DO NOT EXCEED

Maximum Working Pressure: 600 PSI

RADIO SUPPORT MODULE CONTROLS

24 HOURS A DAY
7 DAYS A WEEK

Any questions regarding operation, safety or capabilities of this support module should be directed to:

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Introduction

The Radio Controls provide operators the ability to control the outlet valve of the Support Module from a distance of over 100 yards. An Emergency Close feature is incorporated to rapidly close the valve within 5 seconds. All features can be controlled remotely using the wearable remote, or manually at the control panel.

This manual includes operation instructions and troubleshooting tips for the operator to successfully control the Keystone Support Module.

NOTE: Before each use of the Keystone Support Module, inspect all components to ensure all fittings are tight, no hoses are damaged and all hardware is fastened.

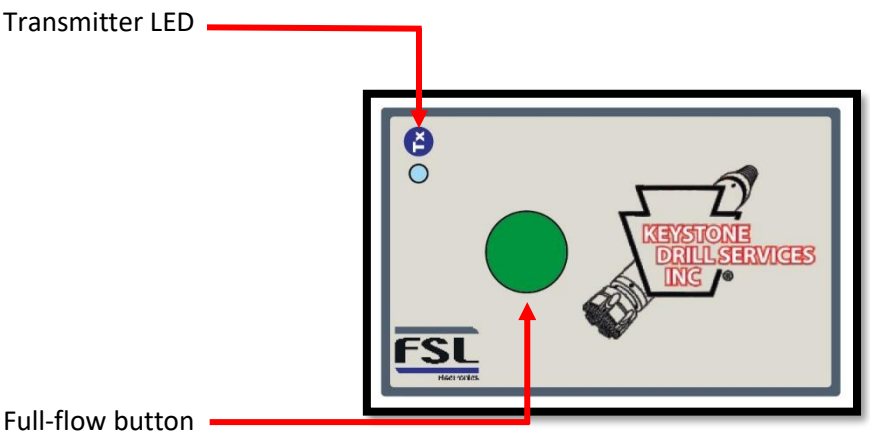
If issues occur during any of the following instruction, please refer to the troubleshooting section at the end of this manual.

Be sure to charge transmitter between use to ensure proper function.

Feature Identification

This section identifies key features used to control and monitor the status of the support module.

Wearable Remote Control



Control Panel

Manual outlet valve control

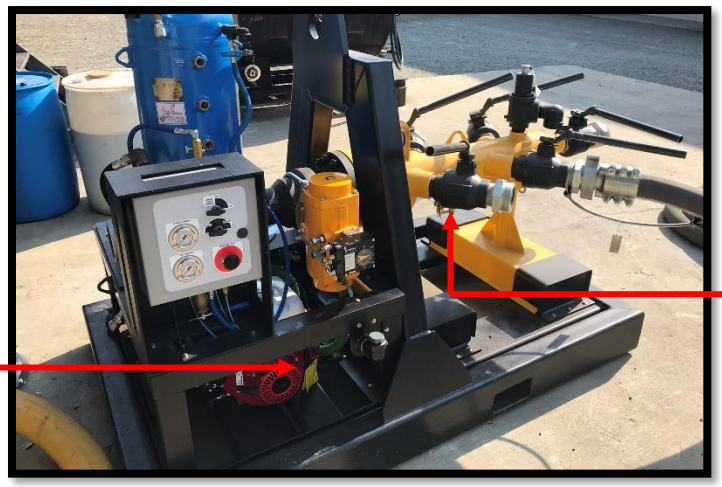
Control pressure gauge

Manual/Remote selector

Outlet pressure gauge

Emergency Close push-button

Other Support Module Features



Control pressure regulator

Keyed ignition

Operation

Remote Controls

If the water injection will not be used during operation, turn the ignition key on the injection motor to the ON position. If the water injection is being used, start the engine and return key to the ON position. *If not starting the engine during use, monitor the 12v battery for proper charge over time to prevent draining to lower voltage.

NOTE: Refer to the water injection manual for priming procedures and operation.

NOTE: The outlet valve will only operate if there is pressure in the manifold. Prior to selecting an option, ensure ball valves leading to each compressor are open.

CAUTION: Use appropriate safety measures when attaching hoses to the manifold and outlet pipe.

Press the GREEN button to open the valve.

The button will remain "on" until it is deselected.

To close the valve, press the GREEN button again.

