the P1 and P2 Motherboard option connectors.
- The P3 connector on the right side is for the Relay PCB.

Power Supply

- 24VDC Universal Input (100-240 VAC); Switching Power Supply with Up to 350mA Available at the TB3 Auxiliary Power Output Terminals
- TB1 provides terminals for DC power input
- TB2 offers field terminals for a remote alarm reset switch
- Includes Alarm Relays 1 and 2 (K1 and K2) and their indicating LEDs
- TB4 Provides Field Wiring Terminals for These Relays
- TB5 is for connection to the 100-240 VAC power source
- J2 is a 2-pin connector for powering the optional Piezo audible annunciator

Blocking diodes isolate internal and external DC supplies as shown in Figure 6-1.

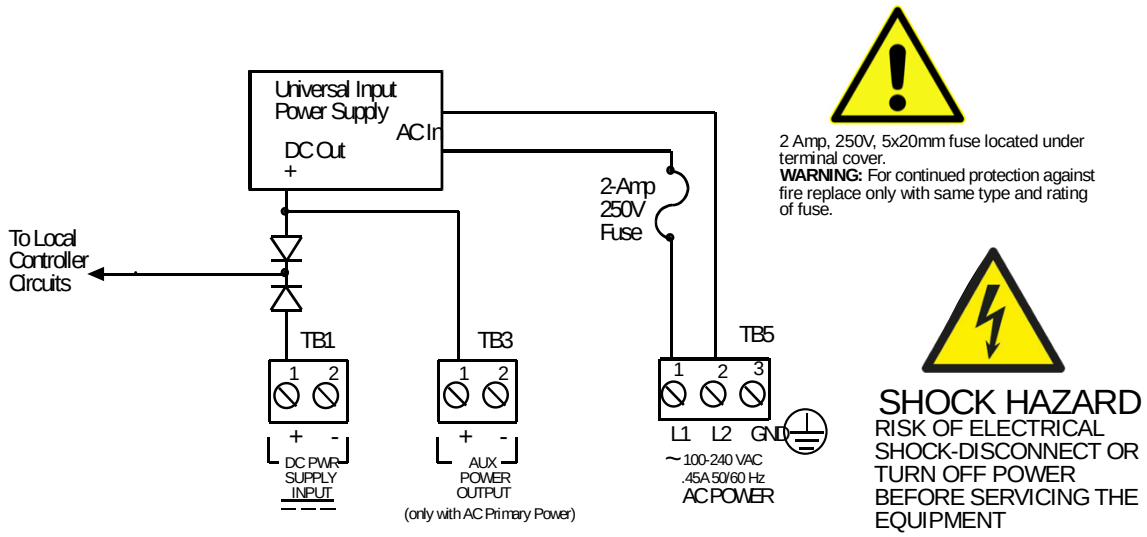


Figure 6-1 AC/DC Power Schematic

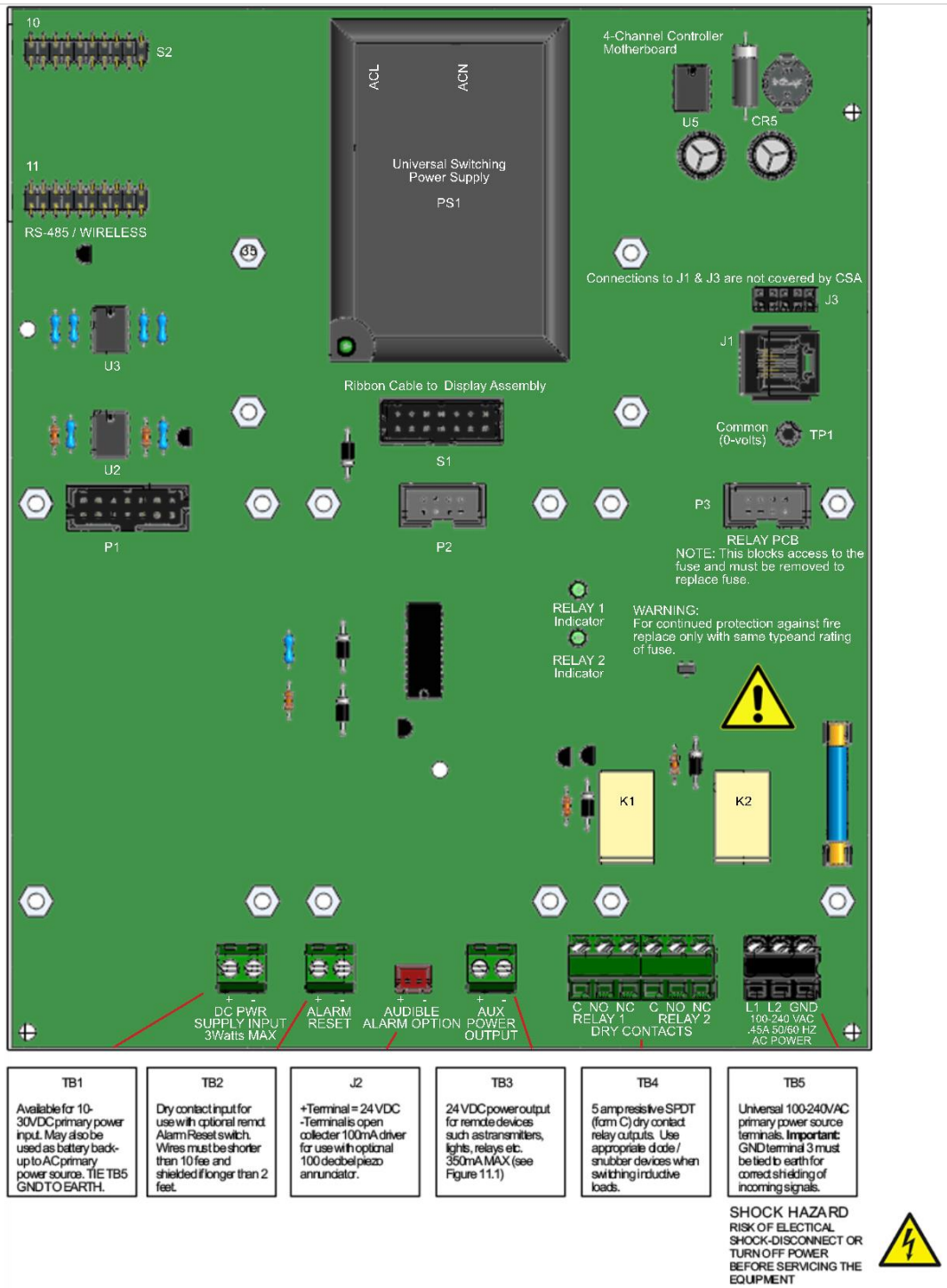


Figure 6-2 Motherboard

6.2 RELAY PCB

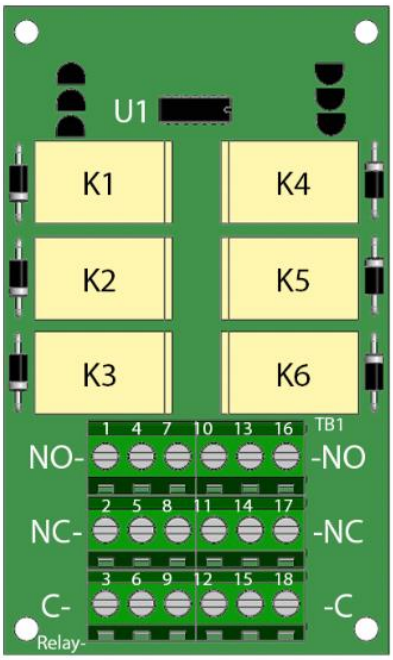
IMPORTANT: PCB MAY ONLY BE INSTALLED INTO MOTHERBOARD POSITION P3.

The Relay PCB, shown in Figure 6-3, adds six 5-amp form C relays. Each relay is programmable as described in Section 4.6.1.

All mechanical (dry contact) relays are rated at 5 Amp for 28 VDC and 250 ~VAC **RESISTIVE** loads.

