

# ChemLogic<sup>®</sup> CL96

## 96-Point Continuous Gas Detector

### Operating Manual

© DOD Technologies, Inc.  
675 Industrial Drive Bldg. A.  
Cary, IL 60013  
[solutions@dodtec.com](mailto:solutions@dodtec.com)  
Phone 815.788.5200 • Fax 815.788.5300  
[DODtec.com](http://DODtec.com)

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## Chapter 1 – Overview

### 1.1 Introduction

DOD Technologies' ChemLogic® CL96 simultaneously monitors up to ninety-six locations (also called *points*) for toxic and corrosive gases. It responds to gases that exceed a programmed alarm level by:

- Triggering visual alarms that warn of high or low concentrations
- Triggering relays or activating analog outputs to external devices
- Displaying the point number, gas type, and gas concentration
- Recording the alarm information and storing it in memory

The CL96 triggers outputs for each individual point for two levels of gas concentrations. These programmable limits are factory-set at 1 TLV and 2 TLV for their respective gases. Each sample point may be positioned up to 400 feet (121 m) from the instrument. This allows operators to remotely monitor gas concentrations in areas subject to potential gas leaks. The CL96 can monitor and detect a wide range of gases. It is designed for continuous and prolonged operation when routine maintenance is performed (per factory specifications). The CL96 employs DOD Technologies' ChemLogic colorimetric technology, utilizing ChemLogic cassettes with chemically infused tape for fast and accurate gas detection.

See Section 7.7 for important disposal information.



**WARNING** : If the system is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

### 1.2 Theory of Operation

The system draws sample flow simultaneously from all installed points. Part of the sample flow is diverted across the ChemLogic cassette tape. The CL96 uses an advanced optical detection system to measure the light level reflected from the tape. As the target gas is detected, the color of the tape changes. This color change results in a loss of reflected light across the tape. This loss of reflected light is detected by the advanced optics system. The CL96 will then report a gas concentration reading and/or a gas alarm.

## 1.3 Sampling and Monitoring

The system draws sample flow simultaneously from all installed points. Part of the sample flow is diverted across the ChemLogic tape where it is analyzed. Each 16-point analyzer exhausts through a single port.

### 1.3.1 Flow Connections

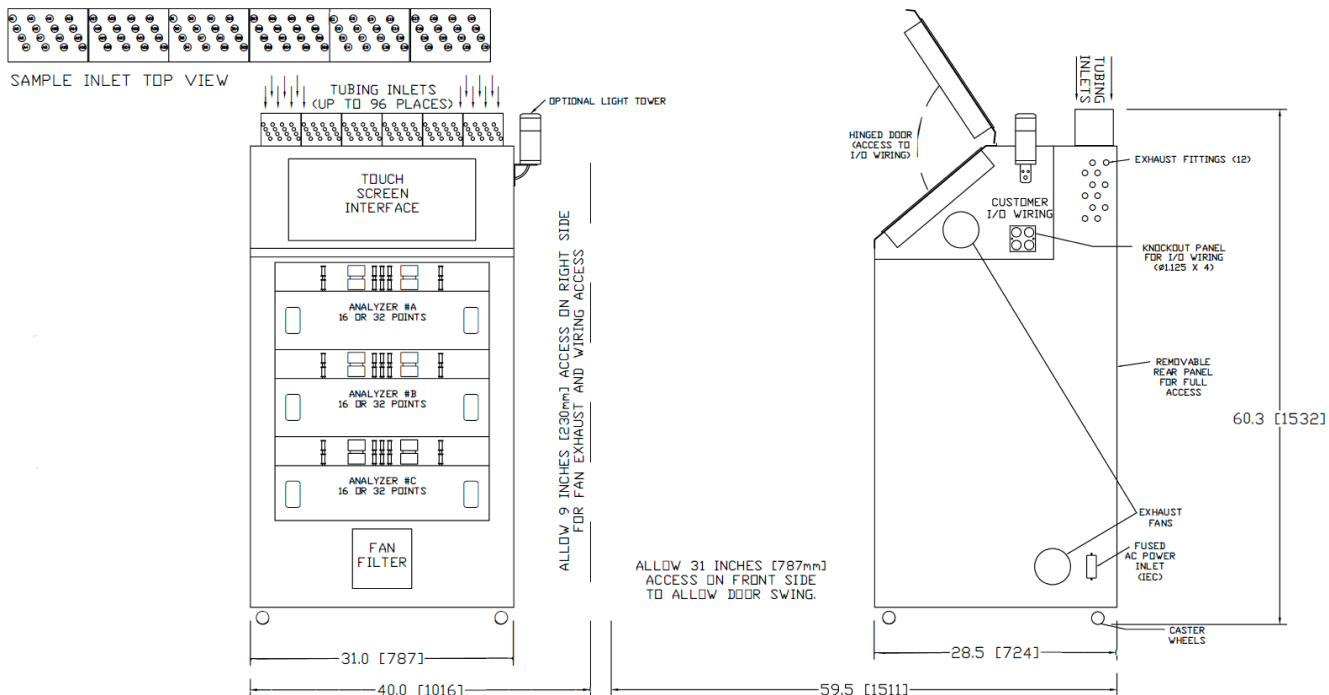
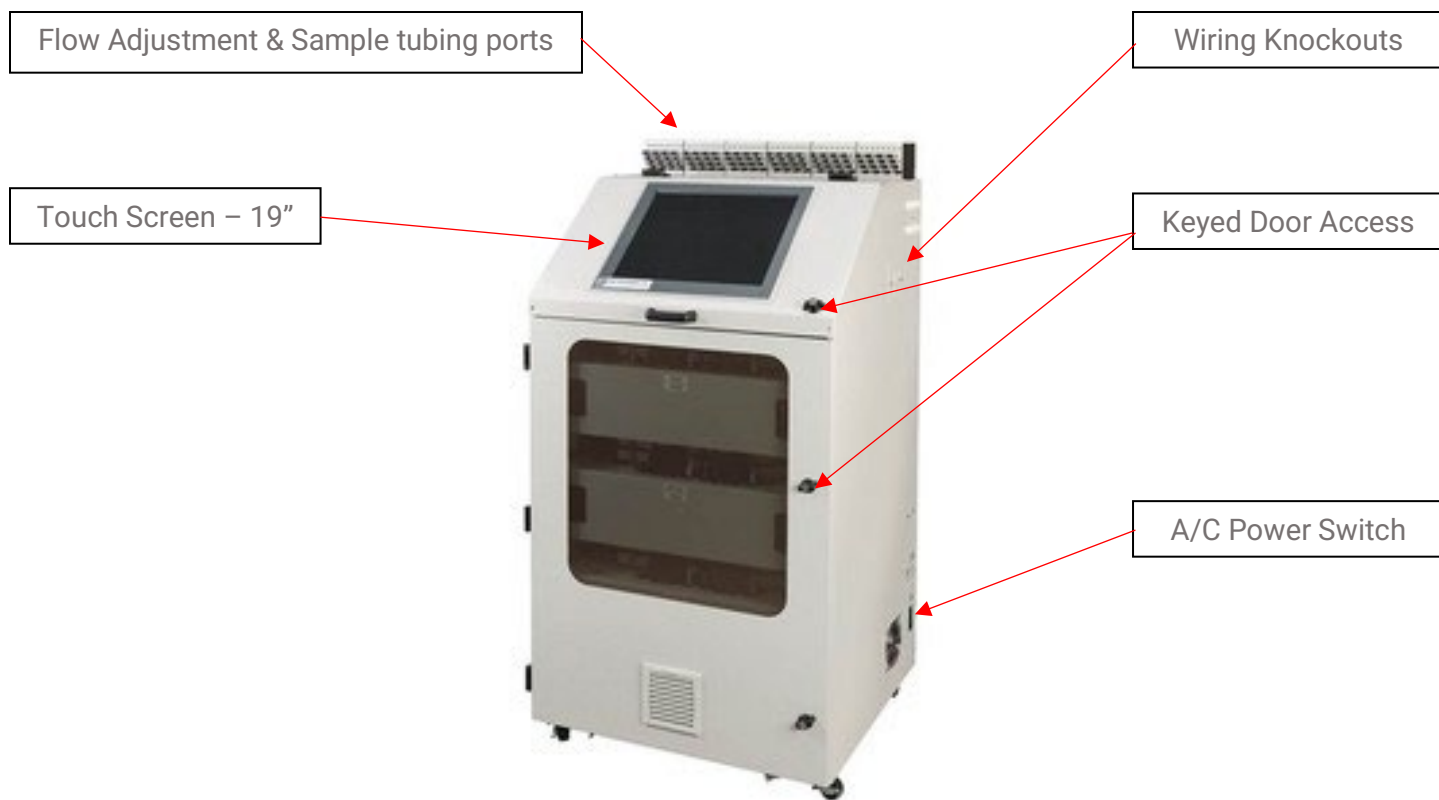
Flow connections consist of “quick-connect” ports on the top and side of the CL96 unit. There are ninety-six inlets, one for each monitored point, and 12 exhaust outlets, one for each analyzer.

## 1.4 Electrical Connections

“Knockout panels” for external electrical connections are provided on the right side of the CL96.

## Chapter 2 – Features

### 2.1 External Layout & Dimensions



### 2.1.1 Status Lamp (OPTIONAL)

The optional status lamp consists of 4 colored lights – Red, Orange, Blue, and Green along with an audible alarm. See Appendix A for ordering information.

### 2.1.2 Output Wiring Knockouts

Knockouts for output wiring are located on the right-side panel near the top.

### 2.1.3 Touch Screen Display

The CL96 uses a full color 19-inch touch panel LCD display. All menus and data entry are accomplished by touching the appropriate area of the screen – see Chapter 5 “Basic Operation”.

### 2.1.4 Keyed Service Door Access

The door uses a key lock to restrict internal access. See section 2.3 for detailed information on the service area.

### 2.1.5 A/C Power & Switch

A/C power is connected on the right-side panel with a standard cable. The on/off power switch is located adjacent to the power cable connection.

### 2.1.6 Flow Adjustment

Flow adjustments for all installed points are located on the top of the device. Refer to section 5.2.4 regarding flow adjustment.

### 2.1.7 ChemLogic Cassette Paper Tape

ChemLogic paper tapes are accessed by opening the maintenance door. Refer to section 6.3 regarding tape installation/replacement.

### 2.1.8 Maintenance Door

The maintenance door allows easy access to the ChemLogic tape for installation and replacement.

**IMPORTANT** : The maintenance door should remain closed and latched except when changing the ChemLogic cassette tape. Do not open the door while in Analysis Mode.

## 2.1.9 Take-up Reel

Empty take-up reels are inserted at the time of ChemLogic tape installation (see section 6.3). During installation, the previous take-up reel which is full is removed from CL96 and discarded. The previous ChemLogic tape reel which is now empty should then be used as the next take-up reel.

## 2.1.10 Tubing Connections

Sample tubing and exhaust use a quick connection system for simple installation. The sampling connections are made on the top of the CL96 while the exhaust tubing connects on the right side. See section 3.3 for information on connecting the sample and exhaust tubing. See also Appendix C for important information on transport times for gas from sampling point to the CL96.

**IMPORTANT** : End-of-the-Line filters or In-Line filters are required at all times on each channel.  
See section 6.2

## 2.2 Maintenance Area

The maintenance area allows easy access for changing ChemLogic tape in the CL96. Figure 2.2 shows the internal layout with the access panel open. See section 3.5 for tape installation.



Figure 2.2



## 2.3 Internal Layout – Service Area

Internal access to the CL96 for installation and service uses the keyed handle located on the right side of the front panel. Figure 2.3 shows the internal layout of the CL96 with the service door open. The door should be opened by trained service personnel (See section 6.2)



Figure 2.3



**WARNING:** Electric shock possible. Turn off the unit and disconnect A/C power to the unit before opening the service door

## 2.4 Password Security

Access to many of the features is controlled through password protection which is entered through the screen displayed in figure 2.4.

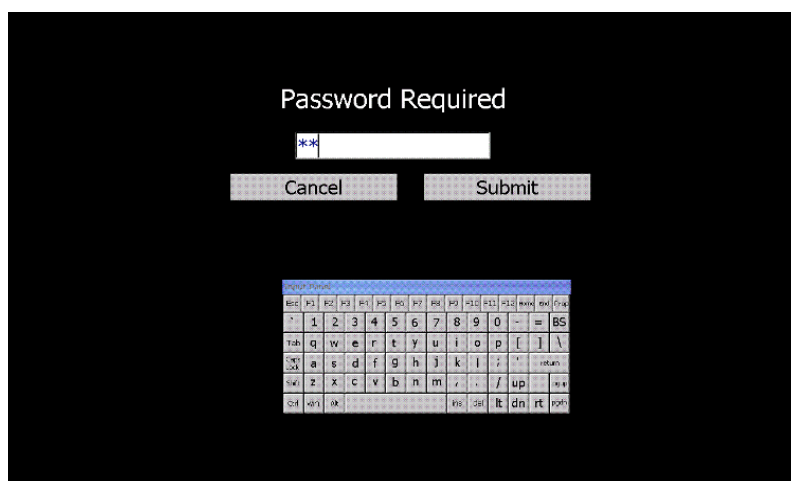


Figure 2.4

When someone attempts to access a screen that is password protected, the screen shown in figure 2.4 will appear (see important note below). Several of the setup & configuration screens of the CL96 require entry of an administrative password. Factory service screens require entry of a service password - see section 7.



**IMPORTANT** : Once a password is entered it remains active for up to 1 minute from entry so that it does not need to be repeatedly entered when switching between screens. Please remember that anyone using the touch screen may access restricted screen locations during this time if the machine is left unattended.

**NOTE** : The administrative password is included on a separate page shipped with your unit. It is suggested that you remove the page and keep it in a safe and secure place. If you forget or lose your password, please contact DOD Technologies, Inc. You can change the passwords on the menu in the “Setup” area – see chapter 6. See Chapter 8 for contact information.

## 2.5 USB Storage

The CL96 uses a removable USB drive to store historical information including concentration logging, event history, configuration information, and TWA data. USB storage drives may be purchased through DOD Technologies – see Appendix A.

## Chapter 3 – Installation

|   |  |
|---|--|
|  | <b>WARNING:</b> Electric shock possible. Turn off the unit and disconnect A/C power to the unit before servicing.                                |
|  | <b>WARNING:</b> If the CL96 is used in a manner not specified by the manufacturer, the protection provided by the equipment may become impaired. |

### 3.1 Selecting a Location

The CL96 is designed for safe use under the following conditions:

- Indoor use only
- Altitude up to 2,000 m
- Temperatures 5°C - 40°C
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40 °C
- 110 VAC supply voltage fluctuations up to +/- 10% of the nominal voltage
- Transient Levels : Impulse withstand (overvoltage) category II of IEC 60364-4-443
- IP Rating IP2x


The CL96 should be placed in a location as central as possible to the locations being monitored while considering the following restrictions:

- The maximum sample line length is 400 ft (121 m). Using the shortest possible sample line length will reduce transport times and increase the response time of the CL96. (see Appendix C)
- A/C power is required to the unit.
- Locate near proper ventilation keeping in mind the maximum length of the exhaust tubing is 25ft.
- The CL96 requires stable temperature and humidity levels within range to operate properly.

Do not place in a location which will expose the CL96 to moisture, dust, corrosive gas, or any unusual environmental conditions which could damage the unit and/or cause it to operate inaccurately.

### 3.2 Unloading / Loading & Installation

The CL96 rests on four rollers which can be locked in place and bolted to the floor if necessary.

|   |  |
|---|--|
|  | <b>CAUTION:</b> Care must be taken when loading, unloading, and moving the CL96. The CL96 is a heavy piece of equipment which could cause injury or death if not handled properly. Make sure the rollers are operating properly and only move the CL96 on a level surface. |
|---|--|

## 3.3 Sample Tubing

Sample tubing is connected to the CL96 on the top the unit. All sample tubes are 1/4" OD x 3/16" ID Teflon FEP (400 ft max length) which may be purchased from DOD Technologies, INC (See Appendix A). Fully

**IMPORTANT** : All sample tubing used with the CL96 must be 1/4" OD x 3/16" ID FEP Teflon. Use of any other tubing may damage the CL96 and/or cause inaccurate gas concentration readings.

depress each sample tube into the proper hole when attaching. To detach the tube, push on the collet and pull the tubing out.

### 3.3.1 End-of-Line Particulate Filters

End of line particulate filters must be installed on all sample lines at all times to prevent damage to the unit. Unused lines must either be plugged or have a filter installed. Filters require regular maintenance – see chapter 6.

**IMPORTANT** : All points require filtration to prevent dust accumulation in tubing and internal damage to the CL96. Dust that collects in the tubing or the internal system may cause sample loss and inaccurate concentration readings.

End of line particulate filters may be purchased from DOD technologies (see appendix A).

## 3.4 Exhaust Tubing

The exhaust line must be 3/8" OD x 1/4" ID tubing with a maximum length of 25ft. Polyethylene is recommended although polypropylene or Teflon may also be used. Exhaust tubing may be purchased from DOD technologies (see appendix A)

## 3.5 A/C Power

When connecting the A/C power to the CL96 assure that all of the following requirements are met:

- A building circuit breaker is required.
- The circuit breaker must be installed in a suitable location that is easily reached.
- The circuit breaker must be labeled as the disconnect device for the CL96.
- The circuit break must break both poles.

See system specifications in Appendix C for power requirements.



**WARNING:** The detachable power cord or the supply line wiring must meet the ratings specified in Appendix C under system specifications.

## 3.6 Output Wiring

See Appendix B for a listing of various output module connections available on the CL96.

### 3.6.1 Standard Output Wiring

The standard output modules included with the system require an external 24V supply connected to the CL96 to supply power for the outputs.

Use only AWG22 to AWG18 twisted wire (wire sizes UL1015 and UL1007)

Strip from .26" to .31" (6.5mm to 8.0mm) from each wire to insert into the connector.

To connect the wires to the spring-loaded output connector:

- Insert the screwdriver into the square shaped hole which will open the round hole for the wire.
- Continue to hold the screwdriver while inserting the wire into the round shaped hole.
- While holding the wire in place remove the screwdriver which closes the clamp onto the wire.
- **IMPORTANT** : Be sure the wire is inserted completely into the hole. Failure to do so could result in system failure, electrical shock.
- To remove a wire, re-insert the screwdriver in the hole as described in step 1 and gently pull the wire out while the spring is compressed.

## Chapter 4 – Setup & Configuration

### 4.1 Set System Date and Time

See section 6.2.e

### 4.2 Gas Selection

Each point on the CL96 must be setup for the appropriate gas and configured accordingly. See section 6.2.a for information on selecting the gas for each point.

### 4.3 Alarm Settings

See section 6.2.a for information on how to adjust the alarm settings after the gas has been selected for each point.

### 4.4 Output Contacts

The CL96 supports both energized and de-energized outputs and may be configured for either latching or non-latching faults/events.

When configured for energized relays, the outputs are normally in a high state and change to a low state when the corresponding fault/alarm occurs. De-energized relays work in the opposite manner. When the power is ON, the Power Loss relay is always in the normally high state.

When latched outputs are selected any fault or alarm that occurs will remain until the 'fault reset' button is touched. If non-latching outputs are selected the output will reset automatically if and when the condition that caused the fault/alarm goes away.

**NOTE** : A message is added to the event log each time the 'fault reset' button is touched.

### 4.5 Concentration Logging

Three levels of concentration logging can be configured in the CL96

- >0 – All concentration detected  $\geq$  LDL are added to the concentration log.
- AP1 – Anytime alarm level 1 is reached, the concentration is added to the log.
- AP2 – Anytime alarm level 1 is reached, the concentration is added to the log.

For AP1 or AP2 logging the system will continue to log concentrations as long as the alarm level is active. If latching faults are enabled the system will continue to log until the 'fault reset' button is touched.

## 4.6 Install New Tape

See section 7.3 for installation instructions.

## 4.7 USB Storage

The use of USB Storage drive is required to retain historical and performance of information including events, alarms, and gas concentrations. High reliability USB Storage drives are available from DOD technologies (see Appendix A) and at most retail electronic stores. See section 7.5 for information on inserting and replacing a USB drive. See also appendix F for information on the data set stored.

## 4.8 Setup Complete

The CL96 is ready for gas detection and analysis.



## Chapter 5 General Machine Operation

### 5.1 Introduction

The touch screen on the CL96 is used for all configuration and control of the unit. Analysis mode is active by default approximately 2 minutes after power on unless an operator intervenes. The machine is designed to continually monitor for gas 24/7. Various tasks can be completed while remaining in analysis including viewing faults and events, viewing Concentration history & TWA logs, checking point configuration and flow limits. Access to the help menu is also available while remaining in analysis.

Analysis is started either by:

1. Power on timeout without user intervention, approx. 2 minutes)
2. Touching the Start Analysis button for a specific analyzer on the Load Tape screen.
3. Touching the 'Analysis' button on the Main Menu which will start analysis for all installed analyzers at the same time.

Analysis will continue until one of the following occur:

1. Power loss.
2. Touching the 'Stop Analysis' button for a specific analyzer on the Load Tape screen. (password may be required)
3. Entering Setup by touching the Setup button on the main menu and entering an appropriate password which will halt analysis on all analyzers.
4. A critical machine fault which may stop an individual analyzer or the entire CL96.

### 5.2 General Screen Navigation



Figure 5.2.1

Figure 5.2.1 shows a portion of the main menu that appears at the top when the machine is powered on. The menu system on the CL96 allows simple access to all the functionality of the system with a simple touchscreen interface. The selected item on the menu ("Analysis" on the figure 5.2.1) will appear in slightly larger **BOLD text with a lighter shade of gray as the background**.

A few things to know about all the menus on the CL96:

- The background color of the top menu area always indicates the status of the machine and will match the color of the optional light attachment. Table 5.2 explains the colors:

|                      |
|----------------------|
| Not installed        |
| Idle (Not analyzing) |
| Analysis Active      |
| Maintenance Fault    |
| Critical fault       |
| Gas Alarm            |

Table 5.2

- Table 5.2 lists the colors in priority from lowest to highest since only 1 color will be displayed at a time. For example, if any channel indicates a Gas Alarm the menu will appear red until the gas is no longer detected or the alarm is cleared. If any point has a low flow the menu will appear yellow, etc.
- On the main menu you can access any of the screens on the menu without exiting analysis except the 'Setup' button which will exit analysis and bring up the Setup sub-menu. Note that the 'Setup' button may require a password depending on the configuration of the CL96.
- Items with a down arrow next to them (such as 'History' in figure 5.2.1) indicates that the button will bring up a sub-menu of screen selections.
- When a sub-menu is selected the new menu will replace the previous menu and will always include the 'BACK' button at the start which will return to the previous menu (see figure 5.2.2).
- Note in figure 5.2.2 the background color is yellow indicating a Maintenance fault (see section xx).



Figure 5.2.2

## 5.3 Initialization

When the CL96 is powered on it will begin with an initialization screen which is followed by the automatic restart screen (figure 5.3)

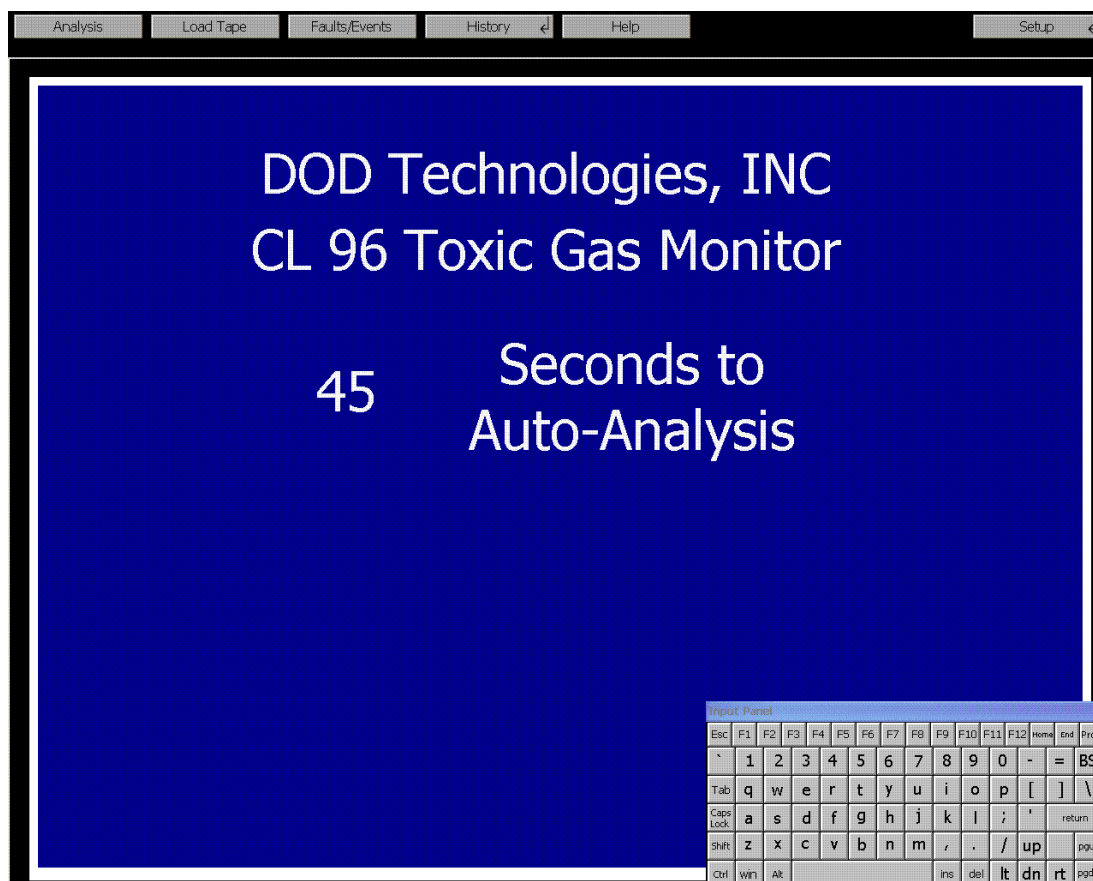


Figure 5.3

If the operator touched another menu button before the timer reaches 0 the machine will go to that screen and **WILL NOT** enter analysis (unless of course the operator touched the analysis button). If the machine should lose power at any time it will return to this screen when power is restored and automatically reenter analysis when the timeout is reached.

## Chapter 6 The Main Menu

### 6.1 Main Menu

The main menu allows the operator to start/stop analysis and access to all information available while remaining in Analysis.

#### 6.1.a Analysis

As the name implies, touching the 'Analysis' button will start the CL96 analysis for all active points. (see Setup in section 6.2.a). Figure 6.1.a.1 shows a 16-point system with analysis active. Note that the menu background is green indicating analysis active and all points are green indicating no flow problems or gas alarms active.

