AUS1415

PLC1400 SERIES

Version 1.0

User
Manual

Warranty & Disclaimer Information

Due to Conspec Controls Inc.'s continuous effort to produce the highest quality monitoring equipment possible, products described in this manual are subject to change at any time without notice. While every effort has been made in preparing this manual to include all information pertinent to the installation, maintenance, and calibration of the product, Conspec Controls Inc. assumes no responsibility for errors, omissions, or any loss due to said errors or omissions.

A gas monitoring system alone cannot prevent hazardous conditions from occurring. The reliability of a gas monitoring system, and the resultant safety level is dependent on, and the responsibility of the user. The user's responsibilities include, but are not limited to:

*Insuring that the correct equipment is specified for conditions at the particular site
*Following recommended installation and wiring guidelines
*Meeting all applicable safety and electrical codes
*Scheduling regular calibrations and servicing
*Replacing inoperative or questionable parts or units

1   WARRANTY

Conspec Controls Inc. provides warranty service for one (1) year from the shipping date on all electronic and mechanical components. Sensor elements are considered a consumable part subject to varying conditions which can affect their expected life. Sensor elements are covered under warranty for a period of six (6) months. Damage to sensor elements due to overexposure of the target gas, poisoning, or other factors beyond Conspec's control are not covered under warranty. Warranty service is limited to defects in materials and workmanship on units which fail under normal use. Conspec will repair or replace any unit found to have failed due to defects in materials or workmanship. This warranty is voided if the unit has been misused, damaged due to incorrect wiring, or altered before return to the factory. Warranty claims that are denied will be billed at the standard rate. Expedited shipping is not covered under warranty.

No other warranty is authorized other than the above.

Before returning a product for service, call Conspec Controls Inc. for a Return Authorization Number (RA#) at (724) 489-8450. Returned units should be packaged securely as damages incurred during shipping are not covered under warranty.

Description:

The Conspec PLC based Multi-channel Controller is designed to monitor gas levels from multiple sources/devices. It is able to have up to fifteen (15) channels while having a designated alarm zone for each channel or device. Alarm zones and relay outputs are customizable allowing flexibility for a large range of applications. The Multi-channel Controller is compatible with and can self identify many versions of the CN/CX gas monitoring equipment. The Multi-channel Controller has two (2) Modbus/RS485 Trunk-Outputs for connecting devices/monitors.
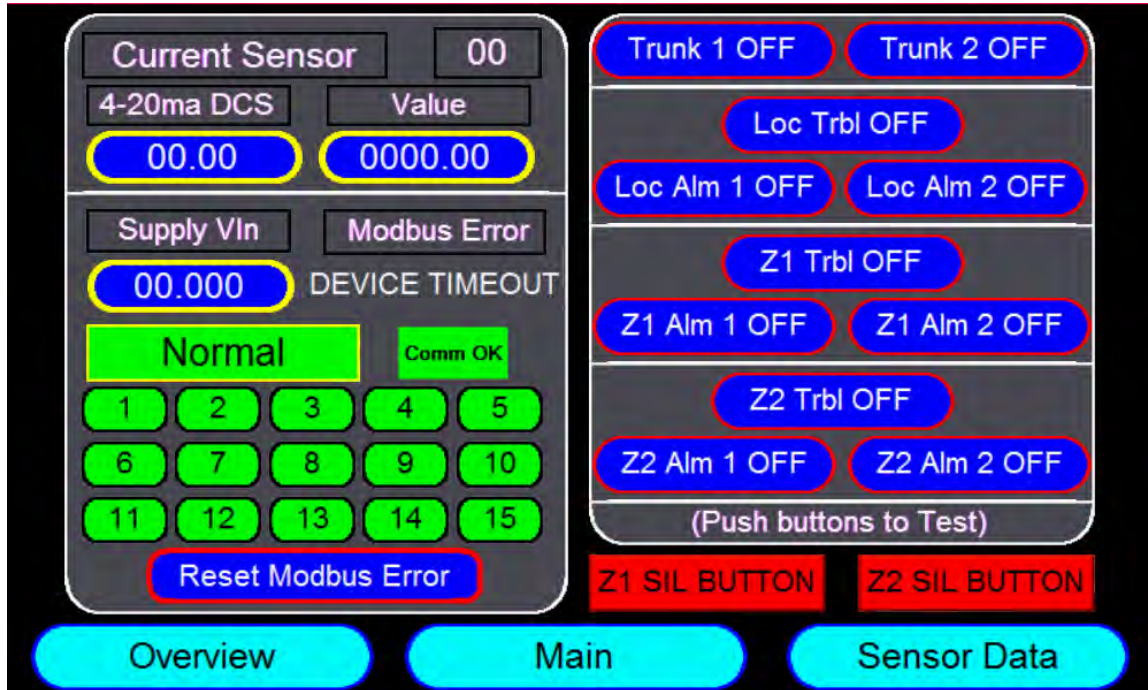
Main:

Pictured above is the Main Screen. From here the user can access the user configuration and information screens.

Available Screens:
Maintenance, Overview 1-15, Admin, Trends, Alarm Log, and Time Weighted Average.

Note: Some screen selections will not be visible until the related options are enabled. For the Overview Screen to be visible at least one monitor has to be enabled. To enable or disable a monitor go to the Admin Screen. For the Time Weighted Average Screen to be visible go to the TWA Setpoint screen and press the enable/disable button. TWA Setpoint screen is located in the Admin Screen.