IMPORTANT: APPROPRIATE DIODE (DC LOADS) OR MOV (AC LOADS) SNUBBER DEVICES MUST BE INSTALLED WITH INDUCTIVE LOADS TO PREVENT RFI NOISE SPIKES.

AC or DC power supplies to relays on the Relay PCB must be the same for each relay.



Note:
This board blocks access to the fuse and must be removed to replace a blown fuse.

Warning:
For continued protection against fire, replace only with same type and rating of fuse.

K1, K2, K3, K4, K5, & K6 are programmable as described in Section 4.6.1

TB1 terminals 1, 4, 7, 10, 13, & 16 are Normally Open Contacts for K1-K6

TB1 terminals 2, 5, 8, 11, 14, & 17 are Normally closed Contact for K1-K6

TB1 terminals 3, 6, 9, 12, 15, & 18 are Common (pole) Contacts for K1-K6

Contacts are rated for 5-amp resistive loads. Arc suppression snubber devices should be used for switching inductive loads.

Figure 6-3 Relay Board

6.3 OPTIONAL 24VDC 50-WATT POWER SUPPLIES

Some applications require 24VDC power in excess of the 10 watts supplied by the PS1 power supply located on the motherboard (see Figure 6-2).

Controller enclosures (Chapter 7) may be equipped with an optional din-rail mounted 50-watt power supply (see Figure 6-4). The integral 50-watt power supply is not available in the NEMA 7 explosion proof enclosures.

