

# UNIBODY™

## UBEC 1S & UBEC 1C Valve Controllers Installation, Operating, & Maintenance Instructions



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To view the most current parts list, drawings, or demonstrations of common EXM commands,  
please visit [www.elkhartbrass.com](http://www.elkhartbrass.com)

## PRODUCT SAFETY INFORMATION

- All personnel who may be expected to use this equipment must be thoroughly trained in its safe and proper use.
- Become thoroughly familiar with the hydraulic characteristics of this equipment.
- Always open and close water valves slowly so that piping fills slowly, thus preventing possible water hammer occurrence.
- After each use, and on a scheduled basis, inspect equipment for damage and proper function.
- Keep fingers and hands clear of moving parts.
- Disconnect power before servicing any electric valve or electric valve controller.
- Use only mild dish soap & water with a soft cloth to clean the controller. Do NOT pressure wash/rinse. Low pressure rinse only.
- Any modifications to the electrical enclosures will destroy the NEMA 4 rating and void warranty coverage of the enclosure and all components within.



**Important: Before installing and operating provided equipment, read this manual thoroughly. Proper installation is essential to safe operation.**

### SYSTEM INFORMATION:

CONTROLLER SERIAL NUMBER: \_\_\_\_\_

CONTROLLER DETAILS OR NOTES:

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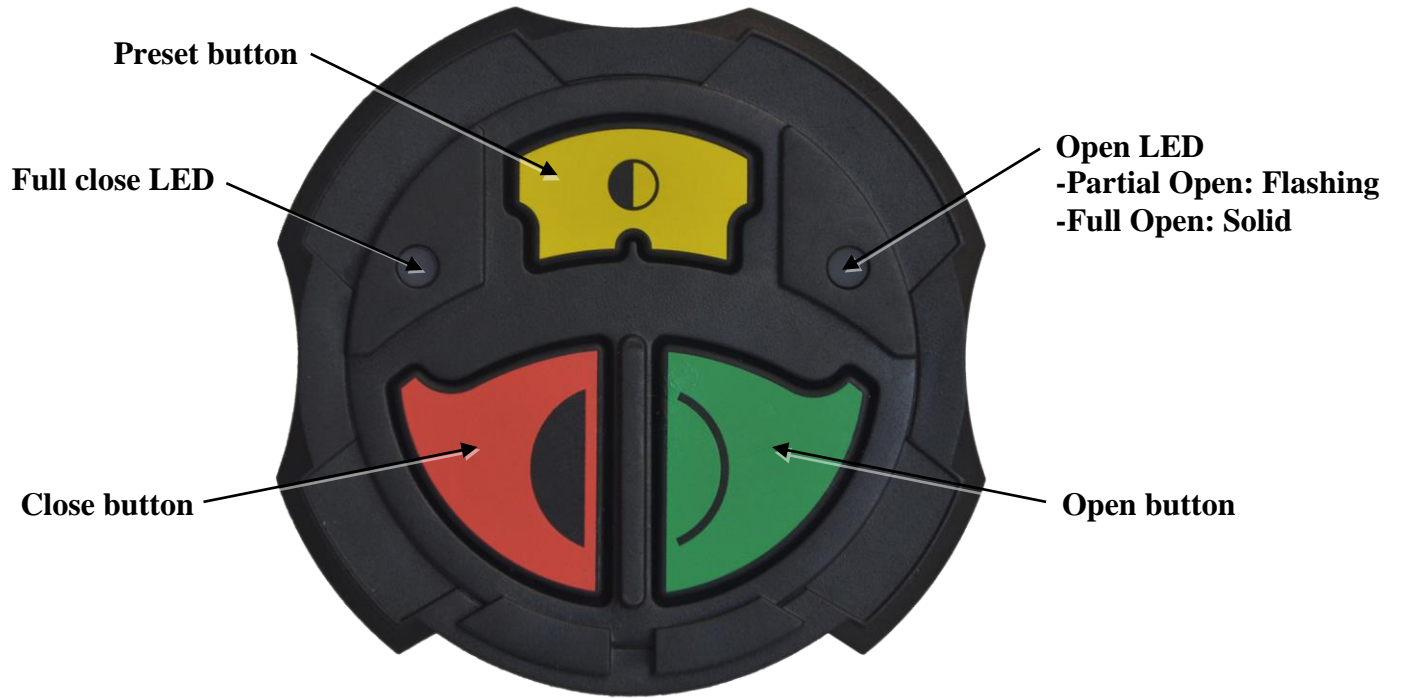
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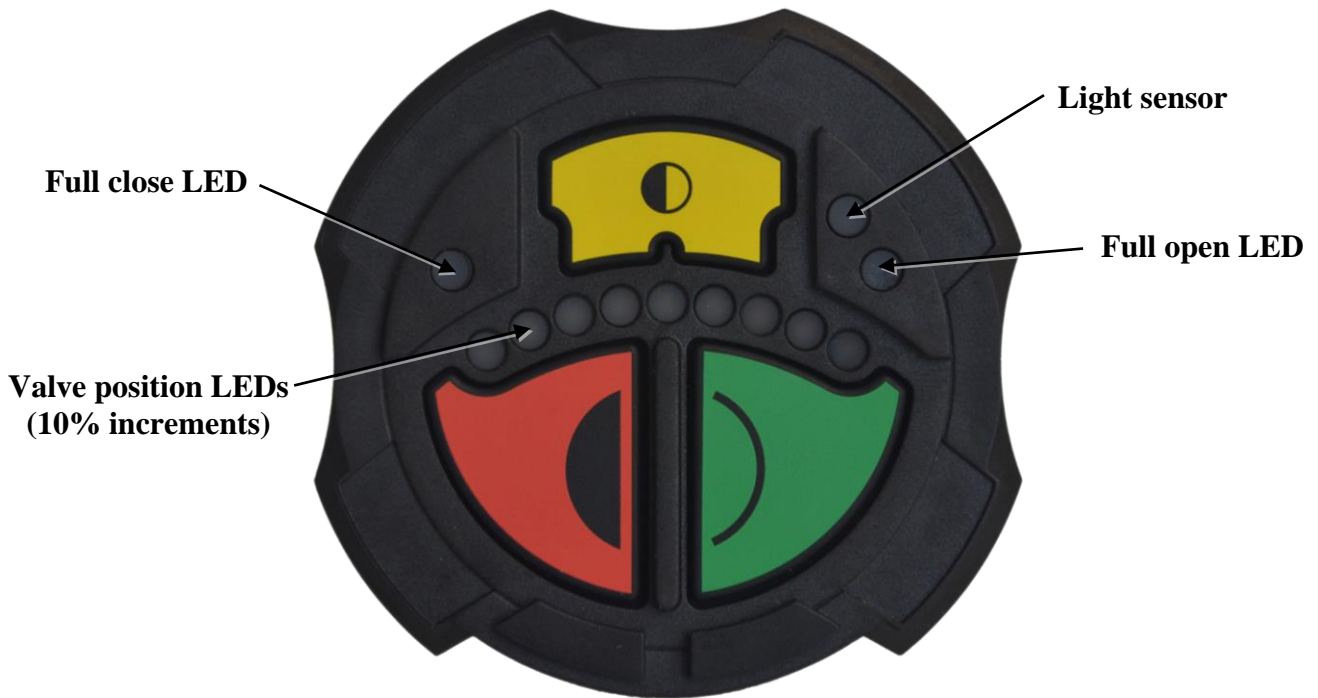
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UBEC 1S Callout



