

# **FREEDOM**

## **FREEDOM 2 Quick Start Guide**



**DOCUMENT P/N SG07230026**

**REV: H**

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## Installation Guidelines

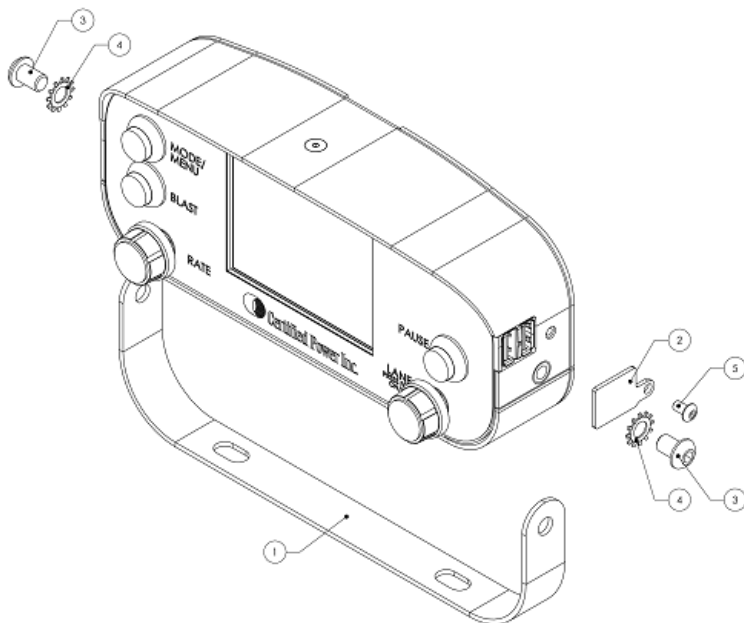
### Equipment required.

After unpacking the equipment check each item against the packing list. You should have the following parts:

1. Freedom 2 spreader controller
2. Mounting brackets (OPTIONAL)
3. Wire harness or adaptor if this is a retrofit.
4. Basic tools to mount the Freedom 2 controller. (NOT INCLUDED)

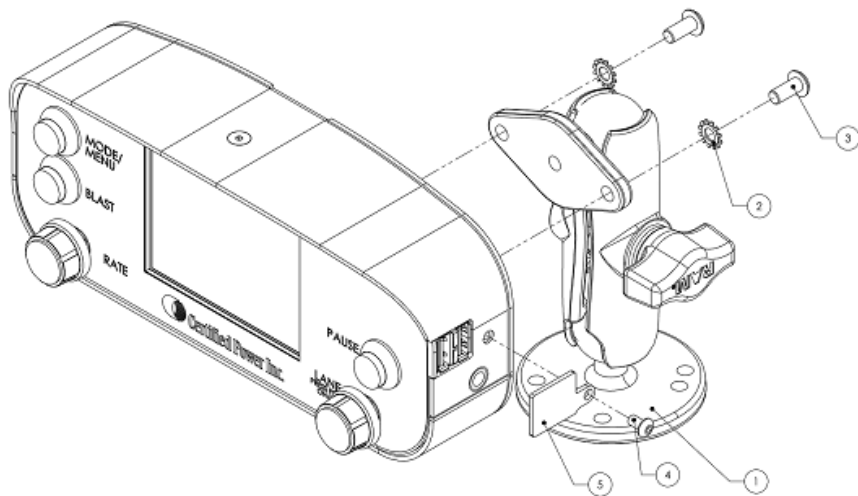
### Mount the Freedom 2 controller (Bracket option 1)

1. There are three bracket kits available. **Always use the mounting hardware supplied in the kits. If longer than specified screws are used, the screws could touch the internal circuit board causing a short and irreparable damage.**
  - U-Bracket kit part# SG07010468-001 (1)
  - Use ¼-20 x 3/8 screws part#HDW0001-000062 (3)
  - Use 1/4in. external tooth lock-washer part# HDW0003-00027 (4)
  - Be sure to install USB cover plate part# SG07070557 (2)
  - Fasten USB cover plate with 6-32x1/4in screw part# 201020 (5)
2. Mount the F2 controller so it does not obstruct the visibility of the vehicle operator.



