WELKER

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
WELKER® ECOSYSTEM™ PULSE BYPASS SYSTEM
WITH XL4 CONTROLLER

OdorEyes
by WELKER

DRAWING NUMBERS
OE181VS.10E
OE181VS.14E
OE220VS.5E
OE220VS.7E

MANUAL NUMBER
IOM-229

REVISION
Rev. A, 09/05/2023

IMPORTANT SAFETY INFORMATION
READ ALL INSTRUCTIONS

Notes emphasize information and/or provide additional information to assist the user.

Caution messages appear before procedures that could result in damage to equipment if not observed.

Warning messages appear before procedures that could result in personal injury if not observed.

This manual is intended to be used as a basic installation and operation guide for the Welker® OdorEyes® ECOsystem™ Pulse Bypass System With XL4 Controller. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is provided in Appendix A of this manual.

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide for the installation, operation, and maintenance of the Welker® OdorEyes® equipment described in this manual. Correct installation and operation, however, are the responsibility of the end user. Welker® reserves the right to make changes to this manual and all products in order to improve performance and reliability.

BEFORE YOU BEGIN

Read these instructions completely and carefully.

IMPORTANT – Save these instructions for local inspector's use.

IMPORTANT – Observe all governing codes and ordinances.

Note to Installer – Leave these instructions with the end user.

Note to End User – Keep these instructions for future reference.

Installation of this ECOsystem™ Pulse Bypass System is of a mechanical and electrical nature.

Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under the warranty.

If you received a damaged ECOsystem™ Pulse Bypass System, please contact a Welker® representative immediately.

Phone: 281.491.2331
Address: 13839 West Bellfort Street
             Sugar Land, TX 77498

1.1 Introduction

We appreciate your business and your choice of Welker® products. The installation, operation, and maintenance liability for this equipment becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance* (IOM) *Manuals* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use.*

If you have any questions, please call Welker® at 1.281.491.2331.

The following procedures have been written for use with standard Welker® OdorEyes® parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.

1.2 Product Description

The Welker® OdorEyes® *ECOsystem™ Pulse Bypass System With XL4 Controller* is designed to infuse the customer pipeline proportional to flow with natural gas that has been supersaturated with vaporized odorant. This skid-mounted automatic bypass system has three (3) primary components: the touch screen controller, the valve section, and the odorant supply tank. Each primary component plays an integral role in the operation of the ECOsystem™ and can be customized to better suit each application.

The touch screen controller serves as the system's brain. It continuously receives feedback from the customer's gas flow meter and the differential pressure (DP) transmitter in the valve section, allowing the system to respond to changing flow conditions. As pipeline conditions change, the controller increases or decreases the injection rate so that the ECOsystem™ continues infusing proportional to flow. On-site and remote troubleshooting and monitoring are made easier by time- and date-stamped audit data detailing system performance, alarm history, and odorant tank level. An optional solar panel generates renewable energy to power the system when an electrical source is unavailable.

The valve section contains two (2) or three (3) solenoids, which control the flow of gas through the odorant supply tank and into the pipeline. Having two (2) or three (3) solenoids allows the ECOsystem™ to better respond to and accommodate varying flow rates and limits interruption to operation in the event of solenoid maintenance. To prolong the operational life of the regulator and solenoids, the Welker® F-5 Filter Dryer conditions the natural gas supply. The DP transmitter communicates the solenoid operation to the controller to ensure proper odorization. For pulse bypass systems used in cold climates, a heater with thermostat can be added to replenish heat lost during regulation.

Each odorant supply tank is equipped with a tank fill inlet, vent port, blanket pressure inlet, level gauge, and outlet to the pipeline. The temperature transmitter communicates odorant temperature to the controller so the system can compensate for temperature changes within the odorant tank. For added automation, an electronic level transmitter can be installed to communicate tank level to the controller. Regardless of volume or orientation, the odorant supply tank comes with 110% containment that is sloped to the drain for easy draining.

Welker® may custom design the ECOsystem™ Pulse Bypass System With XL4 Controller to suit the particular application and specifications of each customer.

1.3 Safety Warning

Wherever hazardous gases or vapor-producing liquids are used, transported, or stored, the potential for an accidental leak exists. Continuous monitoring of these hazards is essential to ensure personnel safety.

1.4 Specifications

The specifications listed in this section are generalized for this equipment. Welker® can modify the equipment according to your company's needs. **Please note that the specifications may vary depending on the customization of your equipment.**

Table 1: ECOsystem™ Specifications	
Application	Vaporized Odorant Infusion
Electrical Connection	AC 120 V DC 24 V
Odorant Tank Volume	20 US Gallons (*75 L*) 50 US Gallons (*189 L*) 60 US Gallons (*227 L*) 100 US Gallons (*378 L*) 120 US Gallons (*454 L*) 250 US Gallons (*946 L*) 500 US Gallons (*1892 L*) Others Available
Features	Odorant Tank Level Gauge Skid With 110% Containment Temperature Transmitter Touch Screen Controller Valve Section (See *Table 2*)
Options	Flag Tracker Level Indicator Heater for Controller Enclosure NEMA 4 or NEMA 7 Enclosure for Controller Solar Panel Steel Building

Table 2: Valve Section Specifications	
Tubing Size	**Low Flow:** ¼" (*0.6 cm*) **High Flow:** ⅜" (*0.9 cm*) **Variable Flow:** ¼" and ⅜" (*0.6* and *0.9 cm*)
Electrical Classification	NEC Class I, Div 1, Group D, T3 NEC Class I, Div 1, Group D, T6
Features	2-Way Solenoid Valve (Qty = 2 or 3) Differential Pressure (DP) Transmitter Regulator for Natural Gas Supply Welker® F-5 Filter Dryer for Natural Gas Supply
Options	Backup Solenoid Enclosure Heater With Thermostat Low Flow Solenoid Volume Bottle [for Systems With ⅜" (*0.9 cm*) Tubing]

1.5 Equipment Diagrams

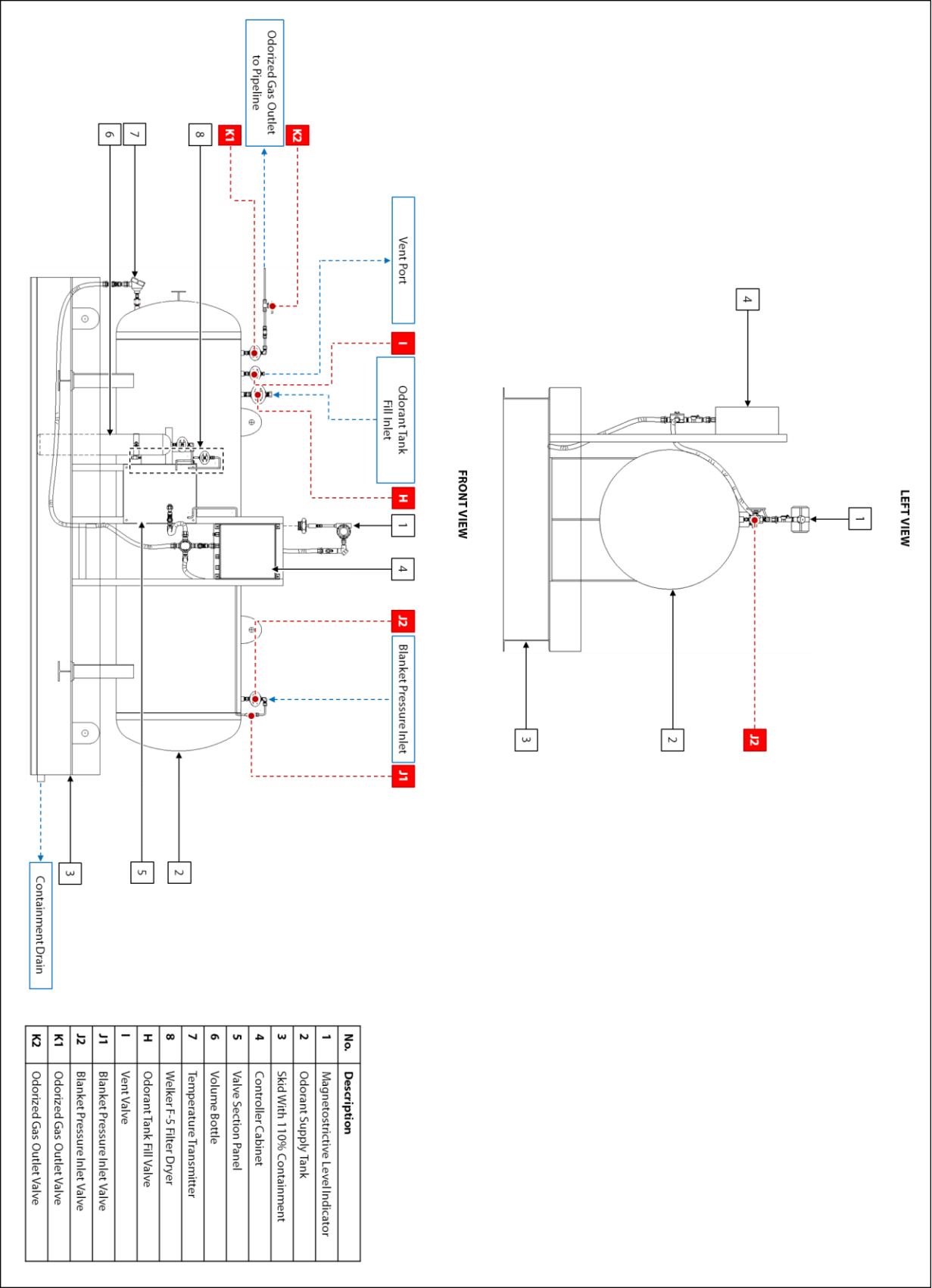### Figure 1: General Arrangement – Horizontal Odorant Tank

FRONT VIEW

LEFT VIEW

Odorized Gas Outlet to Pipeline

Vent Port

Odorant Tank Fill Inlet

Blanket Pressure Inlet

Containment Drain

No.	Description
1	Magnetostrictive Level Indicator
2	Odorant Supply Tank
3	Skid With 110% Containment
4	Controller Cabinet
5	Valve Section Panel
6	Volume Bottle
7	Temperature Transmitter
8	Welker F-5 Filter Dryer
H	Odorant Tank Fill Valve
I	Vent Valve
J1	Blanket Pressure Inlet Valve
J2	Blanket Pressure Inlet Valve
K1	Odorized Gas Outlet Valve
K2	Odorized Gas Outlet Valve

Figure 2: General Arrangement – Vertical Odorant Tank

FRONT VIEW

Vent Port | 1 | Odorant Tank Fill Inlet

I | H

7 | 3 | 6 | 5

REAR VIEW

K2 | K1 | 1 | Blanket Pressure Inlet

Odorized Gas Outlet to Pipeline | J2 | J1

3 | 2 | 7 | 4 | 5

LEFT VIEW

Odorant Tank Fill Inlet

1 | H | K1

7 | 2 | 3 | 6 | 4 | 5

No.	Description
1	Magnetostrictive Level Indicator
2	Valve Section Panel
3	Controller Cabinet
4	Temperature Transmitter
5	Skid With 110% Containment
6	Welker F-5 Filter Dryer
7	Odorant Supply Tank
H	Odorant Tank Fill Valve
I	Vent Valve
J1	Blanket Pressure Inlet Valve
J2	Blanket Pressure Inlet Valve
K1	Odorized Gas Outlet Valve
K2	Odorized Gas Outlet Valve

Figure 3: Valve Section Connections Diagram – Dual Solenoid With Heater

Blanket Pressure Outlet to Odorant Tank

Relief Outlet

Natural Gas Supply Inlet From Pneumatic Filter

Sense Line to Pressure Regulator

Electrical Connection to Controller

Electrical Connection to Heater

Enclosure Not Shown For Clarity

Figure 4: Valve Section Diagram – Dual Solenoid With Heater

FRONT VIEW, ANGLED

Enclosure Not Shown For Clarity

No.	Description
1	Differential Pressure Transmitter
2	DP Transmitter, Low Side
3	DP Transmitter, High Side
4	2-Way Solenoid, Primary
5	Terminal Block & Electrical Connections
6	Thermostat
7	Heater
8	2-Way Solenoid, Backup
9	Pressure Gauge, Natural Gas Supply
10	Relief Valve
11	Pressure Regulator, Natural Gas Supply
A	Regulator Sense Line Valve
B1	Emergency Bypass Valve #1
B2	Emergency Bypass Valve #2
C	Outlet Valve

Figure 5: Valve Section Connections Diagram – Dual Solenoid

Blanket Pressure Outlet to Odorant Tank

Relief Outlet

Natural Gas Supply Inlet From Pneumatic Filter

Sense Line to Pressure Regulator

Electrical Connection to Controller

Enclosure Not Shown For Clarity

Figure 6: Valve Section Diagram – Dual Solenoid

FRONT VIEW, ANGLED

Enclosure Not Shown For Clarity

No.	Description
1	Differential Pressure Transmitter
2	DP Transmitter, Low Side
3	DP Transmitter, High Side
4	2-Way Solenoid, Primary
5	Terminal Block & Electrical Connections
6	2-Way Solenoid, Backup
7	Pressure Gauge, Natural Gas Supply
8	Relief Valve
9	Pressure Regulator, Natural Gas Supply
A	Regulator Sense Line Valve
B1	Emergency Bypass Valve #1
B2	Emergency Bypass Valve #2
C	Outlet Valve