UBEC 1C Callout

## OVERVIEW

Designed with precision in mind, the UBEC 1S and 1C electric valve controllers and integrated LED displays are easy to operate. All controls and indicators are located on the front of the controller. Controls are simple push button style controls. Both controllers are compatible with E3F and E5F electric valve actuators.

See the *Unibody Controller to Actuator Compatibility Guide* on the Elkhart Brass website for recommended Unibody valve and controller compatibility options.

## CONTROLLERS

### UBEC 1S and 1C –

The UBEC 1S and 1C are two operator control devices for use with Unibody valves configured with E3F and E5F electric actuators. Both the 1S and 1C feature extremely compact surface mount housings with large, positive tactile feedback snap buttons for confident gloved operation.

Being surface mount, UBEC 1S/1C promote the ability to locate valve controls in tight spaces or on surfaces without requiring the need for much space behind the panel.

### UBEC 1C

- CAN J1939 communication to Unibody valve using E3F/E5F
- 10 segment, absolute valve position feedback display
- Automatic valve position calibration
- OPEN, CLOSE, and programmable PRESET buttons
- Auto-travel open and close
- Programmable LED intensity
- Automatic adjusting day/night LED intensity
- Datalink interface simplifies wiring between controller & valve

### UBEC 1S

- Direct wire connection to Unibody valve using E3F/E5F
- Full open, full close, and intermediate position feedback
- Automatic valve position calibration
- OPEN, CLOSE, and programmable PRESET buttons
- Auto-travel open and close



UBEC 1C (08899152)



UBEC 1S (08899151)

## INSTALLATION INSTRUCTIONS

### Installation Overview:

- Step 1 – Mounting the Controller
- Step 2 – Wiring the Controller
- Step 3 – Automatic Valve Position Calibration



**Important: Refer to Unibody Manual 98311000 for valve installation instructions when installing a Unibody Valve(s) with an E3F actuator (E5F actuator if valve is an EB6D).**

### Installation Step 1: Mounting the Controller

#### UBEC 1S and UBEC 1C

- UBEC 1S and UBEC 1C controllers are surface mountable. Therefore, only mounting screw holes and wire clearance holes are necessary for installation. Measure and mark mounting location for wire clearance cutout and mounting screw holes. Make sure there is room for the controller on the panel before cutting the holes. Please refer to layout on page 19.
- Drill or cut the 1-1/8" wire clearance hole and the clearance holes for #8-32 mounting screws.
- Place the control module in position and secure with #8-32 mounting screws. It is recommended that lock washers are used on the back side of the panel to ensure the mounting screws do not loosen. Maximum thread engagement from the back of the controller is 7/16", the minimum recommended engagement is 5/16".
- Connect the wiring for your system (see Wiring section) and secure the wiring in place.

