Installation and Operation Instructions
Mark IIXG Diesel Engine Fire Pump Controllers

■ FTA1100

NS1100-50(A)
ECN 237793

Firetrol®

EMERSON™
Network Power

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⚠ WARNING

RISK OF ELECTRICAL SHOCK

Personal injury could occur.
Ensure all power is disconnected before installing or servicing this equipment.

These instructions are intended to assist in the understanding of the installation and operation of the FTA1100. Read through these instructions thoroughly prior to connecting the controller. If there are any questions unanswered in these instructions, please contact the local Firetrol representative or factory service department.

INTRODUCTION

Firetrol® FTA1100 combined automatic and manual diesel engine fire pump controllers are intended for starting and monitoring fire pump diesel engines. They are available for use with 12 or 24 volt negative ground systems using lead acid or Nickel-Cadmium batteries. FTA1100 fire pump controllers are listed by Underwriters Laboratories Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, CSA, *Standard for Industrial Control Equipment* (cUL), and approved by Factory Mutual. They are built to meet or exceed the requirements of the approving authorities as well as NEMA and the latest editions of NFPA 20, *Installation of Centrifugal Fire Pumps*, and NFPA 70, *National Electrical Code*.

MOUNTING CONTROLLER—

Note—Consult the appropriate job plans to determine controller mounting location. Controller must be mounted within view of the engine.

Tools and Materials (all mounting):

1. Assortment of common hand tools of the type used to service electromechanical equipment.
2. Hole (conduit) punch.
3. Drill for drilling wall/floor anchor holes.
4. Hand level.
5. Tape measure.
6. Four (4) anchors with bolts and washer—if wall mount. Six (6) anchors, bolts and washers—if floor/base mount.

Wall Mount—

Procedure—

1. Locate bottom mounting brackets and hardware.
2. Inspect for damage.
3. Gently lay the controller on its back, using protection so the paint is not damaged. It is best to lay the controller in a location that is out of the way from actual mounting location.
4. Attach each bracket to the bottom of the enclosure using the supplied hardware . Tighten nuts securely.

⚠ WARNING

RISK OF PERSONAL INJURY

Controller cannot stand upright with the bottom mounting brackets attached. Leave laying on its back until the wall anchors are ready for controller installation.

Note—Refer to the controller dimension drawing for necessary mounting dimensions.

The controller is wall mounted by using four (4) wall anchors, 2 anchors for the top ears and 2 anchors for the bottom mounting brackets. The ears and brackets are dimensionally on the same center-line for ease in mounting.

5. Using either the dimension print or by measuring the distance between the center lines of the 2 lower bracket slots, transcribe this dimension onto the wall. Note: The bottom edge of the enclosure should be a minimum of 12" (305 mm.) from the floor in case flooding of the pump room occurs.
6. Drill and put 2 anchors into the wall for the 2 lower bracket slot mounts.
7. Mark on the wall, the location of the holes in the upper mounting ears.
8. Drill and put 2 anchors into wall for the upper mounts.
9. Install bolts and washers in 2 lower anchors, leaving a gap between the washer and wall.
10. Lift the controller and place the bottom mounting slots down onto the 2 lower anchor bolts. Do not tighten bolts.
11. Align holes in upper mounting ears and install 2 bolts and washers in anchors.
12. Shim anchors as necessary to ensure rear of enclosure is vertically level and enclosure is not stressed. Tighten all 4 anchor bolts.
13. Check to be sure enclosure door opens and closes freely and that enclosure is level.

Floor/Base Plate Mount—
Procedure–
MOUNTING LEGS (OPTIONAL - IF ORDERED)
Procedure—
1. Unpack legs and mounting hardware.
2. Inspect legs for damage.
3. Gently lay the controller on its back, using protection so the paint is not damaged. It is best to lay the controller in a location that is out of the way from actual mounting location.
4. Attach each leg to the bottom of the enclosure using the provided hardware . Tighten nuts securely.
5. After legs are securely attached, stand the controller up on its legs for mounting. Each leg has 3 holes on the bottom for anchoring to the floor or base plate.

Note—Consult the appropriate job plans to determine controller mounting location.
Refer to the controller dimension print for necessary mounting dimensions.

The controller is floor/base plate mounted by using the 3 pre-drilled holes in each leg. The holes are dimensionally on the same center line for ease in mounting.

6. Using either the dimension print or by measuring distance between the center lines of the holes on one leg, transcribe these dimensions onto the floor/base plate.
7. Drill 3 holes in floor/base plate for anchoring the leg.
8. Mark location of holes for opposite leg and drill 3 more holes.
9. Secure controller to floor/base plate with bolts and washers and tighten.
10. Check to be sure enclosure door opens freely and that enclosure is level.

MAKING ELECTRICAL CONNECTIONS
Important Precautions—
Prior to making any field connections:
1. Open door of enclosure and inspect internal components and wiring for any signs of frayed or loose wires or other visible damage.

2. Verify that the controller information is what is required on the project:
    - Firetrol catalog number
    - Engine voltage and polarity of grounding
    - Incoming line voltage and frequency
    - Maximum system pressure
3. Project electrical contractor must supply all necessary wiring for field connections in accordance with the *National Electrical Code*, local electrical code and any other authority having jurisdiction.
4. Refer to the appropriate field connection drawing for wiring information.

Procedure—

All engine connections, remote alarm functions and AC wiring must be brought into the enclosure at the bottom. (See dimension drawing for exact location). A gland plate is supplied for ease of installation.

Proceed as follows:

1. Use a hole (conduit) punch, not a torch nor a drill, and punch a hole in the gland plate for the size conduit being used.
2. Install necessary conduit.
   Warning—Use only gland plate for conduit entrance. Controller warranty is VOID if any other location is used.
   Note—All field wiring connections are connected to terminal blocks located in the controller. Terminals for interconnection to the corresponding numbered terminals on the engine terminal block are located between the circuit breakers (CB1, *AC power* and CB2-CB3, *battery connections*). Not all engines require all terminals to be connected. Reference engine wiring diagram and Field Connection Diagram for appropriate information. Other terminals are for connecting remote alarm functions and optional features are located on the controller relay board(s).
   AC line connections are made to terminals L1 and L2 (1CB). A ground lug, marked "G" is provided for grounding. This AC circuit should come from a source having a circuit breaker sized in accordance with the *National Electrical Code* and other local codes.
3. Pull all wires necessary for engine connections, remote alarm functions, AC power and all other optional features. Allow enough excess wire inside enclosure to make up connections to the terminal block. Be sure to consult the appropriate field connection diagram. Make sure AC Circuit Breaker (CB1) and Battery Circuit Breakers (CB2, CB3) are turned "Off".
   Warning—Do not use controller wire way for routing external wiring.