Figure 7: Valve Section Connections Diagram – Triple Solenoid With Heater

Blanket Pressure Outlet to Odorant Tank

Relief Outlet

Natural Gas Supply Inlet From Pneumatic Filter

Natural Gas Connection to Volume Bottle

Sense Line to Pressure Regulator

Electrical Connection to Controller

Electrical Connection to Heater

Enclosure Not Shown For Clarity

Figure 8: Valve Section Diagram – Triple Solenoid With Heater

FRONT VIEW, ANGLED

Enclosure Not Shown For Clarity

No.	Description
1	2-Way Solenoid, Low Flow
2	Differential Pressure Transmitter
3	DP Transmitter, Low Side
4	DP Transmitter, High Side
5	Check Valve
6	2-Way Solenoid, High Flow
7	Terminal Block & Electrical Connections
8	Thermostat
9	Heater
10	2-Way Solenoid, Backup
11	Pressure Gauge, Natural Gas Supply
12	Relief Valve
13	Pressure Regulator, Natural Gas Supply
A	Regulator Sensing Valve
B1	Emergency Bypass Valve #1
B2	Emergency Bypass Valve #2
C	Outlet Valve

Figure 9: Valve Section Connections Diagram– Triple Solenoid

Blanket Pressure Outlet to Odorant Tank

Relief Outlet

Natural Gas Supply Inlet From Pneumatic Filter

Natural Gas Connection to Volume Bottle

Sense Line to Pressure Regulator

Electrical Connection to Controller

Enclosure Not Shown For Clarity

Figure 10: Valve Section Diagram – Triple Solenoid

FRONT VIEW, ANGLED

Enclosure Not Shown For Clarity

No.	Description
1	2-Way Solenoid, Low Flow
2	Differential Pressure Transmitter
3	DP Transmitter, Low Side
4	DP Transmitter, High Side
5	Check Valve
6	2-Way Solenoid, High Flow
7	Terminal Block & Electrical Connections
8	2-Way Solenoid, Backup
9	Pressure Gauge, Natural Gas Supply
10	Relief Valve
11	Pressure Regulator, Natural Gas Supply
A	Regulator Sensing Valve
B1	Emergency Bypass Valve #1
B2	Emergency Bypass Valve #2
C	Outlet Valve

Figure 11: Pneumatic Filter

Natural Gas Supply Inlet
¼" FNPT

Natural Gas Supply
Outlet to Valve Section
Natural Gas Supply Inlet

E

F

1

G

Drain
¼" FNPT

No.	Description
1	Welker® F-5 Filter/Dryer
E	F-5 Inlet Valve
F	F-5 Outlet Valve
G	F-5 Drain Valve

Figure 12: Volume Bottle Diagram

Natural Gas Connection
to Valve Section

D

1

No.	Description
1	Volume Bottle
D	Volume Bottle Valve

SECTION 2: INSTALLATION & OPERATION

2.1 Before You Begin

After unpacking the unit, check the equipment for compliance and any damage that may have occurred during shipment. Immediately contact a Welker® representative if you received damaged equipment.

When sealing fittings with PTFE tape, refer to the proper sealing instructions for the brand used.

The ECOsystem™ will ship skid-mounted and "hard-tube" connected with manufacturer-supplied fittings and hardware. However, the customer will need to supply some tubing and fittings in order to complete the installation of the system.

The ECOsystem™ must be installed in a section of the natural gas pipeline with a regulated pressure drop, such as a regulator station or gate station.

All electrical connections must meet local and national electric codes, and excessive weight added to the conduit run must be supported.

2.2 Installation

System Skid

1. Mount the skid to a flat, level surface, such as a concrete slab.
2. Connect a grounding wire to each grounding lug on the skid to safely ground the system.
3. Connect the skid drain port(s) to an appropriate draining location.

System Connections

4. Using appropriately sized customer-supplied tubing, connect from the outlet of the pipeline upstream of the regulated pressure drop to the inlet of the Welker® F-5 Filter Dryer (*Figure 11*).

Tubing must have a minimum diameter of $\frac{3}{8}$".

5. Connect from odorized gas outlet valve K2 to an unused valve on the natural gas pipeline downstream of the regulated pressure drop (*Figure 1* or *Figure 2*).

Welker® recommends using stainless steel tubing for all natural gas process lines, because plastic tubing can absorb odorant from the gas.

6. Ensure that all valves on the system are closed.
7. Ensure that all fittings, connections, and bolts are tightened.

Electrical Connections

> **STOP** Turn OFF the electrical supply prior to making electrical connections.

8. Connect an appropriate electrical supply to the controller. Refer to industry standards for appropriate electrical connections to interface with the PLC.

> **STOP** For systems used in hazardous locations, sealing compound is required to seal all fittings to restrict the passage of gases, vapors, or flames.

9. Connect the customer gas flow signal device to the termination block.

> **NOTE** The controller can accept analog or pulse input.

10. If the ECOsystem™ is not equipped with the optional flag tracker level indicator, installation is now complete; proceed to *Section 2.3, Start-Up Procedures*. If the ECOsystem™ is equipped with the optional flag tracker level indicator, continue to step 11.

Flag Tracker Level Indicator (Optional)

> **!** The float and gasket must be installed to the flag tracker level indicator prior to filling the odorant supply tank.

> **NOTE** The float and gasket are packaged separately for shipment.

11. Remove the bottom drain flange from the base of the level indicator.
12. Install the float to the spring on the bottom drain flange. The top of the float should point up.

> **NOTE** The top of the float is marked to ensure proper orientation.

> **NOTE** The spring attached to the bottom drain flange cushions the float when the odorant supply tank is empty.

13. Replace the shipping gasket with the provided gasket.
14. Install the bottom drain flange with float to the level indicator.

2.3 Start-Up Procedures

Before Commissioning Day:
Odorant Supply Tank

1. Fill the odorant supply tank in accordance with company policy and procedure, taking care not to exceed 80% of the total volume of the supply tank.

> 🛑 **STOP** Never fill the odorant supply tank above 80% of its capacity. Allow at least 20% for product expansion, should the tank be exposed to increased temperatures.

2. Check the odorant supply tank for leaks and repair as necessary.

On Commissioning Day:
Gas Flow

1. Ensure the site is ready to flow gas. Determining that the odorizer is operating correctly can only be verified with gas flow.
2. Enter the Controller Setup menu and ensure that the Odor Rate Required odorization rate is set to 0.0 Lbs/MMcf (*Figure 25*).
3. Initiate gas flow.
4. Enter the Monitor menu's Rates & Totals submenu (*Figure 17*) and verify that the odorizer is reporting a gas flow rate substantially similar to the gas flow rate reported by the flow meter.

> 📝 While the gas flow rate is increasing or decreasing, the rate reported by the odorizer will lag the rate reported by the flow meter.

5. Should the odorizer rate not substantially match the flow meter flow rate, check the Minimum and Maximum flow rates on the Gas Flow Signal setup page (*Figure 37*) and adjust if necessary.
6. Do not commission the odorizer until steps 1–5 are verifiably completed.

Natural Gas Supply Regulator

> 📝 Open and shut valves slowly.

7. As necessary, open any valves between the outlet on the natural gas pipeline and the F-5 inlet.
8. Open F-5 inlet valve E and F-5 outlet valve F (*Figure 11*).
9. Apply natural gas to the valve section to pressurize the natural gas supply regulator (*Figure 3*, *Figure 4*, *Figure 5*, *Figure 6*, *Figure 7*, *Figure 8*, *Figure 9*, or *Figure 10*).

> 📝 The pneumatic supply regulator comes factory-set to the setting required to operate the solenoids.

Valve Configuration

10.   Slowly open the valves indicated in Table 3.

Table 3: Start-Up Valve Orientation		
Valve Letter	**Valve Description**	**Reference Figures**
C	Outlet Valve	3–10
J1 & J2	Blanket Pressure Inlet	1 & 2
K1 & K2	Odorized Gas Outlet	1 & 2

> Once odorized gas outlet valves K1 and K2 are open, gas may free flow from the odorant supply tank to the pipeline until pressure in the system equalizes. Note that free flow will last only for a short time and over-odorization will not occur.

11.   If applicable, slowly open any valves between the odorized gas outlet on the odorant supply tank and the pipeline.
12.   Check for leaks and repair as necessary.

Odorant Supply Tank

13.   Verify pipeline pressure at the point of injection.
14.   Check the differential pressure that the regulator in the odorizer is set to. This will be stamped on a tag affixed to the regulator.
15.   Open regulator sense line valve A (*Figure 4*, *Figure 6*, *Figure 8*, or *Figure 10*).
16.   Open emergency bypass valves B1 and B2 (*Figure 4*, *Figure 6*, *Figure 8*, or *Figure 10*).
17.   Observe the gauge on the regulator as pressure increases. The gauge will show tank pressure plus the differential pressure setpoint shown on the tag.
18.   In order to allow pressure to stabilize, periodically shut emergency bypass valve B1.
19.   If the pressure displayed on the gauge is within 1 or 2 psig of the pipeline pressure plus the differential, continue to step 20. If not, then reopen emergency bypass valve B1 and repeat steps 17 and 18.
20.   Close emergency bypass valves B1 and B2 (*Figure 4*, *Figure 6*, *Figure 8*, or *Figure 10*).
21.   If applicable, open regulator sense line valve A (*Figure 4*, *Figure 6*, *Figure 8*, or *Figure 10*).
22.   If applicable, open volume bottle valve D (*Figure 12*). The volume bottle will fill with the conditioned natural gas.

Touch Screen Controller Configuration

23.   Verify that the customer set points have been correctly set by the manufacturer.
24.   Enter the Controller Setup menu and set the Odor Rate Required to the target odorization rate (in Lbs/MMcf) (*Figure 25*).

Verifying Solenoid and Differential Pressure (DP) Transmitter Operation

25.   From the controller, verify the correct operation of the solenoid and DP transmitter. From the Home screen, select Monitor (*Figure 16*). From the Monitor menu, select System I/O (*Figure 20* and *Figure 21*).
26.   Backup Sol should **always** be green.
27.   As the controller opens the solenoid, verify that DP transmitter raw data drops at the same time as Main Sol turns green.
28.   As the controller closes the solenoid, verify that DP transmitter raw data rises again after Main Sol clears.
29.   Once the correct operation of the solenoid and DP transmitter has been confirmed, the ECOsystem™ is operational.

> No alarms should be showing on the Current Alarms screen (*Figure 15*) or the alarm display area (to the left and just above the function buttons) (*Figure 14*).

> Welker® recommends remaining onsite for at least one-half (½) hour to ensure no alarms develop.

3.1 Understanding the Display

The touch screen controller is used to modify system parameters and view current system information and current alarm status.

The touch screen controller is a menu-driven system. The Home screen is the top screen in the menu tree (*Figure 13*).

Figure 13: Home Screen

Monitor
Takes you to the monitoring screens where you can view current information about the operation of the odorizer.

Setup
Takes you to the setup screens where you can change any set point values in the odorizer.
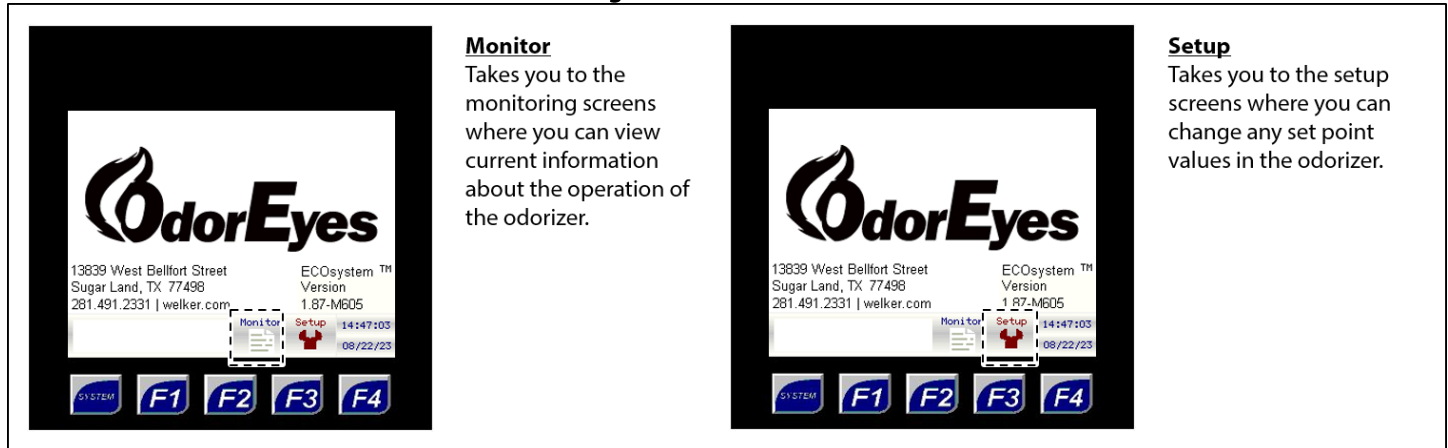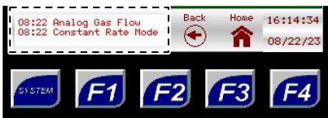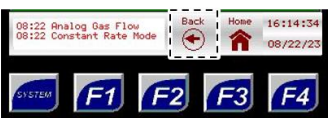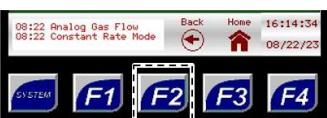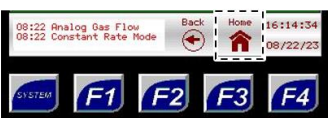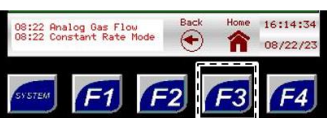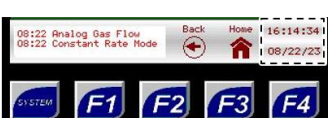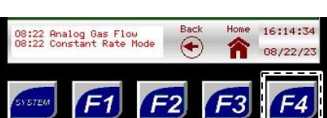
From the Home screen, the user can access three (3) types of screens:
- **Menu-**from this type of screen, the user can access submenus.
- **Informational-**from this type of screen, the user can monitor the odorizer and view current operating conditions. These screens have a **blue** background.
- **Setup-**from this type of screen, numeric and/or text values that affect the setup of the odorizer can be changed. These screens have a **red** background.

