DOD Technologies, Inc.
Innovative Life Safety Systems & Services

CL96 Gas Detection System

Technical Service Manual

Revision 16.11

DOD Technologies, INC • 675 Industrial Dr. Bldg. A • Cary, IL 60013 • Phone (815) 788-5200 • Fax (815) 788-5300

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Preventative Maintenance

Optics System:

DAC verification:

The optic system is self-adjusting and will calibrate itself during analysis. A clean optic channel will have a DAC value between 60 and 140. The DAC values for all points can be found by following these steps.

1. Enter Setup Menu
2. Enter Factory Menu
3. Enter password “1225”
4. Select the System tab
5. Press the DAC button for any active analyzer (see image below)

If there is a DAC value outside of the suggested range, verify the Chemlogic cassette is installed correctly and press calibrate. If the DAC is still outside the suggested range refer to the CL96 Optic Cleaning Procedure.

Background Verification:

The background value for each point can be found in the system screen by following the steps below. If any of the background values are not between 2600 and 3300 the optics should be calibrated by pressing the calibrate button.

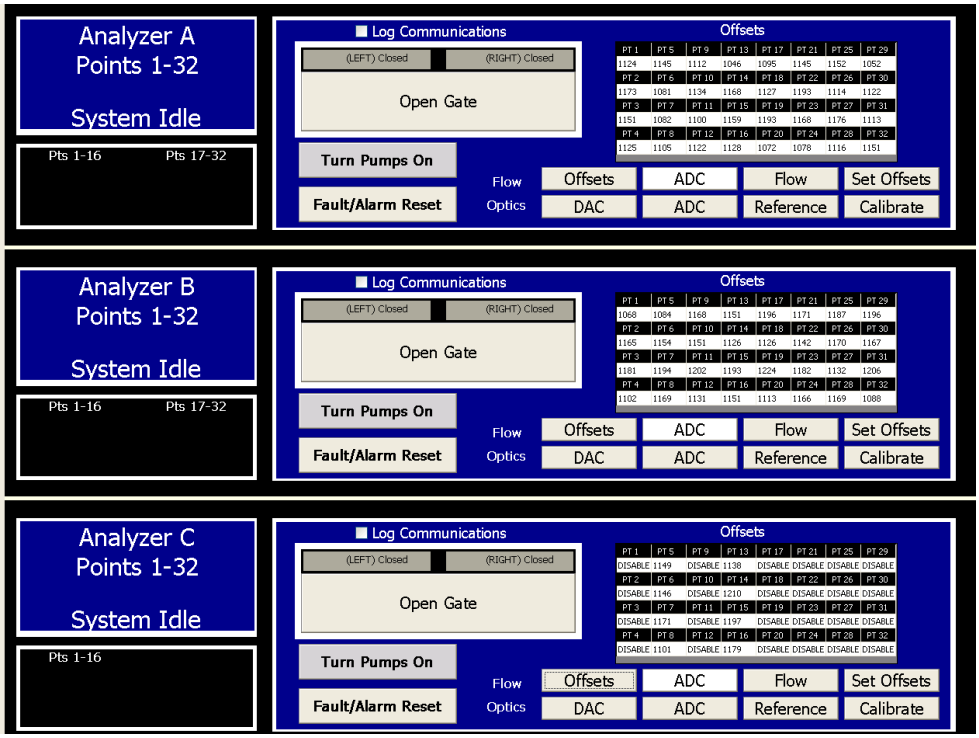
1. Enter Setup menu
2. Enter Factory menu
3. Enter password “1225”
4. Select the System tab
5. Press the ADC button for any active analyzer (see image below)

Flow System:

Pressure Sensor Calibration:

The flow system is monitored internally using one pressure sensor per point. Each pressure sensor has a voltage offset which represents atmospheric pressure when the pumps are turned off. The recommended range for the voltage offset per point is 1000-1400. The voltage offsets can be found by following these steps:

1. Enter Setup Menu
2. Enter Factory Menu
3. Enter password “1225”
4. Select the System tab
5. Press the Offsets button for any active analyzer (see image below)

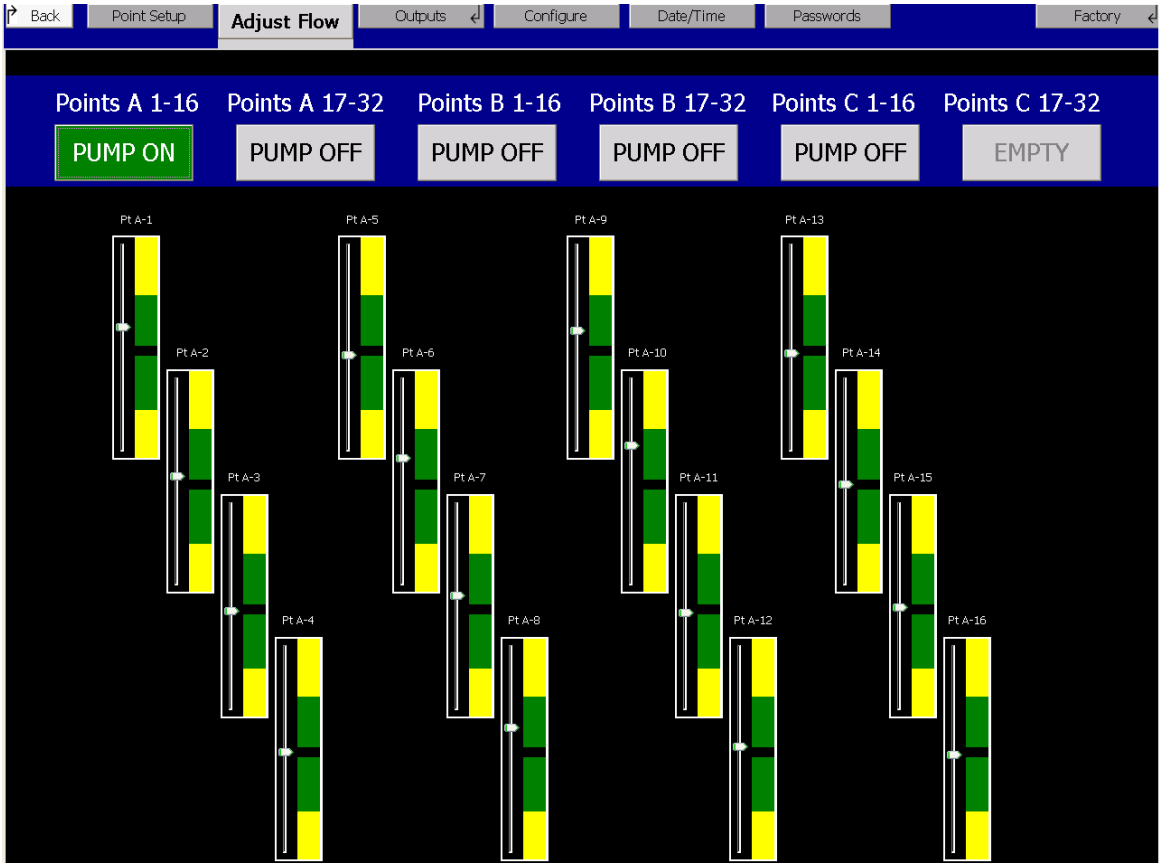


If there is an offset voltage outside of the suggested range remove the sample line and press Set Offsets. If the offset is still outside the suggested range refer to the CL96 Flow Troubleshooting Section.

System Flow Balance:

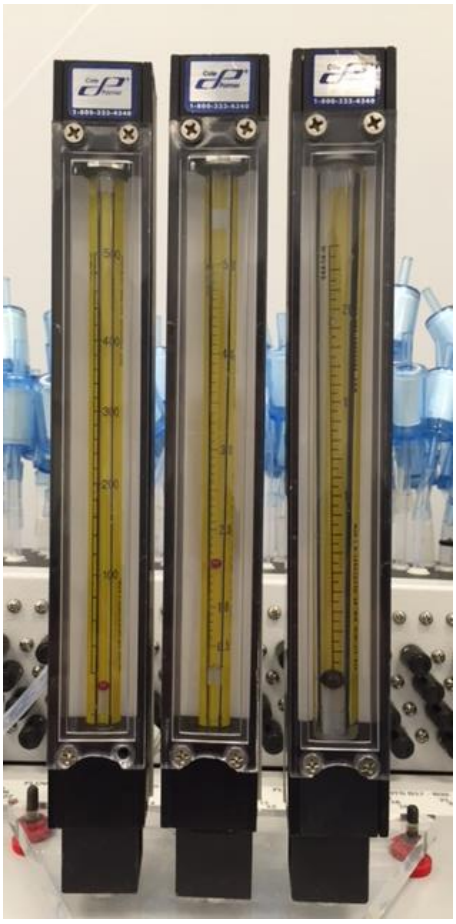
After all voltage offsets are verified to be within range, the entire system can now be flow balanced. To flow balance the system follow these steps:

1. Enter the Setup Menu
2. Select the Adjust Flow tab
3. Select the point grouping that needs to be balanced (see image below)
4. Any point that is not balanced to the black line in the green region should be adjusted.
5. Locate the Point Arrangement Label on the top of the Cl96 enclosure near the inlet manifold.
6. Use the black knobs to adjust and balance inlet flow on each point.