Maintenance Screen:

The Maintenance screen gives the user the ability to view individual gas monitor's information and test the Alarm and Trunk Outputs manually.

The left hand side of the Maintenance Screen is used to select and display the individual gas monitor's information. The digits 1-15 correspond to the associated monitor's address. To view a specific monitor's information press one of numbered buttons. The selected monitor's address will be displayed to the right of "Current Sensor". The Current Sensor's 4-20mA output signal, Gas Value, Supply Voltage In, Modbus Error, Alarm Status, and Communication Status will be displayed in the corresponding window.
Note: The Address selectors for a monitor will not be available unless that monitor is enabled on the Admin Screen.

The right hand side of the Maintenance Screen is used to control the Multi-channel Controller's relay outputs. The outputs can be activated or deactivated by pressing the associated Test buttons. Each button's function and state is detailed on the button.

Controlled Outputs:
Trunk On/Off
Local Trouble, Local Alarm 1, Local Alarm 2,
Zone 1 Trouble, Zone 1 Alarm 1, Zone 1 Alarm 2,
Zone 2 Trouble, Zone 2 Alarm 1, Zone 2 Alarm 2.

Sensor Data:

The Sensor Data screen is used to single scan all of the registers available in the CX/CN series gas monitors. To change the "Current Sensor" use the green digit buttons labeled 1-15 to select a different gas monitor. The Number shown to the right of "Current Sensor" is the sensor that has been read via the Modbus/RS485 network.

Note: The sensor cannot be selected if the monitor is not enabled on the Admin Screen

Overview 1-15 Screen:

The Overview Screen is segmented to into larger gas monitor groups to allow an overview of the gas detection system

Note: The gas monitor will be grayed out if it is not enabled.

The following indicators are available in the Overview Screen.

1. **Monitor's Modbus Address:** is listed in the bottom left side of each box in white text, below the Sensor Value. It indicates which gas monitor's data is being displayed.

2. **Status:** reflects the condition of the respective gas monitor's operating condition.   (Normal, Alarm 1, Alarm 2 Demoted, Comm Fail, Sensor Fail, Calibration, Not In Scan, Temp Error, Time Weighted Average (TWA), and Code Version Error).

3. **Value:** is a direct representation of the corresponding gas monitor's real time gas value. It is displayed in the white box below the monitor's Status.

Overview 1-15 Screen:
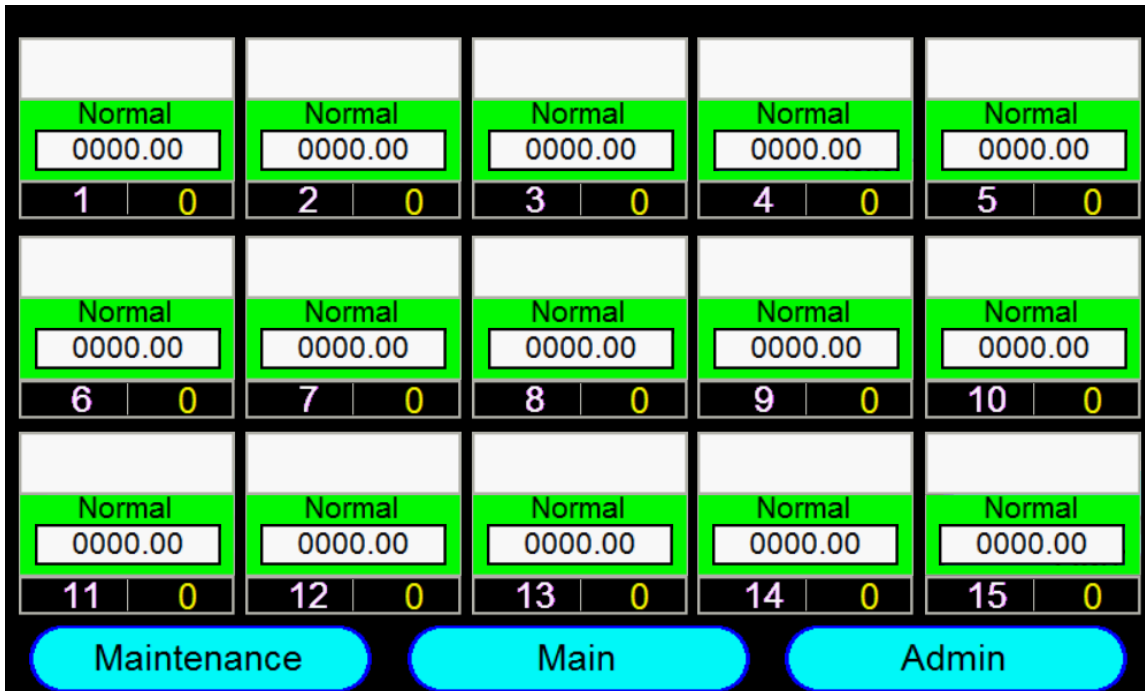
4. **The Zone:** displays which alarm zone has been selected for the corresponding gas monitor. Gas monitors can be divided into two zones. Each alarm zone, zone 1 and zone 2, has individual alarm outputs for 1st alarm, 2nd alarm, and trouble or malfunction. The zone is displayed in the bottom right box of each monitor display box in yellow text.