Navigating the Display

Figure 14: Toolbar and Function Keys

TOOLBAR		FUNCTION KEYS	
	Alarms View any active alarms.		**F1 Key** Takes you to the **Home** screen.
	Back Button Takes you back one (1) level in the menu tree to the previous screen.		**F2 Key** Takes you to the **Current Alarms** screen.
	Home Button Takes you to the **Home** screen.		**F3 Key** Takes you to the **Logging Setup** screen.
	Current Date and Time This is the current date and time in the odorizer. It can be changed from any screen.		**F4 Key** Starts and stops the auto scroll function.

The toolbar appears on every screen.

If nothing on the screen is pressed for a certain amount of time, the sleep function will cause the backlight on the screen to turn off. To wake up the controller, press anywhere on the screen or press one of the function keys.

Viewing the Current Alarms

From any screen, press the F2 key to go to the Current Alarms screen (*Figure 15*).

Figure 15: Current Alarms Screen
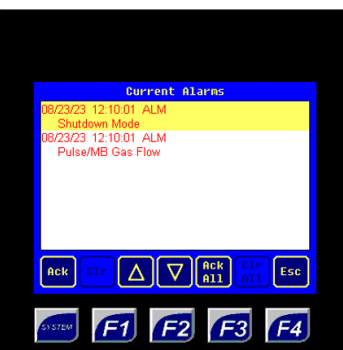
Current Alarms
Active alarms are **red** and are labeled "ALM."

Active alarms that have been acknowledged are **purple** and are labeled "ACK."

Normal (i.e., inactive) alarms are **green** and are labeled "RTN."

Table 4: Current Alarms	
Analog Gas Flow	Can only be active if Analog mode is selected. The controller will go into the selected fail mode when this alarm is active. **NOTE:** If this alarm is active, verify that a 4–20 mA signal is being received from the flow meter.
Pulse Gas Flow	Can only be active if Pulse mode is selected. The controller will go into the selected fail mode when this alarm is active. **NOTE:** If this alarm is active, the pulse input cutoff time has expired. Verify that a pulse input is being received from the flow meter. If this alarm is active when the controller is receiving pulse input from the flow meter, Welker® recommends increasing the pulse input cutoff time to prevent the alarm from becoming active prematurely.
Constant Rate Mode	Can only be active if Constant Rate Mode is specified as the desired fail mode. The controller will enter this gas flow fail mode when there is a gas flow signal loss.
Shutdown Mode	Can only be active if Shutdown Mode is specified as the desired fail mode. The controller will enter this gas flow fail mode when there is a gas flow signal loss.
Fixed Mode	Can only be active if Fixed Mode is enabled and the Fixed Alarm Rate is set. **NOTE:** If this alarm is active, the Fixed Alarm Rate will be the assumed gas flow in the system and will override any other input parameters. The Fixed Rate Alarm will not clear until Fixed Mode is disabled.
Analog Temperature	Can only be active if Transmitter is set as the RTD setup method. **NOTE:** If this alarm is active, verify that a 4–20 mA signal is being received from the temperature transmitter. If this alarm is active, the system will use the manually entered temperature; therefore, Welker® recommends regularly updating the manual temperature value.
Analog Tank Level	Can only be active if an electronic level transmitter is used to track the odorant tank level and the controller loses the 4–20 mA signal from the transmitter. **NOTE:** If this alarm is active, the controller will automatically switch to the odorant flow method to track the odorant tank level. The controller will use the value of odorant in the tank and subtract the appropriate volume each time the solenoid opens.
Tank Low Level	Active if the odorant tank level has dropped below the specified value. **NOTE:** This alarm will clear once the tank is filled with odorant or the alarm set point is lowered.
Odorant Overflow	Active if the differential pressure (DP) transmitter signals the controller indicating gas is passing through it even though the solenoids should not be open. **NOTE:** If this alarm is active, it could be an indication that a solenoid is stuck open and that the system is over-odorizing or that the DP transmitter configuration needs to be adjusted.
Odorant No Flow	Active if the controller signals the solenoid to open but does not receive a signal from the DP transmitter confirming the solenoid has opened. **NOTE:** If this alarm is active, it could be an indication that the solenoid has failed closed or that the pressure differential across the system is not great enough to odorize.

3.2 Navigating the Monitor Menus

Through the Monitor menus, the user can access the Rates & Totals, Solenoid Stats, Tank Level, System I/O, Local Audit Trail, and Local Alarms Log to view current information for the odorizer.

Monitor screens, which have a **blue** background, are informational screens: no values can be changed from these screens.

Figure 16: Monitor Menu Submenus

Monitor Menu
Access monitor submenus to view current information about the operation of the odorizer.

All monitor screens have a **blue** background.

Rates & Totals
Enter this submenu for an overview of system performance.

System I/O
Enter this submenu to view the current status of the digital inputs, digital outputs, and analog inputs in the system.

Solenoid Stats
Enter this submenu to view the current solenoid statistics.

Local Audit Trail
Enter this submenu to view the audit trail, which is stored in the system's internal memory and to the SD card if SD Card Data Logging is enabled.

Tank Level
Enter this submenu to view the current level and temperature of odorant in the tank.

Local Alarms Log
Enter this submenu to view the alarms log, which is stored in the system's internal memory and to the SD card if SD Card Data Logging is enabled.

Rates & Totals

The Rates & Totals submenu provides the user with an overview of system performance.
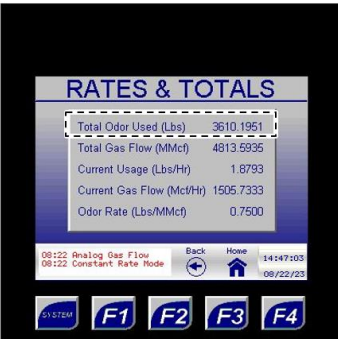
Figure 17: Monitor Menu – Rates & Totals

Rates & Totals
Screen displays an overview of system performance.
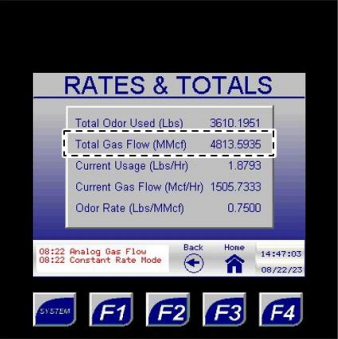
Total Odor Used (Lbs)
The total number of pounds of odorant that have been pulsed into the pipeline since the system was last reset.

This value must occasionally be manually reset at a time interval determined by the user.

Current Gas Flow (Mcf/Hr)
The current volume of gas flowing in the pipeline relative to time.

Total Gas Flow (MMcf)
The total amount of gas flow the odorizer has seen since the system was last reset.

This value must occasionally be manually reset at a time interval determined by the user.

Odor Rate (Lbs/MMcf)
The current odorant usage by the system relative to gas flow (Lbs/MMcf).

Current Usage (Lbs/Hr)
The current odorant usage by the system relative to time.

If the system status totals are used to track system performance, they should be periodically reset through the Controller Setup submenu (*Figure 25*). As the total values increase, they will begin to lose accuracy and will eventually stop accumulating.

Solenoid Stats

Solenoid Stats
Screen displays the current solenoid statistics.

Dwell Time (Sec)
The dwell time is the length of time (in seconds) the solenoid remains open each time it opens.

Total Pulses
The total number of times the solenoid has pulsed odorant into the pipeline.

**Cycle Time (Sec)**
The cycle time is how frequently (in seconds) the solenoid is opening.

Lbs/Pulse
Pounds per pulse is the volume of odorant pulsed into the pipeline every time the solenoid opens.

Pulses/Hr
Pulses per hour is the number of times the solenoid will open per hour given the current dwell and cycle times.

Control Sol:
This indicates which solenoid is currently operating.
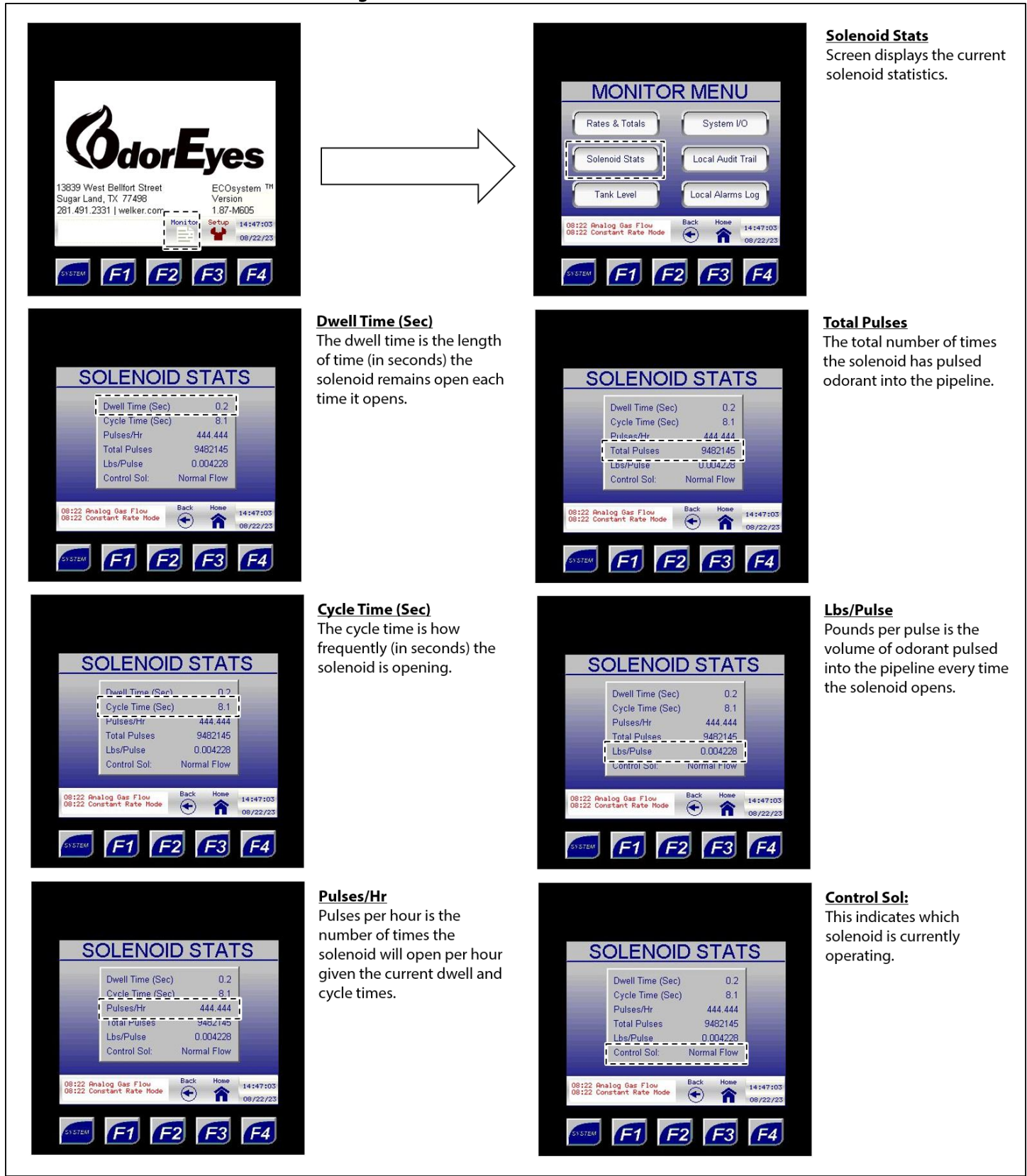
Odorant Tank Level

Figure 19: Monitor Menu – Tank Level

This screen displays the amount of odorant remaining in the odorant supply tank in inches, US gallons, and pounds, as well as the temperature of the odorant in degrees Fahrenheit.