If connection is lost during operation from moving out of range, the outlet valve will remain in the setting it was in at the time of lost connection. Return the transmitter within normal operating range to complete any action.

Manual Controls

When utilizing the manual controls on the control panel, no power is needed for valve control. Manual controls can also be used to override the remote controls. Switching the selector lever from Remote to Manual will shift the control to the user at the control panel.

Rotate the selector lever to Manual

To open the valve, rotate the output control lever to the desired setting. The outlet valve fully opens (100%) between 12-15psi on the control pressure gauge. If the valve is to be regulated to restrict the flow, the lever can be adjusted to match the desired setting.

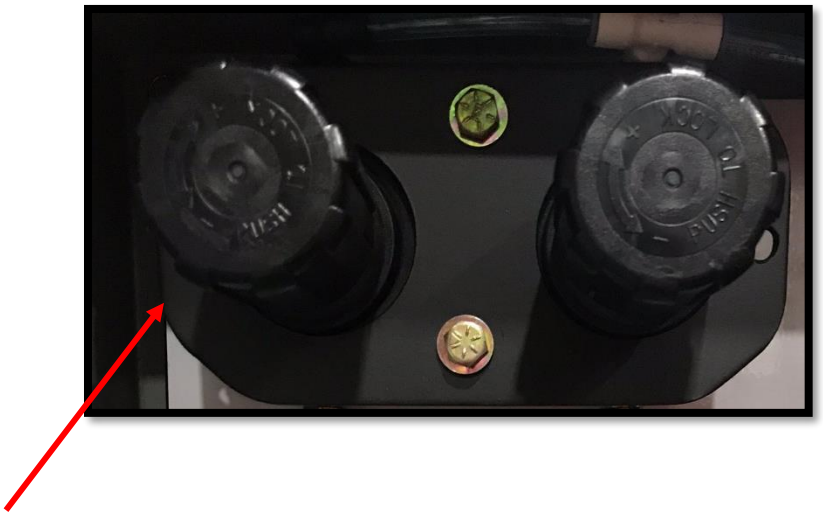
To monitor the current valve setting, an indicator arrow is mounted to the top of the actuator. This can also be used to determine the appropriate setting.

IMPORTANT: In an emergency, press the Emergency Close push-button to rapidly close the valve. Regardless of the setting on the manual outlet control lever, the push-button will override and close the valve. The Emergency Close push-button will also override all remote commands, and will close the valve.

Following use, be sure to turn the key to "off" to prevent battery drain.

Adjusting Pre-set Pressures

The pre-set outlet pressures are set during post-assembly testing, and may vary from the desired pressures based on the equipment being used. The regulators within the control panel determine the control pressures for each of the selections in the Support Module Control app. Adjusting these regulators directly impact the outlet flow/pressure at each setting.



Full-flow regulator

NOTE: The regulators are "push to lock" style knobs. To make adjustments, pull slightly to unlock and be sure to return to the locked position after making necessary adjustments.

To begin adjustment, select the associated button on the wearable control.

With the regulator active, begin adjusting the knob while monitoring the control pressure gauge and the valve position indicator on the actuator.

When finished, be sure to lock the regulator in position, and close the control panel. De-select the button to de-energize the circuit.

NOTE: The minimum control pressure needed for operation is 2-3psi. To maintain full open position is 12-15psi. Full control pressure is preset to 25psi.

Troubleshooting

Problem	Possible Causes	Solution
Remote transmitter is not moving outlet valve	Ignition key is not turned to ON	Turn the ignition key to ON
	Out of signal range	Move within 20 feet of the unit and retry
	Battery is dead	Charge transmitter
	Selector lever is on Manual	Switch selector lever to Remote
	Device not connected to unit	Connect to unit
		Reference appendix instructions
	Low control pressure	Ensure the support module manifold has pressure
		Check control air lines for damage or leaks
		Adjust control pressure regulator setting
	Solenoid valve not operating	Check for power at solenoid when activating with the transmitter

Ultrabeam DC4 Radio Receiver

FSL

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Safer, Smarter and Efficient Technology

