

ELKHART BRASS

Fire Fighting Equipment

24359000 Electric Operator Control Panel

For use with Model 8394053 SPIT-FIRE® Monitor
Installation, Operation, and Maintenance Instructions

Suitable for 24359000, 24359001, and Similar Panels (software rev C 5.0-rev C 6.1)



98553000 REV.D

I. PRODUCT SAFETY

 **Important:** Before installing and operating this equipment, read and study this manual thoroughly. Proper installation is essential to safe operation. In addition, the following points should be adhered to in order to ensure the safety of equipment and personnel:

- All personnel who may be expected to operate this equipment must be thoroughly trained in its safe and proper use.
- Before flowing water from this device, check that all personnel (fire service and civilian) are clear of the stream path. Also confirm stream direction will not cause avoidable property damage.
- Become thoroughly familiar with the hydraulic characteristics of this equipment, and the pumping system used to supply it. To produce effective fire streams, operating personnel must be properly trained.
- Whenever possible, this equipment should be operated from a remote location to avoid exposing personnel to dangerous fire conditions.
- Always open and close valves supplying this equipment slowly, so that the piping fills with water slowly, thus preventing the possible occurrence of water hammer.
- After each use, and on a scheduled basis, inspect equipment per instructions in the maintenance section.
- Disconnect power prior to servicing controls or monitor.
- Any modifications to the electrical enclosure will destroy the NEMA 4 rating and void warranty coverage of the enclosure and all components within.
- All equipment must be installed in accordance with local codes (NFPA 70 or EN/IEC 60079-14) as appropriate and in areas where equipment classification is suitable.

 **WARNING:** Do not attempt to disconnect or work on any electrical equipment in this system unless power is removed or the area is known to be non-hazardous.

SYSTEM INFORMATION:

SERIAL NUMBER: _____

DETAILS:

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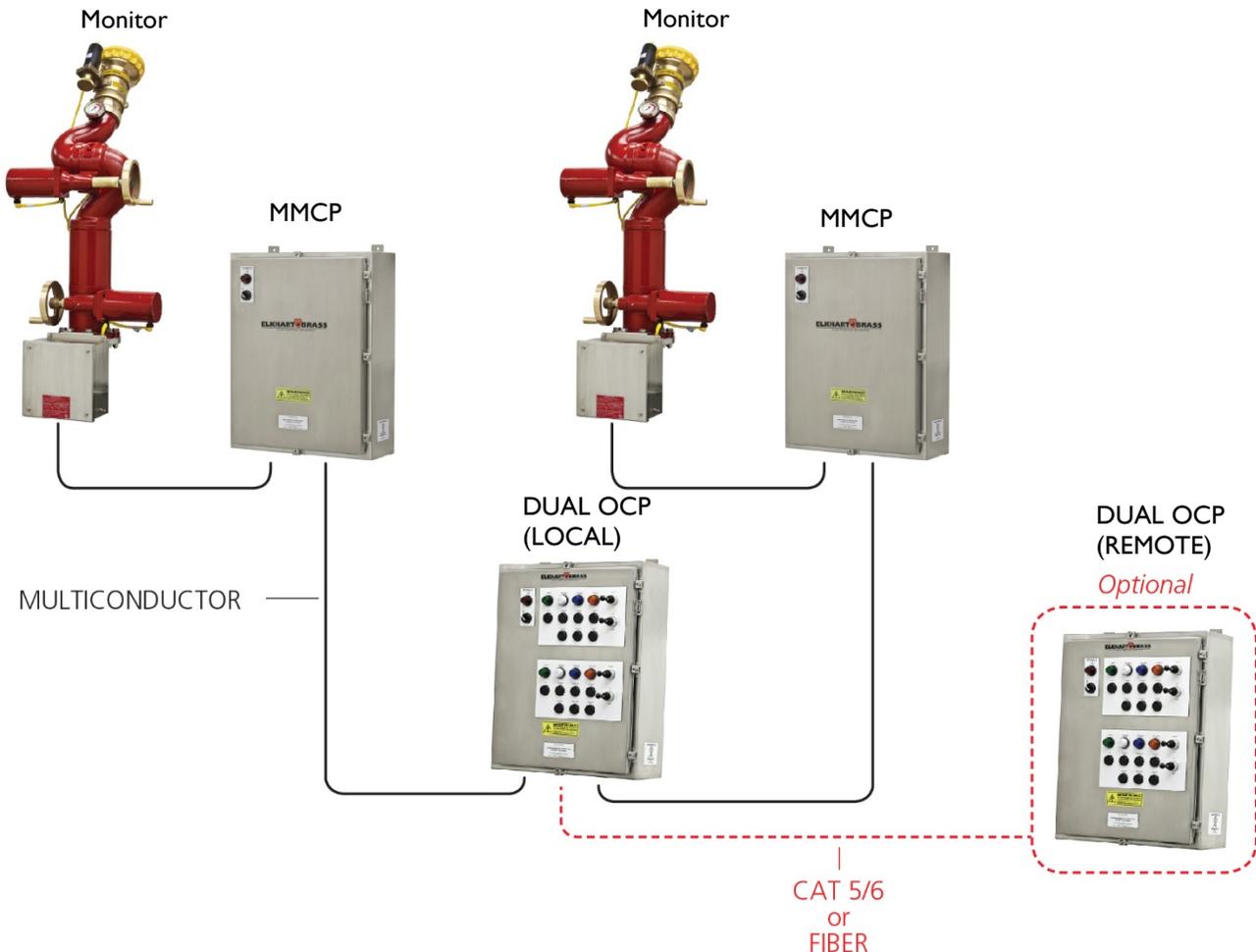
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*For our most up-to-date documentation and specifications, please visit our website at www.elkhartbrass.com

II. OVERVIEW:

- Defined terms are printed in *italicized font*. Definitions can be found in the glossary at the end of this document.
- **Operator control panels (OCPs)** can be purchased as either single *OCPs* - which will control 1 monitor, or as dual *OCPs* -which will control two monitors. Dual *OCPs* have two *PLCs* in them, and they function exactly as two single *OCPs* would. They run the same software as single *OCPs*, and they are configured no differently. Both are shown in the drawings on page 9. This manual shows a dual monitor Operator Control Panel in most pictorial representations.
- Each monitor must have its own **monitor motor control panel (MMCP)**.
- *OCP's* can be configured by the user to operate as a local or as a remote. The hardware is the same.
- All controls provided at a local *OCP* are duplicated at a remote panel. Simultaneous operation is standard, when inputs conflict, the first input received is acted on and the second is ignored. Remote panels may be located up to 6200 feet from the local panel it is paired with when using a fiber network connection.

Example: Two monitor system with local and remote control



III. OPERATION

Controls

Power On/Off Switch – Two pole switch that switches incoming power.

Pilot Lights:

a. Power On Indicator – Indicates both incoming AC power & internal DC control power are on.

NOTE: *When the following pilot lights are on a remote panel, they duplicate the status of the pilot lights on the local panel that it is paired with.*

b. Aux. Device On – Illuminates to indicate the state of the auxiliary device, it may be used in two ways.

a. Actual position feedback (feedback connected to terminal 72)

b. Aux. device output status when jumpers are used in a remote configuration.

c. Water Valve Opened – Illuminates to indicate the state of the water valve, may be used in two ways.

a. Actual position feedback (feedback connected to terminal 71)

b. Water valve output status when jumpers are used in a remote configuration.

d. Oscillation On

a. Illuminates solid when in oscillate mode.

b. Flashes to warn that the *MMCP* power is off.

c. Flashes 4 times, followed by a pause, to indicate an error. Errors are explained by messages that are displayed on the *LCD* screen of the associated *PLC*.

i. If the remote oscillation light is the only one flashing, the error message will be on the remote's *LCD* screen

ii. If the oscillation light is flashing on both the remote and the local, the error message will be on the local screen.

e. Parked –

a. Illuminates solid when the monitor is located at the park position.

b. Flashes fast during the beginning of the parking sequence (waiting for valves to close).

c. Flashes slower while actually performing the park maneuvers.

Push Buttons

1. Aux. Device On – Triggers a momentary output (start pulse) at terminal 69.

2. Aux. Device Off – Triggers a momentary output (stop pulse) at terminal 70.

3. Water Valve Open - Triggers a momentary output (start pulse) at terminal 67.

4. Water Valve Close - Triggers a momentary output (stop pulse) at terminal 68.

5. Oscillate On- Starts the oscillate function described in section III.

6. Oscillate Off - Stops the oscillate function described in section III.

7. Park – Triggers the monitor to begin its park sequence described in section III.

Joysticks

X. Straight/Fog

- a. Controls the nozzle motor to adjust the stream pattern.
- b. Stops the park sequence

XI. Up/Down

- a. Controls the vertical (up/down) motion of the monitor.
- b. Stops the park sequence.