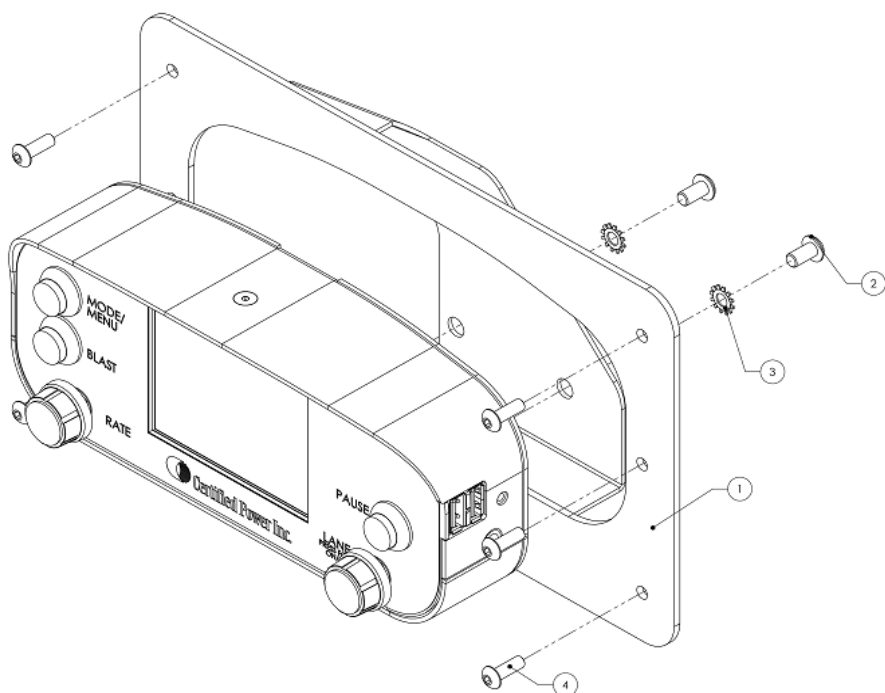
## RAM™ Mounting (Bracket option 2)

1. This is the second of three mounting kits available. **Always use the mounting hardware supplied in the kits. If longer than specified screws are used, the screws could touch the circuit board causing a short and irreparable damage.**
  - RAM™ mount bracket kit part#SG07010468-003 (1)
  - Use 10-32 x 7/16 or shorter screws part#HDW0001-000074 (3)
  - Use #10 external tooth lock-washer part# HDW0003-00001 (2)
  - Be sure to install USB cover plate part# SG07070557 (5)
  - Fasten USB cover plate with 6-32x1/4in screw part# 201020 (4)
2. Mount the F2 controller so it does not obstruct the visibility of the vehicle operator.



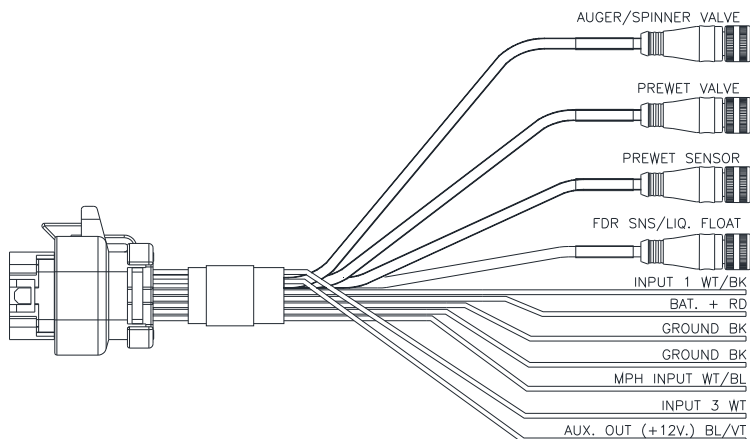
## Flush Console Mounting (Bracket option 3)

