



EXPERTS IN WATER CHEMISTRY SINCE 1903



9010 Sequencer User Manual

101-060-B.1



WALTRON CUSTOMER COMMITMENT

This instruction manual is a technical guide to aid the customer in the set-up, operation, and maintenance of their new Waltron sequencing system. Waltron provides continuous product improvement and reserves the right to make any modifications to the information contained herein without notice.

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Technical questions concerning this product should be addressed to:

Waltron Technical Service Department
Flemington, New Jersey
Phone: (908)-534-5100
Fax: (908)-534-5546
www.waltron.net

Please be ready to provide the following information:

- Date sequencer was purchased
- Sequencer serial number
- Recent maintenance history

Waltron's technical expertise and extensive experience provides personalized solutions to the water quality industry. It is Waltron's commitment to provide the customer with timely and accurate technical service and support.

Waltron fully expects the customer to be satisfied with the quality and performance of this product.

If there are any questions or concerns regarding this product, please feel free to contact Waltron at (908)-534-5100.

Thank you for choosing Waltron!

Please note the Waltron mailing and shipping address:

Waltron Bull & Roberts, LLC
25 Minneakoning Road, Suite 101
Flemington, NJ 08822



SAFETY

Please observe proper safety and handling precautions when installing, operating, maintaining, and servicing this product. The following should be noted and adhered to:

- Read and understand manual before working with the sequencer.
- Pay special attention to warning labels on enclosures, containers, packages and chemicals.
- Only qualified personnel should be involved in the installation, operation, and servicing of the sequencer.
- Follow safety precautions when operating sequencer in conditions of high pressure and/or temperature.

To obtain analyzer safety information or Safety Data Sheets (SDS), please contact Waltron or visit the website at www.waltron.net .



WARRANTY AGREEMENT

If, within one year from the date of shipment, the customer experiences any equipment defects or is not satisfied with the sequencer manufacturing, Waltron will repair, or at its option, replace any defective part(s) free of charge. This warranty requires that the defective part(s) be returned to Waltron with shipping charges prepaid.

At Waltron discretion, a Technical Service Specialist may be sent out to repair or replace the defective part(s) on location. Traveling time and expenses of the Technical Service Specialist is at the customer's expense.

Equipment sent to Waltron must be appropriately packaged and the following information must be provided prior to returning to Waltron:

- The Return Authorization (RA) number assigned to the customer by the Waltron Technical Service Department
- Customer name, address and department
- Name and telephone number of the individual responsible for returning items for repair
- Brief problem description

Ship to Waltron service center:

Waltron Bull & Roberts, LLC
25 Minneakoning Road, Suite 101
Flemington, NJ 08822

The Waltron Warranty Agreement:

- Covers expendable sensors for one month after shipment and reusable electrodes for six months after shipment.
- Does not apply to damages occurred during shipping.
- Warranty will be nullified if goods have been used for purposes other than those for which they are intended or if any seal has been removed, broken or tampered with or if the Waltron trademark or serial number has been removed, defaced, or altered.
- Does not cover expendable supply items such as reagents, tubing and electrolytes.
- Does not cover misuse or mistreatment by the user.
- Does not cover previous repair or alteration by unauthorized individuals.

Waltron does not assume responsibility for contingent liability through alleged failure or failures of products or product accessories.



CHECKLIST OF MATERIALS

In order to ensure customer satisfaction, Waltron does its best to provide adequate and timely packaging and shipping services. Please perform the following after receiving a shipment:

- Inspect all shipping containers upon receipt and record any visible damage. If there are any outward signs of damage, please retain all containers and packages for inspection by carrier. Please retain all packing material so that it can be used for future moving and shipping needs.
- Check all items received against those on the packing list. Chemicals are usually shipped in a separate package and will be itemized accordingly.
- Verify that the number of packages received agrees with the packing list and shipping papers.
- Notify both Waltron and the carrier if any problems occur.

Important Notice:

- All analyzers and sequencers are inspected and tested prior to shipment.
- In normal use, the unit should require only minor maintenance and should operate correctly and without fault over a long period of time.
- Please note that if electronic components need to be replaced, it may be necessary to adjust and/or calibrate the analyzer.



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1 OVERVIEW

1.1 SPECIFICATIONS

1.1.1 PERFORMANCE

Instrument Classification:	Sample sequencer with analog outputs
Application:	Controls multiple sample streams to single analyzer with multiple Analog output signals
Power Supply:	110-220Vac, 50-60 Hz 80 VA
Humidity:	Up to 90% not condensable
Ambient Temperature Range:	10-45° C Sequencer (50-113° F)
Range:	Analyzer dependent
Accuracy:	+/- 0.1 mA In / Out
Unit Dimensions (back plate mounted):	Height=33.5"(90.9 cm), Width=12"(30.5 cm), Depth=7"(17.8 cm)
Positioning and Installation Details:	Wall mounting or panel mount (optional)
Response Time (approx.):	Analysis method dependent
Alarms:	None
Degree of Protection:	IP55 (NEMA 4): Wet section/valves, IP65 (NEMA 4x): Electronics
Required Maintenance:	None
Materials in Contact with Sample:	Silicone, Plastic, Stainless Steel AISI 316
CE Certification (on request):	Meets low voltage and low electromagnetic compatibility directives
Sample Conditioning Requirements:	Filtering between 10 and 60 micron, depending on the matrix, needed only to avoid clogging
Weight:	5 kg

1.1.2 SAMPLE OPERATING CONDITIONS

Temperature Range:	5-55° C (41-131° F)
Inlet Sample:	100–500 ml/min, 0-5 bar, tubing O.D. 1/4" (Swagelok)
Outlet Sample:	Atmospheric, waste tubing I.D. 1/4" (6 mm)
PH:	3-12

1.1.3 SIGNAL OUTPUTS

Analog Outputs:	4x 4-20mA
Serial I/O for Signals:	None

1.2 SAFETY PRECAUTIONS, INSTRUCTIONS, AND HAZARDS

1.2.1 GENERAL INFORMATION

This manual contains important information which is required for installation, start up and operation of the Waltron 9010 Sequencer. Please read this manual carefully before installing and placing the sequencer into service!


Pay attention to all caution and danger labels present on the sequencer and all caution and danger statements written on this manual.


- The user has the responsibility to read and understand the information contained in this manual, and to abide by all applicable employee health and safety regulations.
- Use, maintenance, and service of this sequencer is allowed only by qualified personnel who are fully trained on the sequencer’s operations. These personnel are required to be physically and mentally fit and not under the influence of alcohol or/and drugs.
- When the sequencer is not being used it should be protected by an appropriate circuit breaker. Failure to do so and non-observance of hazards or dangers warnings could result in death or serious injury to the operators or damage to the sequencer.
- Before using the sequencer, it is necessary to visually check for damage to safety devices and report issues to the appropriate responsible person, even if the sequencer continues to operate.
- The sequencer’s components are installed inside a metallic enclosure with a door closed with screws. Only properly trained and authorized personnel should open the enclosure.

1.2.2 LIST OF WARNINGS AND POTENTIAL DANGERS

The table below is a list of hazard and danger warning labels that may be found on the sequencer, analyzer, and/or in this manual.

Table 1.1: List of hazards and dangers.

	<p>Hazard of electrical shock</p> <p>This symbol is used to present a hazard of severe electric shock or electrocution. All controls and maintenance on electrical devices labeled with this symbol should be made by qualified personnel in accordance with national or local regulations. Qualified Personnel means personnel who have been fully trained and have professional experience in avoiding electrical hazards and dangers. To avoid potentially fatal electric shock and/or analyzer damage always disconnect power to the analyzer before servicing.</p>	<p>Components:</p> <ul style="list-style-type: none"> · main power supply · input terminal · valve connections
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	<p>Warning of general hazard</p> <p>Indication of general hazards or warnings to follow during installation, operation, or maintenance.</p>	
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1.2.3 SAMPLE

Take the proper precautions to avoid direct contact with the sample stream(s). It is the responsibility of the user to take all necessary precautions regarding physical, chemical, radiation and/or biological hazards from sample stream and/or sample vapors. It is also the responsibility of the user to ensure the sample stream is compatible with the materials of construction listed below.

Table 1.2: List of materials used in Waltron 9010 Sequencer.