Point Flow Check with Flowmeter:

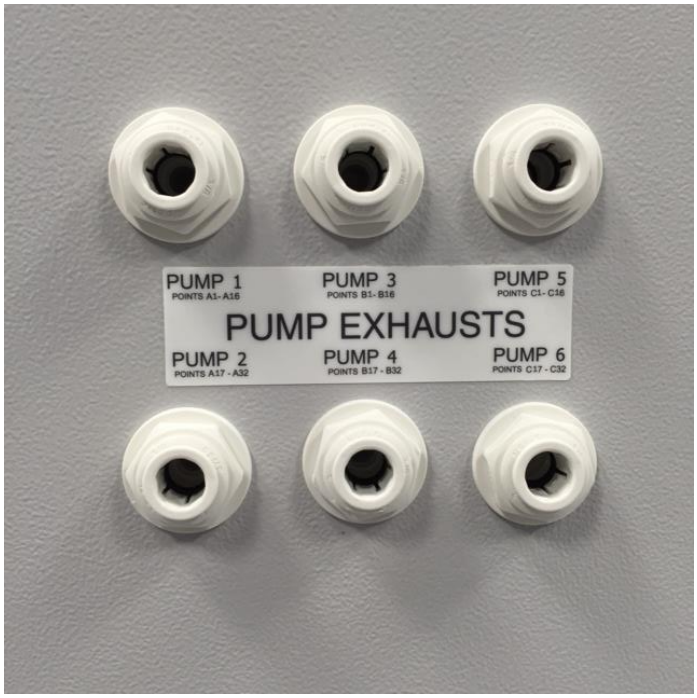
After the flow system is balanced an additional flow check can be done at the inlet of each point using a flowmeter. Each point should be sampling at a flow rate between 1.2 and 1.5 LPM (liters per minute) and this can be measured with a 0-5 LPM flowmeter as show in the center below.



Exhaust Integrity Check:

The exhaust line for each pump should be checked periodically to verify the unit is exhausting correctly. This check can be done by going to the Adjust Flow screen in the Setup Menu. In this screen each pump can be turned on individually by selecting the points that are related to that pump. (See chart below to determine which points are related to which points.) When the pump is turned on in this screen all related point should be balanced near the black line in the green region. Now locate the exhaust port for the related pump on the side of the CL96 (see image below) and plug it. When the exhaust port is plugged, all points should drop to the bottom of the scale in the yellow region. If the onscreen flowmeter does not drop to the bottom of the scale remove the CL96 rear panel and check for leaks between the exhaust port on the side of the cabinet and the exhaust port on the related pump.

Pump	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Related Points	A 1-16	A 17-32	B 1-16	B 17-32	C 1-16	C 17-32



Tape advance system:

Advance Distance Verification:

The distance of each tape advance should be greater than .4 in. and less than .5 in. This can be verified by following these steps:

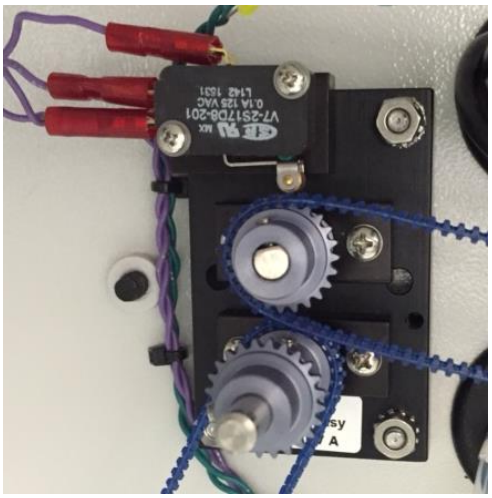
1. Go to the Main Menu
2. Press the Load Tape tab
3. Mark the tape after the optic blocks on the left hand side. (See picture below)
4. Advance the tape by pressing Open Gate then Close Gate

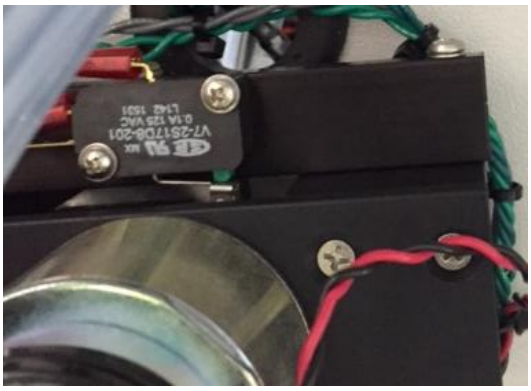
5. Measure the distance the tape advanced past the previous mark

If the tape advance distance is not within the suggested range refer to the Tape Advance Adjustment procedure.

Micro Switch Verification:

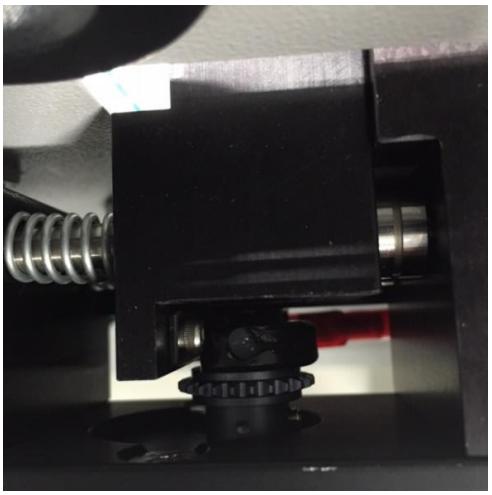
Each CL96 analyzer uses (2) micro switches (see images below) in order to identify the position of the gate during a tape advance. Each micro switch is held in place by (2) Philips head screws. If these screws become loose it could affect the analyzers ability to complete a successful tape advance. Verifying tightness of these screws can be done one time per year at the same time the gate assembly is lubricated.





Lubricating Gate Assembly:

Each analyzer has two gate assemblies located directly below an installed Chemlogic cassette. For the gate assembly to work efficiently, the cam (see image below) attached to the motor must be lubricated at least one time per year. This will allow the gate to open and close with as little resistance as necessary and extend the life on the motor. The cam can be lubricated with any synthetic grease. (See image below) Place some grease on the cam then open and close the gate several times to disperse.



Power verification:

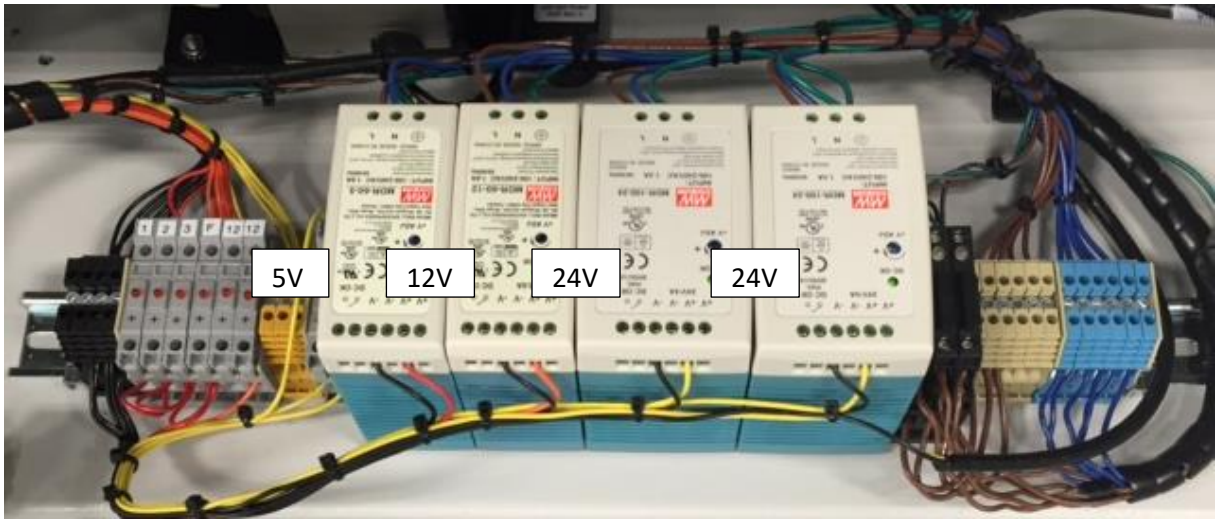
DC Voltage Verification Procedure:

The CL96 comes with two 24VDC power supplies, one 12VDC power supply and one 5VDC power supply. Use the chart and images below to verify the voltages are within factory specifications.

