



# **ChemLogic<sup>®</sup> Portable**

Next Generation Gas Monitor User Manual  
[CLPx]

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EC DECLARATION OF CONFORMITY  
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DOD TECHNOLOGIES INC. declares under our sole responsibility that the product described as:

Equipment Name: ChemLogic  
Equipment Description: Portable Gas Monitor  
Model: CLPx  
Serial number(s): \_\_\_\_\_

Complies with the requirements of the following European Directives:

Low Voltage Directive (LVD) 2014/35/EU.  
Electromagnetic Compatibility Directive 2014/30/EU.  
RoHS Directive 2011/65/EU.

Main standards considered:

EN 61010-1: 2010+A1:2019.  
EN 61326-1:2013.  
EN IEC 63000: 2018.

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Date: 09/01/21 At:  
Cary, Illinois USA

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**IMPORTANT:**

Be sure to read this manual in its entirety before installing and operating the CLPx. Contact the manufacturer with any questions regarding the installation or use of the CLPx.

Read [Appendix G](#) before handling ChemLogic Cassettes.

**ELECTRICAL HAZARD:**

The CLPx may only be serviced by trained service personnel. Contact our service department for more information.

# Chapter 1 – Overview

## 1.1 Introduction

### **WARNING:**

Operation of the ChemLogic® Portable Next Generation gas detection system without a manual in the native language in its country of operation is illegal. A translated copy of the manual should be requested immediately from DOD Technologies and before installation of the device. Failure to do so may result in severe injury.

Contact:

Phone: +1 815-788-5200

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

The DOD Technologies CLPx portable gas monitor is an analytical instrument designed to measure low concentrations of a specific toxic gas or a specific range of related toxic gases or vapors. This equipment is intended to be used as part of a defined air quality management program.

The CLPx uses DOD Technologies ChemLogic® colorimetric technology for fast and accurate gas detection. The CLPx provides a fast response to a wide range of gases. It was designed for maximum uptime, so routine maintenance and service can be performed quickly and easily.

## 1.2 Sampling and Monitoring

The system draws sample flow through the inlet on the front of the unit and through the ChemLogic® Cassette.

## 1.3 Flow

An optional kit allows a short exhaust tube to be used with the CLPx unit. Contact DOD for more information.

## 1.4 Electrical

The unit is powered with a 6Volt rechargeable Lead Acid Battery. Use only the included charger to charge the unit.

## 1.5 Theory of operation

During the analysis cycle the pump draws a measured sample of air through a chemically impregnated “ChemLogic” paper tape. The ChemLogic Cassette reacts to the presence of the specific contaminants by darkening from its original paper color. Light is bounced off the dark stain and sensitive optics repeatedly measure the degree of change from the original color. The CLPX uses an advanced optical detection system to measure the light level reflected from the ChemLogic Cassette. The instrument calculates the change as the level of gas present in the sample. Extremely small concentrations can be detected with this method. The

instrument stores the gas level readings on the MicroSD card for transfer to a computer for further analysis in standard comma separated values (CSV) format.

If the calculated value indicates that the concentration has exceeded either the Low or High ALARM set points, the instrument will sound an ALARM and flash the concentration level in the backlit display. The CLPx automatically calculates the Short-Term Exposure Limit (STEL) for the selected gas and stores the readings in the internal data storage memory and to a MicroSD flash memory card (if installed).

The ChemLogic paper tape is contained within a removable tape cassette. The CLPx monitor automatically advances the roll to position a fresh segment of tape for gas sampling. Each cassette is sealed into a protective package and marked with expiration date and serial number. Cassette life will vary depending the operational conditions and concentration levels of the gas being monitored.

**IMPORTANT:** Use only ChemLogic Cassettes labeled for use with CLPx.

## Chapter 2 – Features

### 2.1 External Layout



Figure 2.1



## 2.1.1 Cassette Access Door

The cassette access door is used to load/unload ChemLogic cassettes into the CLPx. To open the door, turn the door latch release knob counter-clockwise until it stops which will release the latch from the door. Pull the door down to insert/remove the cassette. When complete close the door and turn the knob clockwise to latch the door.



Figure 2.2

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

## 2.1.2 Keypad & Display

The CLPx uses a two-color LCD display with a 5-button keypad see Chapter 5 for a complete description on the use of the keypad and display.

## 2.1.3 ChemLogic tape and Take-up Reel

ChemLogic paper tapes are accessed by opening the door as described in section 2.1.1.

## 2.1.4 Gas Inlet/Exhaust

Sample is pulled through the inlet on the front of the unit, through the paper tape and further scrubbed via a charcoal filter inside the unit.

## 2.1.5 Power

Power the unit on by pressing the enter button. See chapter 5 for complete operation.

## 2.2 Micro Secure Digital (SD) card

The CLPx uses a MicroSD card to store historical information including concentration logging, event history, STEL and configuration information. SD cards may be purchased through DOD Technologies – see Appendix A.

Care should be taken when inserting and removing the MicroSD card. Do not insert or remove the MicroSD card while the machine is in operation. Power down the machine first then insert or remove the MicroSD card to assure no data is lost or the card is corrupted.

Standard MicroSD cards may be used with either FAT16 or FAT32 format. See Appendix F for information on the data stored to the MicroSD card.

## 2.3 Additional Options

### 2.3.1 Exhaust Option (Order P/N 2-700-003)

Adds an external exhaust port on the side of the CLPx to allow exhaust tubing to be added to exhaust the sample gas to an exhaust hood, etc.

### 2.3.2 Sampling Wand (Order P/N 2-700-007)

Adds a sampling wand with 5' of tubing to a fitting which can be connected / disconnected from the inlet port for sampling further from the unit such as detecting leaks around gas cylinders or fittings.

### 2.3.3 Pyrolyzer Option (Order P/N 2-700-013)

Adds pyrolyzer heating element to the exterior of the device. Item can be ordered as a field upgrade or factory upgrade. Contact your DOD Technologies regional sales manager to see full gas list of pyrolyzer ready gases. See Appendix H for installation and setup of the pyrolyzer device.

## Chapter 3 – What's Included

### 3.1 Unpacking the CLPx Case

The CLPx comes in a convenient durable hard-shell storage case with a handle for easy transport. Included in the case are:

- A 0-500cc flow meter with a short tube for use when adjusting the pump to verify proper flow at any time during sampling.
- A battery charger with a charging indication light
- A shoulder strap with two rings to attach to the CLPx

The case can also hold a ChemLogic cassette. Be sure to read the DOD Technologies recommended storage guides for the specific types of cassettes being used.

Use care when handling the CLPx portable gas monitor. Although the CLPx monitor is ruggedly built it is a sensitive instrument. Do not drop the monitor or expose it to excessive moisture or heat that could cause damage to the mechanism or electronics.

Establish a schedule for cleaning and regularly inspect the unit for damage. If any damage is found or the monitor does not operate as described in these instructions, remove the unit from service and tag for repair by authorized personnel.

## Chapter 4 – Setup & Configuration

Follow this checklist to configure the CLPx for first time operation.

### Quick Setup Checklist

1. \_\_\_ Set system date and time (section 5.3.e)
2. \_\_\_ Gas selection (section 5.3.a)
3. \_\_\_ Alarm level settings (section 5.3.c)
4. \_\_\_ Adjust Flow (section 5.3.b)
5. \_\_\_ Install new ChemLogic tape (section 5.5)
6. \_\_\_ Test the optical system (section 5.4.b)
7. \_\_\_ Install removable media (section 6.1)

Setup complete - Ready for monitoring.

**WARNING:** If the CLPx Monitor does not operate as described in these instructions, DO NOT use the monitor. Remove the unit from service and tag for repair by authorized personnel. Failure to confirm that the monitor is operating properly may result in exposing the user to a hazardous atmosphere which could result in serious injury or death.

### 4.1 Battery Charging

The Battery charger for the CLPx monitor is an electrical device that has not been evaluated for intrinsic safety as an ignition source. This device is not to be used in a potentially explosive atmosphere. Use of the CLPx or Battery charger in a flammable or explosive atmosphere may result in ignition of the atmosphere resulting in serious injury or death.

**WARNING:** Battery can EXPLODE, LEAK, or CATCH ON FIRE if directly exposed to high temperature, water, or fire, or if opened, disassembled, or tampered with. Failure to handle battery properly may result in serious injury.

**WARNING:** Dispose of damaged or defective batteries in accordance with federal, state, and local environmental regulations. DO NOT throw away batteries as ordinary trash. Failure to handle battery properly may result in serious injury.

To charge the CLPx plug the charger into a power source (120/230 VAC) and then plug the charging connector into the back of the battery pack. The charger has an indicator light that will glow RED while the unit is charging or GREEN to indicate the battery is fully charged. The unit will not be damaged by continued charging after the indicator light turns GREEN.

**WARNING:** DO NOT remove the battery from the CLPx monitor in a potentially explosive atmosphere. Removal of the battery in a flammable or explosive atmosphere may result in the ignition of the atmosphere, resulting in serious injury or death.

## 4.2 Battery Replacement

Battery removal is not normally necessary. To replace the battery or to install a backup battery follow these steps:

- Disconnect the battery charger (if connected)
- Place the CLPx monitor in a clean work area known to be free of potentially explosive gases or hazards.
- Verify that the unit is powered OFF (the display screen will be blank).
- Lay the instrument on one side.
- The battery pack is mounted to the base of the CLPx monitor with four (4) screws, one at each corner. Remove the screws with a 9/64" (3.5mm) Allen wrench.
- Carefully pull the battery away from the unit and make sure all four screws are disengaged from the case.
- Carefully unplug the two-pin connector attached to the main board on the CLPx.

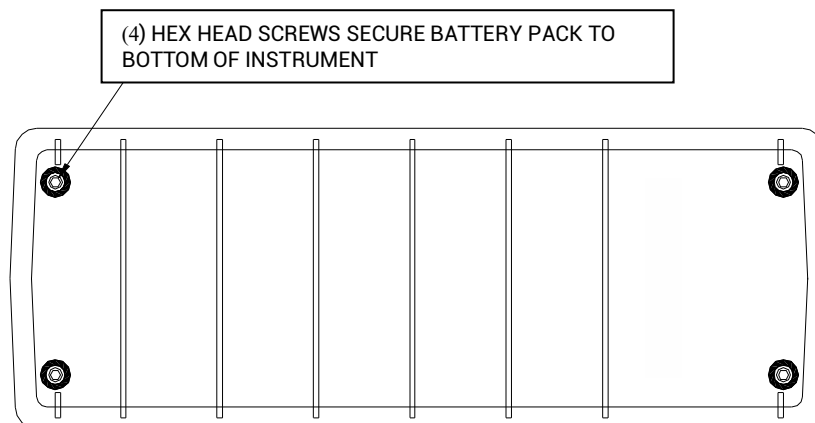


Figure 4.1

To reinstall the battery:

- Carefully reattach the two-pin connector to the main board making sure the latch snaps to hold it in place.
- Align the battery against the case with the charging port on the back of the CLPx.
- Securely tighten the four screws holding the battery in place.