Fittings	PP, Stainless Steel
Connection tubing	Norpren / Stainless

1.2.4 WASTE DISPOSAL

The liquid waste from the sequencer runoff should be disposed properly according to the sample stream contents. Dispose of the waste in accordance with the appropriate regulations.

1.2.5 SEQUENCER GENERAL HAZARDS

1.2.5.1 Electrical Hazards and Precautions

General information:

- In all electrical devices that are 110-220 Vac powered, there is a hazard of electrical shock or electrocution.
- Before servicing the sequencer parts that are electrically powered, turn off/disconnect power to the analyzer to avoid risk of electrocution.
- To turn off power from an electrical device, it is necessary to interrupt the power line using a circuit breaker or an isolating switch to be sure that there is no power in the area to be serviced.

1.2.5.2 Operating Hazards and Precautions

HAZARD Mechanical hazards caused by moving parts/ high pressure

Preventive Actions:

The sequencer's only moving parts are the valves that are enclosed in the valve body. Other kinetic hazards include discharge of high pressure. This can be avoided by checking for leaks prior to operation and stopping and/or reducing flow during maintenance.

HAZARD Hazard of electric shock and/or electrocution in the electrical enclosure.

Preventive Actions:

To avoid risks, the analyzer's components that can cause electric shock and/or electrocution have been designed, built and located in an enclosure. To avoid injury, only open the enclosure with the device powered down.

NOTE: Electrical equipment with input power and grounding must comply with national and/or local regulations and laws.

Preventive Actions:

- Check that the source voltage to be used corresponds with that requested by the sequencer.
- Periodically check the power cord grounding in addition to the sequencer grounding.

2 INTRODUCTION

2.1 SEQUENCER DESCRIPTION

The Waltron 9010 is an in-line sequencer for continuous and batch analysis (sampling, analysis and result processing) sample and results sequencing. The Sequencer is comprised of an electrical section (transmitter) and “wet” section (valve bank).



Figure 2.1: Waltron 9010 Sequencer front view.

2.2 APPLICATIONS

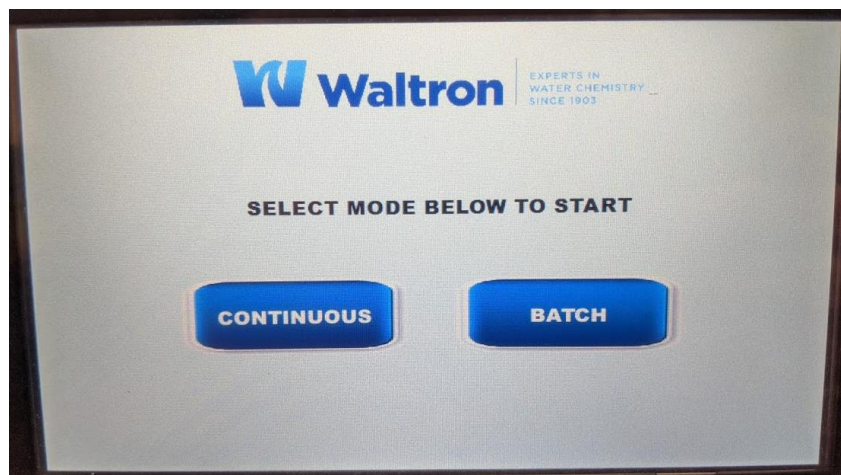
The Waltron 9010 Sequencer is designed to control: the sample provided to, and the results provided from, a variety of Waltron, and other, analyzers.

2.3 GENERAL DESCRIPTION

Water flows from two to four channels or sample points into the sequencer valves 1 - 4, respectively. The transmitter, when operating on a specific sample cycle, will activate the appropriate valve, sending a water sample from the required sample inlet to an analyzer. The remaining samples, while not in cycle, will be flushed to waste. During the sample cycle the sequencer transmitter will also receive an analog signal from the analyzer in the form of 4-20 mA current. This signal will be associated with the respective sample and display, based on a configured range, next to the sample on the Human Machine Interface (HMI).

Readings of other samples, while not in cycle, will be held at the previous reading until then next reading from that sample. Readings will be logged internally at the end of the sample interval.

2.4 SEQUENCING CYCLES



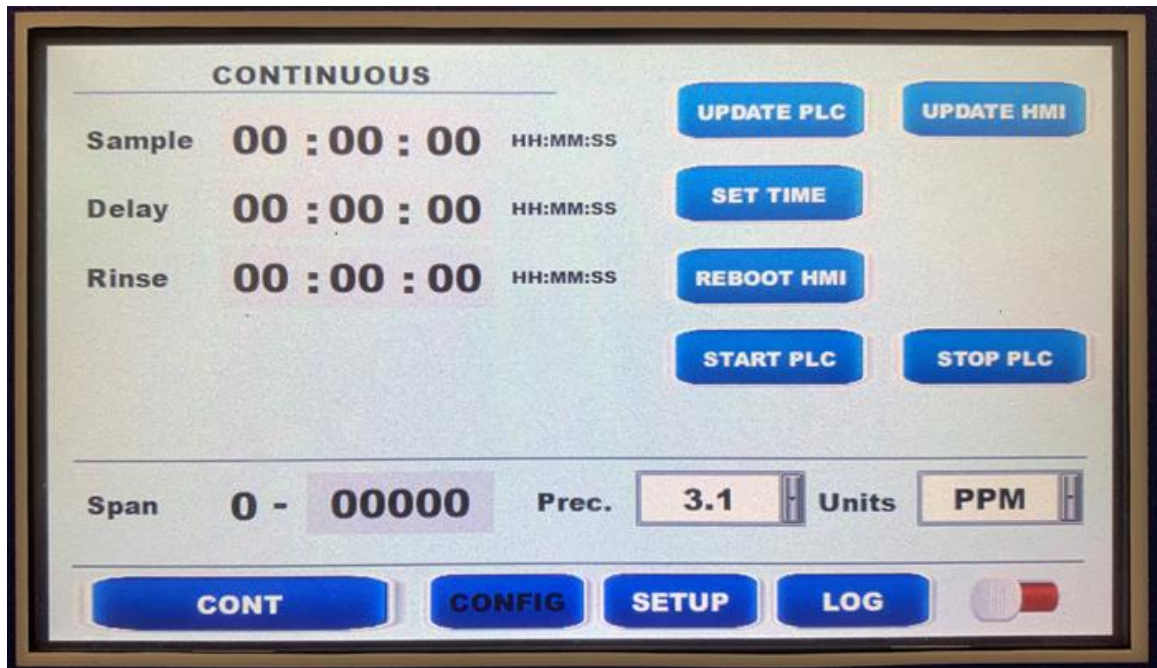
The “Reboot HMI” found in the Configuration Screen can be used to switch between the above modes.

2.4.1 CONTINUOUS ANALYSIS

Continuous analysis mode is used when the analyzer connected to the sequencer uses a process that streams results in real, or near-real, time. This is commonly used with luminescent, Ion selective, potentiostatic, and conductivity measurement.

In this mode, sequencing is completely time based and does not rely on outside signals to cycle to the next sample stream.

Once the user presses the “Continuous” button, they will be taken to the configuration (Config) screen.



On this screen the sequencer timing, return analog signal range, decimal point selection, and units can be set. Also available is the ability to adjust the date and time, “Set Time” button.

- **Sample** - This time sets the duration that the sample passes to the analyzer. This includes the amount of time included in the “Delay” value.
- **Delay** - This is the time in which the sample will run to the analyzer but the value returned from the analyzer will not be updated or recorded. This is the built in universal rinse down period.