Location	DC Voltage
Both 24VDC supplies on pump panel	Greater than 24.6 – 24.8 VDC
12VDC supply on pump panel	Greater than 12.5VDC
5VDC supply on pump panel	6.1VDC (max)
24VDC in control box for PC	Greater than 24.3VDC
24VDC in control box for I/O	Greater than 24.3VDC
5VDC in control box for flow system	Greater than 5.3VDC
12VDC in Control box	Greater than 12.2VDC
5VDC supply for optic blocks	Greater than 5VDC

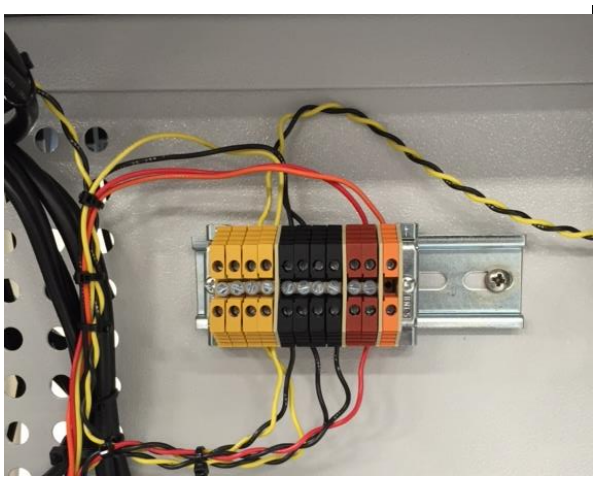
*All power supplies can be adjusted with potentiometer

All power supply voltages should be measured from the pump panel (image below) to begin the voltage verification test and voltages should be adjusted with the potentiometer if outside of the factory specification.



In the Control Box there is a row of terminal blocks mounted on the rear panel (see image below). The supply voltage for the PC and monitor can be measured at the yellow terminal block. The 12VDC supply can be measured at the orange terminal block and the 5VDC for the flow system can be measured at the red terminal block. The DC voltage verification should be done at the yellow terminal blocks mounted on

the bottom panel of the control box (see image below). This 24 V supply is used to power I/O modules located in the control box.



The supply voltage should also be checked at one optic block of each active analyzer. The voltage can can be measured at the green and blue wire of the optic block after the cover is removed (see image below). Because the pins are located next to each other this test should be done carfully to avoid a short and blowing a fuse

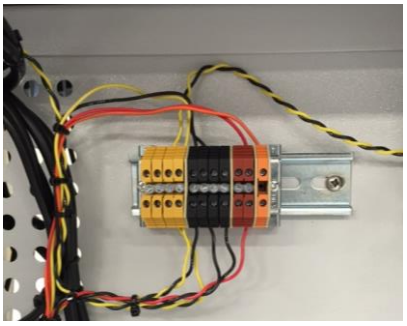
Vibration Damage and Wire Inspection:

Vibration Damage Inspection Procedure:

The pump panel wiring and tubing (see image below) should be checked periodically for damage caused by vibration from the pumps. The wiring harnesses and tubing are tied away from vibration before the CL96 leaves the factory but because the pump panel can be shifted forward the moving parts may not always lay in the intended position. All of the wiring and pump tubing should be carefully inspected for holes that could be cause by vibration.

Wire Inspection Procedure:

The wiring throughout the system should be visually inspected and all terminal block jumpers should be tightened to avoid any intermittent connections. The terminal block jumpers are located in the control box and on the pump panel on all of the terminal blocks.



Faults & Troubleshooting:

Event Code	Description	Possible Cause	Resolution
96112	Gas Alarm Level 1	Gas Release above Alarm Level 1.	Determine release point
96113	Gas alarm Level 2	Gas Release above Alarm Level 2.	Determine release point
96110	Analysis Mode	Analysis Mode	None needed
96111	TWA Cycle Complete	TWA Cycle Complete	None needed
96104	Cannot Get Background Values	Communication issue between optic block and PC.	1. Power cycle analyzer 2. Press verify optics 3. Verify background is within range in system screen 4. Refer to optic troubleshooting procedure
96105	High Background	Background value is out of range.	1. Power cycle analyzer 2. Press verify optics 3. Verify background is within range in system screen 4. Refer to optic troubleshooting procedure
96107	PLC Comm. Error	Communication issue between PC and PLC.	1. Power cycle the CL96 2. If issue reoccurs contact DOD Technologies, Inc.
96108	Optic Calibration Required	Optic system is unable to calibrate automatically	1. Refer to the optic cleaning procedure.
96109	Gas Configuration Error	System is unable to locate the files required to detect the gas family selected.	1. Remove the rear panel 2. Verify the USB thumb drive is connected properly 3. Power cycle the CL96

96116	Low Flow - Verify Tray Insertion	The flow is low for multiple points on an analyzer.	1. Verify analyzer is fully inserted. 2. Make sure all points are flow balanced. 3. Refer to Flow Path verification procedure
96117	Modbus Comm. Failure	Interruption during Modbus communication process.	1. Power cycle unit 2. Contact DOD Technologies, Inc.
96118	Optic Block Comm. Failure	Communication interruption between optic block and PC.	1. Refer to Optic Troubleshooting Procedure.
96119	Flow Block Comm. Failure	Communication interruption between Flow board and PC.	1. Refer to Flow Comm. Fault Procedure.
96121	Gate Open Fault	Micro switch failed to open during a tape advance.	1. Refer to Gate Fault Procedure.
96122	Gate Close Fault	Micro switch failed to close during a tape advance.	1. Refer to Gate Fault Procedure.
96123	Setting DAC to preset values	CL96 was unable to set DAC values back to previously retained values.	1. Power cycle analyzer
96130	System Fault	System hardware issue.	1. Contact DOD
96131	Block Below Minimum Voltage	Optic block voltage dropped below the required voltage of 5.1 V	1. Verify 5V supply is turned up to 6.1 VDC 2. Verify all optic blocks have at least 5.4 VDC 3. See Optic Troubleshooting Procedure
96133	Output Module Failure or Not Installed	Expected I/O module cannot be located by the PC.	1. Refer to I/O Verification Procedure.
96138	Retentive Memory Error, History and/or Tape counters may be corrupt.	Unable to load previous historical events after power cycle.	1.Power cycle CL96
96140	Idle Timeout (System)	CL96 was left out of analysis for a time frame that overlapped the time out setting.	1. Check to see if a fault caused the CL96 to leave analysis 2. If not put the CL96 back into analysis

96148	Output Module Communication Error	I/O module communication issue with the PC.	1. Refer to I/O Verification Procedure
96149	Timeout Advancing Parallel Analyzers	Tape advance issue in parallel analysis mode.	1. Reset fault and re-enter analysis 2. If fault reoccurs contact DOD Technologies, Inc.
Critical Fault	CL96 System Fan Failure	Fan on side panel has failed	1. Replace fan on CL96 side panel
Critical Fault	Pyrolyzer Control Module Fault	Communication issue between the PC and pyrolyzer control modules	1. Verify connection of communication modules. 2. Unplug and re-insert cables on communication module 3. power cycle CL96 4. Replace communication modules
96114	Low Flow	A point has a flow value below the required amount of flow	1. Refer to Flow Path Verification Procedure
96115	High Flow	A point has a flow value above the required amount of flow	1. Refer to Flow Path Verification Procedure
96120	Idle Timeout (Analyzer)	An analyzer was left out of analysis for a time frame that overlapped the time out setting	1. Check to see if a fault caused the CL96 to leave analysis 2. If not put the CL96 back into analysis
96124	ChemLogic tape low	The tape counter days remaining value is equal to the warning value setting	1. Replace the Chemlogic cassette 2. Reset counter
96125	Log write Error-Select Disk in Setup:	The system cannot locate the data logging thumb drive to write new data files	1. Go to History>>Storage and press Remove Disk. 2. Remove thumb drive and reinsert. 3. If fault returns contact DOD Technologies, Inc.
96144	Custom Output Module Failure	The PC cannot communicate with the I/O modules	1. Refer to the I/O Verification Procedure.