## Chapter 5 – Basic Operation

### 5.1 Using the keypad

The CLPX is controlled using the 5-key keypad located under the display. All the display screens are accessed through a simple menu system as shown in figure 5.1

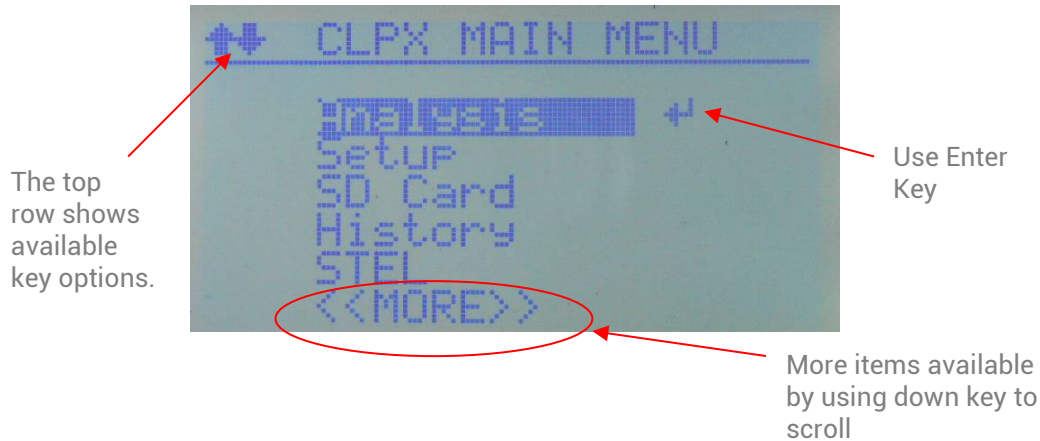


Figure 5.1

- A. On most screens the available keys will be shown on the display. Much of the time the top row indicates which keys to use.
- B. Menus – Use the UP/DOWN keys as shown in Figure 5.1 to navigate through the menu items then use the ENTER key to select the highlighted item. From any sub-menu (setup, service, etc.) use the LEFT key to return to the previous menu.
- C. Password – For access to restricted screens the system will prompt for the appropriate password.

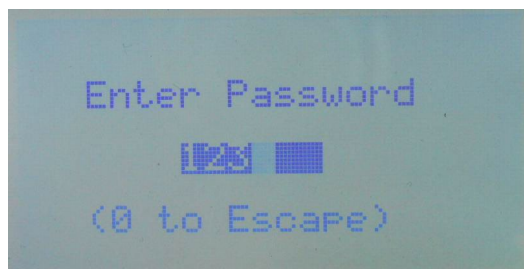


Figure 5.2

Use the LEFT/RIGHT keys to select each digit and the UP/DOWN to change the value of the selected digit. Press the ENTER key when complete to check the password. You can always change the value to 0 and press the ENTER key to return to the previous menu item.

- D. Normal data entry – Most data entry can be accomplished by simple use of the LEFT/RIGHT keys to select/change values as shown in figure 5.3

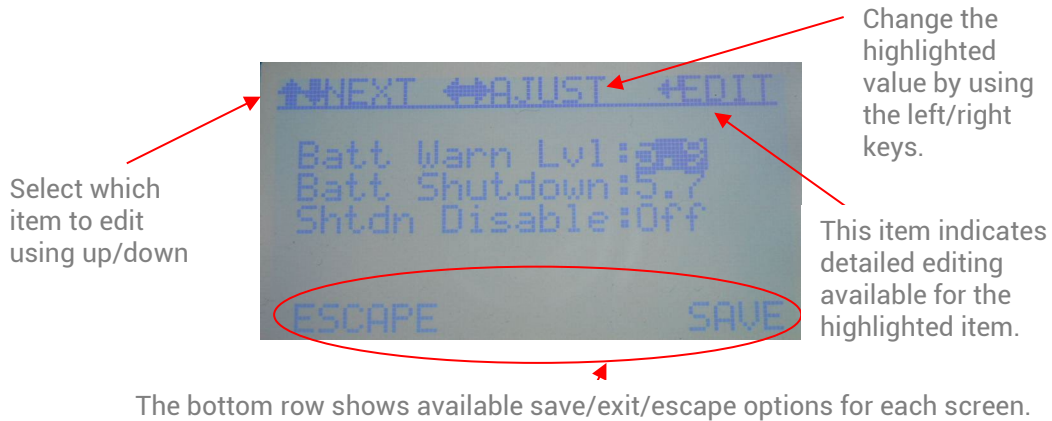


Figure 5.3

Some data items require detailed editing as shown in figure 5.3 When the 'EDIT' item appears on the top row for a highlighted value the operator can either use the LEFT/RIGHT to change the value or use the ENTER key to enter the value directly – see Detailed data entry below.

- E. Detailed data entry – When detailed data entry is selected a screen like Figure 5.4 will display allowing the operator to enter each digit as desired like password entry

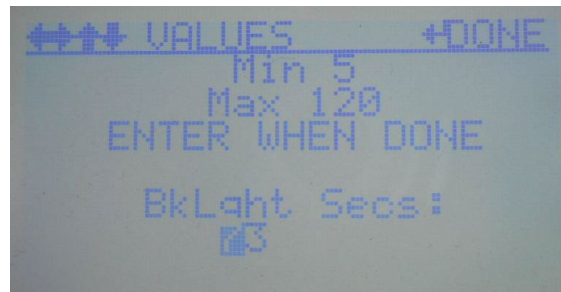


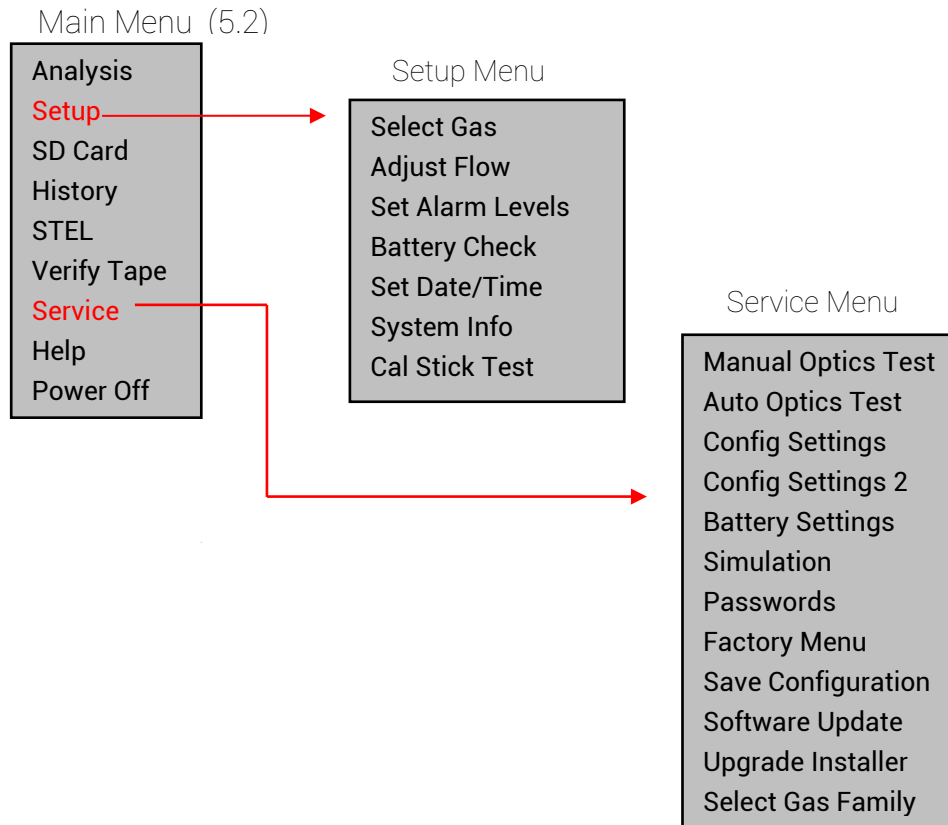
Figure 5.4

Use the LEFT/RIGHT keys to select each digit and the UP/DOWN to change the value of the selected digit. The minimum and maximum allowed values will be displayed. Press the ENTER key when complete to submit the new value and return to the previous data entry screen.

# CLPx Menu Overview

## 5.2 Main Menu

Once the CLPx is configured the main menu contains all the screens necessary for normal operation. The main menu is not password protected. Each selection on the main menu is detailed below.



**Note 1:** The setup menu is not password protected by default.

**Note 2:** The service menu is password protected by default.

Passwords can be changed/cleared in the Password screen on the Service Menu (5.6.3)

## 5.2.1 Analysis

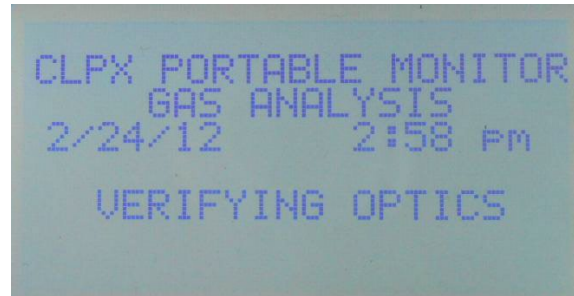


Figure 5.5

Selecting this menu item will start gas analysis and bring up the screen in figure 5.5. During this phase the tape will advance, and the system will verify the optical system and adjust the light intensity if necessary. Once the optical system is verified the analysis screen shown in figure 5.6 will be displayed and the pump will start.

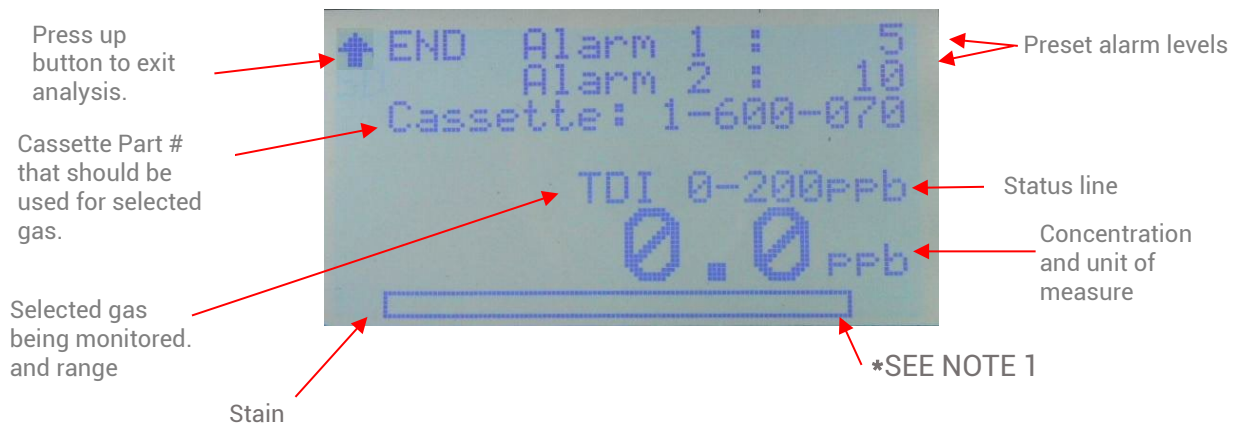


Figure 5.6

**NOTE 1** – An asterisk in the lower right corner indicates the machine has passed the time necessary to detect the LDL for the selected gas since the last tape advance. The asterisk will disappear, and the timer reset at each tape advance. Press the down arrow to reset the timer when looking for LDL at another location.

The words 'Alarm Level 1' and 'Alarm Level 2' will blink when the concentration meets or exceeds the preset alarm levels. Alarm Level 1 blinks at a 2 second rate while Alarm Level 2 blinks at a 1 second rate. In addition, the letters 'SD' will appear in the upper left corner under the up arrow when there is an error writing the MicroSD' card or there is no MicroSD card inserted.

The status line displayed between the cassette part number and the gas/range display will show various information about the current analysis cycle :

- Beyond Full Scale (Actual concentration exceeds full scale)
- Shutdown in X seconds (battery voltage below shutdown level)
- Low Battery (battery voltage below alarm level)
- Adv Pending (preparing/advancing cassette)



**NOTE:** During analysis detailed information is viewable by using the LEFT key. This screen may be useful for service and repair. To return to the main analysis screen press the LEFT key again.

## 5.2.2 Setup Menu

The Setup Menu contains the screens necessary to configure the CLPx for operation. The setup menu is not password protected by default but may be password protected (see service menu).

## 5.2.3 SD Card

The SD Card screen displays the amount of empty space remaining on the MicroSD card. Check this value before each use to assure adequate space remains to log STEL, Concentration, and event history to the card.