These values will either be from a transmitter or manually entered.
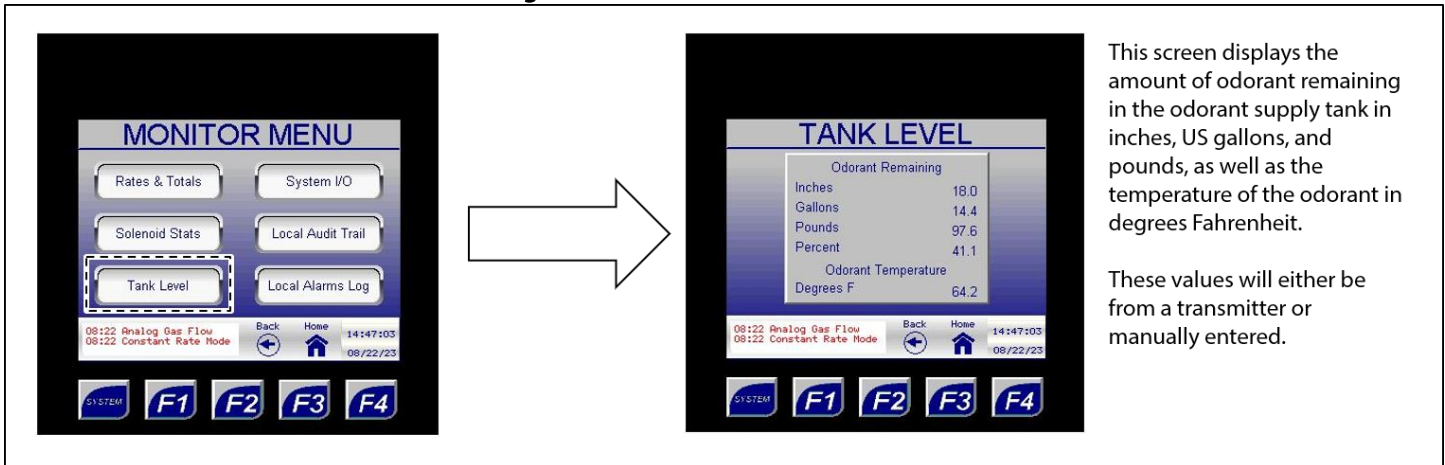
System I/O

> The System I/O submenu provides the user with an overview of the current status of digital inputs, digital outputs, and analog inputs in the system.

Figure 20: Monitor Menu – System I/O, 1 of 2

This screen displays the current status of the digital inputs, digital outputs, and analog inputs in the system.

This will close when the flow switch opens.

This will close when the normal flow solenoid (i.e., primary solenoid) opens.

This will close when the system receives a pulse from the first customer gas flow meter on the pipeline.

This will close when the backup solenoid opens, if applicable.

This will close when the system receives a pulse from the second customer gas flow meter on the pipeline.

This indicates the alarm status.

The alarm status is normally closed.

This will close when the low flow solenoid is open, if applicable.

Analog Input Conversion	
Signal (mA)	**Raw Count**
4	6400
20	32000
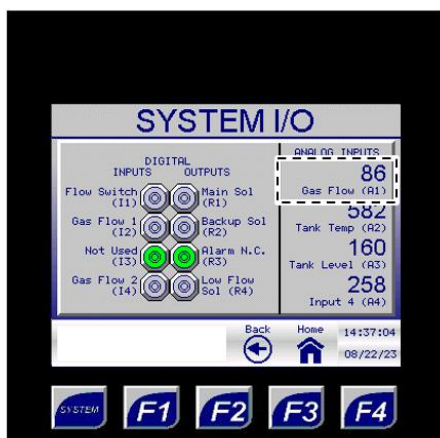
This analog signal is the raw count coming into the odorizer after the signal has been converted from milliamps. This value will vary according to the output from the customer gas flow meter.
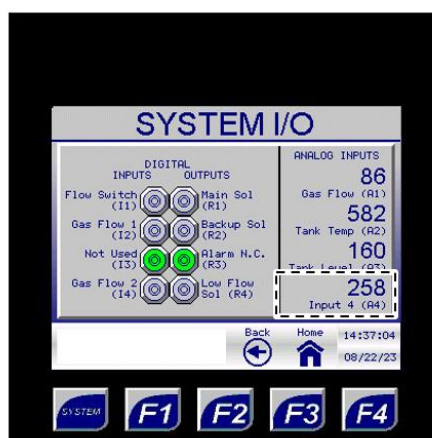
This analog signal is the raw count coming into the odorizer after the signal has been converted from milliamps. This value will vary according to the output from the differential pressure (DP) transmitter.

This analog signal is the raw count coming into the odorizer after the signal has been converted from milliamps. This value will vary according to the output from the RTD, if one is used.
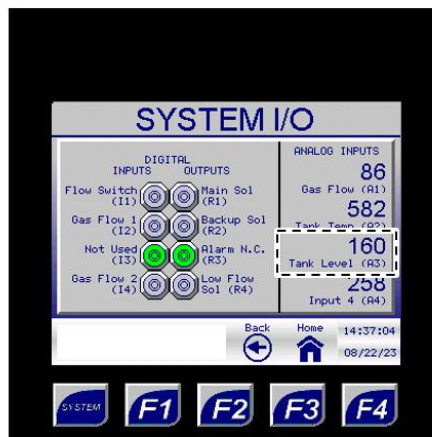
This analog signal is the raw count coming into the odorizer after the RTD signal has been converted from milliamps. This value will vary according to the output from the level transmitter.

Local Audit Trail

From the Local Audit Trail submenu, the user can access the audit trail records stored on internal memory. Up to 600 audit trail records can be stored and viewed.

If SD Card Data Logging is enabled, the audit trail records will also be stored on the installed micro SD card. The micro SD card is equipped with 8 GB of storage.

Figure 22: Monitor Menu – Local Audit Trail
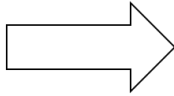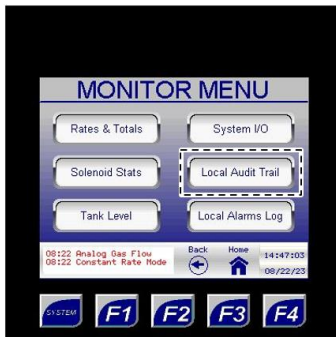
Local Audit Trail
Enter this submenu to view the audit trail, which is stored in the system's internal memory and to the SD card if SD Card Data Logging is enabled.

Press the up or down arrow to scroll through the audit trail records.

Up to 600 audit trail records can be stored in the system's internal memory.

If SD Card Data Logging is enabled, these records will also be stored to the SD card.

Total Gas Flow (MMcf)
Total amount of gas flow the odorizer saw during the user-defined time frame.

The audit trail record number.

The date and time the audit trail record was captured.

Odor Rate for Period (Lbs/MMcf)
Total odorant usage by the system relative to gas flow (Lbs/MMcf) during the user-defined time frame (a.k.a. injection rate).

Total Odor Used (Lbs)
Total amount of odorant in pounds that was injected during the user-defined time frame.

Odorant Remaining (Gal)
Total amount of odorant remaining in US gallons at the end of the user-defined time frame.

Local Alarms Log
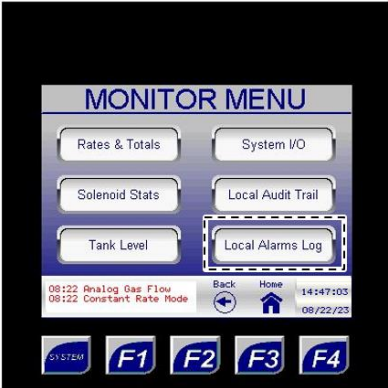
From the Local Alarms Log submenu, the user can access the alarms log stored on internal memory. Up to 428 logged alarms can be stored and viewed.

If SD Card Data Logging is enabled, the logged alarms will also be stored on the installed micro SD card. The micro SD card is equipped with 8 GB of storage.

Figure 23: Monitor Menu – Local Alarms Log

Local Alarms Log
Enter this submenu to view the alarms log, which is stored in the system's internal memory and to the SD card if SD Card Data Logging is enabled.

Press the up or down arrow to scroll through the alarms log records.

Up to 428 alarms log records can be stored in the system's internal memory.

If SD Card Data Logging is enabled, these records will also be stored to the SD card.

The alarm code.
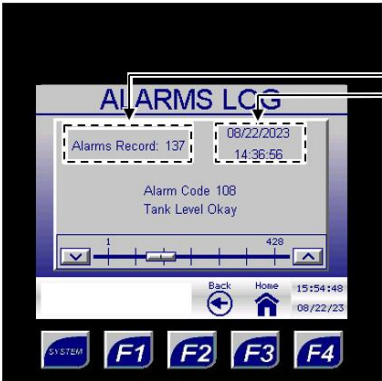
The alarms log record number.

The date and time the alarm occurred or cleared.

The name of the alarm.

3.3 Navigating the Setup Menus

> Through the Setup menu, the user can access the Controller Setup, Odorant Tank, Gas Flow Signal, Modbus Setup, Auto Scroll Setup, and Logging Setup and change numeric and/or text values that alter the parameters and features of the odorizer.

> ⚠ Changing numeric and/or text values in the Setup submenus will alter how the system operates.

Figure 24: Setup Menu Submenus

Password Login
When the Setup button is touched, the Password Login screen appears.

Password Login
Enter a password to access the Setup Menu. Default password is 2331. To change the password, access the Auto Scroll Setup screen.

See *Figure 43*.

Setup Menu
Access setup submenus to change set point values in the odorizer.

All setup screens have a **red** background.

Controller Setup
Enter this submenu to configure the operation of the odorizer.

Modbus Setup
If the Modbus input method is used, enter this submenu to configure the Modbus input and view the current status of the Modbus.

Odorant Tank
Enter this submenu to set the parameters for the odorant tank and temperature transmitter.

Auto Scroll Setup
Enter this submenu to customize screen operation.

Gas Flow Signal
Enter this submenu to set the parameters for the gas flow signal and set the fail mode.

Logging Setup
Enter this submenu to enable or disable data logging to the SD card and monitor the status of the SD card.

Changing Values on Setup Screens

Numeric Values

1. To change a numeric value, press on the value to be changed. A keypad will appear on the screen.
2. Type the new value using the keypad.
3. Once the new numeric value has been entered, press ENTER to save the changes.

> If the new value entered is outside the range of allowable values, the value will revert to the previous value once ENTER is pressed. The keypad will stay active, allowing another value to be entered.

Text Values

4. To change a text value, press on the value to be changed. A dropdown menu will appear on the screen.
5. Scroll through the value's options using the arrow keys in the dropdown menu.
6. Highlight the desired text value, and then press ENTER to save the changes.

> If a mistake is made while entering the new value or if the value does not need to be changed, press the Home button to discard the changes and return to the Home screen.

Controller Setup

> Through the Controller Setup submenu, the user can set the general parameters for the odorizer.

Figure 25: Setup Menu – Controller Setup

Odor Rate Required
Set the number of pounds of odorant to pulse per million standard cubic feet (MMcf) of gas passed.

Reset Totals
Toggling this field to "Yes" causes the gas flow and odorant usage totals to be reset.

Once reset, this field will automatically revert to "No."

Alarm Control Setup
Enter this submenu to configure odorant flow alarms and the differential pressure (DP) transmitter.

See *Figure 29* and *Figure 30*.

Analog Input Setup
Enter this submenu to configure the analog inputs.

See *Figure 26*.

Digital Output Setup
Enter this submenu to configure the digital outputs.

See *Figure 28*.

Solenoid Setup
Enter this submenu to configure the solenoid operations.

See *Figure 27*.

> If the system status totals are used to track system performance, they should be periodically reset through the Controller Setup submenu (*Figure 25*). As the total values increase, they will begin to lose accuracy and will eventually stop accumulating.

Analog Output Setup

Analog Inputs Setup
Enter this submenu to configure the analog inputs if the customer desires to receive the odorization rate in the form of an analog signal.
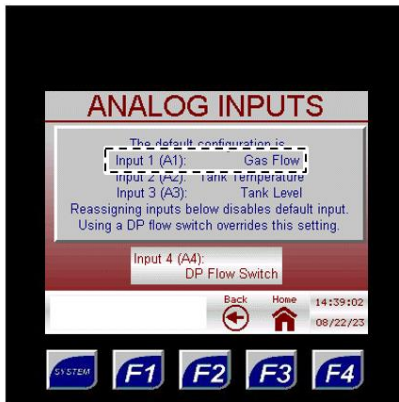
Input 1: Gas Flow
This remains fixed. However, reassigning inputs under Input 4 disables the default input.
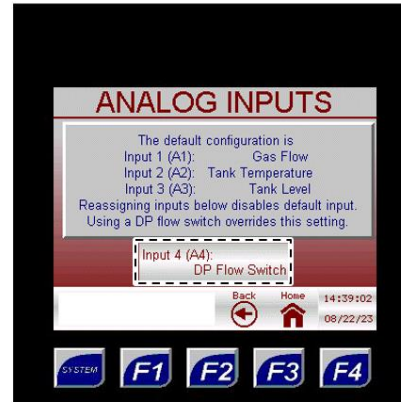
Input 4
Touch this to change the function of Input 4. **Only change under guidance from Welker® OdorEyes® personnel.** It can be changed to one of the following:
- Disabled
- Gas Flow
- Tank Temperature
- Tank Level
- DP Flow Switch
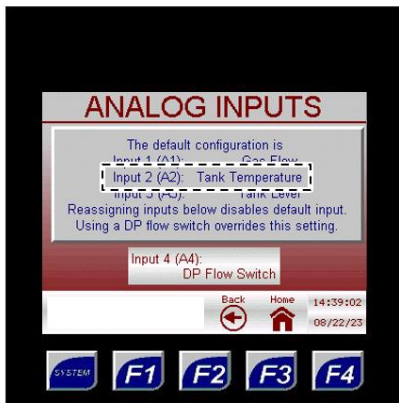
Input 2: Tank Temperature
This remains fixed. However, reassigning inputs under Input 4 disables the default input.
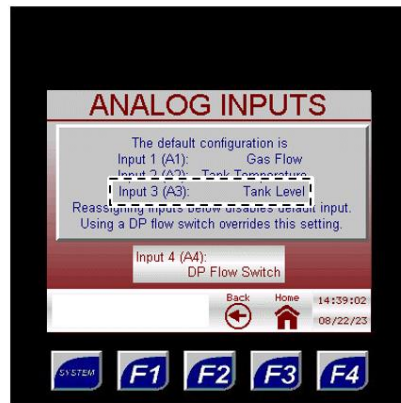
Input 3: Tank Level
This remains fixed. However, reassigning inputs under Input 4 disables the default input.