1. This is the last mounting option. If you are replacing a legacy product that is mounted in a console. **Always use the parts specified in the kits. If the wrong length screws are used, the screw could turn into the circuit board causing a short and irreparable damage.**
  - Flush mount bracket kit part#SG07010468-002 (1)
  - Use 10-32 x 3/8 or shorter screws part#HDW0001-000003 (2)
  - Use #10 external tooth lock-washer part# HDW0003-00001 (3)
  - Use 8-32x1/2 screws part# 73049 to mount the bracket into the console (4)
2. Mount the F2 controller so it does not obstruct the visibility of the vehicle operator.



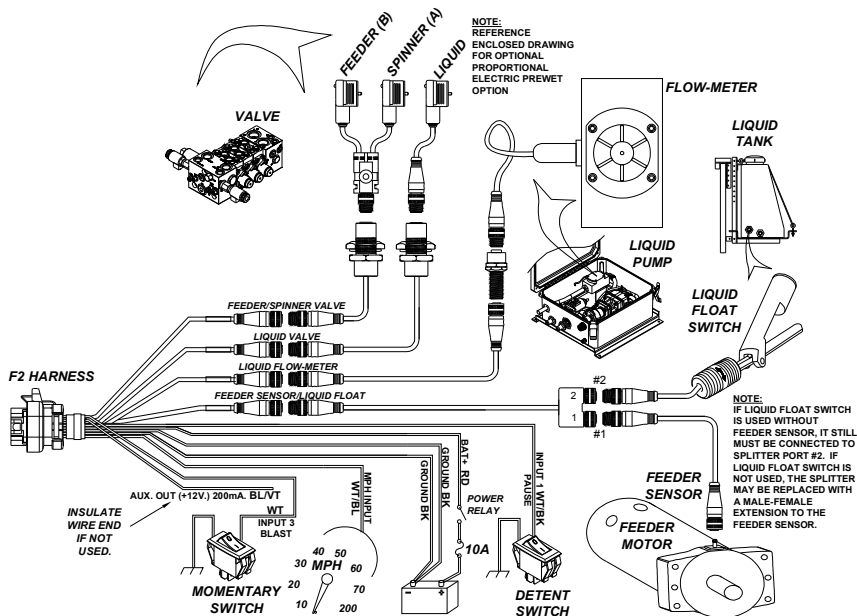
## Installing the Wire Harness

1. Pictured below is one of the typical wire harness used on the F2 Spreader. There are variations of this harness supplied by Certified Power. Contact your Certified Power Sales Rep. for help obtaining full documentation and drawings or your System Owner’s manual.
2. Attach Red B+ wire to an 8-16V circuit.
  - Use a switched or continuous 10amp protected circuit.
  - Closed-loop systems (feeder or liquid) must use a switched 10amp circuit.
  - Use 16AWG wire when additional wire is needed.
3. Attach the (2) Ground wires directly to chassis ground or the battery post.
  - Chassis grounds must be made to bare clean metal.
4. Disconnect battery supply and ground before welding on the vehicle.
5. Attach the MPH wire to the vehicles MPH signal source. Check with the vehicle manufacturer before splicing into any wire to avoid damaging the vehicle electronics.
6. Attach any remote inputs that are required. The standard inputs are listed below.
  - Input 1 WT/BK, REMOTE PAUSE
  - Input 3 WT, REMOTE BLAST
7. Attach Aux. out wire if required. This wire provides a +Bat 200mA. Source.
  - If the Aux. wire is NOT used. Tie up and insulate the wire from chassis ground.
  - Typically this wire is used to control a relay or lamp indicator. Attach any external wiring and cables using the provided installation drawing.