## 5.2.4 History

The recent event history is kept in the CLPx regardless of whether an SD card is inserted or not. A minimum of 16 events are kept at all times although many more events are normally stored depending on memory usage. See appendix D for description of CLPx events.

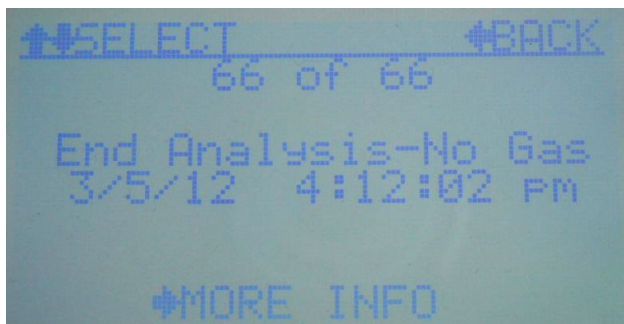


Figure 5.7

The most recent event is always shown first. Use the UP/DOWN keys to scroll through recent events and the LEFT key to exit back to the main menu. You can also use the RIGHT key for more information on selected events. When the right key is pressed the screen shown in figure 5.8 will display.

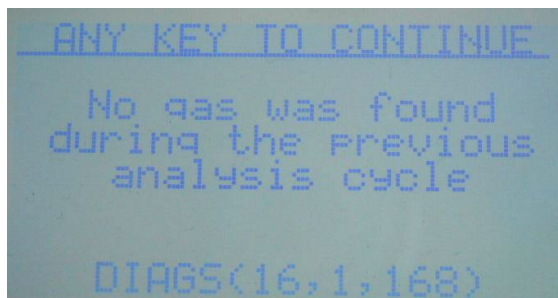


Figure 5.8

Depending on the event this may give more detailed information or diagnostic information on the event. The 'DIAG' codes displayed at the bottom are useful when contacting DOD Support.

## 5.2.5 STEL

The recent STEL event history is kept in the CLPx regardless of whether an SD card is inserted or not. A minimum of 16 STEL values are stored depending on the memory usage of the CLPx. The most recent STEL reading will be displayed as shown in figure 5.9.

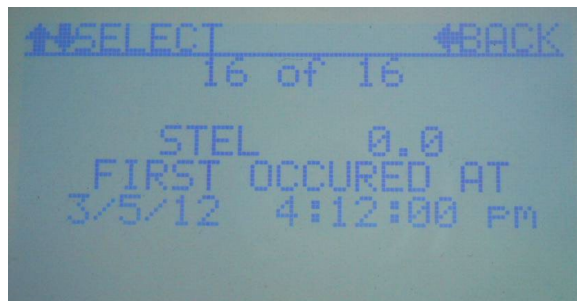


Figure 5.9

At the end of each analysis cycle a new STEL value is added to the log. The time of the highest value is displayed on the screen along with the STEL concentration value. Detailed information is also written to the MicroSD card at the same time (if a properly formatted card is inserted).

## 5.2.6 Verify Tape

When this item is selected a screen similar to Figure 5.9 will display showing the current selected gas and which ChemLogic cassette should be inserted. Use this anytime to check that the proper tape is installed.

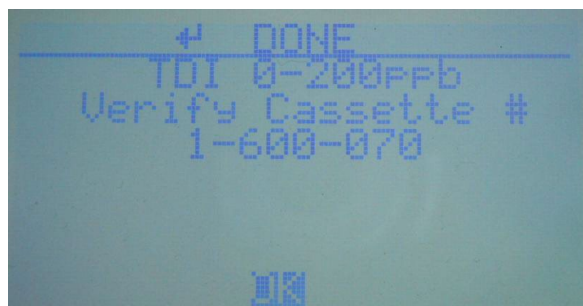


Figure 5.10

## 5.2.7 Service

The Service Menu contains the screens necessary for testing and configuration of the CLPx. It is not normally accessed after the machine is initially configured. See section 5.4 for details. Note that the Service menu is always password protected.

## 5.2.8 Help

The Help menu contains basic information on the operation of the CLPx. Browse through the help screens using the UP/DOWN arrows and use the left arrow to exit back to the menu.

## 5.2.9 Power Off

To power off the CLPx select this item and answer YES to the "Are you sure?" screen that appears. Note that this screen can be quickly accessed by using the UP arrow from the top of the menu so the operator can exit analysis, press UP to get to this item then ENTER and answer YES to power off quickly.

## 5.3 Setup Menu

The setup menu is not password protected by default. In the Configuration settings on the Service Menu the password requirement can be enabled if needed.

### 5.3.1 Select Gas

This selection will display the available gas selections based on the gas family purchased and installed at the factory. Use the ENTER key to select the gas to monitor for which will then set the default Alarm Levels and give the operator the opportunity to change them by going directly to the Set Alarm Level screen (see 5.3.3)

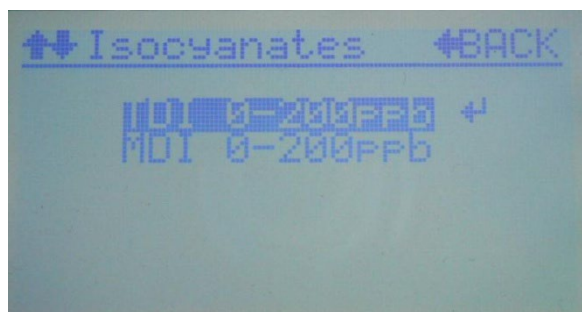


Figure 5.11

### 5.3.2 Adjust Flow

This selection will display the screen shown in figure 5.12. Connect the included flow meter and adjust the pump to get the flow to the value shown. (ex 200 cc). As shown in the screen you can normally adjust the pump using the left right keys or if you would like to enter a specific value press the ENTER key and use the procedure outlined in 5.1.5. A ChemLogic® Cassette tape must be installed when adjusting flow.

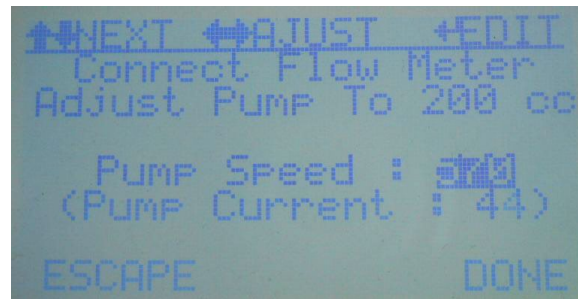


Figure 5.12

### 5.3.3 Set Alarm Levels

This selection will display the screen shown in figure 5.13 to adjust the Alarm Level if necessary. When a gas is selected the alarm levels are set to the default values which are normally 1 and 2 TLV. They can be adjusted if necessary at any time in this screen. Be sure to select 'SAVE' when done if the values are changed.

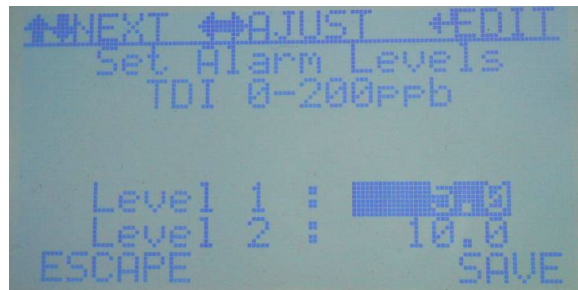


Figure 5.13

### 5.3.4 Battery Check

The battery check menu will display the screen shown in figure 5.14 which displays the current battery voltage along with the warning and shutdown levels. These levels can be adjusted if necessary (not recommended) on the Service Menu.

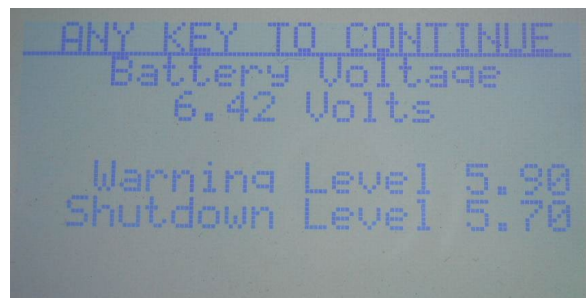


Figure 5.14

### 5.3.5 Set Date/Time

Allows the operator to change the Date/Time. Note the hour displayed is in 24-hour format. Use the LEFT/RIGHT keys to quick adjust each field and the UP/DOWN keys to select each field.

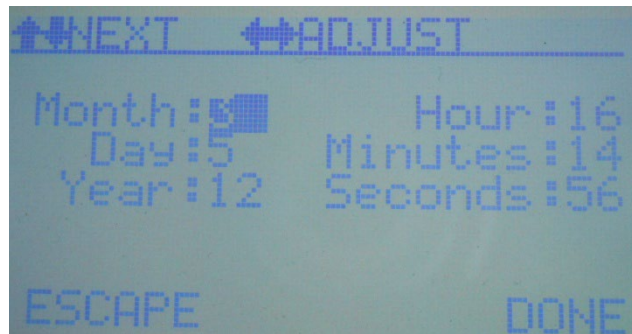


Figure 5.15

### 5.3.6 System Info

Displays the current software version and serial # and selected gas for information purposes only. Software versions 12.3 and higher will also display the Installer/Updater version #.

### 5.3.7 Cal Stick Test

The Cal Stick included with in the case is not necessary for calibrating the system as the optics will self-calibrate however the Cal Stick Test screen allows for verifying that the optics can adjust appropriately and detect color change.

**NOTE:** It is recommended to perform an Optics Auto Test on the Service menu after running the CAL Stick Test.

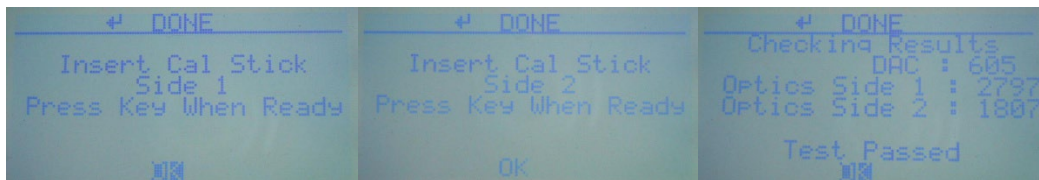


Figure 5.13

Figure 5.14

Figure 5.15

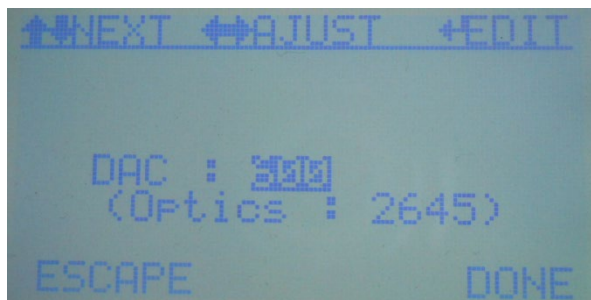
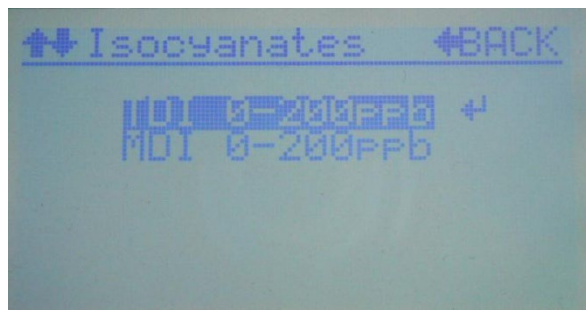
To run the Cal Stick test, follow the directions on the screen. Insert Cal Stick side 1, then Cal Stick Side 2 and view the results. The screen will display an error if the values are out of range or otherwise invalid.

## 5.4 Service Menu

The service menu is password protected using the Service Level password. Most of the items on this menu are for service personnel or validation of the system and are not needed during normal operation of the CLPx.