Wire Sizes—

- Use #14 AWG wire minimum for all electrical connections except for battery charger connections. (Battery chargers connected to terminals 6, 8, and 11.)
- On terminals 6, 8, and 11, use the following information to determine wire sizes:

Linear feet (in conduit run) from controller to terminal block on engine	Maximum Wire Size
0' to 25' (0 to 7.62 m.)	#10 AWG (6 mm^2)
25' to 50' (7.62 m. to 15.24 m.)	#8 AWG (10 mm^2)

4. Make all field connections to remote alarm functions and any other optional features.
5. Verify AC line voltage and frequency with the controller data plate on the enclosure door prior to energizing AC power.

6. Connect AC power to “L1” and “L2” (CB1) —120 Volt, 60 Hz or as called for on controller data plate.
7. Connect remote normally open START push-button wires to terminals “13” and “14” (if used).
8. If deluge valve is used, remove jumper from terminals “16” and “17”. Connect wires from normally closed contact on deluge valve to terminals “16” and “17”.
9. Connect remote normally open shutdown interlock wires to terminals “15” and “16” (if used). A factory installed jumper will be installed on these terminals. If installing a interlock, this jumper may be removed, otherwise leave jumper in place until the set up of the Mark IIXG is complete.
10. Check to see that all connections are both correctly wired (in accordance with field connection diagram) and tight.
11. Close enclosure door.

MAKING SYSTEM PRESSURE CONNECTIONS

The FTA1100 controller requires one (1) “System Pressure” connection from the system piping to the enclosure. The connection fitting, 1/2” FNPT, is provided on the bottom, external side of the enclosure for this purpose.

The “Test Drain” connection, located to the left of the “System Pressure” connection, should be piped to a vented drain or to waste. The “Test Drain” is used only briefly during the weekly test cycle.

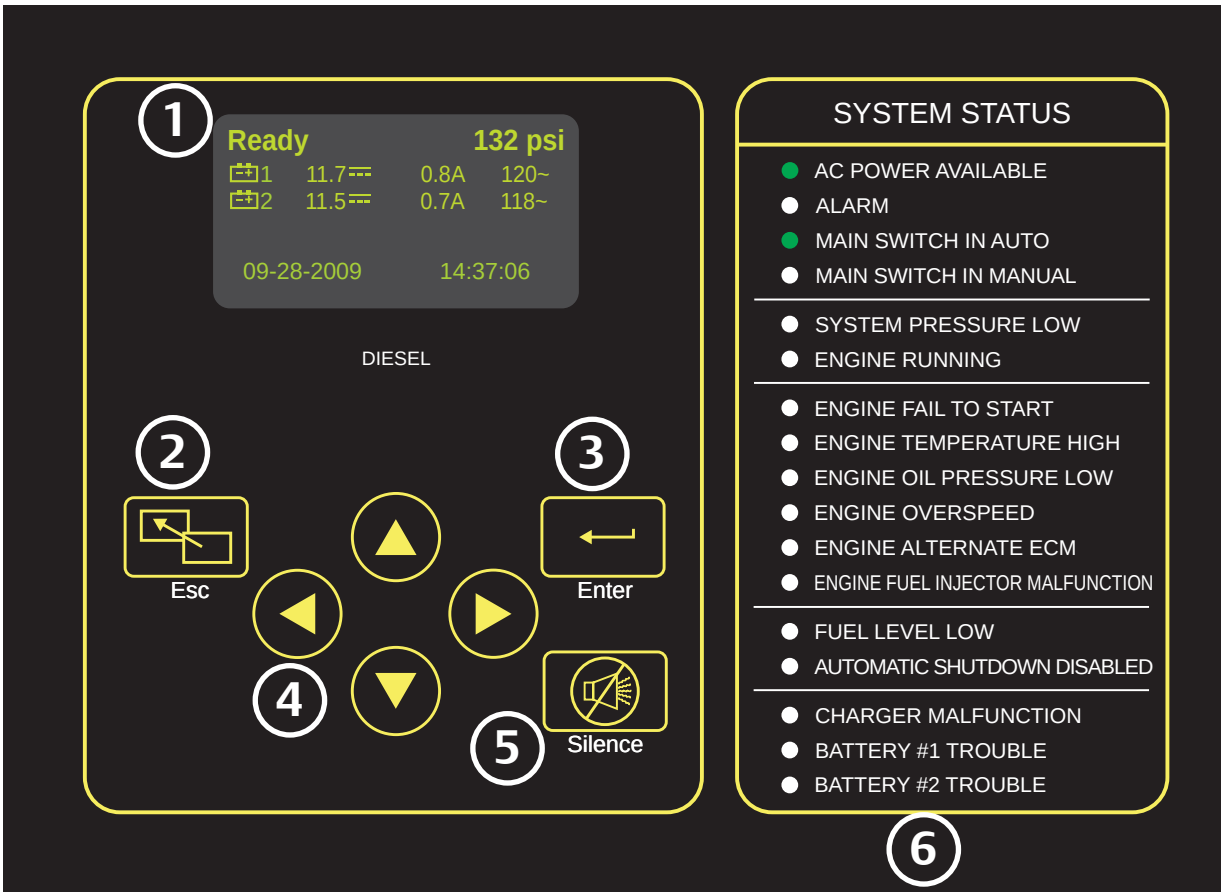
Note—Test drain line must be free flowing. Do not use any valves or plugs on this line.

Refer to NFPA 20 for correct field piping procedure of sensing line between the pumping system and the controller.

PROGRAMMING THE MARK IIXG

1. Energize (Turn “ON”) circuit breakers 1CB (AC Power), 2CB & 3CB (Battery Connections). Follow the programming instructions included in this manual to set pressure, timers, etc...
2. When all programming is complete and the unit is ready to put into service, remove interlock jumper wire from terminals 15 & 16. This jumper is factory installed to prevent starting of the engine during installation and setup.