Black points indicate that the points are not installed or are inactive on the CL96.

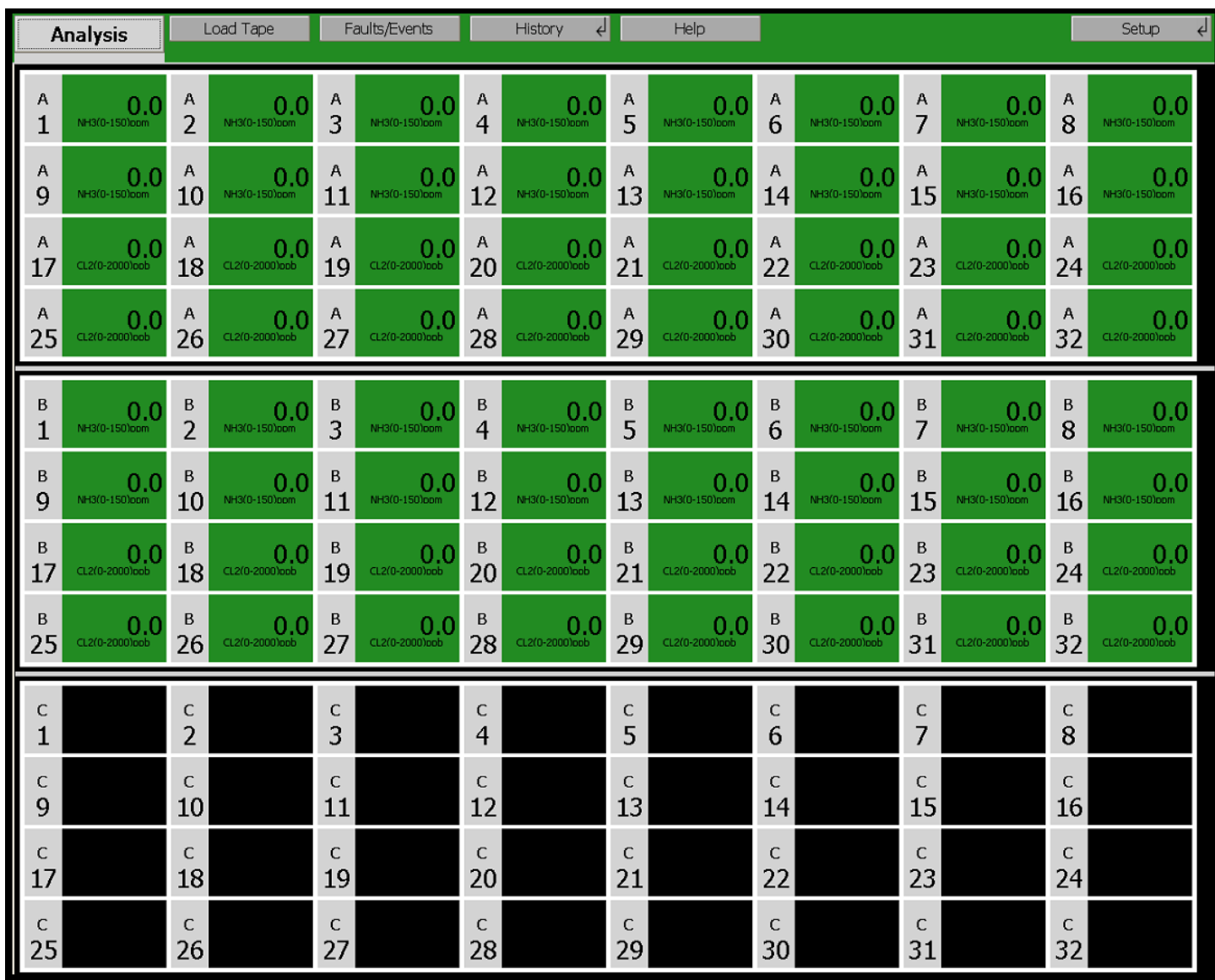


Figure 6.1.a.1

The color of each point on the analysis screen will change according to the current state of the point:

Disabled, Idle, Analyzing, Maintenance fault, or Alarm. (see colors in table 5.2)

Ex: Figure 6.1.a.2 displays which point 9 on analyzer A would look like when a full-scale reading is found while monitoring for H2SE(0-500ppb).

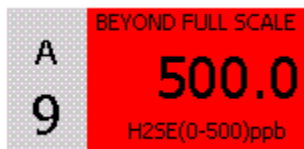


Figure 6.1.a.2

## 6.1.a.2 Point Trend Detail

Touching the gray area on any \*active point on the analysis screen will display the detailed information for the selected point as shown in figure 6.1.a.3. The screen details the point #, name, location, range, alarm levels, flow level, current concentration, and a graph of the previous 15 minutes of concentration detected.

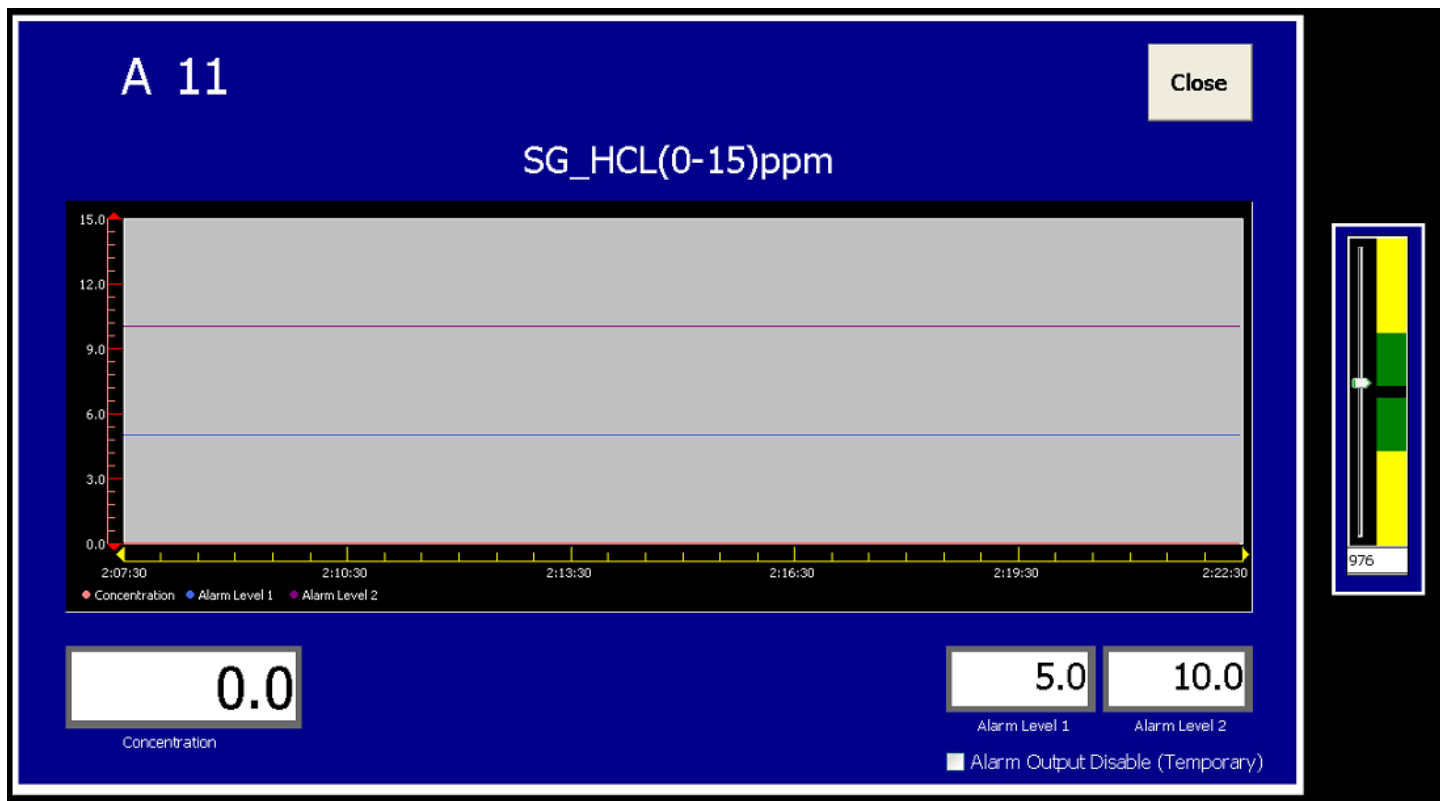


Figure 6.1.a.3

\* Active = any point installed and enabled on the CL96.

## 6.1.b Load Tape

Touching the 'Load Tape' button on the main menu will bring up the screen shown below. Note that stacked analyzers can only be operated together although each analyzer tray can be started and stopped independently. From this screen the operator can also stop analysis for an individual analyzer to allow new tape to be loaded into the system. During Analysis, the buttons for "Open Gate", "reset Counter", and "Verify Optics" are all disabled. The background color of each analyzer will match the status of the analyzer since each analyzer tray can be started / stopped independently.

When loading a new tape follow the procedure described in Chapter 7.



Figure 6.1.b



## 6.1.c Faults/Events

Touching the Faults/Events buttons on the main menu will bring up the screen show in figure 6.1.c. Note this important difference between this screen and the fault/events screen on the 'History' sub-menu. The faults/events on the main menu shown on figure 6.1.c retains a list of the most recent events (128-256). Regardless of whether a USB drive is inserted this list will show the most recent events. Each new fault or event is added to the top of this list and also written to the USB drive (if available).

**NOTE** : New events may not immediately appear on the list while the screen is active. Each time the menu item is selected (from another menu) the current list is activated.

Touch the 'Fault/Alarm Reset' button to reset clear all active faults & alarms.

| Analysis   |          |    |    |      |             | Load Tape  |  | Faults/Events | History | Help | Setup |
|------------|----------|----|----|------|-------------|--|--|---------------|---------|------|-------|
| Date       | Time     | AZ | PT | Type | Event       | Fault/Alarm Reset  |  |               |         |      |       |
| 10/19/2022 | 14:25:10 | C  | 28 | Info | Information | <div>Page Up</div> <div>Up</div> <div>Down</div> <div>Page Down</div> <div>Refresh</div> |  |               |         |      |       |
| 10/19/2022 | 14:25:02 | C  | 6  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:24:58 | C  | 22 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:24:58 | C  | 13 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:24:18 | C  | 25 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:24:06 | C  | 2  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:24:02 | C  | 23 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:23:48 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:23:46 | C  | 4  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:23:30 | C  | 15 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:22:02 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:56 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:56 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:44 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:42 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:30 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:28 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:16 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:14 | B  | 12 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:21:02 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:56 | B  | 4  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:56 | B  | 4  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:48 | C  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:46 | C  | 20 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:46 | C  | 19 | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:38 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:36 | B  | 4  | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:16 | C  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:15 | B  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:15 | A  |    | Info | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:20:14 | C  |    | Info | Analyzing   |  |  |               |         |      |       |
| 10/19/2022 | 14:20:14 | B  |    | Info | Analyzing   |  |  |               |         |      |       |
| 10/19/2022 | 14:20:13 | A  |    | Info | Analyzing   |  |  |               |         |      |       |
| 10/19/2022 | 14:16:36 |    |    | Clr  | Information |  |  |               |         |      |       |
| 10/19/2022 | 14:15:56 |    |    | Set  | Information |  |  |               |         |      |       |

Figure 6.1.c

## 6.1.d History

Touching the History button on the main menu will bring up the sub-menu screen shown in figure 6.6. This sub-menu gives access to the historical data stored on the USB flash drive.

**IMPORTANT** : The CL96 stores all historical data to the USB drive. Make sure a drive is always inserted properly (see Appendix F). If no USB drive is present none of the menu item on the history sub-menu will show any data.

### 6.1.d.1 History -> Concentration Log

Touching the Conc. Log button on the History Menu will bring up the screen shown below. This screen shows the concentrations recorded for each point for the data selected on the calendar.

The alarm levels are color coded as indicated by the three colors on the top of the screen:

1. < alarm level 1
2. >= alarm level 1 and < alarm level 2
3. >= alarm level 2

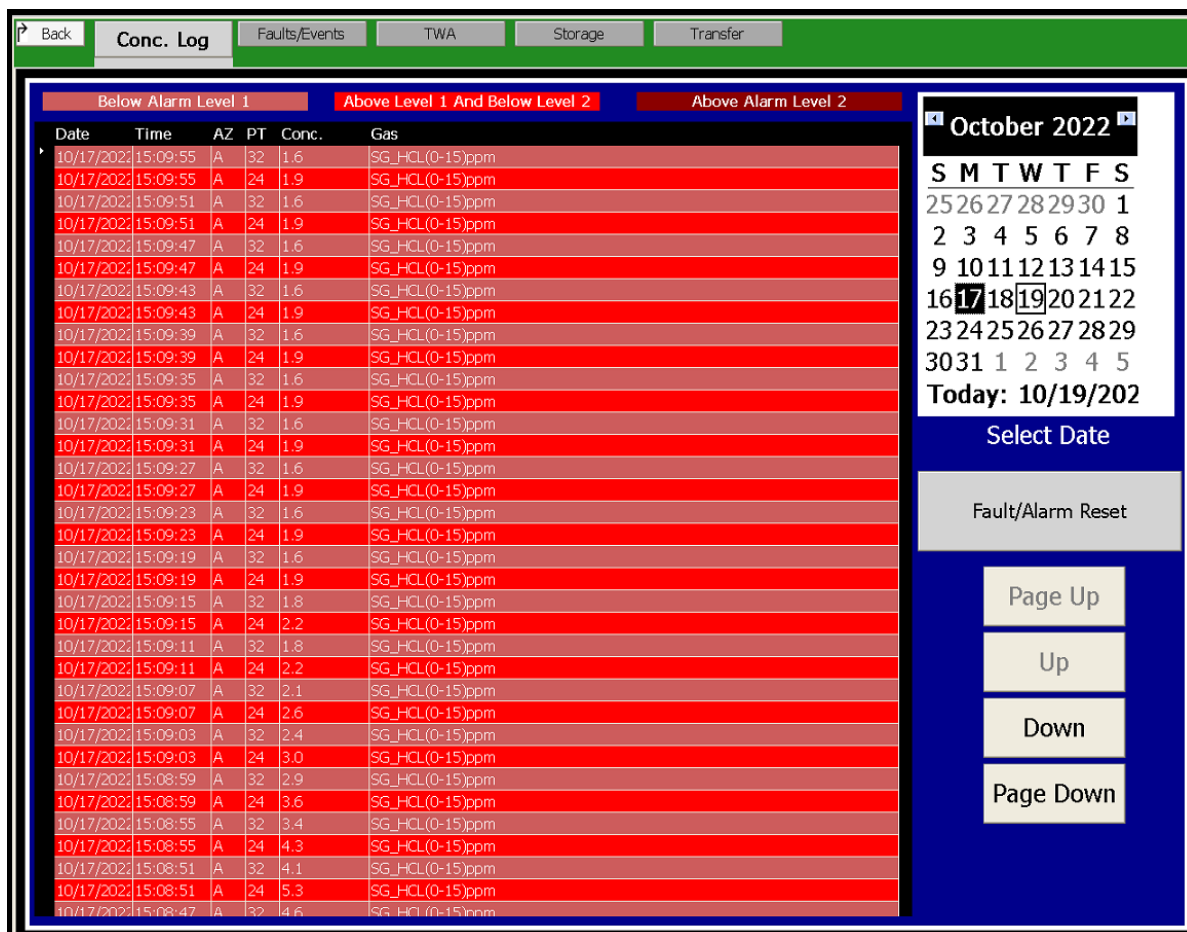
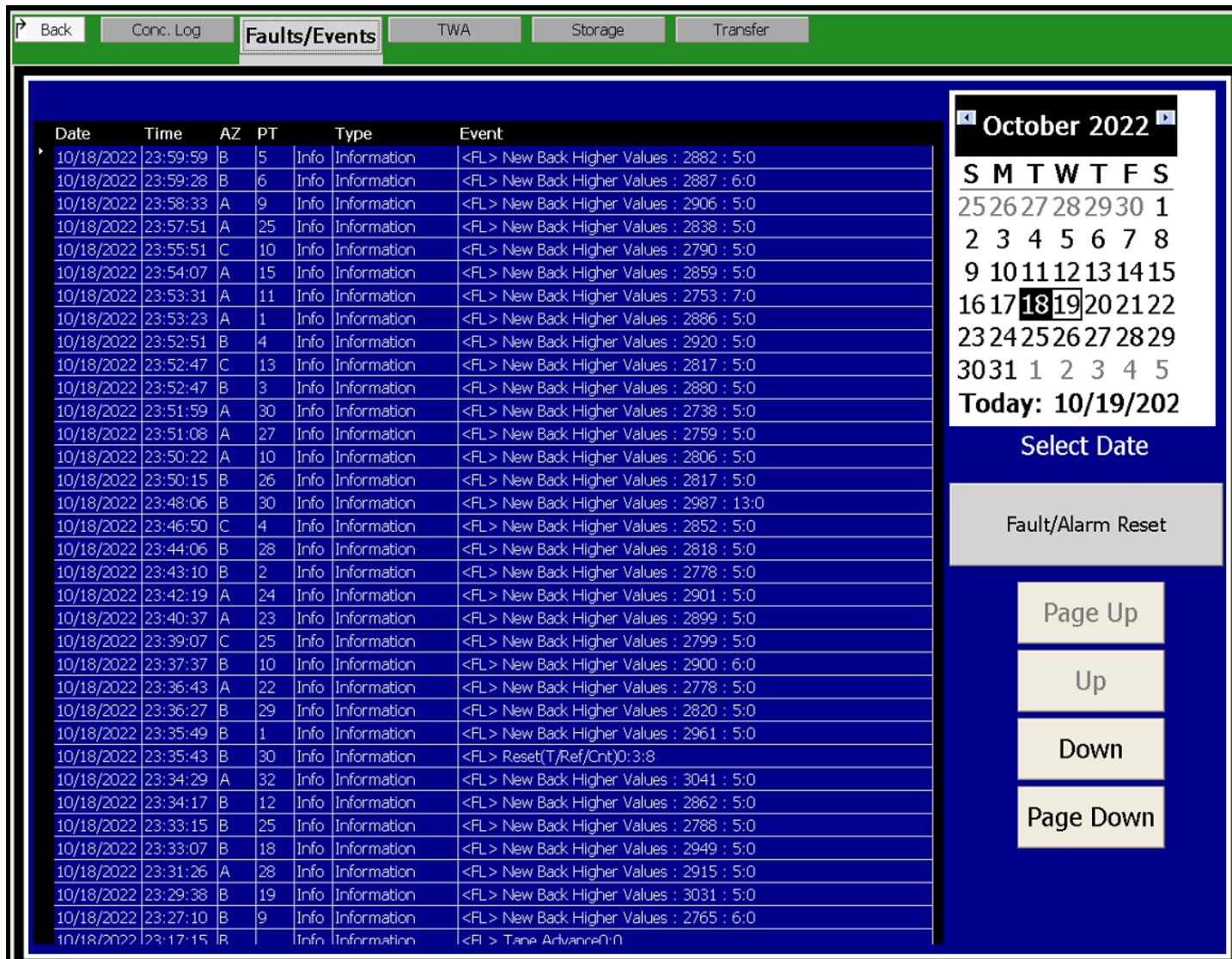


Figure 6.1.d.1

## 6.1.d.2 History -> Faults/Events

Touching the Faults/Events button on the History sub-menu will bring up screen show below. This screen shows only the events that occurred on the specific date selected using the calendar.



The screenshot displays the 'Faults/Events' screen. At the top, there is a navigation bar with buttons: Back, Conc. Log, **Faults/Events**, TWA, Storage, and Transfer. Below this is a table of events with columns: Date, Time, AZ, PT, Type, and Event. The table lists events from 10/18/2022. To the right of the table is a calendar for October 2022, with the date 18/19 highlighted. Below the calendar is a 'Select Date' button. At the bottom right, there is a 'Fault/Alarm Reset' button and a set of navigation buttons: Page Up, Up, Down, and Page Down.

| Date       | Time     | AZ | PT | Type | Event       |
|------------|----------|----|----|------|-------------|
| 10/18/2022 | 23:59:59 | B  | 5  | Info | Information |
| 10/18/2022 | 23:59:28 | B  | 6  | Info | Information |
| 10/18/2022 | 23:58:33 | A  | 9  | Info | Information |
| 10/18/2022 | 23:57:51 | A  | 25 | Info | Information |
| 10/18/2022 | 23:55:51 | C  | 10 | Info | Information |
| 10/18/2022 | 23:54:07 | A  | 15 | Info | Information |
| 10/18/2022 | 23:53:31 | A  | 11 | Info | Information |
| 10/18/2022 | 23:53:23 | A  | 1  | Info | Information |
| 10/18/2022 | 23:52:51 | B  | 4  | Info | Information |
| 10/18/2022 | 23:52:47 | C  | 13 | Info | Information |
| 10/18/2022 | 23:52:47 | B  | 3  | Info | Information |
| 10/18/2022 | 23:51:59 | A  | 30 | Info | Information |
| 10/18/2022 | 23:51:08 | A  | 27 | Info | Information |
| 10/18/2022 | 23:50:22 | A  | 10 | Info | Information |
| 10/18/2022 | 23:50:15 | B  | 26 | Info | Information |
| 10/18/2022 | 23:48:06 | B  | 30 | Info | Information |
| 10/18/2022 | 23:46:50 | C  | 4  | Info | Information |
| 10/18/2022 | 23:44:06 | B  | 28 | Info | Information |
| 10/18/2022 | 23:43:10 | B  | 2  | Info | Information |
| 10/18/2022 | 23:42:19 | A  | 24 | Info | Information |
| 10/18/2022 | 23:40:37 | A  | 23 | Info | Information |
| 10/18/2022 | 23:39:07 | C  | 25 | Info | Information |
| 10/18/2022 | 23:37:37 | B  | 10 | Info | Information |
| 10/18/2022 | 23:36:43 | A  | 22 | Info | Information |
| 10/18/2022 | 23:36:27 | B  | 29 | Info | Information |
| 10/18/2022 | 23:35:49 | B  | 1  | Info | Information |
| 10/18/2022 | 23:35:43 | B  | 30 | Info | Information |
| 10/18/2022 | 23:34:29 | A  | 32 | Info | Information |
| 10/18/2022 | 23:34:17 | B  | 12 | Info | Information |
| 10/18/2022 | 23:33:15 | B  | 25 | Info | Information |
| 10/18/2022 | 23:33:07 | B  | 18 | Info | Information |
| 10/18/2022 | 23:31:26 | A  | 28 | Info | Information |
| 10/18/2022 | 23:29:38 | B  | 19 | Info | Information |
| 10/18/2022 | 23:27:10 | B  | 9  | Info | Information |
| 10/18/2022 | 23:17:15 | B  |    | Info | Information |

Figure 6.1.d.2

Touch the 'Fault/Alarm Reset' button to reset clear all active faults & alarms.

### 6.1.d.3 History -> TWA

Touching the TWA button on the main menu will bring up the sub-menu screen shown below. The operator may use the calendar to select the TWA information for each date.