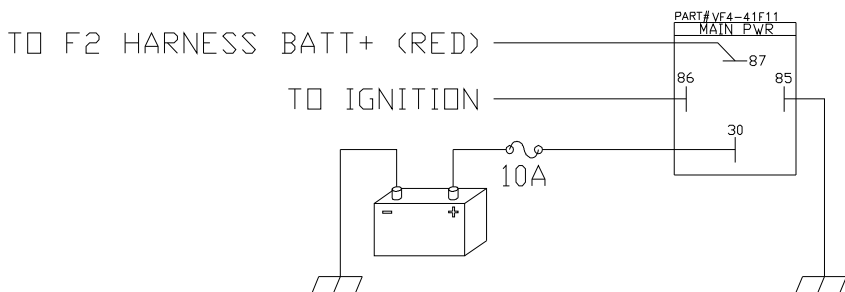
## Typical System Overview

- Below is a basic illustrative guide to install the appropriate harnessing onto the vehicle chassis.
  - Harnessing may vary from the picture.
  - Do not use dielectric grease on M12 connectors
  - All harnessing should be tied up securely and away from moving parts.
  - Avoid routing harnessing near areas of excessive heat such as the engine exhaust pipe.
  - Minimum bend diameter behind a molded connector should be > 3inches.

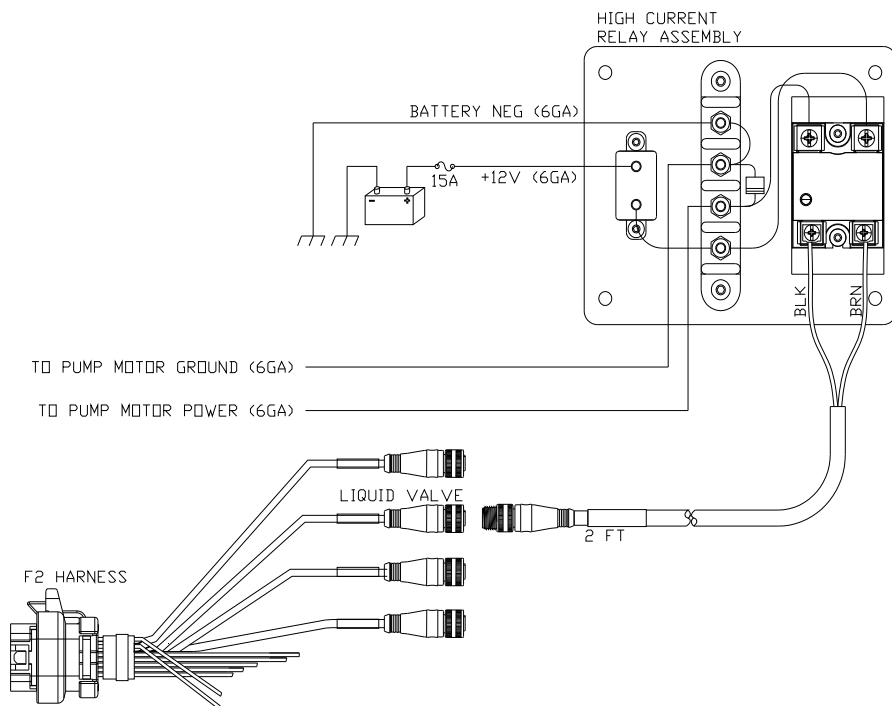


## System Options

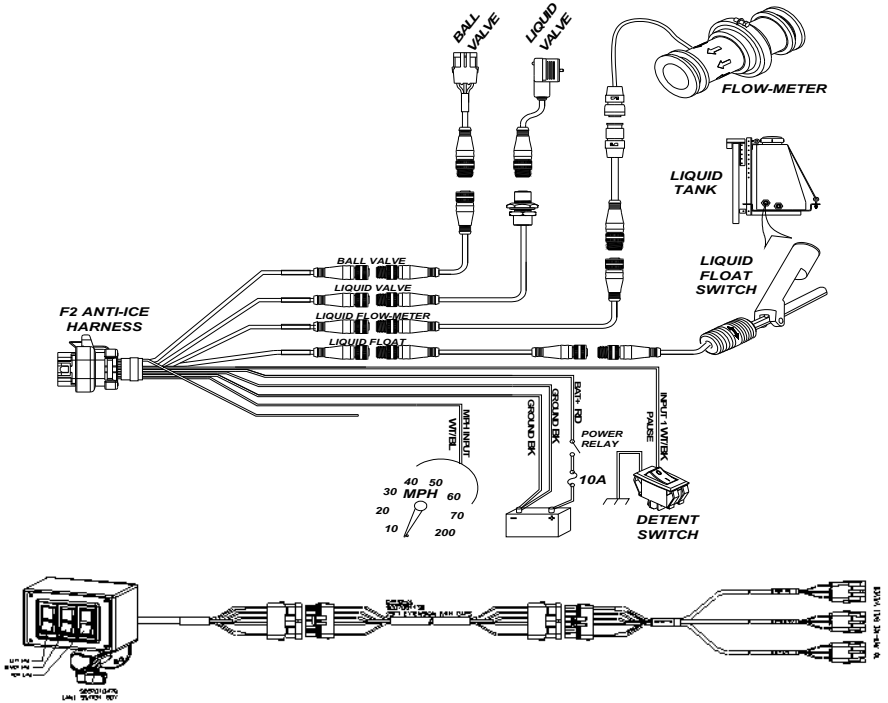
Closed-loop systems (feeder or liquid) must have a main power disconnect. Pictured below is a typical diagram for ignition switched power.