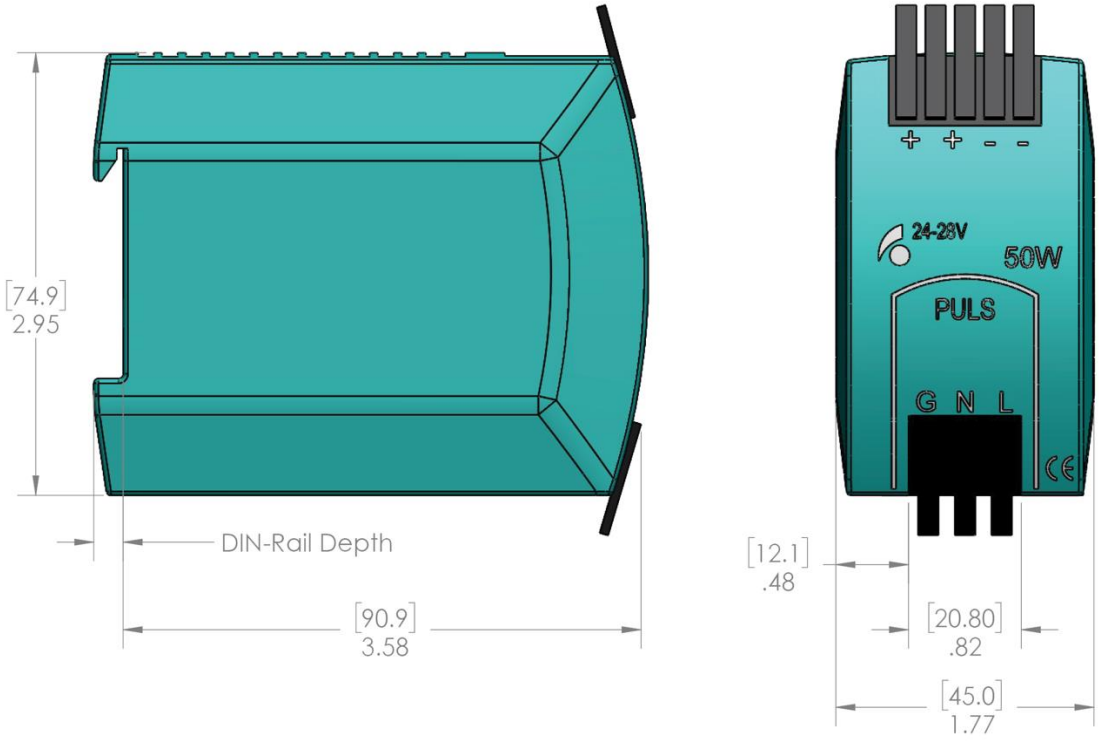


Figure 6-4 50-Watt Power Supply

CHAPTER 7 – TXP-WCR CONTROLLER ENCLOSURE OPTIONS

7.1 NEMA 4X POLYESTER WALL MOUNT

The wall mount NEMA 4X enclosure is shown in Figure 7-1.

Non-metallic enclosures are not grounded by metal conduit. For internal ground points to be grounded to earth, the TB5 – 3 GND terminal must have a proper earth ground connection (see Figure 6-1).

Certifications:

- DIV 2 Groups A, B, C, D
- Category II
- Pollution degree 3
- NEMA 4X
- IP66

CAUTION: NONMETALLIC ENCLOSURES DO NOT PROVIDE GROUNDING BETWEEN CONDUIT CONNECTIONS. USE GROUNDING TYPE BUSHINGS AND JUMPER WIRES. ALL FIELD WIRING MUST HAVE INSULATION SUITABLE FOR AT LEAST 250V.