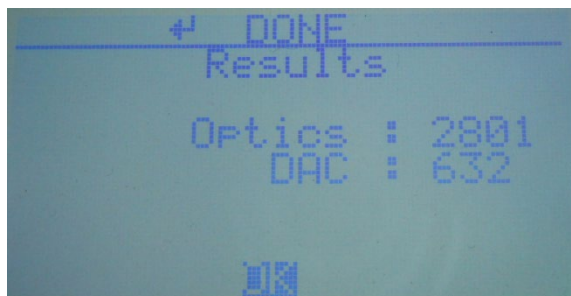
## 5.4.1 Manual Optics Test

The manual optics test allows the light (DAC) to be manually adjusted to check the response of the readings from the installed ChemLogic Cassette Tape. Use the LEFT/RIGHT keys to adjust the amount of light in the optics. The resulting reading from the optics will be displayed after a short delay. To set a specific light(DAC) reading use the detailed editing feature by touching the ENTER key. Note that the values used in this screen are for service/validation only and will not be used when returning to analysis. The Auto Adjust test below (5.4.2) is the recommended quick method to verify the optical system.



## 5.4.2 Auto Optics Test

Use this test to verify the adjustment of the optics and the light intensity. The tape will be approximately 2800.

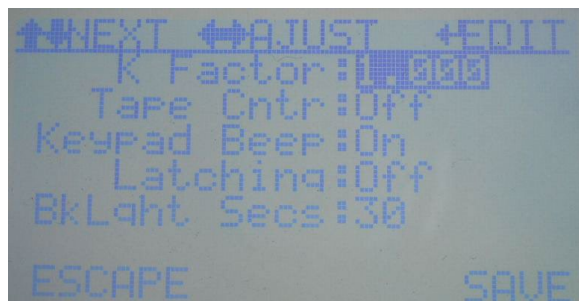


### 5.4.3 Config Settings

The Config settings allow various options in the CLPx to be adjusted. Most of the fields can be quickly changed using the normal edit feature with the LEFT/RIGHT keys. Each value is factory set to the recommended value.

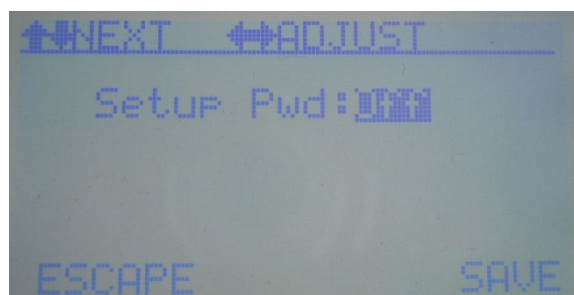
**WARNING:** The K Factor is multiplied by the actual concentration for the selected gas. It is not recommended to change the value to anything other than 1.000.

- K Factor: (default 1.000). This value will scale the concentration reading on the display.
- Tape Cntr: (default: off) The tape counter feature is not yet included in CLPx software.
- Keypad Beep: (default on) The keypad beep feature gives audible response each time a key is pressed and may be disabled by changing this value to off.
- Latching: (default off) The latching feature is not yet included in the CLPx software.
- BkLght Secs: (default 30) This value determines the timeout to turn off the backlight to conserve energy.



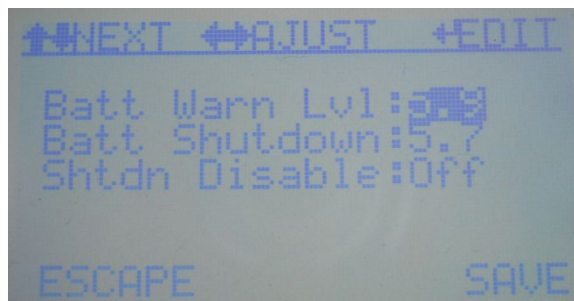
### 5.4.4 Config Settings 2 (PWD settings on older versions)

The config settings 2 menu allows more options to be modified including whether the setup menu is password protected or not. By default, any operator can access the setup menu. To limit access, change this value to ON and use the SETUP or SERVICE passwords to access the setup menu.



## 5.4.5 Battery Settings

The battery settings allow changing of the battery limits but should only be adjusted by service personnel. The low battery warning will appear when the battery voltage reaches the 'Batt Warn Lvl' or below. The CLPx will automatically shut down with 20 second warning when the voltage level reaches the 'Batt Shutdown' voltage or below. The shutdown feature can be disabled however it is highly recommended to leave this feature on – see warning below.



**WARNING:** The automatic shutdown feature of the CLPx during low voltage situations is important to protect the unit. Disabling this feature or changing the recommended voltage level may result in loss of internal configuration, corruption of the MicroSD card and/or corruption of all internal memory.

## 5.4.6 Simulation

The simulation screen can be used for demonstration and training purposes. Enter a value to indicate the level of optical change desired and enable the simulation mode. Return to the analysis screen to begin simulation. Simulation mode remains active until disabled, shutdown, or loss of power. Simulation mode is disabled upon power off the CLPx.

**WARNING:** When simulation mode is enabled the system will not detect gas although the screen may indicate a concentration. The word 'Simulation' will appear on the analysis screen above the concentration.

## 5.4.7 Passwords

The password screen displays the passwords entered in the system and allows them to be edited. To change a password, scroll to the desired password location and press enter. Enter the new password and save it to update the list. Up to 14 passwords may be entered into the system.

## 5.4.8 Factory Menu

The Factory Menu is available only to trained service personnel and is password protected. Contact DOD for more information.



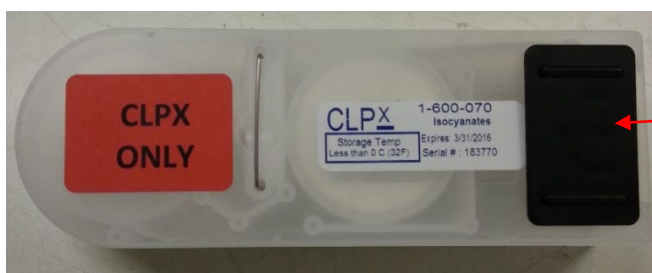
## 5.4.9 Software Update (Version 12.3 and Higher)

The software update selection allows new CLPx software to be installed into the system. Contact DOD Technologies regarding the latest version of software and instructions on how to install correctly.

**WARNING:** The software update procedure should only be used under the guidance of DOD trained service personnel. Contact DOD Technologies, INC for more information. Improper use of the software update selection may result in loss of internal configuration, corruption of the MicroSD card and/or corruption of all internal memory.

## 5.5 Cassette Installation and Removal

Open the Cassette Access Door by turning the Cassette Release knob fully to the left. Remove the black tape guide and place the ChemLogic CLPx cassette inside with the label facing upright and outwards.



Remove this piece before installing cassette

The cassette release knob also opens the gate to allow space for the tape to sit between the optics block and the inlet nosepiece. Ensure the tape is properly located between these two pieces before closing the door and closing the Cassette Release Knob.

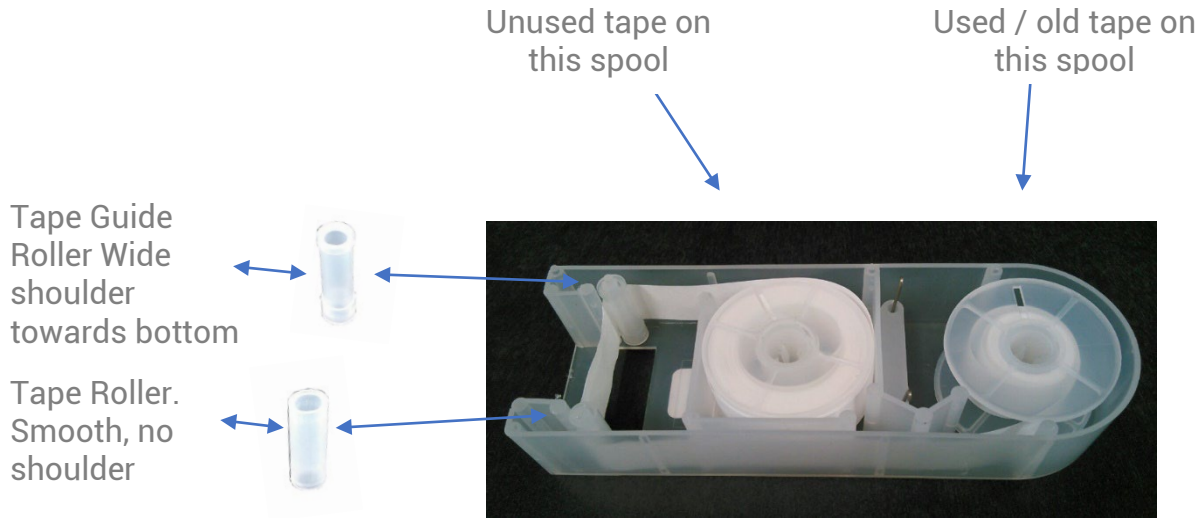


Knob still open

Tape sits between optics block and red nosepiece on gate

To remove the cassette, simply turn the Cassette Release Knob and open the door. Pull the wire handle attached to the cassette. If the tape does not come free, close the gate (by turning the Release Knob), advance the tape, and try again.

If the cassette somehow becomes disassembled, consult the following diagram to reassemble the cassette.



## Chapter 6 – Maintenance

### 6.1 Micro Secure Digital (SD) Card Replacement

See Appendix F for detailed information on the contents of the SD Card.

Install the MicroSD card with the 8-pin gold edge connector facing to the left of the machine when viewing from the back – see Figure 6.1

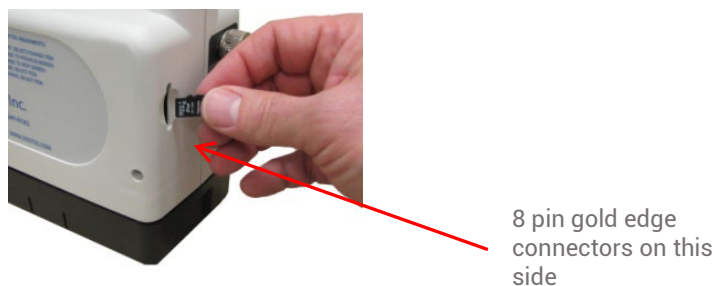


Figure 6.1

### 6.2 Routine Maintenance

Reliable operation of the CLPx monitor requires that the unit be maintained in good working order and that the sample input path and tape transport area are clean. Regularly inspect the CLPx monitor for proper operation and damage. Establish a schedule for cleaning the CLPx monitor based on usage and the nature of the sampling environment and clean as needed according to the cleaning instructions below. If you have any questions or concerns, contact DOD Technologies.

#### 6.2.1 Inspection of the CLPx

1. Inspect the CLPx monitor for damage such as cracks to the housings or loose or missing components.
2. Check the tape door release and lock for proper operation. Check the tape door for damage.
3. Check the sample input path for damage or for missing components.
4. The inlet tube must be properly seated in the optics block and flush with the end of the cover tube.
5. Start the unit and check for any performance issues such as excessive or unusual noise, erratic operation, or problems with the display. If any damage is found, remove the unit from service and tag for repair by authorized personnel.

#### 6.2.2 Cleaning the CLPx

Cleaning of the CLPx portable gas monitor is essential to maintain reliable and accurate measurements. Problems with calibration may be an indication of the need for cleaning. Dust and contaminants can build up and interfere with the sensitive optics. Most routine cleaning of the CLPx monitor involves removal of tape dust build up and cleaning of the sample input path. Additional cleaning may be required in dusty environments or in some atmospheres, such as those where MDI is being measured, which may contain wet or sticky aerosols that can build up in the sample input path. Establish a cleaning schedule that is suitable for the conditions where the CLPx monitor will be used.