5. **Sensor Name:** is an entry box that permits you to change the name of the sensor. This can be changed in any screen that there is "**ENTER MONITOR NAME**" box. The Multi-channel Controller will save the name of the gas monitor as well as display its name in associated functions such as the alarm banner.

Alarm Banner:
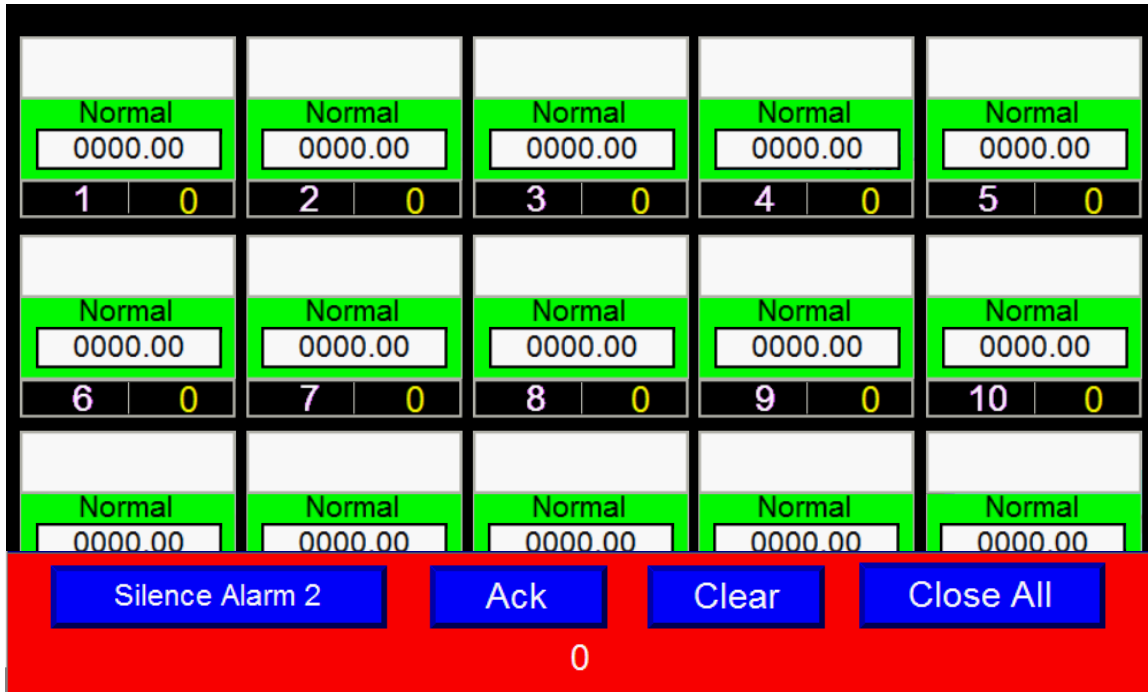
The Alarm Banner appears whenever an alarm is activated.

Local Alarms: Alarm 1, Alarm, 2, Demoted, Sensor Version, Sensor Fail, TWA
Zone 1 Alarms: Alarm 1, Alarm 2, Trouble
Zone 2 Alarms: Alarm 1, Alarm 2, Trouble, Local Trouble, Local Alarm 1

The Banner will automatically close as alarm conditions are cleared or acknowledged.

The Alarm Banner's buttons:

1. **Silence Alarm 2:** unlatches the Local Alarm 2 and the associated Zone One or Two's 2nd Alarm Relay. Zone Alarms can be silenced separately if the "Local Silence Zone(s)" button is enabled in the Zones Screen.

2. **Ack (Acknowlege):** tells the software that the alarm has been activated and saves the alarm in the Alarm Log.

3. **Clear:** closes the Alarm Banner and removes that alarm notice from the Alarm Log

4. **Close All:** closes all Open Alarm Banners when pressed. Multiple alarm banners can be displayed at the same time. The newest alarm banner will be stacked over top of the previous alarm banner.