Electric proportional liquid pumps will typically require a high current relay assembly and wiring as shown below.



A typical anti-ice only wiring diagram is pictured below.



**Lane switches box and harnessing.**

Switch Box: SG07010479

Optional Extension: SG07051136

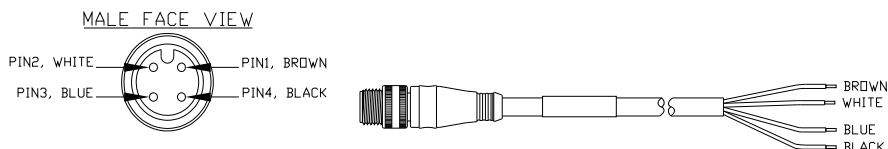
Lane Valve Harness: SG07051115

\*Rate change required by operator to maintain gallons per lane mile output.

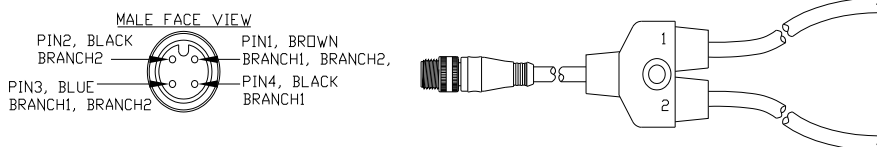


### Standard Harness list

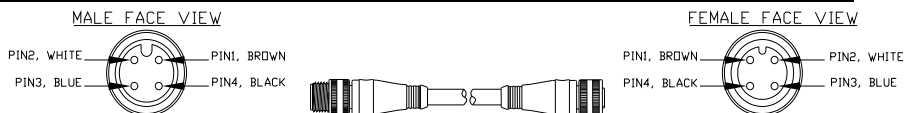
PART#	DESC.	LENGTH
SG07050696	18AWG TPE MALE M12 TO FLYLEAD	3M
SG07050732	18AWG. TPE MALE M12 TO FLYLEAD	10M



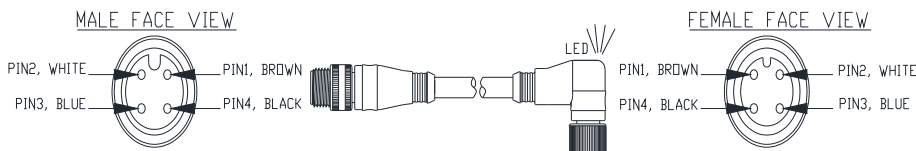
PART#	DESC.	LENGTH
SG07050639	18AWG. TPE SPLITTER M12 TO FLYLEAD	5.2M