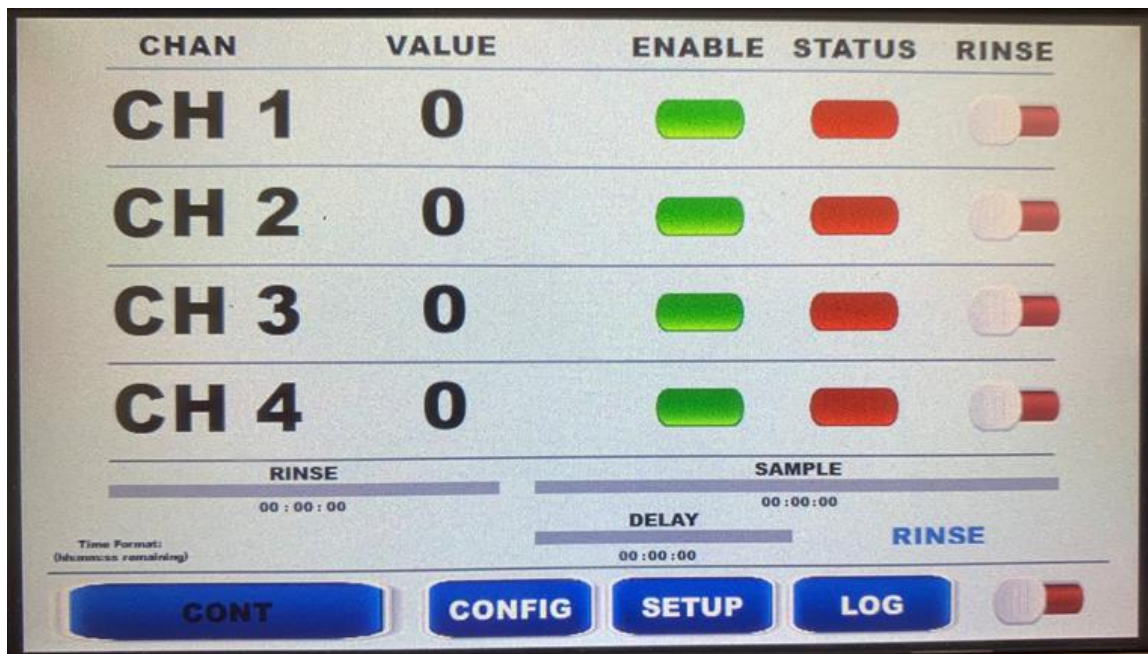
NOTE: If the “Delay” time is equal to or greater than the “Sample” Time the sequencer will move to the following samples without having recorded results from the analyzer.

- **Rinse** - This time sets a period of additional rinse down or delay that is specific to a sample stream or channel. This time starts after the valves have changed over and ends before the sample timer begins. This is recommended for samples that have analyzed values significantly different than those proceeding or following.

WARNING Setting the sample time to ZERO or close to zero can result to rapid cycling of the valve relays and damage to the electronics. This damage is not covered by WARRANTY.

Additional buttons are present for programming updates and force starting/stopping the PLC (These buttons are not commonly used).

NOTE: “Update PLC”, “Update HMI”, “Start PLC”, and “Stop PLC” are buttons used by Waltron Technicians for programming. If accidentally pressed, please cancel out, or start PLC.



The Run screen is accessed by the large button on the lower left. “Cont” for Continuous analysis, or “Batch” for Batch analysis. The column headers are as follow:

- CHAN - Indicates the channel or sample row
- VALUE - Displays the last value of the reading from the analyzer, scaled and formatted to specifications in CONFIG
- ENABLE - Indicates if the channel is turned on or off in the sequence cycle. Green is on, red is off.
- STATUS - Indicates if that channel is currently active in the sequence. Green is active, red is inactive.
- RINSE - These switches toggle and indicate if additional rinse time is selected for there respective channels. Right/Green is selected, Left/Red is not selected. When selected the time entered into the Rinse feild in the CONFIG screen will be added to the cycle.

The values for the three timers can be seen at the bottom of the screen. These are displayed as both count down timers and progress bars.

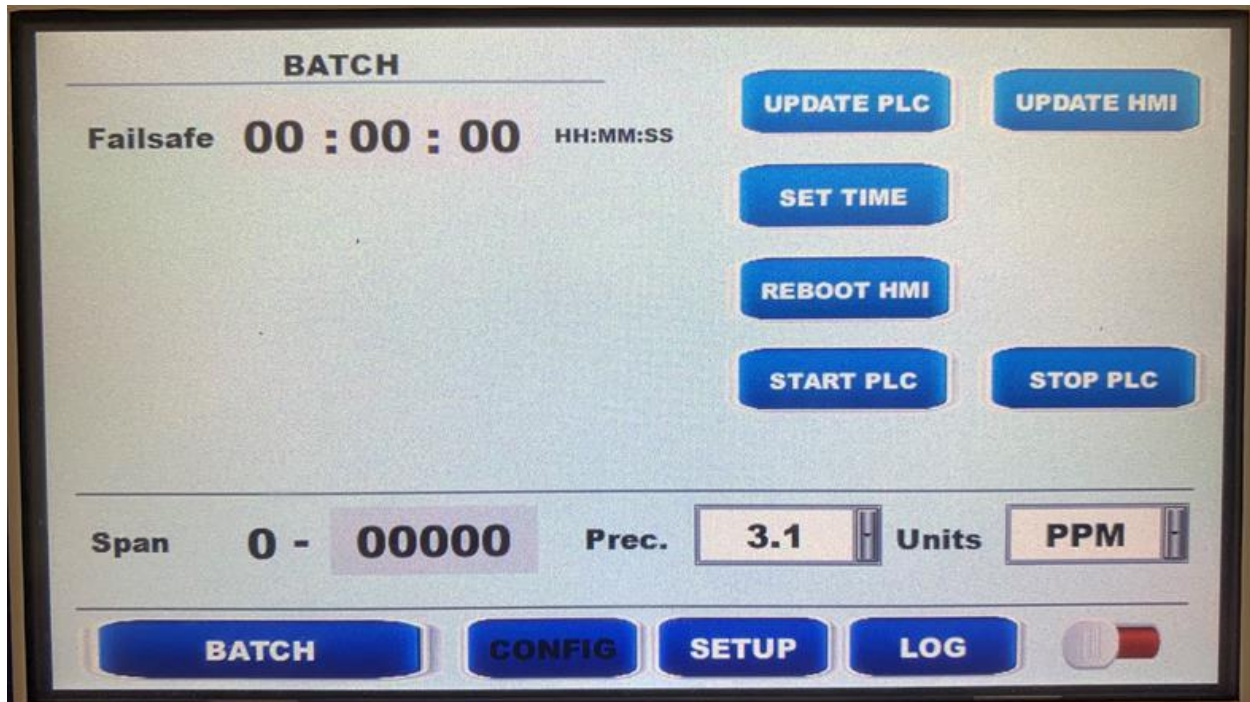
The status indicator at the bottom right indicates if the the sequencer considers the signal to be in “Rinse” and therefore not recieving a value, or “Live” and therefore receiving and displaying the value.

2.4.2 BATCH ANALYSIS

Batch analysis mode is used when the analyzer connected to the sequencer uses a process that analyzes the sample stream one small batch at a time, sometimes with wait periods between analysis cycles. This is commonly used with colorimetric and titrimetric measurement.

In this mode, sequencing is based on a signal from the analyzer to the sequencer. This lets the sequencer know when to switch channels and accept a result value for that channel.

Once the user presses the “Batch” button on the startup screen, they will be taken to the configuration (CONFIG) screen.



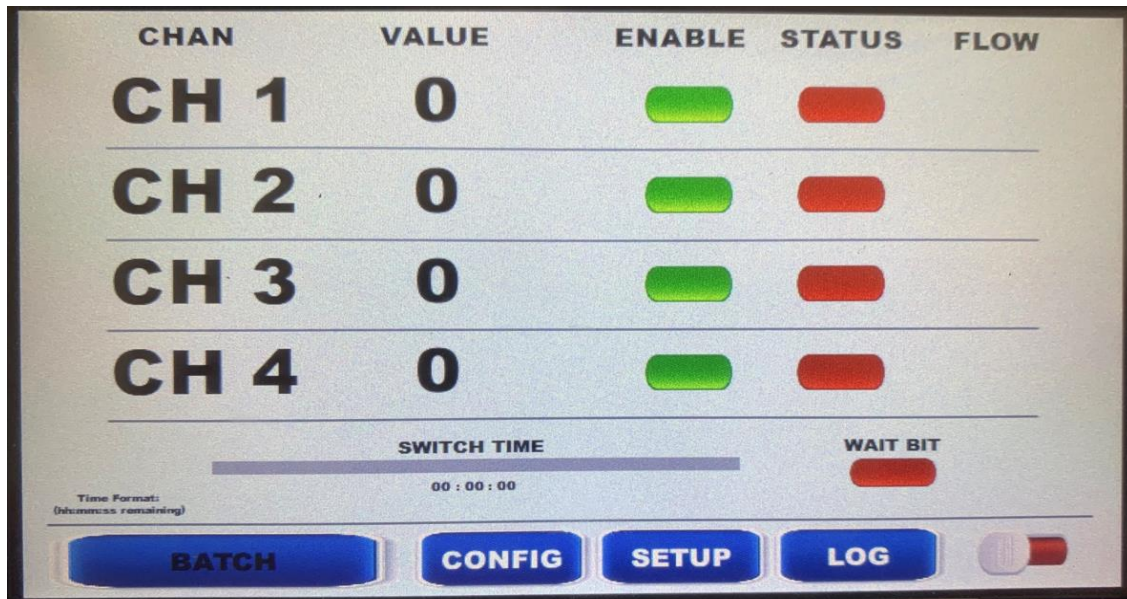
In Batch analysis, the failsafe timer, return analog signal range, decimal point selection, and units can be set from the CONFIG screen. Also available is the ability to adjust the date and time, “Set Time” button. This screen should not be accessed while the analyzer is in run mode.