Admin:
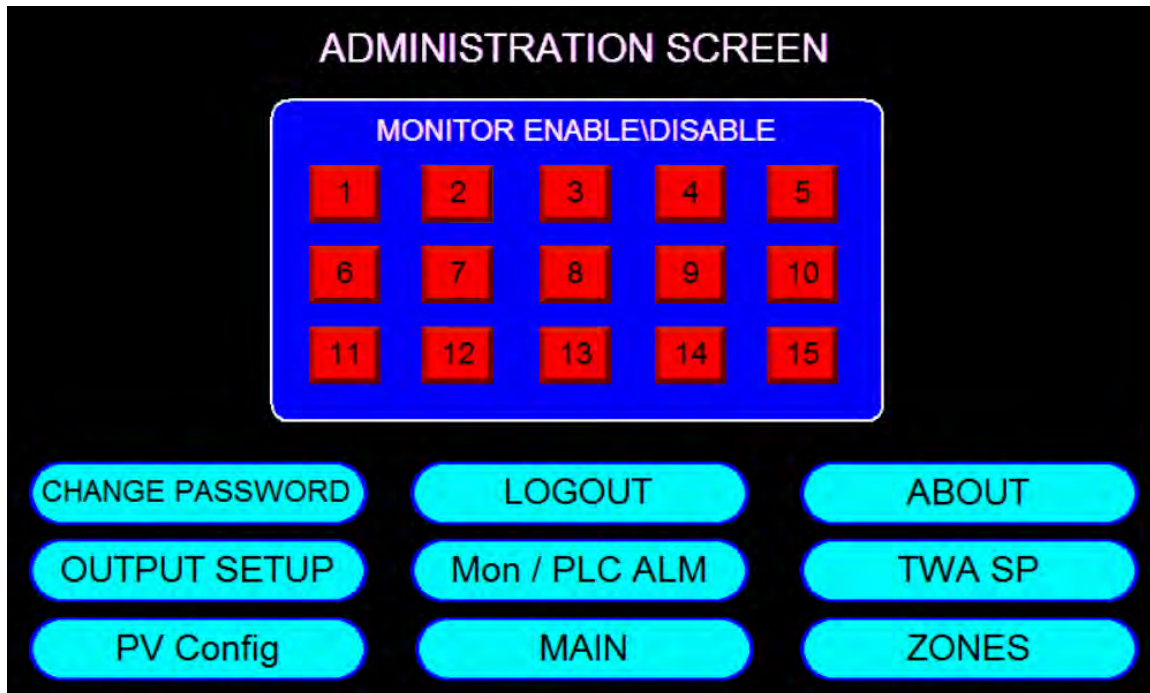
The Admin Screen has many functions. In this screen the user can enable/disable gas monitors, change the password, and navigate to multiple other screens. The user can access the About Screen, Output Setup Screen, Mon/PLC Alarm Screen, TWA SP Screen, PanelView Configuration Screen, Zones Screen, and go back to the Main Screen.

Once the admin password is entered, the password will not have to be re-entered unless the system is left idle for fifteen (15) minutes or the logout button is pressed.

To enter the Admin Screen, a Username and Password is required. By default the User name is "1". The password is also defaulted as "1". Once inside the admin screen the ability to change the password is available. To do so the current password is required followed by the new password and a confirmation of the new password.

1. **Enable/Disable Monitors:** To enable/disable a monitor press the corresponding button with the associated monitor's address. After an address button is pressed it will change between green and red. The AUS1415 is defaulted to have all monitors disabled. If the button is red that indicates it is disabled. When the button is green that shows the monitor is enabled.

2. **Change Password:** when pressed, a screen will appear that gives permission to change the Admin password. To be able to change the password, the old password is required. Next a new password will need to be entered and confirmed.

3. **Logout** takes the user out of the Admin Screen and into the Main Menu. The password will need to be re-entered if the user wants to access the Admin Screen again.

Output Setup:

OUTPUT FUNCTION	PLC PIN	BLINK
TRUNK RELAY 1		
TRUNK RELAY 2		
TROUBLE LOC STROBE		Steady
ALM 1 LOC STROBE		
ALM 2 LOC HORN		
ZONE 1 TROUBLE		Steady
ZONE 1 ALARM 1		
ZONE 1 ALARM 2		
ZONE 2 TROUBLE		Steady
ZONE 2 ALARM 1		
ZONE 2 ALARM 2		Steady

Return   Main

THIS SCREEN IS TO ONLY BE USED BY EXPERIENCED PERSONNEL, WHILE INSTRUCTED BY TECHINICAL SUPPORT.

The Output Setup Screen lets the user assign specific output functions to the PLC's Output Ports. There are eleven (11) different output ports on the PLC (0-10).There are 11 different functions to assign (Trunk Relay 1, Trunk Relay 2, Trouble Local Strobe, Alarm 1 Local Strobe, Alarm 2 Local Horn, Zone 1 Trouble, Zone 1 Alarm 1, Zone 1 Alarm 2, Zone 2 Trouble, Zone 2 Alarm 1, and Zone 2 Alarm 2.)

Example: If Zone 1 Alarm 1 (Z1A1) is assigned as PLC Output Port 3; whenever Z1A1 reaches the specified alarm point, port 3 will be energized. Also, when the Zone 1 Alarm 1 test button is pressed on the Maintenance screen it will energize port 3.

> **The Blink Column** gives the Output Functions the ability to toggle the Trouble alarms and the Zone 2 Alarm 2 from a steady alarm to a blinking alarm. This option is available to allow the user to distinguish between Trouble and Alarm 1(if the same output is used for both). The button toggles between steady and blinking. The blinking status is indicated by is a green background and the word "blinking". Steady is indicated by the text and a blue background.

Mon / PLC Alarms:

The Mon / PLC Alarm Screens let the user specify the two different Setpoints for each alarm, switch the monitors between Rising and Falling, change the alarms to activate from the Monitor or the PLC, and shows if the Input silence buttons are latched.

1. **Setpoints:** There are four available setpoints per monitor. Two alarms for the first setpoints, Setpoint 1 Alarm 1 (SP 1 ALM 1) and Setpoint 1 Alarm 2 (SP 1 ALM 2). There are also two alarms for Setpoint 2, Setpoint 2 Alarm 1 (SP 2 ALM 1) and Setpoint 2 Alarm 2 (SP 2 ALM 2). Only one group of Setpoints can be activated at a time. SP 1 ALM 1 and SP 1 ALM 2 are grouped together; and SP 2 ALM 1 and SP 2 ALM 2 are grouped together.

   To enter a setpoint value for a monitor, press the corresponding white box and a number pad will pop up on the screen. Enter the desired number for the setpoint and then press the ↵ button to save the change.