Wear powder-free surgical gloves (or equivalent) when cleaning the interior surfaces and mechanism to avoid contact with the paper tape dust and other contaminants and when handling pieces of the paper tape in the course of these instructions.

Cleaning the CLPx monitor may require the use of pressurized air. For some cleaning, a rubber bulb blower will provide a good puff of air to remove dust. Avoid the use of a photographic blower brush which may snag and leave brush hair in the mechanism. If compressed air is used, use only clean, dry air at a maximum pressure of 30 psi. Never use shop air which may contain oil or other contaminants. Canned compressed air for photographic or electronic cleaning is recommended when used in accordance with the product. If a spray solvent cleaner is required, use only a **residue free** cleaner such as an aerosol contact and circuit board cleaner. Follow the manufacturer's instructions for proper use of the cleaner.

**WARNING:** Compressed air is hazardous. Careless handling of compressed air may result in serious injury or death.

### 6.2.3 Cleaning the Exterior

Clean the outside of the CLPx monitor with a damp cloth. Keep the tape door closed and avoid excessive water. To remove oily or sticky deposits, use a mild detergent solution on the cloth.

### 6.2.4 Cleaning the Interior

For routine cleaning, carefully wipe the inside of the cassette chamber but avoid contact with the tape gate, the sample input path, and the optic block. Cleaning the tape gate, the sample input path, and the optic block are described below.

### 6.2.5 Cleaning the Gate

When a sample is being taken, the paper tape is held in place by the tape gate. When the sample is complete, the gate opens, and the tape advances a new segment of tape into position for the next test. Paper dust from the tape may accumulate in the tape gate area. To clean the tape gate area, use a rubber bulb blower or clean pressurized air.

## Chapter 7 – Service & Support

For information on service and support for your CLPx contact DOD Technologies using the information below.

### Support

M-F 8am – 5pm (Central Time Zone)

815.788.5200 phone

815.788.5300 fax

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

### Service Center

675 Industrial Drive Bldg. A

Cary, IL 60014

United States

Visit our website

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

## Appendix A – Cassette Expirations

| Cassette Part # | Description   | Machine | *Exp Months | Storage Temp         |
|-----------------|---|---------|-------------|----------------------|
| 1-200-070       | CLPx Phosgene ChemLogic Cassette  | CLPx    | 12          | Less than 25C (77F)  |
| 1-200-075       | CLPx Velcorin ChemLogic Cassette  | CLPx    | 12          | Less than 25C (77F)  |
| 1-300-070       | CLPx Hydride ChemLogic Cassette   | CLPx    | 12          | From 4-10C (40-50F)  |
| 1-300-075       | CLPx COS ChemLogic Cassette   | CLPx    | 12          | From 4-10C (40-50F)  |
| 1-390-070       | CLPx H2S ChemLogic Cassette   | CLPx    | 6           | Less than 25C (77F)  |
| 1-400-070       | CLPx Mineral Acid ChemLogic Cassette  | CLPx    | 12          | Less than 25C (77F)  |
| 1-400-075       | CLPx Nitric Acid ChemLogic Cassette   | CLPx    | 6           | Less than 0 C (32F)  |
| 1-410-070       | CLPx Mineral Acid II and NF3 ChemLogic Cassette                                     | CLPx    | 6           | Less than 0C (32F)   |
| 1-420-070       | CLPX SG Mineral Acid ChemLogic Cassette   | CLPx    | 12          | Less than 0C (32F)   |
| 1-490-070       | CLPx Organic Acid ChemLogic Cassette  | CLPx    | 12          | Less than 25 C (77F) |
| 1-500-070       | CLPx Chlorine ChemLogic Cassette  | CLPx    | 6           | Less than 25C (77F)  |
| 1-500-075       | CLPx Ultra Low Level Chlorine ChemLogic Cassette<br>(Discard 14 days after opening) | CLPx    | 6           | From 4-25C (40-77F)  |
| 1-530-070       | CLPx Ozone ChemLogic Cassette   | CLPx    | 12          | Less than 25C (77F)  |
| 1-550-070       | CLPx Chlorine (Fluorine/Oxidizers) ChemLogic Cassette                               | CLPx    | 6           | Less than 25C (77F)  |
| 1-560-070       | CLPx Chlorine SG ChemLogic Cassette   | CLPx    | 12          | Less than 25C (77F)  |
| 1-600-070       | CLPx Diisocyanate ChemLogic Cassette  | CLPx    | 6           | Less than 0C (32F)   |
| 1-600-570       | CLPx Nitrogen Dioxide ChemLogic Cassette  | CLPx    | 6           | Less than 0C (32F)   |
| 1-700-070       | CLPx Ammonia ChemLogic Cassette   | CLPx    | 12          | Less than 0C (32F)   |
| 1-800-070       | CLPx HCN ChemLogic Cassette   | CLPx    | 6           | Less than 0C (32F)   |
| 1-810-070       | CLPx Sulfur Dioxide ChemLogic Cassette  | CLPx    | 6           | Less than 0C (32F)   |
| 1-D11-070       | CLPx Hydrazine ChemLogic Cassette   | CLPx    | 9           | Less than 25C (77F)  |
| 1-E15-070       | CLPx TDI & MDI SPxNO2 ChemLogic Cassette  | CLPx    | 6           | Less than 0C (32F)   |

*\*Expiration Months are from the date of manufacture. CLPx Cassettes with 12 months expiration will ship with minimum 9 months remaining. CLPx Cassettes with 10 months expiration will ship with minimum 8 months remaining. CLPx Cassettes with 6 months expiration will ship with minimum 4 months remaining.*

*\*\*If DOD Technologies ChemLogic Cassettes are not stored according to the stated storage requirements, we recommend using within 45 days.*

**IMPORTANT:** The expiration date of all ChemLogic Cassettes is printed on the label of each cassette. However, once the package is opened the maximum days the cassette can be used without proper storage is indicated in the table. The effective expiration date is the sooner of the expiration date on the label or the appropriate number of days from the date opened.

**Example:** A cassette part # 1-600-070 has the expiration date of 11/31/2018 printed on the label. It is opened on 05/01/2018 and kept in the CLPx. The actual expiration date would be 6/29/2018 (60 days after opening).

If the cassette is returned to storage in the original packaging (including bag) after each use the cassette can be used up to the original expiration date printed on the label.

When the ChemLogic Cassette package is first opened the date should be recorded on the cassette for reference.

## Appendix B – Options / Accessories / Spare Parts

| PART NUMBER | PART DESCRIPTION  |
|-------------|---|
| 2-800-013   | Particulate Filter for Corrosive Gases (Mineral Acids)        |
| 2-700-003   | CLPx Exhaust Fitting Option                                   |
| D016-0802   | CLPx Calibration Stick  |
| 2-600-202   | SD Micro Memory Card (2GB)                                    |
| 2-700-014   | CLPx Desiccant Filter with Fittings                           |
| 2-700-004   | CLPx Teflon Sampling Wand For 1/4" OD Nozzle                  |
| 2-700-007   | CLPx Teflon Sampling Wand For 3/8" OD Nozzle                  |
| 2-100-503   | Filter for H2S Scrubber                                       |
| 2-700-A06   | CLPx Charger Assembly (Grounded)                              |
| 1-000-A04   | CLPx Flow Test Kit  |
| D096-2938   | CLPx Assembly Display Top Cap                                 |
| 2-700-A04   | CLPx Battery Pack   |
| 2-700-013   | CLPx Pyrolyzer Option   |
| 2-700-040   | CLP/Next Step Upgrade Package to CLPx                         |
| 2-9300-102  | Fitting Reducer 3/8" to 1/4" Tube Quick Connect Polypropylene |
| Q035-0017   | Knob - CLP/Nextstep Open Gate                                 |
| 780248      | Particulate Filter for Non-Corrosives (Phosgene & Hydrides)   |
| Q077-0463   | Shoulder Strap 1" x 48" Light Duty                            |
| 2-800-013   | Particulate Filter for Corrosive Gases (Mineral Acids)        |
| 2-700-A07   | Assembly Internal Filter CLPx                                 |
| 2-100-121   | CLPx Sample Inlet Nozzle                                      |
| 2-700-008   | Upgrade Kit CLPx Inlet Nozzle                                 |
| Q096A3172   | Assy CLP Window and Door                                      |
| 2-700-015   | Option CLPx High Humidity Nosepiece (Tech Upgrade Only)       |
| 1-000-556   | Flow meter 0.1 to 1.0 LPM                                     |
| 2-700-041   | New CLPx Kit Case   |
| Q2700-0001  | PCB Assembly CLP Microcontroller                              |
| Q096-3173   | CLPx Case with Custom Foam                                    |
| 2-700-A02   | Assy CLPx Optics Block  |
| 9-300-059   | Synthetic Grease  |

## Appendix C – Technical Specifications

| <b>Physical Dimensions</b> |  |
|----------------------------|--|
| Height                     | 8.6" (21.8 cm)   |
| Width                      | 4.1" (10.4 cm)   |
| Depth                      | 11.3" (28.7 cm)  |
| Weight                     | 6 lbs. (2.72 kg)   |
| Operating Temperature      | 40°F to 95°F / 4°C to 35°C   |
| <b>Flow</b>                |  |
| Sample Tubing              | ¼" O.D. FEP Teflon (10 ft. max)<br>6" Maximum for Diisocyanate Detection |
| <b>Electrical</b>          |  |
| Power                      | 6V DC 0.2 Amp Max  |
| <b>Misc.</b>               |  |
| Data Logging               | Micro SD card  |



## Appendix D – System Event Messages

### Color Coding

|        |             |                     |
|--------|-------------|---------------------|
| RED    | Alarm       | Gas Alarm           |
| ORANGE | Fault       | Service Fault       |
| YELLOW | Maintenance | Minor Fault         |
| BLUE   | Event       | Information Message |
| GREEN  | Event       | Status Update       |

| CLPx Event ID | Message               | Possible Cause                                     |
|---------------|-----------------------|--|
| 7028          | Gas Alarm Level 1     | Gas Detected                                       |
| 7029          | Gas Alarm Level 2     | Gas Detected                                       |
| 7001          | No Gas Data           | No Gas Selected                                    |
| 7002          | No Gas Selected       | No Gas Selected                                    |
| 7003          | Invalid Gas Data(1)   | Contact DOD  |
| 7004          | Invalid Gas Data(2)   | Contact DOD  |
| 7005          | Invalid Gas Data(3)   | Contact DOD  |
| 7006          | Invalid Gas Data(4)   | Contact DOD  |
| 7007          | Optic Calib Fault(1)  | Optics Dirty, No Cassette Installed or End of Tape |
| 7008          | Optic Calib Fault(2)  | Optics Dirty, No Cassette Installed or End of Tape |
| 7009          | Optic Calib Fault(3)  | Optics Dirty, No Cassette Installed or End of Tape |
| 7013          | Invalid Gas Data 1    | Contact DOD  |
| 7014          | Invalid Gas Data 2    | Contact DOD  |
| 7015          | Invalid Gas Data 3    | Contact DOD  |
| 7016          | Invalid Gas Data 4    | Contact DOD  |
| 7017          | Optic Fault L         | Contact DOD  |
| 7018          | Optic Fault H         | Contact DOD  |
| 7030          | High Background       | No Cassette or End of Tape                         |
| 7031          | Invalid K Factor      | K Factor must be > 0.5 and < 3.0                   |
| 7032          | Tape Advance Err1     | Tape Jam,, Low Voltage                             |
| 7033          | Tape Advance Err2     | Tape Jam,, Low Voltage                             |
| 7034          | No Pump Detected      | Contact DOD  |
| 7026          | Check Filter          | Replace Carbon Filter                              |
| 7027          | Filter Clogged        | Replace Carbon Filter                              |
| 7037          | Power Off NVRam Error | Machine Configuration error                        |
| 7019          | Memory Flash Err      | No card, Card Full, or Error writing card          |

| CLPx Event ID | Message             | Possible Cause                              |
|---------------|---------------------|---|
| 7010          | Power On            |   |
| 7011          | Power Off           |   |
| 7021          | Analysis Started    | Analysis Mode Selected on Main Menu         |
| 7022          | End Analysis-No Gas | End of analysis cycle - no gas was detected |
| 7023          | End Analysis-Gas    | End of analysis cycle - Gas was detected    |
| 7036          | Power Off Shutdown  | Low voltage auto shutdown                   |
| 7012          | Gas Selected        | Gas Selection made                          |
| 7020          | Defaults Restored   |   |
| 7024          | Event Log Cleared   |   |
| 7025          | Conc Log Cleared    |   |
| 7038          | Alarm Lvl1 Change   |   |
| 7039          | Alarm Lvl2 Change   |   |
| 7040          | Software Update     | System Software update                      |
| 7041          | Update Complete     | System Software update                      |
| 7042          | Installer Update    | Software Installation System Update         |
| 7043          | Installer Upd Comp  | Software Installation System Update         |