96146	Output Module Offline	The PC cannot communicate with the I/O modules	1. Refer to the I/O Verification Procedure
96147	Point Disabled Due to High Background	A point has been disabled due to a high background	1. Press Verify Optics button in the Load Tape screen
96153	Warning: PT Disabled, Check Optic Block(Ref)	A point was disabled due to reference fluctuations	1. Replace the optic block
96154	Pyrolyzer Failure - Point Disabled	A single Pyrolyzer element has failed	1. Replace element
96101	No event file found for selected date	The CL96 could not locate a log file for the selected day.	None needed
96102	Starting new log file	New log file started	None needed
96103	Power On	CL96 was powered on	None needed
96106	Faults & Alarms Reset	Faults and alarms were reset.	None needed
96126	Optic Calibrated	Optic calibration was manually performed.	None needed
96127	Flow Offsets Reset	Flow offset calibration was performed.	None needed
96128	Point configuration updated/saved	Point Configuration was changed and saved.	None needed
96129	Machine configuration updated/saved	System Configuration was changed and saved.	None needed
96132	Simulation Mode	Simulation Mode started.	None needed
96134	K Factor update	K Factor update	None needed
96135	Passwords updated	Passwords updated	None needed
96136	Multi-Point configuration change	Multi-Point configuration change.	None needed
96137	Previous machine settings restored.	Previous machine settings restored.	None needed
96139	ChemLogic tape days counter reset	ChemLogic tape days counter reset.	None needed
96141	PLC Connected	PLC Connected	None needed
96142	Optics Auto Adjusted	Optics Auto Adjusted	None needed
96143	Optic Point Needs Cleaning	Optic Point Needs Cleaning	1. Refer to the Optic Cleaning Procedure.
96145	Optic Adjustment Suggested	Optic Adjustment Suggested	1. Refer to the Optic Cleaning Procedure.
96150	Point Alarm Output Disable	Point Alarm Output Disable	None needed
96151	Point Output Disable Timer Reset	Point Output Disable Timer Reset	None needed
96152	Optic Validation(Ref)	A point has an unstable reference value.	Replace the optic block
96154	Established PLC Connection	Established PLC Connection	None needed
96155	Restarting PLC Connection	Restarting PLC Connection	None needed

96156	New Logging Span	New Logging Span	None needed
96157	Data Logging Cleanup	Data Logging Cleanup	None needed
96158	New Logging Disk Setup	New Logging Disk Setup	None needed
96159	Gate Open Verification	System had to retry gate open process.	Refer to the Gate Fault Procedure
96160	Gate Close Verification	System had to retry Gate close process.	Refer to the Gate Fault Procedure
96161	Factory Log->	Factory Log mode enabled	None needed
96162	PLC:	PLC: message	None needed
96162	Output testing	Output testing was done	None needed
96162	Temperature Validation	Temperature Validation	None needed

Optic Cleaning Procedure:

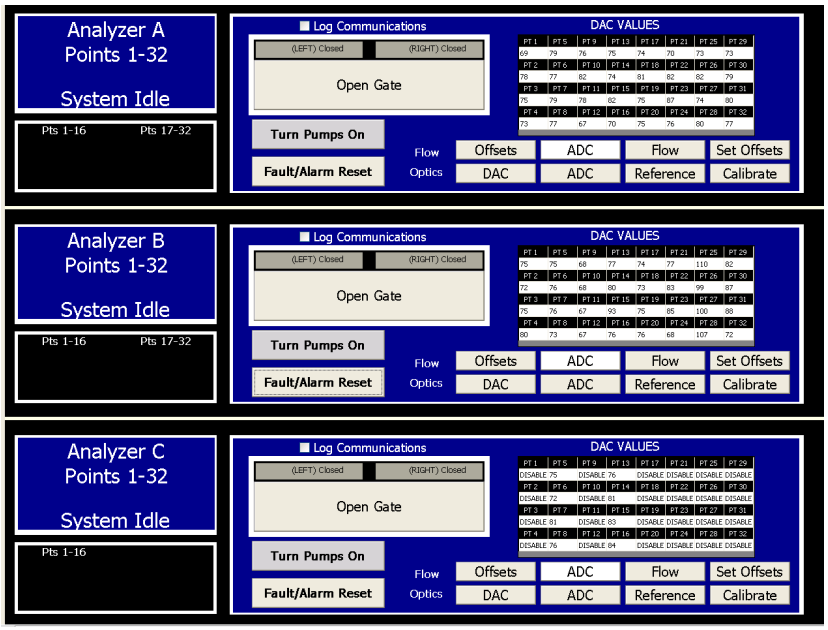
This procedure should be followed when any of the following messages appear in the CL96 event log:

1. Optic Calibration Required (service fault)
2. Optic point needs cleaning
3. Optic adjustment suggested

The events above may appear in the event log if there is an issue with the optic system. The optic system is self-adjusting and will make the required adjustments internally when one of the channels becomes dirty until further action is necessary. If the Optic Calibration Service Fault appears the system can no longer compensate for the dirty optic channels and the following procedure must be followed:

First enter the System screen by following the steps below:

1. Enter Setup Menu
2. Enter Factory Menu
3. Enter password “1225”
4. Select the System tab
5. Press the DAC button for any active analyzer (see image below)



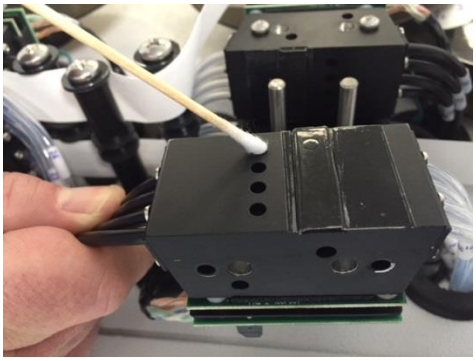
The screen above should be used to locate the point(s) that need to be cleaned. Press the Calibrate button to allow the optics to adjust. Locate any point that has a DAC value above 140. Once the points that need to be cleaned are located gather the following tools:

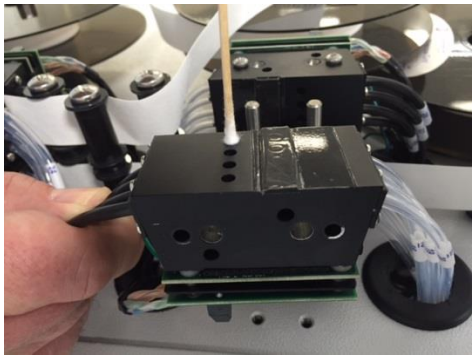
1. # 2 Phillips screw driver.
2. Cotton swabs
3. A form of Alcohol (methanol, ethanol)

The top of each analyzer will have a point map; use this map to locate the optic block that needs to be removed. Once the block is located open the related gate by pressing the open gate button and remove the ChemLogic cassette out of the way. Next, remove the optic block cover by unscrewing out the two phillips screws (see image below).

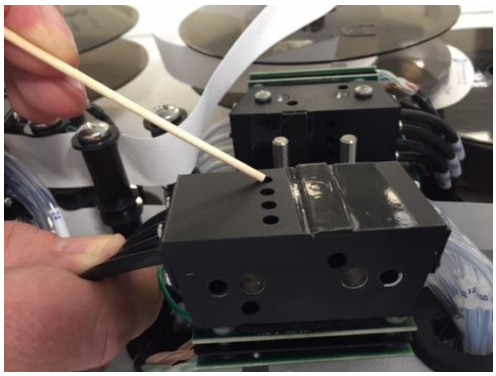
After the cover is removed, unscrew the two phillips screws holding the optic block down and pull the block over the optic alignment pins (see image below note; the pictures are showing a 16 point analyzer not a 32 point analyzer. In the case of a 32 point analyzer there will also be a black plate that lies between the lower 16 points and upper 16 points, the alignment pins and hold down screws will be longer.

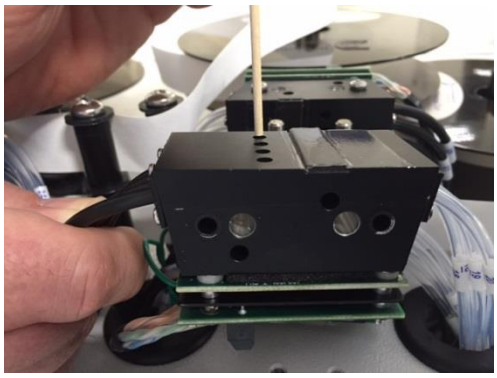
At this point the face of the block will be exposed and all the optic channels will be accessible. Using the alcohol and cotton swabs clean both of the fiber optic channels within the point that has reported a DAC value over 140. Notice there are two fiber optic lenses per point. Both must be cleaned for the best possible results (see images below).





If the cotton end of the swab does not work the flat wooden end can also be used (see images below). Do not use anything metal or sharp to as this may damage or scratch the fiber or optic lens.





After the cleaning is complete re-install the optic block, Chemlogic cassette, and close the gate. Power cycle the analyzer by carefully disconnecting the green power connector on the back of the analyzer and re-connecting (see image below).

After the analyzer is power cycled, press the Calibrate button for the related analyzer. Next, look at the DAC values for the channels that were cleaned. The DAC values should now be within the factory specification of 60-120. If the DAC is not within this range, the cleaning procedure must be repeated.