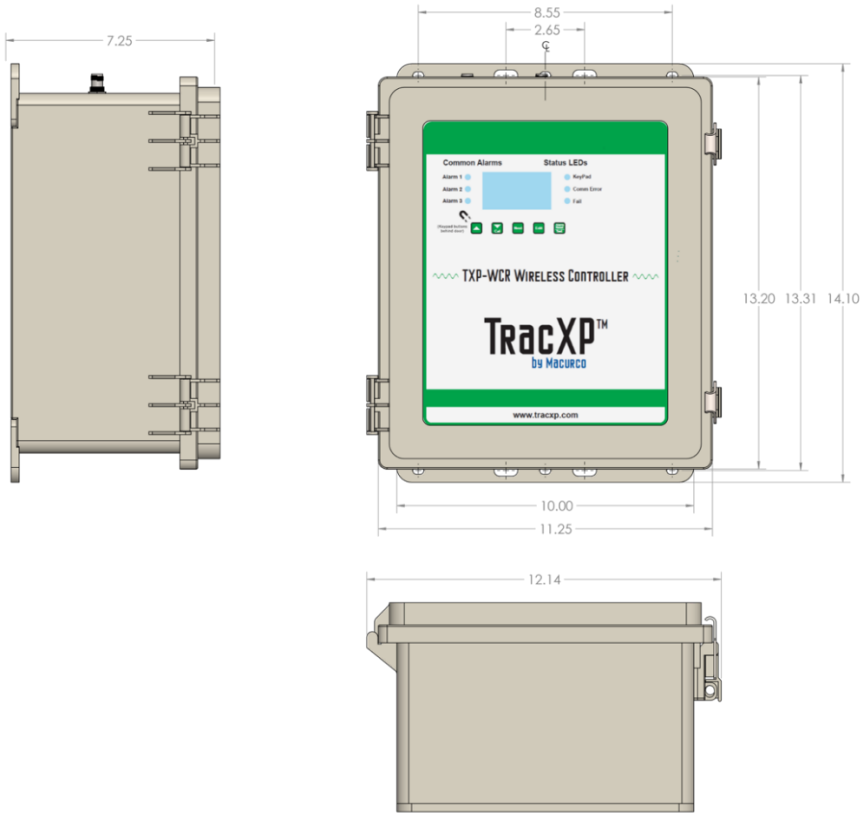


Figure 7-1 NEMA 4X Polyester Wall Mount Enclosure

7.2 NEMA 4 PAINTED CARBON STEEL WALL MOUNT

The mount shown in Figure 7-2 is a Painted Carbon Steel NEMA 4 wall mount enclosure designed for non-corrosive installations.

Certifications

- DIV 2 Groups A, B, C, D
- Category II
- Pollution degree 3
- NEMA 4
- P66

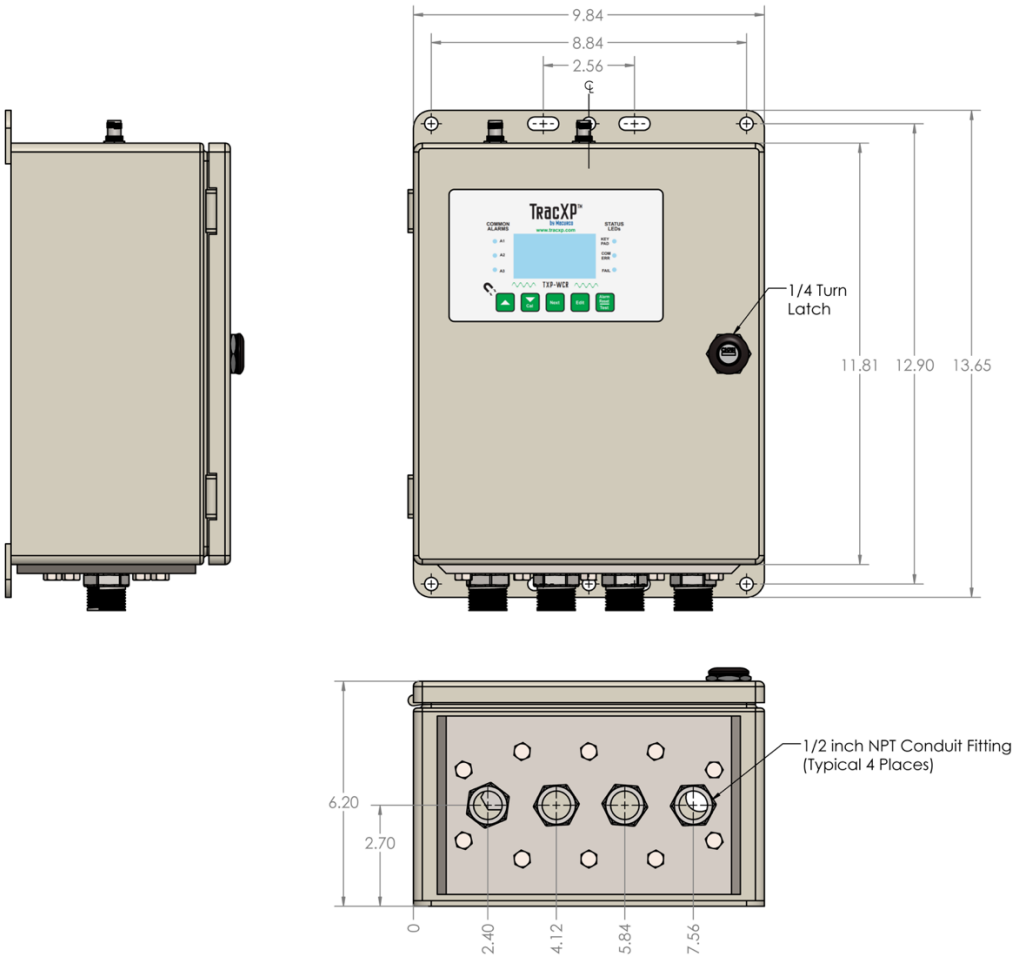


Figure 7-2 NEMA 4 Painted Carbon Steel Wall Mount Enclosure

7.3 NEMA 4X STAINLESS STEEL WALL MOUNT

The mount shown in Figure 7-3 is a 316 Stainless Steel NEMA 4X wall mount enclosure designed for corrosive installations.