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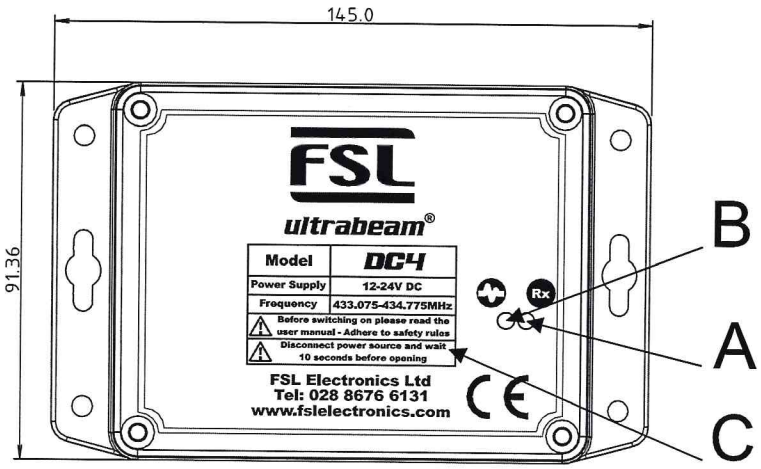
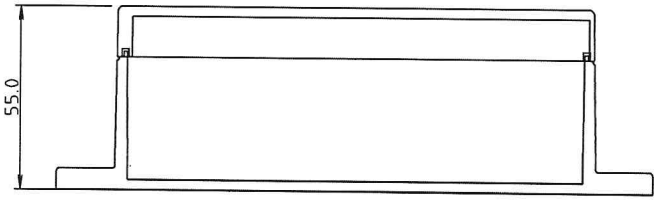
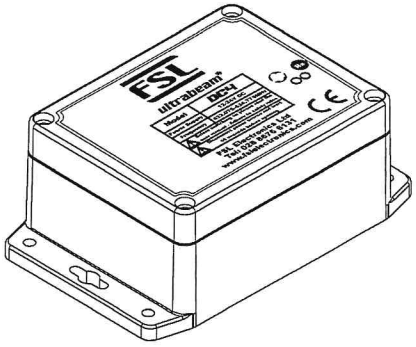
Ultrabeam DC4

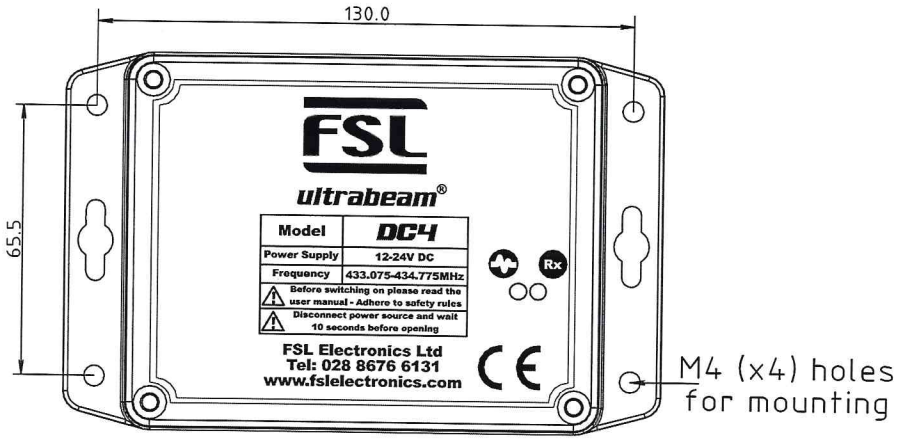






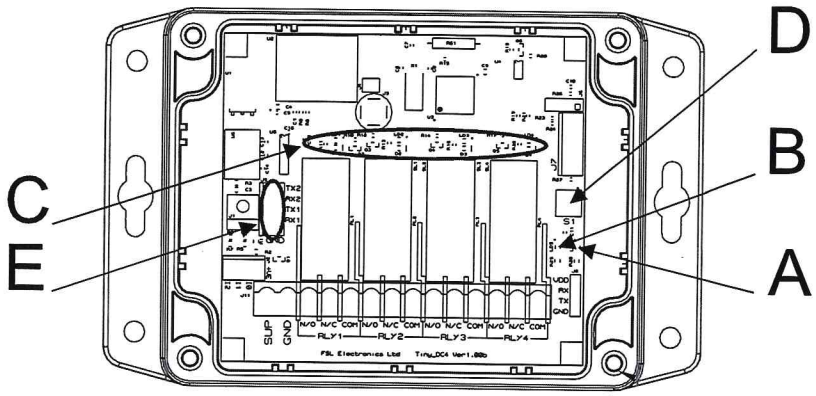
A	Receive LED
B	Heartbeat LED
C	Identification