2. **The Rising and Falling** button changes how the PLC reads the monitor. Rising is used to detect how much gas is coming into the local atmospheric location. Falling is to show the amount of depletion of a gas in the local atmospheric location.

3. **Mon / PLC Alarm** is a button that changes how the alarms get read. Monitor Mode reads directly from the monitor itself. While PLC Alarm reads the bit from the PLC. PLC mode consolidates the sensors, and gives more accessibility. Not all the monitors of every channel have to be read the same way.

4. **Zone Silence Indicators** let the user see whenever the silences are latched. These silence indicators are PLC silences that are on Inputs of the PLC. Input I/0 is the trouble silence button, I/1 is the Zone 1 silence button, and I/2 is the Zone 2 silence button. There is no indicator for the trouble silence. Only Zone 1 and Zone 2 have an available Zone Silence Indicator. The indicators are labeled as "Z1 SIL BUT" and "Z2 SIL BUT".

The Monitor / PLC Alarm is divided two distinct screens. One screen is to access monitors 1-8 which is located on the "Mon / PLC Alarms 1-8" screen. The second screen is to access monitors 9-15. The user can view the "Mon / PLC Alarms 9-15" screen press the "Mon/PLC ALM 9-15" button, and to go back to the "Mon / PLC Alarms 1-8" screen press the "Mon/PLC ALM 1-8" button.

Zones:
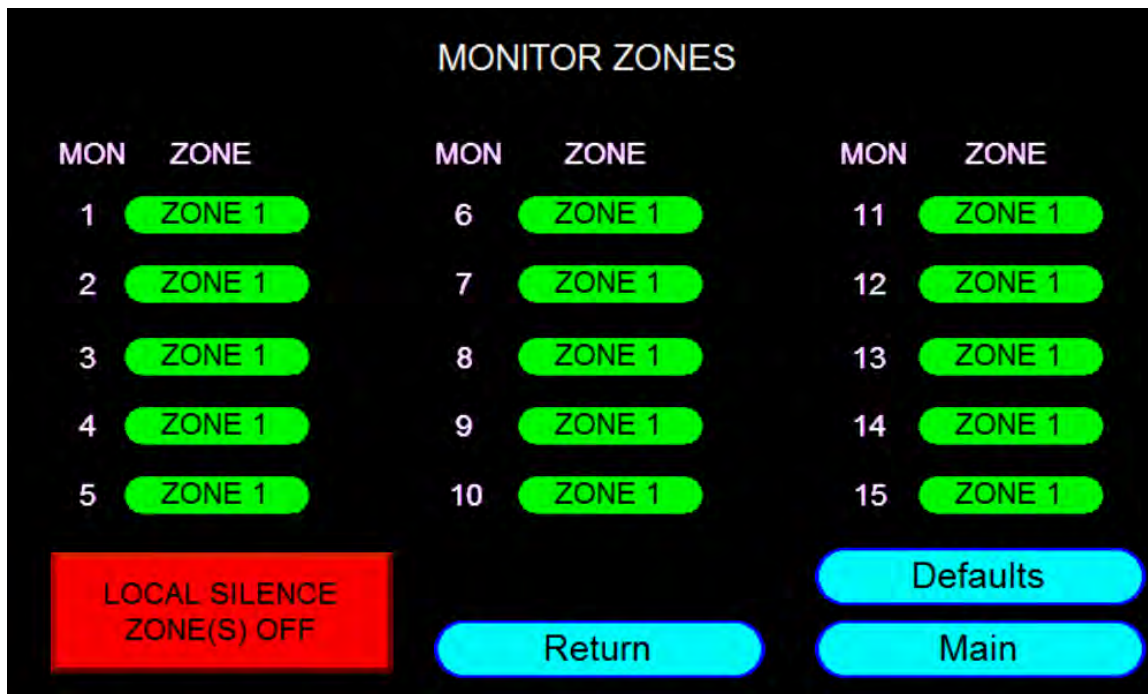
The Zone Screen is where the user is able to change the zone assigned to each monitor. To change the zone that a monitor is assigned to, press the zone button labeled as "Zone 1" or "Zone 2". Not all monitors have to be in the same zone. The monitor will not be available to change the zone unless the monitor is enabled on the Admin Screen.