Mark IIXG User Interface and Display



1 ***Informational Display***
Control Status and System Pressure
Battery 1 & 2 Status - DC Volts, Charging Amps, AC Volts (charger)
Active Alarms - Primary Status Notification
Date-Time or Active Timer
Secondary Status Notification

2 ***ESC Button***
Used to go backwards through menu screens

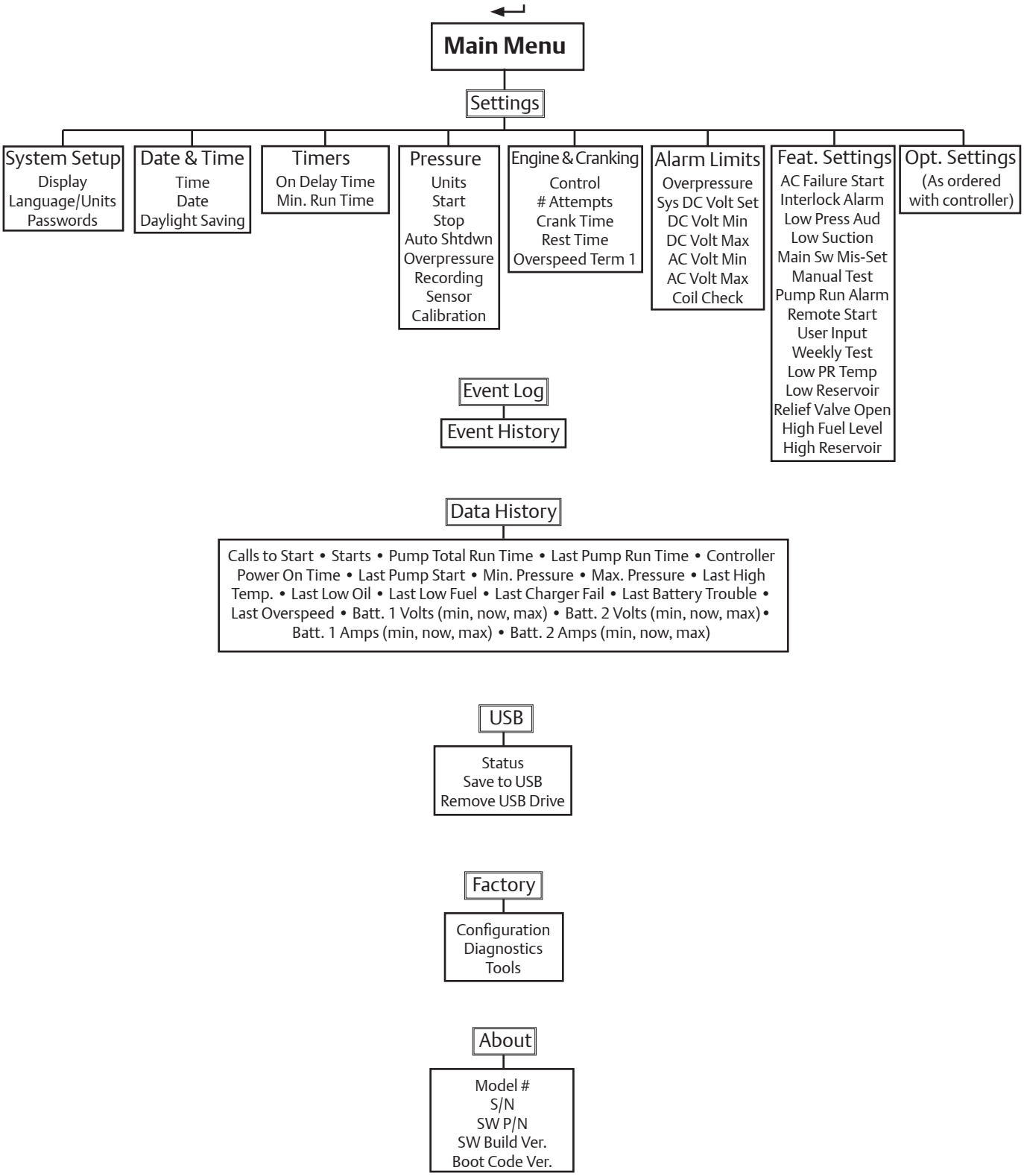
3 ***Enter Button***
Used to go forwards through menu screens and save user defined settings

4 ***Directional Arrows***
Used to go up and down in menu screens and change user defined values

5 ***Silence Alarm Button***
Used to silence audible alarm

6 ***System Status LED's***
Provide visual indication of important system information

Mark IIXG User Menu Structure



Programming Notes

The Firetrol Mark IIXG is multi-level password protected. User programmable functions are protected by a Level 1 password.

LEVEL 1 PASSWORD
2 - 1 - 1 - 2

1 Indicates the level of password required to modify a setting.

Note: Many menu settings feature an "enable/disable" option. These options are indicated by a "✓" for enabled or a "X" for disabled. In many cases this can also be interpreted as "✓" for yes or a "X" for no.

Mark IIXG User Menu Settings

Note: Many menu settings feature an “enable/disable” option. These options are indicated by a "✓” for enabled or a “x” for disabled.

🔒1 Indicates the level of password required to modify setting.

System Setup - Display

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ *DISPLAY* ↵ ***BRIGHTNESS*** ↵ 🔒1
Use ▲ and ▼ arrows to set desired display brightness. Press ↵ to confirm.

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ *DISPLAY* ↵ ▼ ***CONTRAST*** ↵ 🔒1
Use ▲ and ▼ arrows to set desired display contrast. Press ↵ to confirm.

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ *DISPLAY* ↵ ▼ ***INVERT*** ↵ 🔒1
Use ▲ or ▼ arrows to enable/disable inverted display (bright background with dark letters). Press ↵ to confirm.

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ *DISPLAY* ↵ ▼ ***KEYBOARD*** ↵ 🔒1
Use ▲ or ▼ arrows to set the amount of time of keyboard inactivity before the display returns to the main screen. Press ↵ to confirm.

System Setup - Language & Units

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ ▼ *LANGUAGE & UNITS* ↵ ***LANGUAGE*** ↵ 🔒1
Use ▲ and ▼ arrows to select preferred display language. Press ↵ to confirm.

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ ▼ *LANGUAGE & UNITS* ↵ ▼ ***PRESSURE*** ↵ 🔒1
Use ▲ and ▼ arrows to select preferred pressure unit display (psi, bar, kPa). Press ↵ to confirm.