Analog Input Conversion	
Signal (mA)	Raw Count
4	6400
20	32000

STOP Only change Analog Input 4 under guidance from Welker® OdorEyes® personnel.

Solenoid Setup
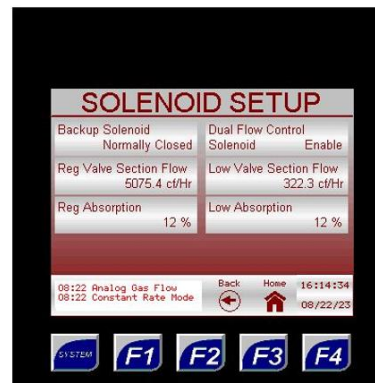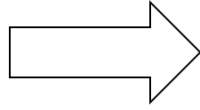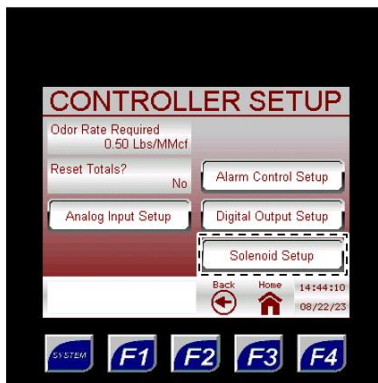
Solenoid Setup
Enter this submenu to configure the solenoid setup if the system is equipped with two (2) or three (3) solenoids.
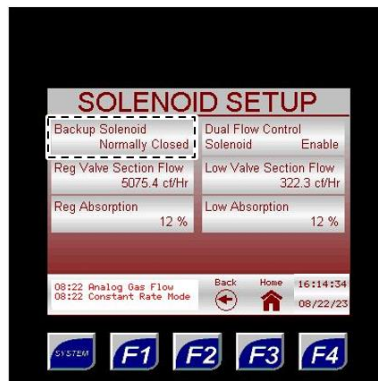
Backup Solenoid
For systems that use a backup solenoid in series with the primary solenoid, the backup solenoid can be normally open or normally closed.

This must be set correctly so that the system will operate properly in the event of primary solenoid failure.
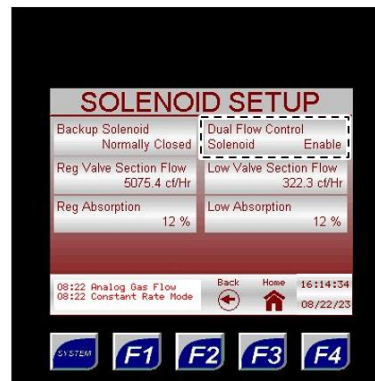
Dual Flow Control Solenoid
For dual solenoid systems, this should be **disabled**.

For triple solenoid systems, this should be **enabled**.

This is set at the factory.
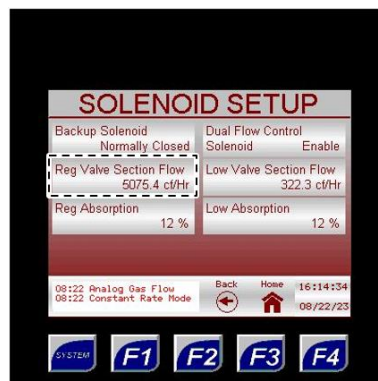
Reg Valve Section Flow
This constant, which is based on the inlet pressure and the pressure drop across the solenoid, is the volume of gas (cf/Hr) used by the control logic for calculations.

This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
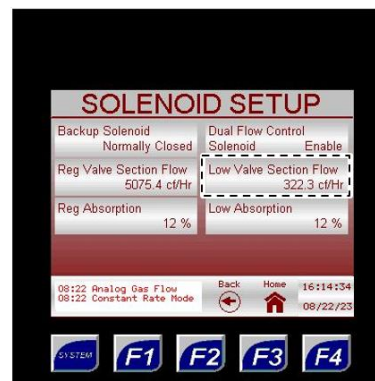
Low Valve Section Flow
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
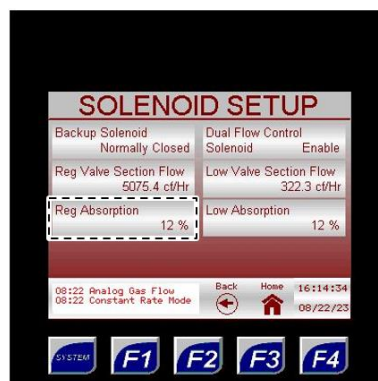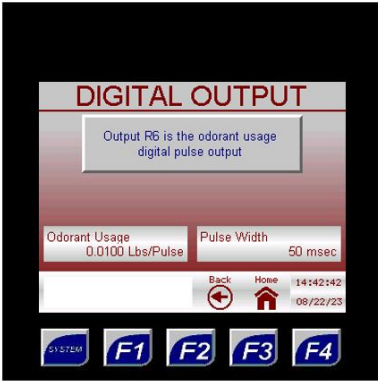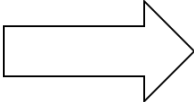
Reg Absorption
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
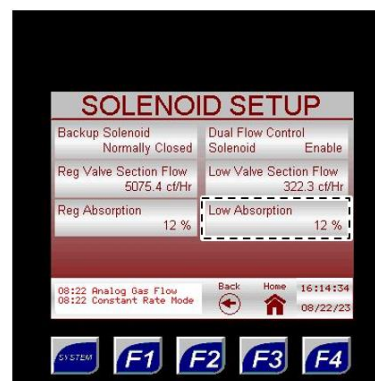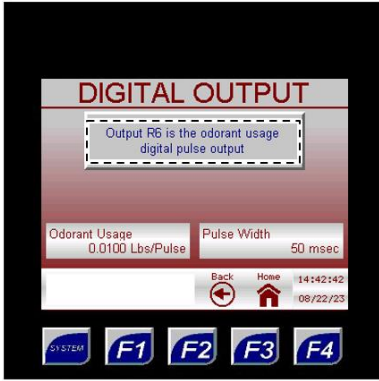
Low Absorption
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.

Digital Output Setup
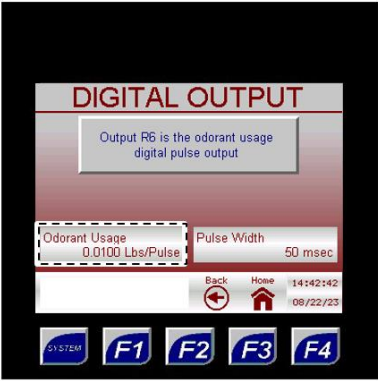
Figure 28: Controller Setup – Digital Output Setup
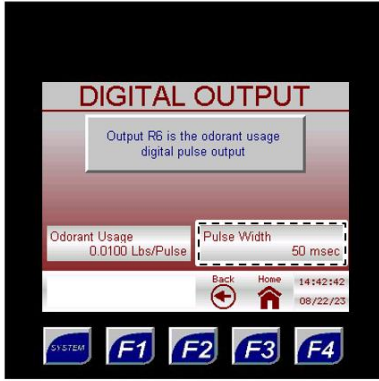
Digital Output
Enter this submenu to configure the odorant usage digital pulse output.

Output R6
Output R6 is the odorant usage digital pulse output.

Odorant Usage
This indicates odorant usage in Lbs/Pulse.

Pulse Width
This indicates the odorant pulse width in terms of milliseconds.

Alarm Control Setup

Figure 29: Controller Setup – Alarm Control Setup
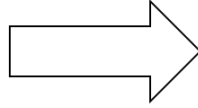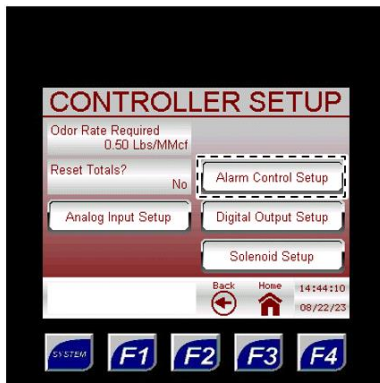
Alarm Control Setup
Enter this submenu to configure the odorant flow alarms and to enter the differential pressure (DP) transmitter setup submenu.
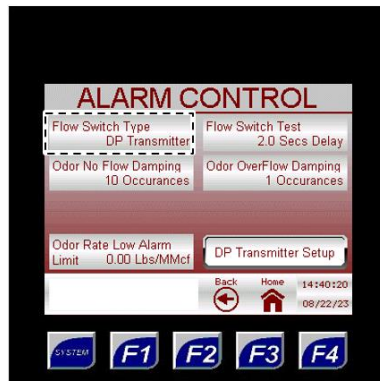
Flow Switch Type
This indicates that the odorant flow switch type is a differential pressure (DP) transmitter.

Flow Switch Test
This indicates the delay, in seconds, of the flow switch test.

Odor No Flow Damping
This indicates the number of times odorant flow is not detected before an alarm occurs.

Odor OverFlow Damping
This indicates the number of times when odorant overflow occurs before an alarm occurs.

Odor Rate Low Alarm Limit
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.

DP Transmitter Setup
Enter this submenu to set up the differential pressure transmitter.

DP Transmitter Setup

Figure 30: Alarm Control Setup – Differential Pressure (DP) Transmitter Setup
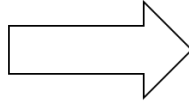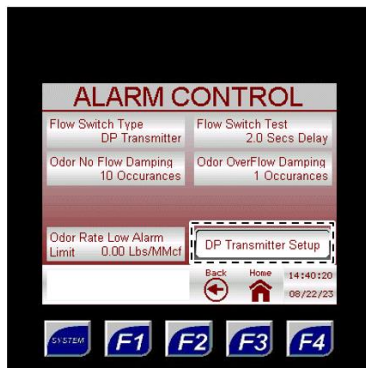
DP Transmitter Setup
Enter this submenu to configure the differential pressure transmitter setup.
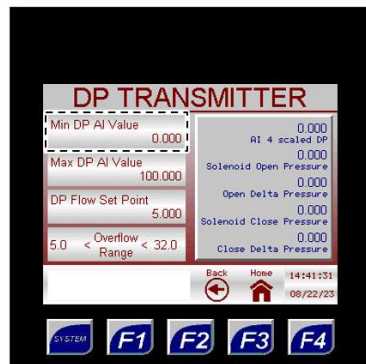
Min DP AI Value
This is the value that is represented by 4 mA from the DP transmitter.

This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
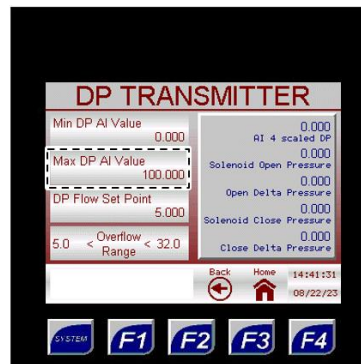
Max DP AI Value
This is the value that is represented by 20 mA from the DP transmitter.

This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
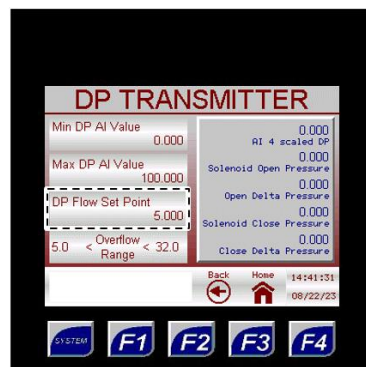
DP Flow Set Point
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
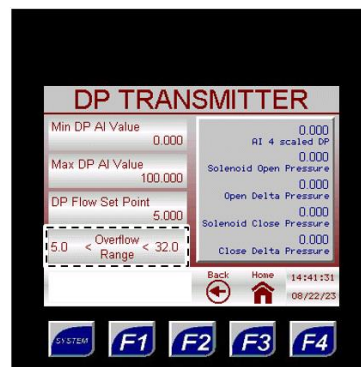
Overflow Range
This value is factory-set according to customer specifications and should not be changed unless instructed by Welker® OdorEyes® personnel.
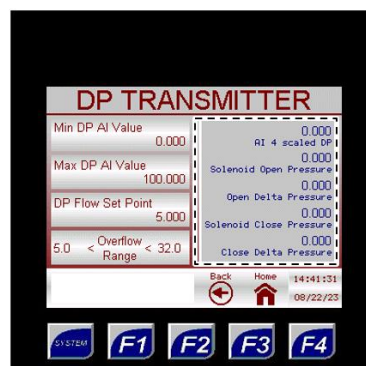
DP Transmitter Data
This displays live data from the differential pressure transmitter.