Back
Conc. Log
Faults/Events
**TWA**
Storage
Transfer

| End Date   | Time    | Start Date | Time    | AZ | PT | Gas            | Avg | Peak | Peak    | Peak 15 |
|------------|---------|------------|---------|----|----|----------------|-----|------|---------|---------|
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 32 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 31 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 30 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 29 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 28 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 27 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 26 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 25 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 24 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 23 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 22 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 21 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 20 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 19 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 18 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 17 | NH3(0-75)ppm   | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 16 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 15 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 14 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 13 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 12 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 11 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 10 | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 9  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 8  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 7  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 6  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 5  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 4  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 3  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 2  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | C  | 1  | SG_CL2(0-5000) | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | B  | 32 | PH3(0-1500)ppb | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | B  | 31 | PH3(0-1500)ppb | 0.0 | 0    | 4:22 PM | 0       |
| 10/18/2022 | 4:22 PM | 10/18/2022 | 4:22 PM | B  | 30 | PH3(0-1500)ppb | 0.0 | 0    | 4:22 PM | 0       |

October 2022

SMTWTFS

25 26 27 28 29 30 1

2 3 4 5 6 7 8

9 10 11 12 13 14 15

16 17 18 19 20 21 22

23 24 25 26 27 28 29

30 31 1 2 3 4 5

Today: 10/19/2022

Select Date

Fault/Alarm Reset

Page Up

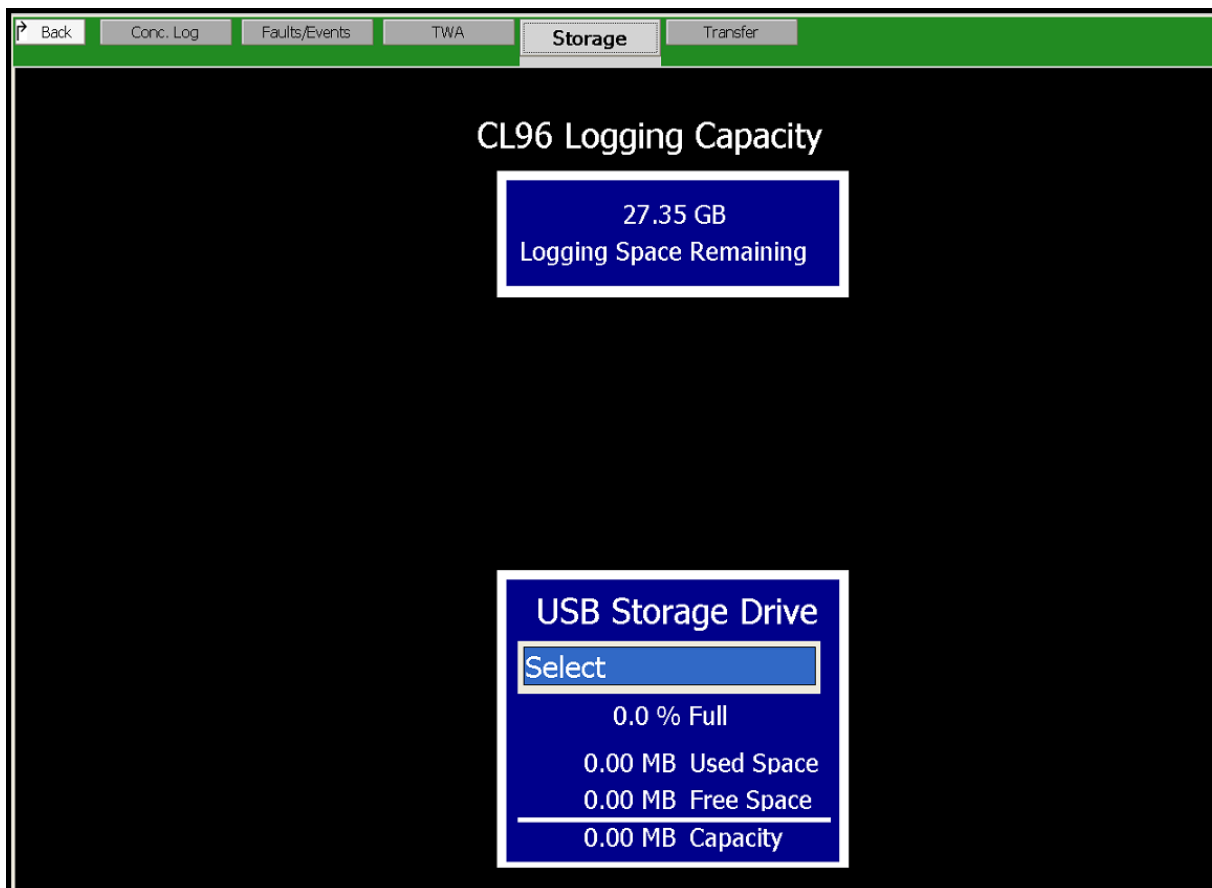
Up

Down

Page Down

Figure 6.1.d.3

## 6.1.d.4 History -> Storage



Back Conc. Log Faults/Events TWA **Storage** Transfer

CL96 Logging Capacity

27.35 GB  
Logging Space Remaining

USB Storage Drive

Select

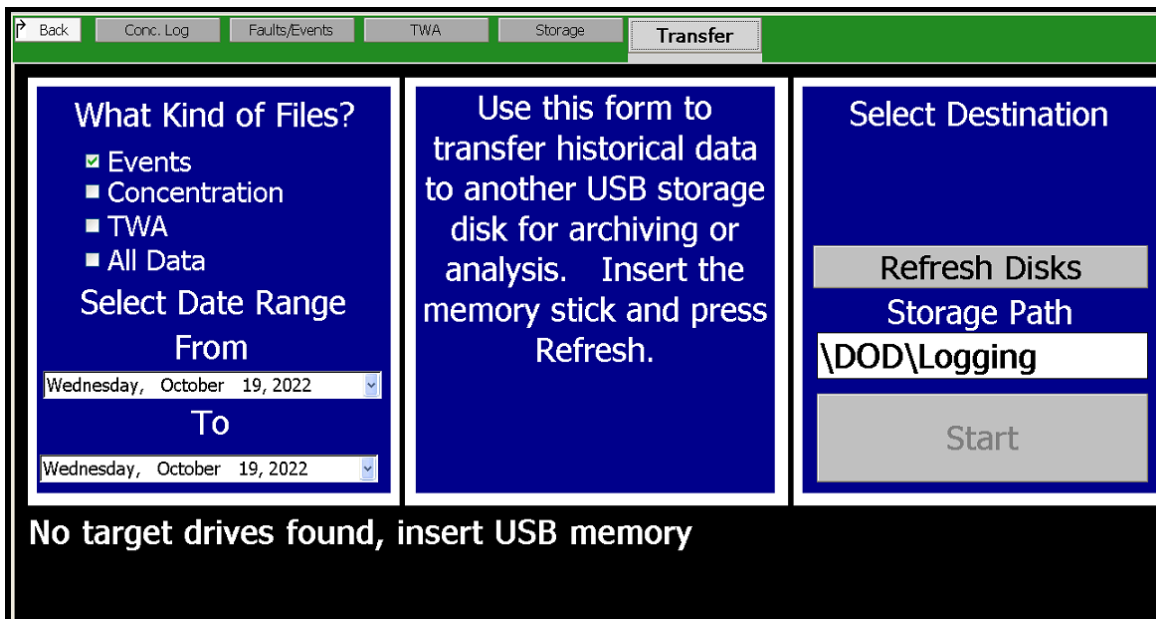
0.0 % Full

0.00 MB Used Space

0.00 MB Free Space

0.00 MB Capacity

## 6.1.d.5 History -> Transfer



Back Conc. Log Faults/Events TWA Storage **Transfer**

What Kind of Files?

- ☒ Events
- ☐ Concentration
- ☐ TWA
- ☐ All Data

Select Date Range

From  
Wednesday, October 19, 2022

To  
Wednesday, October 19, 2022

Use this form to transfer historical data to another USB storage disk for archiving or analysis. Insert the memory stick and press Refresh.

Select Destination

Refresh Disks

Storage Path  
\\DOD\\Logging

Start

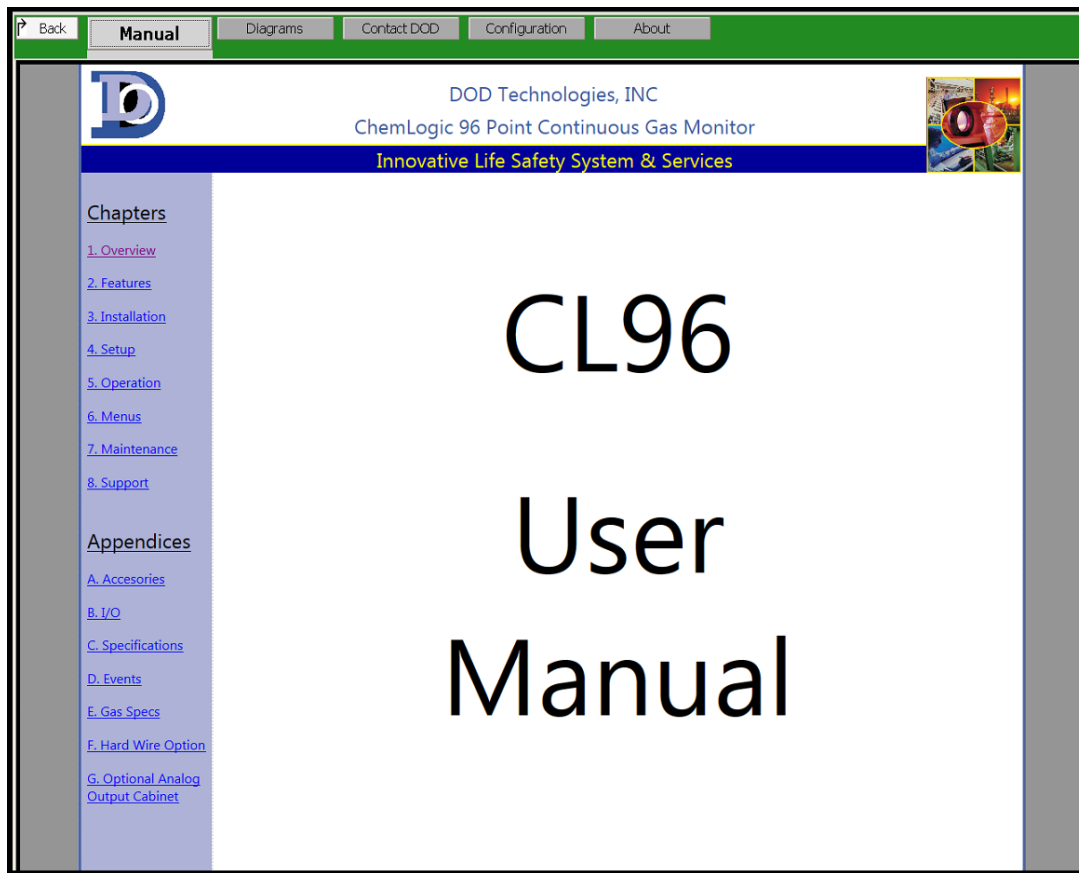
No target drives found, insert USB memory

## 6.1.e. Help

Selecting the 'Help' button from the Main Menu will direct you to tabs and screens containing useful references and helpful information.

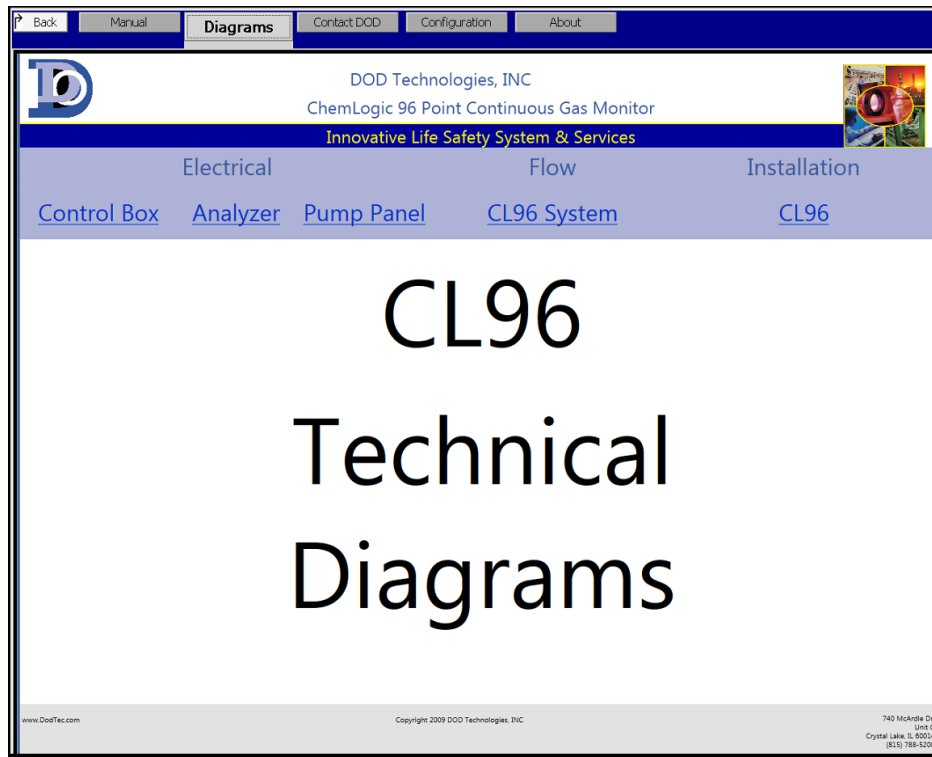
### 6.1.e.1 Help -> Manual

An interactive CL96 User Manual is available in this section. It is menu-driven to help you quickly find specifications and other useful information on your ChemLogic CL96 system. A PDF copy of the User Manual can also be viewed or downloaded by visiting the CL96 product page at [DODtec.com](http://DODtec.com).

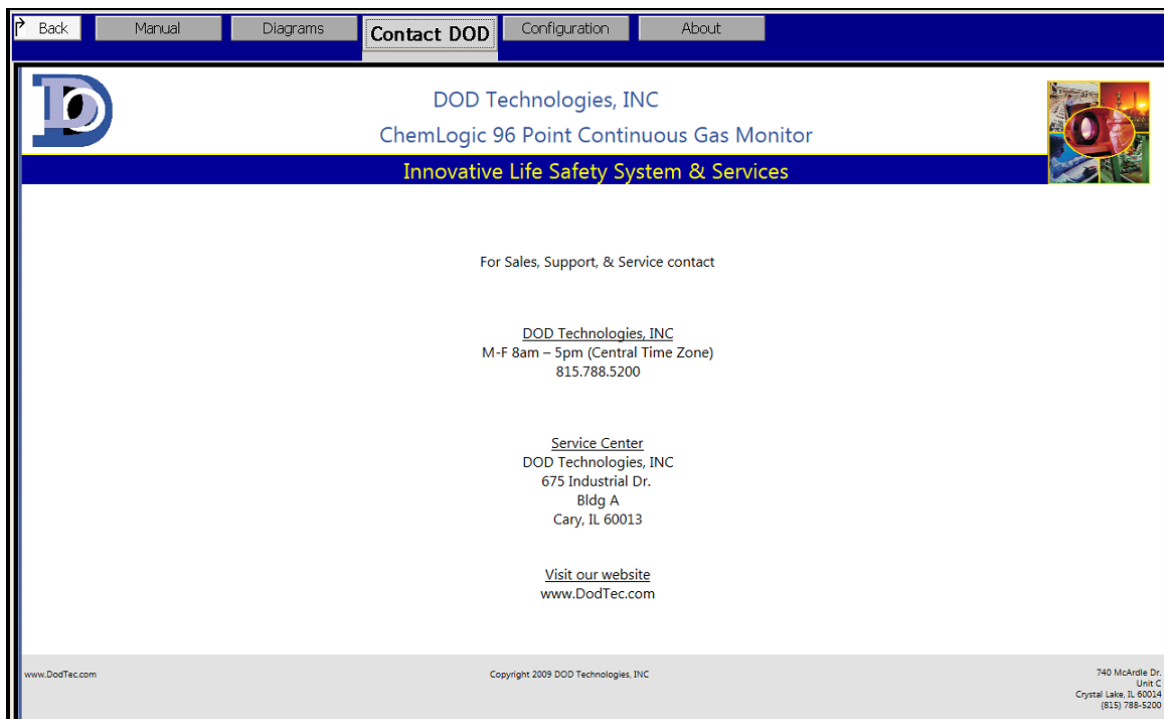




## 6.1.e.2 Help -> Diagrams



## 6.1.e.3 Help -> Contact DOD



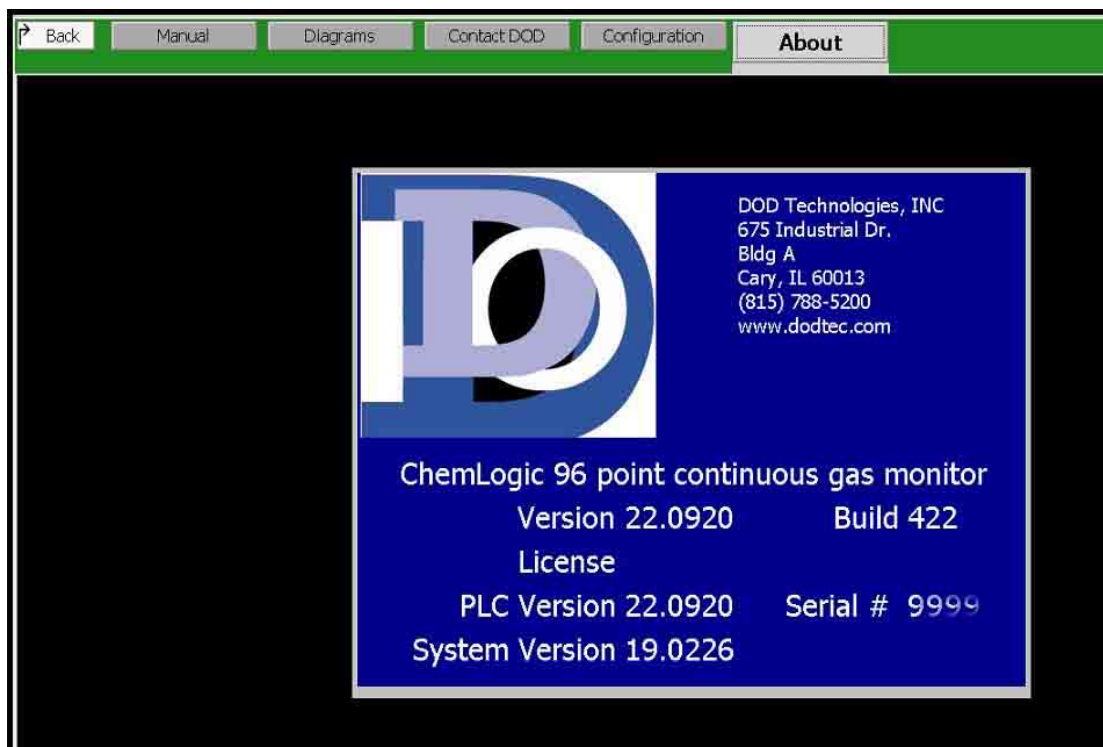


## 6.1.e.4 Help -> Configuration

| Back   | Manual | Diagrams   | Contact DOD | Configuration   | About |
|--|--------|--|-------------|---|-------|
| <b>Analyzer A</b>  |        |  |             |   |       |
| <b>Optic Block Front Side</b><br><div>Block 6<br/>Version :<br/>Serial # :</div> <div>Block 5<br/>Version :<br/>Serial # :</div> <div>Block 2<br/>Version :<br/>Serial # :</div> <div>Block 1<br/>Version :<br/>Serial # :</div> |        | <b>Optic Blocks Back Side</b><br><div>Block 8<br/>Version :<br/>Serial # :</div> <div>Block 7<br/>Version :<br/>Serial # :</div> <div>Block 4<br/>Version :<br/>Serial # :</div> <div>Block 3<br/>Version :<br/>Serial # :</div> |             | <b>Transducer Boards</b><br><div>BLOCK_1<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_3<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_2<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_4<br/>Version : 2.1<br/>Serial # : 61438</div> |       |
| <b>PROFIBUS</b><br>Status : 0<br>DpState : 0<br>DiagFlag : False<br>Ext Diag Flag : False  |        |  |             |   |       |
| <b>Analyzer B</b>  |        |  |             |   |       |
| <b>Optic Block Front Side</b><br><div>Block 6<br/>Version :<br/>Serial # :</div> <div>Block 5<br/>Version :<br/>Serial # :</div> <div>Block 2<br/>Version :<br/>Serial # :</div> <div>Block 1<br/>Version :<br/>Serial # :</div> |        | <b>Optic Blocks Back Side</b><br><div>Block 8<br/>Version :<br/>Serial # :</div> <div>Block 7<br/>Version :<br/>Serial # :</div> <div>Block 4<br/>Version :<br/>Serial # :</div> <div>Block 3<br/>Version :<br/>Serial # :</div> |             | <b>Transducer Boards</b><br><div>BLOCK_5<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_7<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_6<br/>Version : 2.1<br/>Serial # : 61438</div> <div>BLOCK_8<br/>Version : 2.1<br/>Serial # : 61438</div> |       |
| <b>Analyzer C</b>  |        |  |             |   |       |
| <b>Optic Block Front Side</b><br><div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div>   |        | <b>Optic Blocks Back Side</b><br><div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div>   |             | <b>Transducer Boards</b><br><div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div> <div>Not Installed</div>   |       |

## 6.1.e.5 Help -> About

Selecting the 'About' tab from the 'Help' menu displays the screen shown below. This screen contains important system details including the version, license number, serial number and more.



**Note:** Certain references in the photo above have been altered or omitted for proprietary purposes. Details and references will vary by system.

## 6.1.f Setup

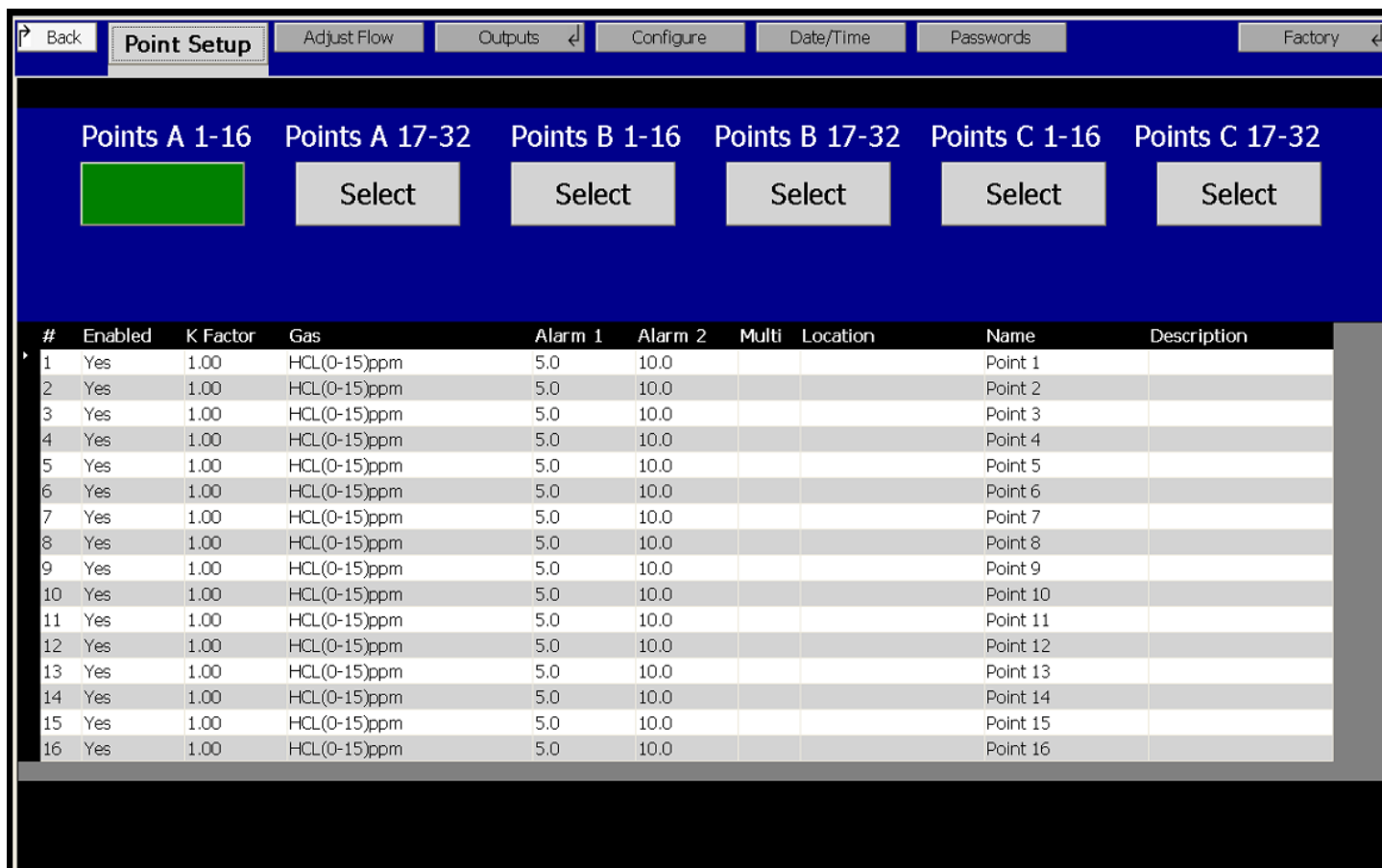
Pressing the Setup button while in analysis will end the analysis cycle on all installed analyzers if the proper password is entered. Touching the Setup button on the main menu will bring up the Setup sub-menu – see section 6.2 below.

## 6.2 Setup Sub-Menu

The setup sub-menu contains the configuration screen for the CL96 necessary for normal operation. Access to the Setup sub-menu is password protected (see section 6.2.f).

## 6.2.a Setup -> Point Setup

When the Point Setup button is touched the screen below appears. The buttons along the top allow selection of each analyzer that is installed (if not installed the buttons are disabled). Selecting an analyzer with the button at the top will display the configuration of the corresponding 16 points for the selected analyzer. Touching anywhere on the row for each point will bring up the screen in 6.2.a.2 which allows each point to be configured.



The screenshot shows the 'Point Setup' screen. At the top, there is a navigation bar with buttons: Back, Point Setup (highlighted), Adjust Flow, Outputs, Configure, Date/Time, Passwords, and Factory. Below the navigation bar, there are six buttons for selecting analyzers: Points A 1-16 (green), Points A 17-32 (Select), Points B 1-16 (Select), Points B 17-32 (Select), Points C 1-16 (Select), and Points C 17-32 (Select). Below these buttons is a table with 16 rows, each representing a point. The table has columns for #, Enabled, K Factor, Gas, Alarm 1, Alarm 2, Multi, Location, Name, and Description. All points are currently enabled and set to HCL(0-15)ppm with alarm levels of 5.0 and 10.0.

| #  | Enabled | K Factor | Gas          | Alarm 1 | Alarm 2 | Multi | Location | Name     | Description |
|----|---------|----------|--------------|---------|---------|-------|----------|----------|-------------|
| 1  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 1  |             |
| 2  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 2  |             |
| 3  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 3  |             |
| 4  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 4  |             |
| 5  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 5  |             |
| 6  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 6  |             |
| 7  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 7  |             |
| 8  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 8  |             |
| 9  | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 9  |             |
| 10 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 10 |             |
| 11 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 11 |             |
| 12 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 12 |             |
| 13 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 13 |             |
| 14 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 14 |             |
| 15 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 15 |             |
| 16 | Yes     | 1.00     | HCL(0-15)ppm | 5.0     | 10.0    |       |          | Point 16 |             |

Figure 6.2.a.1

For each point the Gas type, alarm levels, name, location, description, K Factor, and enabled/disabled may be adjusted. Note that changing the K Factor requires a high-level password.

The alarm levels will automatically be adjusted to the default levels when the gas type is changed from the drop-down menu. Alarm Level 1 must be  $\geq$  LAL for the selected gas,  $\leq$  Alarm Level 2, AND  $\leq$  Full Scale for the selected gas. Alarm Level 2 must be  $\geq$  LAL for the selected gas,  $\geq$  Alarm Level 1, AND  $\leq$  Full Scale for the selected gas.

**IMPORTANT** : When a point is disabled no gas analysis is performed.

### Point A-6

Gas:

Alarm Level 1:

Alarm Level 2:

Name:

Location:

Description:

K Factor:

Disabled: ☐

### Gas Specs

#### Hydrochloric Acid

Symbol:

LDL:

Full Scale:

Alarm 1 Default:

Alarm 2 Default:

Units:

Input Panel

|           |     |     |    |    |    |    |    |     |     |     |     |     |        |     |      |
|-----------|-----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|--------|-----|------|
| Esc       | F1  | F2  | F3 | F4 | F5 | F6 | F7 | F8  | F9  | F10 | F11 | F12 | Home   | End | Prop |
| `         | 1   | 2   | 3  | 4  | 5  | 6  | 7  | 8   | 9   | 0   | -   | =   | BS     |     |      |
| Tab       | q   | w   | e  | r  | t  | y  | u  | i   | o   | p   | [   | ]   | \      |     |      |
| Caps Lock | a   | s   | d  | f  | g  | h  | j  | k   | l   | ;   | '   |     | return |     |      |
| Shift     | z   | x   | c  | v  | b  | n  | m  | ,   | .   | /   | up  |     | pgup   |     |      |
| Ctrl      | win | Alt |    |    |    |    |    | ins | del | lt  | dn  | rt  | pgdn   |     |      |

Figure 6.2.a.2

## 6.2.b Setup -Adjust Flow

When the Adjust Flow, button is touched the screen below appears. The buttons along the top allow selection of each analyzer that is installed (if not installed the buttons are disabled). Touch the button for the analyzer once to turn on the pump for that analyzer or touch the same button again to turn off the pump. When the button is touched the flow levels for those 16 points are displayed below and may be adjusted with the corresponding flow control valves on the top of the machine. Only 1 analyzer may be selected at a time.

**IMPORTANT** : Although only 16 points can be adjusted at a time, both pumps for the analyzer tray are active at the same time (if 32 points are installed).