### Installation Step 2: Wiring the Controller

#### Wiring Recommendations

- UBEC 1S – All wiring: Cross Link or equivalent (Must meet or exceed NFPA 1901 Section 13). Wire gauge: 18 AWG up to 150 ft. (45.7 m)
- UBEC 1C – Power & Ground wiring: Cross Link or equivalent (Must meet or exceed NFPA 1901 Section 13). Wire gauge: 18 AWG up to 150 ft. (45.7 m)
- UBEC 1C – CAN wire gauge/length: 22 AWG or larger up to 131 ft. (40 m)

#### Wiring Unibody Valve(s) with an E3F actuator (E5F actuator if valve is an EB6D)

- Connect power and ground to supply (12 or 24 VDC). Red +(Pos) & Black -(Neg)  
Powered by 12V – units are rated for 18A. Peak 24A. Fuse should be 30A.  
Powered by 24V – units are rated for 10A. Peak 18A. Fuse should be 20A.
- Connect controller wiring for your valve based on model of controller and the number of controllers used.

#### Wiring UBEC 1S Controller(s)

- For a single UBEC 1S controlling one valve. Connect power and ground (12v or 24v) to the controller. Use 1 amp fuse for 12v (0.5 amp for 24v) on positive controller leads. Connect valve

function leads from the controller to the valve using Deutsch p/n 0462-201-16141 female contacts. See Wiring Diagrams on page 8 for contact positions and wire colors for the UBEC 1S.

- For a two UBEC 1S controllers controlling one valve the builder would be responsible for providing sealed connections for the leads of like valve functions from each controller into a single lead going to the E3F or E5F actuators. In this set up the UBEC 1S controllers would all be secondary controllers and neither would be able to override the other. Connect power and ground to the controllers. Use 1 amp fuse for 12v (0.5 amp for 24v) on positive controller leads. Connect valve function leads from the controllers to the valve using Deutsch p/n 0462-201-16141 female contacts. See Wiring Diagrams on page 8 for contact positions and wire colors for the UBEC 1S.

## Wiring UBEC 1C Controller(s)

### For a single UBEC 1C controlling one valve:

- Connect power and ground to the controller. Use 1 amp fuse for 12v (0.5 amp for 24v) on positive controller leads.
- Connect CAN wiring from the UBEC 1C to the valve. See Wiring Diagrams on the following page for pin positions and wire colors for wiring a UBEC 1C.
- When done there should be continuity between the CAN LOW contacts (Green wires in connector position A), CAN HIGH contacts (Blue wires in connector position B), and CAN SHIELD contacts (Black wires in connector position C) throughout the entire CAN communication wiring harness.\*\*

### For two UBEC 1C controllers controlling one valve:

- Connect power and ground to the controllers. Use 1 amp fuse for 12v (0.5 amp for 24v) positive controller leads.
- Connect CAN wiring from the first UBEC 1C to a CAN Connector Kit (P/N 37221001) at the valve and then onto the second UBEC 1C.
- Connect the CAN wiring from the CAN Connector Kit to the valve. This CAN line must not exceed 3 ft. (1 m) (The CAN lead from the valve actuator will plug directly into one of the positions in the "Y" connector). The wire length from one UBEC 1C to the other should not exceed 131 ft. (40 m) when added together.
- When done there should be continuity between all CAN LOW contacts (Green wires in connector position A), CAN HIGH contacts (Blue wires in connector position B), and CAN SHIELD contacts (Black wires in connector position C) throughout the entire CAN communication wiring harness.\*\*
- Power up the controllers and valve and use programming code 34 to turn off the terminating resistor in the valve actuator. See Programming Mode section on page 12.
- In this set up both UBEC 1Cs would be secondary controllers and neither would be able to override the other.