Optic System Troubleshooting Procedure:

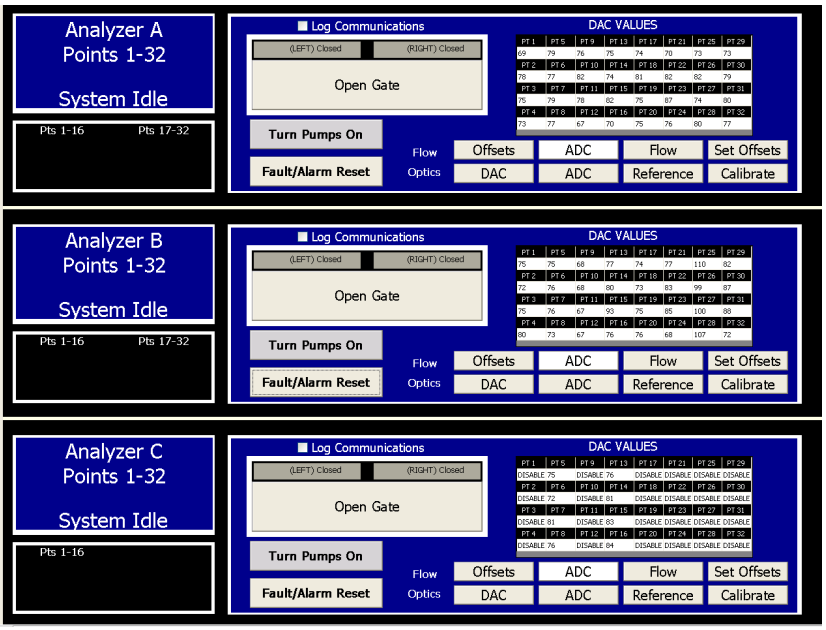
This procedure should be followed when any of the following messages appear in the CL96 event log:

1. Cannot Get Background Values (Service Fault)
2. Optic Block Comm. Failure. (Service Fault)
3. Setting Block to Preset Values (Service Fault)
4. Block Below Minimum Voltage (Service Fault)

There are two things that can cause the faults listed above: 1. A problem with communication or 2. A problem with power. The following steps will cover the verification of proper communication and power.

First enter the System screen by following the steps below:

1. Enter Setup Menu
2. Enter Factory Menu
3. Enter password “1225”
4. Select the System tab
5. Press the DAC button for any active analyzer (see image below)



Select the DAC button for each analyzer and look for any “0” values or “255” values. Also, press the ADC button for each analyzer and look for any “0” values or “4095” values. If any point has these DAC or ADC values follow these steps first.

1. Power Cycle the Analyzer
2. Open the Gate
3. Rotate the Chemlogic Cassette so there is a fresh tape surface between the gate
4. Close the Gate
5. Press Calibrate

If the results persist move on to the power and communication verification steps.

Power Verification Procedure:

The following tools will be needed to perform the Optic System Power Verification.

1. Digital Multi-meter
2. #2 phillips screwdriver
3. #1 standard screwdriver

First, remove the cover for the optic block that is not working properly (see image below). When the cover is removed the power wires will be accessible. Using the DMM, measure the DC voltage between

the green wire (+) and the blue wire (-). Do this carefully to avoid a short between the DMM probes and a blown fuse. The voltage at each block should be greater than 5.3 VDC.

If the voltage is below 5.3VDC measure between the red (+) and the black (-) located on the green connector at the back of the analyzer (see image below). The voltage here should also be greater than 5.3 VDC.

If the voltage at the green connector is below the required voltage, continue down to the pump panel and measure the voltage at the related analyzers fuse holder, red wire (+) and black terminal block (-)(see image below). Also verify none of the red lights are on, if one is on, this indicates a blown fuse and it must be replaced.

If the voltage here is also below the required 5.3 VDC measure the voltage at the 5V supply located on the left (see image below). The output voltage on the supply must be at its max which is 6.18VDC. If the voltage is below this, use the potentiometer to turn it all the way up. If the supply cannot be turn up to 6.1VDC it must be replaced.

If the power system is operating correctly but the fault returns, follow the Communication Verification Procedure.

Communication Verification:

Verify that the orange and brown wires are tight and fully inserted into the optic block (see image below).

For the optic system to communicate properly the addresses on each block must be set correctly. A 32 point analyzer should be addressed 1 through 8 and a 16 point analyzer should be addressed 1 through 4. Using the optic block map on each analyzer and the chart below, with the optic covers removed, confirm the addresses are correct.

Points	Binary Address
1 through 4	1
5 through 8	2
9 through 12	3
13 through 16	4
17 through 20	5
21 through 24	6
25 through 28	7
29 through 32	8

After the addresses are verified check to confirm the analyzer communication cable is connected properly at the PC (see image below). Then confirm all optic block communication cables are securely connected to the interconnect board below the analyzer (see image below).

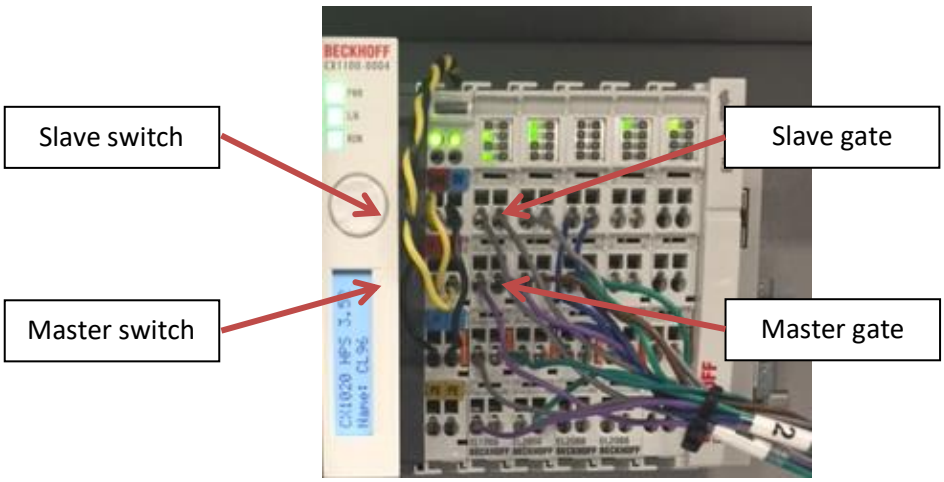
If all power and communication verification are good and the Service Faults continue please contact DOD Technologies for more technical support.

Gate Fault Procedure:

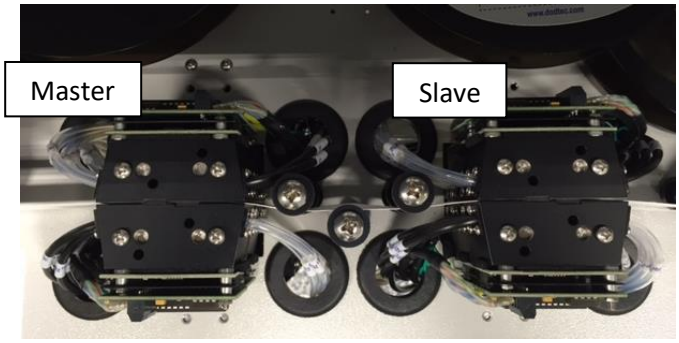
This procedure should be followed when any of the following messages appear in the CL96 event log:

1. Gate Open Fault (Service Fault)
2. Gate Close Fault (Service Fault)

Each analyzer has (2) micro switches and (2) gate assemblies that are wired into modules inside the control box. The master micro switch is the purple wire at the input module and the slave micro switch is the grey wire at the input module (see image below). The master gate is a green wire at the output module and the slave gate is a blue wire at the output module. A control box wiring diagram can be found in appendix section of the manual.



When standing in front of the analyzer the slave gate and micro switch are on the right and the master gate and micro switch are on the left (see image below).



A normal tape advance will follow these steps:

1. Slave gate opens (output light on)
2. Slave micro switch closes (input light on)
3. Master gate opens (output light on)
4. Master micro switch opens (input light off)
5. Slave gate closes (output light on)
6. Slave micro switch opens (input light off)
7. Master gate closes (output light on)
8. Master micro switch closes (input light on)

A gate open fault indicates the gate did not open correctly and a gate close fault indicates that the gate did not close correctly. To verify the gate and micro switch system is working corectly each step of the tape advance process must be verified. This can be done by opening and closing the gate from the load tape screen while verifying the corresponding lights are turning on and off in the correct sequence (listed above).

If a micro switch light is not turning on or off verify all wiring at the input module in the control box and at the micro switche connectors. The Micro switches can also be opened and closed manually while checking the status of the lights to verfy the micro switches are working correctly. If a gate is not opening or closing as it should verify the wiring between the motor and the output module in the control box.

If the issue cannot be found or resolve using this method please contact DOD Technologies Inc. technical additional support.