Certifications

- DIV 2 Groups A, B, C, D
- Category II
- Pollution degree 3
- NEMA 4X
- IP66

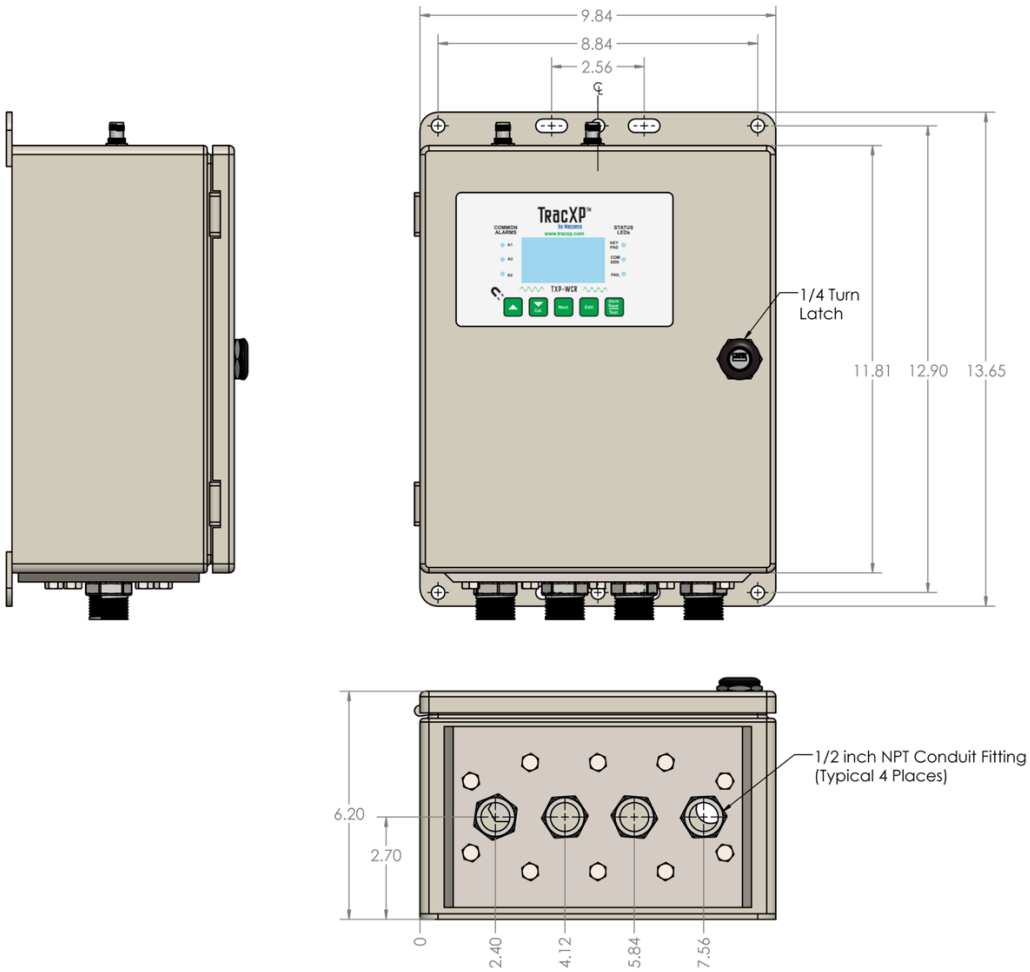


Figure 7-3 NEMA 4X Stainless Steel Wall Mount Enclosure

7.4 NEMA 7 EXPLOSION-PROOF WALL MOUNT

The mount shown in Figure 7-4 is aluminum NEMA 7 wall mount enclosure designed for mounting into potentially hazardous areas.

NOTE: The rail mounted 50-watt Power Supply module is not available for this enclosure.