System Setup - Passwords

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ ▼ *PASSWORDS* ↵ ***LEVEL 1*** ↵ 🔒1
Use ▲▼◀▶ arrows to set preferred password for level 1 access. Press ↵ to confirm.

↵ *SETTINGS* ↵ *SYSTEM SETUP* ↵ ▼ *PASSWORDS* ↵ ▼ ***LEVEL 2*** ↵ 🔒2
Use ▲▼◀▶ arrows to set preferred password for level 2 access. Press ↵ to confirm.

NOTE: A higher level can change a lower level password (level 2 can change level 1). If passwords are changed from factory default and forgotten, charges my be incurred to reset the passwords.

Settings - Date & Time

↵ *SETTINGS* ▼ *DATE & TIME* ↵ ***TIME*** ↵ 🔒1
Use ▲▼◀▶ arrows to set current local time (24 hr format). Press ↵ to confirm.

↵ *SETTINGS* ▼ *DATE & TIME* ↵ ▼ ***DATE*** ↵ 🔒1
Use ▲▼◀▶ arrows to set current date (YYYY-MM-DD). The day of week will automatically update as required. Press ↵ to confirm.

↵ *SETTINGS* ▼ *DATE & TIME* ↵ ▼ ***DATE FORMAT*** ↵ 🔒1
Use ▲▼ arrows to set current date format (YYYY-MM-DD, DD-MM-YYYY, MM-DD-YYYY). Press ↵ to confirm.

↵ *SETTINGS* ⓥ *DATE & TIME* ↵ ⓥ ***DAYLIGHT SAVING*** ↵ 🔒1

Use ⓐⓥ arrows to enable or disable automatic Daylight Saving time adjustments. Press ↵ to confirm.

ⓥ (+/-) ↵ Use ⓐⓥ arrows to set number of minutes to adjust for at the beginning or end of Daylight Saving time. Press ↵ to confirm.

ⓥ (DST +) "Begin" - Hour ↵ Use ⓐⓥ arrows to set the hour of day that Daylight Saving time begins. Press ↵ to confirm.

ⓥ (DST +) "Begin" - Day ↵ Use ⓐⓥⓛⓡ arrows to set the day of the month that Daylight Saving time begins. Press ↵ to confirm.

ⓥ (DST +) "Begin" - Month ↵ Use ⓐⓥ arrows to set the month of the year that Daylight Saving time begins. Press ↵ to confirm.

(Example: Hour=2:00, Day=2nd Sun, Month=Mar means Daylight Saving time would begin at 2:00a.m. on the 2nd Sunday in March)

ⓥ (DST -) "End" - Hour ↵ Use ⓐⓥ arrows to set the hour of day that Daylight Saving time ends. Press ↵ to confirm.

ⓥ (DST -) "End" - Day ↵ Use ⓐⓥⓛⓡ arrows to set the day of the month that Daylight Saving time ends. Press ↵ to confirm.

ⓥ (DST -) "End" - Month ↵ Use ⓐⓥ arrows to set the month of the year that Daylight Saving time ends. Press ↵ to confirm.

(Example: Hour=2:00, Day=1st Sun, Month=Nov means Daylight Saving time would end at 2:00a.m. on the 1st Sunday in November)

Settings - Timers

↵ *SETTINGS* ↵ ⓥ *TIMERS* ↵ ***ON DELAY*** ↵ 🔒1

Use ⓐⓥⓛⓡ arrows to set preferred on delay time. Press ↵ to confirm.

Note: On Delay (also known as sequential start) time, delays the starting of the motor when an automatic call to start is received.

↵ *SETTINGS* ↵ ⓥ *TIMERS* ↵ ⓥ ***MIN RUN/OFF DELAY*** ↵ 🔒1

Use ⓐⓥ arrows to set timer mode to Minimum Run or Off Delay. Press ⓡ key and use ⓐⓥⓛⓡ keys to set desired time. Press ↵ to confirm.

Note: Minimum Run time will begin when motor starts, Off Delay time will begin when system pressure has been restored to Stop pressure setting.

Settings - Pressure

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ***UNITS*** ↵ 🔒1

Use ⓐⓥ arrows to set preferred pressure unit system (psi, bar, kPa). Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***START*** ↵ 🔒1

Use ⓐⓥ arrows to set desired pump start pressure. Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***STOP*** ↵ 🔒1

Use ⓐⓥ arrows to set desired pump stop pressure. Press ↵ to confirm.

Note: Pump stop pressure must be set below the pump "churn" pressure (including minimum suction pressure), otherwise the pump will run continuously once started.

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***AUTOMATIC SHUTDOWN DISABLED*** ↵ 🔒1

Use ⓐⓥ arrows to enable or disable the automatic shutdown disabled feature. Press ↵ to confirm.

Note: Enabling this feature makes the controller "manual stop only".

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***OVERPRESSURE ALARM*** ↵ 🔒1

Use ⓐⓥ arrows to enable or disable the overpressure alarm feature. Press ↵ to confirm.

ⓥ Limit ↵ Use ⓐⓥ arrows to set the pressure limit for the overpressure alarm. Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***RECORDING - DELTA*** ↵ 🔒1

Use ⓐⓥ arrows to set pressure delta recording limit. Press ↵ to confirm.

Note: Pressure will be recorded whenever pressure changes by more than set limit.

ⓥ ***HOURLY*** ↵ Use ⓐⓥ arrows to enable or disable hourly pressure recording. Press ↵ to confirm.

Note: Pressure will be recorded every hour, on the hour.

↵ *SETTINGS* ↵ *PRESSURE* ↵ ***SENSOR***

The maximum operating pressure of the sensor (transducer) is displayed. Value cannot be changed from this location.

↵ *SETTINGS* ↵ ⓥ *PRESSURE* ↵ ⓥ ***CALIBRATION - SET TO ZERO*** ↵ 🔒2

NOTE: Before proceeding, place jumper wire between field terminals #15 & 16 to prevent starting of the engine. A calibrated pressure gauge will be required to correctly adjust the settings.

Remove/relieve system pressure from the controller sensing line. If gauge shows 0 psi, no adjustments are required; otherwise set zero calibration to same value as displayed on pressure gauge. (Example: With system pressure removed the gauge reads 3 psi, set zero calibration value to 3).

Use ⓐⓥ arrows to set zero calibration value. Press ↵to confirm.

Using calibrated gauge, restore pressure to controller sensing line. Adjust span setting to match the value shown on the gauge.