🛑 **STOP** Only change differential pressure (DP) values under guidance from Welker® OdorEyes® personnel.

Odorant Tank Setup

> Through the Odorant Tank Setup submenus, the user can input information for the odorant tank and temperature transmitter.

Figure 31: Setup Menu – Odorant Tank

Odorant Tank
Enter this submenu to set the parameters for the odorant tank and temperature transmitter.

Tank Level Setup
Set the parameters for how the tank level will operate.

RTD Setup
Select the method for reading the temperature of the odorant in the tank.

Tank Volume Setup
View the tank volume settings and access the strapping tables.

Odorant Type Setup
View the factory-set absorption values at different temperatures for the odorant used.

Tank Level Setup

Figure 32: Odorant Tank – Tank Level Setup

Tank Level Setup
Set the parameters for how the tank level will operate.

Method
Toggle between the two (2) methods for tracking the odorant tank level:
1. odorant flow
2. electronic level transmitter

Low Level Alarm Limit
The low level alarm set point is a percent value at which the system will trigger an alarm for low odorant level in the tank.

To clear this alarm, the tank can be filled with odorant or the set point can be lowered.

Current Level
View the current level of the tank in inches and US gallons.

Adjust Level
If the odorant flow method is used, the current tank level can be manually adjusted.

Min Level
If the electronic level transmitter method is used, this value is the 4 mA signal.

This value is typically factory-set at 0.0 inches.

Max Level
If the electronic level transmitter method is used, this value is the 20 mA signal.

When using an electronic level transmitter to track the odorant tank level, the Method should be set to Transmitter. When estimating the odorant tank level based on odorant usage, the Method should be set to Odorant Flow.

The Current Level numeric value cannot be directly changed. Instead, the user must enter a value in the Adjust Level field to increase or decrease the Current Level by the specified amount.
- To decrease the Current Level, enter the volume to be subtracted from the current level as a negative number in the Adjust Level field, and then press ENTER to save the changes. The Current Level should have decreased by the amount entered, and the Adjust Level should have reverted to 0.0.
- To increase the Current Level, enter the volume to be added to the current level in the Adjust Level field, and then press ENTER to save the changes. The Current Level should have increased by the amount entered, and the Adjust Level should have reverted to 0.0.

Tank Volume Setup

Figure 33: Odorant Tank – Tank Volume Setup

Tank Volume Setup
Set the parameters for the tank volume.

Size
This is the volume of the tank in US gallons.

Odorant Density
The odorant density will vary according to the odorant used.

The odorant density should be published by the odorant manufacturer in pounds/US gallons at 60 °F.

Volume Conversion
This value is the volume of liquid odorant per inch. This is used only with vertical odorant tanks.

Strapping Table
Toggle this field to enable or disable the tank strapping field.

For horizontal odorant tanks, this field should be **enabled**. For vertical odorant tanks, this field should be **disabled**.

Strapping Table Pg 1, 2, 3
If strapping is enabled, view the tank depth and tank volume for each strapping point. See *Figure 34*.

Figure 34: Tank Volume Setup – Strapping Tables
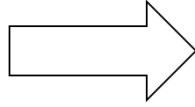
The strapping table page number.

Each page displays the tank depth in inches and the tank volume in US gallons for multiple strapping points.

The minimum strapping point for the tank is displayed on page 1.

It is zero (0) inches and zero (0) US gallons.

The right column of each table displays the tank volume in US gallons per inch.

Each table row is a single strapping point.

The left column of each table displays the tank depth in inches.

Each table row is a single strapping point.
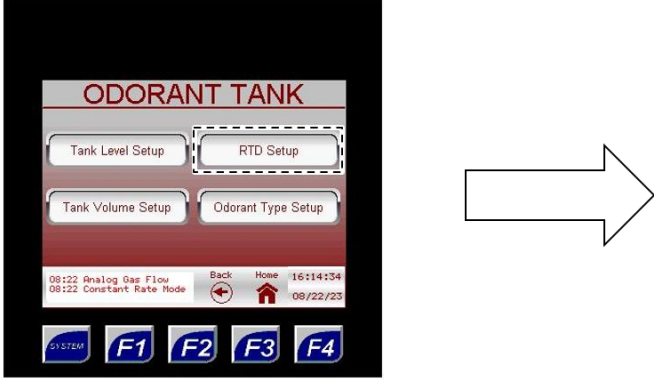
The maximum strapping point for the tank is displayed on the last page.

The maximum strapping point will depend on the tank size and volume.

If the odorant tank is horizontal, the strapping points will be calculated and entered at the factory.

RTD Setup

Figure 35: Odorant Tank – RTD Setup

RTD Setup
Select the method for reading the temperature of the odorant in the tank.

Method
Toggle between the two (2) methods for reading the temperature of the odorant in the tank:
1. manual entry
2. temperature transmitter

Min Temperature
If the temperature transmitter method is used, this value is the 4 mA signal.

Max Temperature
If the temperature transmitter method is used, this value is the 20 mA signal.

Current Temperature
If the temperature transmitter method is used, this is the current temperature of the odorant tank.
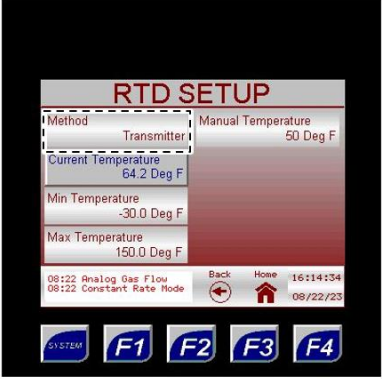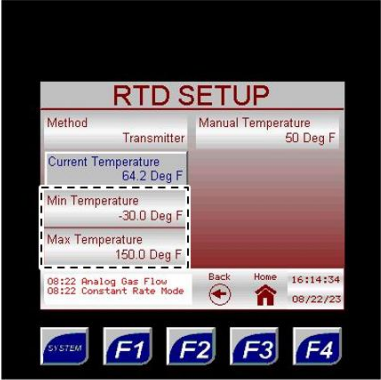
Manual Temperature
Manually enter the temperature of the odorant in the tank in degrees Fahrenheit.
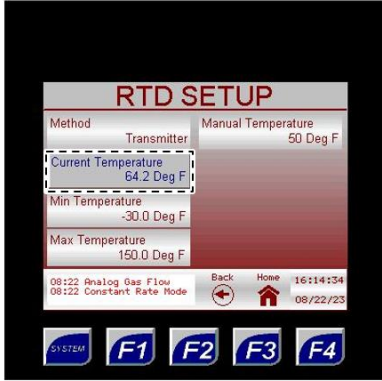
The temperature should be manually entered even if the temperature transmitter method is used, as the system will automatically switch over to manual entry in the event of signal loss from the transmitter.
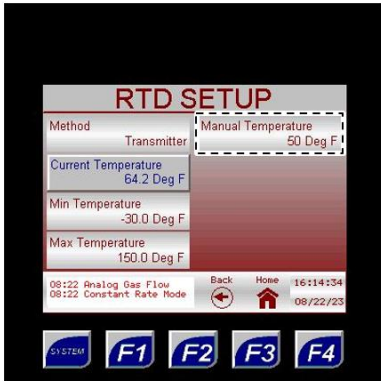
When using a temperature transmitter to track the temperature in the odorant tank, the Method should be set to Transmitter. When there is no device tracking the temperature in the odorant tank, the Method should be set to Manual Entry.

Setting an accurate manual temperature is necessary even when using a temperature transmitter. The temperature of the odorant supply tank is key to system operation; correct odorization is not possible without this value.

Odorant Type Setup

Figure 36: Odorant Tank – Odorant Type Setup

Odorant Type Setup
View the factory-set absorption values at different temperatures for the odorant used.

The first value in each cell is the temperature in degrees Fahrenheit.

The temperatures range from -30 °F to 120 °F and increase by increments of 10 °F.

The second value in each cell is the absorption value associated with the temperature in the cell.

These values are factory-set based on customer specifications.

⚠ If the type of odorant used is changed, please contact Welker® OdorEyes® personnel for new absorption values and/or pressure regulator settings.

Gas Flow Signal

> Through the Gas Flow Signal submenus, the user can set up the parameters of the odorant gas flow input signal.

Figure 37: Setup Menu – Gas Flow Signal

Gas Flow Signal
Enter this submenu to set the parameters for the gas flow signal and set the fail mode.

Method
Toggle between the three (3) input signal types:
1. Analog input: used if there is a 4–20 mA signal representative of the pipeline gas flow
2. Pulse input: used if there is a dry contact pulse input signal
3. Modbus input: used if gas flow rate will be provided via modbus

AI Zero Gas Flow Cutoff
This value is only active if the analog input method is used.

Any value below this gas flow cutoff value (in milliamps) will be treated as zero gas flow (0 Mcf/Hr).

Current Gas Flow
This value is the current gas flow signal for the pipeline (Mcf/Hr).

Pulse Input Gas Volume
This value is the total cubic feet of gas that each pulse input to the controller represents.

This value is used for the pulse input method only.

The system automatically calculates how many gas flow input signal pulses it will accept before opening the solenoid for odorization.

Min Flow Rate
If analog input is used, this value is the 4 mA signal.

If pulse input is used, this value must be manually set so the odorizer can approximate the current gas flow rate based on the pulse inputs.

In most cases, this value comes factory-set to zero (0) Mcf/Hr.

Modbus Input Flow
If the Modbus input method is used, this is the value the Modbus is downloading for the flow rate (Mcf/Hr).

This value can be changed here for testing purposes.

Max Flow Rate
If analog input is used, this value is the 20 mA signal.

If pulse input is used, this value must be manually set so the odorizer can approximate the current gas flow rate based on the pulse inputs.

Fail/Fixed Mode Setup
Enter this submenu to select the desired fail mode and set up applicable parameters.
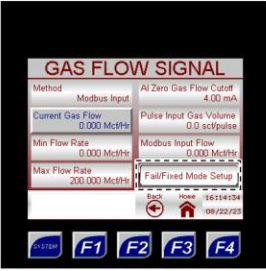
> If the gas flow signal will be analog, the analog signal must be 4–20 mA powered by the user.
> If the gas flow signal will be a pulse, the pulse will be a digital pulse powered by the controller.

> If the pulse input method is selected, the Pulse/Modbus Cutoff must also be set (*Figure 38*).

Fail/Fixed Mode Setup

Figure 38: Gas Flow Signal – Fail/Fixed Mode Setup
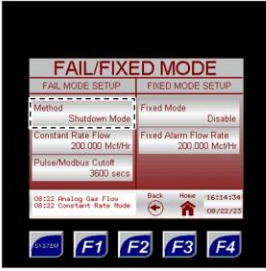
Fail/Fixed Mode Setup
Enter this submenu to select the desired fail mode, enable or disable the fixed mode, and set up applicable parameters.

Fail Mode Setup
Select the desired fail mode and set up applicable parameters.
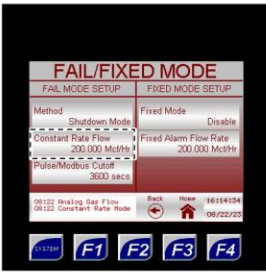
Fixed Mode Setup
Enable or disable the fixed rate mode.

Method
Toggle between two (2) fail modes:
1. constant rate mode: the system will act as a timer, pulsing odorant into the pipeline at the customer-specified rate
2. shutdown mode: the system will halt odorization and will not start again until a gas flow signal is received

Fixed Mode
When disabled, the system will odorize proportional to flow. When enabled, the Fixed Alarm Flow Rate will be the assumed gas flow in the system and will override any other input parameters. The Fixed Rate Alarm will be active on the Current Alarms screen.

Constant Rate Flow
This value is only active if the fail mode is set to constant rate mode.

In the event of a gas flow signal loss, the system will continue to odorize at the constant rate set here (Mcf/Hr).

Fixed Alarm Flow Rate
When Fixed Mode is enabled, the flow rate (Mcf/Hr) must be manually set. The system will odorize based on this rate until the Fixed Mode is disabled.