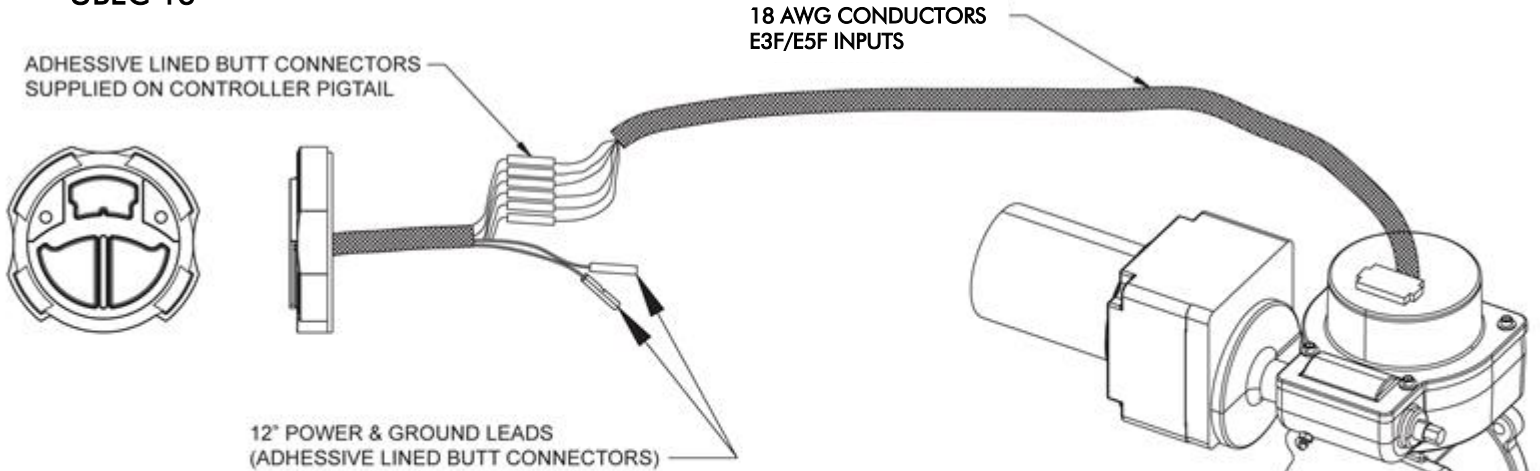


**Important: Power up the controller(s) and valve(s) and initiate Automatic Valve Position Calibration. See Installation Step 3 – Automatic Valve Position Calibration.**

\*\* CAN Shield (black wire connector position C) stops at valve connector

# Wiring Diagrams

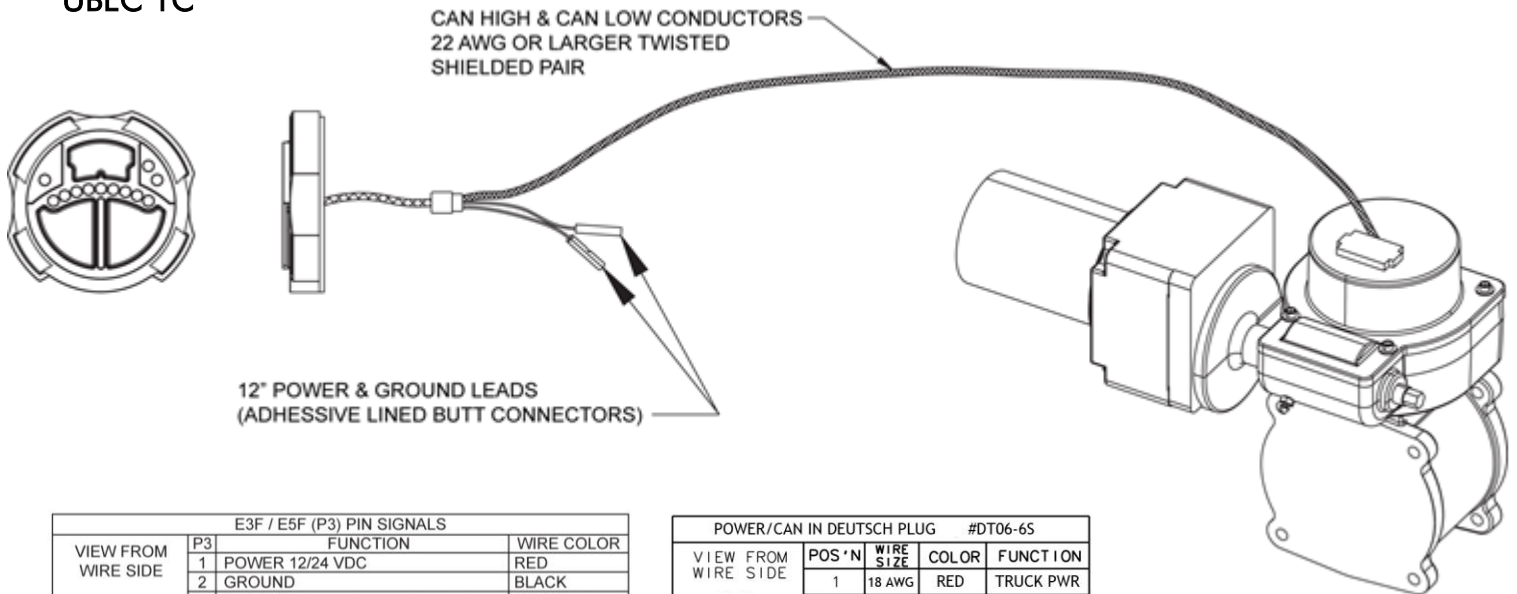
## UBEC 1S



**E3F Actuated Valve\*  
(E5F If Using EB6D)**

E3F / E5F (P3) PIN SIGNALS			
VIEW FROM WIRE SIDE	P3	FUNCTION	WIRE COLOR
	1	POWER 12/24 VDC	RED
	2	GROUND	BLACK
	3	INDICATOR LIGHT CLOSE (12 VDC)	WHITE
	4	INDICATOR LIGHT OPEN (GROUND)	GREEN
	5	AUTO CALIBRATE	PLUG
	6	VALVE CONTROL (-)	BLACK
	7	VALVE CONTROL (+)	RED
	8	CLOSE	BLUE
	9	PRESET	BROWN
	10	OPEN	ORANGE
	11	DATALINK CAN HIGH	PLUG
	12	DATALINK CAN LOW	PLUG

