

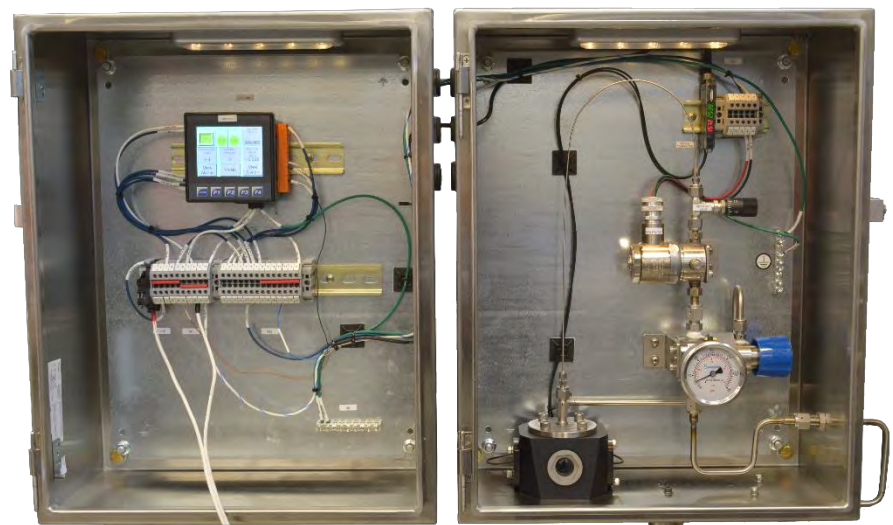


User's Guide

GPL 750

Natural Gas Odorization System

Patented



GPL Odorizers

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Thank you for your purchase of the GPL750 Natural Gas Odorization System. In the pages to follow you will find the User’s Guide for this product.

Please understand that failing to adhere to these instructions may result in the void of warranty, destruction of property, injury, or even death. For your convenience, we have included a checklist on the following page to document the required annual maintenance for this unit.

If you are interested in learning more about our GPL Odorizers Maintenance Program to ensure that your unit remains functioning correctly, please call us today at (303) 927-7683. Our service contracts are a convenient and cost-effective way to protect your warranty coverage as well as your property.

Thank you for your trust in our products.

Brian Cox
General Manager
GPL Odorizers LLC



Do not install, maintain, or operate this equipment without reading, understanding, and following the proper GPL Odorizers instructions. Otherwise, injury or damage or both may result.

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Note

The information contained in this document is subject to change without notice.

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Principles of Operation

The natural gas odorizer accurately doses the gas with odorant in individual droplets of 0.01 cc. The optical sensor counts each droplet and feeds the information back to the controller. The controller measures the flow and injects the next odorant dosage when sufficient gas has passed. The actual dose is calculated and optimized, based on flow rate requirements and the configured injection rate. The measure can vary from one to multiple drops to provide optimal and consistent odorization and maximize the component life. The target period between doses is three minutes. The optimization algorithm creates some variation in the duration between doses to compensate for the effects of flow rate fluctuations.

As the drops pass the optical sensor, they are registered in the controller, and a flow rate is determined. The optical sensor can accurately record drops as fast as 6/sec, which is well beyond the maximum dosing rate range.

In the event, an extra drop falls after the valve is shut, the system recognizes the incident, and an appropriate additional amount of gas is calculated and permitted to flow before the next dose.

Spring- and dome-loaded regulator automatically controls the pressure of the odorant to the injector based on pipeline pressure to ensure consistent dosing.

The controller calculates the odorant injection rate, and the total odorant usage is determined. A pulse is generated when a configurable mass of odorant has flowed. Additionally, measured gas flow rate and mass of odorant injected are stored hourly in non-volatile memory for regulatory documentation.

The system monitors itself and generates an external alarm signal if it is unable to odorize within the configured alarm range. Alarm conditions are stored and time-stamped in non-volatile memory.

In the event of a power failure, the solenoid may be manually opened and the pressure regulator adjusted to provide an acceptable injection rate in a mechanical mode. In this case, if the flow computer is down because there is no power on site, gas can still be safely odorized and delivered.

With only one moving part contacting the odorant, this is a highly reliable and easily maintained system.

The controller combines the speed and programming power of a PLC with low current draw and flexible communications of an RTU and the modern features of an internet server.

Startup

Procedure

Verify all installation procedures complete.

Configure Gas.

Configure Odorant.

Configure Alarms.

Set needle valve to recommended setting for maximum site gas flow rate and odorant injection rate (see table).

Place in Man Gas with Rate = 1MSCFH

Turn on the unit (Main Screen).

Count how many times the solenoid cycles to produce one drop.

Set solenoid on time multiplier equal to the number of cycles.

Verify that one, and only one drop is produced at that setpoint.

Place in Auto Gas Mod.

Configure Gas

Select gas flow signal source: pulses or 4-20mA.

Pulses

Enter K Factor for gas pulses (cubic feet/pulse (metric system: cubic meters/pulse)).

Only change other settings if necessary for troubleshooting (see section on troubleshooting).

4-20mA

Enter Max Gas Rate – This is the gas rate that a signal of 20mA equals.

Enter Min Gas Rate – A gas rate below this value should be assumed to be zero.

Odorizer does not inject at a measured gas rate below this value. This setting can be set to zero if desired.

Configure Odor

Enter target injection rate in units of #/MMCF (metric: mg/SM3).

Optional:

Select Odor Blend – Arkema and Chevron blends are listed. The selection may remain at default which assumes a density of 6.79 #/gallon (1 g/cc), or the user may select “User Defined,” which would allow manual entry of density.