XII. Left/Right

- a. Controls the horizontal (left/right) rotation of the monitor.
- b. Stops the park sequence
- c. Stops the oscillation sequence.

Hand Wheels



Hand wheels are provided for all three axis (horizontal, vertical, and nozzle) to operate the monitor in a power failure. See monitor manual for operating details.



WARNING: The hand wheels are not monitored. If the hand wheels are moved, the *PLC* will not know it. This will cause two problems. First, the positions displayed on the *LCD* will be inaccurate. Second, during the oscillate function, the monitor could try to move beyond the mechanical limits. To prevent this, the user should run the park sequence after every use of any hand wheel.

AUTOMATIC FUNCTIONS

PARK

This is a two part routine.

Part One – Home

- Park light flashes fast and movement is delayed while the software provides time for all valves to close.
- Park light continues to flash, but more slowly. The monitor will move until each axis (horizontal, vertical, and nozzle) as far as they can physically go. The monitor calibrates itself by intentionally running into the end of travel limits. When the motors stall, they will make a grinding noise. This is normal and is not damaging the motors or the monitor.
- After a short time, the monitor then completes a series of motion tasks to exercise and drain the monitor nozzle.

Part Two - Go to park angles

- Park light is still flashing.
- Monitor will return to the park angles set in the program for each axis.
- Upon completion, the park light turns solid. It will remain on and solid as long as the monitor is in the park position.
- Park can be cancelled by moving the directional joystick.

VALID PARK ANGLES

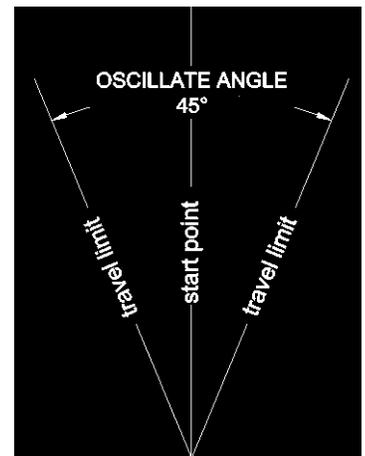
Horizontal: 7° - 354° Vertical: 0° - 135° Nozzle: 0° - 90°

NOTE: Monitor will not park if the water valve is open, the auxiliary device is on, or the monitor is in oscillation mode.

OSCILLATE

Similar to a lawn sprinkler, in oscillate mode, the monitor repeats a pattern of right to left, then left to right rotation. Direction changes when it reaches the *travel limits* established by the oscillate angle. The *oscillate angle* is programmed by the user in the main menu. The oscillate angle is always centered on the *start point*. The *start point* is where the monitor was at when the oscillate-on button was pressed.

While in oscillation, the monitor may be moved up or down, and the nozzle spray pattern may also be changed without affecting the left/right movement. To stop oscillation, either press the stop-oscillate button, or move the left/right joystick. If oscillation is started while the monitor is parked, the horizontal park position will be the start point.



VALID OSCILLATION ANGLE

1° - 347°

Note: Words in *italics* are terms explained in the drawing.



WARNING: The start point changes every time the oscillate-on button is pressed.

EXERCISE

Every 24 hours the monitor will automatically exercise. During the exercise routine, all three motors will run and the monitor will move. Exercise is necessary to keep the monitor moving freely. This routine takes less than a minute to complete.

Exercise starts exactly 24 hours from the last time the park button was pressed. Therefore, parking the monitor will also reset the start time for exercise routine.

The exercise routine begins with 5 short moves of the horizontal axis (1deg). This is used as a warning to alert anyone working on the system that exercise is about to begin.

All three axis will then move left-right, up-down, and fog-straight. They will then return to the position that they started from. They will return to the park positions only if that is where they started from.

Note: Exercise will not start unless the monitor is not moving and all valves are closed. If exercise does not start, it won't start again until the next scheduled exercise period.

AUXILLARY INPUTS

Auxiliary inputs can be used to allow the user to trigger certain functions by switching an associated input on one *PLC* that causes several *PLCs* on the same network to react. Aux inputs can be wired to any *PLC* on a network. That *PLC* can then relay the input through the network to any or all of the other *PLCs* on the same network. Each *PLC* receiving the relayed input will also obey that input. There are four auxiliary inputs:

- 1 Start Oscillation.
- 2 Open water valves.
- 3 Start aux device. (Often used as Open foam valve)
- 4 Start the park sequence

Aux inputs can only be used when a network configuration is used.

Example: *PLC* 10 has a customer supplied 2 pole maintained pushbutton wired to auxiliary inputs 1 and 2. *PLC* 10, 13, 16, and 18 all control monitors that surround and protect a particular storage tank. Pressing that button will cause all four monitors to start oscillation and open their water valves.

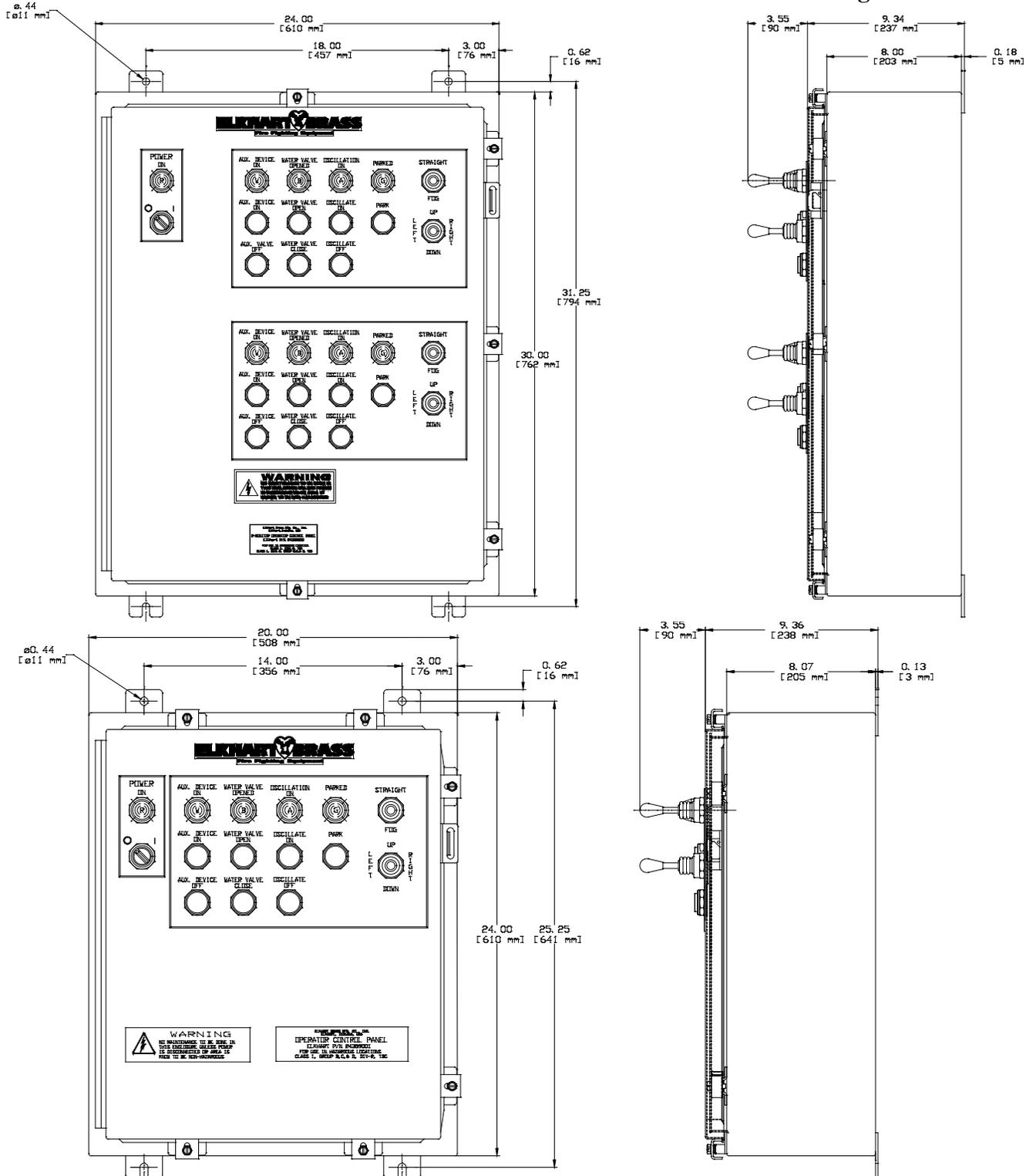
In the above example, *PLC* 10 was configured by the user to relay its auxiliary inputs to *PLC* 13, 16 & 18. This is explained in the communications and set up section of this manual.