Pulse/Modbus Cutoff
If the pulse input method is used, this value is the amount of time (in seconds) the system will wait between pulse inputs before it will determine there is a gas flow signal loss and go into the set fail mode.
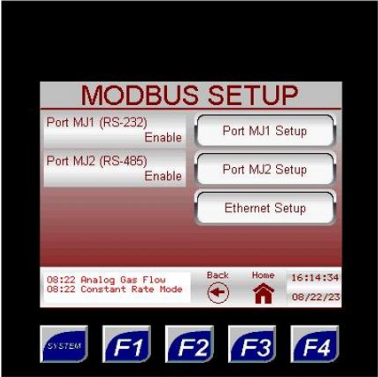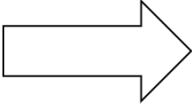
Setting the Fail Mode to Constant Rate will allow odorization to continue at the specified rate.
Setting the Fail Mode to Shutdown will halt odorization until the alarm is cleared.
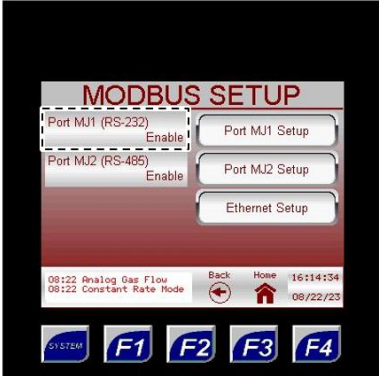
If the gas flow value does not change during the Pulse/Modbus Cutoff time, the system will alarm for loss of flow and will enter the specified Fail Mode. The alarm will clear on the next pulse input or change in Modbus gas flow, and the system will resume normal operation.
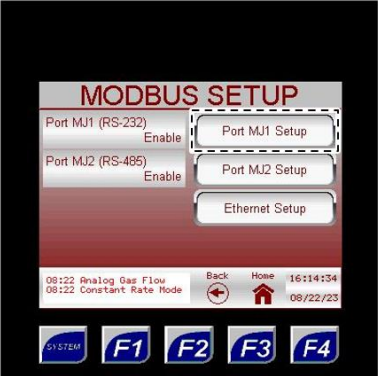
Modbus Setup

Figure 39: Setup Menu – Modbus Setup
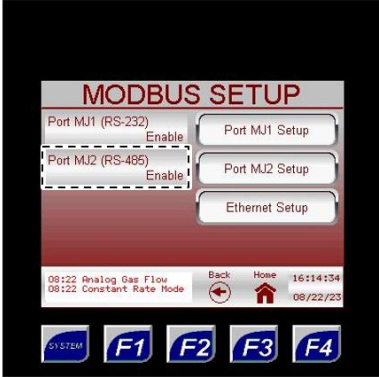
Modbus Setup
If the Modbus input method is used, enter this submenu to configure the Modbus input and view the current status of the Modbus.
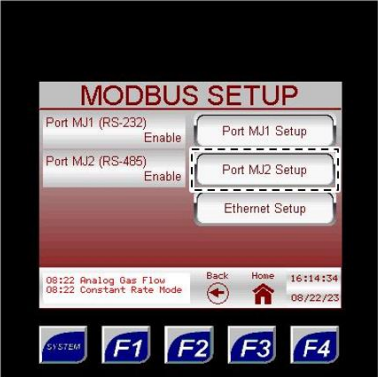
Port MJ1
When enabled, the mode of port MJ1 switches to Modbus.
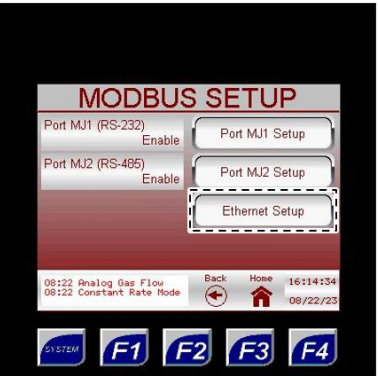
Port MJ1 Setup
Enter this submenu to configure port MJ1 and view its current status.

Port MJ2
When enabled, the mode of port MJ2 switches to Modbus.
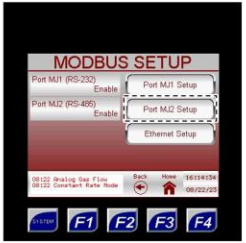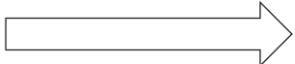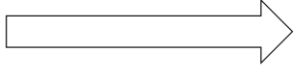
Port MJ2 Setup
Enter this submenu to configure port MJ2 and view its current status.

Ethernet Setup
Enter this submenu to configure the Ethernet connection and view its current status.

Figure 40: Modbus Setup – Port MJ1/MJ2 Setup

Port MJ1 Setup
Enter this submenu to configure port MJ1 and view its current status

Port MJ2 Setup
Enter this submenu to configure port MJ2 and view its current status

Port Type
The port type can be set to:
• RS-232
• RS-485
• Modem
• Ethernet
• Fiber A
• Fiber B
• GSM Dual
• GSM Quad
• Radio 900 MHz
• Radio Zigbee

Stop Bits
This value can be set to 1 or 2.

Baud
The available baud rate ranges from 300 to 115200.

Handshake
The required handshake can depend on the Port Type and/or Protocol used.

The handshake can be set to:
• None
• Xon / Xoff
• Hardware
• Multidrop Full
• Multidrop Half
• Radio Modem

Parity
This value can be set to None, Odd, or Even.

MJ1 Modbus Setup
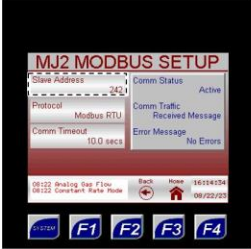Enter this submenu to complete configuration of port MJ1 and view its current status.
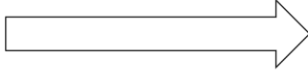
MJ2 Modbus Setup
Enter this submenu to complete configuration of port MJ2 and view its current status.
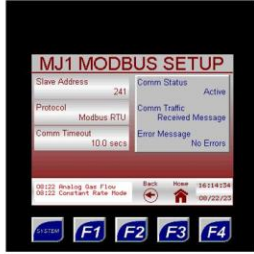
Data Bits
This value can be set to 7 or 8.

MJ1/MJ2 Modbus Setup

Figure 41: Port MJ1/MJ2 Setup – MJ1/MJ2 Modbus Setup
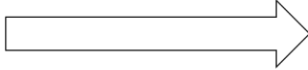
MJ1 Modbus Setup
Enter this submenu to complete configuration of port MJ1 and view its current status.

MJ2 Modbus Setup
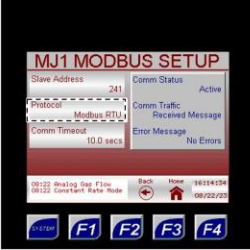Enter this submenu to complete configuration of port MJ2 and view its current status.

Slave Address
This value is the Modbus slave address for the odorizer.

Comm Timeout
This value is the timeout between Modbus messages (in seconds).

Protocol
The protocol setting applies to port MJ1 or MJ2 only.

The protocol can be set to:
• CsCAN
• Generic
• Modbus RTU
• Modbus MSCII
• Modbus TCP

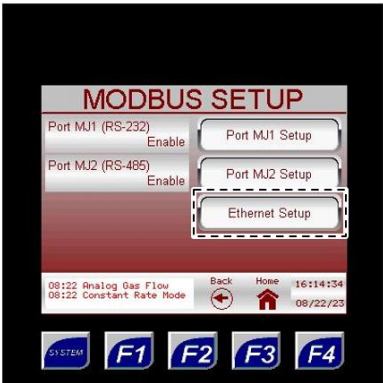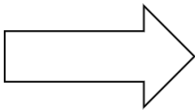These fields display the current status of the Modbus for troubleshooting purposes.
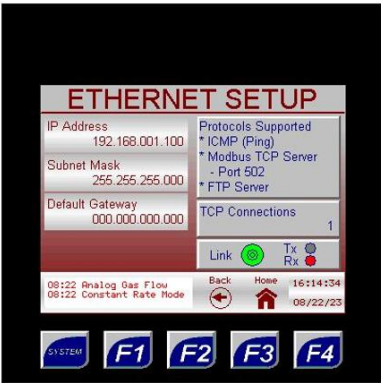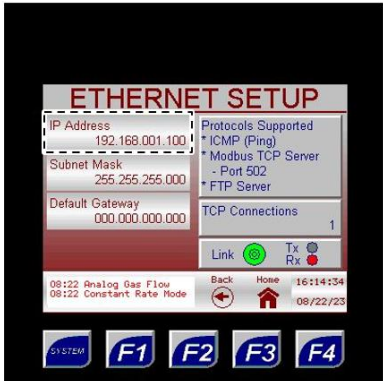
Ethernet Setup

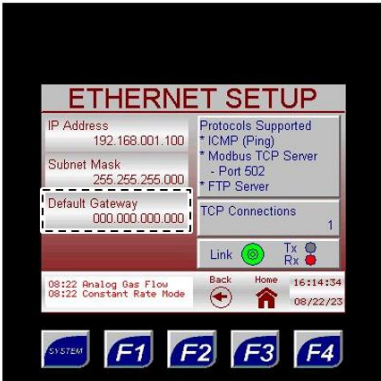Figure 42: Modbus Setup – Ethernet Setup

Ethernet Setup
Enter this submenu to configure the Ethernet connection and view its current status.
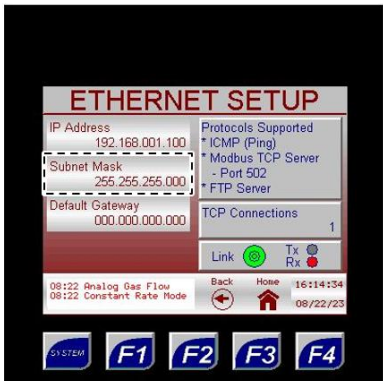
IP Address
Manually assign an IP address.

Pressing this field will bring up an on-screen keyboard for address entry.
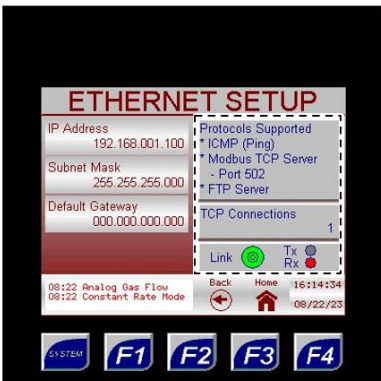
Default Gateway
Manually assign the default gateway.

Pressing this field will bring up an on-screen keyboard for gateway entry.
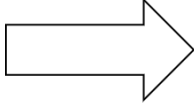
Subnet Mask
Manually assign the subnet mask.

Pressing this field will bring up an on-screen keyboard for subnet mask entry.

This column displays general and diagnostic information about the Ethernet connection.

Auto Scroll Setup

Figure 43: Setup Menu – Auto Scroll Setup

Auto Scroll Setup
Enter this submenu to customize screen operation.

Auto Scroll
When Auto Scroll is enabled, the touch screen controller will automatically scroll through seven (7) pre-set screens.

See *Figure 44*.

Note
Auto Scroll can be started or stopped at any time by pressing the F4 key.

Screen Switch Time
When Auto Scroll is enabled, the Screen Switch Time is the length of time each of the pre-set screens will display before going to the next screen.

The Screen Switch Time can be set by the customer to the desired length of time.

Current Password
Displays current password, which may be changed by touching the field and entering a new password.

Figure 44: Auto Scroll Pre-Set Screens
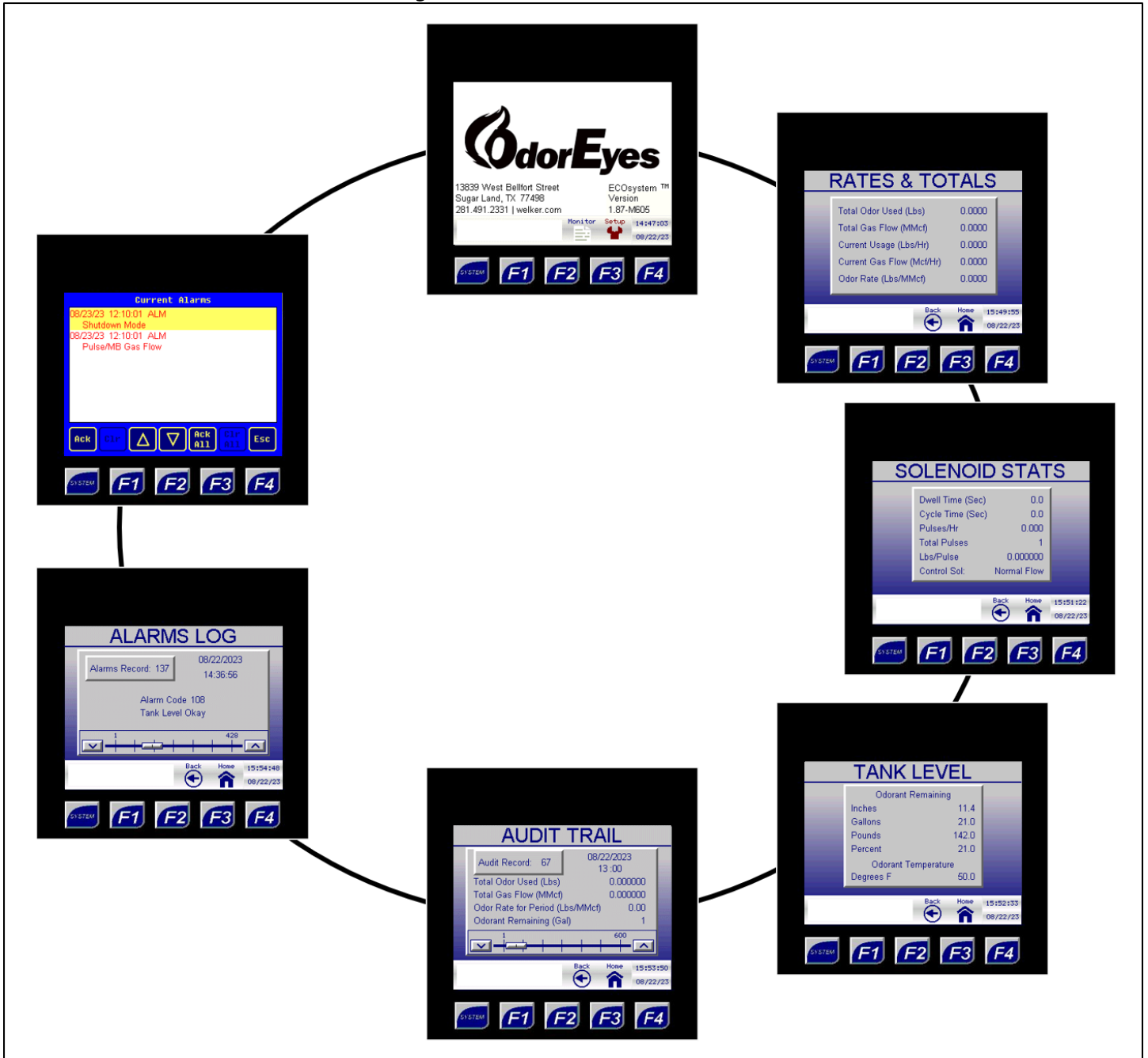
Logging Setup

Through the Logging Setup submenus, the user can set up and reset the data logs stored locally.