## Appendix E – Gas Specifications

### CLPx LDL List (Software Version 19.04 Build 991 and Above)

| ChemLogic Cassette PN | Name                               | Gas           | LDL  | FS   | Units | TLV  | Alarm 1 Default | Alarm 2 Default | Response Time TLV (T100)*seconds |
|-----------------------|------------------------------------|---------------|------|------|-------|------|-----------------|-----------------|----------------------------------|
| 1-700-070             | Ammonia                            | NH3           | 1.9  | 75   | ppm   | 25   | 25              | 50              | 12                               |
| 1-420-070             | Arsenic Pentafluoride <sup>^</sup> | AsF5 (HF)     | 0.4  | 10   | ppm   | 0.5  | 2               | 4               | 16                               |
| 1-420-070             | Arsenic Trichloride <sup>^^</sup>  | AsHCl3 (HCL)  | 0.2  | 15   | ppm   | 2    | 5               | 10              | 30                               |
| 1-420-070             | Arsenic Trifluoride <sup>^</sup>   | AsF3 (HF)     | 0.4  | 10   | ppm   | 0.5  | 2               | 4               | 16                               |
| 1-300-070             | Arsine                             | AsH3          | 0.9  | 500  | ppb   | 5    | 50              | 100             | 16                               |
| 1-300-070             | Arsine                             | AsH3          | 0.9  | 50   | ppb   | 5    | 5               | 10              | 16                               |
| 1-420-070             | Boron Tribromide <sup>^^^</sup>    | BBr3 (HBr)    | 0.3  | 20   | ppm   | 2    | 3               | 6               | 12                               |
| 1-420-070             | Boron Trichloride <sup>^^</sup>    | BCl3 (HCL)    | 0.2  | 15   | ppm   | 2    | 5               | 10              | 30                               |
| 1-420-070             | Boron Trifluoride                  | BF3           | 98.5 | 5000 | ppb   | 100  | 100             | 200             | 12                               |
| 1-490-070             | Bromine                            | HCOOH         | 0.5  | 10   | ppb   | 5    | 3               | 6               |                                  |
| 1-420-070             | Carbonyl Fluoride <sup>^</sup>     | COF2 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-300-075             | Carbonyl Sulfide                   | COS           | 1    | 20   | ppm   | 5    | 5               | 10              | 12                               |
| 1-500-075             | Chlorine                           | Cl2           | 1    | 20   | ppb   | 100  | 500             | 1000            | 16                               |
| 1-500-075             | Chlorine                           | Cl2           | 1    | 5    | ppb   | 100  | 1               | 2               |                                  |
| 1-560-070             | Chlorine SG                        | CL2           | 44   | 5000 | ppb   | 100  | 500             | 1000            | 16                               |
| 1-560-070             | Chlorine SG                        | CL2           | 7    | 2000 | ppb   | 100  | 500             | 1000            | 16                               |
| 1-550-070             | Chlorine Dioxide                   | ClO2          | 32.1 | 1000 | ppb   | 100  | 100             | 200             |                                  |
| 1-420-070             | Chlorine Trifluoride <sup>^</sup>  | ClF3 (HF)     | 0.4  | 10   | ppm   | 0.5  | 2               | 4               | 16                               |
| 1-300-070             | Diborane                           | B2H6          | 14.9 | 1000 | ppb   | 100  | 100             | 200             | 12                               |
| 1-420-070             | Dichlorosilane <sup>^^</sup>       | SiH2Cl2 (HCL) | 0.2  | 15   | ppm   | 2    | 5               | 10              | 30                               |
| 1-420-070             | Difluoromethane <sup>**</sup>      | CH2F2         | 1    | 40   | ppm   | 1.2  | 10              | 20              | 88                               |
| 1-700-070             | Dimethylamine                      | DMA           | 49   | 5000 | ppb   | 5000 | 2500            | 5000            | 16                               |
| 1-550-070             | Fluorine                           | F2            | 86.5 | 3200 | ppb   | 100  | 1000            | 2000            | 12                               |
| 1-420-070             | Fluorosilicic acid <sup>^</sup>    | H2SiF6 (HF)   | 0.4  | 10   | ppm   | 0.5  | 2               | 4               | 16                               |

|           |                            |                   |      |          |     |          |      |      |     |
|-----------|----------------------------|-------------------|------|----------|-----|----------|------|------|-----|
| 1-420-070 | Fluoromethane**            | CH3F              | 1    | 40       | ppm | 1.8      | 10   | 20   | 104 |
| 1-300-070 | Germane                    | GeH4              | 98.3 | 200<br>0 | ppb | 200      | 200  | 400  | 60  |
| 1-420-070 | Germanium Tetrafluoride^   | GeF4<br>(HF)      | 0.4  | 10       | ppm | 0.5      | 2    | 4    | 16  |
| 1-420-070 | Hexachlorodisilane^^       | SiCl2<br>(HCL)    | 0.2  | 15       | ppm | 2        | 5    | 10   | 30  |
| 1-420-070 | Hexafluorocyclobutene**    | C4F6              | 1.5  | 40       | ppm | 5        | 5    | 10   | 32  |
| 1-600-070 | Hexamethylene Diisocyanate | HDI               | 2.6  | 200      | ppb | 5        | 5    | 10   | 116 |
| 1-600-070 | HMDI                       | HMDI              | 1.2  | 100      | ppb | 5        | 5    | 10   | 116 |
| 1-D11-070 | Hydrazine                  | N2H4              | 8    | 500      | ppb | 10       | 10   | 20   | 180 |
| 1-420-070 | Hydrogen Bromide           | HBR               | 0.3  | 20       | ppm | 3        | 3    | 6    | 12  |
| 1-420-070 | Hydrogen Chloride          | HCL               | 0.2  | 15       | ppm | 2        | 2    | 4    | 30  |
| 1-800-070 | Hydrogen Cyanide           | HCN               | 0.4  | 20       | ppm | 4.7      | 4.7  | 9.4  | 16  |
| 1-420-070 | Hydrogen Flouride          | HF                | 0.4  | 10       | ppm | 0.5      | 2    | 4    | 16  |
| 1-420-071 | Hydrogen Flouride          | HF                | 0.1  | 4        | ppm | 0.5      | 1    | 2    |     |
| 1-300-070 | Hydrogen Selenide          | H2Se              | 18.2 | 500      | ppb | 50       | 50   | 100  | 60  |
| 1-300-070 | Hydrogen Sulfide           | H2S               | 16.7 | 90       | ppb | 100<br>0 | 1000 | 2000 | 20  |
| 1-300-070 | Hydrogen Sulfide           | H2S               | 0.3  | 20       | ppm | 1        | 1    | 2    | 52  |
| 1-300-070 | Hydrogen Sulfide           | H2S               | 0.3  | 50       | ppm | 1        | 1    | 2    |     |
| 1-300-070 | Hydrogen Sulfide           | H2S               | 0.3  | 50       | ppm | 1        | 1    | 2    |     |
| 1-600-070 | IPDI                       | IPDI              | 3    | 200      | ppb | 5        | 5    | 10   | 84  |
| 1-600-070 | MDI                        | MDI               | 1    | 200      | ppb | 5        | 5    | 10   | 30  |
| 1-E15-070 | MDI                        | MDI               | 1    | 200      | ppb | 5        | 5    | 10   |     |
| 1-410-070 | Nitric Acid                | HNO3              | 12.5 | 600<br>0 | ppb | 200<br>0 | 2000 | 4000 | 16  |
| 1-550-070 | Nitrogen Dioxide           | NO2               | 85.2 | 900<br>0 | ppb | 200      | 3    | 6    | 280 |
| 1-600-570 | Nitrogen Dioxide           | NO2               | 0.7  | 25       | ppm | 0.2      | 3    | 6    | 32  |
| 1-410-070 | Nitrogen Trifluoride**     | NF3               | 1    | 50       | ppm | 10       | 5    | 10   | 4   |
| 1-600-070 | NDI                        | NDI               | 2    | 100      | ppb | 5        | 5    | 10   |     |
| 1-530-070 | Ozone II                   | O3                | 30   | 300      | ppb | 100      | 100  | 200  | 28  |
| 1-535-070 | Ozone II                   | O3                | 30   | 300      | ppb | 100      | 100  | 200  | 28  |
| 1-420-070 | Phenyl Trichlorosilane^^   | SiCl2Ph (<br>HCl) | 0.2  | 15       | ppm | 5        | 5    | 10   | 30  |
| 1-200-070 | Phosgene                   | COCl2             | 4.9  | 90       | ppb | 100      | 100  | 200  | 16  |
| 1-200-070 | Phosgene                   | COCl2             | 5.3  | 300<br>0 | ppb | 100      | 100  | 200  | 16  |
| 1-300-070 | Phosphine                  | PH3               | 5    | 150<br>0 | ppb | 50       | 50   | 100  | 12  |
| 1-420-070 | Phosphorus Oxychloride^^   | POCl3<br>(HCl)    | 0.2  | 15       | ppm | 2        | 5    | 10   | 30  |