IV. INSTALLATION

Mounting Recommendations

OCPS should be mounted on a rigid stand. Panel location must be such that the operator can visually see the monitor and nozzle while operating the controls, and the controls should be located at a comfortable elevation for use, and the *LCD* screen should be at a good viewing height near eye level.

MOUNTING DIMENSIONS – Do Not Scale Drawings



Electrical Wiring

Power to *OC*P (local and/or remote)

- User must supply power disconnect.
- 240 / 120 VAC, 50 / 60 Hz, 1 ϕ , 15 Amp



WARNING!! While working inside the panel be aware of the terminals located at the bottom, they contain live electricity even when the panel is switched off, and caution should be exercised at all times.

24 VDC control wiring:

- *OC*P to *MM*C*P*: A minimum of 14 conductors are required to control a standard *MM*C*P*. A dual *OC*P will have two sets of 14 conductors, in two different conduits, run to each *MM*C*P*.
- Auxiliary inputs, if used, will require additional conductors. These will run between the switch or contact that activates the aux input and the *OC*P. 5 conductors (4 inputs & 1 common) are required to use all 4 aux inputs.
- Sizing is dependent on circuit length. Circuit length is twice the distance between the *MM*C*P* and the *OC*P.

WIRE SIZE FOR CONDUCTORS BETWEEN OPERATOR CONTROL PANEL AND MONITOR MOTOR CONTROL PANEL	
CIRCUIT LENGTH	WIRE SIZE
UP TO 750 FEET (228 m)	18 AWG (0.75 mm ²)
750 TO 1500 FEET (457 m)	16 AWG (1.00 mm ²)
1500 TO 2500 FEET (762 m)	14 AWG (2.50 mm ²)
2500 TO 3500 FEET (1066 m)	12 AWG (4.00 mm ²)

Network Communications Wiring

- All PLCs and HMIs communicate over Ethernet IP.
- Up to 16 PLCs can be connected on the same network.
- PLC to Ethernet switch wiring is already provided inside the *OC*P cabinets.
- All Ethernet switches must be field interconnected. They will support either a star or a ring topography.
- Networks can be wired with either copper wire or fiber optic cable. Fiber Optic cable allows greater transmission distances.

CABLE LENGTH INFORMATION	
Multi Mode Fiber Optic Cable with SC connectors (SC 62.5/125)	For Distances up to 6200 feet (2 km)
Ethernet Cat5e or Cat6e Cable	For Distances up to 250 feet (91 m)

Jumpers Required at the Remote OCP to Activate the Water and Aux Pilot Lights

To make the water valve pilot light work on a remote *OCP*, a jumper must be installed between the water valve output and the water valve feedback terminals, which are terminals [67] & [71] respectively.

To make the auxiliary device pilot light work on a remote *OCP*, a jumper must be installed between the aux device output and the aux device feedback terminals, which are terminals [69] & [72] respectively.

Refer to drawing 30231031S2 – see notation “jumpers required for indicators.”

Auxiliary Input Wiring

Please consult Elkhart Brass before using this feature. The use of auxiliary inputs significantly increases network traffic that would cause the network to fail.

Aux Input 1 [TERM 73] – Start Oscillation.

Aux Input 2 [TERM 74] – Open water valves.

Aux Input 3 [TERM 75] – Start aux device. (Typically used as Open foam valve)

Aux Input 4 [TERM 76] – Start the park sequence

To activate these functions: Wire a maintained normally opened switch or contact between the correct aux input terminal block and 24VDC(+) [TERM 51A]. Jumpers may be used to simultaneously trigger Aux Inputs 1 & 2, or 1, 2, &3. Do not jumper Aux input 4 with any other Aux input.

NOTE: If an external +24VDC source is going to be used for the auxiliary inputs, make sure that the 0VDC of that source is connected to 0VDC [TERM52] of this panel.



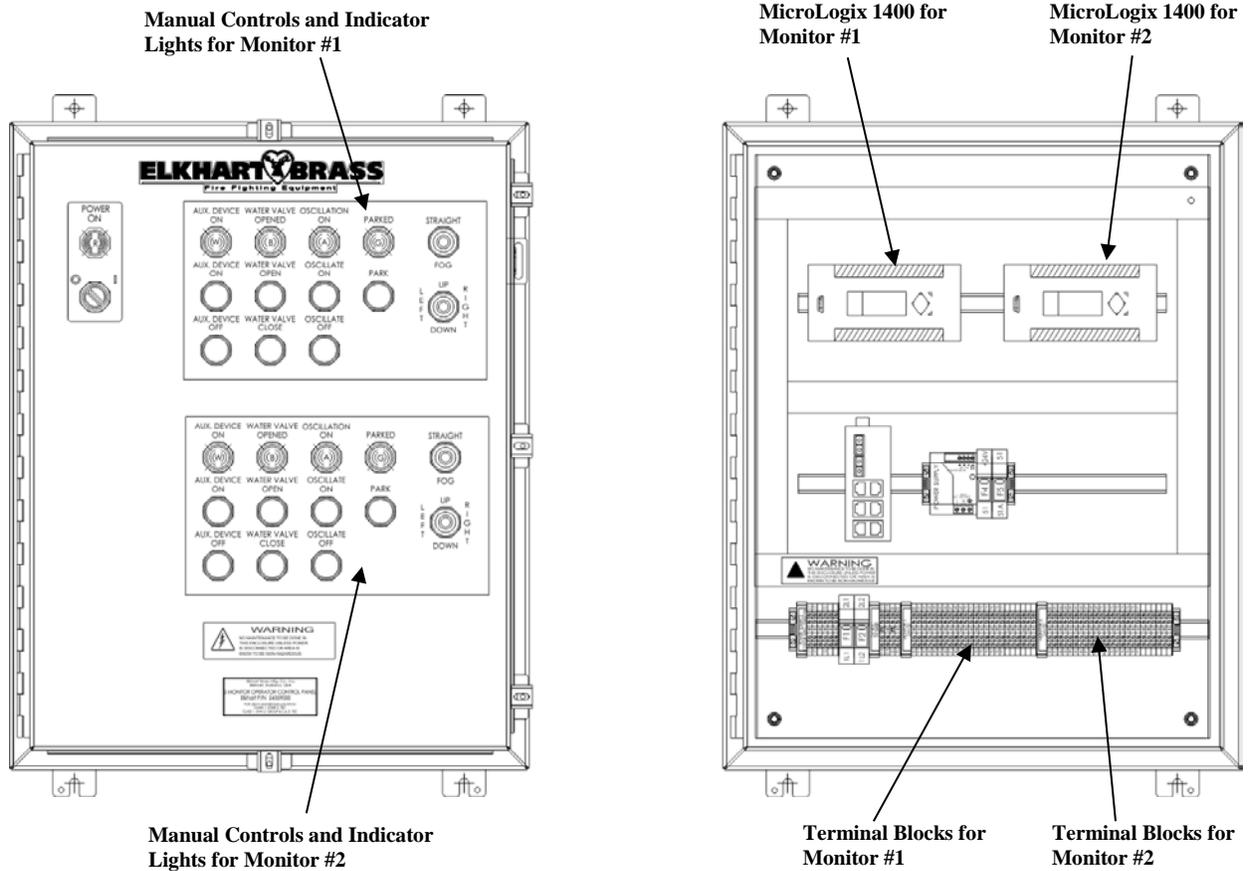
WARNING!! Make sure panels are properly grounded. Use hubs and glands rated for bonding in a hazardous location.