If a micro SD card is installed, data will automatically be logged to the installed card when SD Card Data Logging is enabled.

Figure 45: Setup Menu – Logging Setup

Logging Setup
Enter this submenu to enable or disable data logging to the SD card and monitor the status of the SD card.

SD Card Data Logging
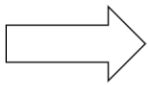Must be enabled for the system to automatically log information to the installed SD card.

SD Card Access
If a micro SD card is installed to the system, its contents can be viewed from this screen.

SD Card Diagnostics
Enter this submenu to monitor the SD card data logs stored by the odorizer.
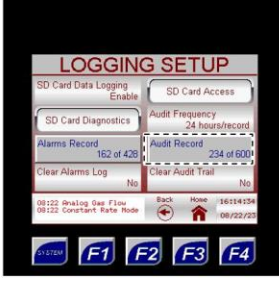
Audit Frequency
This value is the number of hours (from 1 to 24) of accumulated data each audit trail record will store.

The audit trail stores 600 records.
If this value is set to 1, only 600 hours of information will be stored.
If this value is set to 24, 600 days (i.e., 14,400 hours) of information will be stored.

Alarms Record
This is where the current record will be stored in memory.

The maximum number of alarms log records that can be stored is 428.

Audit Record
This is where the current record will be stored in memory.

The maximum number of audit trail records that can be stored is 600.

Clear Alarms Log
Press to delete all records in the Alarms Log and reset the Alarms Record to zero (0).

Clear Audit Trail
Press to delete all records in the Audit Trail and reset the Audit Record to zero (0).

📝 If the micro SD card needs to be removed, first disable SD Card Data Logging. Failure to disable SD Card Data Logging prior to removing the micro SD card will trigger the SD Card Error alarm.

📝 To continue data logging, insert a new micro SD card, and then enable SD Card Data Logging through the Logging Setup submenu (*Figure 45*).

SD Card Diagnostics

Figure 46: Logging Setup – SD Card Diagnostics

SD Card Logging
Monitor the status and storage capacity of the installed SD card.
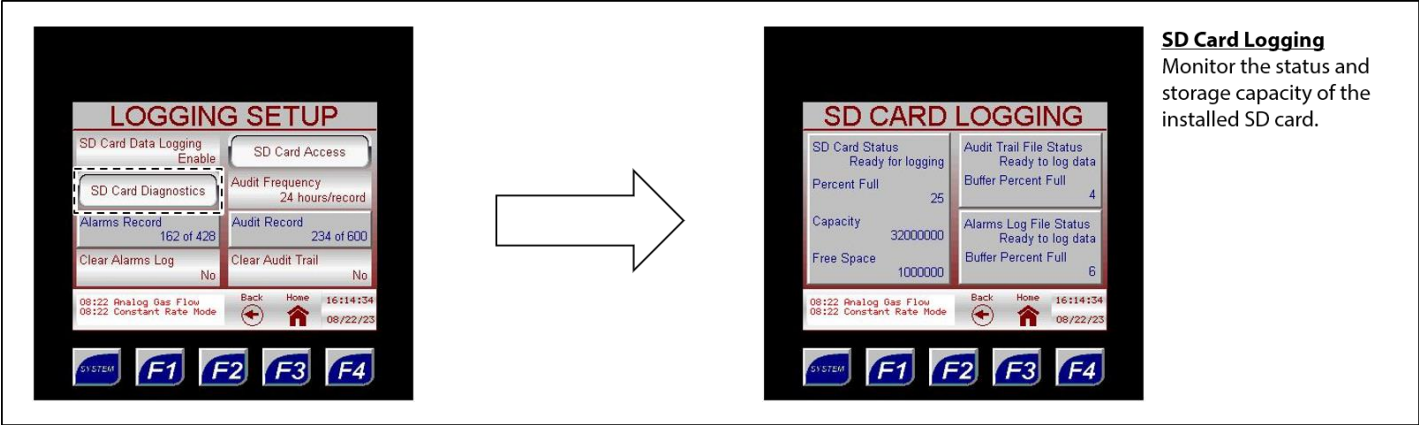
SD Card Access

Figure 47: Logging Setup – SD Card Access

If a micro SD Card is installed to the system, its contents can be viewed from this screen.

Contact Welker® OdorEyes® personnel for assistance installing software updates.
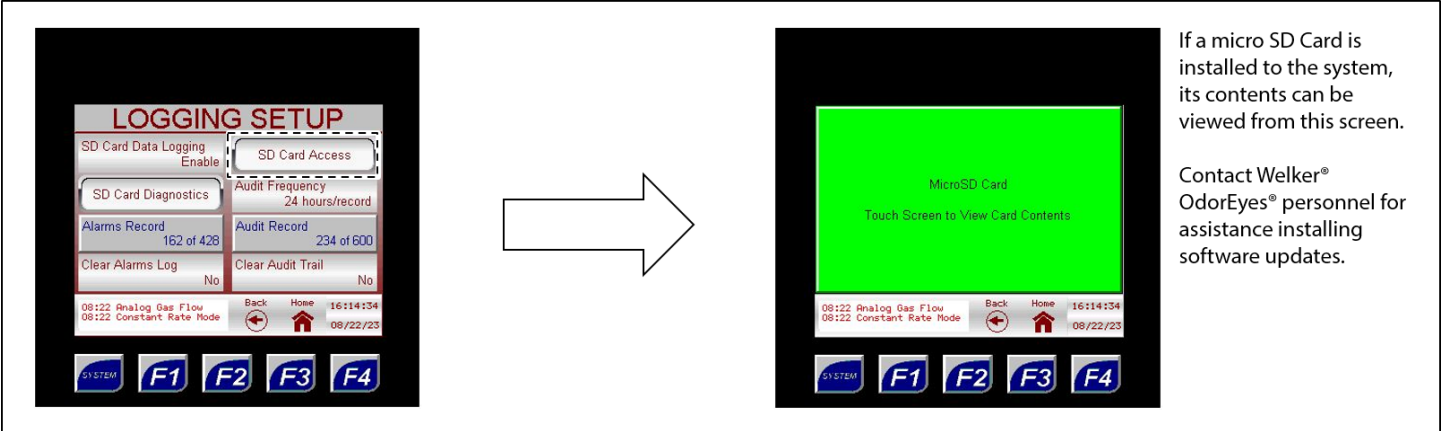
4.1 Before You Begin

1. **Refer to** *Appendix B, Maintenance Schedule,* **for the itemized Welker® recommended maintenance schedule for the ECOsystem™.**
2. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs of the system in case of unexpected wear or faulty seals.

⚠️ New seals supplied in spare parts kits should be lightly lubricated before being installed to ease the installation of the seals and reduce the risk of damage when positioning them on parts. Wipe excess lubricant from the seals, as it may adversely affect analytical instrument results.

📝 For sample-exposed seals, Welker® recommends non-hydrocarbon-based lubricants, such as Krytox®.
For non-sample-exposed seals, Welker® recommends either non-hydrocarbon-based lubricants or silicone-based lubricants, such as Molykote® 111.

📝 After the seals are installed, the outer diameter of shafts and inner diameter of cylinders may be lubricated to allow smooth transition of parts.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.

4.2 Maintenance

1. During operation, monitor the system for leaks. If leaks are present, halt operation and repair as necessary.
2. Occasionally, a system component may need to be repaired or replaced for manufacturer recommended maintenance. To perform maintenance on components:
   a. Turn OFF all electrical power to the system.
   b. Depressurize the system and close all valves.

⚠️ Prior to closing odorized gas outlet valves K1 and K2 and/or the pipeline isolation valve, the ECOsystem™ must be powered down. This is to prevent the odorant supply tank from building pressure.

   c. Disconnect the tubing and remove individual system components for maintenance.
   d. For complete and proper maintenance on individual system components, refer to their respective *Installation, Operation, and Maintenance* (IOM) *Manual.* A list of component *Installation, Operation, and Maintenance* (IOM) *Manuals* is available in *Appendix A, Referenced or Attached Documents,* in this manual.
   e. After performing necessary maintenance on system components, reconnect all instrument tubing.
   f. Reinstall the system according to the instructions in *Section 2.2, Installation,* and *Section 2.3, Start-Up Procedures.*

Welker® *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- IOM-025: Welker® IR-1, IR-2, IR-4, and IR-6 Instrument Regulators
- IOM-033: Welker® RV-1, RV-2, RV-2CP, and RV-3 Relief Valves
- IOM-105: Welker® NV-1 and NV-2 Instrument Valves
- IOM-169: Welker® F-5 Filter Dryer

Other *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- ABB Inc. K-TEK Products AT200 Magnetostrictive Level Transmitter (Welker® IOM-V011)
- ASCO, L.P. 0.55 W Low Power Solenoid Valves Low Power Series (Welker® IOM-V267)
- ASCO, L.P. 1.4 W Low Power Solenoid Valves Low Power Series (Welker® IOM-V266)
- ASCO, L.P. General Service Solenoid Valves Series 8314 (Welker® IOM-V121)
- ASCO, L.P. High Pressure Solenoid Valves Series 8223 (Welker® IOM-V103)
- CCI Thermal Technologies Inc. Cata-Dyne™ Explosion-Proof Gas Catalytic Heaters WX Series (Welker® IOM-V030)
- Emerson Process Management Regulator Technologies, Inc. Fisher™ 1301 Series High-Pressure Regulators Types 1301F and 1301G (Welker® IOM-V107)
- GE Oil & Gas Mooney Series 20/20S/20H/20HS Pilot Regulators (Welker® IOM-V101)
- Horner APG, LLC XL4 OCS Modules (Welker® IOM-V369)
- Inline Industries, Inc. 201F Ball Valve (Welker® IOM-V222)
- INTERTEC Instrumentation Ltd. CP MULTITHERM C Electric Heater (Welker® IOM-V104)
- INTERTEC Instrumentation Ltd. TS Thermostat (Welker® IOM-V105)
- MTS Systems Corporation Level Plus® Liquid-Level Sensors With Temposonics® Technology M-Series Model MR Analog Transmitter (Welker® IOM-V036)
- Power-Sonic Corporation PS-1270 12 Volt 7.0 AH Rechargeable Sealed Lead Acid Battery (Welker® IOM-V223)
- PR electronics 5333D 2-Wire Programmable Transmitter (Welker® IOM-V270)
- PR electronics PRetop 5331B 2-Wire Programmable Transmitter (Welker IOM-V269)
- Quest-Tec Solutions Magne-Trac™ Level Indicators (Welker® IOM-V367)
- Saginaw Control & Engineering EL Enclosure SCE-30EL3012LP (Welker® IOM-V265)
- Solutions With Innovation L505 Visual Level Indicator Dip-Tape Visual Level Indicator (Welker® IOM-V037)
- Swagelok Company Check Valves C, CA, CH, CP, and CPA Series (Welker® IOM-V076)
- Swagelok Company One-Piece Instrumentation Ball Valves 40G Series and 40 Series (Welker® IOM-V085)
- Swagelok Company Plug Valves P4T and P6T Series (Welker® IOM-V102)
- Swagelok Company Proportional Relief Valves R Series (Welker® IOM-V086)
- WIKA Instrument Corporation Bourdon Tube Pressure Gauges Type 232.53 and Type 233.53 (Welker® IOM-V171)

Welker® drawings and schematics suggested for use with this unit:

- System Drawing: OE181VS.10E (Dual Solenoid Valve Section With Optional Heater, ¼" Tubing)
- System Drawing: OE181VS.14E (Dual Solenoid Valve Section, ¼" Tubing)
- System Drawing: OE220VS.5E (Triple Solenoid Valve Section With Optional Heater, ¼" and $\frac{3}{8}$" Tubing)
- System Drawing: OE220VS.7E (Triple Solenoid Valve Section, ¼" and $\frac{3}{8}$" Tubing)
- Additional drawings available.

APPENDIX B: MAINTENANCE SCHEDULE

Welker® recommends keeping high-wear parts on hand and replacing these parts immediately when worn or damaged.

Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for each component for maintenance instructions.

Table B1: ECOsystem™ Maintenance Schedule			
Action	Weekly	Every 12 Months	As Necessary
If applicable, confirm proper functioning of the heater.	X		
Open F-5 drain valve G to allow moisture to drain from the filter.	X		
Verify the pneumatic supply pressure.		X	
Rebuild the F-5 using a Welker® repair kit. • Replace the O-rings and filter cartridge.		X	
View the controller's current alarms.			X
Inspect the tubing, valves, and fittings on the system for leaks.			X
Replace the controller battery.			X
Maintain the regulator.			X
Maintain the relief valve.			X
Maintain the solenoid(s).			X

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