|           |  |                                |      |           |     |          |      |      |     |
|-----------|--|--------------------------------|------|-----------|-----|----------|------|------|-----|
| 1-420-070 | Phosphorus Pentachloride <sup>^^</sup> | PCl <sub>5</sub> (HCl)         | 0.2  | 15        | ppm | 2        | 5    | 10   | 30  |
| 1-420-070 | Phosphorus Pentafluoride <sup>^</sup>  | PF <sub>5</sub> (HF)           | 0.4  | 10        | ppm | 0.5      | 2    | 4    | 16  |
| 1-420-070 | Phosphorus Tribromide <sup>^^^</sup>   | PBr <sub>3</sub> (HBr)         | 0.3  | 20        | ppm | 2        | 3    | 6    | 12  |
| 1-420-070 | Phosphorus Trichloride <sup>^^</sup>   | PCl <sub>3</sub> (HCl)         | 0.2  | 15        | ppm | 2        | 5    | 10   | 30  |
| 1-420-070 | Phosphorus Trifluoride <sup>^</sup>    | PF <sub>3</sub> (HF)           | 0.4  | 10        | ppm | 0.5      | 2    | 4    | 16  |
| 1-300-070 | Silane                                 | SiH <sub>4</sub>               | 0.2  | 50        | ppm | 5        | 5    | 10   | 16  |
| 1-420-070 | Silicon Tetrachloride <sup>^^</sup>    | SiCl <sub>4</sub> (HCl)        | 0.2  | 15        | ppm | 2        | 5    | 10   | 30  |
| 1-810-070 | Sulfur Dioxide                         | SO <sub>2</sub>                | 24.9 | 250<br>0  | ppb | 0        | 250  | 500  | 4   |
| 1-410-070 | Sulfur Hexafluoride <sup>**</sup>      | SF <sub>6</sub>                | 400  | 200<br>0  | ppm | 400      | 600  | 800  | 248 |
| 1-420-070 | Sulfur Tetrafluoride                   | SF <sub>4</sub> (HF)           | 0.4  | 10        | ppm | 0.5      | 2    | 4    | 16  |
| 1-410-070 | Sulfuric Acid                          | H <sub>2</sub> SO <sub>4</sub> | 23.3 | 750       | ppb | 50       | 50   | 100  | 76  |
| 1-420-070 | Tetrafluorosilane <sup>^</sup>         | SiF <sub>4</sub> (HF)          | 0.4  | 10        | ppm | 0.5      | 2    | 4    | 16  |
| 1-700-070 | Tetrakis(dimethylamido)titanium        | TDMAT                          | 10   | 200<br>00 | ppb | 500<br>0 | 2500 | 5000 | 16  |
| 1-420-070 | Tin Tetrachloride <sup>^^</sup>        | SnCl <sub>4</sub> (HCl)        | 0.2  | 15        | ppm | 2        | 5    | 10   | 30  |
| 1-600-070 | Toluene Diisocyanate                   | TDI                            | 1.1  | 200       | ppb | 5        | 5    | 10   | 16  |
| 1-E15-070 | Toluene Diisocyanate                   | TDI                            | 1    | 200       | ppb | 5        | 5    | 10   |     |
| 1-420-070 | Trichlorosilane <sup>^^</sup>          | SiHCl <sub>3</sub> (HCl)       | 0.2  | 15        | ppm | 2        | 5    | 10   | 30  |
| 1-700-070 | Trimethylamine                         | TMA                            | 30   | 500<br>00 | ppb | 500<br>0 | 2500 | 5000 | 16  |
| 1-420-070 | Tungsten Hexafluoride <sup>^</sup>     | WF <sub>6</sub> (HF)           | 0.4  | 10        | ppm | 0.5      | 2    | 4    | 16  |
| 1-200-075 | Velcorin                               | DMDC                           | 10.3 | 500       | ppb | 40       | 50   | 100  |     |

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

\*\* Requires pyrolyzer for detection

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

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

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

### **Software Notice**

1-500-070 has been replaced by 1-560-070 for software version 20.03 and greater.

1-400-070 has been replaced by 1-420-070 for software version 19.04 and greater.

## CLPx LDL List (Software Version 19.04 Build 990 and Below)

| ChemLogic Cassette PN | Name                                 | Gas           | LDL  | FS   | Units | TLV  | Alarm 1 Default | Alarm 2 Default | Response Time TLV (T100)*seconds |
|-----------------------|--------------------------------------|---------------|------|------|-------|------|-----------------|-----------------|----------------------------------|
| 1-700-070             | Ammonia                              | NH3           | 1.9  | 75   | ppm   | 25   | 25              | 50              | 12                               |
| 1-400-070             | Arsenic Pentafluoride <sup>^</sup>   | AsF5 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-400-070             | Arsenic Trichloride <sup>^^</sup>    | AsHCl3 (HCL)  | 0.2  | 15   | ppm   | 5    | 5               | 10              | 30                               |
| 1-400-070             | Arsenic Trifluoride <sup>^</sup>     | AsF3 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-300-070             | Arsine                               | AsH3          | 0.9  | 500  | ppb   | 5    | 50              | 100             | 16                               |
| 1-300-070             | Arsine                               | AsH3          | 0.9  | 50   | ppb   | 5    | 5               | 10              | 16                               |
| 1-400-070             | Boron Tribromide <sup>^^^</sup>      | BBr3 (HBr)    | 0.3  | 20   | ppm   | 3    | 3               | 6               | 12                               |
| 1-400-070             | Boron Trichloride <sup>^^</sup>      | BCl3 (HCL)    | 0.2  | 15   | ppm   | 5    | 5               | 10              | 30                               |
| 1-400-070             | Boron Trifluoride                    | BF3           | 90.1 | 5000 | ppb   | 100  | 100             | 200             | 12                               |
| 1-300-075             | Carbonyl Sulfide                     | COS           | 1    | 20   | ppm   | 5    | 5               | 10              | 12                               |
| 1-400-070             | Carbonyl Fluoride <sup>^</sup>       | COF2 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-500-070             | Chlorine                             | Cl2           | 39.5 | 5000 | ppb   | 500  | 500             | 1000            | 16                               |
| 1-500-075             | Chlorine                             | Cl2           | 1    | 20   | ppb   | 500  | 500             | 1000            | 16                               |
| 1-500-070             | Chlorine                             | Cl2           | 6.7  | 2000 | ppb   | 500  | 500             | 1000            | 16                               |
| 1-400-070             | Chlorine Trifluoride <sup>^</sup>    | ClF3 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-300-070             | Diborane                             | B2H6          | 14.9 | 1000 | ppb   | 100  | 100             | 200             | 12                               |
| 1-400-070             | Dichlorosilane <sup>^^</sup>         | SiH2Cl2 (HCL) | 0.2  | 15   | ppm   | 5    | 5               | 10              | 30                               |
| 1-550-070             | Fluorine                             | F2            | 86.5 | 3200 | ppb   | 1000 | 1000            | 2000            | 12                               |
| 1-400-070             | Fluorosilicic acid <sup>^</sup>      | H2SiF6 (HF)   | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-300-070             | Germane                              | GeH4          | 98.3 | 2000 | ppb   | 200  | 200             | 400             | 60                               |
| 1-400-070             | Germanium Tetrafluoride <sup>^</sup> | GeF4 (HF)     | 0.4  | 10   | ppm   | 2    | 2               | 4               | 16                               |
| 1-400-070             | Hexachlorodisilane <sup>^^</sup>     | SiCl2 (HCL)   | 0.2  | 15   | ppm   | 5    | 5               | 10              | 30                               |
| 1-420-070             | Hexafluorocyclobutene <sup>**</sup>  | C4F6          | 1.5  | 40   | ppm   | 5    | 5               | 10              | 32                               |
| 1-600-070             | Hexamethylene Diisocyanate           | HDI           | 2.6  | 200  | ppb   | 5    | 5               | 10              | 116                              |
| 1-600-070             | HMDI                                 | HMDI          | 1.2  | 100  | ppb   | 5    | 5               | 10              | 116                              |
| 1-D11-070             | Hydrazine                            | N2H4          | 8    | 500  | ppb   | 10   | 10              | 20              | 180                              |
| 1-400-070             | Hydrogen Chloride                    | HCL           | 0.2  | 15   | ppm   | 2    | 2               | 4               | 30                               |

|           |                            |               |      |          |     |          |      |      |    |
|-----------|----------------------------|---------------|------|----------|-----|----------|------|------|----|
| 1-400-070 | Hydrogen Bromide           | HBR           | 0.3  | 20       | ppm | 3        | 3    | 6    | 12 |
| 1-800-070 | Hydrogen Cyanide           | HCN           | 0.4  | 20       | ppm | 4.7      | 4.7  | 9.4  | 16 |
| 1-400-070 | Hydrogen Flouride          | HF            | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |
| 1-300-070 | Hydrogen Selenide          | H2Se          | 18.2 | 500      | ppb | 50       | 50   | 100  | 60 |
| 1-300-070 | Hydrogen Sulfide           | H2S           | 16.7 | 90       | ppb | 100<br>0 | 1000 | 2000 | 20 |
| 1-300-070 | Hydrogen Sulfide           | H2S           | 0.3  | 20       | ppm | 1        | 1    | 2    | 52 |
| 1-600-070 | IPDI                       | IPDI          | 3    | 200      | ppb | 5        | 5    | 10   | 84 |
| 1-600-070 | MDI                        | MDI           | 1    | 200      | ppb | 5        | 5    | 10   | 30 |
| 1-400-075 | Nitric Acid                | HNO3          | 12.5 | 600<br>0 | ppb | 200<br>0 | 2000 | 4000 | 16 |
| 1-600-570 | Nitrogen Dioxide           | NO2           | 0.7  | 25       | ppm | 3        | 3    | 6    | 32 |
| 1-410-070 | Nitrogen Trifluoride**     | NF3           | 1    | 50       | ppm | 10       | 5    | 10   | 4  |
| 1-530-070 | Ozone                      | O3            | 30   | 300      | ppb |          |      |      | 28 |
| 1-400-070 | Phenyl Trichlorosilane^^   | SiCl2Ph (HCl) | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-200-070 | Phosgene                   | COCl2         | 4.9  | 90       | ppb | 100      | 100  | 200  | 16 |
| 1-200-070 | Phosgene                   | COCl2         | 5.3  | 300<br>0 | ppb | 100      | 100  | 200  | 16 |
| 1-300-070 | Phosphine                  | PH3           | 5    | 150<br>0 | ppb | 50       | 50   | 100  | 12 |
| 1-400-070 | Phosphorus Oxychloride^^   | POCl3 (HCl)   | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-400-070 | Phosphorus Pentachloride^^ | PCl5 (HCl)    | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-400-070 | Phosphorus Pentafluoride^  | PF5 (HF)      | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |
| 1-400-070 | Phosphorus Tribromide^^^   | PBr3 (HBr)    | 0.3  | 20       | ppm | 3        | 3    | 6    | 12 |
| 1-400-070 | Phosphorus Trichloride^^   | PCl3 (HCl)    | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-400-070 | Phosphorus Trifluoride^    | PF3 (HF)      | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |
| 1-300-070 | Silane                     | SiH4          | 0.2  | 50       | ppm | 5        | 5    | 10   | 16 |
| 1-400-070 | Silicon Tetrachloride^^    | SiCl4(HCl)    | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-400-075 | Sulfuric Acid              | H2SO4         | 23.3 | 750      | ppb | 50       | 50   | 100  | 76 |
| 1-810-070 | Sulfer Dioxide             | SO2           | 24.9 | 250<br>0 | ppb | 0        | 250  | 500  | 4  |
| 1-400-070 | Sulfur Tetrafluoride       | SF4 (HF)      | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |
| 1-400-070 | Tetrafluorosilane^         | SiF4 (HF)     | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |
| 1-400-070 | Tin Tetrachloride^^        | SnCl4 (HCl)   | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-600-070 | Toluene Diisocyanate       | TDI           | 1.1  | 200      | ppb | 5        | 5    | 10   | 16 |
| 1-400-070 | Trichlorosilane^^          | SiHCl3 (HCl)  | 0.2  | 15       | ppm | 5        | 5    | 10   | 30 |
| 1-400-070 | Tungsten Hexafluoride^     | WF6 (HF)      | 0.4  | 10       | ppm | 2        | 2    | 4    | 16 |

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

\*\* Requires pyrolyzer for detection

^ Compounds which hydrolyze to HF

^^ Compounds which hydrolyze to HCl

^^^ Compounds which hydrolyze to HBr

## Appendix F – Removable Media

To ensure that historical and performance information is stored properly be sure to insert a Micro - Secure Digital (SD) card in the proper slot at all times. See Section 6.1

The SD card stores all information in standard comma separated values (\*.CSV) format for easy access with any computer. Remove the SD card from the CLPx as described in section 6.1 and transfer the files to your personal computer\*. The files are best viewed with programs that convert CSV format to rows and columns (Microsoft Excel, OpenOffice, etc) but can be viewed with any text editor.

Figure F.1 shows the folders found on the SD card depending on the configuration or your CLPx and the use of the SD cards.

### Micro SD Card Root Folder

- \ConcLog – Concentration Log Files
- \Config – Configuration Files (DOD Service)
- \EventLog – Event Log Files
- \StelLog – STEL Log Files

Figure F.1

Files are stored in sub-folders which are named by the date they are created in the format yy-mm-dd. Within each folder are the individual log files for that day using the file name format "TYPEHH.csv" where TYPE = Type of file such as "CONC", "EVNT", or "STEL"

HH – Hour from 01 to 24

Example:

\ConcLog\12-02-21\Conc14.csv - Contains the concentration information (see below) for the 14<sup>th</sup> hour (2PM) on February 21<sup>st</sup>, 2012.