Certifications

- DIV 1 & 2 Groups B, C, D
- Includes 'O' Ring in door to satisfy NEMA 4 rating

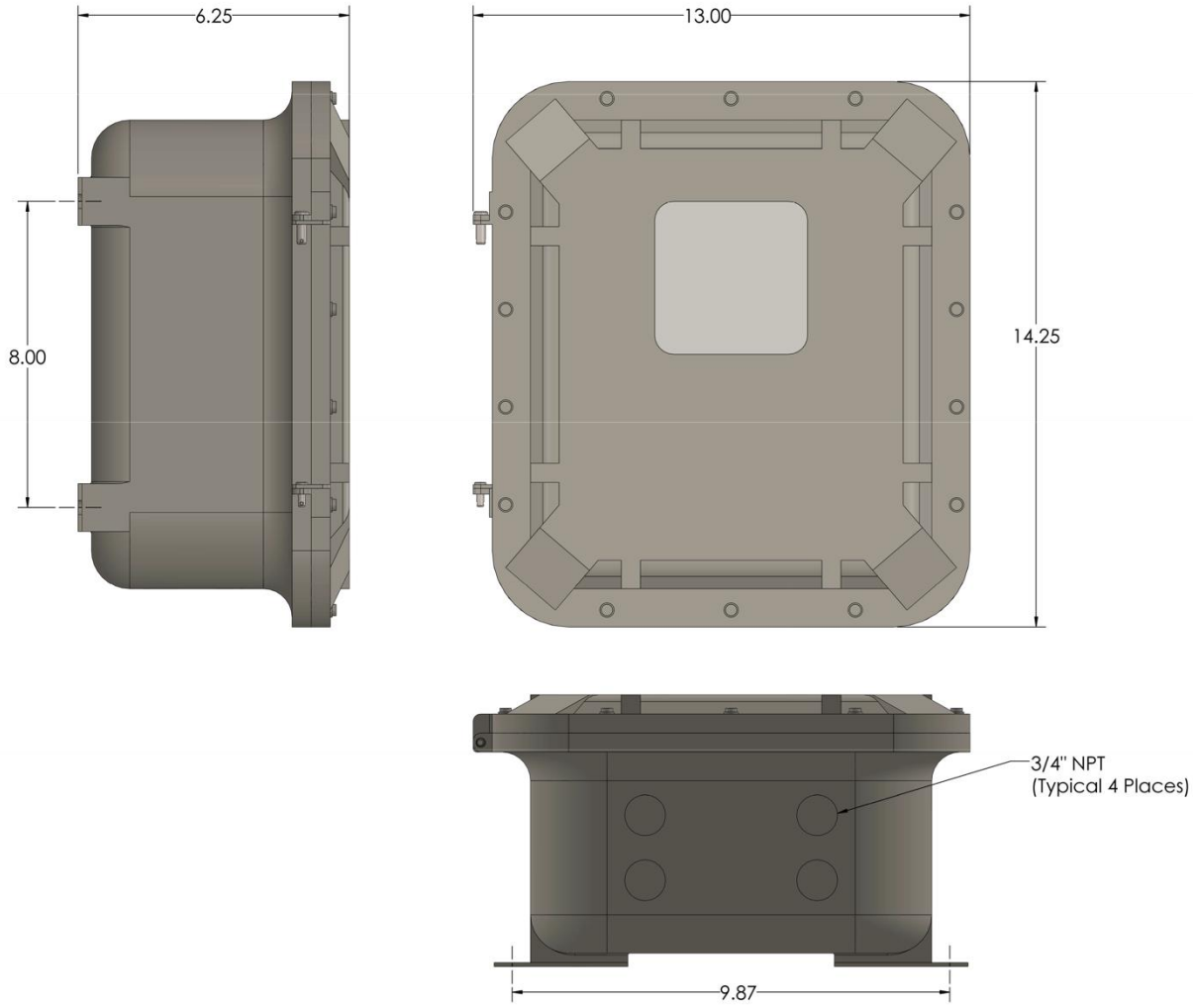


Figure 7-4 NEMA 7 Explosion Proof Wall Mount Enclosure

CHAPTER 8 – TXP-WCR ANTENNA SELECTION

8.1 ANTENNA SELECTION

8.1.1 DIPOLE AND COLLINEAR ANTENNAS

Key Qualities & Notes

- Connected to the Radio via a length of coax cable.
  NOTE: If the cable is larger than 6mm diameter (1/4 inch), be aware of sideways tension on the connection. Thick cables have large bending radii and sideways force on the connector can cause a poor connection.
- The polarity of these antennas is the same as the main axis, and they are normally installed vertically.
- They can be mounted horizontally (horizontal polarity), however the antenna at the other end of the wireless link would need to be mounted perfectly parallel for optimum performance.
  NOTE: This is very difficult to achieve over distance.
- If the antenna is mounted vertically, it is only necessary to mount the other antennas vertically for optimal "coupling" – this is easy to achieve.
- Dipole and collinear antennas provide best performance when installed with at least 1 to 2 wavelengths clearance of walls or steelwork.

The wavelength is based on the frequency:

- Wavelength in meters = 300 / frequency in MHz
- Wavelength in feet = 1000 / frequency in MHz

Antennas may be mounted with less clearance, but radiation will be reduced. If the radio path is short this won't matter. It is important the antenna mounting bracket to well connected to "earth" or "ground" for good lightning surge protection.