## UBEC 1C



**E3F Actuated Valve\*  
(E5F If Using EB6D)**

E3F / E5F (P3) PIN SIGNALS			
VIEW FROM WIRE SIDE	P3	FUNCTION	WIRE COLOR
	1	POWER 12/24 VDC	RED
	2	GROUND	BLACK
	3	INDICATOR LIGHT CLOSE (12 VDC)	PLUG
	4	INDICATOR LIGHT OPEN (GROUND)	PLUG
	5	AUTO CALIBRATE	PLUG
	6	VALVE CONTROL (-)	BLACK
	7	VALVE CONTROL (+)	RED
	8	CLOSE	PLUG
	9	PRESET	PLUG
	10	OPEN	PLUG
	11	DATALINK CAN HIGH	BLUE
	12	DATALINK CAN LOW	GREEN

POWER/CAN IN DEUTSCH PLUG #DT06-6S				
VIEW FROM WIRE SIDE	POS 'N	WIRE SIZE	COLOR	FUNCTION
	1	18 AWG	RED	TRUCK PWR
	2	18 AWG	BLACK	GROUND
	3	18 AWG	GREEN	CAN LOW
	4	18 AWG	BLUE	CAN HIGH
	5	18 AWG	BROWN	CAN SHIELD
	6			PLUG

\*Refer to Unibody manual P/N 98311000 for valve installation





**Important: All valves must have the position calibrated after installation.**

The automatic calibration routine has been incorporated to simplify the calibration of the position display to the open and closed positions of an E3F or E5F actuated valve. **These routines must be utilized so the position of the valve will be displayed accurately.**

### Automatic Valve Position Calibration for UBEC 1S

**Unibody valve models except EB\_J or EB\_S butterfly valves:**

1. Remove CAN wires from positions 11 & 12 in the 12 pin valve connector and replace them with 2 of the seal plugs that have been removed from other positions earlier.
2. Turn on power to the valve and controller(s).
3. Use the OPEN and CLOSE buttons to place the valve approximately 1/4 open.
4. Press and hold the CLOSE and PRESET or OPEN and PRESET buttons for 5 seconds. When the buttons are released the valve will start to move. The valve will travel to the closed position, calibrate the closed position, then move back to the open position, calibrate that position and then return back to the closed position and stop. The valve is now position calibrated.

**Unibody models EB-J or EB\_S butterfly valves: (These valves operate in reverse of all the others so the valve motor polarity must be reversed)**

The UBEC1S cannot be used with these valves.

### Automatic Valve Position Calibration for UBEC 1C

**Unibody model valves except for the EB\_J or EB\_S butterfly valves:**

1. Turn on power to the valve and controller(s).
2. Use the OPEN and CLOSE buttons to place the valve approximately 1/4 open.
3. Press and hold the CLOSE and PRESET or OPEN and PRESET buttons for 5 seconds, or until the valve starts to move, and release the buttons. The valve will travel to the closed position, calibrate the closed position, then move back to the open position, calibrate that position and then return back to the closed position and stop. The valve is now position calibrated.

**Unibody valve models EB\_J or EB\_S butterfly valves: (These valves operate in reverse of all the others so the controller and valve actuator must be programmed to reverse the valve motor polarity. Use the following program CODE 216 for reverse polarity)**

1. Press and hold the CLOSE button, then press and hold the OPEN button. After 5 seconds the red CLOSED LED will flash. Program code 216 can now be entered.
2. Use the OPEN button to set the first digit of the code 216, two green LEDs on. Each time the OPEN button is pressed the next LED will illuminate.



3. Press the CLOSE button to move the cursor to the next digit. Now all LEDs will be off and ready for the second digit to be entered. Press the OPEN button once, one green LED on.



- Press the CLOSE button to move the cursor to the next digit. All LEDs will be off. Press the OPEN button 6 times, six green LEDs on.



- After 3 seconds, the LEDs will indicate the valve type. One (1) LED is for a standard valve, two (2) LEDs are for a reverse valve.



- Press the OPEN button to change this setting so that there are 2 green LEDs on. If you go past 2 green LEDs just keep pressing the OPEN button until you are back to 2.



- Press and hold the PRESET button for 3 seconds to accept the setting and return to programming mode. All green LEDs will turn off and the red CLOSED LED will continue flashing to indicate that the controller has returned to programming mode. At this point let the controller 'time out'. After 10 seconds the red closed LED will quit flashing.

- Cycle power to the UBEC 1C controller.

- Press and hold the CLOSE button, then press and hold the OPEN button. After 5 seconds the red CLOSED LED will flash. Program code 411 can now be entered.

- Use the OPEN button to set the first digit of the code 411, four green LEDs on. Each time the OPEN button is pressed the next LED will illuminate.



- Press the CLOSE button to move the cursor to the next digit. Now all LEDs will be off and ready for the second digit to be entered. Press the OPEN button once, one green LED on.



- Press the CLOSE button to move the cursor to the next digit. All LEDs will be off. Press the OPEN button one time again, one green LED on.