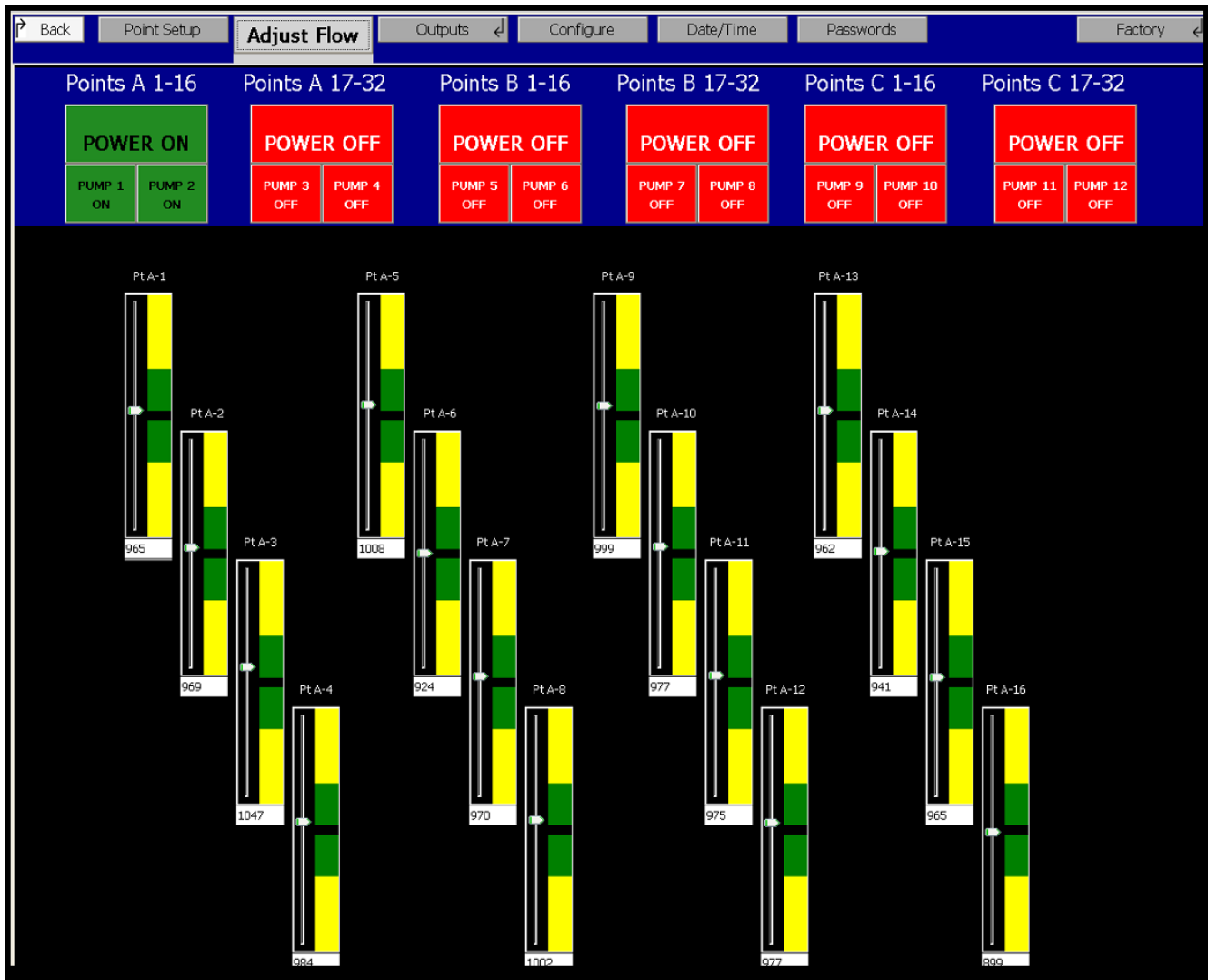


Figure 6.2.b

**NOTE** : There may be a slight delay between the time the control valve is turned and the update reading the CL96. Adjust the knob slowly and wait a few seconds to verify the level indicated on the unit is accurate.

## 6.2.C Setup -> Outputs

When the Point Setup button is touched the Outputs, Sub-Menu appears as described below. The outputs screen allows calibration & viewing of all output modules installed on the CL96.

### 6.2.c.1 Setup -> Outputs -> Alarms

When the Test Faults button is touched the screen below is displayed. This same screen is used to test the 24V output models and/or the relay contact if installed. For each installed analyzer, the touch button allows the operator to toggle the outputs active/inactive. Depending on the system setting for Energize/De-energized relays the output is set accordingly. On the left side of each analyzer tray display is a box which is colored appropriately for the selected faults. Below that is another box that shows which outputs are 'active'.

In figure 6.2.c.1 below both the critical fault for points 1-16 and general fault on points 17-32 are selected. Since the critical fault is higher priority the color of the box is orange (see table 5.2). If energized relays have previously been setup on the unit then the critical fault relay for analyzer A1 would not be off while the Alarm Level 1, Alarm Level 2, and general fault relays for analyzer A1 would be on.

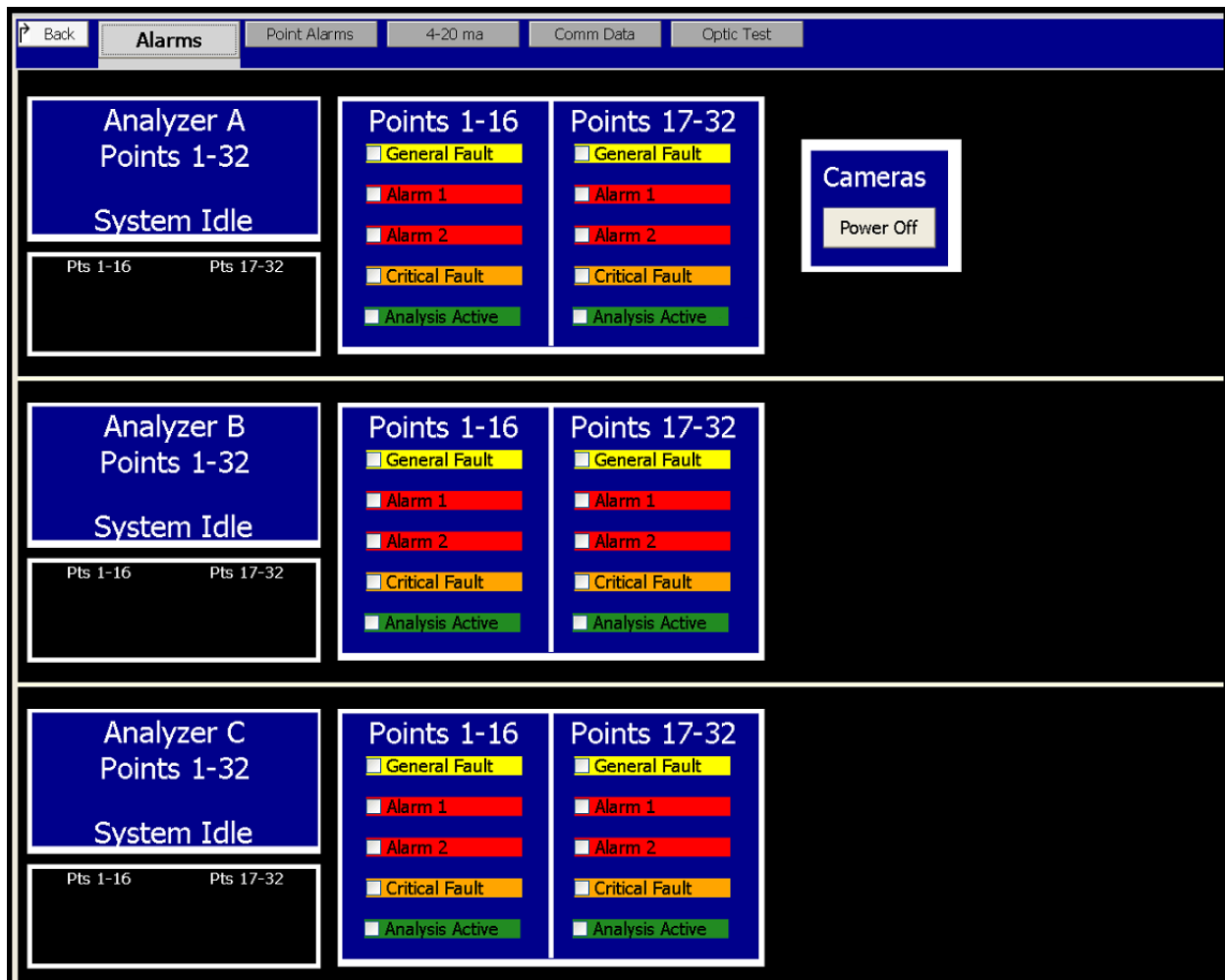
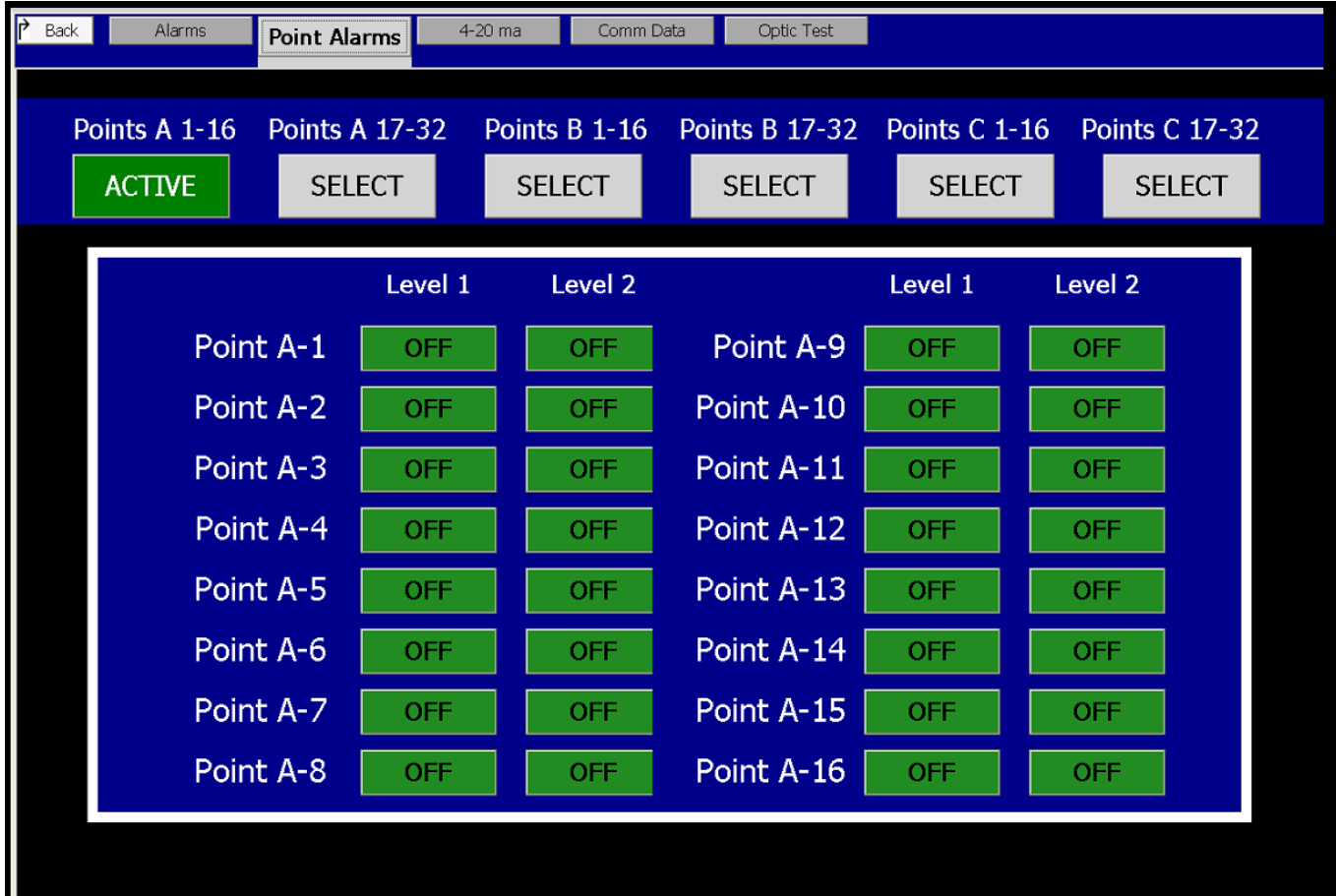


Figure 6.2.c.1

## 6.2.c.2 Setup -> Outputs -> Point Alarms

When the Test Points button is touched the screen below is displayed. The buttons along the top allow selections of each analyzer that is installed (if not installed the button are disabled). The same screen is used to test the 24V output modules and/or the relay contacts if installed. For each installed point, the touch buttons allow the operator to toggle the outputs active/in-active. Depending on the system setting for the Energized/De-energized relays the output is set accordingly.

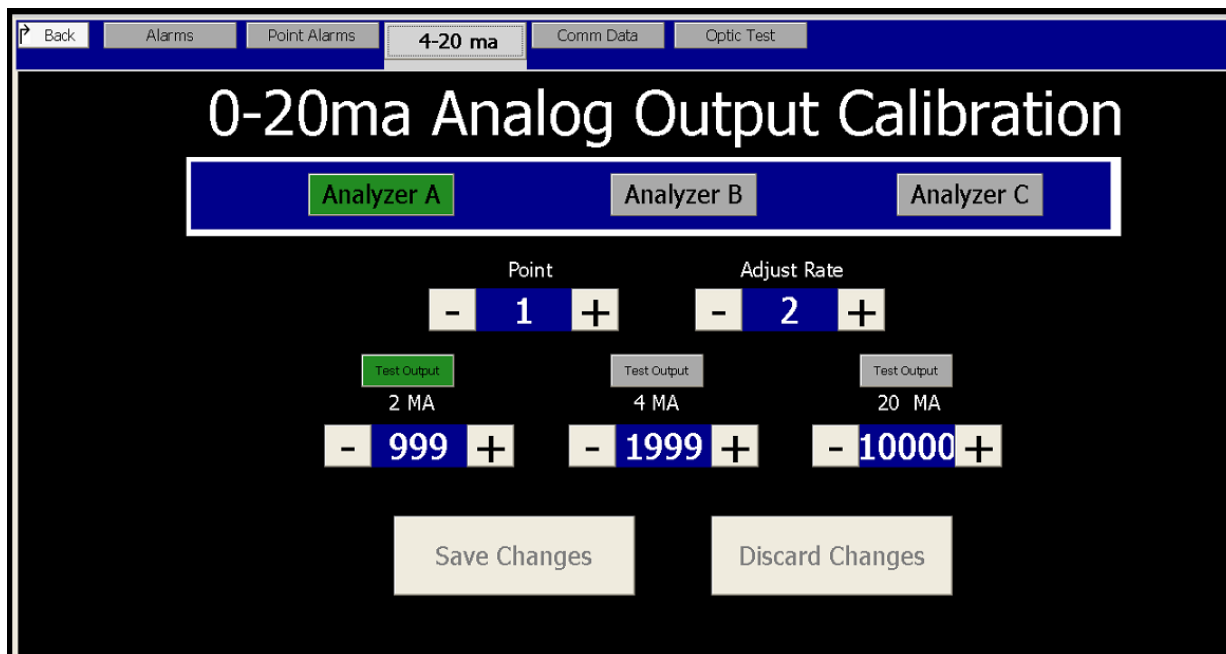
In figure 6.2.c.2 below, several of the point alarms have been selected for analyzer A1.



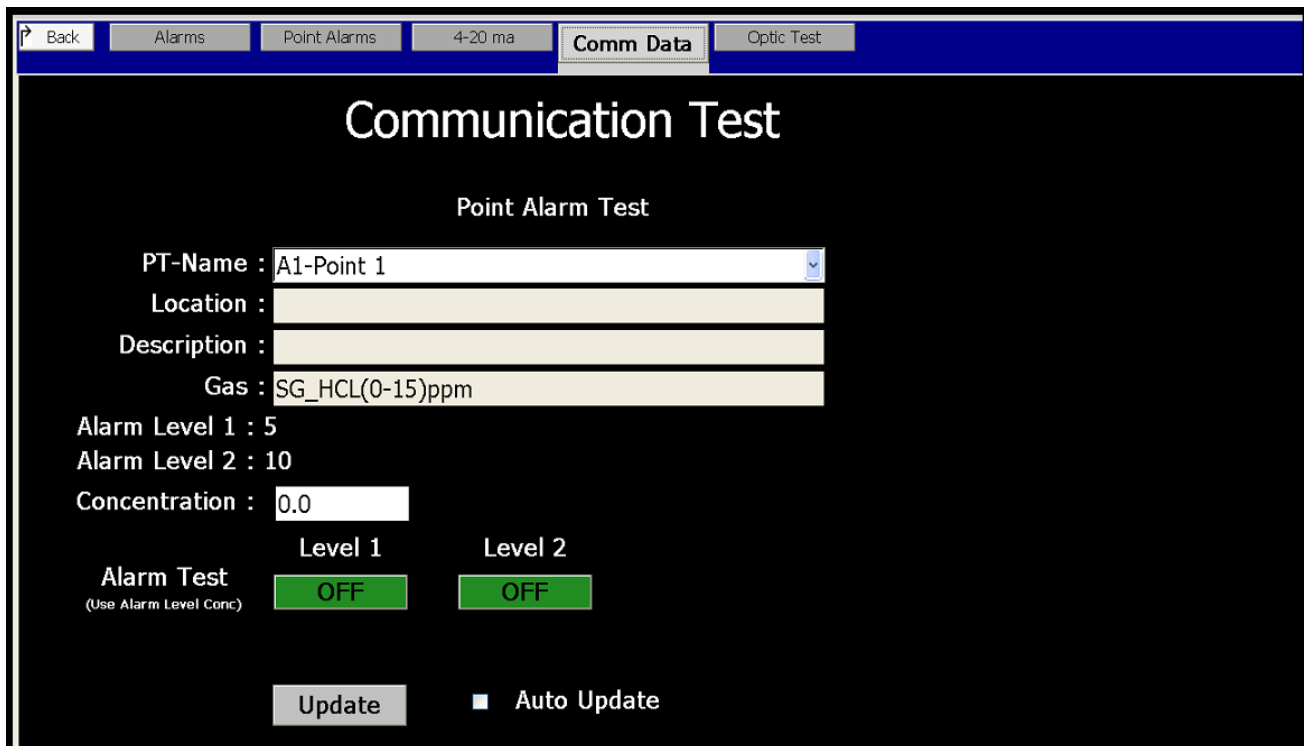
|           | Level 1 | Level 2 |            | Level 1 | Level 2 |
|-----------|---------|---------|------------|---------|---------|
| Point A-1 | OFF     | OFF     | Point A-9  | OFF     | OFF     |
| Point A-2 | OFF     | OFF     | Point A-10 | OFF     | OFF     |
| Point A-3 | OFF     | OFF     | Point A-11 | OFF     | OFF     |
| Point A-4 | OFF     | OFF     | Point A-12 | OFF     | OFF     |
| Point A-5 | OFF     | OFF     | Point A-13 | OFF     | OFF     |
| Point A-6 | OFF     | OFF     | Point A-14 | OFF     | OFF     |
| Point A-7 | OFF     | OFF     | Point A-15 | OFF     | OFF     |
| Point A-8 | OFF     | OFF     | Point A-16 | OFF     | OFF     |

Figure 6.2.c.2

### 6.2.c.3 Setup -> Outputs -> 4-20mA



### 6.2.c.4 Setup -> Outputs -> Comm Data





## 6.2.c.5 Setup -> Outputs -> Optic Test

Back
Alarms
Point Alarms
4-20 ma
Comm Data
**Optic Test**

### Optical Strip Point Alarm Test

Start New Test

(LEFT) Closed
(RIGHT) Closed

Open Gate

Alarm 1  
OFF
Alarm 2  
OFF

Background : 0  
Reading 1 : 0  
Reading 2 : 0

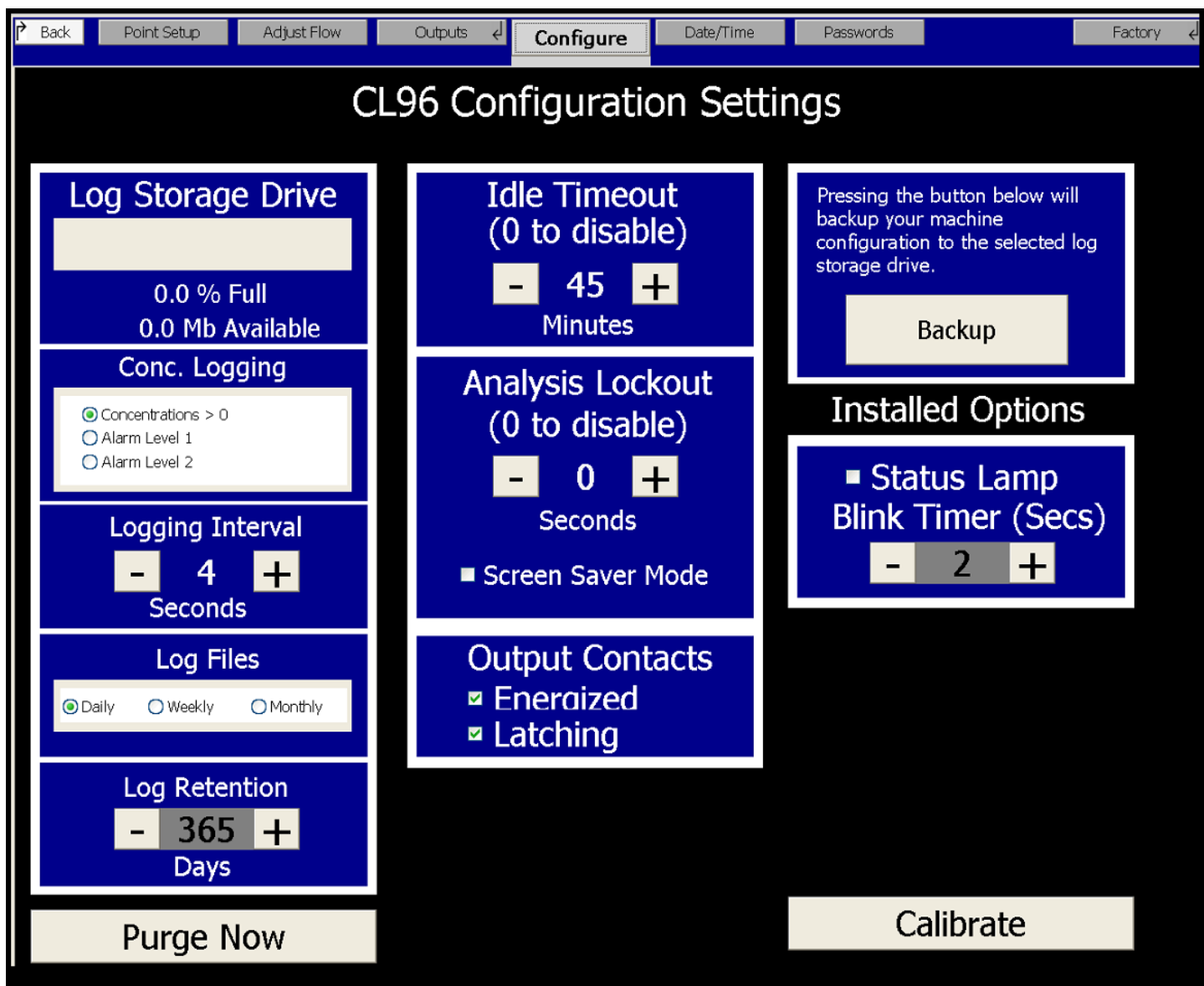
PT-Name : A1-Point 1  
Location :  
Description :  
Gas : SG\_HCL(0-15)ppm  
Alarm Level 1 : 5  
Alarm Level 2 : 10  
Concentration : 0  
BACKGROUND

\*\*\*\*\* STEP 1 \*\*\*\*\*

1. Select Point
2. Open Gate
3. Insert Background (WHITE) strip over selected point
4. Close Gate
5. Press BACKGROUND button

## 6.2.d Setup -> Configure

When the Configure button is touched the screen below is displayed. Each of the blocks on the screen are described below.



**CL96 Configuration Settings**

**Log Storage Drive**

0.0 % Full  
0.0 Mb Available

**Conc. Logging**

☒ Concentrations > 0  
☐ Alarm Level 1  
☐ Alarm Level 2

**Logging Interval**

- 4 +  
Seconds

**Log Files**

☒ Daily ☐ Weekly ☐ Monthly

**Log Retention**

- 365 +  
Days

**Purge Now**

**Idle Timeout (0 to disable)**

- 45 +  
Minutes

**Analysis Lockout (0 to disable)**

- 0 +  
Seconds

☒ Screen Saver Mode

**Output Contacts**

☒ Energized  
☒ Latching

Pressing the button below will backup your machine configuration to the selected log storage drive.

**Backup**

**Installed Options**

☒ Status Lamp Blink Timer (Secs)

- 2 +

**Calibrate**

Figure 6.2.d

## Logging Configuration

Three components make up the logging configuration of the system: Where to log, what to log, and how often to log. The drop-down list at the top will contain the available USB storage drives installed. Below the selected drive is the information on the space available for logging.

**IMPORTANT** : Hard Disk 1 and Hard Disk 2 are reserved for use by the CL96 system. Each USB drive installed in the USB Hub will be sequentially named beginning with Hard Disk 3.

The drop-down list for Conc. Logging gives the operator the three available choices for what concentration data should be logged:

1. All concentrations
2. Those above Alarm Level 1
3. Those above Alarm Level 2.

Only points where gas is detected are logged to the disk. An appropriate event message is always written to the event log when gas exceeds alarm level 1 or 2 on a per point basis.

The third component of the Logging Configuration is the logging interval. The value entered here determine how often the concentration is logged to the storage drive. Use the + and – keys to adjust the value from 4 to 120 seconds in 4 second increments.

## Idle Timeout

The idle timeout box allows adjustment of the time a critical fault will be issued if any installed analyzer is left out of analysis. Setting the value to = disables the fault from occurring. Use the + and – keys to adjust the value from 0-45 minutes.

## Output Contact

Energized relays determine the normal state of the relays/outputs. When energized is selected the faults, general alarm levels, and point outputs will all be energized under normal conditions. When a fault or alarm occurs, the outputs will become de-energized. The opposite occurs when this checkbox is not selected.

Selecting Latching faults causes faults to remain active until the 'Reset Faults/Events' button is pressed to acknowledge the problem.

**NOTE** : Flow faults are not affected by the latching faults option. Flow faults will never be latched on the CL96 but will always be recorded in the event log when they occur and are cleared. See below for flow fault filter.

## Flow Fault Filter

The flow fault filter setting determines the minimum time to filter a flow fault (either high or low flow). For example: putting this setting to 30 seconds would require a continuous low flow for 30 seconds before a fault is set AND another continuous 30 second period of corrected flow before the flow is cleared.