Flow Check Procedure:

This procedure should be followed when any of the following messages appear in the CL96 event log:

1. Flow Block Comm. Failure (Service Fault)
2. Low Flow - Verify Tray Insertion (Service Fault)
3. High Flow (Informational)
4. Low Flow (Informational)

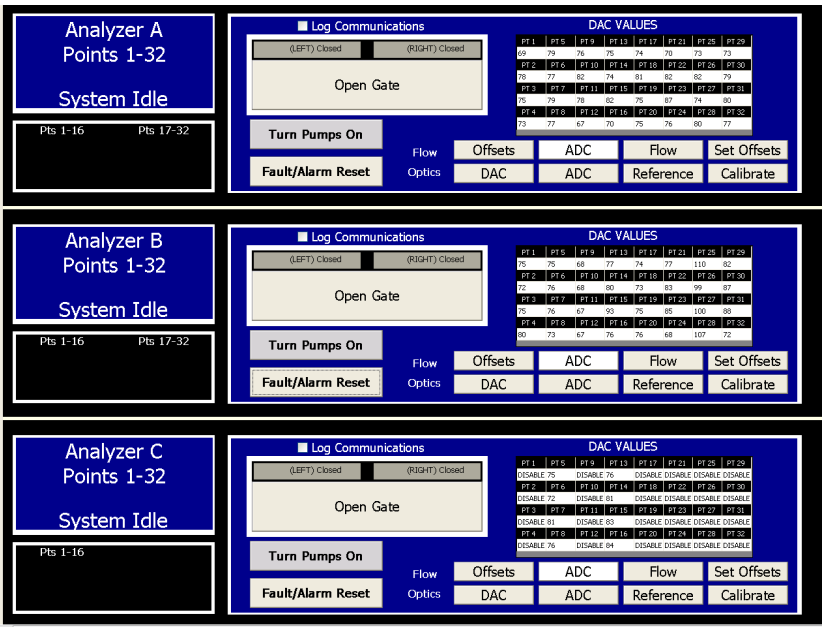
A flow fault can occur when there is an issue with the flow path or communication between the PC and the flow system transducers. For a Flow Block Comm. failure follow the Flow Communication Verification process and for a Low Flow, High Flow, and Low Flow - Verify Tray Insertion Fault continue to the Flow Path Verification Process.

Flow Communication Verification Procedure:

First enter the System screen by following the steps below:

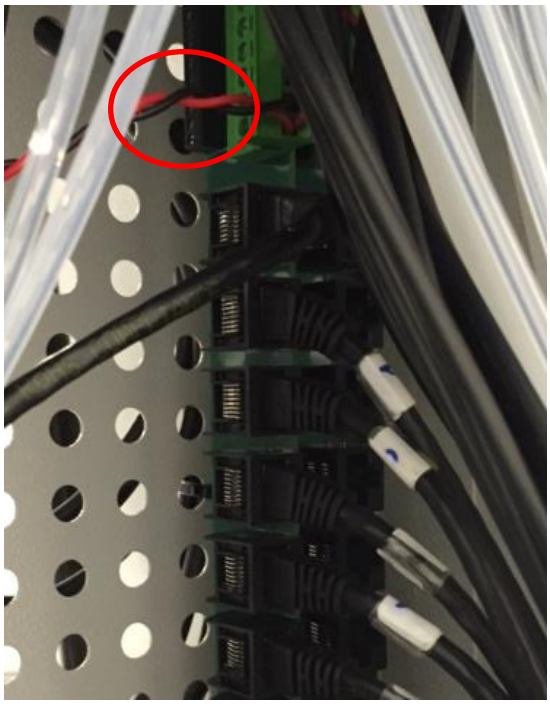
1. Enter Setup Menu
2. Enter Factory Menu
3. Enter password “1225”
4. Select the System tab
5. Press the Offsets button for any active analyzer (see image below)

Check for any 0 values. This would indicate a communication issue between the flow system boards and the PC.

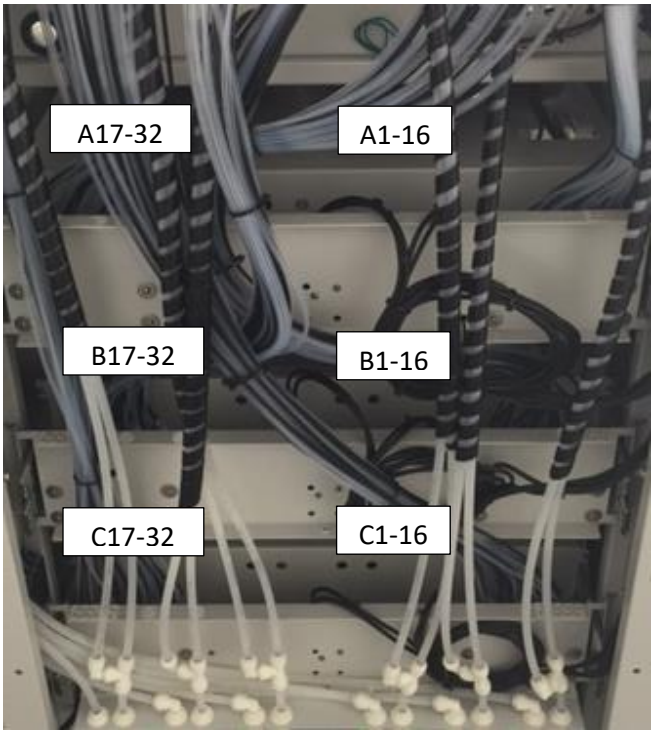


If a 0 value is found press the Set Offsets button for the related analyzer. If this does not resolve the issue check the flow system fuse light (See image below). If the red light is on, the fuse is blown and must be replaced.

Next remove the rear panel and locate the flow system interconnect board (see image below). Verify that there is greater than 5.3V at the red (+) and black (-) wires. Also, verify that all interconnect board connections are secured.



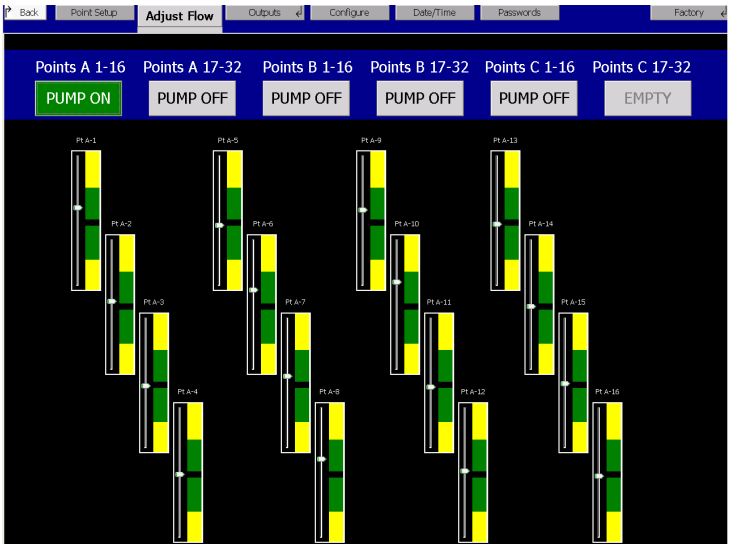
If all previous steps do not help locate a problem power cycle the transducer board that is producing 0 values by unplugging it and plugging it back in. Use the image below to locate the correct board. After the transducer board is plugged back in return to the system screen and press Set Offsets. If this does not eliminate 0 values please contact DOD Technologies technical support.



Flow Path Verification Procedure:

For a Low Flow, High Flow and Verify Tray Insertion Fault follow these steps:

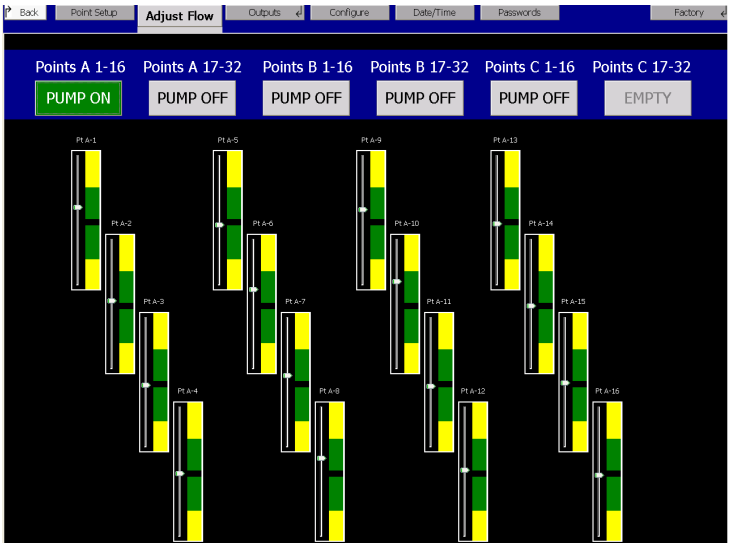
1. Enter the Setup Menu
2. Select the Adjust Flow tab
3. Select the related points that indicate a flow issue. (see image below)
4. Locate points that are outside of the target range (green).



If the system is warning low flow on all points verify that the pump is on. This can be done by feeing the top of the pump to check if it is vibrating.

If the pump is running verify that the related analyzer is fully inserted. The best way to do this is to slowly push the analyzer in until it stops then push with both hands to insert the fittings into the manifold located behind the analyzer.

If flow is still low, locate the filter at the end of each sample line and verify that it's not clogged.



Next, verify that the flow system offsets are between 1000 and 1400 in the System screen and try to balance the flow again.

If none of these checks helps resolve the Low Flow Faults contact DOD Technologies Inc. technical support.