- **Failsafe** - In batch analysis the analyzer indicates that the sequencer that the analysis cycle has completed and it can display the value and move on to the next sample. The failsafe timer should be set to a time that exceeds the combined wait time between batches and maximum analysis time.
 - Should the analyzer fail to signal or otherwise be offline, the sequencer will continue to provide alternative samples and wait for a signal relay from the analyzer.

WARNING Setting the failsafe time to ZERO or close to zero can result to rapid cycling of the valve relays and damage to the electronics. This damage is not covered by WARRANTY.

Additional buttons are present for programming updates and force starting/stopping the PLC (These buttons are not commonly used).

NOTE: “Update PLC”, “Update HMI”, “Start PLC”, and “Stop PLC” are buttons used by Waltron Technicians for programming. If accidentally pressed, please cancel out, or start PLC.



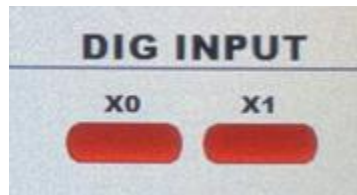
The Run screen is accessed by the large button on the lower left. “BATCH” for Batch analysis. The column headers are as follow:

- CHAN - Indicates the channel or sample row
- VALUE - Displays the last value of the reading from the analyzer, scaled and formatted to specifications in CONFIG
- ENABLE - Indicates if the channel is turned on or off in the sequence cycle. Green is on, red is off.
- STATUS - Indicates if that channel is currently active in the sequence. Green is active, red is inactive.
- FLOW - The batch process cycles following a combination of Relays. Relay 1 indicates that the analyzer has signaled proper flow to allow for accurate measurement of the sample stream. Relay 2 indicates from the analyzer that the analysis process has ended.
 - If the sequencer receives Relay 1 followed by Relay 2, the result is recorded and the sequencer cycles. If the sequencer receives Relay 2 without Relay 1, the previous measurement is held and the channel is flagged for low flow in the log until the next “good” reading.

	Relay 1	Relay 2	Flow Warning
Scenario 1	YES	YES	NO
Scenario 2	NO	YES	YES

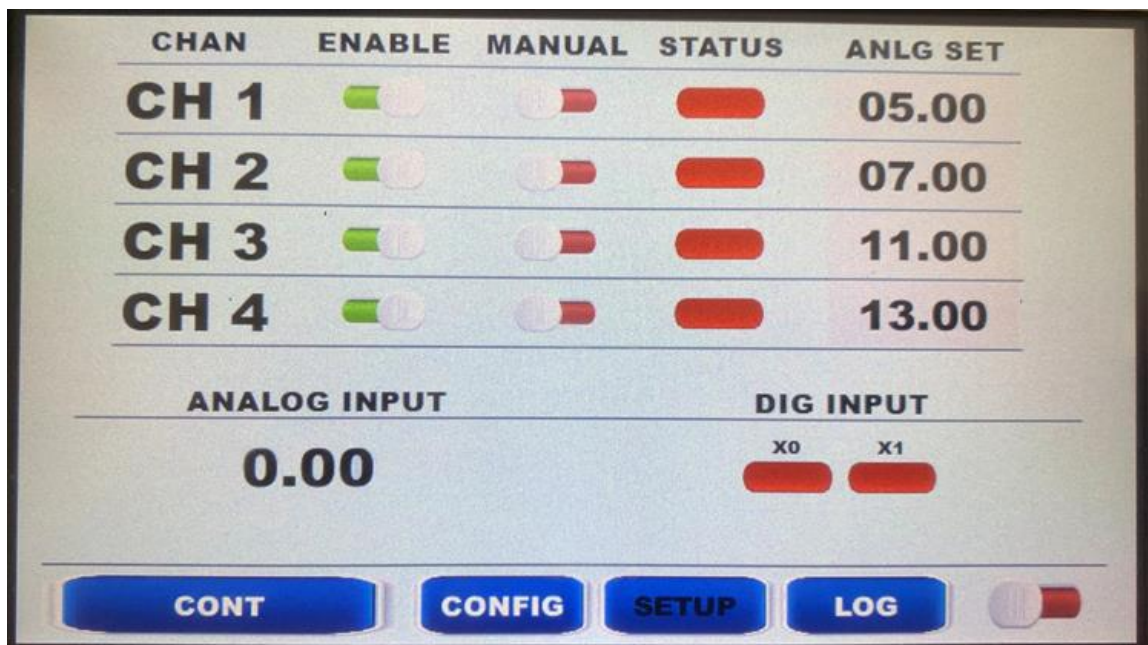
The values for the failsafe timer can be seen at the bottom of the screen. This is displayed as both count down timer and progress bar. “WAIT BIT” indicates if the sequencer has received Relay 1.

NOTE: Batch analyzers with one relay, no flow switch, or inability to indicate “good” or “bad” analysis cycles, may require that Relay one be shorted inside the sequencer electronics.



The status of both of these relays is indicated on the bottom of the SETUP Screen. Green indicates that the relay is active (closed), Red indicates that the relay is inactive (open). Please note that these are non-latching relays, but during a sequence cycle, the “Wait Bit” (X0) will stay green.

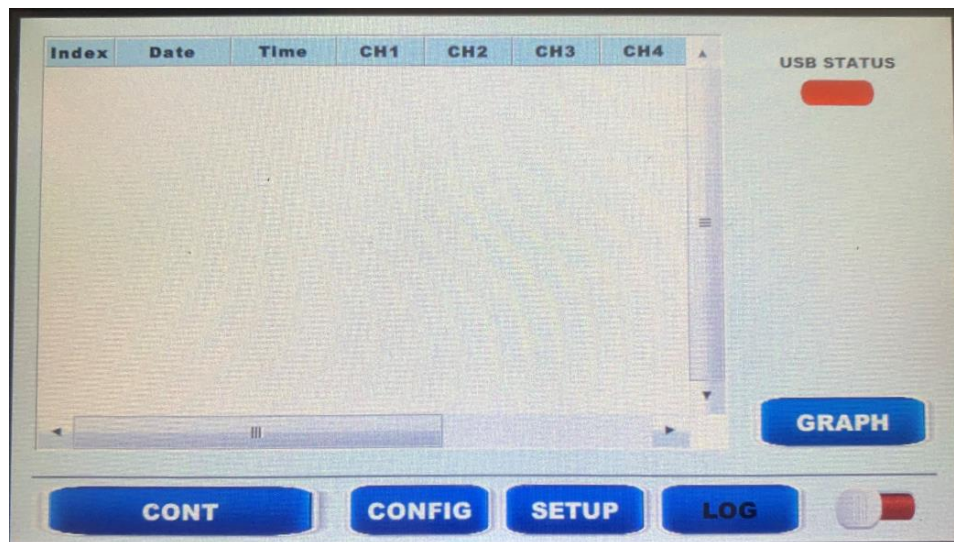
2.4.3 ADDITIONAL SCREENS



Additionally, the SETUP Screen is used to enable or disable a sample stream, manually control a valve, and to check the analog input and outputs. This screen should not be accessed while the sequencer is in run mode.