Local Silence Zone(s): While the local silence zone button is active it allows the silence buttons to silence every monitor in the associated zone. While the button is deactivated only the monitor that you are silencing will be silenced. The local silence button is active while the button green. The button is deactivated when the button is red.
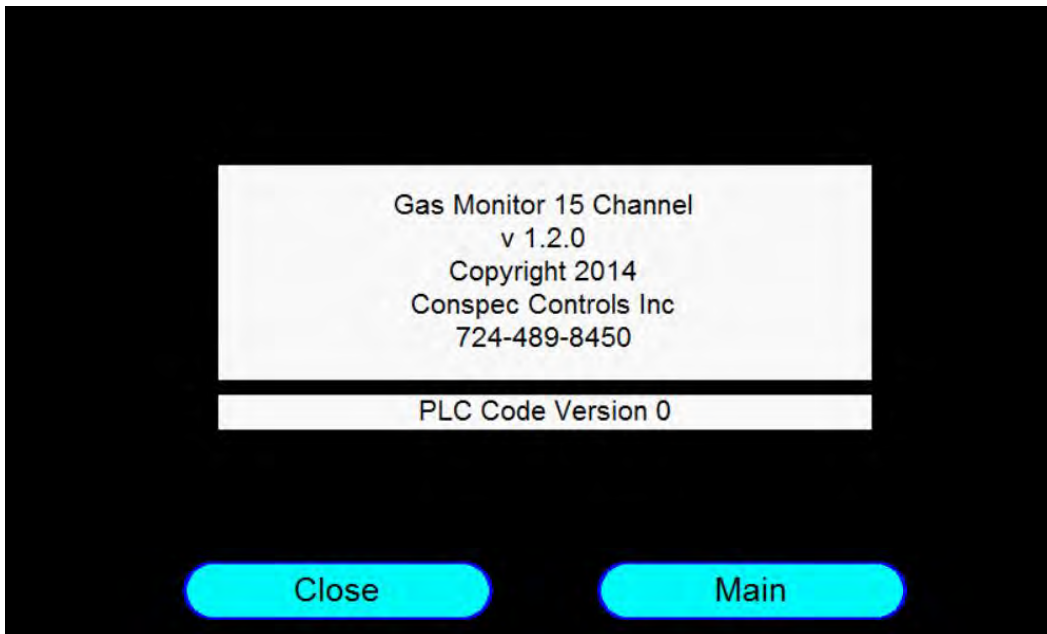
Defaults:
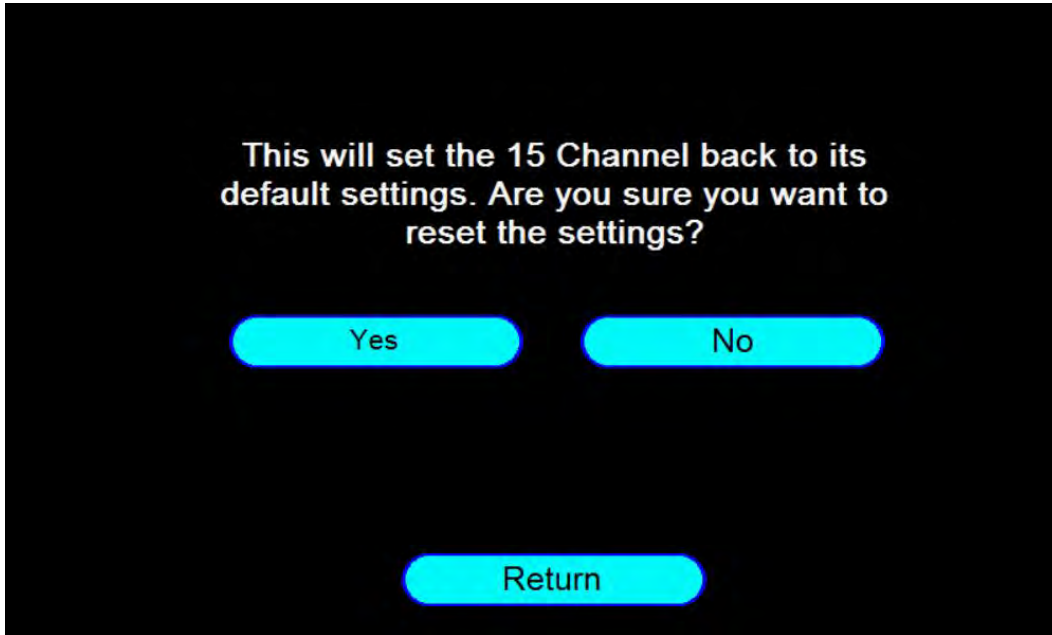
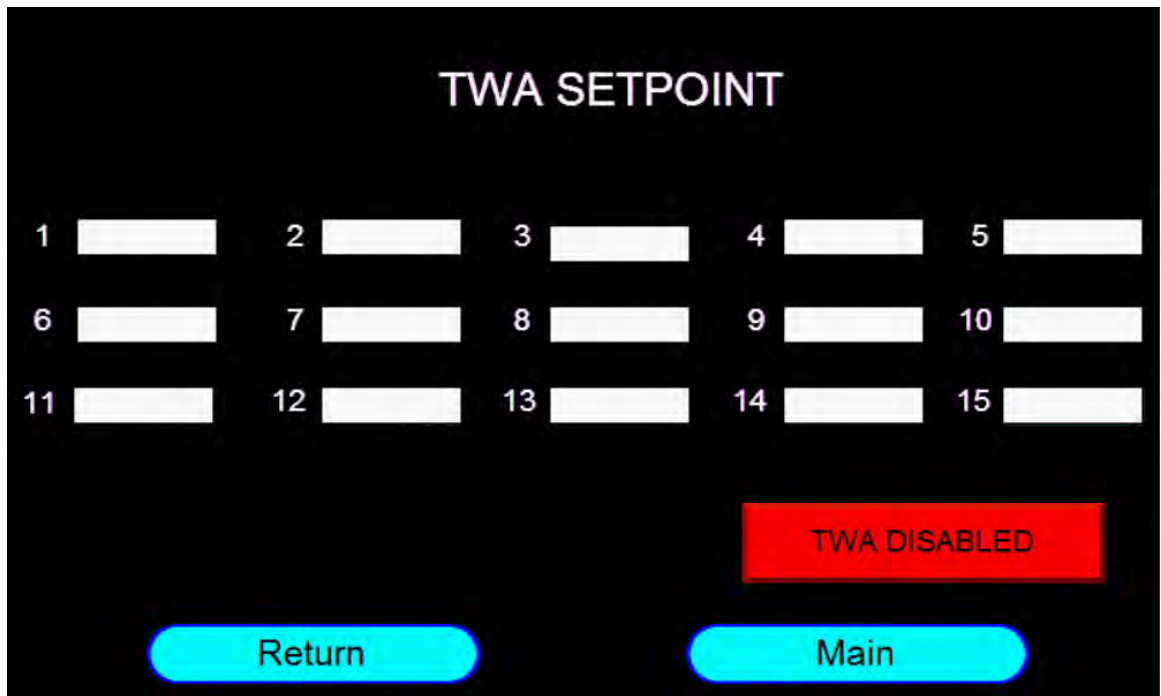The Default Screen lets the user set the AUS1415 back to its factory settings.