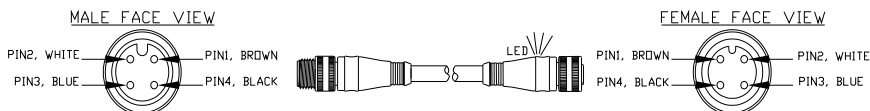
PART#	DESC.	LENGTH
SG07050997	18AWG. TPE MALE TO FEMALE	.3M
SG07050731-001	18AWG. TPE MALE TO FEMALE	1M
SG07050684	18AWG. TPE MALE TO FEMALE	3M
SG07050731-002	18AWG. TPE MALE TO FEMALE	5M
SG07050485	18AWG. TPE MALE TO FEMALE	7M



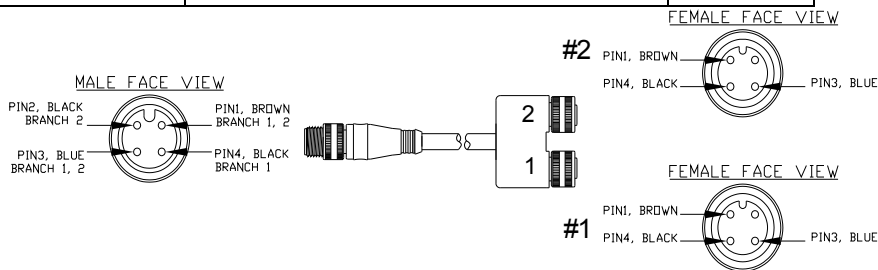
PART#	DESC.	LENGTH
SG07070052	18AWG. TPE MALE ST TO FEMALE 90 LED	2.5M



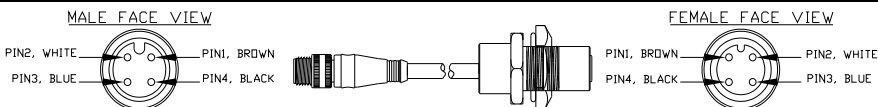
PART#	DESC.	LENGTH
SG07050509	18AWG. TPE MALE TO FEMALE ST LED	2M
SG07050411	18AWG. TPE MALE TO FEMALE ST LED	3.7M
SG07050546	18AWG. TPE MALE TO FEMALE ST LED	7M



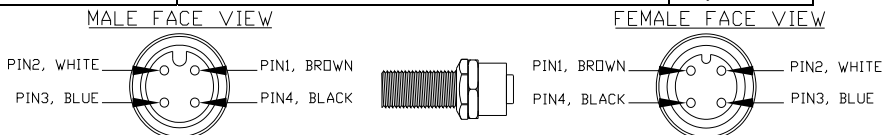
PART#	DESC.	LENGTH
SG07050638	18AWG. TPE MALE TO 2X FEMALE	6.4M
SG07050651	18AWG. TPE MALE TO 2X FEMALE	.3M



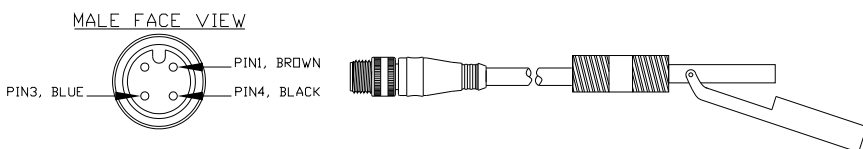
PART#	DESC.	LENGTH
SG07050488	18AWG. TPE MALE TO FEMALE BPM W/ CAP	1M
SG07050503	18AWG. TPE MALE TO FEMALE BPM	.3M (12in.)
SG07050722-002	18AWG. TPE MALE TO FEMALE BPM W/ CAP	5M
SG07050722-003	18AWG. TPE MALE TO FEMALE BPM W/ CAP	7M
SG07050722-001	18AWG. TPE MALE TO FEMALE BPM W/ CAP	10M