The column headers are as follow:

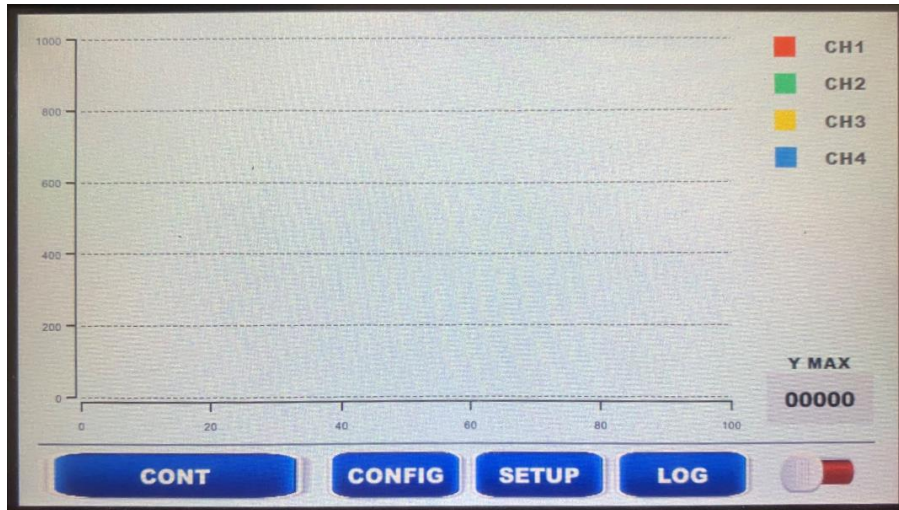
- CHAN - Indicates the channel or sample row
- ENABLE - Toggles the channel/stream on the sequencer. Right/Green is enabled, Left/Red is disabled.
- MANUAL - Toggles open a specific channel to send to the analyzer. Results during manual sampling are not automatically logged.
- STATUS - Indicates if that channel is currently active in the sequence. Green is active, red is inactive. Only one channel can be active at a time.
- ANLG SET - This field is present only when a channel is enabled. Entering a value in this field between 0 - 20.00 will cause the sequencer to output that current on that channel. This can be used to calibrate on the analog receiving device connected to the sequencer.
- ANALOG INPUT - This provides an indication of the signal being received by the sequencer.



Pressing the LOG button at the bottom of the screen will bring up the results log table. This table is updated every time this sequencer changes channel / samples.

Internally, the Sequencer will store the last 1,000 results. After the internal buffer gets filled, the analyzer will overwrite the oldest data log. With a blank USB stick plugged into the back of the HMI, the Sequencer will write to a new file every 900 readings.

With a USB plugged into and recognized by the sequencer, the status indicator will change from Red (disconnected) to Green (Connected). The User can manually force the sequencer to write to the USB by pressing the SAVE button that appears on the left of the screen.



The graph screen provides a display of the last 100 readings. It is color coded by the four channels using the legend in the upper right of the screen.

The Y-Axis can be adjusted to the desired range by changing the number in the field below Y MAX.

2.5 SEQUENCER MANIFOLD

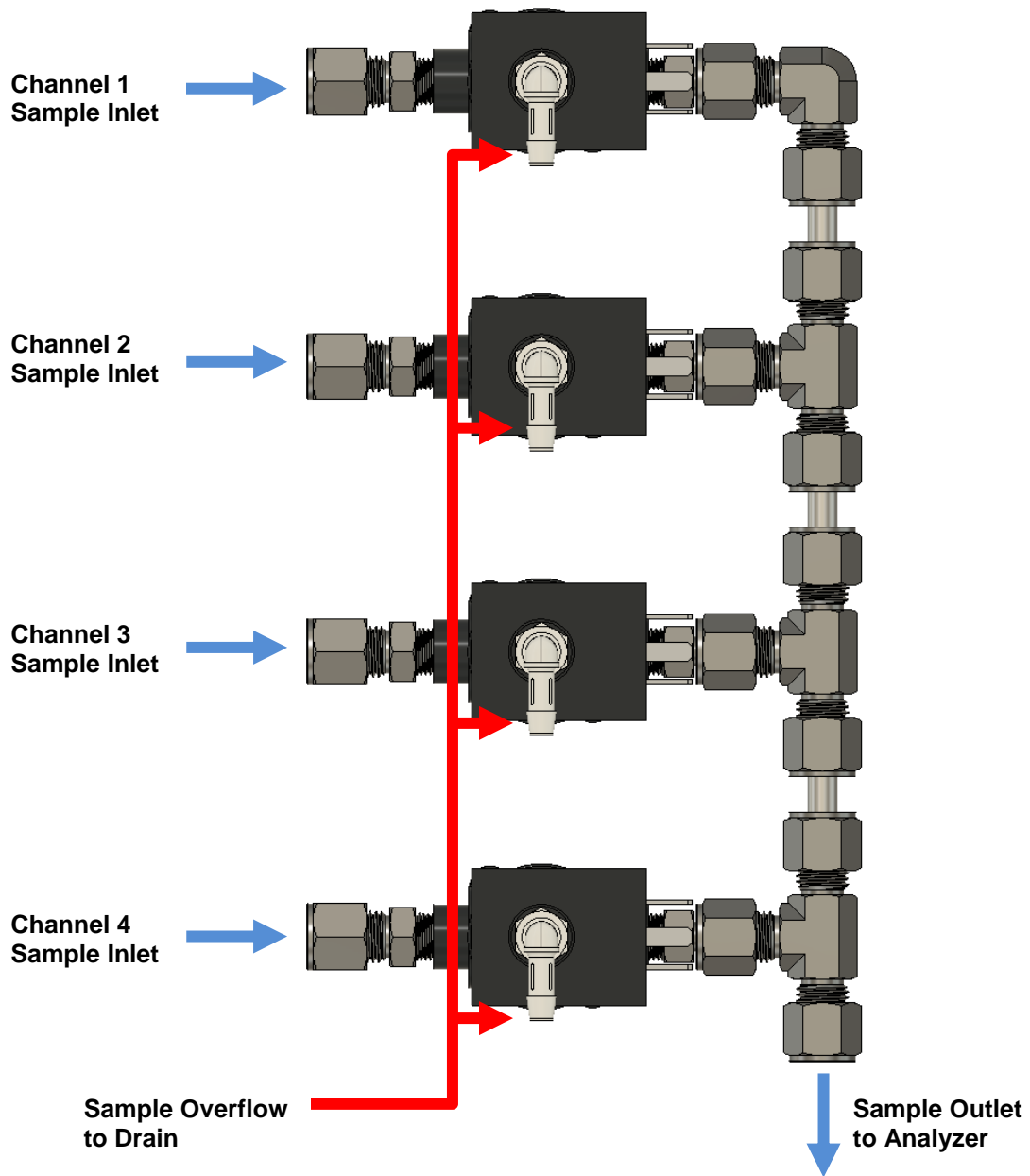


Figure 2.7: Sequencer Manifold.

2.6 ELECTRONICS

The microprocessor and its PCB assembly are located in the transmitter housing. It provides control for the entire analyzing system. It handles the sequencer operations, collects all the data, and it controls all the I/O to and from the HMI touchscreen, and the outputs to external devices.



Figure 2.8: Transmitter Housing.

3 INSTALLATION

3.1 RECEIVING

The Waltron 9010 Sequencer is assembled and tested for proper performance. Depending on options selected, it may or may not have valves included. Before proceeding with analyzer installation, it is recommended to:

- Check that the box and analyzer have not been damaged during transportation.
- Take extreme care during analyzer unpacking and moving.
- Be careful not to misplace accessories during unpacking. Refer to the included packing list.

3.2 SEQUENCER HANDLING

Take care when lifting or moving the sequencer. Before moving the sequencer, it is recommended to manually empty all of the hydraulic parts of any liquids.

3.3 LOCATION AND MOUNTING

It is recommended to install the sequencer in a suitable location::

- The location is to be clean, covered and properly enclosed to provide the sequencer with good ventilation and low dust concentration.
- Required environmental conditions:
 - Temperature between 10and 45°C (50-113F) at max 80% relative humidity. If the temperature could fall below 5°C, the analyzer should be installed in a heated cabinet.
- Depending on the mounting options selected, the sequencer could come with a variety of mounting hardware for both the transmitter and valvers (if selected).
- Reagent bottles are supplied with the analyzer.
- For batch process sequencer, a fast-loop reservoir should be mounted between the sequencer and analyzer.

3.4 PRE-INSTALLATION

Before installing the sequencer, take the following precautions:

- Place the sequencer and paired analyzer close to the sample point to achieve the minimum response time; the sample should be homogenous and representative.
- The drain line should be properly dimensioned and positioned at a downward slope to allow the drain of sample waste, the analyzed sample (by gravity), and the overflow coming from external fast-loop reservoir (if used).