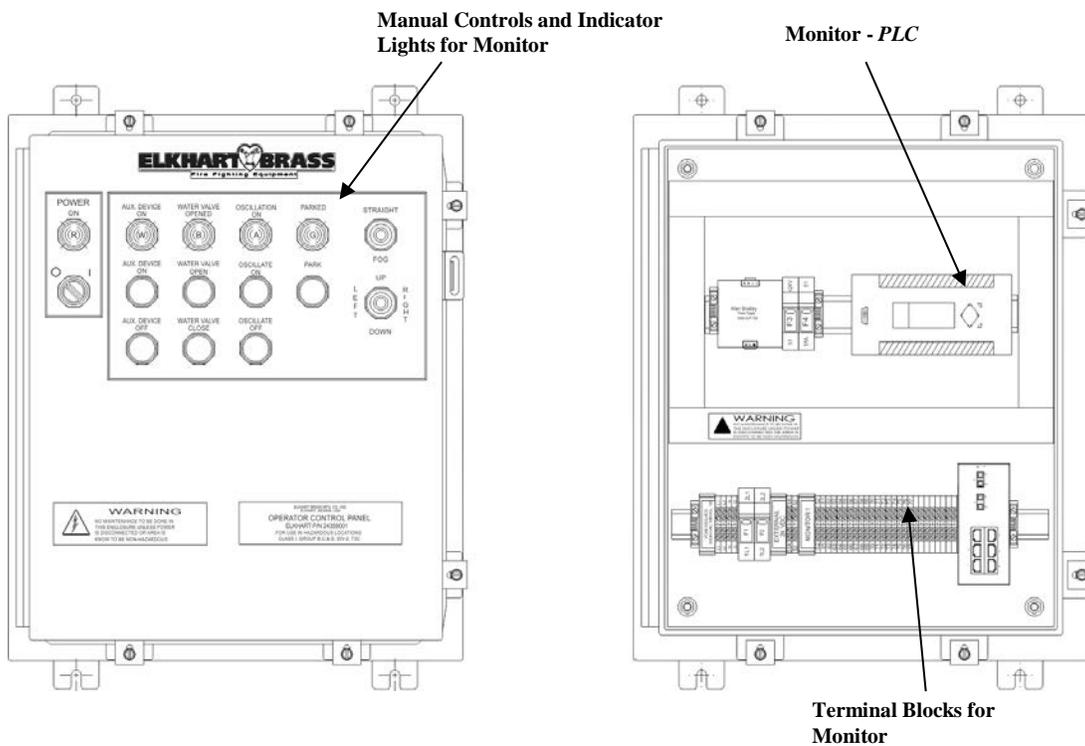
WARNING!! Do not take covers off of the motors because it may destroy the seal. If the cover has been removed, the warranty is void and the service life of the motor will be significantly reduced.

V. PANEL LAYOUT DRAWINGS

DUAL OCP (LOCAL OR REMOTE) LAYOUT WITH ALL COMPONENTS



SINGLE OCP (LOCAL OR REMOTE) LAYOUT WITH ALL COMPONENTS



VI. CONFIGURATION & SETUP

CONFIGURATIN SEQUENCE

IP Addresses

IP addresses should be configured as the first step because it helps avoid nuisance error messages. This procedure is explained in detail in the next chapter.

It may help to make a map of all the PLCs, and choose their IP addresses in advance

- Each *PLC* must have a unique IP address.
- Remove the Ethernet cables connected to the bottom side of the *PLCs*.
- **Power up only one *OCP* at a time**, and configure the IP addresses for each *PLC* in the *OCP*.
 - Powering up multiple *OCPs* would cause the error “IP address conflict” because from the factory, they are all configured with the same IP addresses.
 - Factory default is 192.168.32.10 for single *OCPs*
 - Factory default is 192.168.32.10 & 192.168.32.11 for dual *OCPs*)
- Plug the Ethernet cables back in after setting the IP address.
- Cycle Power

Program Configuration

Configuration is usually completed by the end user. This is a simple procedure that involves reading and answering questions that appear on the *PLC's LCD* screen. Answers are entered via the keypad.

Configuration steps can be performed in any order, but be aware that it is likely that the *PLCs* will generate communication error messages during configuration. This is because some of the steps in the configuration sequence direct and activate communication between *PLCs*. Often one *PLC* tries to talk to another that is not on line yet or is not yet configured. These error messages can easily be silenced by simply pressing [OK]. The message will then go away for 1 hour, or will go away permanently when the error condition is resolved. You can continue the configuration with error messages silenced.

It is possible to prevent the communication errors by using the following configuration sequence. However, it is often not practical to use in some installations, because it requires that the user make two trips to each *OCP*.

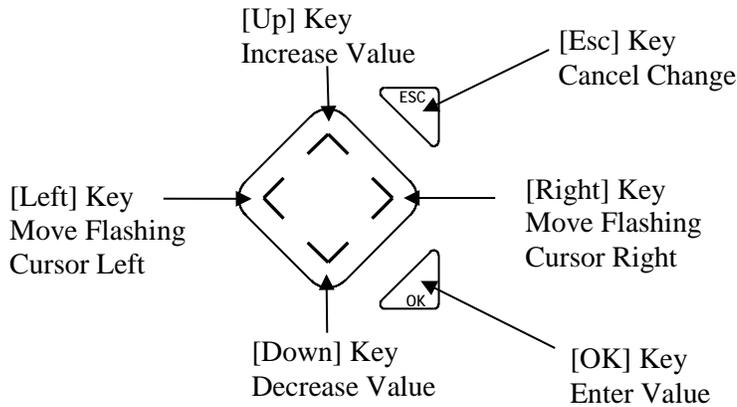
Recommended Program Configuration Sequence

- Configure all the IP addresses for all the *PLCs* in the system first. .
 - Leave all the panels powered on (so they can receive communication) during step 2 & 3.
- 2) Go to the Communications & Setup Menu and answer those questions, then answer the questions on the main menu.
 - 4) Repeat for each *PLC* on the network.

MICROLOGIX 1400 OVERVIEW

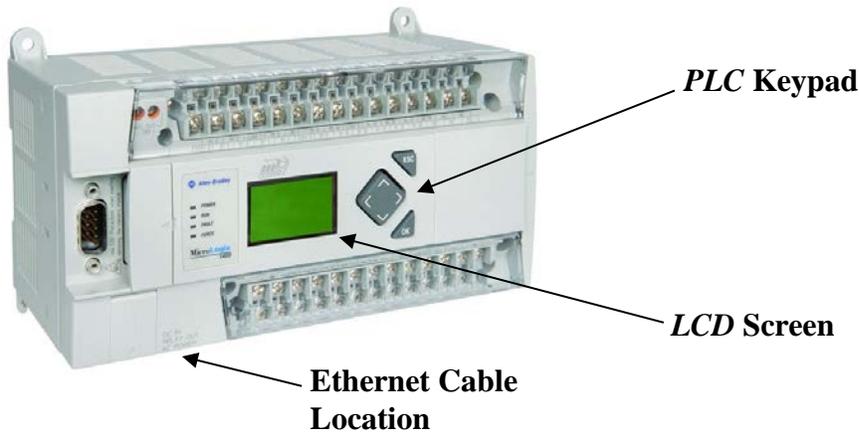
How the keypad works

Keypad for MicroLogix 1400



- [OK] Saves the data you enter and navigates to another screen; usually the next screen. Occasionally, it may redirect you to a different screen based on the data input.
- [ESC] Cancels any changes made that were not yet saved by pressing [OK]. It also navigates to the previous screen except when you are on either the main menu or the communications and set up menu screens. Then the [ESC] key is used to toggle between those menus.
- [LEFT] & [RIGHT] move the cursor while the [UP] & [DOWN] key will increase or decrease a numeric value.

PLC (Micrologix 1400)



1 SETTING THE IP ADDRESS



Important: Turn the Panel Power On (position I) to configure the PLC.

1.1. SETTING THE IP ADDRESS.

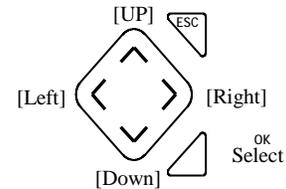
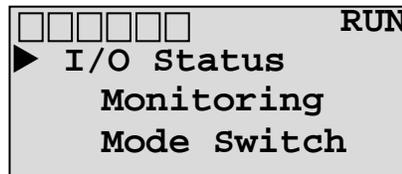
- 1.2. Each PLC that is connected on a network with other *PLC*'s must have a unique IP address. All *PLC*s ship from the factory with their IP addresses set to either 192.168.32.10 or 192.168.32.11. If you have multiple panels, you will have to change the IP addresses on some of the panels to avoid duplication.



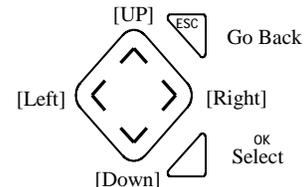
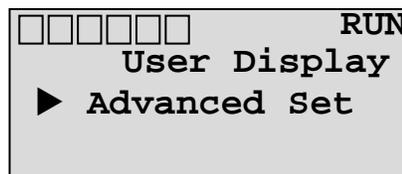
Understanding IP Addresses. Every *PLC* will need to have a different IP Address. The IP Address contains two pieces of information. The first part of the Address, which is highlighted in the example below, is the network identification. It must remain set at 192.168.032 for everything connected to this network. The second part of the address, not highlighted, is the *local address* (sometimes referred to as device ID). This must be different for each device connected to the network.