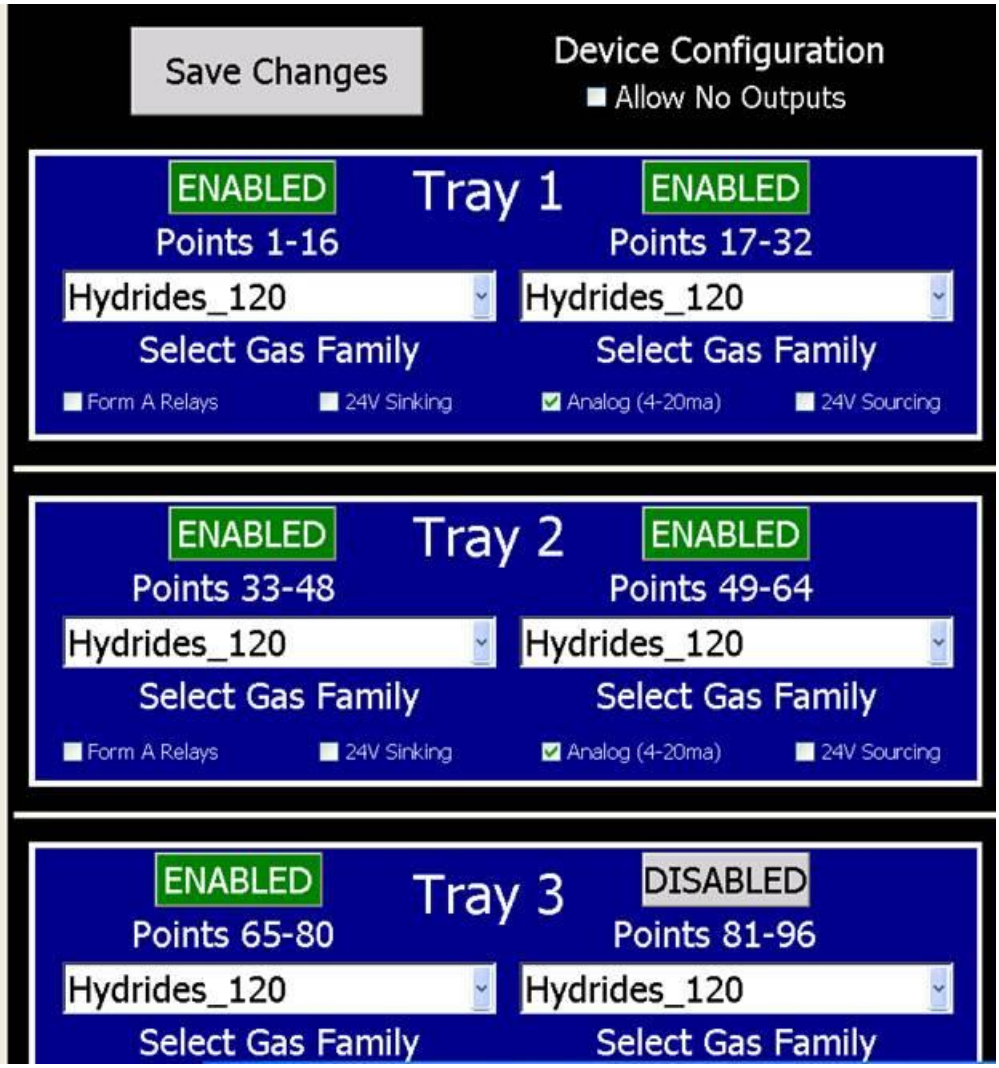
I/O Verification Procedure:

This procedure should be followed when any of the following messages appear in the CL96 Event Log:

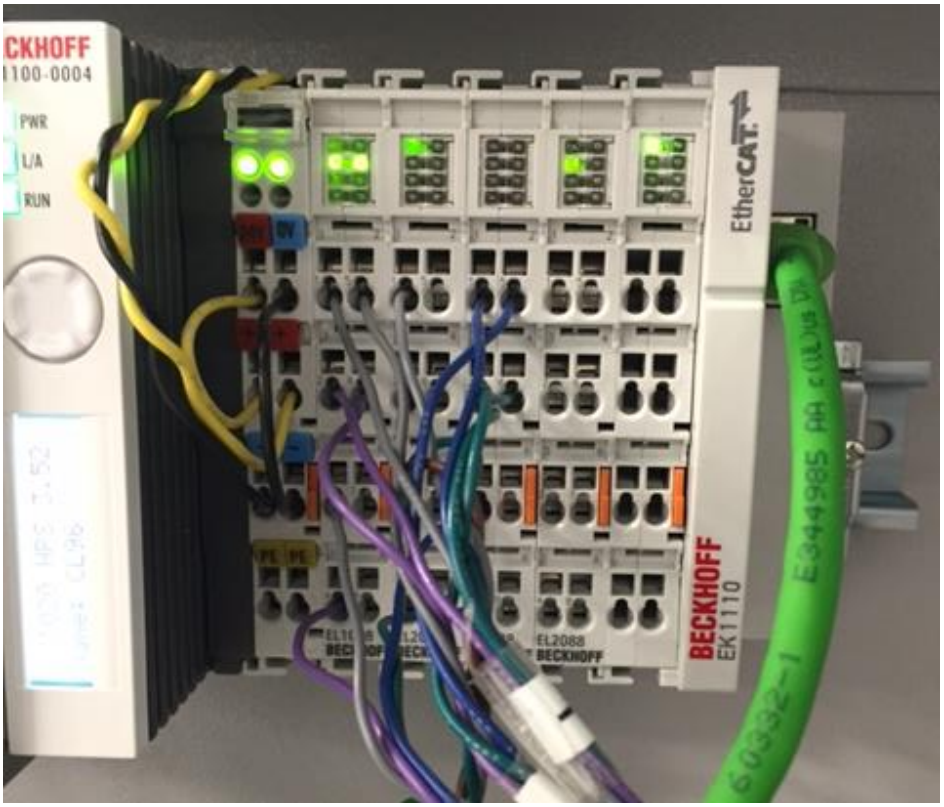
1. Output Module Communication Error (Service Fault)
2. Output module failure or not installed (Service Fault)

First enter the configuration screen by following these steps:

1. Enter the Setup Menu
2. Enter the Factory Menu
3. Select the Configuration Tab (see image below)



Verify that the correct boxes are checked for each active installed analyzer and check the allow no outputs box in the unit does not have any output modules. After any changes are made in this screen the unit should be power cycled. If this does not resolve the fault reset the communication between the PC and modules by unplugging the green cable in the control box (see image below) and plugging it back in.



If this does not resolve the fault confirm the address settings on each bank of I/O modules using the address charts below. Each bank of modules will have (1) EK1101 module at the beginning with (3) address dials (see image below).

	Switch x256	Switch x16
	Position and # of points	Always 1
A 16 points	1	1
A 32 points	2	1
B 16 points	3	1
B 32 points	4	1
C 16 points	5	1
C 32 points	6	1

	Switch x1
	Module type
Form C relays	1
24 V sinking	2
4-20 mA	3
24 V sourcing	4

If none of these steps help resolve the fault please contact DOD Technologies Inc. technical support for further assistance.

Hardware Replacement:

Optic Block Replacement:

To replace a CL96 optic block the following tools will be needed:

1. #1 Phillips screwdriver
2. #2 Phillips screwdriver
3. #1 standard screwdriver

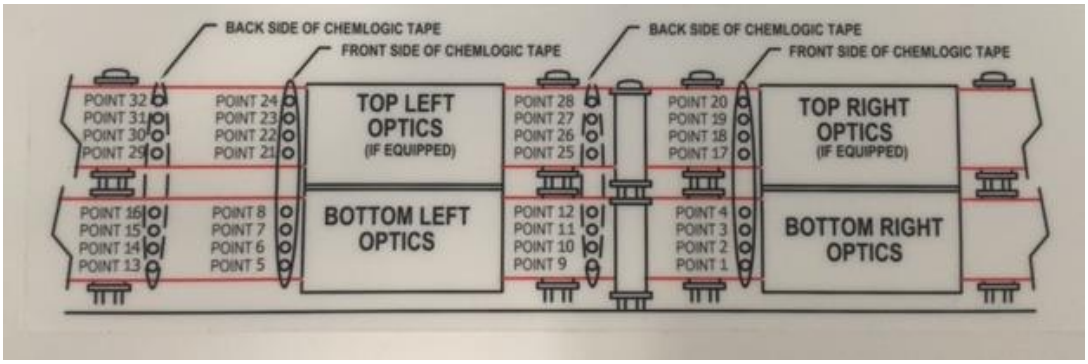
To replace a CL96 optic block, follow these steps:

1. Open the gate
2. Remove power from the analyzer by unplugging the green connector.

3. Remove the (2) screws holding the optic block cover down.

4. Remove the (2) screws holding down the optic block.

5. Remove all (8) tubes and pay attention to the orientation for reinsertion. (See image below)

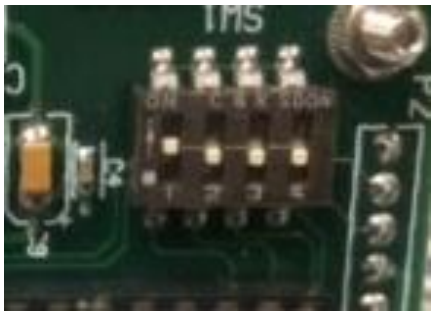


6. Unscrew (4) wires and pay attention to orientation for reinsertion. (See image below)

7. Lift block over pins and then remove the pins.

8. Install the new block by following the steps in reverse order

9. Confirm the address on the new block matches the address on the old block.



10. Reinstall the Chemlogic Cassette and close the gate.
11. Press the verify optics button on the load tape screen.

Pump Replacement:

To replace a CL96 pump the following tools will be needed:

1. # 10 nut driver

To replace a CL96 Pump, follow these steps and use the image below for assistance:

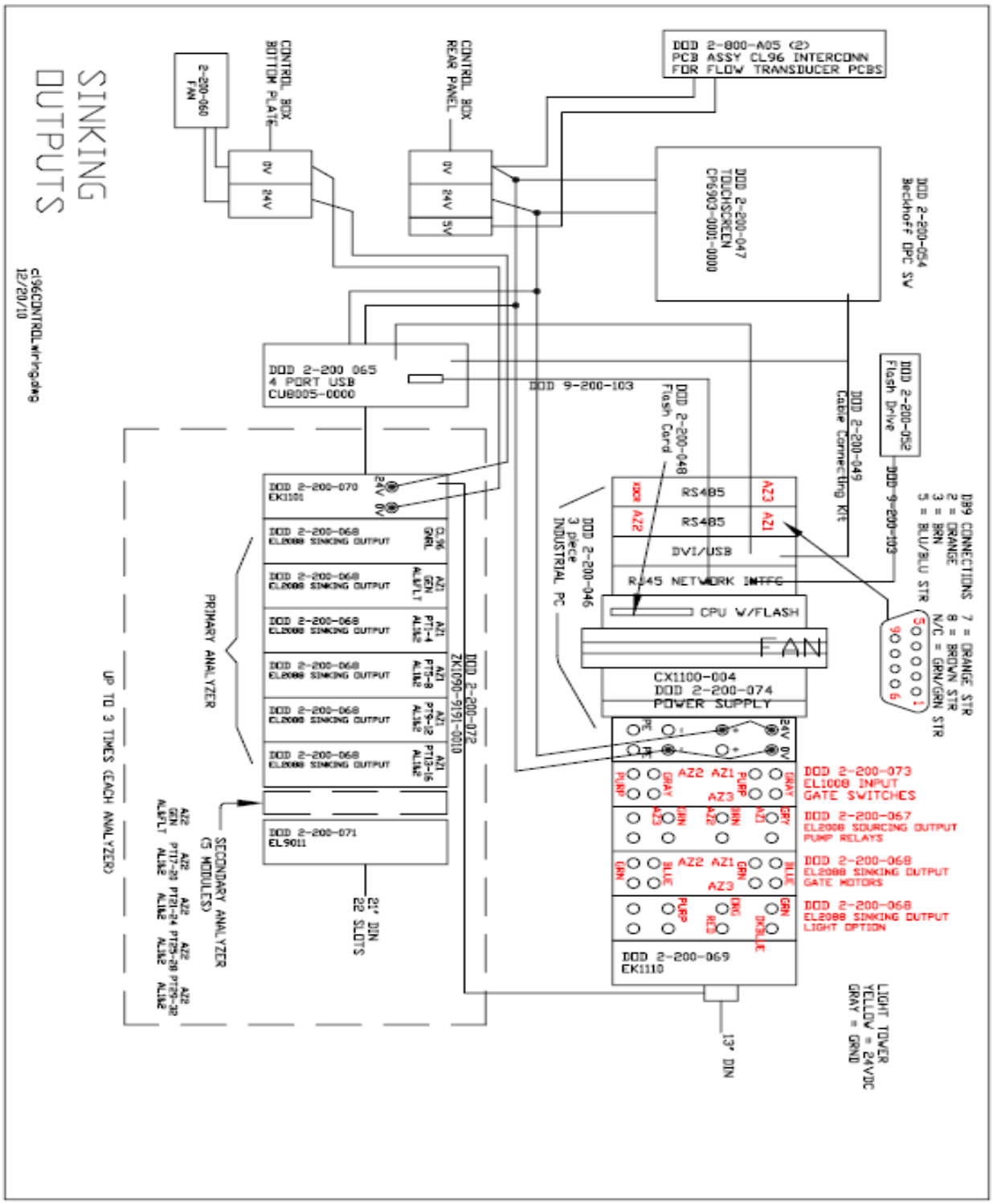
1. Slide the pump plate out
2. Carefully Disconnect the (2) pin power connector
3. Remove the pump inlet and exhaust tubing.
4. Remove the (4) nuts holding the pump plate down.
5. Lift the pump out of the CL96
6. Put the new pump in place of the old pump
7. Install the (4) # 10 nuts and tighten
8. Fully insert the inlet and exhaust tubing
9. Reconnect the (2) pin power connector.

Inlet and exhaust tubing

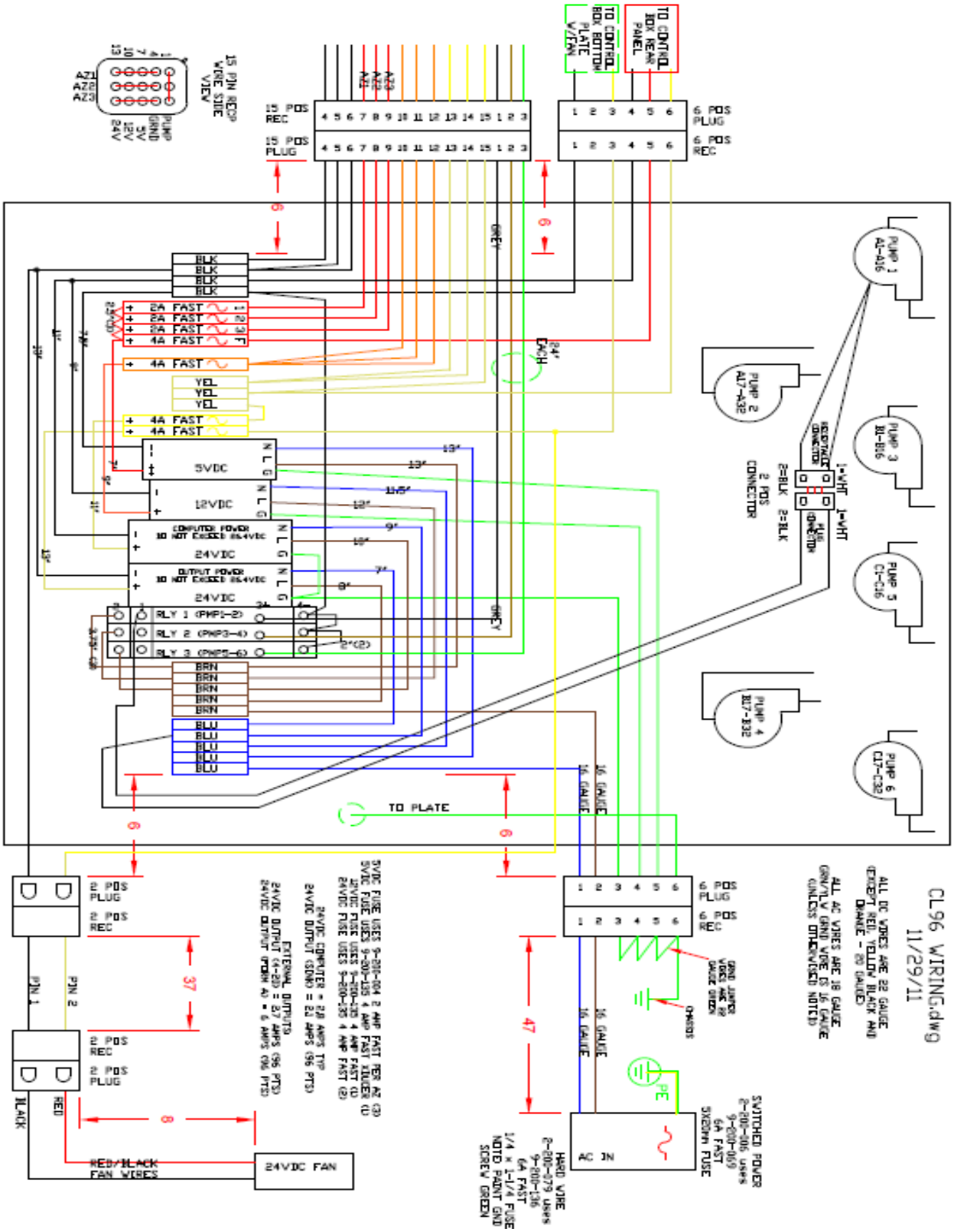

10 Nuts
Power Connector
PUMP 1
PUMP 3
PUMP 2
230 VAC

Appendices

Appendix A: Control Wiring



Appendix B: Pump Panel Wiring



Appendix C: Analyzer Wiring