- After 3 seconds all of the green LEDs will turn on.



- Press and hold the PRESET button for 5 seconds or until all of the green LEDs turn off to accept the setting and return to programming mode. The red CLOSED LED will continue flashing to indicate that the controller has returned to programming mode. At this point let the controller 'time out'. After 10 seconds the red closed LED will quit flashing.

- Cycle power to the UBEC 1C controller and the valve.

- Press and hold the CLOSE and PRESET or OPEN and PRESET buttons for 5 seconds, or until the valve starts to move, and release the buttons. The valve will travel to the closed position, calibrate the closed position, then move back to the open position, calibrate that position and then return back to the closed position and stop. The valve is now position calibrated.

## PROGRAMMING MODE (UBEC 1C ONLY)

Programming mode allows the user to customize some default setting on the controller. When in programming mode the position LED's are used to set the control and display module to the desired settings.

**NOTE: The valve must be closed and the red CLOSED LED must be on to enter program mode.**

### Entering and Exiting Program Mode

Press and hold the CLOSE button, then press and hold the OPEN button. After 5 seconds the red CLOSED LED will flash. A program code can now be entered.

To exit program mode simply let the controller 'time out' by not pressing any buttons for 10 seconds. The red CLOSED LED will return solid when programming mode has been exited.

### Daytime LED Intensity (CODE 318)

**NOTE: You must be in programming mode with the red CLOSED LED flashing to make changes.**

1. Use the OPEN button to set the first digit of the code 318, three green LEDs on. Each time the OPEN button is pressed the next LED will illuminate.



2. Press the CLOSE button to move the cursor to the next digit. Now all LEDs will be off and ready for the second digit to be entered. Press the OPEN button once, one green LED on.



3. Press the CLOSE button to move the cursor to the next digit. All LEDs will be off. Press the OPEN button eight times, eight green LEDs on.



4. After 3 seconds all the LEDs will turn on at the current brightness level. Use the OPEN and CLOSE buttons to scroll through the intensity levels.
5. Once chosen, press and hold the PRESET button for 3 seconds to accept the setting and return to programming mode. All green LEDs will turn off and the red CLOSED LED will continue flashing to indicate that the controller has returned to programming mode. At this point programming mode can be exited by letting the controller 'time out' after 10 seconds.
6. All the LEDs will flash if there was a problem exiting programming mode. Press any button to cancel the warning, or let the controller 'time out' after 10 seconds. The red CLOSED LED will return to solid.

### Nighttime LED Intensity (CODE 317)

Follow instructions from the Daytime LED Intensity setup to set a Nighttime LED Intensity level. Only press the button seven times in step three to enter the code 317 instead of 318.

## Valve Configuration Transfers

**NOTE: You must be in programming mode with the red CLOSED LED flashing to make changes.**

The valve configuration transfer codes enable the user to transfer information from a UBEC1C to an E3F or E5F actuator or vice versa. The valve polarity can be transferred using this function.

### Transfer Information from UBEC 1C to E3F or E5F (CODE 411)

1. Use the OPEN button to set the first digit of the code 411, four green LEDs on. Each time the OPEN button is pressed the next LED will illuminate.



2. Press the CLOSE button to move the cursor to the next digit. Now all green LEDs will be off and ready for the second digit to be entered. Press the OPEN button once, one green LED on.



3. Press the CLOSE button to move the cursor to the next digit. All green LEDs will be off. Press the OPEN button one time again, one green LED on.



4. After 3 seconds all of the green LEDs will turn on.



5. Press and hold the PRESET button for 5 seconds or until all of the green LEDs turn off to transfer the setting(s) and return to programming mode. The red CLOSED LED will continue flashing to indicate that the controller has returned to programming mode. At this point let the controller 'time out'. After 10 seconds the red closed LED will quit flashing.

### Transfer Information from E3F or E5F to UBEC 1C (CODE 412)

1. Use the OPEN button to set the first digit of the code 412, four green LEDs on. Each time the OPEN button is pressed the next LED will illuminate.



2. Press the CLOSE button to move the cursor to the next digit. Now all green LEDs will be off and ready for the second digit to be entered. Press the OPEN button once, one green LED on.



3. Press the CLOSE button to move the cursor to the next digit. All green LEDs will be off. Press the OPEN button two times, two green LEDs on.



4. After 3 seconds all of the green LEDs will turn on.



5. Press and hold the PRESET button for 5 seconds or until all of the green LEDs turn off to transfer the setting(s) and return to programming mode. The red CLOSED LED will continue flashing to indicate that the controller has returned to programming mode. At this point let the controller 'time out'. After 10 seconds the red closed LED will quit flashing.

## Setting the Valves Terminating Resistor ON or OFF (CODE 34)

**NOTE: You must be in programming mode with the red CLOSED LED flashing to make changes.**

1. Use the OPEN button to set the first digit of the code 34, three green LEDs on. Each time the OPEN button is pressed the next LED will illuminate. Press the OPEN button three times, three green LEDs should be on.



2. Press the CLOSE button to move the cursor to the next digit. Now all green LEDs will be off and ready for the second digit to be entered. Press the OPEN button four times, four green LEDs should be on.