WARNING! The sample drain of the sequencer must be at ambient pressure with no restriction or counter pressure. Please verify that this condition has been strictly respected during installation.

- Clearance requirements for the sequencer should be about 4" (10 cm) on either side and about 20" (50 cm) in the front.

3.5 MOUNTING SCHEMATICS (BACKPLATE WITH VALVES)

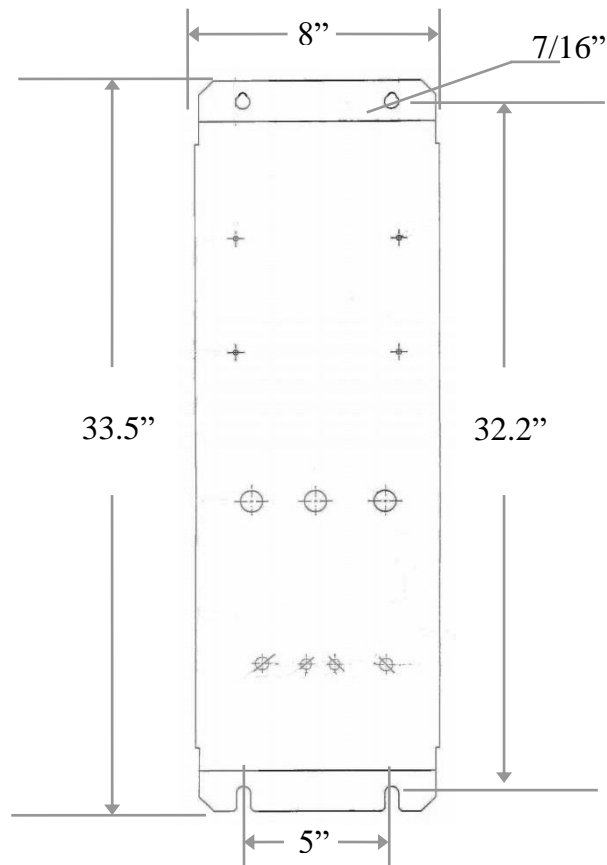


Figure 3.1: The dimensions for mounting the sequencer.

3.6 ELECTRICAL CONNECTIONS

General information:

- The electrical installation should be carried out by qualified personnel in accordance with national or local regulations.
- Before servicing the analyzer or its parts that are electrically powered, turn off power to avoid risks of electrocution.
- To turn off power from an electrical device, it is necessary to interrupt the power line using a circuit breaker or an isolating switch to be sure that there is no power in the area to be serviced.
- Protection against indirect contacts is guaranteed by efficient grounding of all isolated metal masses.
 - The user is responsible for checking and guaranteeing the efficiency of the sequencer's grounding.

Users and qualified maintenance personnel must proceed as follows:

- Always isolate power before servicing the analyzer.

In case of loss of power, the sequencer stops and automatically restarts into startup mode as soon as power is restored.



No maintenance should be conducted on the instrument without first switching off the power.

3.6.1 AC POWER CONNECTION

The Waltron 9010 Sequencer is designed for operation with 110-220Vac, 50/60 Hz power. All the connections must be made in accordance with national or local regulations. The analyzer is equipped with a main power switch. It is always recommended that the analyzer is connected to the main via a circuit breaker or an isolating switch installed near the unit.

To make changes to the AC power connections, it is necessary to open the transmitter enclosure. The connections are shown below in Figure 3.2.

3.6.2 USER SIGNAL CONNECTIONS

The sequencer provides a terminal block inside the transmitter housing for electronic connections to the solenoids valves, power and analog output signals.

Table 3.1 below shows the terminal block connections inside the transmitter housing.

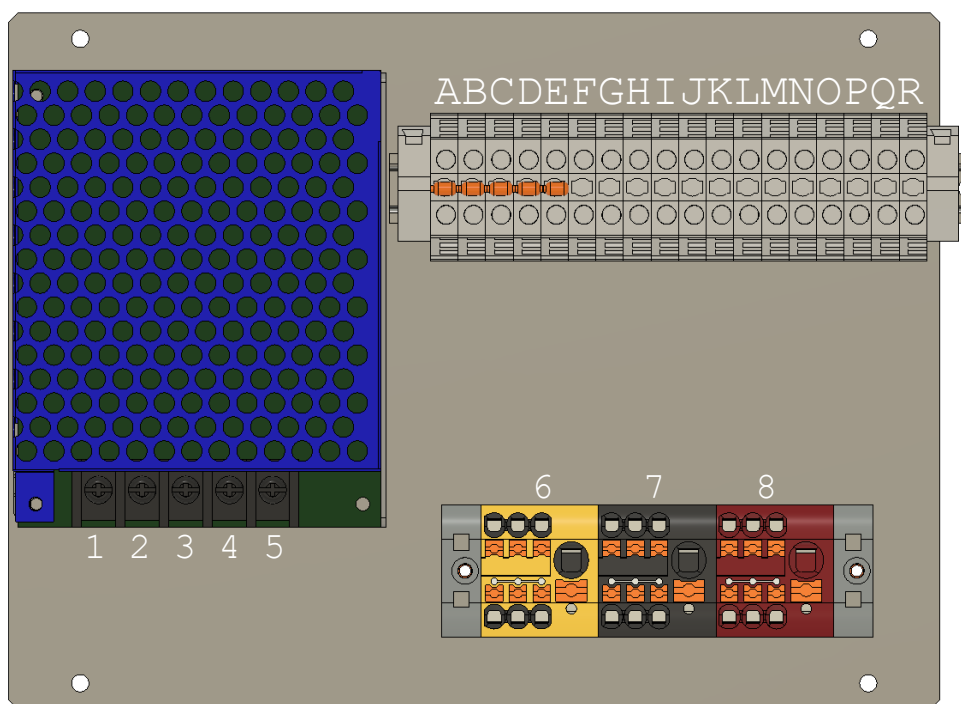


Figure 3.3: Electrical connections for user connections and power connections.

Table 3.1: Terminal block pin locations.

Pin Number	Terminal Description	Batch Process Cable Connection
1	AC Line	
2	AC Neutral	
3	Ground	
4	DC V-	
5	DC V+	
6	Ground Block	
7	Return Block	
8	V+ Block	Analyzer Relay Common
A - E	Return Terminals: Valve RTN 1-4, Analog RTN 1-4	
F	Analog In -	Analyzer 4-20mA signal -
G	Analog in +	Analyzer 4-20mA signal +
H	Analog 4 Out +	
I	Analog 3 Out +	
J	Analog 2 Out +	
K	Analog 1 Out +	
L	Relay 1 RTN	Analyzer Relay 1
M	Relay 2 RTN	Analyzer Relay 2
N	Valve 4 +	
O	Valve 3 +	
P	Valve 2 +	
Q	Valve 1 +	
R	Not Used	

4 SEQUENCER INITIAL START-UP



Before proceeding with analyzer start-up it is absolutely necessary to check that all procedures for a proper installation and reagent preparation have been made. Please verify that all instructions have been followed.

4.1 PREPARING THE SEQUENCER FOR START-UP

Once installation is complete, proceed as follows to prepare the sequencer for online operation :

1. Connect the sample line inlet tubing (or filtered sample outlet coming from optional filtration system) to the respective valve inlet. Do this for every channel/sample line.
 2. Connect the valve manifold sample outlet to the analyzer or loop reservoir.
NOTE: A Fast Loop Reservoir is required with Waltron Batch Process Colorimeters
 3. Connect tubing from the valve sample overflow to drain.
-

WARNING!

The drain of the analyzer must be at ambient pressure with no restriction. Please verify that this condition has been strictly followed during initial start-up procedures.

4. Adjust sample flow to the sequencer to analyzer's required flow, not to exceed 250ml/min, typically 120 ml/min.
5. Connect the analyzer output signal to the sequencer input terminals.
6. Connect the sequencer output signals to the DCS, panel monitoring system, or other data collection device.
7. Plug in the sequencer.
8. Setup the sequencer (Section 5)

5 SETUP AND RUN

5.1 USER INSTRUCTIONS

Screen descriptions can be found in Section 2, Introduction.

Select the sequencing mode, based on the analyzer type.