192.168.032.010
| Network ID | Local |
| Address

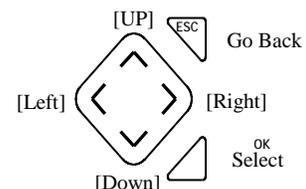
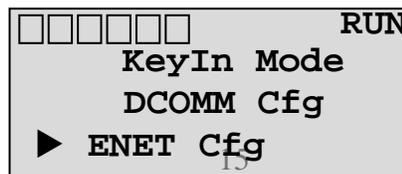
- 1.3. Be sure the auxiliary inputs, terminals 73, 74, 75, and 76 are off (or not connected) before configuring an OCP or setting an IP address.
- 1.4. The six small boxes at the top of the screen are status indicators. Their function is labeled on the *PLC* case above the *LCD* screen. These indicators are not relevant to the configuration process and may not match the figures below.
- 1.5. Hold the [ESC] key for 5+ seconds until the screen changes to the figure below. Then scroll down using the down key until the screen changes to the next screen shown in 1.6.



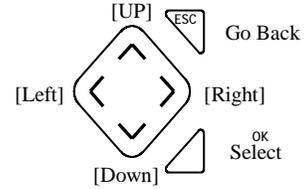
- 1.6. Keep scrolling [DOWN] until cursor is on Advanced Set. Push [OK].



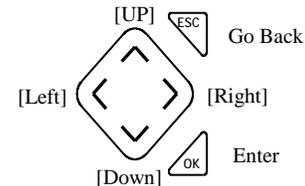
- 1.7. Scroll down until the cursor is on ENET Cfg and press [OK]



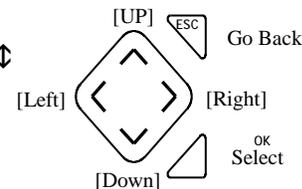
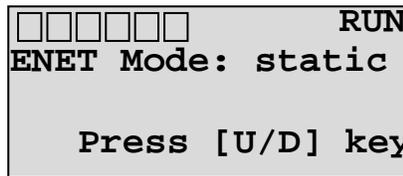
1.8. Scroll down until the cursor is on IP Address and press [OK]



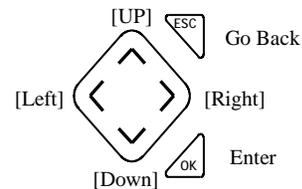
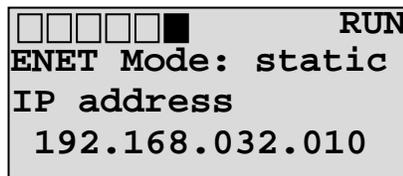
1.9. Do not enter a password. Press [OK].



1.10. The next screen should show the ENET Mode as “static”. If not, use the [UP] or [DOWN] keys to select “static”. Press [OK].



1.11. Enter an IP Address from the group listed below. Any of the listed IP Addresses can be used as long as you don't use the same address twice. If there are existing devices on the network, be sure not to duplicate their IP Addresses either. The listed IP addresses allow a networked system that consists of up to 16 PLCs. For example, a system could have 8 remote OCPs and 8 local OCPs controlling 8 monitors, or a system could have 16 local OCPs controlling 16 monitors. Any other variations are acceptable as long as the maximum number of PLCs is limited to 16. If more monitors are desired, a second separate network can be built using the standard OCPs and software. Larger custom systems can also be provided.



Valid system IP addresses are as follows:

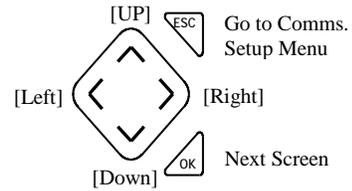
192.168.032.010	192.168.032.011	192.168.032.012	192.168.032.013
192.168.032.014	192.168.032.015	192.168.032.016	192.168.032.017
192.168.032.018	192.168.032.019	192.168.032.020	192.168.032.021
192.168.032.022	192.168.032.023	192.168.032.024	192.168.032.025



PROCEDURE FOR EDITING NUMERIC VALUES

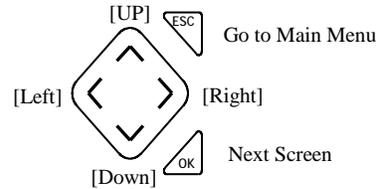
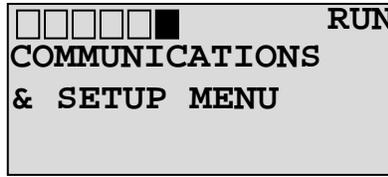
Press the left/right arrows to move the cursor over the digit you want to change, that digit will begin flashing. Use the up/down arrow to increase or decrease the value. Use this same procedure throughout the entire configuration process.

- 1.12. Press [OK] and cycle power to enter your change. **Repeat this step for every PLC that is in the network before moving onto the next section. Record the IP addresses for each PLC for future reference.**
- 1.13. After all the PLC's IP addresses are set, you must configure the PLCs by answering questions that appear on the LCD screen. On power up, the PLC will display this screen. Press [ESC]. This will take you to the communications and setup menu.



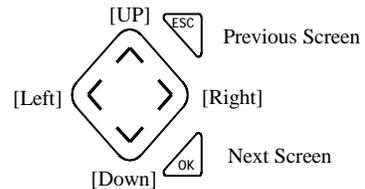
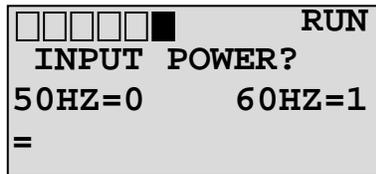
2. COMMUNICATIONS AND SETUP MENU

2.1. This is the title screen for the communications and setup menu. Press [OK].

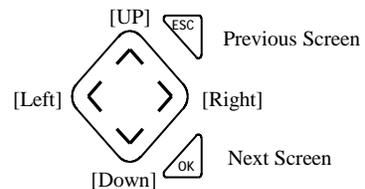
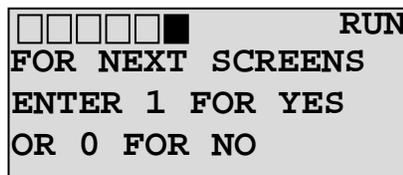


Note: When you are on a title screen (main menu or communications & setup) you can toggle between the two title screens by pressing [ESC].

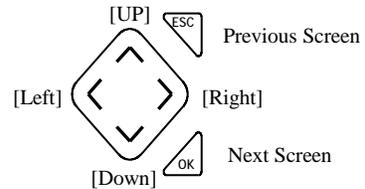
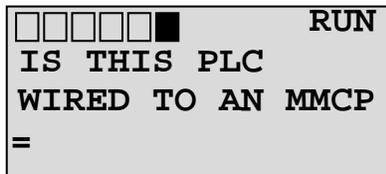
2.2. Some countries provide electrical power at different frequencies. You must tell the *PLC* what frequency is being provided. Enter a 0 will for 50Hz or a 1 for 60Hz. Press [OK].



2.3. The next few screens will ask questions that need to be answered as yes or no. This *PLC* only accepts numeric values, so you have to Enter a 1 for yes and a 0 for no. Press [OK].

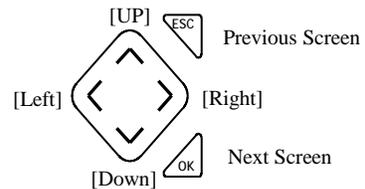
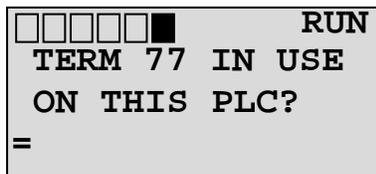


2.4. If this panel is hardwired to an *MMCP* enter a 1, otherwise enter 0. This input will tell the *PLC* whether you want it to operate as a local *OCF* (hardwired to *MMCP*) or remote *OCF* (Ethernet connection only). Press [OK]



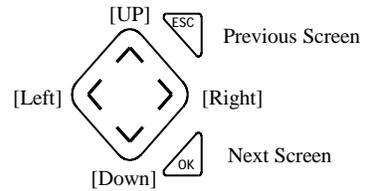
2.5. ****If you answered no in 2.4, skip to 2.8.****

Terminal 77 is the feedback from the power supply in the *MMCP* to the *PLC*. This tells the *PLC* if there is power on at the *MMCP*. If you did not connect a field wire to terminal 77, or if this is an older panel that does not have terminal 77, enter 0/NO. If terminal 77 is wired up in both the *OCF* and *MMCP*, then answer this question with a 1/YES. Press [OK]



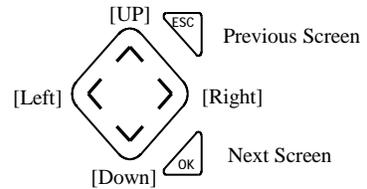
2.6. Is this PLC paired with a remote? Enter 1 for yes and 0 for no. Press [OK].