Enter lb/pulse (metric: mg/pulse) out to change the K factor of the output odorant usage pulse.

Enter contract hour.

Configure Alarms

Switch Alarm Test to “Testing” to ensure Gas Control detects the alarm signal.

Enter Hi Gas Rate – Should be set somewhat higher than the maximum gas rate at the site. See Alarms section for more details.

Set HiHi, Hi, Lo, and LoLo injection rate alarm setpoints as desired.

Optional:

Man Gas Delay

Inj Rate Delay

Iso Alarm Drips

Alarms and Responses

Injection Rate Alarms

HiHi – Injection rate is unacceptably high, shuts off odorizer

Hi – Warning alarm that injection rate is higher than expected

Lo – Warning alarm that injection rate is lower than expected

LoLo – Injection rate is unacceptably low, shuts off odorizer

Isolation Valve Alarm – Too many drops have occurred after the isolation valve has shut. Odorizer cycles and calculates injection rate over that time span.

MTO Alarm – Max Time Open alarm. The solenoid valve has been open too long for a batch. Odorizer cycles and calculates injection rate over that time span.

Hi Gas Alarm – Odorizer has detected a gas flow rate higher than possible for the station.

Maintenance Alarms:

Filter Maintenance – Time for annual PM to flush out filter

Solenoid maintenance – Isolation solenoid valve has exceeded 1,000,000 cycles. Check for proper functionality, consider replacing.

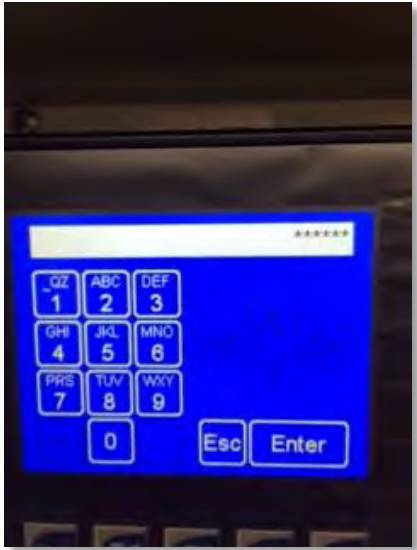
Solenoid Override – Isolation solenoid valve has been left in electrical override. The unit cannot be placed into normal operation.

Manual Gas Alarm – Unit is in manual gas mode, and not tracking live gas flow.

IO Assign Alarm – IO points have been reassigned to conflicting points. IO should only be reassigned under the guidance of a service technician.

HMI

Security



After a period of non-use, the HMI goes into security mode. To use the HMI enter the password. Click Password, and the second screen appears in which you may enter a numeric password. The default password is 262560.

Upon successful entry, the HMI automatically switches to the Main screen.

Main



System – On/Off (touch to toggle)

Alarm – Red= Alarm, Green = OK

Solenoid – Red = Shut, Green = Open

Gas Rate MCFH – Currently measured gas flow rate

Injection Rate Actual – Currently measured injection rate

Last Drop (seconds) – Elapsed time since the last drop of odorant detected

Flow Until Batch MCF (metric: SM3) – How many thousands of cubic feet of gas must flow until next batch

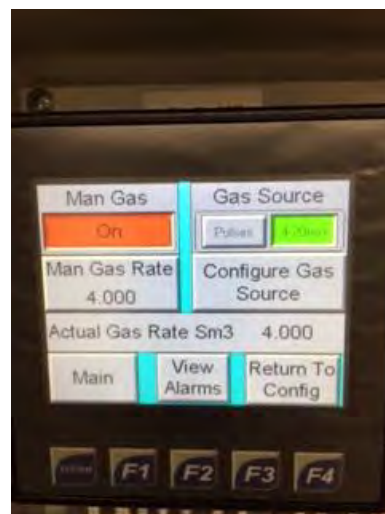
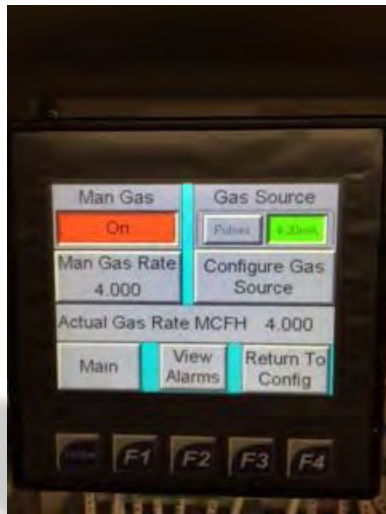
View Alarms, Menu, View Usage – Links to the indicated screens

Menu



Links to screens

Config Gas



Man Gas – Touch to toggle on/off – Man Gas is a manual override to the live gas readings to the odorizer.

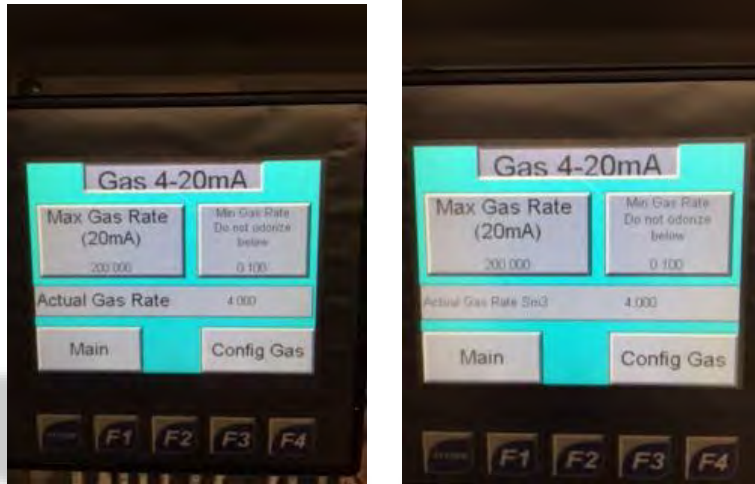
Man Gas Rate – The gas flow rate that is applied if Man Gas is ON.