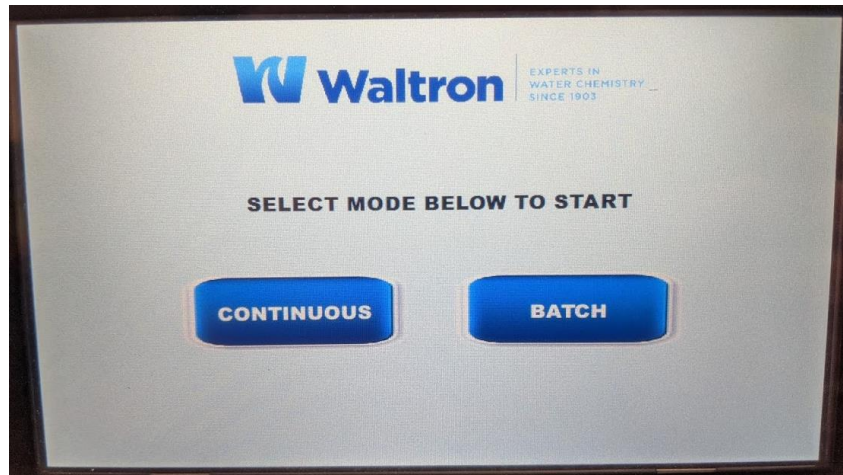


Figure 5.1: Sequencing mode screen at power on.

5.2 CONFIGURATION

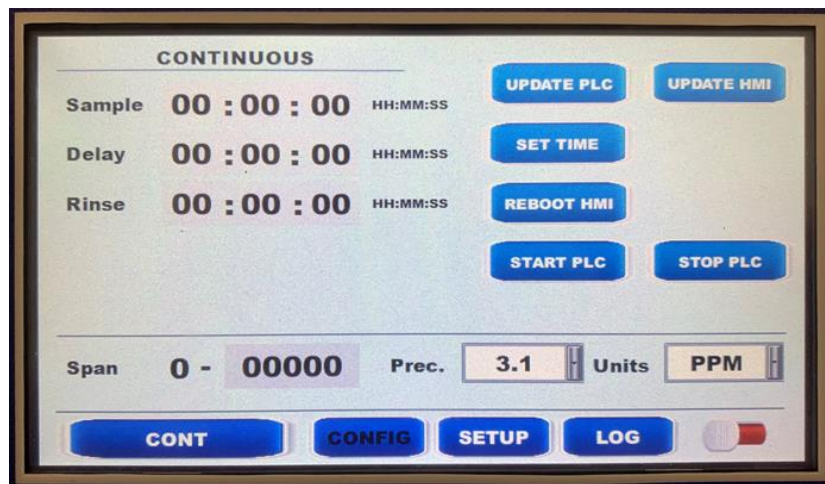


Figure 5.2: Continuous Configuration.

Set the sequence times desired for your analysis cycles.

- **Sample** - This time sets the duration that the sample passes to the analyzer. This includes the amount of time included in the “Delay” value.
- **Delay** - This is the time in which the sample will run to the analyzer but the value returned from the analyzer will not be updated or recorded. This is the built in universal rinse down period.

NOTE: If the “Delay” time is equal to or greater than the “Sample” Time the sequencer will move to the following samples without having recorded results from the analyzer.

- **Rinse** - This time sets a period of additional rinse down or delay that is specific to a sample stream or channel. This time starts after the valves have changed over and ends before the sample timer begins. This is recommended for samples that have analyzed values significantly different than those proceeding or following.

WARNING Setting the sample time to ZERO or close to zero can result to rapid cycling of the valve relays and damage to the electronics. This damage is not covered by WARRANTY.

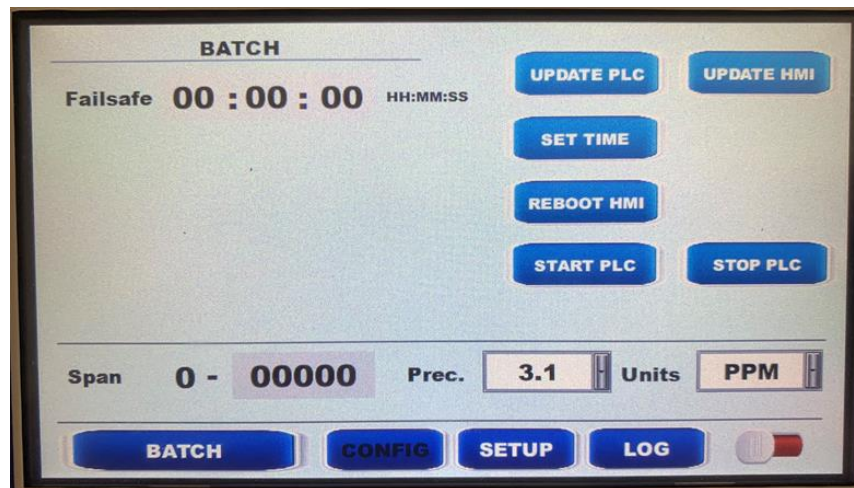


Figure 5.3: Batch Configuration.

- **Failsafe** - The failsafe timer should be set to a time that exceeds the combined wait time between batches and maximum analysis time. Setting the timer below this number will cause an error in the sequence.

WARNING Setting the failsafe time to ZERO or close to zero can result to rapid cycling of the valve relays and damage to the electronics. This damage is not covered by WARRANTY.

- **Span** - The sequencer will interpret the incoming analyzer signal based on the span. It should match that set to the analyzer output.
- **Precision (Prec.)** - This changes the display of the number of figures before and after the decimal point.
- **Units** - Allows the user to select PPM or PPB for display.

NOTE: While possible, it is not recommended to set the analyzer to run in this screen.

5.3 SETUP

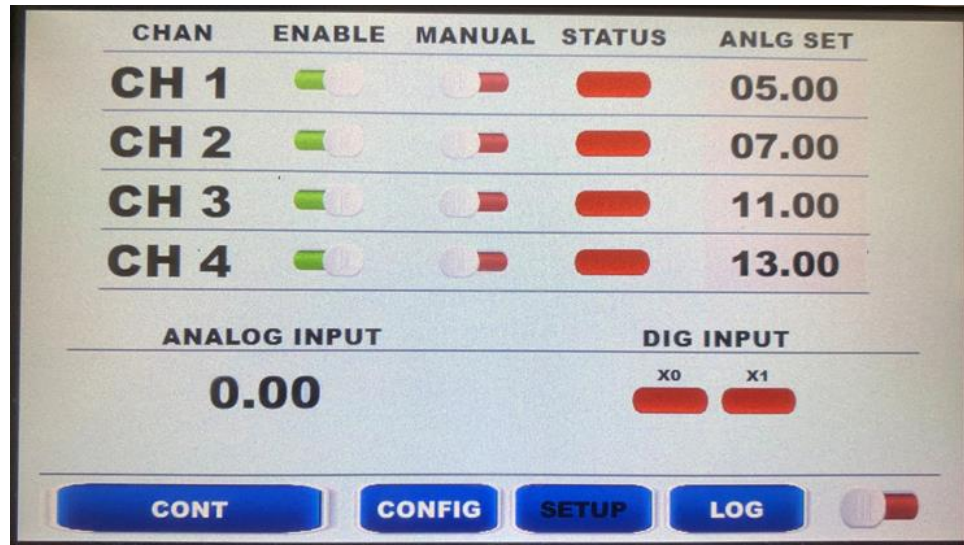


Figure 5.4: SETUP.

1. Under ENABLE, select the amount of channels used corresponding to the attached valves.
2. Analog Setpoints can be tested by entering values in ANLG Set. Values in the field will be set to the respective outlets and allow for the DCS or other collection device to calibrate the signal. (Note: these values will be overwritten once the sequencer receives a running value for this channel.)
3. To test the analog in, set the connected analyzer to “push” a desired signal. This will appear under ANALOG INPUT.
4. If using Batch Analysis, relays 1 and 2 can be tested under X0 and X1. These are non-latching indicators.

NOTE: While possible, it is not recommended to set the analyzer to run in this screen.