About:

The About Screen provides information on the system type, version type, PLC Code Version, and Contact Information.

TWA Setpoint:

The Time Weighted Average (TWA) Set point Screen allows the user to change the Set point of each monitor's TWA Alarm. The TWA is a weighted average spanning over a user specified time. MSHA tested their time for 8 hours (480 minutes). If the monitor's TWA level is above the assigned Set point the TWA Alarm will be active. The TWA Enable/Disable button turns on and off the TWA Monitoring system. The Enable/Disable button lets the user navigate to the TWA settings page from the Main Menu.

Time Weighted Average Values:

The Time Weighted Average Value has two pages. One for monitors 1-8 and another for monitors 9-15. These pages display The TWA value, sensor name, and time elapsed. These pages let the user change if the TWA is on or off, which individual monitors are enabled or disabled, and the ability to change the Workday time in minutes.

The TWA Start button resets the TWA clock to 0:00 then starts a new TWA. The TWA Stop button disables the TWA. The enable/disable button allows the TWA alarm of individual monitors to be disabled or enabled. The value on the left hand side on the screen is the current calculated TWA value for that monitor. The Address of the monitor is to the left of the value. If the TWA value is higher than the TWA Set point, the TWA alarm will sound. The time elapsed shows how long the TWA has been enabled. The workday (on the bottom right side of the screen) is displayed in minutes. The workday time is the number that is divided to figure out the TWA. Since the TWA is an average of an eight (8) hour span, the workday in minutes would be 480 minutes.
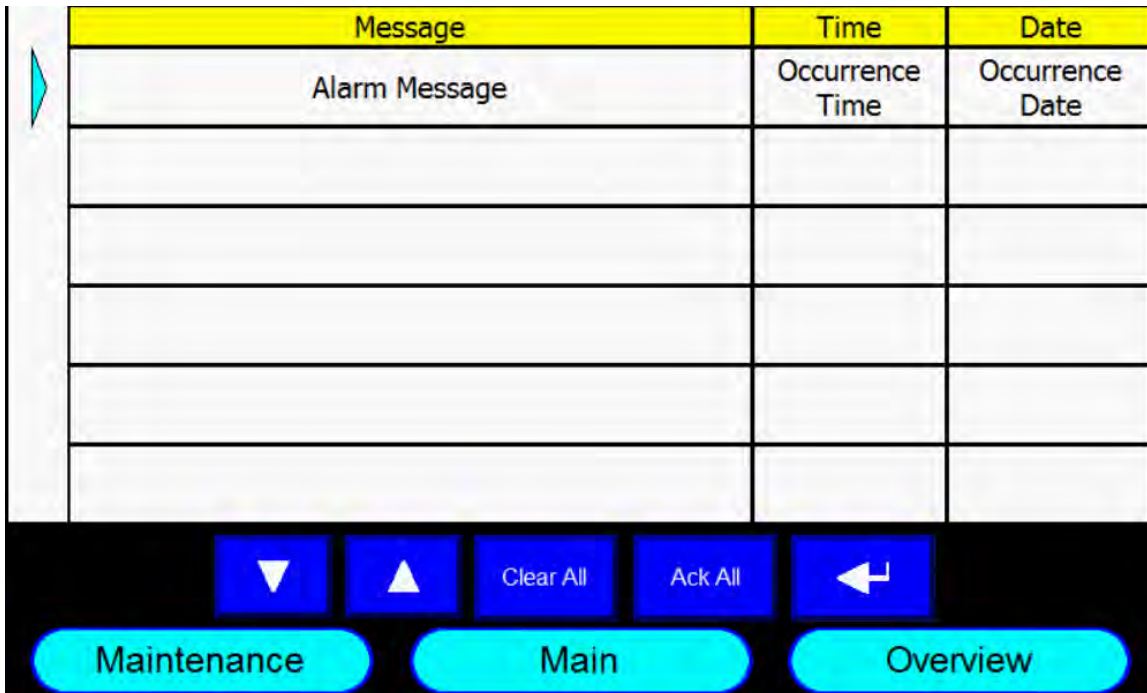
Trend Menu:

The Trends Menu displays the three different trend options. The three options are to view the trends of monitors 1-5, 6-10, or 11-15.