□	□	□	□	□	■	RUN
THIS PLC PAIRED						
WITH A REMOTE?						
=						



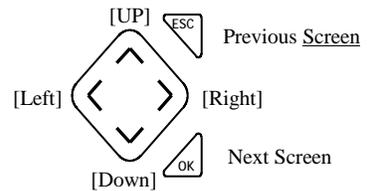
2.7. Is this PLC paired with an RF panel (radio control panel)? Enter 1 for yes and 0 for no. Press [OK].

□	□	□	□	□	■	RUN
THIS PLC PAIRED						
WITH AN RF?						
=						



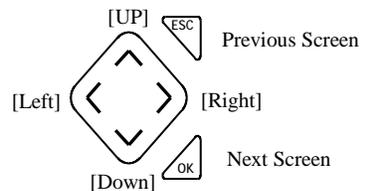
2.8. Enter the *local address* (last two digits of the IP address) of the PLC that is wired to an *MMCP* and is paired with this remote.

□	□	□	□	□	■	RUN
WHAT PLC IS						
WIRED TO MMCP						
=						

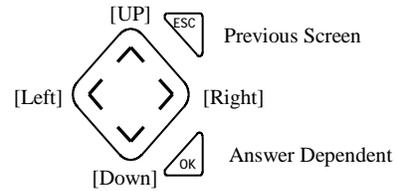
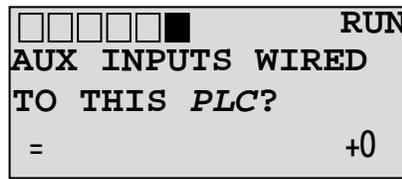


2.9. Enter the *local address* (last two digits of the IP address) for this *PLC*. Press [OK]

□	□	□	□	□	■	RUN
ENTER THIS PLC'S						
LOCAL ADDRESS						
=						+00099

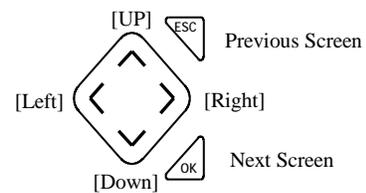
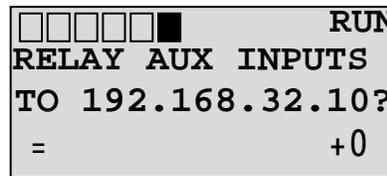


2.10. This screen is asking if any Aux inputs are wired to this PLC. Aux inputs would be connected to terminals 73, 74, 75, or 76. If any of these terminals have field wires connected, answer this screen with a 1 for yes, or 0 for no. Press[OK]



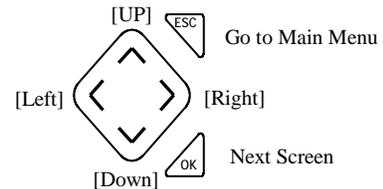
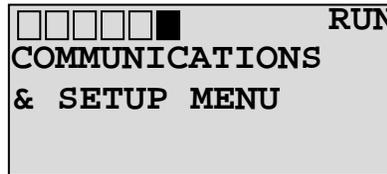
If you answered no, you have completed the communications setup, move to 3 Main Menu. If yes, go to next screen.

2.11. For the next several screens, you will be asked the same “relay aux inputs to” question repeatedly, but with a different IP address in each question. Answer yes when the IP address is for a PLC that you want to receive and mimic the auxiliary inputs sent to it. Press [OK].



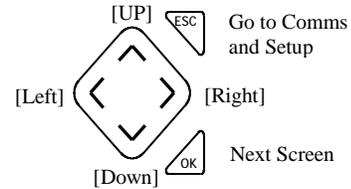
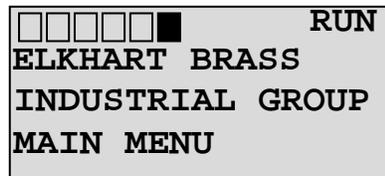
After answering all questions with yes or no, you will be directed back to the communication and setup title screen.

2.12. Title screen for Communications and Setup Menu. Press [ESC] to return to the Main Menu.



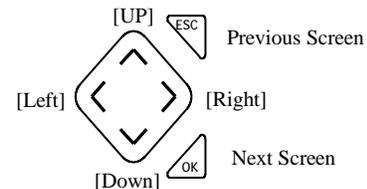
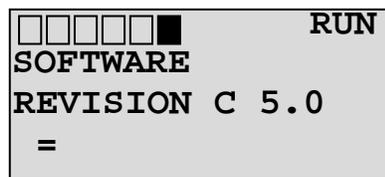
3. MAIN MENU

3.1. Title screen for Main Menu. Press [OK].

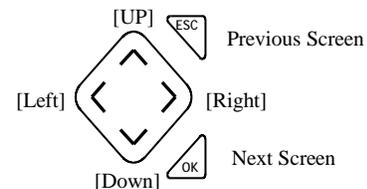
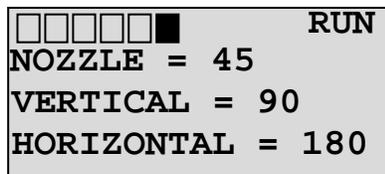


Note: When you are on a title screen (main menu or communications & setup) you can toggle between the two title screens by pressing [ESC].

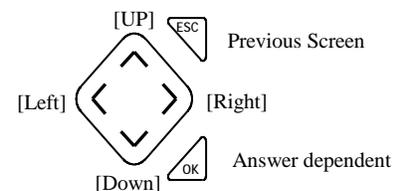
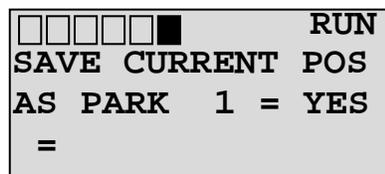
3.2. This displays the software revision (read only). Press [OK].



3.3. These are the current positions (degrees) of the monitor and nozzle and will update as the monitor is moved (read only). **These positions will be incorrect until the monitor is parked the first time.** Press the park button now, the green light will flash and the park sequence will begin. The park function will take less than two minutes. During this time the monitor will move until each axis reaches a hard stop and will make a grinding noise, which is normal. After the hard stops are found, it will return to its park angles set in the program. The park sequence is complete when the park light goes solid green. Press [OK].



3.4. The monitor is usually parked so that it is directed at a specific target, and the nozzle is configured at the correct spray angle, so that it is ready to fight an anticipated fire. Park positions can be entered manually in the upcoming screens but the easier way is to move the monitor and nozzle with the joysticks until it is properly aimed and the nozzle configured. Then answer this question with a Yes/1, and the current positions for all three axes will automatically become the park positions. Skip to oscillate angle if answered Yes/1. If you answer with No/0, you will be asked to enter each park position manually in upcoming screens. Press [OK]



*If Yes/1, go to 3.9
If No/0, go to next screen*



VII. SPECIFICATIONS

Operator Control Panel (*OCP*) Features:

- **Construction** – 316 Stainless Steel enclosure rated for Hazardous Location (Class I, Division 2).
- **Compliance** – (NFPA 70) NEC: 2008, Article 501 – Class I, Groups “B, C, and D,” Division 2 and Article 505 – Class I, Zone 2, AEx nA IIC T3 requirements; UL Labeled.
- **Control Power** – I/O (On/Off) 2-Position selector switch.
- **Pilot Lights** – Power On, Water Valve Open, Aux. Device On or Foam Valve On, Parked, and Oscillation On functions.
- **Internal Power** – 24 VDC Power Supply for controls.
- **Controls** – NEMA 4 (IP-66) controls. Joystick controls for monitor and nozzle movement (UP, DOWN, LEFT, RIGHT, STRAIGHT STREAM, and FOG) and pushbutton controls for Park, Oscillation ON/OFF, Water Valve OPEN/CLOSE and Aux. (Auxiliary) Device ON/OFF or Foam Valve OPEN/CLOSE.
- **Conduit Knockouts, Hubs, and external wiring** – Supplied by others.
- **All incoming panel power, disconnect means, and lockout devices** – Supplied by others.