3. After 3 seconds the green LEDs will show the setting for the terminating resistor. All green LEDs lit up indicate the terminating resistor is ON, no green LEDs lit indicate it is OFF. Use the OPEN button to change the setting.
4. Once the correct setting is chosen, press and hold the PRESET button for 5 seconds to accept the setting. The green LEDs will turn off (if on) and the red CLOSED LED will continue to flash to indicate that the controller is still in programming mode. At this point let the controller 'time out'. After 10 seconds the red closed LED will quit flashing.
5. All the LEDs will flash if there was a problem exiting programming mode. Press any button to cancel the warning, or let the controller 'time out' after 10 seconds. The red CLOSED LED will stop flashing.

## OPERATING INSTRUCTIONS

### UBEC 1S

On power-up the controller will be in the normal operating mode. The green OPEN, red CLOSE, and yellow PRESET buttons will control the valve position. The red LED will be on when the valve is in the fully closed position. The green LED will flash when the valve is in an intermediate position between full open and full closed. The green LED will be solid when the valve is in the fully open position. Once a preset position has been programmed, pressing the PRESET button will move the valve to that position.

### UBEC 1C

On power-up the controller will be in the normal operating mode. The green OPEN, red CLOSE, and yellow PRESET buttons will control the valve position. The red LED will be on when the valve is in the fully closed position. The 10 green LED indicators will show the valve position. Each LED indicator signifies 10 percent of the valve position. When the valve is in the full open position all 10 of the green LEDs will be lit. Once a preset position has been programmed, pressing the PRESET button will move the valve to that position. All information is supplied to the controller from the E3F or E5F electric actuator on the J1939 CAN bus.

### Auto Travel OPEN and Auto Travel CLOSE

#### UBEC 1S & UBEC 1C

The auto travel OPEN routine will fully open the valve when initiated.

1. Press and hold the OPEN button
2. While holding the OPEN button, press and release the CLOSE button
3. Release the OPEN button and the valve will automatically travel to the fully open position

The auto travel CLOSE routine will fully close the valve when initiated.

1. Press and hold the CLOSE button
2. While holding the CLOSE button, press and release the OPEN button
3. Release the CLOSE button and the valve will automatically travel to the fully closed position

### Setting the PRESET Position

#### UBEC 1S

Once a preset position has been programmed, pressing the PRESET button will cause the valve to move to the preprogrammed preset position. When the valve reaches the preset position, either the red LED will be lit when the valve reaches the closed position, the green LED will be lit when the valve reaches the open position, or the green LED will remain blinking to indicate the valve is in between full open and full closed.

1. Press the OPEN and CLOSE buttons and set the valve to the desired position. This can be full closed, full open, or somewhere in between.
2. Press and hold the PRESET button for 10 seconds
3. Release the PRESET button and do not operate the valve for 5 seconds

## UBEC 1C

Once a preset position has been programmed, momentarily pressing the PRESET button will cause the LED that represents the programmed preset position to start blinking while the valve moves to that position. When the valve reaches the preset position, the LED will stop blinking and remain solid.

1. Press the OPEN and CLOSE buttons and set the valve to the desired position. This can be full closed, full open, or somewhere in between.
2. Press and hold the PRESET button for 10 seconds. When the setting is stored the LED(s) will flash
3. Release the PRESET button and do not operate the valve until the LED(s) stop flashing

## MAINTENANCE INSTRUCTIONS

### Preventive Maintenance

The control system should be inspected during each apparatus check. Inspect the valve controller, wiring, and valve for damage.

- Operate all possible functions to ensure that each works normally
- Fully open and fully close valve to check for full range operation
- During valve check, inspect rotation for smoothness and seats/seals for leaks
- Inspect all exposed wiring for signs of damage



**Caution: DO NOT use high pressure spray to clean the EXM System. Using high pressure spray can damage seals and lead to serious damage of electrical components.**

## SPECIFICATIONS

### UBEC 1S

- Input power 12/24 VDC (9 VDC to 30 VDC)
- Electrical Load 0.2 AMPS
- Fuse Rating 1 AMPS (12V) & 0.5 AMPS (24V)
- Dimensions 3 1/2" x 3 1/2" x 3/4"
- Weight 0.345 lbs.
- Operating temperature range -40°F to +185°F (-40°C to +85°C)
- Environmental Rating NEMA 4

### UBEC 1C

- Input power 12/24 VDC (9 VDC to 30 VDC)
- Electrical Load 0.2 AMPS
- Fuse Rating 1 AMPS (12V) & 0.5 AMPS (24V)
- Dimensions 3 1/2" x 3 1/2" x 3/4"
- Weight 0.345 lbs.
- Operating temperature range -40°F to +185°F (-40°C to +85°C)
- Environmental Rating NEMA 4