## 6.2.e Setup -> Date Time

When the Date/Time button is touched the below is displayed. After adjusting the correct date and time on the screen be sure to touch the 'Set' button to save the settings.

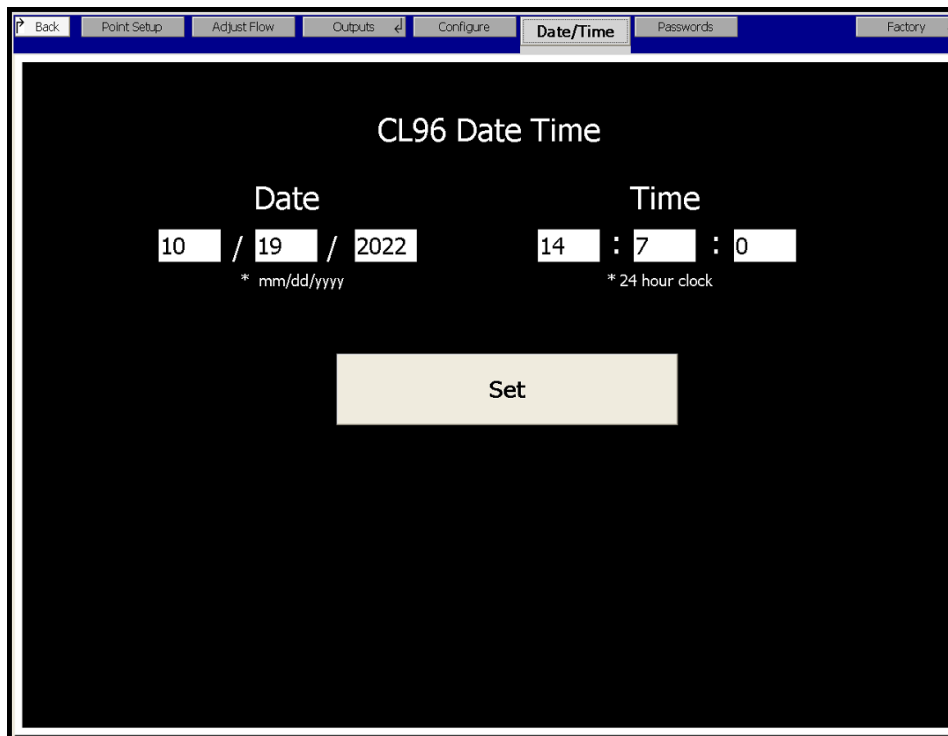
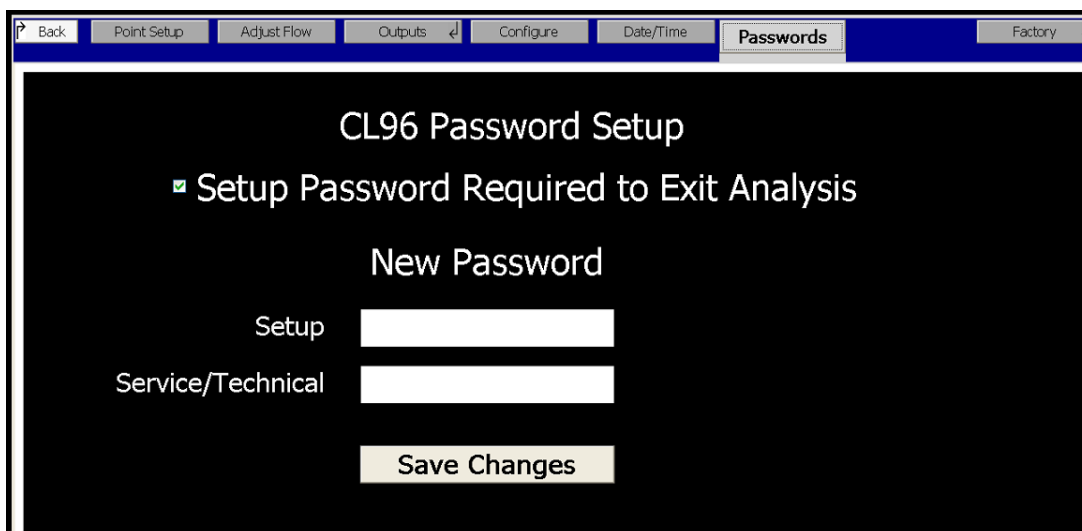


Figure 6.2.e

## 6.2.f Setup-> Passwords

When the Passwords button the password entry screen will be displayed. Note that the Administrator password is required to access the screen.



Back Point Setup Adjust Flow Outputs Configure Date/Time **Passwords** Factory

### CL96 Password Setup

☒ Setup Password Required to Exit Analysis

New Password

Setup

Service/Technical

Save Changes

## 6.3 Factory Setup Sub-Menu

The Factory setup sub-menu contains the configuration screen for the CL96 necessary for normal operation. Access to the Setup sub-menu is password protected ([see section 6.2.f](#)).

## 6.3.a Setup -> Factory -> System

Back
System
Multi Pt
Simulation
Configuration
Settings
Restore
Update
Technician

Analyzer A  
Points 1-32  
System Idle  
Pts 1-16 Pts 17-32

Log Communications
(LEFT) Closed (RIGHT) Closed
Open Gate

Fault/Alarm Reset
Turn Pumps On

Flow Offsets ADC Flow Set Offsets  
Optics DAC ADC Reference Calibrate

Analyzer B  
Points 1-32  
System Idle  
Pts 1-16 Pts 17-32

Log Communications
(LEFT) Closed (RIGHT) Closed
Open Gate

Fault/Alarm Reset
Turn Pumps On

Flow Offsets ADC Flow Set Offsets  
Optics DAC ADC Reference Calibrate

Analyzer C  
Points 1-32  
System Idle  
Pts 1-16 Pts 17-32

Log Communications
(LEFT) Closed (RIGHT) Closed
Open Gate

Fault/Alarm Reset
Turn Pumps On

Flow Offsets ADC Flow Set Offsets  
Optics DAC ADC Reference Calibrate

## 6.3.b Setup -> Factory -> Multi Pt

Back
System
**Multi Pt**
Simulation
Configuration
Settings
Restore
Update
Technician

Enabled
Disabled

Gas
☒

AsH3(0-500)ppb

Alarm Level 1
☒

1000

Alarm Level 2
☒

2000

Name

Location

Description

K Factor

Parallel Sampling Enabled

Disabled

Analyzer

Analyzer A 17-32

Analyzer B 17-32

Analyzer C 17-32

Analyzer A 1-16

Analyzer B 1-16

Analyzer C 1-16

Points

|  |  |  |  |
|--|--|--|--|
| <input type="checkbox"/> B-1             | <input type="checkbox"/> B-2             | <input type="checkbox"/> B-3             | <input type="checkbox"/> B-4             |
| <input type="checkbox"/> B-5             | <input type="checkbox"/> B-6             | <input type="checkbox"/> B-7             | <input type="checkbox"/> B-8             |
| <input type="checkbox"/> B-9             | <input type="checkbox"/> B-10            | <input type="checkbox"/> B-11            | <input type="checkbox"/> B-12            |
| <input type="checkbox"/> B-13            | <input type="checkbox"/> B-14            | <input type="checkbox"/> B-15            | <input type="checkbox"/> B-16            |
| <input checked="" type="checkbox"/> B-17 | <input checked="" type="checkbox"/> B-18 | <input checked="" type="checkbox"/> B-19 | <input checked="" type="checkbox"/> B-20 |
| <input checked="" type="checkbox"/> B-21 | <input checked="" type="checkbox"/> B-22 | <input checked="" type="checkbox"/> B-23 | <input checked="" type="checkbox"/> B-24 |
| <input checked="" type="checkbox"/> B-25 | <input checked="" type="checkbox"/> B-26 | <input checked="" type="checkbox"/> B-27 | <input checked="" type="checkbox"/> B-28 |
| <input checked="" type="checkbox"/> B-29 | <input checked="" type="checkbox"/> B-30 | <input checked="" type="checkbox"/> B-31 | <input checked="" type="checkbox"/> B-32 |

Clear All

Set All

Apply Changes

## 6.3.c Setup -> Factory -> Simulation

| Back  | System | Multi Pt  | <b>Simulation</b> | Configuration | Settings | Restore | Update | Technician |
|---|--------|---|-------------------|---------------|----------|---------|--------|------------|
| <b>Analyzer A</b><br>Points 1-32<br><b>System Idle</b><br>Pts 1-16      Pts 17-32 |        | <b>Simulation Enabled</b><br>Select Point      Rate (1-99)      Time (Secs)<br><div>1</div> <div>5</div> <div>4</div> <b>All Points On Analyzer</b> |                   |               |          |         |        |            |
| <b>Analyzer B</b><br>Points 1-32<br><b>System Idle</b><br>Pts 1-16      Pts 17-32 |        | <b>Simulation Enabled</b><br>Select Point      Rate (1-99)      Time (Secs)<br><div>1</div> <div>5</div> <div>4</div> <b>All Points On Analyzer</b> |                   |               |          |         |        |            |
| <b>Analyzer C</b><br>Points 1-32<br><b>System Idle</b><br>Pts 1-16      Pts 17-32 |        | <b>Simulation Enabled</b><br>Select Point      Rate (1-99)      Time (Secs)<br><div>1</div> <div>5</div> <div>4</div> <b>All Points On Analyzer</b> |                   |               |          |         |        |            |



## 6.3.d Setup -> Factory -> Configuration

Back
System
Multi Pt
Simulation
**Configuration**
Settings
Restore
Update
Technician

Save Changes
Device Configuration
☒ Allow No Outputs

ENABLED

Tray 1

ENABLED

Points 1-16
Points 17-32

MineralAcid\_SG
MineralAcid\_SG

Select Gas Family
Select Gas Family

Days Remaining 0 SET
Days Remaining 0 SET

☐ Form A Relays
☐ 24V Sinking
☐ Analog (4-20ma)
☐ 24V Sourcing

ENABLED

Tray 2

ENABLED

Points 33-48
Points 49-64

Hydrides\_120
Hydrides\_120

Select Gas Family
Select Gas Family

Days Remaining 0 SET
Days Remaining 0 SET

☐ Form A Relays
☐ 24V Sinking
☐ Analog (4-20ma)
☐ 24V Sourcing

ENABLED

Tray 3

ENABLED

Points 65-80
Points 81-96

Chlorine\_SG
Ammonia

Select Gas Family
Select Gas Family

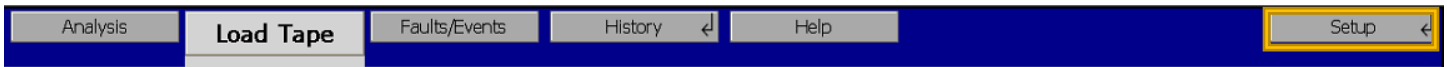
Days Remaining 0 SET
Days Remaining 0 SET

☐ Form A Relays
☐ 24V Sinking
☐ Analog (4-20ma)
☐ 24V Sourcing

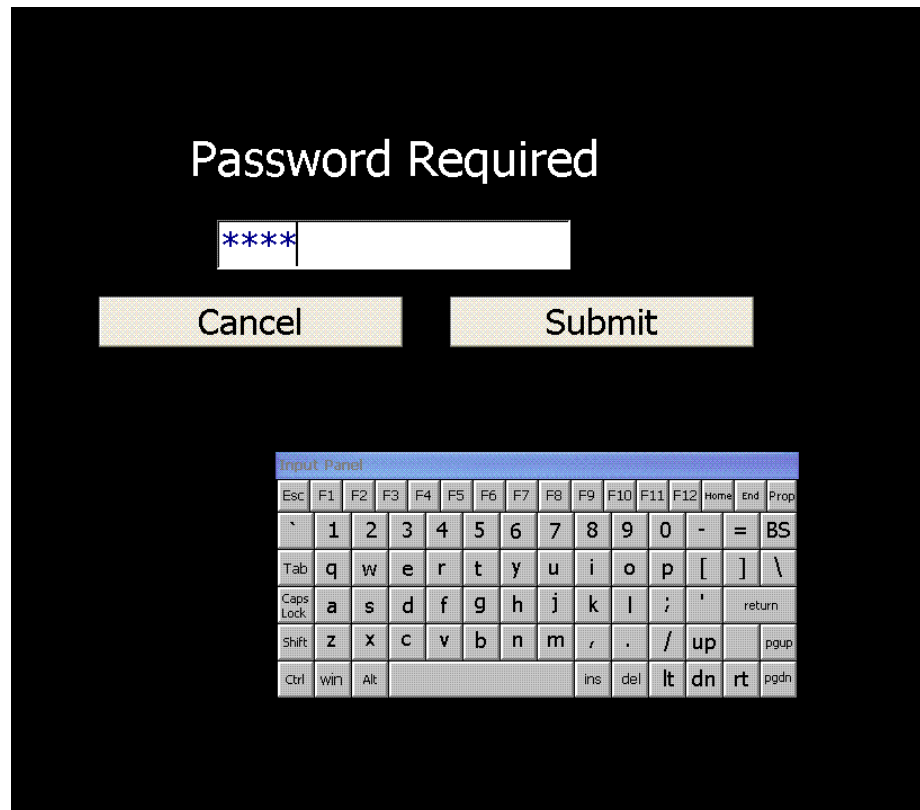
## 6.3.e Setup -> Factory -> Settings

To access the Configuration Settings menu for the CL96, complete the following steps:

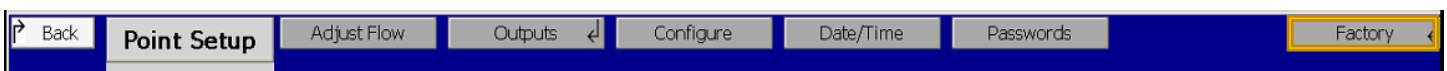
### 1. CL96 Main Menu → SETUP



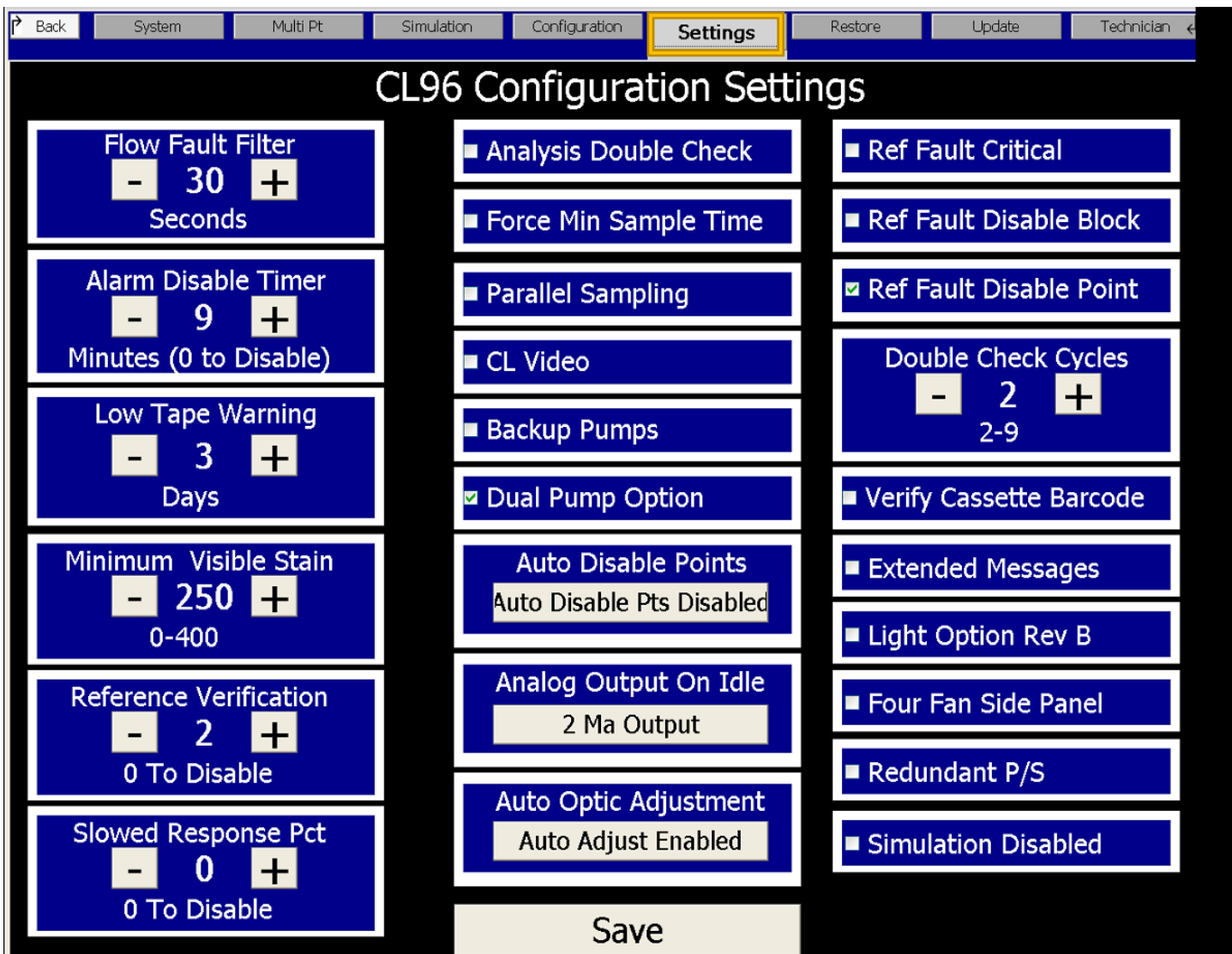
### 2. Enter password



### 3. SETUP Menu → FACTORY Menu



#### 4. From the FACTORY Menu SETTINGS



**CL96 Configuration Settings**

|  |  |   |
|--|--|---|
| Flow Fault Filter<br>- 30 +<br>Seconds                 | <input type="checkbox"/> Analysis Double Check       | <input type="checkbox"/> Ref Fault Critical                 |
| Alarm Disable Timer<br>- 9 +<br>Minutes (0 to Disable) | <input type="checkbox"/> Force Min Sample Time       | <input type="checkbox"/> Ref Fault Disable Block            |
| Low Tape Warning<br>- 3 +<br>Days                      | <input type="checkbox"/> Parallel Sampling           | <input checked="" type="checkbox"/> Ref Fault Disable Point |
| Minimum Visible Stain<br>- 250 +<br>0-400              | <input type="checkbox"/> CL Video                    | Double Check Cycles<br>- 2 +<br>2-9                         |
| Reference Verification<br>- 2 +<br>0 To Disable        | <input type="checkbox"/> Backup Pumps                | <input type="checkbox"/> Verify Cassette Barcode            |
| Slowed Response Pct<br>- 0 +<br>0 To Disable           | <input checked="" type="checkbox"/> Dual Pump Option | <input type="checkbox"/> Extended Messages                  |
|  | Auto Disable Points<br>Auto Disable Pts Disabled     | <input type="checkbox"/> Light Option Rev B                 |
|  | Analog Output On Idle<br>2 Ma Output                 | <input type="checkbox"/> Four Fan Side Panel                |
|  | Auto Optic Adjustment<br>Auto Adjust Enabled         | <input type="checkbox"/> Redundant P/S                      |
|  | <b>Save</b>  | <input type="checkbox"/> Simulation Disabled                |

### 6.3.e.1 Minimum Visible Stain

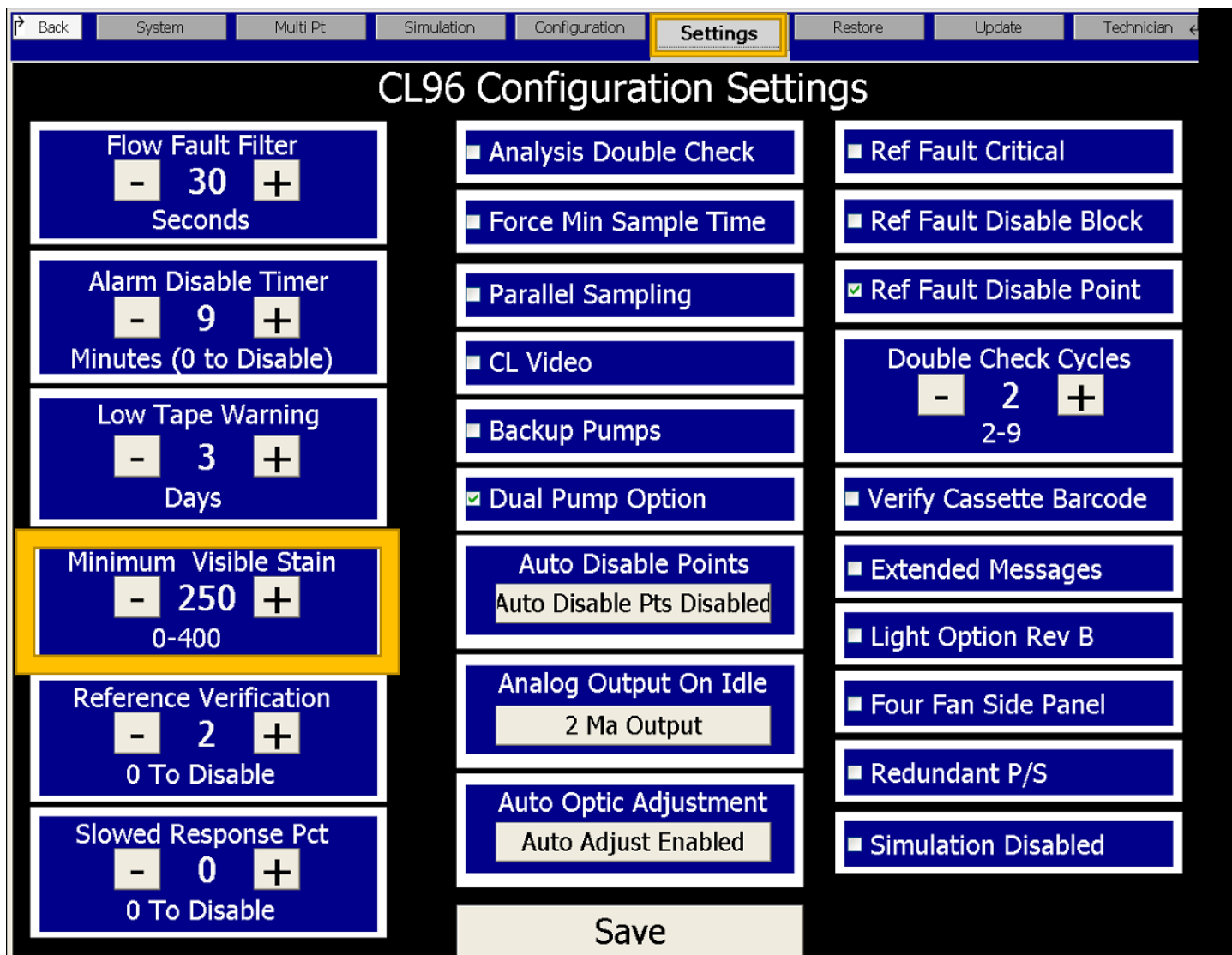
The Minimum Visible Stain (MVS) feature was implemented as an enhancement (in 2017) as part of the software version 17.0130 update. MVS allows color change or the stain to continue to accumulate during the same window, or on the same spot of the ChemLogic cassette, until the minimum count threshold is achieved.

The default setting for MVS is 250 counts. MVS is user adjustable from 0 to 400 counts. 0 counts would disable the MVS feature. When enabled, the MVS software will not trigger a tape advance during a gas event until the set MVS value is reached. MVS set at 250 counts and above should result in the stain being visible to the human eye during a gas event.

The typical counts required to see a stain with the human eye is approximately 200 counts. This varies slightly by gas and ChemLogic cassette.

The MVS software feature can be accessed and modified by following the below path.

From the **FACTORY Menu**  **SETTINGS**



**CL96 Configuration Settings**

|   |   |   |
|---|---|---|
| <b>Flow Fault Filter</b><br>- 30 +<br>Seconds                 | <input type="checkbox"/> Analysis Double Check          | <input type="checkbox"/> Ref Fault Critical                 |
| <b>Alarm Disable Timer</b><br>- 9 +<br>Minutes (0 to Disable) | <input type="checkbox"/> Force Min Sample Time          | <input type="checkbox"/> Ref Fault Disable Block            |
| <b>Low Tape Warning</b><br>- 3 +<br>Days                      | <input type="checkbox"/> Parallel Sampling              | <input checked="" type="checkbox"/> Ref Fault Disable Point |
| <b>Minimum Visible Stain</b><br>- 250 +<br>0-400              | <input type="checkbox"/> CL Video                       | <b>Double Check Cycles</b><br>- 2 +<br>2-9                  |
| <b>Reference Verification</b><br>- 2 +<br>0 To Disable        | <input type="checkbox"/> Backup Pumps                   | <input type="checkbox"/> Verify Cassette Barcode            |
| <b>Slowed Response Pct</b><br>- 0 +<br>0 To Disable           | <input checked="" type="checkbox"/> Dual Pump Option    | <input type="checkbox"/> Extended Messages                  |
|   | <b>Auto Disable Points</b><br>Auto Disable Pts Disabled | <input type="checkbox"/> Light Option Rev B                 |
|   | <b>Analog Output On Idle</b><br>2 Ma Output             | <input type="checkbox"/> Four Fan Side Panel                |
|   | <b>Auto Optic Adjustment</b><br>Auto Adjust Enabled     | <input type="checkbox"/> Redundant P/S                      |
|   | <b>Save</b>   | <input type="checkbox"/> Simulation Disabled                |

MVS was implemented to allow a stain or color change continue to accumulate to pre-set count changes. The purpose is to allow low level concentrations to accumulate on the same spot making the stain visible to the human eye. Previous software versions advanced tape when set count changes were reached. During low level detection this could result in tape advances and low-level readings without visible stains. MVS reduces the possibility of low-level detection without visible stains.

## 6.3.e.2 Dual Pump Option

The CL96 Continuous Gas Monitor has an optional dual pump feature. This option includes an additional pump for each 16-point analyzer, resulting in up to 80% reduced transport time. This dual pump feature also acts as a backup pump in the event of a pump failure. For each 16-point set, two pumps are installed (see Figure 1). Check valves are connecting the two pumps in each 16-point analyzer (see Figure 2). In the event, one pump fails the other pump will take over for the failed pump. Flow rates will drop from the data provided in Table 2 to the data provided in Table 1, but all points will remain in analysis. A general fault will be issued stating that the pump has failed.

Below includes the data from the current standard CL96 transport times and flow rates (1) and the dual pump option transport times and flow rates (2).