Gas Source – Pulses, 4-20ma – Touch to select

Configure Gas Source – Link to the screen to configure the gas source selected.

Actual Gas Rate MCFH (metric: SM3H) – The flow rate the odorizer is using.

Gas Config 4-20mA

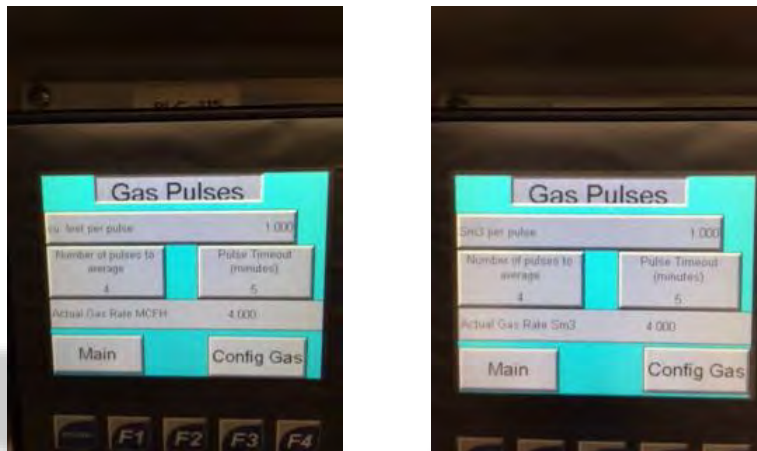


Max Gas Rate – This is the gas rate that a signal of 20mA equals

Min Gas Rate – A gas rate below this value should be assumed to be zero. Odorizer does not inject at a gas rate below this value and can be set to zero if desired.

Actual Gas Rate – If Man Gas is OFF, this is the rate that is being indicated by the selected source.

Gas Config Pulses



Cubic feet per pulse – K Factor for gas pulses (cubic feet (metric: SM3) per pulse). Touch to change.

NOTE: Only change other settings if necessary for troubleshooting (see section on troubleshooting).

Number of pulses to average – How many pulses to use to calculate live flow rate

Pulse Timeout (minutes) – If no pulses for this many minutes, assume a rate of zero flow.

Config Odor



Injection Rate Target #/MM (metric: mg/SM3) – Touch to enter desired injection rate.

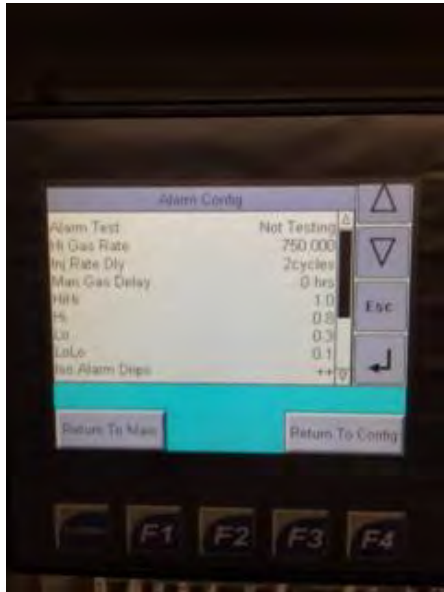
Odor blend – Touch to select odor blend from choices (Arkema and Chevron blends)

Density #/gal (metric: g/cc) – Data can only be entered if User Defined is selected as odor blend. Otherwise, the appropriate density for the selected blend is automatically displayed.

Enter #/pulse (metric: g/pulse) out to change the K factor of the output odorant usage pulse.

Enter contract hour.

Config Alarms



Alarm Test – Switch Alarm Test to “Testing” to ensure Gas Control detects the alarm signal.

Hi Gas Rate – Should be set somewhat higher than the highest gas rate at the site. If exceeded, the gas rate temporarily zeroes until a recalculation can be done.

Set HiHi, Hi, Lo, and LoLo injection rate alarm setpoints as desired.

Man Gas Delay – How long (hours) to allow unit to be in Man Gas before sending an alarm

Inj Rate Delay – How many consecutive batch cycles should exceed the configured rate before alarming

Iso Alarm Drips – How many drops after the isolation valve is shut are allowable before triggering an alarm

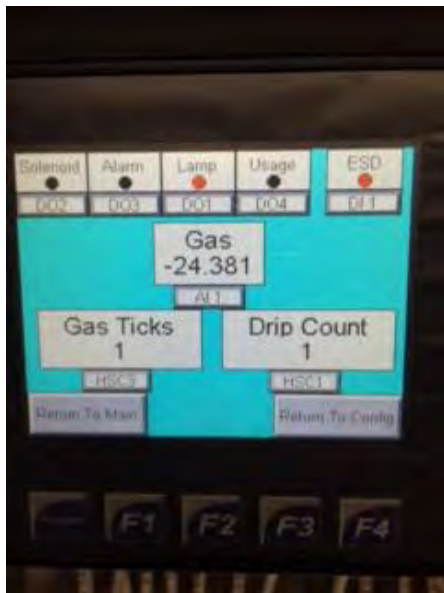
HiHi, Hi, Lo, LoLo alarm disables

File IO



Recipe file storage

IO



Displays the current state of each input and output as well as which IO point they are assigned to.