PART#	DESC.	LENGTH
SG07070374	MALE TO FEMALE THREADED BULKHEAD	N/A



PART#	DESC.	LENGTH
SG07070121	SS HORZ. FLOAT SWITCH; MALE TPE	.6M
SG07070122	POLY FLOAT SWITCH; MALE TPE	.6M



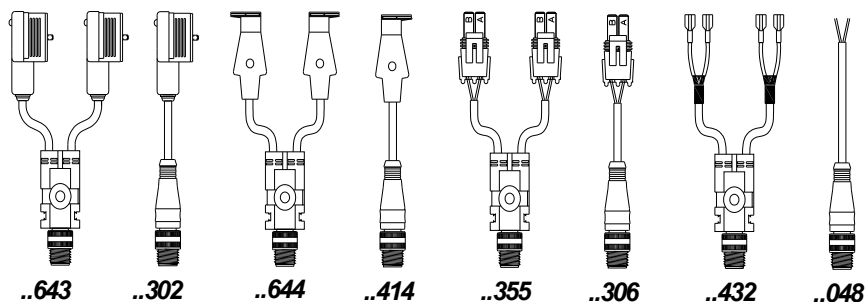
PART#	DESC.	LENGTH
SG07050643	22AWG. DIN CORDSET DUAL	.6M
SG07050302	22AWG. DIN CORDEST SINGLE	.6M
SG07050644	22AWG. AMP JR. TIMER DUAL	.6M
SG07050414	22AWG. AMP JR. TIMER SINGLE	.6M
SG07050355	22AWG. WEATHER-PAK DUAL	.6M
SG07050306	22AWG. WEATHER-PAK SINGLE	.6M
SG07050432	22AWG. FLYLEAD DUAL	.6M
SG07070048	22AWG. FLYLEAD SINGLE	.6M

**FULL-DIN**

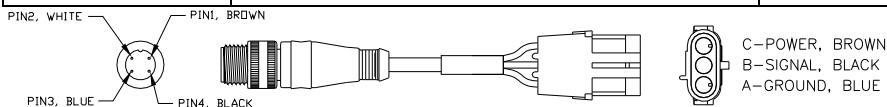
**AMP JR TIMER**

**WEATHER-PAK**

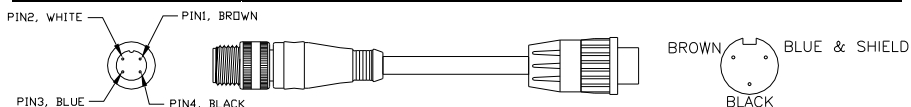
**FLYLEAD**



PART#	DESC.	LENGTH
SG07050294	ANTI-ICE BALL VALVE HARNESS	1.8M



PART#	DESC.	LENGTH
SG07050808	ANTI-ICE FLOWMETER HARNESS	2.5M

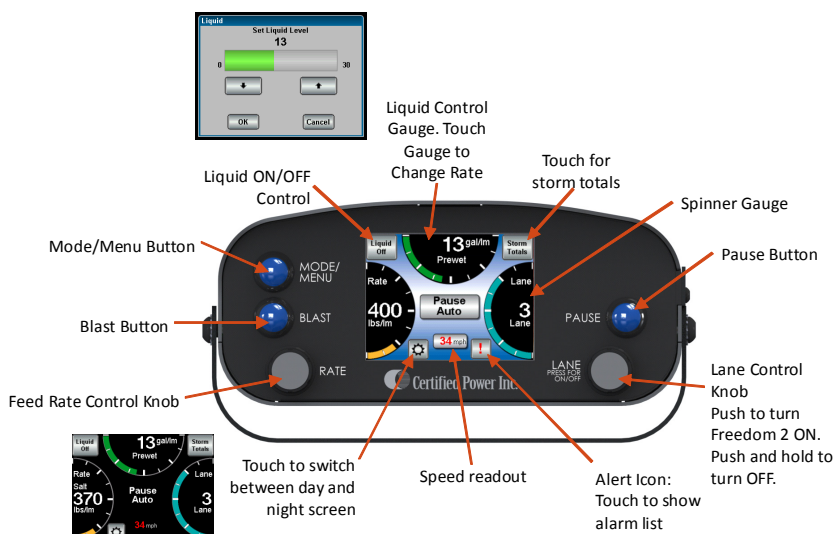


Anti-ice switch box and harnessing refer to page 8.