General Specs

- | | | |
|-------------------------------|--|--|
| • Input Power | 120/240 VAC (50/60Hz.) 1 Phase
240 VA max. power | } Power converts to 24
VDC in control panel |
| • Electrical Load | 2 AMPS MAX | |
| • Panel Dimensions | 24” x 36” (610mm x 914mm) – Dual <i>OCP</i>
20” x 24” (508mm x 610mm) – Single <i>OCP</i> | |
| • Panel Weights | Approx. 100 lbs. (45 kg) – Dual <i>OCP</i>
Approx. 80 lbs. (36 kg) – Single <i>OCP</i> | |
| • Operating Temperature Range | +14°F to +140°F (-10°C to +60°C) | |

UL Product Marking

- UL Listed and Labeled (Class I, Division 2)

VIII. TROUBLESHOOTING

<i>OCP</i> SYSTEM	
Symptom	Solution
Remote <i>OCP</i> not controlling the correct <i>monitor</i> , or any <i>monitor</i> .	<ul style="list-style-type: none"> • Check the IP Address that was set up in the communication & setup menu. • Check that all IP addresses are unique in the networked system. • Check that all cable connections are present and are secured. • Check that the local <i>OCP</i> and <i>MMCP</i> are powered up.
Local <i>OCP</i> not controlling the <i>monitor</i> .	<ul style="list-style-type: none"> • Check that the <i>MMCP</i> Power On light is on (illuminated). • Check that the value entered in section VI 2.4, is 1. • Check that the proper wiring connections have been made to the correct <i>MMCP</i>. • Check the <i>MMCP</i> manual troubleshooting section.
Motor relays chattering, motors stutter while moving.	<ul style="list-style-type: none"> • Two <i>OCPs</i> are configured as remotes to the same local <i>OCP</i>.
Unable to see the User Display Menu to make program changes.	<ul style="list-style-type: none"> • Cycle power and the <i>PLC</i> will automatically revert to the Elkhart Brass menu.
Joysticks or Pushbuttons are not functioning correctly	<ul style="list-style-type: none"> • Check the contact block for loose wiring. • Check for correct operation of the contact block.
Motor direction erratic and motor torque low – able to stop monitor with little effort	<ul style="list-style-type: none"> • Check wiring between <i>MMCP</i> and monitor - COMMON wire was switched with Winding wire
Nozzle cable gets caught	<ul style="list-style-type: none"> • Check cable routing and slack
Monitor physical position does not agree with the Position Data on the <i>LCD</i>	<ul style="list-style-type: none"> • Section VI. 2.2 was answered incorrectly. • The monitor was moved manually by using the hand wheels.
Unable to close the water valve.	<ul style="list-style-type: none"> • Make sure that there is not a jumper between terminals 10 and 14 in the <i>MMCP</i> • Check for correct wiring between the valve and the <i>MMCP</i> – reference the valve and <i>MMCP</i> interconnect drawings and manuals if needed.
Unable to turn off the auxiliary device.	<ul style="list-style-type: none"> • Make sure that there is not a jumper between terminals 15 and 19 in the <i>MMCP</i> • Check for correct wiring between the valve and the <i>MMCP</i> – reference valve and <i>MMCP</i> the interconnect drawings and manuals if needed.

 **Warning: Do not attempt to disconnect or work on any electrical equipment in this system unless power is removed or the area is known to be non-hazardous.**

INDICATOR LIGHTS	
Power On indicator light does not come on when the switch is in the I (On) position	With the power turned 0 (Off) <ul style="list-style-type: none"> • Check for burned out bulb • Check power fuses F1 and F2
Oscillate Light continually flashes	<ul style="list-style-type: none"> • This is an indication that the <i>MMCP</i> has power turned off or the internal power supply has failed
If the park light does not flash during parking or turn solid after parking.	<ul style="list-style-type: none"> • Check for a burned out bulb
At the local <i>OCP</i> with water or foam flowing out of the nozzle and the Foam or Auxiliary Device or Water Valve Opened light is not on	<ul style="list-style-type: none"> • Check for a burned out bulb • Check for correct feedback wiring from the valve actuator and the <i>MMCP</i>
At the remote <i>OCP</i> with water flowing out of the nozzle and the Water Valve Opened light is not on	<ul style="list-style-type: none"> • Check for a burned out bulb • Check that the jumper is in place at terminals 67 to 71
At the remote <i>OCP</i> with foam flowing out of the nozzle and the Foam Valve Opened or Auxiliary Device ON light is not on	<ul style="list-style-type: none"> • Check for a burned out bulb • Check that the jumper is in place at terminals 69 to 72
At the local <i>OCP</i> with a monitor oscillating the indicator light is not on	<ul style="list-style-type: none"> • Check for a burned out bulb • If two Local <i>OCP</i>'s are connected to one <i>MMCP</i>, oscillate will only illuminate on the panel that had the oscillate button activated. This connection is not recommended.
At the remote <i>OCP</i> with a monitor oscillating the indicator light is not on	<ul style="list-style-type: none"> • Check for a burned out bulb

Please refer to our website at www.elkhartbrass.com for any further information. Any problems that cannot be fixed/solved should be taken to your Elkhart Brass Representative.

ERROR MESSAGES

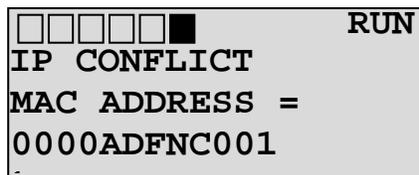
IP Conflict means that two or more *PLC*'s have the same IP address. To resolve this error, follow the steps below.

Identify the two *PLC*'s that are affected. Each *PLC* that has a duplicated IP address will have the IP conflict message on its screen. One of those IP address will need to be changed to resolve this error. Unplug the Ethernet cable from the *PLC* A. This is the one that will keep its IP address.

Cycle power to *PLC* B, the one that is going to be changed. On power up, the error message should have gone away.

Change the IP address in *PLC* B, to one that has not been used from the table in section VI.

Cycle power to both *PLC*s and then plug the Ethernet cable back in.



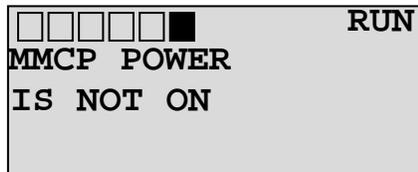
MMCP power is not on - Oscillate light is flashing; means there is no power on terminal 77 of the local *OCP*. To resolve this error, follow the steps below.

Check to see if the *MMCP* power pilot light is on, located on the door of that panel.

If off, check for blown fuses in the *MMCP* (main power or DC power). Refer to the *MMCP* manual for these fuses.

If terminal 77 is not field wired, or if the terminal does not exist (older panel). Refer to section VI Configuration & Setup, paragraph 2.5 and change the answer to no/0.

Pressing [OK] will silence this message for 1 hour and it takes you back to the main menu but it does not fix the problem.



Communication Error message is triggered when the remote panel sends information to the local panel, and the local panel has not received it. Possible causes are:

The remote panel is not powered up.

Incorrect answer to question 2.9.

An Ethernet cable is unplugged or damaged.

A router in the network is damaged or not powered up. Depending on the network configuration (star, ring, etc.), the damaged router could be in a panel other than the local *OCP* or the remote *OCP*.

When the error is resolved, cycle power.



Communication Error message is triggered when the remote panel sends information to the local panel has not received. Possible causes are:

The RF panel is not powered up.

Incorrect answer to a question in the RF configuration & setup.

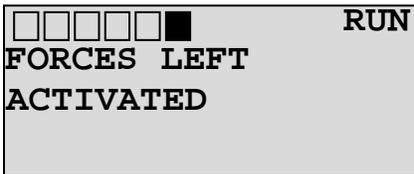
An Ethernet cable is unplugged or damaged.

A router in the network is damaged or not powered up. Depending on the network configuration (star, ring, etc.), the damaged router could be in a panel other than the local **OCP** or the remote **OCP**.

When the error is resolved, cycle power.

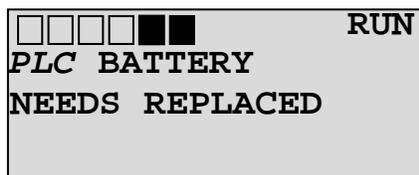


Forces left activated indicates that a service technician/programmer used a feature that bypasses some portion of the program. If this warning appears the program may not operate as intended. Contact your technician/programmer. Pressing [OK] will acknowledge this message and take you back to the main menu. **Acknowledging the message does not fix the problem.**



PLC battery needs replaced. The **PLC** battery powers both the **PLC** memory that stores the program and the real time clock. If this message is displayed, you will soon be in jeopardy of losing the program or having incorrect time functions if power is interrupted. When the controller's Battery Low (Bat Lo) indicator is lit, the **LCD** screen will display this message. When the indicator turns on, it means that either the battery is disconnected, or that the battery requires replacement. The controller is designed to operate for up to 2 weeks without power, from the time the indicator first turns on. We recommend that you replace the battery immediately when the indicator turns on. Contact Elkhart Brass for a replacement battery. Replacement battery P/N 18503000. To avoid program and settings being erased, the battery must be replaced while the PLC is powered on. Batteries may also be obtained from your local Allen Bradley distributor.