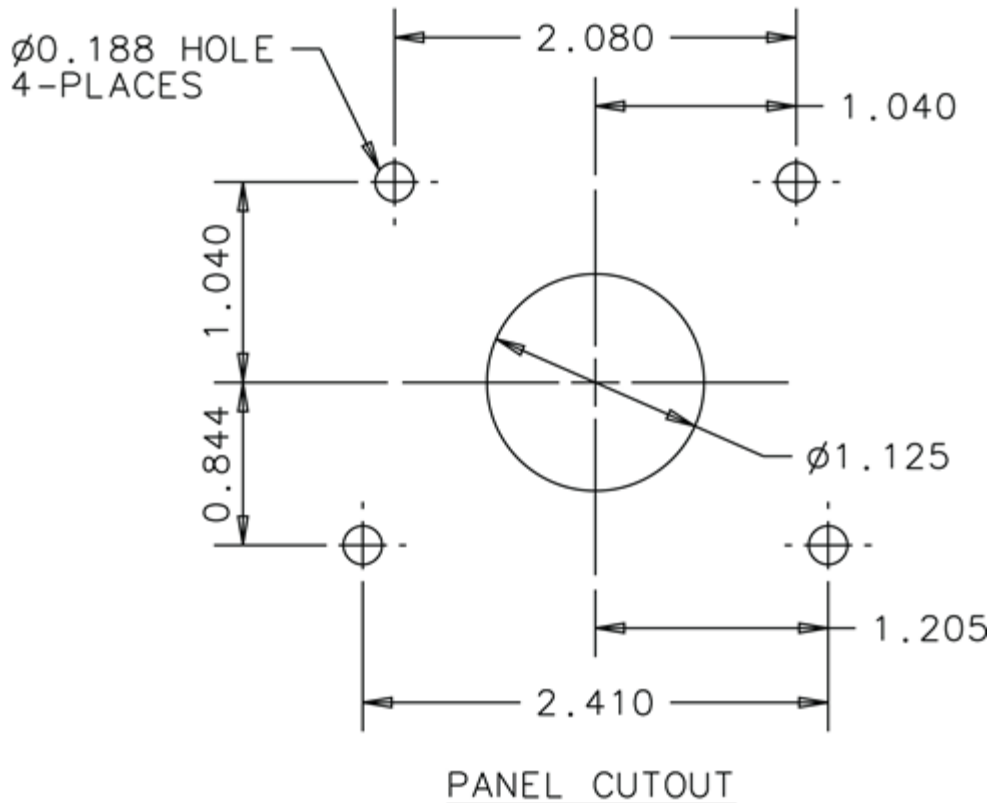
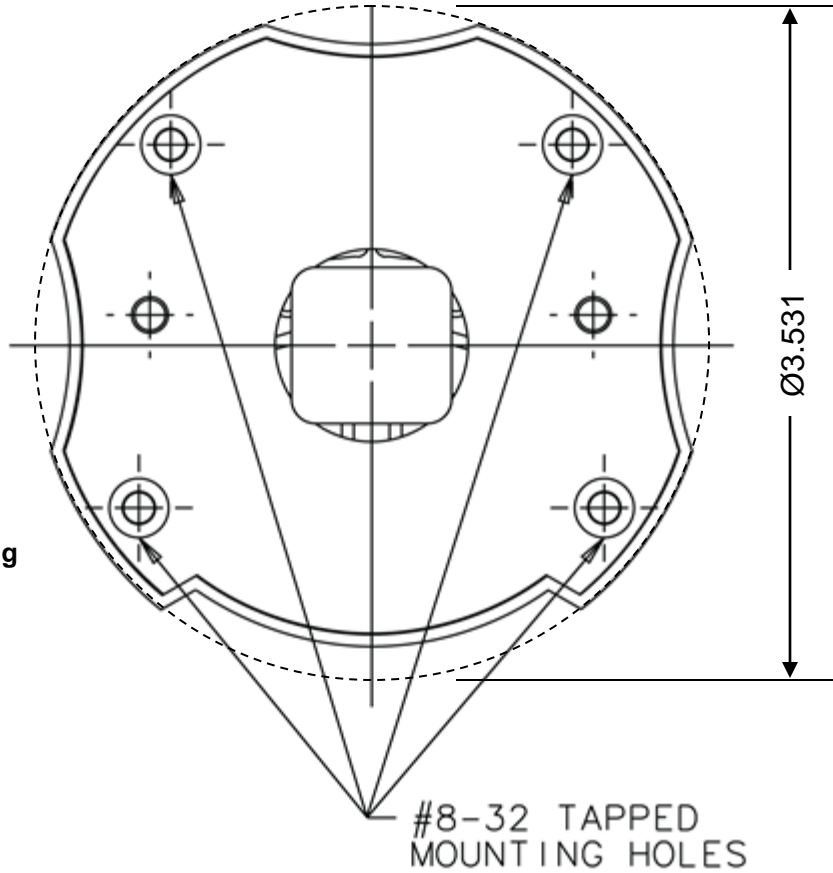


## MOUNTING TEMPLATES

**NOTE:** Pages must NOT be scaled during printing or template size will be scaled incorrectly.

UBEC 1S & UBEC 1C

5/16" to 7/16" maximum thread engagement. Exceeding this depth during installation could result in damage to the controller



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UBEC 1S & UBEC 1C VALVE CONTROLLERS  
INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS  
98349000 REV. E

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