Maint

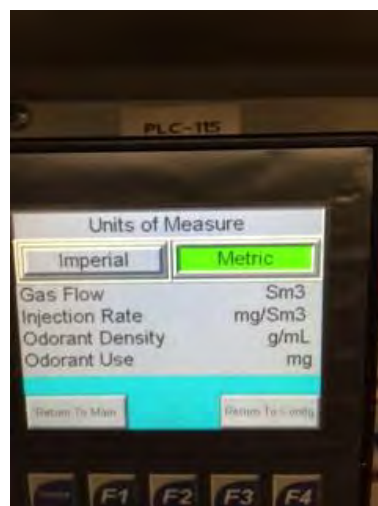
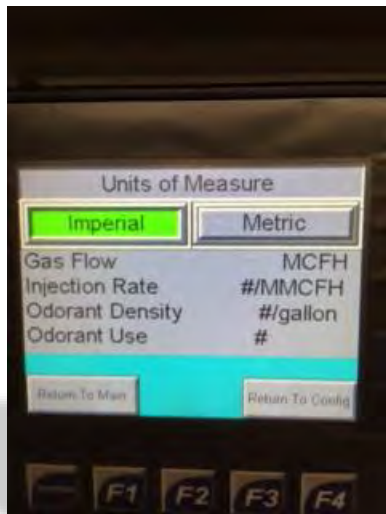


Solenoid Cycles – How many cycles on current solenoid valve. The close Reset button resets the count to zero. Should only be reset upon replacing the valve.

Filter Age – How long since the last time the filter was flushed. The close Reset button resets the date. Should be reset each time filter is flushed.

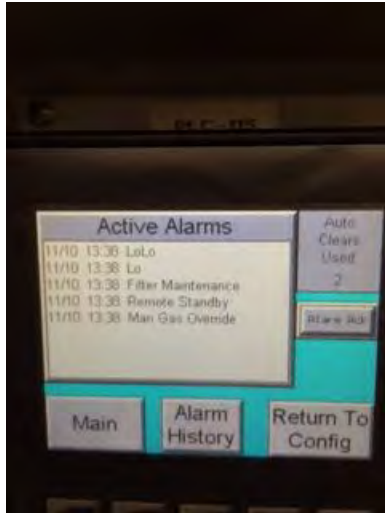
Solenoid Override – Forces solenoid valve open. Triggers alarm.

Imperial Metric



Allows selection of imperial and metric units of measure. For example, MCFH vs. SM3.

View Alarms



Displays Active Alarms

Auto Clears Used -- Shows how many autoclears have been used up – limit = 2 (non-configurable). Only HiHi and LoLo use autoclears.

Alarm Ack – Touch to acknowledge and clear alarms.

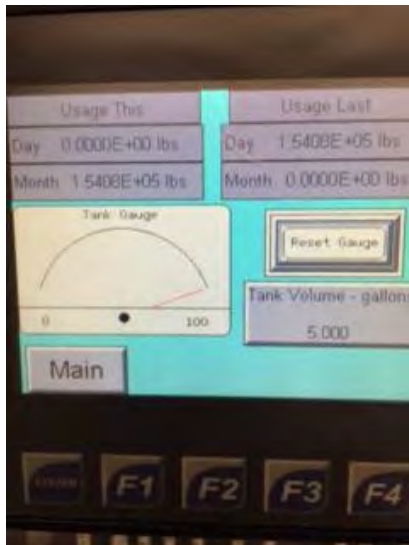
Alarm History – Touch to switch to alarm history screen.

Alarm History



Stores historical alarms along with their date stamp

Usage Screen



Shows usage in lb (metric: g) for Current hour and day, and previous hour and day.

Shows calculated tank full percent – Approximation only!

Reset Gauge – Touch to reset tank gauge to 100% upon filling tank

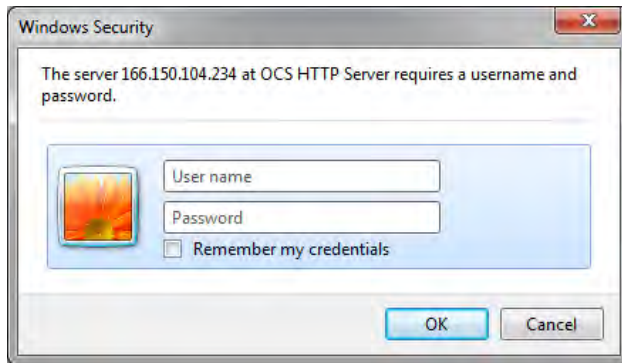
Tank Volume – Touch to enter the tank capacity in gallons (metric: cc)

Web Pages

Initial page:

Enter [http://\[ipaddress\]/index.htm](http://[ipaddress]/index.htm) or (metric: [http://\[ipaddress\]/index.htm](http://[ipaddress]/index.htm))

Security:



User Name: GPL

Password: 262560

Main

Index.htm

Index_metric.htm

GPL Odorizers
GPL750 Natural Gas Odorizer

Status			
Unit is:	Alarm	Solenoid	Gas Rate
<input type="button" value="ON"/> <input type="button" value="OFF"/>			
Injection Rate	Last Drop (seconds)	Flow Until Batch	
#/MM			

GPL Odorizers
GPL750 Natural Gas Odorizer

Status			
Unit is:	Alarm	Solenoid	Gas Rate
<input type="button" value="ON"/> <input type="button" value="OFF"/>			
Injection Rate	Last Drop (seconds)	Flow Until Batch	
mg/SM3			