5.4 RUN

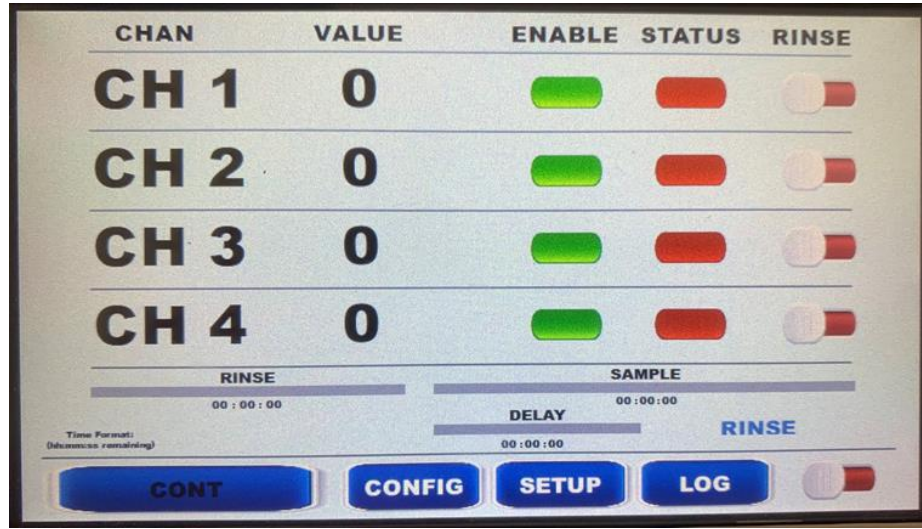


Figure 5.5: Run Continuous.

In Continuous mode:

1. Select any channels in which additional rinse time is desired. Note: this will increase the sequencer cycle time on this channel.
2. Toggle the switch on the bottom right to Right/Green.
3. The sequencer is now running.

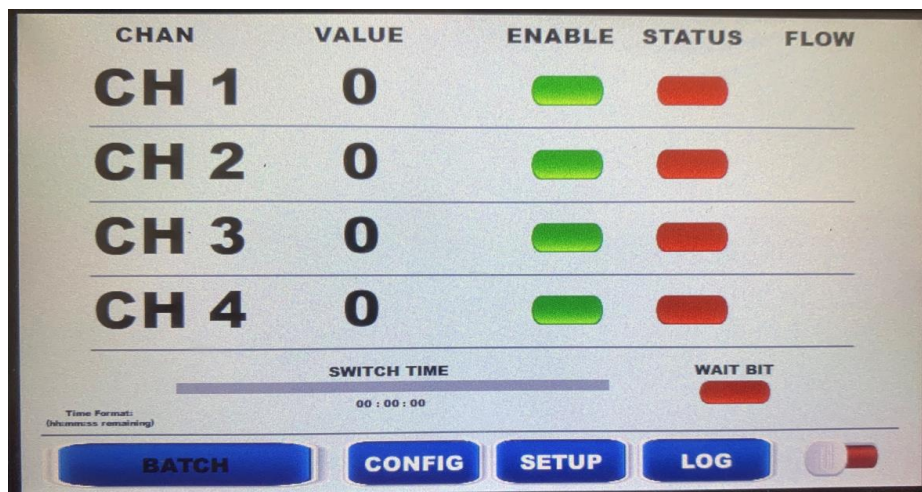


Figure 5.6: Run Batch.

In Continuous mode:

1. Toggle the switch on the bottom right to Right/Green.
2. The sequencer is now running.

5.5 LOG

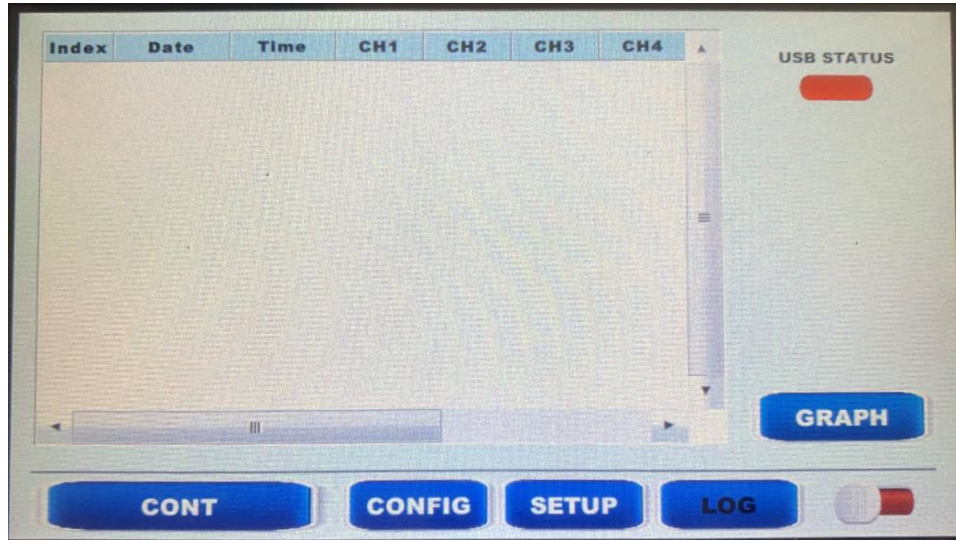


Figure 5.7: Log Screen.

LOG Table:

This is intended to be a reference for recent results of sequencer cycles. Data from every channel is logged each time, so repeated data is expected until that channel's analysis cycle.

USB Status:

This indicates that the sequencer recognizes that a USB is plugged into the transmitter. When plugged in, it will change from Red to Green.

SAVE:

This button will appear with a USB plugged in. When pressed, it will record the log table to the USB. Note: the sequencer will log to USB in run mode at regular intervals. It is recommended to save to USB prior to removal to ensure data is properly recorded.

Remove USB:

Pressing this button will allow the USB to be safely removed after confirmation, and the SAVE and REMOVE buttons will disappear. The USB device can be reinserted at any time.

5.6 GRAPH

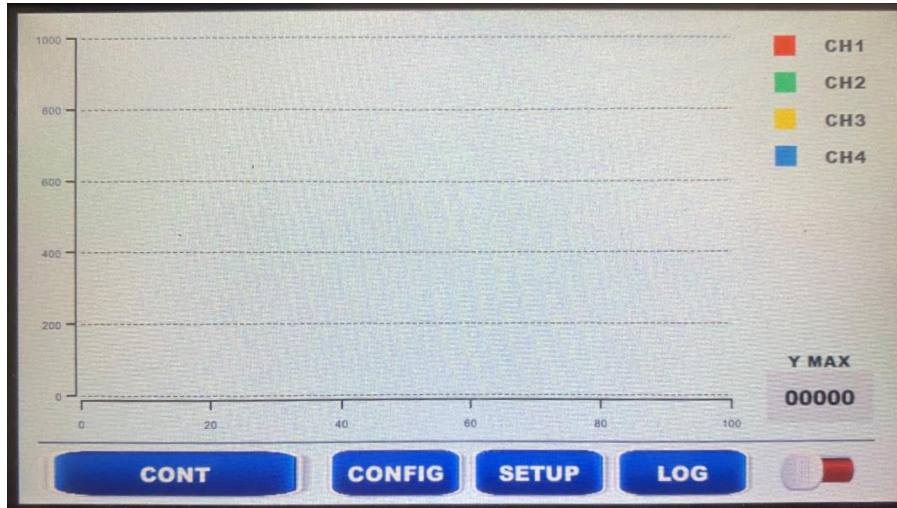


Figure 5.8: Graph Screen.

Graph:

This graph is intended to be used for reference only and will not be recorded in this format.

Y MAX:

Changing this field will adjust the vertical scale of the graph.



6 MAINTENANCE

6.1 SCHEDULED MAINTENANCE

The Waltron 9010 Sequencer should not require scheduled maintenance.



7 SEQUENCER SHUT-DOWN

1. To shut-down the sequencer, disconnect power.
2. Valves will divert sample flow to drain when not powered.



8 TROUBLESHOOTING

Table 9.1: Issues.

	Action Required
Channel not sequencing	Ensure that the channel is enabled in SETUP
Channel sequencing before recording batch	Ensure Failsafe time exceeds the sum of batch time and wait time. (Time it takes to measure the sample and the time between measurements)
Sequencing before recording continuous	Ensure the Delay time does not exceed the Sample time.
Loss of flow alarm	Verify there is sample flow to the valve and that the valve is operating correctly.

9 SPARE PARTS

Table 9.1: Spare Parts Listing.

Description	Part Number
Solenoid valve with coil	P1000-087
Solenoid valve cable, with connector, 24 inch	P2000-054
Solenoid valve cable, with connector, 90 inch	P2000-019
9010 Transmitter, complete	P4000-028
Panel mount brackets	P3000-044
Panel mount bezel	P3000-045
Wall mount bracket	P3000-043