### 1. Single pump transport times and flow rates – STANDARD CL96 CONFIGURATION

| Outer Diameter (OD)                  |   | 0.25 in. (OD)   |         |         |         |
|--------------------------------------|---|-----------------|---------|---------|---------|
| Inner Diameter (ID)                  |   | 0.1875 in. (ID) |         |         |         |
| Length in Feet                       |   | 100             | 200     | 300     | 400     |
| Length in Meters                     |   | 30              | 61      | 91      | 122     |
| Number of Analyzer's per Sample Line | 1   | 24 sec.         | 48 sec. | 72 sec. | 96 sec. |
|                                      | 2   | 13 sec.         | 26 sec. | 39 sec. | XXXX    |
|                                      | 3   | 11 sec.         | 22 sec. | XXXX    | XXXX    |
|                                      | Transport Time in Seconds - SINGLE PUMP               |                 |         |         |         |
|                                      | Flow Rate: 1PT - 1.4LPM, 2PT's - 2.5LPM, 3PT's 3.0LPM |                 |         |         |         |

Table 1

2. Dual pump transport times and flow rates – **OPTIONAL CL96 CONFIGURATION**

|   |   |                 |         |         |         |
|---|---|-----------------|---------|---------|---------|
| <b>Outer Diameter (OD)</b>                      |   | .25 in (OD)     |         |         |         |
| <b>Inner Diameter (ID)</b>                      |   | 0.1875 in. (ID) |         |         |         |
| <b>Length in Feet</b>                           |   | 100             | 200     | 300     | 400     |
| <b>Length in Meters</b>                         |   | 30              | 61      | 91      | 122     |
| <b>Number of Analyzer's<br/>per Sample Line</b> | <b>1</b>  | 11 sec.         | 22 sec. | 32 sec. | 43 sec. |
|   | <b>2</b>  | 6 sec.          | 12 sec. | 18 sec. | 24 sec. |
|   | <b>3</b>  | 5 sec.          | 10 sec. | 15 sec. | XXXX    |
|   | Transport Time in Seconds                             |                 |         |         |         |
|   | Flow Rate: 1PT - 2.8LPM, 2PT's - 5.3LPM, 3PT's 7.0LPM |                 |         |         |         |

Table 2

- a. **Dual Pump Option** – 96-point system (6, 16 points analyzers) would include 12 pumps.

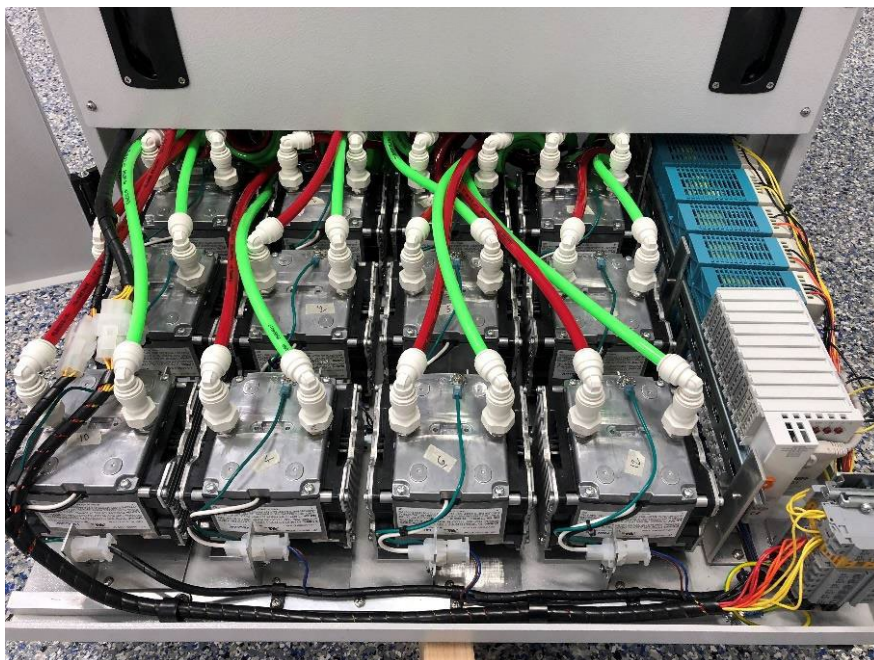
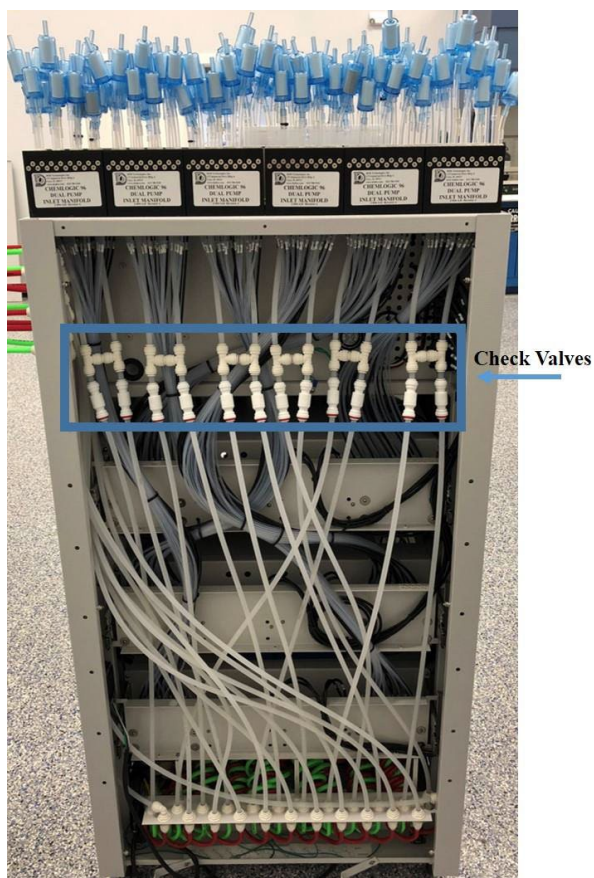


Figure 1

- b. **Dual Pump Option** – Back up feature included with dual pump option. Check valves connecting the two pumps and automatically closing the valve when one of the pumps fails.





**Figure 2**

The Dual Pump option is only available when initially ordering the CL96. It is not available as a field upgrade. To ensure your system is properly equipped with this option, reference the following DOD part numbers:

**2-800-071**

Option – CL96 Dual Pump 110VAC (one required for every 16-point analyzer)

**2-800-072**

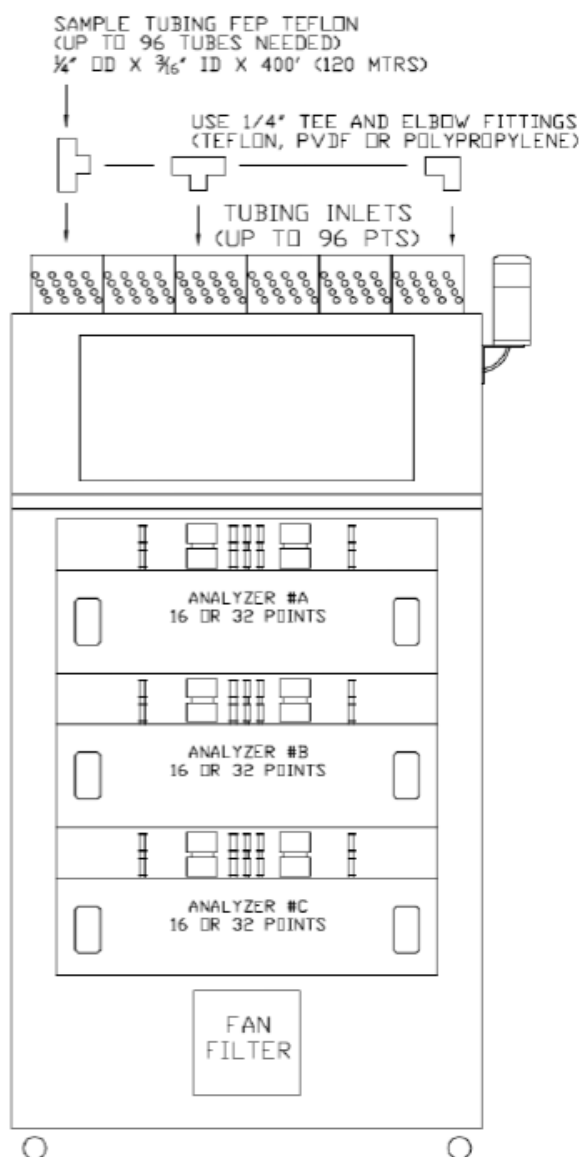
Option – CL96 Dual Pump 230VAC (one required for every 16-point analyzer)

### 6.3.e.3 Parallel Sampling

The CL96 Parallel Sampling option allows a sample line to be shared between 2 or 3 analyzers, allowing multiple gases to be analyzed from a single sample line. The main sample line requires ¼"OD x 3/16" ID FEP Teflon tubing connected by ¼" T and elbow fittings (Teflon, PVDF or Polypropylene only) to the other analyzers.

Each analyzer that is used will increase the flow on the sample line resulting in reduced transfer times while the individual flow to each point on the manifolds will remain the same as the individual points not using the parallel sampling. You must enable parallel sampling in the CL96 Configuration settings and check parallel sampling for each point in the individual point set up screen.

See **Figure A** for an example of Parallel Sampling set up.



**Figure A**



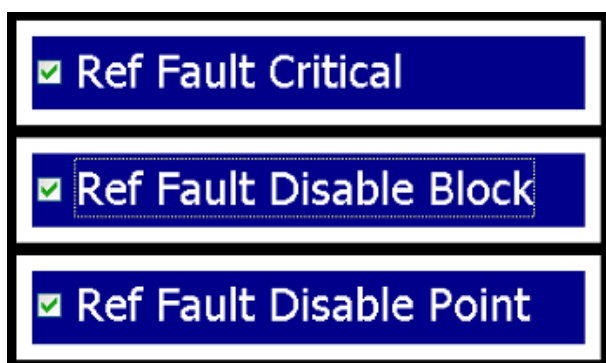
### 6.3.e.3.1 Parallel Sampling Transport Times

The table below shows the time required for a sample to travel from the sampling location or the end of the sample line to the CL96. The transport times are based on various tubing lengths and sample lines.

| Outer Diameter (OD)                  |   | 0.25 in. (OD) |         |         |         |                 |         |         |         |
|--------------------------------------|---|---------------|---------|---------|---------|-----------------|---------|---------|---------|
| Inner Diameter (ID)                  |   | 0.15 in. (ID) |         |         |         | 0.1875 in. (ID) |         |         |         |
| Length in Feet                       |   | 100           | 200     | 300     | 400     | 100             | 200     | 300     | 400     |
| Length in Meters                     |   | 30            | 61      | 91      | 122     | 30              | 61      | 91      | 122     |
| Number of Analyzer's per Sample Line | 1   | 16 sec.       | 32 sec. | 48 sec. | 64 sec. | 24 sec.         | 48 sec. | 72 sec. | 96 sec. |
|                                      | 2   | 9 sec.        | 18 sec. | XXXX    | XXXX    | 13 sec.         | 26 sec. | 39 sec. | XXXX    |
|                                      | 3   | 8 sec.        | XXXX    | XXXX    | XXXX    | 11 sec.         | 22 sec. | XXXX    | XXXX    |
|                                      | Transport Time in Seconds                             |               |         |         |         |                 |         |         |         |
|                                      | Flow Rate: 1PT - 1.3LPM, 2PT's - 2.4LPM, 3PT's 3.0LPM |               |         |         |         |                 |         |         |         |

### 6.3.e.4 Reference Validation Fault

CL96 software version 16.0620 (2016), implemented three features to take action when a reference validation message occurs. These features can be enabled or disabled in the Factory→Settings screen. To enable, check the desired box and save the configuration. To disable uncheck the box and save the configuration.



The CL96 advanced reference diode allows the optic system to verify the proper intensity of the LED's continuously (See Technical Note - ChemLogic Optic Block Diagram). In the rare event a fluctuation of an LED occurs, the reference diode catches the fluctuation and previously would report an informational message being logged for the specific analyzer and point combination in the event log with no faults occurring. Software version 16.0620 provides three optional actions or faults when a reference optic validation occurs.

#### 1. REFERENCE FAULT CRITICAL

- When a reference validation occurs, a critical fault is triggered and analysis mode is exited for the specific analyzer (16 points)
- 

#### 2. REF FAULT DISABLE BLOCK

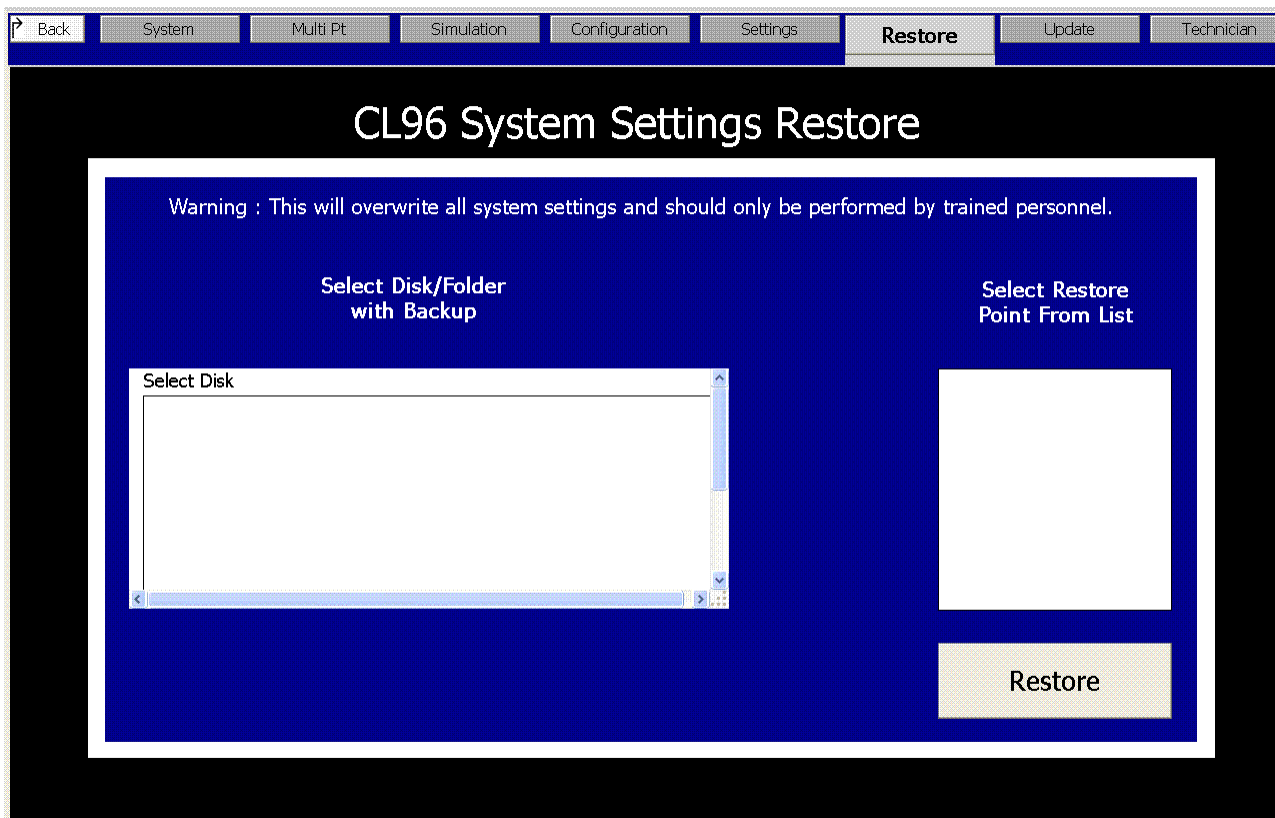
a. When the reference validation occurs, a general fault is triggered and all points on the affected optic block are disabled (4 points)

### 3. REF FAULT DISABLE POINT

a. When the reference validation occurs, a general fault is triggered and the single affected point is disabled (1 point)

**IMPORTANT** : If only number 1 (REFERENCE FAULT CRITICAL) is enabled, it will remain enabled until the CL96 is power cycled. After a power cycle the fault will need to be re-enabled. Number 2 and 3 below will remain enabled during a power cycle.

## 6.3.f Setup -> Factory -> Restore



## 6.3.g Setup -> Factory -> Update

## Chapter 7 – Maintenance and Disposal



**DANGER:** Disconnect power before servicing

### 7.1 Returning to a Safe State (Post-Service)

Before returning the CL96 to service after maintenance or perform verify the following checks:

- Verify all A/C power connections are secured properly.
- Check all ground wire connections are secured properly to each panel on the unit.
- Verify each analyzer tray is installed on the rails and connected properly.
- Check tubing connections on both sides of each pump.
- Verify all sample tubing and exhaust tubing connections on the unit.

### 7.2 Maintenance Door Access

The maintenance door is used to access the ChemLogic cassette. Two keyed latches secure the door. Turn both latches with the keys to open the maintenance door and be sure to secure both latches when closing the door.

**IMPORTANT :** The maintenance door should remain closed and latched except when servicing the ChemLogic® cassette.

### 7.3 Control Panel Door



**WARNING :** Turn off and remove power from the system prior to opening the control panel door.

To open the control panel door:

- Insert the key provided into the slot and rotate counterclockwise to unlock the door.
- Turn the latch counterclockwise to unlatch the door.
- Lift the control panel access door until it locks (listen for click)
- The door should remain in the up position until the lock is released.

When service is completed be sure to close the service door and secure the keyed latch to the closed position. Verify that the service door cannot be pulled open – secure the door using the key to lock the door.

**IMPORTANT :** The control panel access door should remain closed and latched except when servicing the system.

## 7.4 ChemLogic® Cassette

The ChemLogic cassette paper tape has an expiration date printed on the label. Expired tape should be disposed of and replaced with new tape to assure proper gas concentration readings. Each DOD ChemLogic® tape cartridge for the CL96 will last for 120 days under normal usage. See Appendix A for ordering information.

## 7.5 ChemLogic Cassette Installation

1. From the main menu touch the 'Load Tape' button (section xxx)
2. Open the maintenance door. (section 7.1)
3. On the screen touch the 'OPEN/CLOSE GATE' button to open up the gate
4. (For 32-point systems only) Remove the upper take-up reel by gently pulling.
5. Remove the lower take-up reel by gently pulling and dispose properly.
6. (For 32-point systems only) Remove the upper empty tape reel.
7. Remove the lower empty tape reel and install as the new lower take-up reel.
8. (for 32-point systems only) Install the empty reel as the new upper take up reel.
9. Secure the new lower ChemLogic cassette tape on the bottom take up reel. The tape should be around the bottom in a clockwise direction as shown.
10. Feed the tape as shown with the arrows in figure 7.1.
  - a. From the lower tape reel
  - b. Around the bottom tape guide
  - c. Through the opening between the right-side optic blocks
  - d. Between the middle tape guides
  - e. Through the opening between the left side optic blocks
  - f. Between the rubber roller and the capstan
  - g. Around the tape guide on to the take-up reel
  - h. Fold the end of the tape and insert into the slot in the empty tape reel. Be sure the tape is wound clockwise around the take up reel.
  - i. Turn the take-up at least 2 full turns to secure the tape.
  - j. (for 32-point systems only) Repeat these steps for the upper tape.
11. On the screen touch the 'OPEN/CLOSE GATE' button to close the gate
12. On the screen touch the 'Reset Counter' button. (See section 6.2.c)
13. On the screen touch the 'Verify Optics' button to calibrate the optics systems.



**WARNING** : Keep fingers clear of the gate system while touching the open/close gate button.

## 7.6 End of line particular filters

End of line (point detection particulate filters which protect the CL96 from damage are required on all points including points not being monitored. Table 7.1 details the type of filter required for each gas. Filters must be replaced on a regular basis as shown in the table. Filter orientation is not critical in either application.

**IMPORTANT** : All points require filtration to prevent dust accumulation in tubing and internal damage to the CL96. Dust that collects in the tubing or the internal system may cause sample loss and inaccurate gas concentration readings.




| Corrosive Use   | Non-Corrosive Use   |
|---|---|
| <div style="display: flex; align-items: center; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>Part Numbers:</p> <p>Blue Housing: 60009</p> <p>Filter Membrane: 60010</p> </div> <div style="font-size: 2em; color: red; font-weight: bold;">OR</div> <div> <p>Part Number</p> <p>2-800-013</p> </div> </div> |  <p style="text-align: center; margin-top: 20px;">Part Number:<br/>780248</p> |
| <p>Mineral Acids</p> <p>Chlorine</p> <p>Oxidizers (Excluding NO<sub>2</sub>)</p> <p>Ammonia/Amines</p> <p>SO<sub>2</sub></p>  | <p>Hydrides</p> <p>Phosgene</p> <p>NO<sub>2</sub></p>   |

Table 7.1

## 7.7 Flow Adjustment

Each channel should be adjusted whenever a new ChemLogic® tape or particulate filter is installed. See section 6.2.b.

## 7.8 USB Storage Drive Replacement

It is highly recommended to keep a USB flash drive inserted in the unit at all times. A general fault is issued anytime a USB drive is not inserted or full. To insert or replace a USB drive follow this steps.

1. Exit analysis
2. Go to the USB Drive removal screen on the main menu under History.
3. Touch the 'remove' button to halt writing to the disk.
4. Follow the procedures from section 7.2 to open the control panel access door.
5. Remove the USB drive from the system and replace with new drive.
6. Wait 5 seconds for the system to initialize.
7. Close and latch the control panel access door.

Appendix F details the data stored on the CF card and how to access it on a personal computer.

## 7.6 Fuse Replacement

The system is protected with a 6-amp fast acting (5X20mm) fuse.



**DANGER: Warning : Turn off and remove power from the system prior to servicing the fuse.**

## 7.7 Equipment Disposal



**RECYCLING WASTE ELECTRICAL & ELECTRONIC EQUIPMENT (WEEE)**

European Models with Option Part#2-800-002 must be disposed of at a designated collection point. Contact our European Representative for WEEE Directive disposal arrangements.

## Chapter 8 – Service & Support

Contact DOD Technologies for product assistance and technical support:

### Phone Support

M-F 8:30am – 5pm (Central Time Zone-U.S.A.)

**815.788.5200**

### International Headquarters

675 Industrial Drive, Bldg. A.

Cary, IL 60013

### E-mail us at:

[solutions@dodtec.com](mailto:solutions@dodtec.com)

### Visit our website:

[DODtec.com](http://DODtec.com)

### For permanent discontinuation:

Discontinued units may be eligible for recycling. Please contact DOD Technologies for additional information and instructions for arranging safe return of your equipment.

## Appendix A – Parts & Accessories

### Filters & Tubing

| PART NUMBER | PART DESCRIPTION  |
|-------------|---|
| 780248      | Particulate Filter for Non-Corrosives (Phosgene & Hydrides) |
| 2-800-013   | Particulate Filter for Corrosive Gases (Mineral Acids)      |
| 2-500-052   | Pyrolyzer Freon Filter                                      |
| 2-100-503   | Filter for H <sub>2</sub> S Scrubber                        |
| 60009       | Filter Housing for Teflon Membranes (Mineral Acids)         |
| 2-500-502   | 47mm Teflon Membranes (Pack of 10) - use with P/N 60009     |
| 60010       | 47mm Teflon Membranes (Pack of 100) - use with P/N 60009    |
| 2-800-007   | Duct Mounting Kit for 1/4" Sample Line Tubing               |
| 2-800-008   | KIT Duct Mounting Kit for 3/8" Tubing                       |
| 14249       | 250 ft. FEP Teflon Tubing (3/16 ID x 1/4 OD)                |
| 77347       | 500 ft. FEP Teflon Tubing (3/16 ID x 1/4 OD)                |
| 48423       | Tubing FEP 1/4 OD x 3/16 ID x 1000'                         |
| 2-400-004   | Tubing Exhaust 3/8 x 1/4 Polypropylene, 25' max             |

### Options and Accessories

| PART NUMBER | PART DESCRIPTION  |
|-------------|---|
| 2-200-058   | USB Flash Drive   |
| 2-800-055   | CL96 Cassette Verification Scanner                                |
| 2-800-053   | CL96 Circuit Breaker with Ground Fault Protection                 |
| 2-800-073   | CL96 Exhaust Manifold (12 Pumps)                                  |
| 2-800-077   | CL96 Sample Line Integrity Option                                 |
| 2-800-410   | 4-Color LED Light with Horn                                       |
| 2-800-071   | CL96 Dual Pump 110VAC (One Required for every 16 points)          |
| 2-800-072   | CL96 Dual Pump 230VAC (One Required for every 16 points)          |
| 2-800-006   | CL96 OPC Server Software Machine License (1 required per machine) |
| 2-800-051   | CL96 Expansion Analyzer Camera (for 1 analyzer)                   |
| 2-800-050   | CL96 Analyzer Camera (for 1 analyzer)                             |
| 2-800-054   | CL96 Backup Pump Configuration - Pump Sold Separately             |



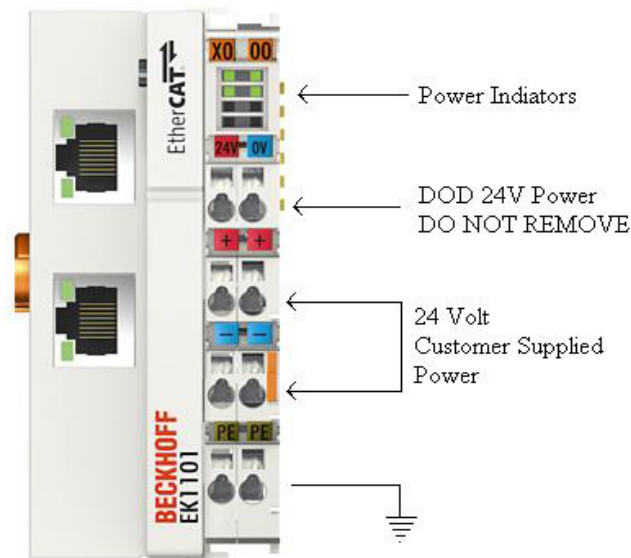
## Appendix B – I/O Connection Detail



**DANGER:** Disconnect power before servicing

### B.1 EK1101 Coupler

Each analyzer tray (16 or 32 point) has its own output module section, and each section is coupled together with an EK1101 module. Two different power sources are used for the module. Power to operate the module itself is supplied by the CL96 power and prewired by DOD Technologies. – do NOT remove. Power for all outputs must be supplied by the customer on pins 6 and 7.