Unit is: On/Off – Click to select

Alarm – On/OFF

Solenoid – On/Off

Gas Rate (MCFH/SM3H) – Current measured gas rate

Injection Rate Actual – Current measured injection rate

Last Drop (seconds) – Elapsed time since the last drop of odorant detected

Flow Until Batch (MCF/SM3) – How many thousands of cubic feet of gas must flow until next batch

Usage

The screenshot displays the 'GPL Odorizers' interface for 'GPL750 Natural Gas Odorizer'. It features a blue header with the title and a main content area with a blue border. The interface is divided into two main sections: 'Odorant Usage' and 'Bulk Tank'. The 'Odorant Usage' section contains a table with columns for 'Current' and 'Last', and rows for 'Day' and 'Month'. The 'Bulk Tank' section includes a 'Tank Gauge % full' field with a 'RESET' button, and a 'Tank Capacity' field with a numeric input (showing '0') and a 'Send' button. At the bottom, there is a navigation bar with buttons for 'Main', 'Alarms', 'Usage', 'IO', 'Config Gas', 'Config Alarms', 'Config Odor', and 'Maint'.

Odorant Usage			
Current		Last	
Day		Day	
Month		Month	

Bulk Tank			
Tank Gauge % full		RESET	
Tank Capacity		0	Send

Main Alarms Usage IO
Config Gas Config Alarms Config Odor Maint

Shows usage in lbs (metric: grams) for current hour and day, and previous hour and day.

Shows calculated tank full percent – Approximation only!

Reset Gauge – Touch to reset tank gauge to 100% when filling tank

Tank Volume – Touch to enter the tank capacity in gallons (metric: cc)

Alarms

The screenshot displays the 'GPL Odorizers' interface for the 'GPL750 Natural Gas Odorizer'. It features two main sections: 'Autoclears' and 'Active Alarms'. The 'Autoclears' section includes a table with 'AutoClears Used' (empty), 'AutoClears Allowed' (set to 0 with a 'Send' button), and 'Acknowledge Alarms' (set to YES). The 'Active Alarms' section is a list of 14 alarm types, each with an empty status field. At the bottom, there are navigation buttons for 'Main', 'Alarms', 'Usage', 'IO', 'Config Gas', 'Config Alarms', 'Config Odor', and 'Maint'.

Autoclears	
AutoClears Used	
AutoClears Allowed	0 <input type="button" value="Send"/>
Acknowledge Alarms	<input type="button" value="YES"/>

Active Alarms	
HiHi Injection	
Hi Injection	
Lo Injection	
LoLo Injection	
Isolation	
No Odorant	
Man Gas	
Solenoid Ovrđ	
Solenoid Maintenance	
Filter Maintenance	
Hi Gas	
Remote Standby	
IO Assign	

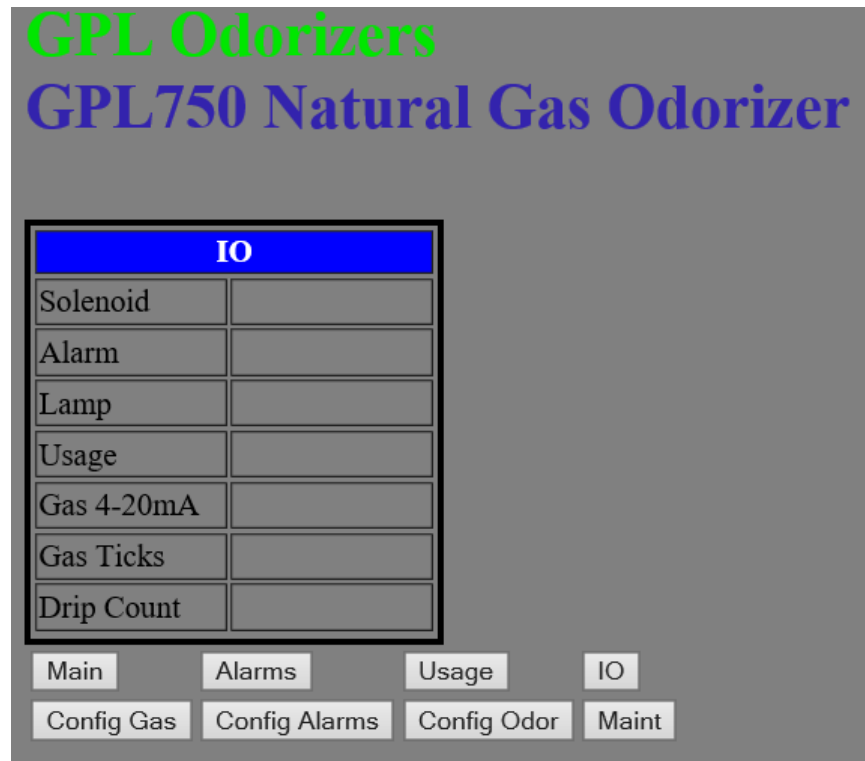
Main Alarms Usage IO
Config Gas Config Alarms Config Odor Maint

Autoclears used – Shows how many autoclears have been used up – limit = 2 (non-configurable). Only HiHi and LoLo use autoclears.

Acknowledge Alarm – Click YES to acknowledge and clear alarms.

Active Alarms – See Alarms and Responses section for description

IO



Displays the raw status of the physical IO points.