## Basic Control operation

1. The basic User Controls are defined below.



## Gaining access to the Main Menu

2. With the vehicle safely in park, hold the “MODE/MENU” button in.

- The Main menu should appear after holding the menu button for 3 seconds.
- Press the “User level” icon.
- Using the drop down select “Technician” or “Admin”
- The Password field is left blank from the factory for Technician.
- The Password field for “Admin” is “admin”.
- Touch the password field to enter a password if logging into “Admin”.
- Touch ‘OK’ to login to Tech or Admin after entering the Password.

### Using F.I.R.S.T to perform system setup and Calibration.

1. “F.I.R.S.T.” is an interactive Setup guide intended to help the User setup and calibrate the F2 controller for use.
  - You must be logged in as Technician or Admin to use F.I.R.S.T.
  - Press the “F.I.R.S.T. Guide” icon located in the Main Menu.
2. Use the “F.I.R.S.T.” Guide to complete setup and calibration of the F2 control.
3. As setup steps are completed check marks will appear for each section.



### Basic Diagnostics/troubleshooting (common errors and their meanings)

1. Errors seen while Saving Trims
  - “Setting not Saved, Min exceeds Max”, this is a common message seen while saving trims. Usually occurs if saving a minimum trim percent that is over the maximum trim percent. Try setting max trim first then set minimum trim last. The error also appears if no feedback is being received from the closed-loop sensor when a Save is applied.
  - “Setting not Saved, Valve open”, this error message appears when saving trims and the F2 cannot detect current flowing through the Hydraulic valve electrical circuit. Suspect a connector or broken wire between the F2 control and Valve coil connection on the hydraulic valve.
2. Errors seen while calibrating ground-speed MPH (Speed Cal)
  - “Ground Speed Error”, this error appears if trying to save a “Speed Cal” and not having any groundspeed signal present at

the MPH Ground Speed input. Try a different “Speed Type” and watch for the “Pulses Per minute” value to reflect a frequency indicating a good groundspeed signal at the input.

### 3. Common on-screen operating errors.

- “Sensor Power Error”, if the sensor power supply line is shorted to ground or has more than 750mA of current draw the sensor power supply from the F2 is being overloaded. Suspect a faulty Feeder sensor or Liquid Flow-meter sensor. Also suspect a pinched or crushed wire, corroded connector or any fault that may cause a short to chassis ground.
- “Feeder Rate limited”, if the Feeder is running at max speed and the current target application rate is NOT being met, this error will display. Sometimes this error would be indicative of a system that has not been calibrated or has been calibrated improperly. This error also applies to Liquid, and the Spinner. This error clears itself when the target rate is being met.
- “Feeder Rate Overrun”, if the Feeder is running at its lowest speed and the current target application rate is NOT being met, this error will display. Sometimes this error would be indicative of a system that has not been calibrated or has been calibrated improperly. This error also applies to Liquid, and the Spinner. Usually this error will only display at very low sustained vehicle speeds of usually 5mph or less and low target rates. This error clears itself when the target rate is being met.
- “Sensor fault” and “Feeder Override”, these error occurs when the F2 was operating in closed-loop mode and was not receiving sensor feedback. The F2 automatically defaults into open-loop after this error occurs. Suspect a stalled motor or conveyor, drag chain or dry or stalled liquid pump. This error occurs for any closed-loop function. The error condition is cleared with a power cycle.