Trends:
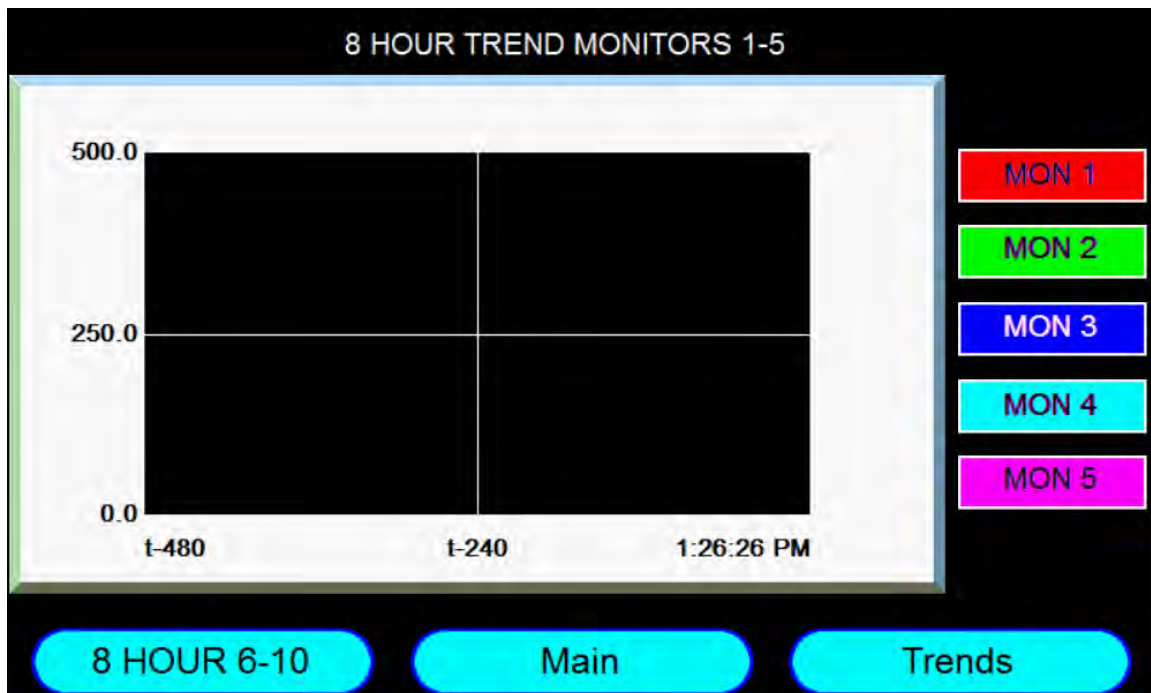
The Trends screen is a graphical representation of the sensor reading over a set period of time. The X-axis represents the sensor value. The Y-axis is represented as the TWA time. Each trend screen displays five monitors at a time. Each monitor is color coded as red, green, blue, cyan, and magenta with a legend on the right hand side so show each monitor address.

Alarm Log:

Message	Time	Date
Alarm Message	Occurrence Time	Occurrence Date

▼ ▲ Clear All Ack All ←

Maintenance Main Overview

The Alarm Log Screen shows the history of all the alarms, and notifications that have been tracked for information and troubleshooting purposes. The alarms and notifications that are tracked are: Alarm 2, Demoted, Alarm 1, Sensor Fail, Comm Error, Not In Scan, Temperature Error, Calibration, Version Old, Zone 1 Alarm 1 Test, Zone 1 Alarm 2 Test , Zone 1 Trouble Test, Zone 2 Alarm 1 Test, Zone 2 Alarm 2 Test , Zone 2 Trouble Test, Local Alarm 1 Test, Local Alarm 2 Test, TWA Started, TWA Alarm, Operation Mode SP2, Operation Mode SP1, TWA Stopped, and TWA Status.

The user can navigate through the screen with the up and down arrows below the display box. The Alarm Log can hold 100 notifications. If a new notification is made while the Alarm Log is full the Alarm Log will delete the oldest notification and put the newest one at the top. The Alarms are displayed chronologically.

APPENDIX:

STATUS DESCRIPTIONS:

DISPLAYED STATUS	DESCRIPTION
NORMAL	NORMAL - Normal operating mode (no alarms, faults, communication errors, etc.)
ALARM 1	ALARM 1 - Monitor reading equals or exceeds the First Alarm set point
ALARM 2	ALARM 2 - Monitor reading equals or exceeds the Second Alarm set point
DEMOTED	DEMOTED - If a monitor is in Comm Fail for three consecutive scans, it will become demoted. The demoted the monitor will wait 20 scans and attempt to read monitor again. The monitor will continue to cycle in and out of being demoted until communications are fixed or the monitor is disabled(Admin screen).
COMM FAIL	COMMUNICATION FAIL - The PLC is a unable to communicate with the monitor.
SENSOR FAIL	SENSOR FAIL - The monitor has determined that sensor signal has moved outside of predefined parameters or experienced a loss of signal. Refer to the Monitor Manual for details and instructions.
CALIBRATION	CALIBRATION MODE - Indicates that the monitor is in calibration mode.
NOT IN SCAN	NOT IN SCAN - The monitor is set to not be read
TEMP ERROR	TEMPERATURE ERROR - The measured operating temperature falls outside the temperature range of the monitor.
TWA	TIME WEIGHTED AVERAGE - The monitor reading averaged over an eight hour time period.
CODE VER ERR	CODE VERSION ERROR - When the code version is not available in the internal memory.