## B.2 Standard Output Module (24 V Sinking)

|               |              | Pts 1-16           |            |            |             |              |                    | Pts 17-32 (Optional) |              |              |              |        |
|---------------|--------------|--------------------|------------|------------|-------------|--------------|--------------------|----------------------|--------------|--------------|--------------|--------|
| Bus Connector | CL96 General | Analyzer 1 General | Points 1-4 | Points 5-8 | Points 9-12 | Points 13-16 | Analyzer 2 General | Points 17-20         | Points 21-24 | Points 25-28 | Points 29-32 |        |
| Part #        | EK1101       | EL2088             | EL2088     | EL2088     | EL2088      | EL2088       | EL2088             | EL2088               | EL2088       | EL2088       | EL2088       | EL2088 |
| See Note #    |              | 1                  | 2          | 3          | 3           | 3            | 2                  | 3                    | 3            | 3            | 3            | 3      |

| Output # | Description     |
|----------|-----------------|
| 1        | Critical        |
| 2        | General         |
| 3        | Alarm 1         |
| 4        | Alarm 2         |
| 5        | Analysis Active |
| 6        | Watchdog        |
| 7        | Power On        |
| 8        |                 |

| Output # | Description     |
|----------|-----------------|
| 1        | Critical        |
| 2        | General         |
| 3        | Alarm 1         |
| 4        | Alarm 2         |
| 5        | Analysis Active |
| 6        | Watchdog        |
| 7        | Power On        |
| 8        |                 |

| Output # | Description      |
|----------|------------------|
| 1        | Pt X Alarm 1     |
| 2        | Pt X Alarm 2     |
| 3        | Pt (X+1) Alarm 1 |
| 4        | Pt (X+1) Alarm 2 |
| 5        | Pt (X+2) Alarm 1 |
| 6        | Pt (X+2) Alarm 2 |
| 7        | Pt (X+3) Alarm 1 |
| 8        | Pt (X+3) Alarm 2 |

\*\* For each module X = the lowest Point #

Figure B.2.1

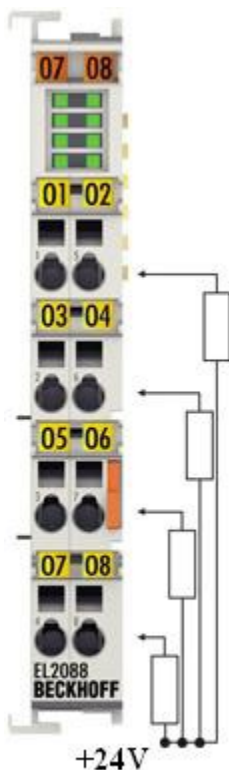


Figure B.2.2

## B.3 Optional Output Relays

| Pts 1-16      |                 |                 |                       |                       |            |            |            |            |             |              |              |              |                       |                       |              | Pts 17-32 (Optional) |              |              |              |              |              |              |  |  |  |
|---------------|-----------------|-----------------|-----------------------|-----------------------|------------|------------|------------|------------|-------------|--------------|--------------|--------------|-----------------------|-----------------------|--------------|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--|--|--|
| Bus Connector | CL96 General(A) | CL96 General(B) | Analyzer 1 General(A) | Analyzer 1 General(B) | Points 1-2 | Points 3-4 | Points 5-6 | Points 7-8 | Points 9-10 | Points 11-12 | Points 13-14 | Points 15-16 | Analyzer 2 General(A) | Analyzer 2 General(B) | Points 17-18 | Point 19-20          | Points 21-22 | Points 23-24 | Points 25-26 | Points 27-28 | Points 29-30 | Points 31-32 |  |  |  |
| Part #        | EK1101          | EL2624          | EL2624                | EL2624                | EL2624     | EL2624     | EL2624     | EL2624     | EL2624      | EL2624       | EL2624       | EL2624       | EL2624                | EL2624                | EL2624       | EL2624               | EL2624       | EL2624       | EL2624       | EL2624       | EL2624       | EL2624       |  |  |  |
| See Note #    | 1               | 2               | 3                     | 4                     | 5          | 5          | 5          | 5          | 5           | 5            | 5            | 5            | 3                     | 4                     | 5            | 5                    | 5            | 5            | 5            | 5            | 5            | 5            |  |  |  |

**Note 1 - CL 96 General Outputs(A)**

| Relay # | Description    |
|---------|----------------|
| 1       | Critical Fault |
| 2       | General Fault  |
| 3       | Alarm Level 1  |
| 4       | Alarm Level 2  |

**Note 3 - Analyzer X General(A)**

| Relay # | Description    |
|---------|----------------|
| 1       | Critical Fault |
| 2       | General Fault  |
| 3       | Alarm Level 1  |
| 4       | Alarm Level 2  |

**Note 5 - Point Alarms**

| Relay # | Description      |
|---------|------------------|
| 1       | Pt X Alarm 1     |
| 2       | Pt X Alarm 2     |
| 3       | Pt (X+1) Alarm 1 |
| 4       | Pt (X+1) Alarm 2 |

**Note 2 - CL 96 General Outputs(B)**

| Relay # | Description     |
|---------|-----------------|
| 1       | Analysis Active |
| 2       | Watchdog        |
| 3       | Power On        |
| 4       |                 |

**Note 4 - Analyzer X General(B)**

| Relay # | Description     |
|---------|-----------------|
| 1       | Analysis Active |
| 2       | Watchdog        |
| 3       | Power On        |
| 4       |                 |

Figure B.3.1

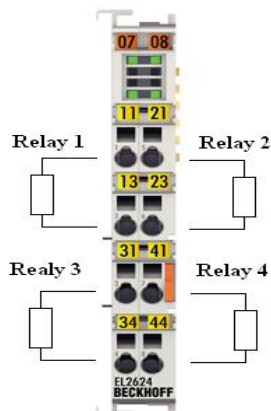


Figure B.3.2

### B.4 Optional 4-20 Outputs

| Part #   | Bus Connector | Kbus Conv | Pts 1-16   |            |             |              | Pts 17-32    |              |              |              |
|--|---------------|-----------|------------|------------|-------------|--------------|--------------|--------------|--------------|--------------|
|  |               |           | Points 1-4 | Points 5-8 | Points 9-12 | Points 13-16 | Points 17-20 | Points 21-24 | Points 25-28 | Points 29-32 |
| EK1101   | BK1250*       | KL4414    | KL4414     | KL4414     | KL4414      | KL4414       | KL4414       | KL4414       | KL4414       | KL4414       |
| * Required 24V power supply connection on BK1250 |               |           |            |            |             |              |              |              |              |              |

Figure B.4.1

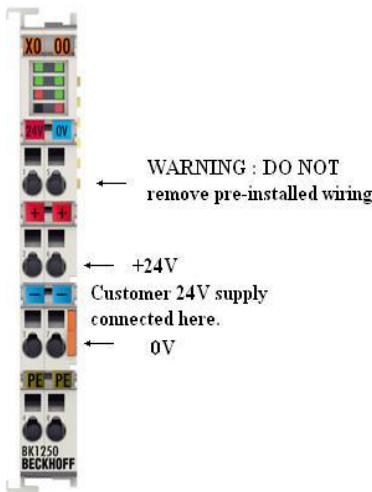


Figure B.4.2

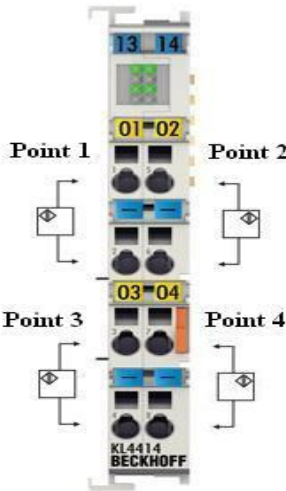


Figure B.4.3

Repeat for each module – Points 5-8, 9-12, etc.

## Appendix C – System Specifications

### The CL96 is designed for safe use under the following conditions

- Indoor use only
- Altitude up to 2,000 m
- Temperature 5°C - 40 °C
- Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C.
- A/C power as specified below with +/- 10% of the nominal voltage
- Transient Levels: Impulse withstand (overvoltage) category II of IEC 60364-4-443



**WARNING** :The detachable power cord or the supply line wiring must meet the rating specified below .

### CL96 System Specification

Height: 59" (+10" for tubing)

Width: 31" (+9 for wiring)

Depth: 28.5 "

Weight: 450pbs. (fully loaded), (Max shipping weight 600lbs)

A/C Power:

(North American Models)

120V ~ 60 Hz ~ 3 A

(European Models with Option Part #2-800-002)

230V~ 50 Hz ~ 3A

IP Rating: IP2x

IK Code: IK08 (European Models with Option Part #2-800-002)



## Appendix D – System Event Message

| COLOR CODING |                            |
|--------------|----------------------------|
| RED          | Gas Alarm                  |
| ORANGE       | Service Fault (critical)   |
| YELLOW       | Maintenance (non-critical) |
| BLUE         | Information Message        |
| GREEN        | Status (during analysis)   |

| Level         | Text  | Analyzer | Point | Description   |
|---------------|---|----------|-------|---|
| Alarm         | "Alarm Level 1 "                                | Yes      | Yes   | Gas alarm level 1 on specified analyzer/point                   |
| Alarm         | "Alarm Level 2 "                                | Yes      | Yes   | Gas alarm level 2 on specified analyzer/point                   |
| CriticalFault | "Cannot get background values "                 | Yes      |       | Communication failure with 1 or more optic blocks               |
| CriticalFault | "High Background "                              | Yes      | Yes   | Tape empty or too dark to read correctly                        |
| CriticalFault | "PLC Comm Error "                               |          |       | Critical communication fault in PLC                             |
| CriticalFault | "Optic Calibration required "                   | Yes      |       | Optic need calibration - see manual                             |
| CriticalFault | "Gas Configuration Error "                      |          |       | Gas File data missing or invalid                                |
| CriticalFault | "Low Flow - Verify Tray Insertion"              | Yes      | Yes   | Multiple point low flow, check analyzer tray inserted properly  |
| CriticalFault | "Modbus Comm Failure "                          |          |       | Failure reading data internally                                 |
| CriticalFault | "Optic Block Comm Failure "                     |          |       | Failure reading data from 1 or more optic blocks                |
| CriticalFault | "Flow Block Comm Failure "                      |          |       | Failure reading data from 1 or more transducer blocks           |
| CriticalFault | "Gate Open Fault "                              | Yes      |       | Gate did not open before timeout                                |
| CriticalFault | "Gate Close Fault "                             | Yes      |       | Gate did not close before timeout                               |
| CriticalFault | "Setting DAC to preset values "                 | Yes      |       | Failure writing to optic blocks                                 |
| CriticalFault | "System Fault"                                  |          |       | Critical system fault - contact DOD Technologies                |
| CriticalFault | "Block Below Minimum Voltage"                   |          |       | Power supply low - contact DOD Technologies                     |
| CriticalFault | "Output module failure or not installed"        | Yes      |       | Output modules missing or fault                                 |
| CriticalFault | "Retentive Memory Error"                        |          |       | Critical internal memory error, event log or conc history fault |
| CriticalFault | "Idle Timeout (System) "                        |          |       | Idle timeout for all active analyzers on system                 |
| Analyzing     | "Analysis Mode "                                | Yes      |       | Analysis mode started/stopped as specified                      |
| Analyzing     | "TWA Cycle Complete "                           | Yes      | Yes   | Written every 8 hours or when analysis mode ends                |
| GeneralFault  | "Low Flow "                                     | Yes      | Yes   | Low flow on specified analyzer/point                            |
| GeneralFault  | "High Flow "                                    | Yes      | Yes   | High flow on specified analyzer/point                           |
| GeneralFault  | "Idle Timeout (Analyzer) "                      | Yes      |       | Idle timeout fault  |
| GeneralFault  | "ChemLogic tape low "                           | Yes      |       | Less than 3 days of tape remaining on specified analyzer.       |
| GeneralFault  | "Logging write error - verify disk inserted : " |          |       | USB Logging disk full, missing, or error writing to disk        |
| GeneralFault  | "Custom Output Module Failure"                  |          |       | Failure communicating with custom module installation           |
| Information   | "No event file found for selected date "        |          |       | Machine was not operating or different USB disk inserted        |
| Information   | "Starting new log file "                        |          |       | New data file log started for specified date                    |
| Information   | "Power On "                                     |          |       | Machine was powered on at date/time specified                   |
| Information   | "Faults & Alarms Reset "                        |          |       | Fault Reset button was pressed by operator                      |
| Information   | "Optic Calibrated "                             | Yes      |       | Optic calibration complete                                      |
| Information   | "Flow Offsets Reset "                           |          |       | Flow offsets reset by technician                                |
| Information   | "Point configuration updated/saved "            | Yes      |       | Configuration saved/updated for specified analyzer              |
| Information   | "Machine configuration updated/saved"           |          |       | Machine configuration saved/updated                             |
| Information   | "Simulation Mode"                               |          |       | Simulation mode started/stopped                                 |
| Information   | "Passwords updated"                             |          |       | Passwords were changed  |
| Information   | "Multi-Point configuration change"              | Yes      | Yes   | Multiple points were updated simultaneously                     |
| Information   | "Previous machine settings restored."           |          |       | Default settings restored                                       |
| Information   | "ChemLogic tape days counter reset "            | Yes      |       | Operator reset the tape counter manually                        |
| Information   | "Optics Auto Adjusted"                          | Yes      |       | Optics were adjusted by system                                  |
| Information   | "Optic Point Needs Cleaning"                    | Yes      |       | Clean optics at earliest possible date                          |

## Appendix E – LDL List

| Name                               | Gas           | Gas Family    | Calibration PN2 | TLV | Full Scale | LDL  | Units | ChemLogic Cassette PN |
|------------------------------------|---------------|---------------|-----------------|-----|------------|------|-------|-----------------------|
| Ammonia                            | NH3           | Ammonia       | 2-800-405       | 25  | 75         | 1.2  | ppm   | 1-700-050             |
| Ammonia                            | NH3           | Ammonia       | 2-800-405       | 25  | 150        | 1.2  | ppm   | 1-700-050             |
| Arsenic Pentafluoride <sup>^</sup> | AsF5 (HF)     | MA-SG         | 2-800-409       | 0.5 | 10         | 0.2  | ppm   | 1-420-150             |
| Arsenic Trichloride <sup>^^</sup>  | AsHCl3 (HCl)  | MA-SG         | 2-800-409       | 2   | 15         | 0.2  | ppm   | 1-420-150             |
| Arsenic Trifluoride <sup>^</sup>   | AsF3 (HF)     | MA-SG         | 2-800-409       | 0.5 | 10         | 0.2  | ppm   | 1-420-150             |
| Arsine                             | AsH3          | Hydrides      | 2-800-401       | 5   | 500        | 2.2  | ppb   | 1-300-050             |
| Arsine                             | AsH3          | Hydrides (LL) | 2-800-406       | 5   | 50         | 0.3  | ppb   | 1-300-050             |
| Boron Tribromide <sup>^^^</sup>    | BBr3 (HBr)    | MA-SG         | 2-800-409       | 2   | 20         | 0.1  | ppm   | 1-420-150             |
| Boron Trichloride <sup>^^</sup>    | BCl3 (HCl)    | MA-SG         | 2-800-409       | 2   | 15         | 0.2  | ppm   | 1-420-150             |
| Boron Trifluoride                  | BF3           | MA-SG         | 2-800-409       | 100 | 3,200      | 89   | ppb   | 1-420-150             |
| Boron Trifluoride                  | BF3           | MA-SG         | 2-800-409       | 100 | 10,000     | 89   | ppb   | 1-420-150             |
| Bromine                            | Br2           | Bromine       | 2-800-407       | 100 | 1,000      | 68.8 | ppb   | 1-490-050             |
| Carbonyl Sulfide                   | COS           | COS           | 2-800-412       | 5   | 20         | 0.9  | ppm   | 1-300-085             |
| Carbonyl Fluoride <sup>^</sup>     | COF2 (HF)     | MA-SG         | 2-800-409       | 0.5 | 10         | 0.2  | ppm   | 1-420-150             |
| Chlorine                           | Cl2           | Chlorine-SG   | 2-800-414       | 100 | 5,000      | 44.6 | ppb   | 1-560-150             |
| Chlorine                           | Cl2           | Oxidizers     | 2-800-408       | 100 | 3,200      | 50.1 | ppb   | 1-550-050             |
| Chlorine                           | Cl2           | Chlorine-SG   | 2-800-414       | 100 | 2,000      | 6.9  | ppb   | 1-560-150             |
| Chlorine Trifluoride <sup>^</sup>  | ClF3 (HF)     | MA-SG         | 2-800-409       | 0.5 | 10         | 0.2  | ppm   | 1-420-150             |
| Diborane                           | B2H6          | Hydrides      | 2-800-401       | 100 | 1,000      | 6    | ppb   | 1-300-050             |
| Dichlorosilane <sup>^^</sup>       | SiH2Cl2 (HCl) | MA-SG         | 2-800-409       | 2   | 15         | 0.2  | ppm   | 1-420-150             |
| Fluorine                           | F2            | Oxidizers     | 2-800-408       | 100 | 3,200      | 49.8 | ppb   | 1-550-050             |
| Fluorine                           | F2            | Oxidizers     | 2-800-408       | 100 | 10,000     | 60   | ppb   | 1-550-050             |
| Fluorine (SG)                      | F2            | Chlorine-SG   | 2-800-414       | 100 | 10,000     | 41.6 | ppb   | 1-560-150             |

| Name                     | Gas           | Gas Family    | Calibration PN2 | TLV   | Full Scale | LDL   | Units | ChemLogic Cassette PN |
|--------------------------|---------------|---------------|-----------------|-------|------------|-------|-------|-----------------------|
| Fluorine (SG)            | F2            | Chlorine-SG   | 2-800-414       | 100   | 1,000      | 41.6  | ppb   | 1-560-150             |
| Fluorosilicic acid^      | H2SiF6 (HF)   | MA-SG         | 2-800-409       | 0.5   | 10         | 0.2   | ppm   | 1-420-150             |
| Germane                  | GeH4          | Hydrides      | 2-800-401       | 200   | 2,000      | 62.1  | ppb   | 1-300-050             |
| Germane                  | GeH4          | Hydrides (LL) | 2-800-406       | 200   | 2,000      | 62.1  | ppb   | 1-300-050             |
| Germanium Tetrafluoride^ | GeF4 (HF)     | MA-SG         | 2-800-409       | 0.5   | 10         | 0.2   | ppm   | 1-420-150             |
| Hexachlorodisilane^^     | SiCl2 (HCl)   | MA-SG         | 2-800-409       | 2     | 15         | 0.2   | ppm   | 1-420-150             |
| Hexafluorocyclobutene**  | C4F6          | Pyro          | 2-800-415       | 5     | 40         | 1.5   | ppm   | 1-420-150             |
| Hydrogen Chloride        | HCl           | MA-SG         | 2-800-409       | 2     | 15         | 0.1   | ppm   | 1-420-150             |
| Hydrogen Chloride        | HCl           | MA-SG         | 2-800-409       | 2     | 20         | 0.1   | ppm   | 1-420-150             |
| Hydrogen Bromide         | HBr           | MA-SG         | 2-800-409       | 2     | 20         | 0.1   | ppm   | 1-420-150             |
| Hydrogen Fluoride        | HF            | MA-SG         | 2-800-409       | 0.5   | 10         | 0.2   | ppm   | 1-420-150             |
| Hydrogen Fluoride        | HF            | MA-SG         | 2-800-409       | 0.5   | 20         | 0.2   | ppm   | 1-420-150             |
| Hydrogen Selenide        | H2Se          | Hydrides (LL) | 2-800-406       | 50    | 500        | 5.1   | ppb   | 1-300-050             |
| Hydrogen Sulfide         | H2S           | Hydrides      | 2-800-401       | 1     | 20         | 0.2   | ppm   | 1-300-050             |
| Nitric Acid              | HNO3          | MA-SG         | 2-800-409       | 2,000 | 5,000      | 187.5 | ppb   | 1-420-150             |
| Nitrogen Dioxide         | NO2           | Oxidizers     | 2-800-408       | 0.2   | 30         | 1.3   | ppm   | 1-550-050             |
| Nitrogen Trifluoride**   | NF3           | Pyro          | 2-800-415       | 10    | 50         | 1     | ppm   | 1-420-150             |
| Phenyl Trichlorosilane^^ | SiCl3Ph (HCl) | MA-SG         | 2-800-409       | 2     | 15         | 0.2   | ppm   | 1-420-150             |
| Phosgene                 | COCl2         | Phosgene      | 2-800-404       | 100   | 5,000      | 8.8   | ppb   | 1-200-050             |
| Phosgene                 | COCl2         | Phosgene      | 2-800-404       | 100   | 3,250      | 8.8   | ppb   | 1-200-050             |
| Phosgene                 | COCl2         | Phosgene      | 2-800-404       | 100   | 300        | 3.9   | ppb   | 1-200-050             |
| Phosphine                | PH3           | Hydrides      | 2-800-401       | 50    | 1,500      | 4.9   | ppb   | 1-300-050             |
| Phosphine                | PH3           | Hydrides      | 2-800-401       | 50    | 3,000      | 4.9   | ppb   | 1-300-050             |
| Phosphorus Oxychloride^^ | POCl3 (HCl)   | MA-SG         | 2-800-409       | 2     | 15         | 0.2   | ppm   | 1-420-150             |



| Name                                   | Gas                            | Gas Family      | Calibration PN2 | TLV   | Full Scale | LDL  | Units | ChemLogic Cassette PN |
|--|--------------------------------|-----------------|-----------------|-------|------------|------|-------|-----------------------|
| Phosphorus Pentachloride <sup>^^</sup> | PCl <sub>5</sub> (HCl)         | MA-SG           | 2-800-409       | 2     | 15         | 0.2  | ppm   | 1-420-150             |
| Phosphorus Pentafluoride <sup>^</sup>  | PF <sub>5</sub> (HF)           | MA-SG           | 2-800-409       | 0.5   | 10         | 0.2  | ppm   | 1-420-150             |
| Phosphorus Tribromide <sup>^^^</sup>   | PBr <sub>3</sub> (HBr)         | MA-SG           | 2-800-409       | 2     | 20         | 0.1  | ppm   | 1-420-150             |
| Phosphorus Trichloride <sup>^^</sup>   | PCl <sub>3</sub> (HCl)         | MA-SG           | 2-800-409       | 2     | 15         | 0.2  | ppm   | 1-420-150             |
| Phosphorus Trifluoride <sup>^</sup>    | PF <sub>3</sub> (HF)           | MA-SG           | 2-800-409       | 0.5   | 10         | 0.2  | ppm   | 1-420-150             |
| Silane                                 | SiH <sub>4</sub>               | Hydrides        | 2-800-401       | 5     | 50         | 0.2  | ppm   | 1-300-050             |
| Silane                                 | SiH <sub>4</sub>               | Hydrides        | 2-800-401       | 5,000 | 15,000     | 40   | ppb   | 1-300-050             |
| Silicon Tetrachloride <sup>^^</sup>    | SiCl <sub>4</sub> (HCl)        | MA-SG           | 2-800-409       | 2     | 15         | 0.2  | ppm   | 1-420-150             |
| Sulfur Dioxide                         | SO <sub>2</sub>                | SO <sub>2</sub> |                 | 250   | 2,500      | 19.3 | ppb   | 1-810-050             |
| Sulfur Tetrafluoride <sup>^</sup>      | SF <sub>4</sub> (HF)           | MA-SG           | 2-800-409       | 0.5   | 10         | 0.2  | ppm   | 1-420-150             |
| Sulfuric Acid                          | H <sub>2</sub> SO <sub>4</sub> | MA-SG           | 2-800-409       | 50    | 3,200      | 97.1 | ppb   | 1-420-150             |
| Tetrakis(dimethylamido)titanium        | TDMAT                          | Ammonia         | 2-800-405       | 2     | 10         | 0.1  | ppm   | 1-700-050             |
| Tertiary Butyl Arsine                  | TBA                            | Hydrides        | 2-800-401       | 91    | 500        | 12   | ppb   | 1-300-050             |
| Tetrafluorosilane <sup>^</sup>         | SiF <sub>4</sub> (HF)          | MA-SG           | 2-800-409       | 0.5   | 10         | 0.2  | ppm   | 1-420-150             |
| Titanium Tetrachloride <sup>^^</sup>   | TiCl <sub>4</sub> (HCl)        | MA-SG           | 2-800-409       | 2     | 15         | 0.1  | ppm   | 1-420-150             |
| Tin Tetrachloride <sup>^^</sup>        | SnCl <sub>4</sub> (HCl)        | MA-SG           | 2-800-409       | 2     | 15         | 0.2  | ppm   | 1-420-150             |
| Trichlorosilane <sup>^^</sup>          | SiHCl <sub>3</sub> (HCl)       | MA-SG           | 2-800-409       | 2     | 15         | 0.2  | ppm   | 1-420-150             |
| Tungsten Hexafluoride <sup>^</sup>     | WF <sub>6</sub> (HF)           | MA-SG           | 2-800-409       | 0.5   | 10         | 0.2  | ppm   | 1-420-150             |

\* Additional ranges may be available and are subject to change. Please see specific product brochure or contact DOD Technologies.

\*\* Requires pyrolyzer option for detection

<sup>^</sup> Compounds which hydrolyze to HF

<sup>^^</sup> Compounds which hydrolyze to HCl

<sup>^^^</sup> Compounds which hydrolyze to HBr

MA-SG = Mineral Acid SG

Hydrides (LL) = Hydrides (Low-Level Arsine)

## Appendix F – Hard Wire Connection (Optional)



**WARNING** :The detachable power cord or the supply line wiring must meet the rating specified below .

When the hard-wired option is specified the installation must be done by a qualified electrician.

**IMPORTANT:** When installing A/C voltage to the CL96 for the hard wire connection read carefully:

- A switch or circuit-breaker shall be included in the building installation.
- It shall be in close proximity to the equipment and within easy reach of the OPERATOR.
- It shall be marked as the disconnecting point for the CL96 equipment.

When the Hard-Wire option is specified the A/C power must be provided by the customer to the FILTER which is located on the right side of the unit inside the back cabinet. After disconnecting all power to the CL96 remove the back cabinet which will reveal the A/C filter shown in figure 1.

**NOTE THE A/C FILTER IS MOUNTED UPSIDE DOWN IN THE CL96**

- Connect A/C power to the screw terminals numbered 1 & 2
- Screw # 1 is Line and Screw #2 is neutral
- Connect the ground wire to the terminal as shown in Figure 2
- Replace the protective plastic cover over the screws

Make sure the wires are tightened properly and the protective plastic covers are replaced over the screws.



Figure 1



Figure 2

## Appendix G – Optional Secondary Enclosures



**WARNING** :Disconnect power before servicing.

Many of the I/O options for the CL96 are packaged as secondary enclosures. These secondary enclosures are typically located remotely, mounted on the side or close to the CL96 cabinet. This section describes mounting (G.1), A/C Power (G.2), connecting to the CL96 (G.3), and external wiring (G.4) for the varying options available.

### G.1 Mounting A Secondary Enclosure

Before mounting the secondary enclosure, be sure to read through sections G.2, G.3 and G.4 to understand and design your wiring requirements for A/C power to the unit and wiring to the I/O modules. It may be necessary to drill the opening for the wiring before mounting depending on the location selected for each cabinet.