Bat Lo



IX. MAINTENANCE

Monthly Inspection and Maintenance

1. Check all terminal blocks and connections for being properly taut to 4.5 – 7.1 in-lbs (0.508 – 0.802 Nm).
2. Check all contact blocks and operators for functionality. If there are loose connections tighten them. If a contact block is not functioning properly, replace it.
3. Check all light bulbs on outside of the panel. If any are burnt out, replace the bulb.
4. Check for proper operation of system overall. Please refer to the Troubleshooting section if you are experiencing problems.
5. Park the monitor on a regular basis, once per week. This will keep the grease distributed and improve the life of the monitor.

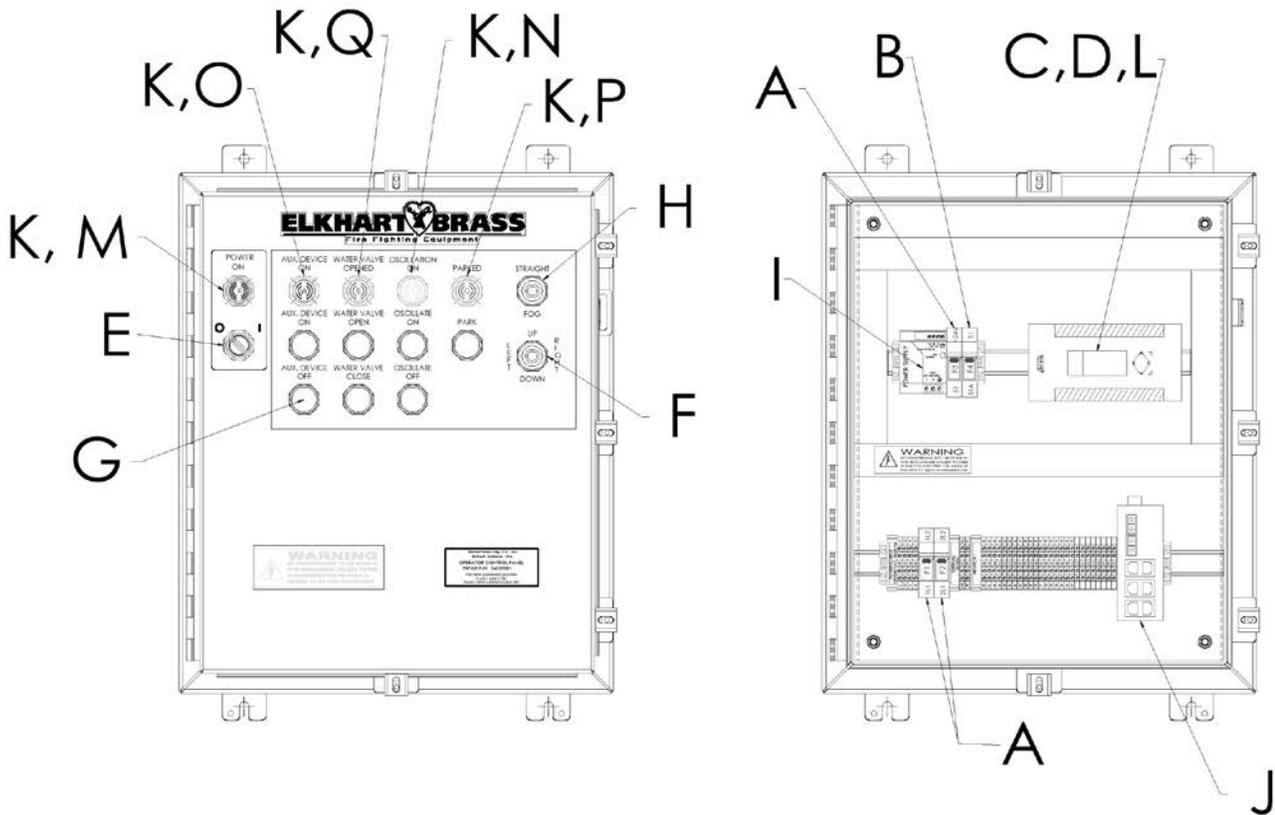
Fuse Chart

FUSE CHART				
Main Power	F1	F2	F3	F4
All Voltage Configurations	FNQ-R-5	FNQ-R-5	FNQ-R-5	FNQ-R-3

**For custom panels, refer to the label in the panel for the correct fuse size.

 **Attention:** When cycling the monitor through the motions (up, down, left, right, fog, straight), be sure to exercise the system a minimum of 2 (two) complete cycles. This will help redistribute the grease inside the monitor for improved operation and extended durability.

X. SPARE PARTS DIAGRAM/LIST



Operator Control Panel - P/N's 243590000, 24359001, and Similar Panels		
Part No.	Description	
A	59079130	Fuse - Class CC (5-Amp Time-Delay) Rejection Type
B	32233150	Fuse - Class CC (3-Amp Time-Delay) Rejection Type
C	28249000	AB Micro-Logix 1400 PLC (w/o program)
D	59079093	AB Micro-Logix 1400 PLC (w/ program)
E	59079211	Switch Contact Block AB #800TC-XAF (Explosion Protected) (Power)
F	59079090	Switch Contact Block AB #800T-XAR (Logic Reed) (Monitor JS)
G	59079100	Switch Contact Block AB #800T-XD1R (Logic Reed) (PB)
H	59079170	Switch Contact Block AB #800T-XD2R (Logic Reed) (Nozzle JS)
I	52955000	Power Supply 24VDC - 4.2 Amps (Single Phase Input)
J	65761000	N-Tron - Multimode Managed Switch
K	18455000	Bulb - Indicator Universal (LED) White
L	18503000	PLC Battery
M	44435000	Pilot light lens in Red
N	44435010	Pilot light lens in Amber
O	44435020	Pilot light lens in White
P	44435030	Pilot light lens in Green
Q	44435040	Pilot light lens in Blue

XI. GLOSSARY

LCD (Liquid Crystal Display)



This is the message and data input screen on the *PLC*.

MMCP (Monitor Motor Control Panel) –



This panel serves as both a motor control panel and a relay panel for valves and other outputs. This panel is hardwired to the monitor and the local *OCP*. It only has a power On/Off switch and a power ON indicator light on its door.

Monitor (with nozzle)



This is the assembly of the nozzle, motors, hand wheels, and plumbing.

OCP (Operator Control Panel)



An *OCP* is a panel that has the push buttons and joysticks for controlling the monitor. There are two versions of this panel. A dual control version that operates two monitors, (left photograph); and a single control panel which operates only one monitor, (right photograph). See detail drawings on page 10.

OCP's can be configured by the user to operate as local or remote *OCP*'s. Every system will have an *OCP* that is configured as a local *OCP* for each monitor. It is given the term local because it is located nearest the monitor. The local *OCP* is hardwired to the *MMCP*.

Some system may also have one remote *OCP*'s pre monitor (*OCP* configured to remotely control the monitor via Ethernet). These panels can be located a greater distance away from the monitor because they do not need to be hardwired to the *MMCP*. Remote *OCP*'s connect to the local *OCP* with only an Ethernet connection. They operate exactly like a local *OCP*.

PLC (Programmable Logic Controller) –



This is the computer that controls the actual operation of the individual monitors along with the communication to the other monitors in the network. The *PLC* is located inside the *OCP*.

XII. ENGINEERING CHANGE REVISION EXPLANATIONS

Revision REL – ECN 151005

- Release for Production

Revision A – ECN 151210

- Revised for software version C5

Revision B – ECN 160202

- Added fuse chart to maintenance section

Revision C – ECN 170101

- Title Page
 - Title was, “Setup Instructions”.
 - Added, “and Similar Panels”
- Table of Contents
 - Added “Parts Diagram/List”
 - Renumbered Subsequent Sections
- Section IX
 - Revised fuse chart to remove redundant information.
- Section X
 - Formerly Glossary. Added Parts Diagram/List as Section X.
- Section XI
 - New section number for Glossary
- Section XII
 - Engineering Change Revision Explanations section was formerly unnumbered.

Revision D – ECN 170705

- Title Page
 - Added software revision range to reflect rev. C6.1