Ultrabeam DC4



Power Supply	12 - 28VDC
Frequency	433.05-434.79MHz
Antenna	Internal or External
Colour	Dark Grey
Protection Class	IP 65
Housing Material	High Impact ABS (UL94-HB)
Dimensions	145.0 x 91.36 x 55.0 mm
Outputs	4
Rated Load	10A at 24VDC / 250VAC
Additional Outputs	RS232 @ 57.6k baud
Inputs	3(No Operation in default Firmware)
Rated Voltage	12-24VDC

3) Light Signals



A	Receive LED
B	Heartbeat LED
C	Output Active Indication LEDs
D	Learn Switch (S1)
E	RS232 Connection

The Blue LED (A)	Meaning
...is off	No data is being received from the transmitter
... blinks fast	The receiver is receiving data from the transmitter

The Red LED (B)	Meaning
...is off	The receiver is not switched on
... blinks slow	The receiver is operating as normal

The Amber LEDs (C)	Meaning
...is off	The relay is not energised
... is steady on	The relay is energised

4) General Operating instructions

4.1) How the receiver operates

The transmitter should be stored in an assigned location when not being used.

To place the unit in operation, proceed as follows:

1. Ensure that the operator is in a position so they have a clear view of the movements and actions of the controlled machine.

2. Press any of the control buttons to wake the transmitter from sleep and to transmit the desired operation.
   The Green LED on the transmitter indicates that the transmitter is now awake.
   The Red LED indicated that the unit is now transmitting.

3. If the operation is momentary the operation will remain active until the button is released.
   If the operation is toggling the operation will change state.
   if the operation if latching then the operation will change state.

4. When the operator releases the control button the red LED will switch off and the after 1 minute the Green LED will switch off again and the transmitter will go back to sleep.

4.2) Handset Learn Procedure

1. Press and hold the S1 on the receiver Until the Red light goes solid.

2. Now release S1.

3. Now press any button on the transmitter.

4. On the receiver the Blue LED should flash indicating that the handset is now paired.

5. With the handset learned the corresponding relay will work when a button is pressed.

4.3) Handset Erase Procedure

1. Remove power from the receiver

2. Press and hold S1 on the receiver

3. Apply power to the receiver

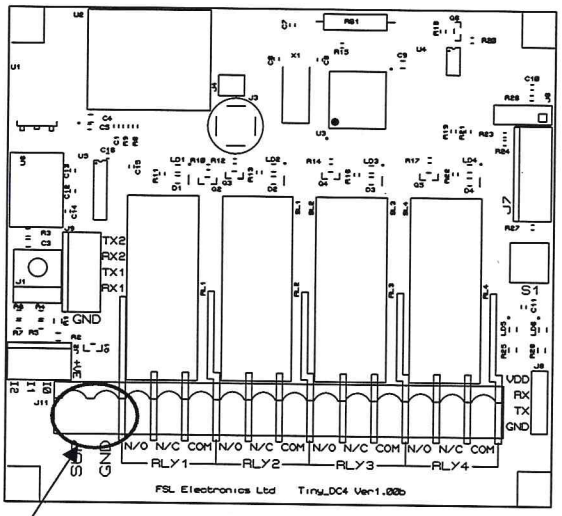
4. The Red and Blue LED's will be on solid

5. Keep holding S1 until the Red and Blue LED's turn off

6. Release S1 Red and Blue LED's will now flash alternatively to indicate erase done.

5) Connections

5.1) Power Connection



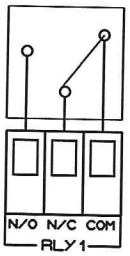
12-24V DC Supply

The supply to the receiver is via the 14 way connector.
The pin marked SUP is the 12-24 V DC supply.
The pin marked GND is the 0 V DC return.

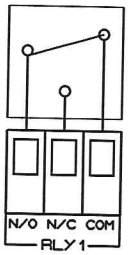
RELAY NO	BUTTON	CONFIGURATION	FUNCTION
1	START	N/O	MOMENTARY
2	STOP	N/O	MOMENTARY
3	ALL STOP	N/O	MOMENTARY
4	N/A	N/A	N/A

5.2) Output Connections

Each Relay on the receiver has a Common (COM), Normally Open (N/O) & Normally Closed Connection (N/C). These connections are isolated from the other relays on the board.



Relay connection when relay is not energised



Relay connection when relay is energised

5.3) Example Connections

Below is a simple example showing possible ways to connect a load to the relay contacts.