Optional enclosure(s) must be firmly mounted before wiring.

#### G.1.1 Remote Secondary Enclosure Mounting

If the enclosure is to be mounted externally use the provided mounting brackets to secure the cabinet at the desired location.

#### G.1.2 Direct mounting on the CL96

If specified at time of purchase, the CL96 cabinet can be pre-drilled to easily mount secondary enclosures to the side of the cabinet. The CL96 cabinet will have four (4) bolts mounted on the side for each (max 2) cabinet that mounts on the side panel. – See figure G.1.1.

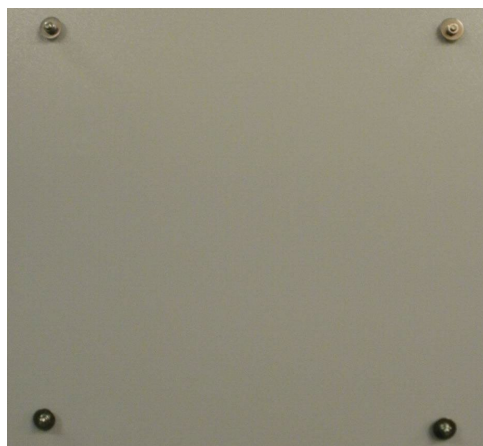


Figure G.1.1

Remove the nut and lock washer from each of the four bolts, mount the external cabinets onto the four bolts using the attached bracket then replace the lock washers and nuts. Tighten the nuts to secure the cabinet to the side of the CL96 panel.

## G.2 Connecting A/C Power to the Secondary Enclosure

All optional secondary enclosures contain their own DC Voltage power supply. The cabinets are delivered with a power cable and a liquid tight cord grip which may be used to power the unit as described below.

**IMPOTANT:** When installing A/C power to the secondary enclosure read carefully:

- Installation of A/C power must be done by a qualified electrician.
- A switch or circuit breaker shall be included in the building installation.
- It shall be in close proximity to the secondary enclosure and within reach of the OPERATOR.
- It shall be marked as the disconnecting point for the secondary enclosure.

Be sure to follow all safety precautions and disconnect electrical power from both the CL96 and secondary enclosure before servicing.

### G.2.1 Installing the liquid tight cord grip (DOD Part #2-9400-523)

- Drill a 7/8" hole in the side of the cabinet at the desired location
- Using the liquid tight cord grip (DOD Part #2-9400-523)
- Unscrew the cord grip cap
- Unscrew the inside nut (leave the fixed nut on the fitting)
- Place the included O-ring over the threads on the inside portion of the fitting so that it sits inside the fixed nut – see figure G.2.1.



Figure G.2.1

- Insert the threads through the hole from the outside into the cabinet and replace the nut on the inside as shown in figure G.2.2 – tighten securely.



Figure G.2.2

## G.2.2 Installing the A/C Power Cable

- Insert the exposed wires of the power cord through the hole in the fitting from the outside and then into the cord grip cap as shown in figure G.2.3.

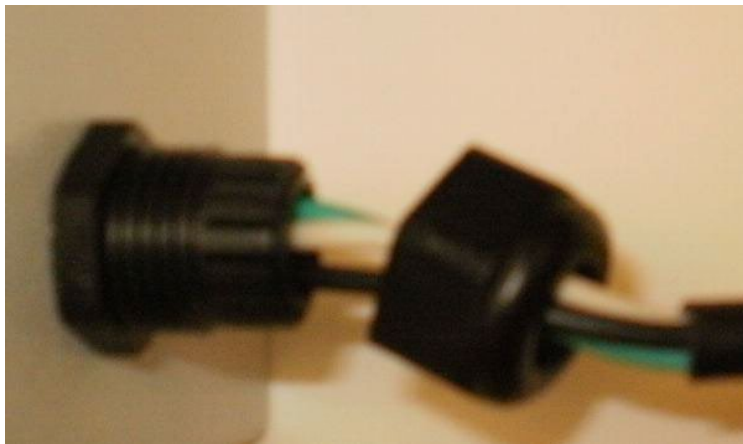


Figure G.2.3

- Pull the appropriate length of cord inside the cabinet to allow the shielded portion of the cable to reach the power filter.
- Tighten the cord grip cap shown in Figure G.2.3 back onto the fitting securely to hold the cord in place.

## G.2.3 Attaching the A/C Power inside the cabinet

- See Figure G.2.4 below for reference
- Pull down lightly on the plastic cover on the Power Filter exposing screw connections #1 and #2.
- Attach the Neutral/White wire to the Power Filter at the label for Screw #2, tighten securely.


- Attach the LineBlack wire to the Power Filter at the label for Screw #1, tighten securely.
- Push the plastic cover back into place on the Power Filter over screws connections #1 and #2.
- Locate the Protective Earth (PE) Ground stud as shown in figure G.2.4.



Figure G.2.4

- Remove the top nut from the PE ground stud
- Leave the star washer on the bottom of the ground stud touching the cabinet, then place the ring terminal from the green wire over the star washer.
- Replace the nut on top of the ring terminal and tighten securely.
- NOTE: Do not attach any wires other than the Green ground wire from the A/C power cord to the PE Ground terminal.

## G.3 Connecting to the CL96

|   |   |
|---|---|
|  | <p><b>Warning:</b> Do NOT use the A/C power opening to bring any other wires into the secondary enclosure. Analog wiring and the ethernet cable must be brought in through a separate opening dependent on the user's design.</p> |
|---|---|

Drill a second hole in the side of the external cabinet at the desired location. Bring the shielded ethernet cable into the cabinet through the hole and connect as described below.

### G.3.1 Connecting to the CL96 with Ethernet Cable

All secondary enclosures connect to the CL96 with a shielded RJ45 cable (sold separately).

- Attach one end of the cable to the CL96. Depending on the configuration of your machine the connection point will vary. Contact DOD if you are not sure where to plug the ethernet cable.
- Attach the other end of the cable to the top connector on the EK1101 module as shown in Figure G6.



- Multiple external cabinets can be daisy-chained using the bottom RJ-45 connector as a starting point for the second shielded cable.



Figure G.3.1

## G.4 Wiring Output Modules

### G.4.1 Analog (4-20 ma) Output Wiring

See Appendix B.4 for information on wiring to analog output modules.

### G.4.2 Beckhoff Form A Relays

See Appendix B.3 for information on wiring to Beckhoff Relay Modules.

### G.4.3 Form C Relay Wiring

The form C relay modules (blue) are labeled inside the external cabinet as shown below.

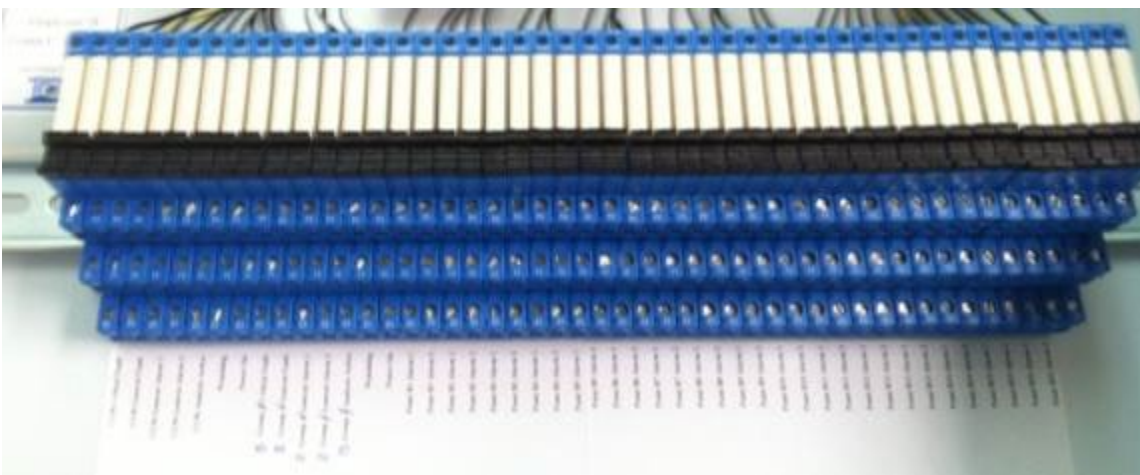


Figure G.4.1

[illegible]

DC-TEC-MAN-CL96\_B  
REV 1/9/2024



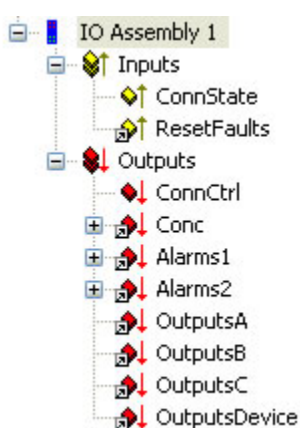
## Appendix H – Data Communication

### H.1 – Ethernet/IP

**IMPORTANT:** if you move to change the IP address of the CL96 the System must be ‘re-activated’ by DOD Technologies support before data can be monitored via the Ethernet/IP Slave connection.

#### H.1.1 Data Format

The Ethernet/IP interface allows remote monitoring of fault/alarm outputs, concentration levels, and fault reset. You must supply the IP Address of the CL96 to DOD Technologies, INC to configure the Ethernet/IP. The data is mapped as:



Downlink (From Master to CL96):

Assembly Instance: 102

Size (16-bit Words) : 3

| Offset (Words) | # Words | Data Description  | Format                                     |
|----------------|---------|-------------------|--|
| 0              | 2       | Connection Status |  |
| 2              | 1       | Fault Reset       | Bit 0 - Change from 1 to 0 to reset faults |

Uplink (From CL96 to Master) :

Assembly Instance: 101

Size (16-bit words) : 114

| Offset (Words) | # Words | Data Description                       | Format                                  |
|----------------|---------|--|---|
| 0              | 2       | Connection Status                      |   |
| 2              | 96      | Concentration levels for all 96 points | Conc * 10 (eg. 23 = 2.3 actual conc)    |
| 98             | 1       | Analyzer A Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 99             | 1       | Analyzer A Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 100            | 1       | Analyzer B Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 101            | 1       | Analyzer B Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 102            | 1       | Analyzer C Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 103            | 1       | Analyzer C Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 104            | 1       | Analyzer A Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 105            | 1       | Analyzer A Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 106            | 1       | Analyzer B Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 107            | 1       | Analyzer B Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 108            | 1       | Analyzer C Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 109            | 1       | Analyzer C Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 110            | 1       | Faults/Alarms Analyzer A               | *See Below                              |
| 111            | 1       | Faults/Alarms Analyzer B               | *See Below                              |
| 112            | 1       | Faults/Alarms Analyzer C               | *See Below                              |
| 113            | 1       | Faults/Alarms CL96                     | *See Below                              |

The Fault/Alarms are indicated as follows:

- Bit 0 – Critical Fault
- Bit 1 – General Fault
- Bit 2 – Alarm Level 1
- Bit 3 – Alarm Level 2
- Bit 4 – Analysis Active
- Bit 5 – Power
- Bit 7 – Heartbeat

For Analyzer A, B, and C the lower 8 bits (0-7) are for the lower analyzer and the upper 8 bits (8-15) are for the upper analyzer. For the CL96 Fault/Alarms the alarms indicate the status of the entire machine. See Appendix B for details of the I/O indicators.

The bits for Alarm Level 1, Alarm level 2, and all Faulty/Alarms may be affected by the “Energized Faults/Alarms” setting of the CL96.

## H.2 – Profibus

The following information is available on the Profibus/Slave interface. The CL96 Faults/Alarms (Discrete Outputs)

| Token                     | Description                                | Type    |
|---------------------------|--|---------|
| Machine Critical Fault    | Machine has critical fault                 | Boolean |
| Machine Maintenance Fault | Machine has a maintenance issue            | Boolean |
| Machine Gas Alarm 1       | Level 1 Gas Alarm at Least 1 Machine Point | Boolean |
| Machine Gas Alarm 2       | Level 2 Gas Alarm at Least 1 Machine Point | Boolean |
| Power On                  | Power is on to Analyzer                    | Boolean |

### Each Analyzer Faults/Alarms (Discrete Outputs)

| Token                      | Description                                    | Type    |
|----------------------------|--|---------|
| Analyzer Critical Fault    | This Analyzer has critical fault               | Boolean |
| Analyzer Maintenance Fault | This analyzer has a maintenance issue          | Boolean |
| Analyzer Gas Alarm 1       | Level 1 Gas Alarm at Least 1 Point on Analyzer | Boolean |
| Analyzer Gas Alarm 2       | Level 2 Gas Alarm at Least 1 Point on Analyzer | Boolean |
| Analyzing                  | Analysis active on Analyzer                    | Boolean |

### Each Point Concentration & Alarm Indicators

| Token         | Description                           | Type |
|---------------|---------------------------------------|------|
| Concentration | Current concentration (*10) for point | Word |

## H.2.1 Data Format

Default Slave ID: 2

Size (Bytes): 228

| Byte #<br>(Bytes) | Size #<br>Bytes | Data Description                       | Format                                  |
|-------------------|-----------------|--|---|
| 1                 | 4               | Connection Status                      |   |
| 5                 | 192             | Concentration levels for all 96 Points | Conc * 10 (eg. 23 = 2.3 actual conc)    |
| 197               | 2               | Analyzer A Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 199               | 2               | Analyzer A Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 201               | 2               | Analyzer B Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 203               | 2               | Analyzer B Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 205               | 2               | Analyzer C Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 207               | 2               | Analyzer C Alarm Level 1 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 209               | 2               | Analyzer A Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 211               | 2               | Analyzer A Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 213               | 2               | Analyzer B Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 215               | 2               | Analyzer B Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 217               | 2               | Analyzer C Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 1-16  |
| 219               | 2               | Analyzer C Alarm Level 2 Indicators    | Bit 0 - 15 = Alarm Level 1 points 17-32 |
| 221               | 2               | Faults/Alarms Analyzer A               | *See Below                              |
| 223               | 2               | Faults/Alarms Analyzer B               | *See Below                              |
| 225               | 2               | Faults/Alarms Analyzer C               | *See Below                              |
| 227               | 2               | Faults/Alarms CL96                     | *See Below                              |

The Fault/Alarms are indicated as follows:

- Bit 0 – Critical Fault
- Bit 1 – General Fault
- Bit 2 – Alarm Level 1
- Bit 3 – Alarm Level 2
- Bit 4 – Analysis Active
- Bit 5 – Power
- Bit 7 - Heartbeat

For Analyzer A, B and C the lower 8 bits (0-7) are for the lower analyzer and the upper 8 bits (8-15) are for the upper analyzer. For the CL96 Fault/Alarms the alarms indicate the status of the entire machine. See Appendix B for detail on the I/O indicators.

The bits for Alarm Level 1, Alarm Level 2 and all the Fault/Alarms may be affected by the “Energized Faults/Alarms” setting of the CL96.

## Appendix I – Unified Exhaust Option Installation

The Unified Exhaust Manifold (2-800-073) for the CL96 is an option that combines the 12 individual exhaust tubes into a single manifold. The CL96 Exhaust Manifold tubing can handle up to 50' (using a qty of 2, part# 2-400-048).

The Unified Exhaust Manifold was designed to take the 12 exhaust tubes as an input, and output as one larger unified exhaust tube. The exhaust manifold output port can be mounted such that it can face upward or downward (dependent upon the customer installation requirements).

Qualified personnel are required to perform the installation.

### Installation instructions

#### 1. Required tools

- 1.1. Masking tape (used for paper template).
- 1.2. #2 phillips screwdriver.
- 1.3. 7/8" Socket, 6-Point, deep well socket.
- 1.4. 1" Socket, 6-Point, deep well socket.
- 1.5. Ratchet Driver to fit deep well sockets.
- 1.6. Center punch.
- 1.7. Drill.
- 1.8. 7/32" drill bit.
- 1.9. Drop cloth to capture metal shavings while drilling holes.
- 1.10. Small vacuum to remove any metal shavings.

#### 2. Preparation

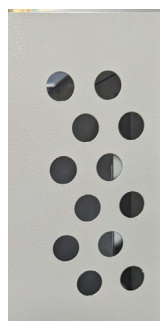
- 2.1. Disconnect power to the CL96. Ensure your facility utilizes **Lockout processes**.
- 2.2. Verify no power is supplied to the system prior to opening the system for installation.
- 2.3. Remove the CL96 rear panel screws (3) using a #2 Phillips screwdriver.
- 2.4. After the screws have been removed lift/slide the rear panel up for removal. Use caution as the panel has a grounding wire connected in the lower corner. Ensure the wire connection is not damaged. The ground wire is long enough to provide access to the exhaust ports.
- 2.5. Label each of the individual exhaust tube according to the exterior panel label. The labeling will help identifying which exhaust tube to re-install after Exhaust Manifold has been mounted to the side of the enclosure.

- 2.6. Next disconnect the interior exhaust fittings/plugs from the side panel bulkhead fittings. Press the fittings collet to release all tubing from the side panel bulkhead fittings. Set plugs aside to re-install at later time.



*Images 1 2, and 3: Exterior and Interior Views from back of CL96 side panel. Tubing fittings/plugs and bulkhead fittings.*

- 2.7. After the exhaust fittings are disconnected from the bulkhead fittings from the interior of the CL96 the exterior exhaust tubing also needs to be disconnected.
- 2.8. Next remove the bulkhead fittings from the CL96 side panel. Utilize the 7/8" Socket, 6-Point, deep well socket for the exterior and the 1" Socket, 6-Point, deep well socket for the interior to remove the bulkhead fitting.



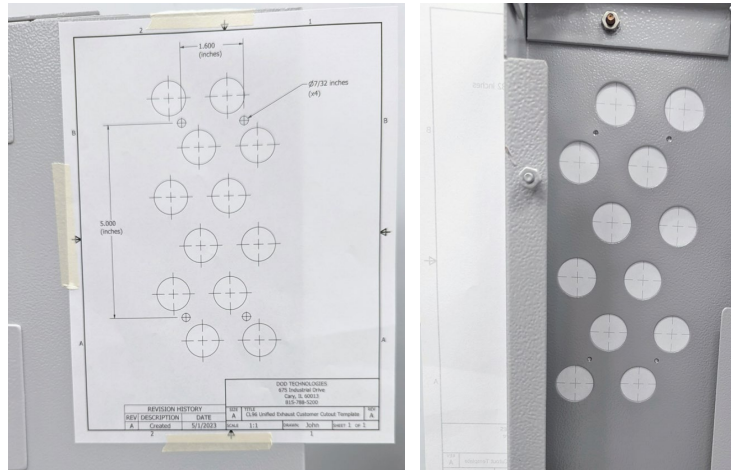
*Image 4: CL96 side panel view with bulkhead fittings removed.*

- 2.9. The system is now ready to use template to drill holes for mounting the Exhaust manifold.



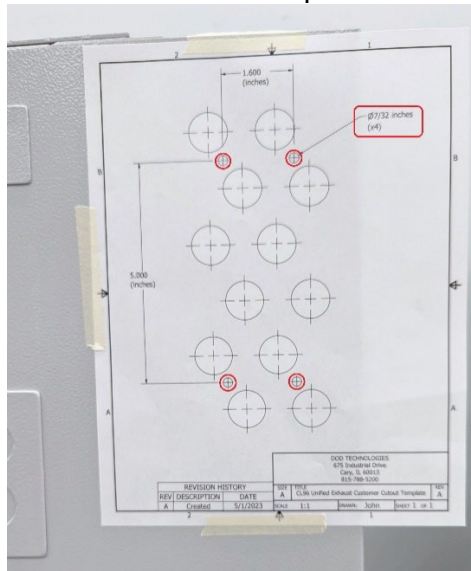
### 3. Exhaust Manifold mounting holes (Skip this section 3 if the side panel has the holes pre-drilled).

- 3.1. Utilizing the pdf named CL96 Unified Exhaust Customer Cutout Template. Align the larger diameter holes with the holes in the side panel where the bulkhead fittings were previously installed. Verify the outline of the holes from the template are visibly aligned with the holes of the side panel. View from the interior and exterior of the enclosure to ensure alignment.



*Images 5 and 6: CL96 side panel view with template affixed to the side panel.*

- 3.2. Place drop cloth or other method to prevent metal shavings from drilling are captured.  
**NOTE: Ensure metal fillings are completely removed from the enclosure interior to prevent shorts or any other damage.**
- 3.3. After drop cloth or other method to prevent metal shavings from drilling is in place, use a center punch to mark the (4) smaller hole centers on the template.



*Image 7: CL96 side panel view with template affixed to the side panel.*

- 3.4. Next using a drill with the 7/32" bit align the drill bit with the center punch indentation to drill out the mounting holes for the exhaust manifold.
- 3.5. Deburr the (4) holes.



*Images 8 and 9: CL96 side panel view with (4) mounting holes the side panel.*

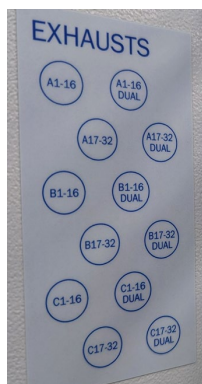
- 3.6. Remove the template and drop cloth.  
**NOTE: Ensure metal fillings are completely removed from the enclosure interior to prevent shorts or any other damage.**
- 3.7. The side panel is now ready to mount the Exhaust Manifold.
4. Installation of Exhaust Manifold.
  - 4.1. Utilizing the (4) 10-32 3/8" long screws mount the manifold to the side of the enclosure. Utilize typical torque for a 10-23 stainless steel screw.
  - 4.2. Mount the manifold with the outlet port facing upwards or downwards according to your location requirements.



*Images 10, 11, and 12: CL96 side panel view with (4) mounting holes the side panel.*



- 4.3. Re-installing the system exhaust tubing following the labeling placed on the tubing/plugs when they were disconnected in section 2. For ease of installation start with the lower exhaust tubing/plug first. Ensure fittings/plugs are fully seated to prevent any exhaust leak.



*Images 13: Exterior label for Exhaust locations*



*Image 14: Example of fitting not fully seated. Image 15: Example of fitting fully seated.*



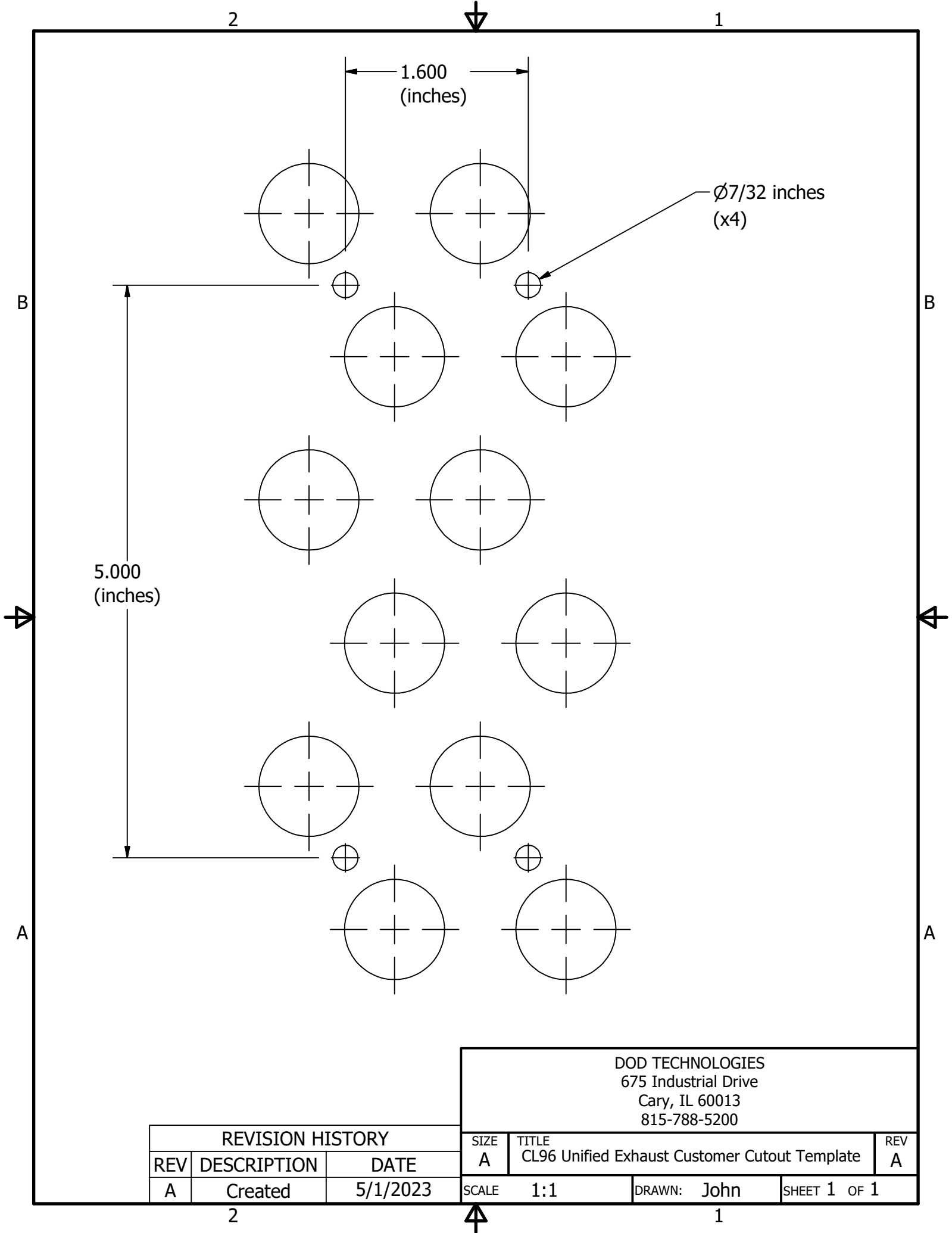
*Images 16, 17, and 18: Interior Exhaust tubing/plugs (varies depending on options installed)*

- 4.4. Re-install rear panel.

4.5. Install Exhaust tubing into manifold.



- 4.6. Ensure exhaust tubing is fully seated.
5. Verify exhaust tubing is properly installed for the system.
  6. Remove Lockout/Tagout equipment and apply power to the system.
  7. Verify the system is operating properly with no exhaust leaks. Contact DOD service for support if required.



5.000  
(inches)

1.600  
(inches)

$\varnothing 7/32$  inches  
(x4)

| REVISION HISTORY |             |          |
|------------------|-------------|----------|
| REV              | DESCRIPTION | DATE     |
| A                | Created     | 5/1/2023 |

|  |  |              |
|--|--|--------------|
| DOD TECHNOLOGIES<br>675 Industrial Drive<br>Cary, IL 60013<br>815-788-5200 |  |              |
| SIZE<br>A  | TITLE<br>CL96 Unified Exhaust Customer Cutout Template | REV<br>A     |
| SCALE<br>1:1   | DRAWN: John  | SHEET 1 OF 1 |