ⓥ ***SET TO SPAN*** ↵ Use ⓐⓥ arrows to set span calibration value. Press ↵ to confirm.

NOTE: Remove interlock jumper wire from terminal #15 & 16 when calibration is complete.

ⓥ ***RESET TO DEFAULT*** ↵ Use ⓐⓥ arrows to enable reset. Press ↵ to confirm.

NOTE: Calibration setting will reset to factory defaults and reset function will automatically return to disabled.

Settings - Engine & Cranking

↵ *SETTINGS* ↵ ⓥ *ENGINE & CRANKING* ↵ ***CONTROL*** ↵ 🔒3

Current value is shown (Mechanical or Electronic). This setting determines the type of Engine being used.
Use ⓐⓥ arrows to select engine type. Press ↵ to confirm.

Also shown on this screen are the cranking cycle values (# Crank Attempts, Duration of a Crank Cycle, Duration of a Rest Cycle). This is informational only and cannot be changed.

↵ *SETTINGS* ↵ ⓥ *ENGINE & CRANKING* ↵ ***OVERSPEED (Engine Terminal #1)*** ↵ 🔒1

This setting determines if the Fuel Valve Relay (Terminal #1) remains energized during an overspeed condition. This output is required on some engines.
Use ⓐⓥ arrows to enable or disable this setting. Press ↵ to confirm.

Settings - Alarm Limits

↵ *SETTINGS* ↵ ⓥ *ALARM LIMITS* ↵ ***OVERPRESSURE ALARM ENABLED*** ↵ 🔒1

Use ⓐⓥ arrows to enable or disable this setting. Press ↵ to confirm.

ⓥ ***LIMIT*** ↵

Use ⓐⓥ arrows to set pressure limit at which the alarm is activated. Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *ALARM LIMITS* ↵ ⓥ **V⎓**

Indicates controller battery voltage setting. Informational only - setting cannot be changed from this menu.

↵ *SETTINGS* ↵ ⓥ *ALARM LIMITS* ↵ ⓥ **V⎓** ***MIN*** ↵ 🔒1

Use ⓐⓥ arrows to set minimum voltage point for Battery Trouble alarm. Press ↵ to confirm.

← *SETTINGS* ← ▼ *ALARM LIMITS* ← ▼ **V⎓ *MAX*** ← 🔒1
Use ▲▼ arrows to set maximum voltage point for Battery Trouble alarm. Press ← to confirm.

← *SETTINGS* ← ▼ *ALARM LIMITS* ← ▼ ***V~ MIN*** ← 🔒1
Use ▲▼ arrows to set minimum voltage point for AC Voltage Low alarm. Press ← to confirm.
▼ ***ENABLED*** ← 🔒1
Use ▲▼ arrows to enable or disable the AC Voltage Low alarm. Press ← to confirm.

← *SETTINGS* ← ▼ *ALARM LIMITS* ← ▼ ***V~ MAX*** ← 🔒1
Use ▲▼ arrows to set maximum voltage point for AC Voltage High alarm. Press ← to confirm.
▼ ***ENABLED*** ← 🔒1
Use ▲▼ arrows to enable or disable the AC Voltage High alarm. Press ← to confirm.

← *SETTINGS* ← ▼ *ALARM LIMITS* ← ▼ ***COIL CHECK*** ← 🔒1
Use ▲▼ arrows to set monitoring of the engine starting solenoid coils (1-, -2, 1&2, OFF). Press ← to confirm.

Settings - Feature Settings

← *SETTINGS* ← ▼ *FEATURE SETTINGS* ← ***AC POWER LOSS START***
← ***ENABLED*** 🔒1
Use ▲▼ arrows to enable or disable the AC Voltage Loss Start feature. Press ← to confirm.
▼ ***DELAY*** 🔒1
Use ▲▼ arrows to set the time delay between loss of AC voltage and engine starting (0-60 sec.).
Press ← to confirm.

← *SETTINGS* ← ▼ *FEATURE SETTINGS* ← ▼ ***INTERLOCK ALARM*** ← 🔒1
Use ▲▼ arrows enable or disable the alarm for Interlock On. Press ← to confirm.

← *SETTINGS* ← ▼ *FEATURE SETTINGS* ← ▼ ***LOW PRESSURE AUD*** ← 🔒1
Use ▲▼ arrows enable or disable the audible alarm for Low System Pressure. Press ← to confirm.

← *SETTINGS* ← ▼ *FEATURE SETTINGS* ← ***LOW SUCTION***
← ***ENABLE*** 🔒1
Use ▲▼ arrows to enable or disable the alarm for Low Suction Pressure. Press ← to confirm.
▼ ← ***AUDIBLE*** 🔒1
Use ▲▼ arrows to enable or disable the audible alarm for Low Suction Pressure. Press ← to confirm.
▼ ← ***COMMON ALARM*** 🔒1
Use ▲▼ arrows to enable or disable the common alarm output (ALR relay) for Low Suction Pressure.
Press ← to confirm.
▼ ← ***PUMP ROOM*** 🔒1
Use ▲▼ arrows to select the alarm output relay for Low Suction Pressure (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ← to confirm.

← *SETTINGS* ← ▼ *FEATURE SETTINGS* ← ***MAIN SWITCH MIS-SET***
← 🔒1
Use ▲▼ arrows to choose how the Main Switch Mis-Set alarm relay operates. “Pick Up” means the relay will energize when the switch is not in auto. “Drop Out” means the relay we de-energize when the switch is not in auto.
Press ← to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ⓥ ***MANUAL TEST*** ↵

↵ ***DURATION*** 🔒1

Use ⓐⓥ arrows to set the minimum run time (duration) when manual test push-button is used (10 - 99 min.). Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ***PUMP RUN ALARM***

↵ ***AUDIBLE*** 🔒1

Use ⓐⓥ arrows to enable or disable the audible alarm for Pump Run. Press ↵ to confirm.

ⓥ ↵ ***COMMON ALARM*** 🔒1

Use ⓐⓥ arrows to enable or disable the common alarm output (ALR relay) for Pump Run. Press ↵ to confirm.

ⓥ ↵ ***PUMP ROOM*** 🔒1

Use ⓐⓥ arrows to select the alarm output relay for Pump Run (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ***REMOTE START***

↵ ***USE ON DELAY*** 🔒1

Use ⓐⓥ arrows to enable or disable the on delay timer function when remote start is used. Press ↵ to confirm.
NOTE: The on delay timer must be set in the TIMER SETTINGS menu.