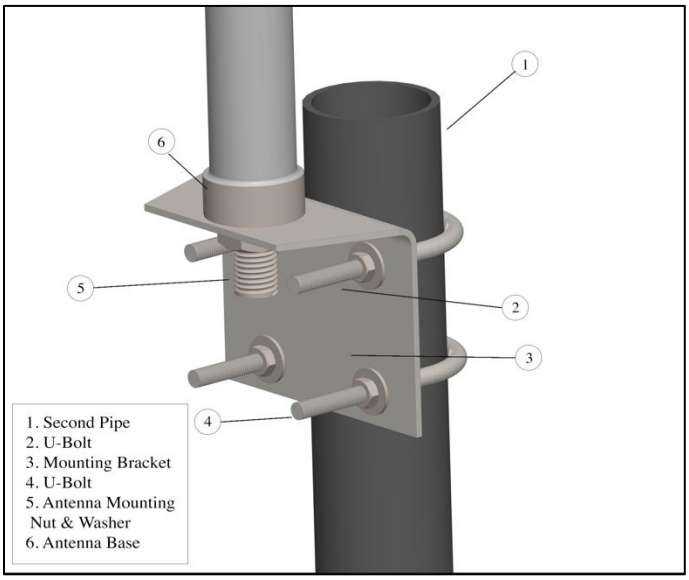


Figure 7-5 Dipole Antenna *Installation Diagram*

8.1.2 YAGI ANTENNAS

Key Qualities & Notes

- Directional along the central beam of the antenna.
- Folded element is located towards the back.
- Antenna should be pointed in the direction of the transmission.
- Should be mounted with at least 1 to 2 wavelengths of clearance from other objects.
  NOTE: There is a large degree of RF isolation between horizontal and vertical polarity (approx. –30dB) so this installation method is a good idea if there is a large amount of interference from another system close by transmitting vertical polarity.
- The polarity of the antenna is the same as the direction of the orthogonal elements. For example, if the elements are vertical the Yagi transmits with vertical polarity.
- In networks spread over wide areas, it is common for a central unit to have an omni-directional antenna and the remote units to have Yagi antennas.
  NOTE: In this case, as the omni-directional antenna will be mounted with vertical polarity, then the Yagi's must also have vertical polarity. Care needs to be taken to ensure the Yagi is aligned correctly to achieve optimum performance.
- Two Yagi antennas can be used for a point-to-point link.
  NOTE: In this case, they can be mounted with the elements horizontally to give horizontal polarity.

IMPORTANT: A YAGI HAS DRAINAGE HOLES IN THE DIPOLE ELEMENT, DO NOT MOUNT THE ANTENNA WITH THE DRAINAGE HOLES UP.

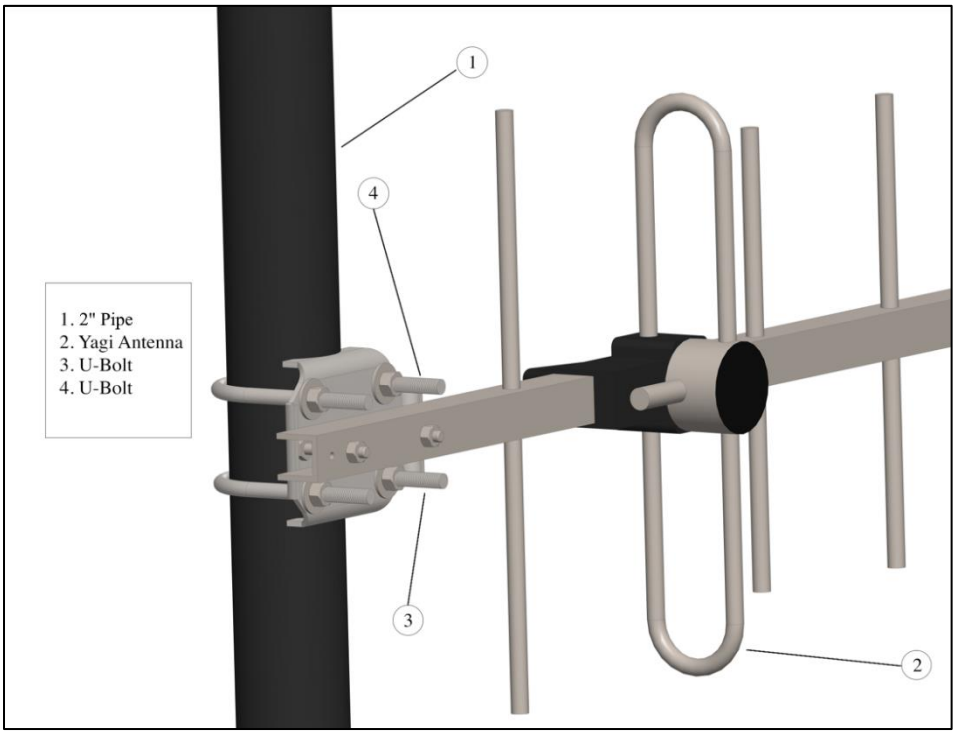


Figure 7-6 Yagi Antenna Installation Diagram

8.1.3 MOUNTING NEAR OTHER ANTENNAS

NOTE: Avoid mounting your network's antenna near any other antenna even when the other antenna is transmitting on a different radio band. High RF energy of the transmission from a close antenna can deafen a receiver. This is a common cause of problems with wireless systems.

1. Provide vertical separation between antennas for more efficient transmission
2. Mount beneath or above the other antenna if vertical separation is not possible.
3. Use different polarity to the other antenna, if possible, to isolate the RF coupling.
4.