Solenoid, Alarm, Lamp, and Usage are ON/OFF

Gas 4-20mA should show a range of 0-100 if a valid signal is connected. If no signal is available a number close to -25 displays

Gas Ticks and Drip Count are raw event counters

Config Gas

Config Gas		
Man Gas	Gas Source	
Status:	Current	Select
<input type="button" value="ON"/> <input type="button" value="OFF"/>		0. <input type="radio"/> Pulses 1. <input type="radio"/> 4-20mA <input type="button" value="Select"/>
Man Gas Rate	<input type="button" value="Config Pulses"/>	<input type="button" value="Config 4-20mA"/>
<input type="text" value="0"/> <input type="button" value="Submit"/>		
Actual Gas Rate		

Main Alarms Usage IO
Config Gas Config Alarms Config Odor Maint

Man Gas – Click on On or Off – Man Gas is a manual override to the live gas readings to the odorizer

Man Gas Rate – The gas flow rate that is applied if Man Gas is ON

Gas Source –

Current: 0 = Pulses, 1 = 4-20mA

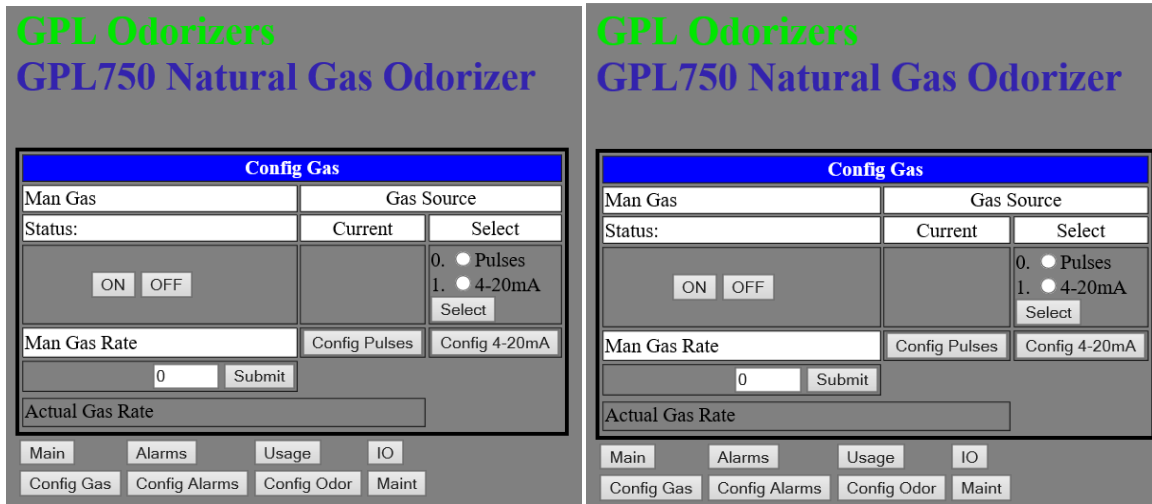
Select: Pulses, 4-20ma – Click to select

Config Pulses – links to the pulse configuration page

Config 4-20mA – links to the 4-20mA configuration page

Actual Gas Rate MCFH (metric: SM3H) – The flow rate the odorizer is using

Config Pulses



Cubic feet per pulse – K Factor for gas pulses (cubic feet per pulse (metric: SM3/pulse))

NOTE: Only change other settings if necessary for troubleshooting (see section on troubleshooting).

Number of pulses to average – How many pulses to use to calculate live flow rate

Pulse Timeout (minutes) – If no pulses for this many minutes, assume a rate of zero flow

Actual Gas Rate – If Man Gas is OFF, this is the rate that is being indicated by the selected source.

Config 4-20mA

GPL Odorizers

GPL750 Natural Gas Odorizer

Config Gas		
Man Gas	Gas Source	
Status:	Current	Select
<input type="button" value="ON"/> <input type="button" value="OFF"/>		0. <input type="radio"/> Pulses 1. <input type="radio"/> 4-20mA <input type="button" value="Select"/>
Man Gas Rate	Config Pulses	Config 4-20mA
<input type="text" value="0"/> <input type="button" value="Submit"/>		
Actual Gas Rate		
<input type="button" value="Main"/>	<input type="button" value="Alarms"/>	<input type="button" value="Usage"/>
<input type="button" value="IO"/>	<input type="button" value="Config Gas"/>	<input type="button" value="Config Alarms"/>
<input type="button" value="Config Odor"/>	<input type="button" value="Maint"/>	

Max Gas Rate –The gas rate that a signal of 20mA equals

Min Gas Rate – A gas rate below this value should be assumed to be zero. Odorizer does not inject at a measured gas rate below this value. May be set to zero if desired.

Actual Gas Rate – If Man Gas is OFF, this is the rate that is being indicated by the selected source.

Config Alarms

GPL Odorizers

GPL750 Natural Gas Odorizer

Alarm Config	
Alarm Test	<input type="button" value="ON"/> <input type="button" value="OFF"/>
Hi Gas Rate	0 <input type="text"/> <input type="button" value="Submit"/>
Injection Rate Delay (cycles)	0 <input type="text"/> <input type="button" value="Submit"/>
Man Gas Delay (hours)	0 <input type="text"/> <input type="button" value="Submit"/>
HiHi	0 <input type="text"/> <input type="button" value="Submit"/>
Hi	0 <input type="text"/> <input type="button" value="Submit"/>
Lo	0 <input type="text"/> <input type="button" value="Submit"/>
LoLo	0 <input type="text"/> <input type="button" value="Submit"/>

Alarm Test – Switch Alarm Test to “Testing” to ensure Gas Control detects the alarm signal.