ⓥ ↵ ***AUTO SHUTDOWN*** 🔒1

Use ⓐⓥ arrows to enable or disable the automatic shutdown feature when remote start is used.
NOTE: If enabled, the minimum run timer set in TIMER SETTINGS will be used.
Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ***USER INPUT***

↵ ***ENABLE*** 🔒1

Use ⓐⓥ arrows to enable or disable the user defined alarm. Press ↵ to confirm.

ⓥ ↵ ***ON DELAY*** 🔒1

Use ⓐⓥ arrows to select an on delay time before the alarm is acknowledged (0-99 seconds). Press ↵ to confirm.

ⓥ ↵ ***AUDIBLE*** 🔒1

Use ⓐⓥ arrows to select if the user input activates the audible alarm. Press ↵ to confirm.

ⓥ ↵ ***COMMON ALARM*** 🔒1

Use ⓐⓥ arrows to select if the user input activates the common alarm output (ALR Relay). Press ↵ to confirm.

ⓥ ↵ ***PUMP ROOM*** 🔒1

Use ⓐⓥ arrows to select if the user input activates the alarm output (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

ⓥ ↵ ***ON MESSAGE TEXT*** 🔒1

Use ⓐⓥⓛⓡ arrows to program the message that is displayed and recorded when the user defined alarm is activated. Press ↵ to confirm.

ⓥ ↵ ***OFF MESSAGE TEXT*** 🔒1

Use ⓐⓥⓛⓡ arrows to program the message that is displayed and recorded when the user defined alarm is deactivated. Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ***WEEKLY TEST SETUP***

↵ ***ENABLE*** 🔒1

Use ⓐⓥ arrows to disable or define the frequency of the Weekly Test feature (Disabled, Every Week, Every 2 Weeks, ...Every 5 Weeks). Press ↵ to confirm.

ⓥ ↵ ***ON*** 🔒1

Use ⓐⓥ arrows to choose the day of the week that the Weekly Test is performed. Press ↵ to confirm.

▼ ↵ ***AT*** 🔒1

Use ▲▼◀▶ arrows to choose the time of day that the Weekly Test is performed. Press ↵ to confirm.

▼ ↵ ***FOR*** 🔒1

Use ▲▼ arrows to choose the duration (engine run time) of the Weekly Test. Press ↵ to confirm.

▼ ↵ ***NOW IN WEEK*** 🔒1

Use ▲▼ arrows to choose current time frame in reference to the Weekly Test schedule. Press ↵ to confirm. (Example: If test is programmed for every 2 weeks on Sunday and today were Friday then - If testing is desired to start this week, then every other week thereafter, we would now be in week 2 of 2 - If testing is desired to start on the following Sunday, not the coming Sunday, then we would now be in week 1 of 2).

↵ *SETTINGS* ↵ ▼ *FEATURE SETTINGS* ↵ ***LOW PUMP ROOM TEMP***

↵ ***AUDIBLE*** 🔒1

Use ▲▼ arrows to enable or disable the audible alarm for Low Pump Room Temperature. Press ↵ to confirm.

▼ ↵ ***COMMON ALARM*** 🔒1

Use ▲▼ arrows to enable or disable the common alarm output (ALR relay) for Low Pump Room Temperature. Press ↵ to confirm.

▼ ↵ ***PUMP ROOM*** 🔒1

Use ▲▼ arrows to select the alarm output relay for Low Pump Room Temperature (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ▼ *FEATURE SETTINGS* ↵ ***LOW RESERVOIR***

↵ ***AUDIBLE*** 🔒1

Use ▲▼ arrows to enable or disable the audible alarm for Low Reservoir Level. Press ↵ to confirm.

▼ ↵ ***COMMON ALARM*** 🔒1

Use ▲▼ arrows to enable or disable the common alarm output (ALR relay) for Low Reservoir Level. Press ↵ to confirm.

▼ ↵ ***PUMP ROOM*** 🔒1

Use ▲▼ arrows to select the alarm output relay for Low Reservoir Level (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ▼ *FEATURE SETTINGS* ↵ ***RELIEF VALVE OPEN***

↵ ***AUDIBLE*** 🔒1

Use ▲▼ arrows to enable or disable the audible alarm for Relief Valve Open. Press ↵ to confirm.

▼ ↵ ***COMMON ALARM*** 🔒1

Use ▲▼ arrows to enable or disable the common alarm output (ALR relay) for Relief Valve Open. Press ↵ to confirm.

▼ ↵ ***PUMP ROOM*** 🔒1

Use ▲▼ arrows to select the alarm output relay for Relief Valve Open (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ▼ *FEATURE SETTINGS* ↵ ***HIGH FUEL LEVEL***

↵ ***AUDIBLE*** 🔒1

Use ▲▼ arrows to enable or disable the audible alarm for High Fuel Level. Press ↵ to confirm.

▼ ↵ ***COMMON ALARM*** 🔒1

Use ▲▼ arrows to enable or disable the common alarm output (ALR relay) for High Fuel Level. Press ↵ to confirm.

▼ ↵ ***PUMP ROOM*** 🔒1

Use ▲▼ arrows to select the alarm output relay for High Fuel Level (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ *FEATURE SETTINGS* ↵ ***HIGH RESERVOIR***

↵ ***AUDIBLE*** 🔒1

Use ⓐⓥ arrows to enable or disable the audible alarm for High Reservoir Level. Press ↵ to confirm.

ⓥ ↵ ***COMMON ALARM*** 🔒1

Use ⓐⓥ arrows to enable or disable the common alarm output (ALR relay) for High Reservoir Level. Press ↵ to confirm.

ⓥ ↵ ***PUMP ROOM*** 🔒1

Use ⓐⓥ arrows to select the alarm output relay for High Reservoir Level (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ *SETTINGS* ↵ ⓥ ***OPTION SETTINGS*** ↵

NOTE: The list of available options and the settings associated with them will vary with each controller. Listed below are the most common user defined settings that may appear.

↵ ***AUDIBLE*** 🔒1

Use ⓐⓥ arrows to enable or disable the audible alarm for selected option. Press ↵ to confirm.

ⓥ ↵ ***COMMON ALARM*** 🔒1

Use ⓐⓥ arrows to enable or disable the common alarm output (ALR relay) for selected option. Press ↵ to confirm.