8.1.4 COAX CABLES

Moisture ingress into a coax cable connection is the most common cause of problems with antenna installations. To weatherproof the connection:

A three-layer sealing process is recommended:

1. Add an initial layer of electrical PVC tape
2. Add a second layer of self-vulcanizing weatherproofing tape.
3. Add a final layer of electrical PVC tape.

Allowing a drip "U loop" of cable before the connection allows:

- water to drip off the bottom of the U instead of into the connection,
- reduces installation strain, and
- provides spare cable length in case later the original connectors need to be removed, - the cable can be cut back and new connectors fitted.

NOTE: Avoid installing coax cables together in long parallel paths. Leakage from one cable to another has a similar effect as mounting an antenna near another antenna.

8.2 SURGE PROTECTION & GROUNDING

Voltage surges can enter the Wireless System via:

- the antenna connections,
- power supply connections,
- connections to other equipment, and
- even the earth or ground connection.

Surges are electrical energy following a path to earth and the best protection is achieved by draining the surge energy to earth via an alternate path.

Wireless devices need to have a solid connection to earth via:

- a ground stake, or
- ground grid if the soil has poor conductivity.

Solid connection means a large capacity conductor (not a small wire) with no coils or sharp bends. All other devices connected to the controller need to be grounded to the same ground point. There can be significant resistance between different ground points leading to very large voltage differences during lightning activity. As many wireless units are damaged by earth potential surges due to incorrect grounding as direct surge voltage.
It is very difficult to protect against direct lightning strikes but the probability of a direct strike at any one location is very small. Unfortunately, power line surges and electromagnetic energy in the air can induce high voltage surges from lightning activity several miles away.

8.2.1 ANTENNA GROUNDING

Electromagnetic energy in the air will be drained to ground via any and every earth path. An earth path exists between the antenna and the WTA, and to protect against damage this earth path current must be kept as small as possible.

This is achieved by providing better alternate earth paths.

1. Ground the antenna to the same ground point as the WTA.

Surge energy induced into the antenna will be drained:

1. by the mount's ground connection,
2. by the outside shield of the coax cable to the ground connection on the radio, and
3. by the internal conductor of the coax cable via the radio electronics.
    - This third earth path causes damage unless the other two paths provide a better earth connection allowing surge energy to bypass the electronics.

When an antenna is located outside of a building and outside of an industrial plant environment, external coax surge diverters are recommended to further minimize the effect of surge current in the inner conductor of the coax cable.

Coax surge diverters have gas-discharge element which breaks down in the presence of high surge voltage and diverts any current directly to a ground connection. A surge diverter is not normally required when the antenna is within a plant or factory environment, as the plant steelwork provides multiple parallel ground paths and good earth grounding will provide adequate protection without a surge diverter.

8.2.2 CONNECTIONS TO OTHER EQUIPMENT

Data devices connected to the wireless unit should be well grounded to the same ground point as the wireless unit. Surges can enter the wireless unit from connected devices, via:

- I/O
- serial
- ethernet connections

Special care needs to be taken where the connected data device is remote from the wireless unit requiring a long data cable. As the data device and the wireless unit cannot be connected to the same ground point, different earth potentials can exist during surge conditions:

1. Fit surge diverters to the data cable to protect against surges entering the wireless unit.

2. Fit surge diverters for the I/O wiring to protect the wireless unit from surge voltages being induced on long lengths of wire from nearby power cables.

CHAPTER 9 – TXP-WTA LEGACY MODE

TXP-WCR Controllers are not compatible with TXP-WTA Sensor Assemblies in legacy mode.

When using a TXP-WTA with other TracXP products, it is necessary to operate wirelessly in Legacy Mode.

To enter Legacy mode:

1. Enter the **RF Link Menu** discussed in the WTA manual.

To switch from Wireless mode to Legacy mode:

1. Select RF Link.
2. Enter the special key sequence of four **UP** keystrokes.
3. Enter the appropriate **Hop Channel** and **System ID** in accordance with your **Server's Network Configuration**.

All other WTA settings function as discussed in the WTA manual.

CHAPTER 10 – OPTIONAL ADD-ONS

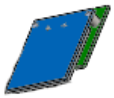
Explosion-Proof Antenna

Power Supply

PN: 83-800K-0000-00

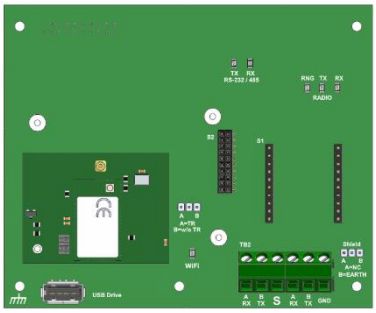
Radio

PN: 83-800I-0000-00



Alarm (Light)

Controller Multifunction Option Board



CHAPTER 11 – TABEL OF FIGURES

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