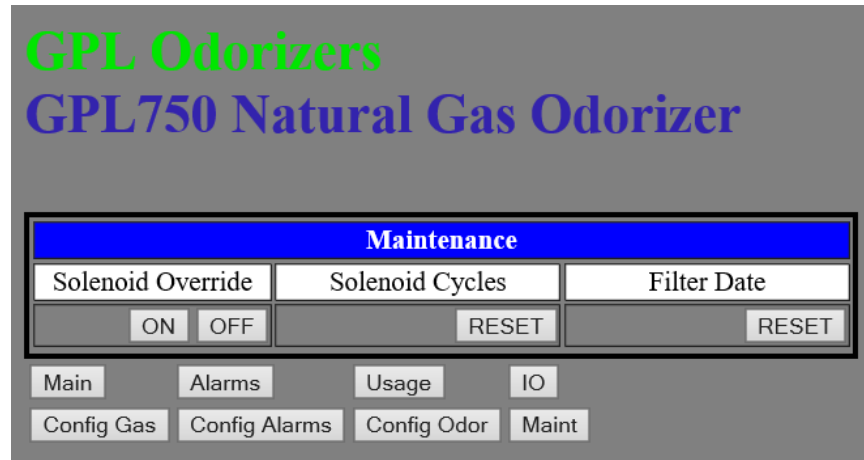
Hi Gas Rate – Should be set somewhat higher than the highest gas rate at the site. If exceeded, the gas rate is temporarily zeroed until a recalculation can be done.

Man Gas Delay – How long (hours) to allow unit to be in Man Gas before sending an alarm

Inj Rate Delay – How many consecutive batch cycles should exceed the configured rate before alarming

Set HiHi, Hi, Lo, and LoLo injection rate alarm setpoints as desired.

Maint



Solenoid Override – Forces solenoid valve open. Triggers alarm.

Solenoid Cycles – How many cycles on current solenoid valve. The close Reset button resets the count to zero. Reset when replacing the valve.

Filter Date – How long since the last time the filter was flushed. The close Reset button resets the date. Reset each time the filter is flushed.

Config Odor



Injection Rate Target #/MM (metric: mg/SM3) – Touch to enter desired injection rate

Odor blend – Touch to select odor blend from choices (Arkema and Chevron blends). See odorant blend table.

Density #/gal (metric: g/cc) – Data can only be entered if User Defined is selected as odor blend. Otherwise, the appropriate density for the selected blend is automatically displayed.

Enter #/pulse (metric: mg/pulse) out to change the K factor of the output odorant usage pulse.

Enter desired contract hour.

Alarms and Logs

Access Alarms and Logs through FTP. Set FTP to binary transfer.

User Name: GPL

Password: 262560

Alarms

The Alarms are stored in CSV files in the Logs directory.

Hourly Logs

Hourly logs are stored in the Logs/Hour directory and are in CSV format. Each day is stored in a separate CSV file with 24 hourly entries.

Appendices

Odorant Blend Table





Value	Odorant Blend
0	Default
1	User Defined
2	Scentinel A
3	Scentinel C
4	Scentinel E
5	Scentinel F-20
6	Scentinel F-25
7	Scentinel F-35
8	Scentinel F-40
9	Scentinel F-50
10	Scentinel H-85
11	Scentinel N
12	Scentinel O
13	Scentinel O-10
14	Scentinel P
15	Scentinel Q
16	Scentinel S-20
17	Scentinel S-35
18	Scentinel S-40
19	Scentinel S-50
20	Scentinel T
21	Scentinel T-50
22	Scentinel TB
23	Scentinel TE
24	Spotleak 1001
25	Spotleak 1005
26	Spotleak 1007
27	Spotleak 1009
28	Spotleak 1039
29	Spotleak 1420

Target Drip Rates

Based on an odorant with a density of 6.8 #/gallon (SG ≈ 0.8), the following drip rate table provides a cross check for appropriate drip rates.

Flow Rate	Injection Rate								
	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
100	35.93	26.95	21.56	17.96	15.40	13.47	11.98	10.78	minutes/drip
500	7.19	5.39	4.31	3.59	3.08	2.69	2.40	2.16	minutes/drip
1000	3.59	2.69	2.16	1.80	1.54	1.35	1.20	1.08	minutes/drip
2500	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3	drips/minute
5000	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	drips/minute
10000	2.8	3.7	4.6	5.6	6.5	7.4	8.4	9.3	drips/minute
25000	7.0	9.3	11.6	13.9	16.2	18.6	20.9	23.2	drips/minute
50000	13.9	18.6	23.2	27.8	32.5	37.1	41.8	46.4	drips/minute
100000	27.8	37.1	46.4	55.7	64.9	74.2	83.5	92.8	drips/minute
250000	69.6	92.8	116.0	139.2	162.4	185.6	208.8	231.9	drips/minute
500000	139.2	185.6	231.9	278.3	324.7	371.1	417.5	463.9	drips/minute
750000	208.8	278.3	347.9	417.5	487.1	556.7	626.3	695.8	drips/minute