ⓥ ↵ ***PUMP ROOM*** 🔒1

Use ⓐⓥ arrows to select the alarm output relay for selected option (Disabled, PTR (Pump Room Trouble), ETR (Engine Trouble), Both PTR and ETR). Press ↵ to confirm.

↵ ⓥ ***EVENT LOG*** ↵

The Event Log is a record of events (pressure recording, alarms, starts, etc...) that are stored in the memory of the Mark IIXG. The last 3000 events are kept in this memory. The events are stored in the order that they occur, with the most recent being "first" (the last event that occurred will be event #1). The following keys are used to browse through the event log:

ⓡ Move forward through the events one at a time (1 - 2 - 3....etc)

ⓛ Move backward through the events one at a time (55 - 54 - 53....etc)

ⓐ Move forward through the events ten at a time (60 - 70 - 80....etc)

ⓥ Move backward through the events ten at a time (91 - 81 - 71....etc)

Pressing and holding of the arrow keys will allow the scrolling to move faster.

↵ ⓥ ***DATA HISTORY*** ↵

The Data History is a record of important data and events that are kept throughout the life of the controller.

Use ⓐⓥ arrows to scroll through the information stored in the Data History log. The available information is: Numbers of calls to start • Number of actual starts • Pump total run time • Pump last run time • Total controller power on time • Last pump start time/date • Minimum system pressure • Maximum system pressure • Last high temp. alarm time/date • Last low oil pressure time/date • Last low fuel level time/date • Last charger failure time/date • Last battery trouble time/date • Last engine overspeed time/date • Battery 1 & 2 voltage min/current/max • Battery 1 & 2 amps min/current/max

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↵ ⓥ ***USB*** ↵

↵ ***SAVE TO USB*** 🔒1

Use ⓐⓥ arrows to enable or disable the Save to USB function. Press ↵ to confirm.

The following is saved to the USB flash drive: Event Log, Data History, Controller Information and all user defined settings (pressure settings, timer settings, alarm settings....etc.). The saved file is a text file named the same as the controller serial number (87654321.txt) and can be viewed using most word processing software.

Note: Use of a flash drive larger than 1GB may result in excessively long read/write operations. If a flash drive larger than 1GB must be used, create a 1GB or less partition on that drive.

▼ ↵ ***REMOVE DRIVE*** 1

Use ▲▼ arrows to enable or disable the Remove Drive feature. Press ↵ to confirm.
Much like a computer, the Remove Drive feature ensures file closure prior to removing the USB flash drive from the Mark IIXG. Use of this feature helps prevent file corruption.

NOTE: The Mark IIXG also features an automatic daily save function. Every day at midnight (0:00) the events for that day are written to a file on the USB flash drive. This file is also a text file (.txt) and is named for the month, in the current year folder under Firetrol (x:\Firetrol\2009\Sept.txt).

↵ ▼ *FACTORY* ↵ *CONFIGURATION* ↵ ***MODEL*** ↵
↵ ***SERIAL NUMBER*** 3

Use ▲▼◀▶ arrows to enter the controller serial number. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***MODEL*** 3

Use ▲▼ arrows to select required model number. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***BATTERY TYPE*** 3

Use ▲▼ arrows to select required battery type. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***BATTERY VOLTAGE*** 3

Use ▲▼ arrows to select required battery voltage. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***PRESSURE SENSOR*** 3

Use ▲▼ arrows to select if a pressure sensor (transducer) is used. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed. If disabled, menu options in SETTINGS/PRESSURE are disabled.

▼ ↵ ***AUTOSTART NC*** 3

Use ▲▼ arrows to enable or disable this parameter. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***USER INPUT NUMBER*** 3

Use ▲▼ arrows to select input used for user defined option. Press ↵ to confirm.
NOTE: This is a factory set parameter and under normal circumstances would never be changed.

▼ ↵ ***LOW SUCTION*** 3

Use ▲▼ arrows to select input used for Low Suction Pressure option. Press ↵ to confirm.
NOTE: This value cannot be changed unless a Low Suction option has been selected in the options configuration.

▼ ↵ ***SCREEN SAVER*** 1

Use ▲▼ arrows to enable or disable the screen saver function. Press ↵ to confirm.
NOTE: The display screen is designed to automatically dim 5 minutes after returning to the home screen and without any activity. The screen will “wake up” or return to set brightness on a key press or any event that would cause a message to appear on the screen. This feature is designed to prolong the life of the display. It is not recommended that this function be disabled.

↵ ▼ *FACTORY* ↵ *CONFIGURATION* ↵ ▼ ***OPTIONS*** ↵ 3

This is area where ordered options are added by the factory. Any user defined parameters for these options would appear in the SETTING/OPTION SETTINGS menu.

↵ ▼ *FACTORY* ↵ *CONFIGURATION* ↵ ▼ ***ADC CALIBRATION*** ↵ 4

This area displays the values of the Analog to Digital Converter calibrations. This calibration is done by the manufacturer. Any changes to these settings would have to be made by the factory.

↵ ⓥ *FACTORY* ↵ ⓥ ***DIAGNOSTICS*** ↵

RAW INPUT: ANALOG ↵

Input values are shown. This information is for factory level troubleshooting purposes.

ⓥ ***RAW INPUT: DISCRETE*** ↵

Input values are shown. This information is for factory level troubleshooting purposes.

ⓥ ***RAW INPUT: KEYS*** ↵

Input values are shown. This information is for factory level troubleshooting purposes.

ⓥ ***RAW OUTPUT: DISCRETE*** ↵

Output values are shown. This information is for factory level troubleshooting purposes.

ⓥ ***MARK IIXG STARTS***

Displays the total number of times the Mark IIXG has been booted.

ⓥ ***LAMP TEST*** ↵ 🔒1

Use ⓐⓥ arrows to enable the lamp test. Press ↵ to begin test. All System Status LED's should illuminate.
↵ Use ⓐⓥ arrows to disable the lamp test. Press ↵ to end test. System Status LED's should turn off and return to normal indications.

ⓥ ***AUDIBLE TEST*** ↵ 🔒1

Use ⓐⓥ arrows to enable the audible test. Press ↵ to begin test. The audible alarm should sound.
↵ Use ⓐⓥ arrows to disable the audible test. Press ↵ to end test. The audible alarm will turn off.