## F.1 Concentration Log Files (CONCHH.CSV)

Concentration log files log information to the MicroSD card (if installed). A sample alarm file is shown in figure F.2 The columns show: Date/Time, Gas Concentration, Alarm Level 1, Alarm Level 2, Pump current (for filter diagnosis), Diagnostic Flags, two diagnostic values and the time since the pump started in seconds

| Date/Time       | Conc | Alarm Level 1 | Alarm Level 2 | Pump Current | Diagnostic Flags | Diag Value 1 | Diag Value 2 | Cycle Time |
|-----------------|------|---------------|---------------|--------------|------------------|--------------|--------------|------------|
| 3/15/2012 17:33 | 0    | 500           | 1000          | 36           | 16               | 2851         | 2849         | 4          |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 41           | 0                | 2851         | 2849         | 8          |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 44           | 0                | 2851         | 2851         | 12         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 46           | 0                | 2851         | 2848         | 16         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 47           | 0                | 2851         | 2845         | 20         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 47           | 0                | 2851         | 2851         | 24         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 48           | 0                | 2851         | 2848         | 28         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 49           | 0                | 2851         | 2848         | 32         |
| 3/15/2012 17:33 | 0    | 500           | 1000          | 49           | 0                | 2851         | 2847         | 36         |

Figure F.2

## F.2 Event Log Files (EVENTHH.CSV)

New fault and alarm events are stored in internal memory and copied to the MicroSD card (if installed) A sample event log as stored on the MicroSD is shown in figure F.3. The columns show: Date/Time, Event Description, Diagnostic Value 1, On/Off, and Diagnostic Value 2 The Events are listed in Appendix D.

| Date Time       | Event              | Diagnostic Value 1 | On/Off | Diagnostic Value 2 |
|-----------------|--------------------|--------------------|--------|--------------------|
| 3/12/2012 10:44 | Power On           | A                  | 1      | 0                  |
| 3/12/2012 10:44 | Installer Update   | 2A                 | 1      | 120301             |
| 3/12/2012 10:44 | Installer Upd Comp | 2B                 | 1      | 120301             |
| 3/12/2012 10:45 | Power Off          | B                  | 1      | 0                  |

Figure F.3

## F.3 STEL Log Files (STELHH.CSV)

New STEL values are written to the log file at the conclusion of each analysis cycle. A sample STEL log as stored on the MicroSD is shown in figure F.4. The columns show: unused future use),Date/Time, date/time log written, High STEL value, High STEL Date/Time, length of STEL sample time (in seconds).

| Future Use | Log Date Time   | STEL High Conc | Date Time Occurred | Length (Seconds) |
|------------|-----------------|----------------|--------------------|------------------|
| 0          | 2/14/2012 10:44 | 12.3           | 2/14/2012 10:23    | 900              |
| 0          | 2/15/2012 12:24 | 1.4            | 2/15/2012 12:17    | 427              |
| 0          | 2/17/2012 8:44  | 2.3            | 2/17/2012 6:24     | 900              |
| 0          | 2/19/2012 21:45 | 19.2           | 2/19/2012 20:29    | 72               |

Figure F.4

## F.4 Formatting Micro SD Disks

The Micro SD Cards can be formatted on any Windows PC with FAT16 or FAT32 format. Most new disks purchased are pre-formatted with FAT32 which will work.

**WARNING** – Formatting the Micro SD card will erase all information stored on the card.

## F.5 Software Update Procedure

**WARNING** – Failure to carefully follow these instructions may result in corruption of the CLPx software and require the unit to be returned for service. We highly recommend contacting our service department for assistance when performing this procedure.

Before you begin verifying which versions of each are installed on your CLPx as follows:

- Select 'SETUP' from the main menu
- Scroll down and select 'System Info'
- On the screen it will show the following :

CLPx MONITOR  
Version XX.XXXX  
Date Version Updated  
Installer MM.MMMM  
Date Installer Updated  
Serial # NNNN

If the Installer Version (MM.MMMM) is equal to or greater than 12.406 you can skip to the CLPx Software Update section.

### F.5.A CLPx Installer Update

Do this only if your installer package is less than less than 12.406  
You will need a special access password to perform this update

#### READ THROUGH ALL THESE DIRECTIONS BEFORE YOU BEGIN

- Power off the CLPx
- Insert the Micro SD Card with the installer update package
- Power on the CLPx
- Scroll down on the main menu and select SERVICE
- Enter the appropriate password
- Scroll down and select 'Factory Menu'
- Enter the special access password from DOD Technologies, INC
- Scroll down the factory menu and select UPGRADE INSTALLER

**NOTE:** *Follow these instructions carefully and be patient. The updating process can take some time to complete (DO NOT PRESS EXTRA KEYS)*

- On the Installer Update screen select 'DONE' then <enter>
- Wait for the Update Complete screen to appear.
- Select OK to exit the installer.

**IMPORTANT:** Return to the main menu and power off the CLPx

**NOTE:** *On some versions of software you may receive an erroneous error during the power off sequence. This will not cause a problem with your CLPx.*

## F.5.B CLPx Software Update

READ THROUGH ALL THESE DIRECTIONS BEFORE YOU BEGIN

- Power off the CLPx
- Insert the Micro SD Card with the software update package
- Power on the CLPx with the <enter> key
- Scroll down on the main menu and select SERVICE
- Enter the appropriate password
- Scroll down and select SOFTWARE UPDATE
- When prompted for "Are you sure?" select YES then <enter>

**NOTE:** *Follow these instructions carefully and be patient. The updating process can take some time to complete (DO NOT PRESS EXTRA KEYS)*

- On the Software Update screen select 'DONE' then <enter>
- Wait for the software update to complete at which time the update complete screen will appear
- Press OK which will power off the CLPx
- Wait 5 seconds
- Power on the CLPx with the <enter> key
- Listen for a sequence of tones which ends with 4 quick beeps (approx. 10-15 seconds total)
- After the tones complete wait 5 seconds
- Power on the CLPx with the <enter> key
- 

Your software update is complete and the new version # will be displayed on the welcome screen

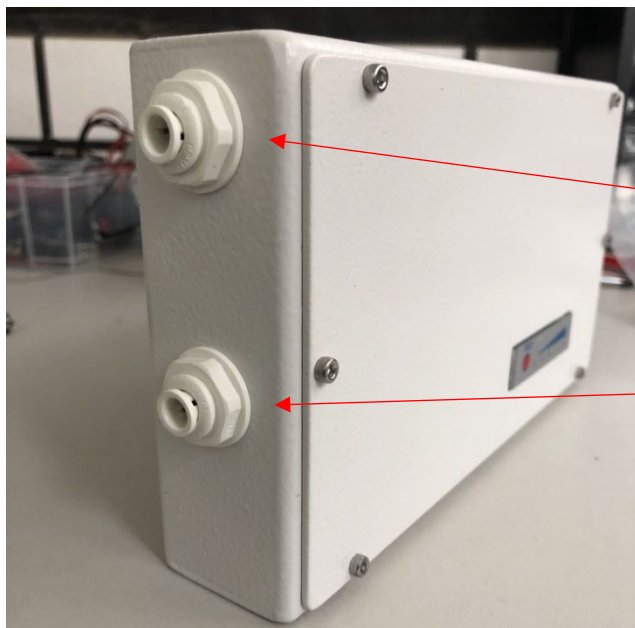
## Appendix G – ChemLogic® Cassettes

DOD ChemLogic cassettes are designed for use in colorimetric based gas monitoring systems. Since this is a particular end-use function and does not release or result in exposure to hazardous chemicals under normal use Material Safety Data Sheets (MSDS) are not required.

ChemLogic cassettes are non-toxic and require no special precautions for protection. However, contact with skin may cause the cassette to react, change color, and no longer be useful in your gas monitoring system. We therefore recommend that rubber gloves be worn at all times while handling including removal and installation. Always wash hands as a precaution after handling DOD ChemLogic cassettes.

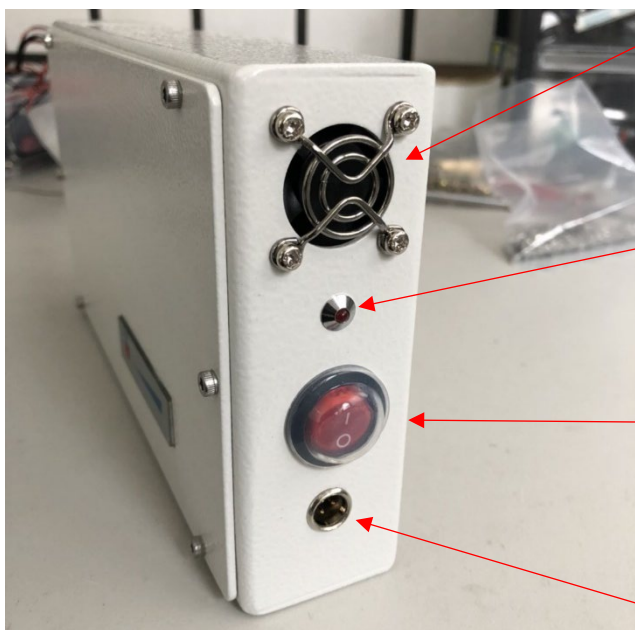
## Appendix H – Pyrolyzer Option

DOD Technologies now offers a CLPx pyrolyzer option. When powering on, allow pyrolyzer 30 seconds of warm up time before entering analysis. With a full charge, the pyrolyzer can run continuously for 2-3 hours. This option is available as a factory upgrade under part number 2-700-013.



Sample Input

Sample output to CLPx

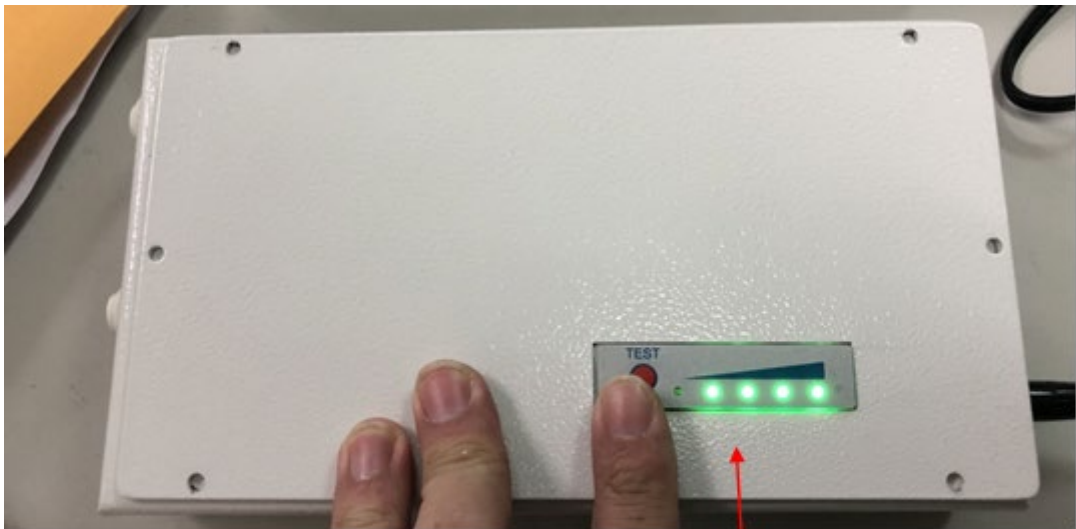


Pyrolyzer Fan

Heater Damage Indicator

Pyrolyzer Power Switch

Charging Indicator Light



Battery Level Indicator

CLPx Pyrolyzer Complete View



4b