Troubleshooting Guide

ALARM	ISSUE	ACTION
HIHI and HI	Injection rate has exceeded programmed limit	<ol style="list-style-type: none"> 1. Clear the alarm and restart the unit to see if the problem can be duplicated. 2. Once the operator has restarted the unit, ensure the optical comparator is seeing the drops; the yellow pulse output light should be blinking at the same pace as the odorant dripping (observe through the sight glass).  The yellow output light should flash solid. If the output light is flickering, the optical comparator needs calibration.  3. Once confirmed that optical comparator is functioning correctly, confirm that the HMI is receiving the pulse being sent from the Optical Comparator.  Each time a drop falls, and a pulse is received by the HMI, the “Seconds Since Last Drop” should reset to “0.”  4. Count the drops that fall after the solenoid closes (“Solenoid Red” on HMI). 5. If more than 10 drops fall after solenoid closes, the solenoid may need to be replaced. (See “Isolation Alarm” for further troubleshooting steps.) 6. If the problem cannot be duplicated and the solenoid and optical comparator are functioning correctly, download hourly logs from the odorizer to ensure that gas flow is not changing rapidly.
Lo and LoLo	Injection rate has fallen below programmed limits	<ol style="list-style-type: none"> 1. Check the blanket gas pressure on the odorant tank (set point: 15-20 PSI above pipeline pressure) and odorant regulator (inside the mechanical box, set point: 5-10 PSI above pipeline pressure) to confirm they are properly set. 2. Clear the alarm and restart the unit to see if the problem can be duplicated. 3. If the problem still exists, ensure that the optical comparator is seeing the drops; the yellow pulse output light should be blinking at the same pace as the odorant dripping

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		<p>(observe through sight glass). ⚠ The yellow output light should flash solid. If the output light is flickering, the optical comparator needs calibration. ⚠</p> <ol style="list-style-type: none"> 4. Once confirmed that optical comparator is functioning correctly, confirm that the HMI receives a pulse sent from the optical comparator. ⚠ Each time a drop falls, and a pulse is received by the HMI, the “Seconds Since Last Drop” on main HMI screen should reset to “0.” ⚠ 5. Once confirmed that the optical comparator is functioning properly and HMI is receiving pulses, observe the “Flow until batch” on HMI. If this number is decreasing and going into negative numbers, the needle valve needs to be adjusted to allow for more volume of odorant to be injected.
<p>Isolation Alarm</p>	<p>Too many drops have fallen after the solenoid valve has closed</p>	<ol style="list-style-type: none"> 1. Check the blanket gas pressure on the odorant tank (set point: 15-20 PSI above pipeline pressure) and odorant regulator (inside the mechanical box, set point: 5-10 PSI above pipeline pressure) to confirm they are properly set. 2. Looking in the sight glass, count the number of drops that fall in the drip chamber after the solenoid closes. 3. If more than 10 drops fall after the solenoid valve closes, the valve may need to be replaced. (Under normal operation, the solenoid should not allow more than 5 drops to fall after it shuts). 4. If the solenoid replacement cannot be immediately performed, lower the pressure of the odorant using the blue-handled regulator inside of the cabinet to help the solenoid seal.

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MTO (Max Time Open) Alarm	The solenoid valve has been open too long for a batch	<ol style="list-style-type: none"> 1. Go to the “Config Odor” HMI screen on the controller and ensure that the “Batch Time” is not set too low. ⚠ Factory default time is 3 minutes; systems with batch times less than 1 minute are more prone to MTO alarms. ⚠ 2. Observe the unit while it is injecting a batch of odorant. If “Flow until batch” on main HMI screen is constant, decreasing or a negative number, this causes the unit not to close out the batch and triggers the MTO alarm. 3. Open up the metering valve by turning the handle counter-clockwise. This should allow more odorant to flow through the system, increasing the drip rate and allowing the system to close out batches. 4. To confirm that the MTO Alarm problem has been resolved, observe the “Flow until batch” value on the main HMI screen. This number should steadily increase when the unit is injecting odorant.
Hi Gas Alarm	Odorizer has detected a gas flow rate higher than possible for the station	<ol style="list-style-type: none"> 1. Check the “Config Alarms” screen of the HMI to ensure that the HI Gas alarm is set slightly above the highest possible flow the station can encounter. 2. If a 4-20mA transmitter is on the pipeline flow meter, confirm that the signal is working properly. 3. If there is a pulse output, ensure that the pulse K-factor is correct, the meter is pulsing correctly, and odorizer controller is seeing the pulses (“Gas ticks” can be found on the IO screen of the controller).

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Filter Maintenance	Time for annual preventative maintenance, flush out filter and replace filter cartridge	Perform filter maintenance and reset the filter date on the Maintenance screen of the HMI. Once “Filter Age” has been reset the unit will alarm one year from this date.
Solenoid Maintenance	Solenoid valve has exceeded 1,000,000 cycles, time to replace the valve	Replace the solenoid valve and reset the solenoid cycles on the Maintenance screen of the HMI. Once “Solenoid Cycles” have been reset the unit alarms after 1,000,000 more cycles on the solenoid.
Solenoid Override	Solenoid valve is currently in electrical override (Open position)	Turn off solenoid override (refer to the maintenance screen of the HMI). Turning off the override clears the alarm automatically.
Manual Gas Alarm	Unit is in manual gas mode, and not tracking live gas values	<ol style="list-style-type: none"> 1. Clear this alarm by turning off “Manual Gas” (refer to “Config Gas” screen of the HMI). 2. If the station does not currently have a gas flow meter or the flow meter is not functioning properly, the user can set the unit in “Manual Gas” mode and lengthen the number of hours that the unit waits before alarming in the “Man Gas Delay” row. (Refer to the “Config Alarms” screen on the HMI).

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IO Assign Alarm	IO points have been reassigned to conflicting points	⚠ IO points should only be changed under guidance of a GPL certified technician; please contact GPL odorizers by calling (303) 927-7683 before attempting to reassign IO points and clear this alarm. ⚠