ⓥ ***USB TEST*** ↵ 🔒1

Use ⓐⓥ arrows to enable the USB test. Press ↵ to begin test. A small test file is written to the USB flash drive then read back from the drive. If the write/read is successful, the test is passed. After completion of the test the setting will automatically return to disabled.

ⓥ ***FLAGS***

These flags are a part of a manufacturer level testing tool.

↵ ⓥ *FACTORY* ↵ ⓥ ***TOOLS*** ↵

↵ ***CLEAR DATA HISTORY*** 🔒3

Use ⓐⓥ arrows to enable this option. Press ↵ to confirm. Data History will be cleared and option will automatically revert back to disabled.
NOTE: Once cleared, this data cannot be recovered.

↵ ***CLEAR EVENT LOG*** 🔒3

Use ⓐⓥ arrows to enable this option. Press ↵ to confirm. The Event Log will be cleared and option will automatically revert back to disabled.
NOTE: Once cleared, this data cannot be recovered.

↵ ***RESET TO DEFAULTS*** 🔒3

Use ⓐⓥ arrows to enable this option. Press ↵ to confirm. The Mark IIXG will be reset to "out of the box" default settings.
NOTE: All user and factory configuration settings will be lost.

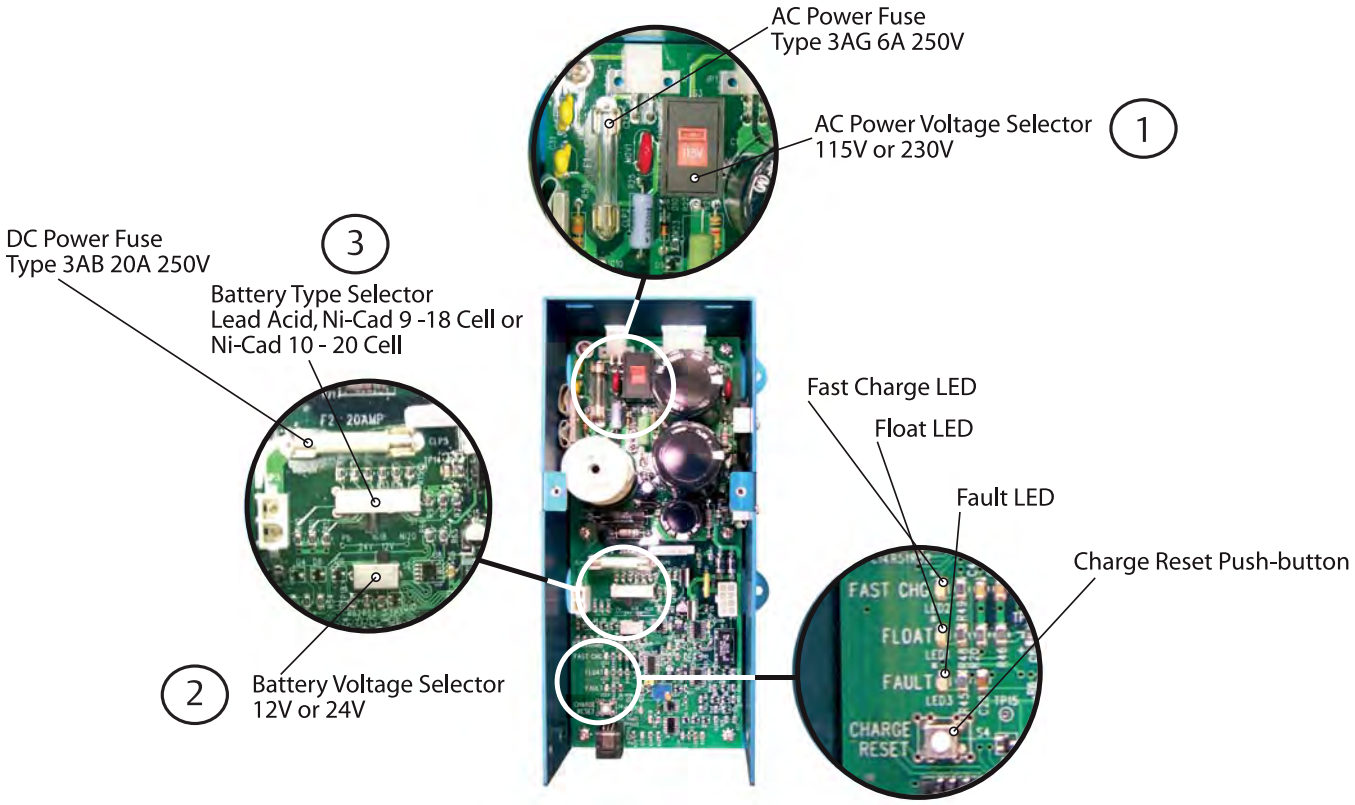
↵ ***FIRMWARE UPDATE*** 🔒3 ↵

This is a tool for installing firmware updates. Updates are installed from a USB flash drive. On screen instructions will guide the process. Installing firmware usually takes just a few minutes, however, the controller is out of service during this time.

↵ ⓥ ***ABOUT*** ↵

Information is shown for: Model Number, Serial Number, Software (Part Number, Build Number, Date), and Boot Code (Part Number and Version Information).

BATTERY CHARGER



When installing the battery charger as a replacement part, it is necessary to verify the proper charger settings and adjust as necessary.

1. Incoming AC voltage 115 or 230 volts.
2. Battery voltage - 12 or 24 volts DC.
3. Battery type - Lead Acid / Ni-Cad 9 or 18 Cell / Ni-Cad 10 or 20 Cell.

If battery charger is powered with the incorrect settings, damage to the charger and/or batteries may occur.

The Firetrol® battery charger features a fully automatic 4 step charging cycle. The charging cycles are as indicated:

Step 1: Qualification Stage (Flashing yellow and green LEDs)
During this stage, the battery charger checks the batteries to insure they can accept a fast charge. It also checks for missing or defective batteries. If the charger detects missing or defective batteries a fault will be given (solid red LED).

Step 2: Fast Charge (Solid yellow LED)
Charges the batteries until they reach peak voltage.

Step 3: Bulk Charge (Solid yellow LED and slow blinking green LED)
Charges the batteries at a constant potential of peak voltage until current reaches 500mA.

Step 4: Float Charge (Solid green LED)
Trickle charges the batteries to maintain peak potential.

- Charger reset push-button (resets charging cycle to beginning)