ALiEn2™
PLUNGER LIFT CONTROLLER

Getting Started with ALiEn2

EXTREME TELEMATICS CORP.

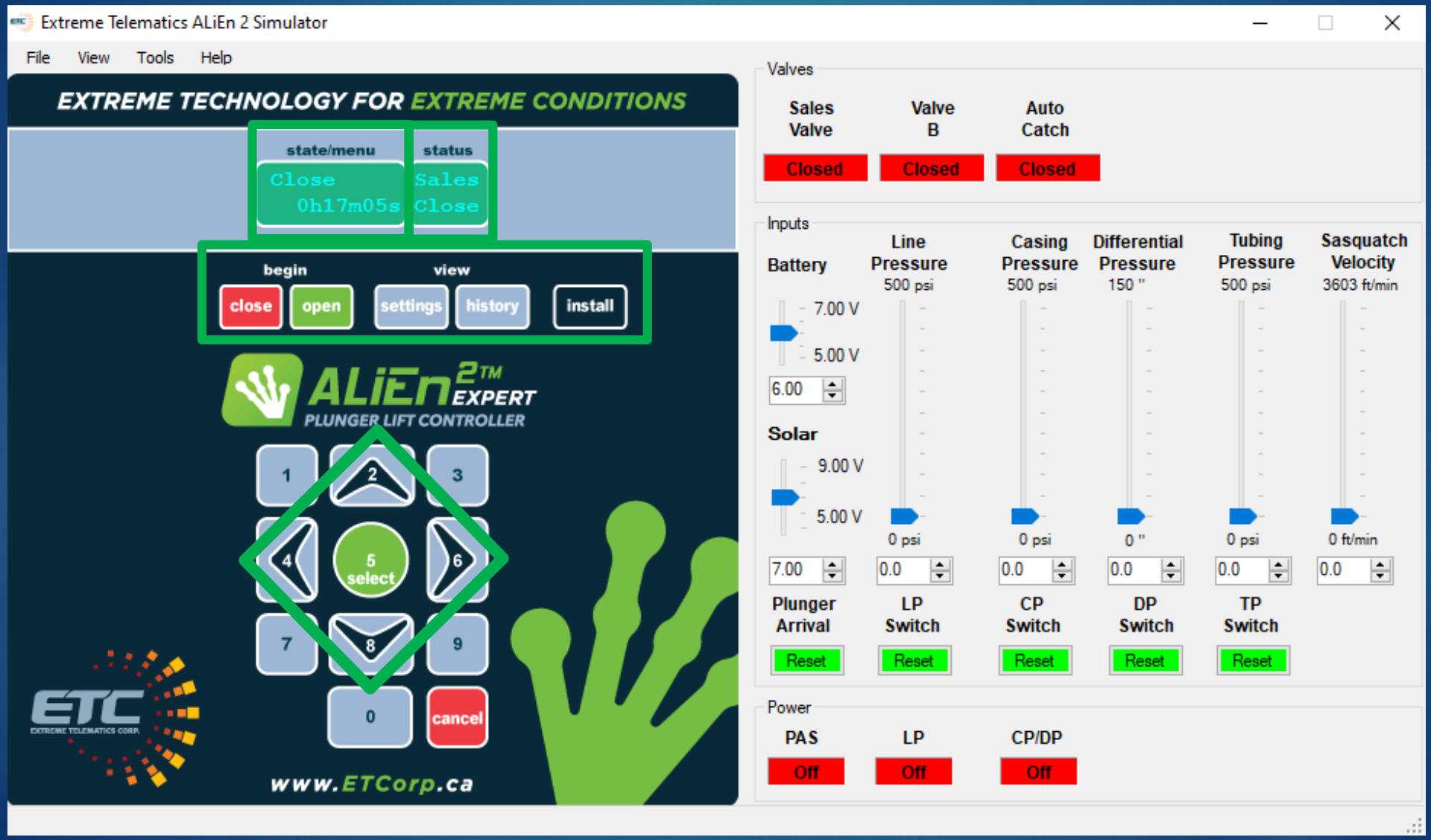
ETC
EXTREME TELEMATICS CORP.

Overview

- Simulator
- Basic Navigation
- The Plunger Cycle
- Model Comparison
- Available Connections
- Controller Wiring
- Optimization Cycles
- Install Menu
- Settings
- History
- Support

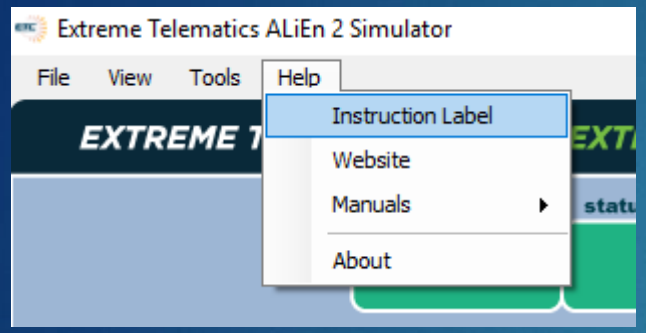
Copyright Extreme Telematics Corp
8/5/2020

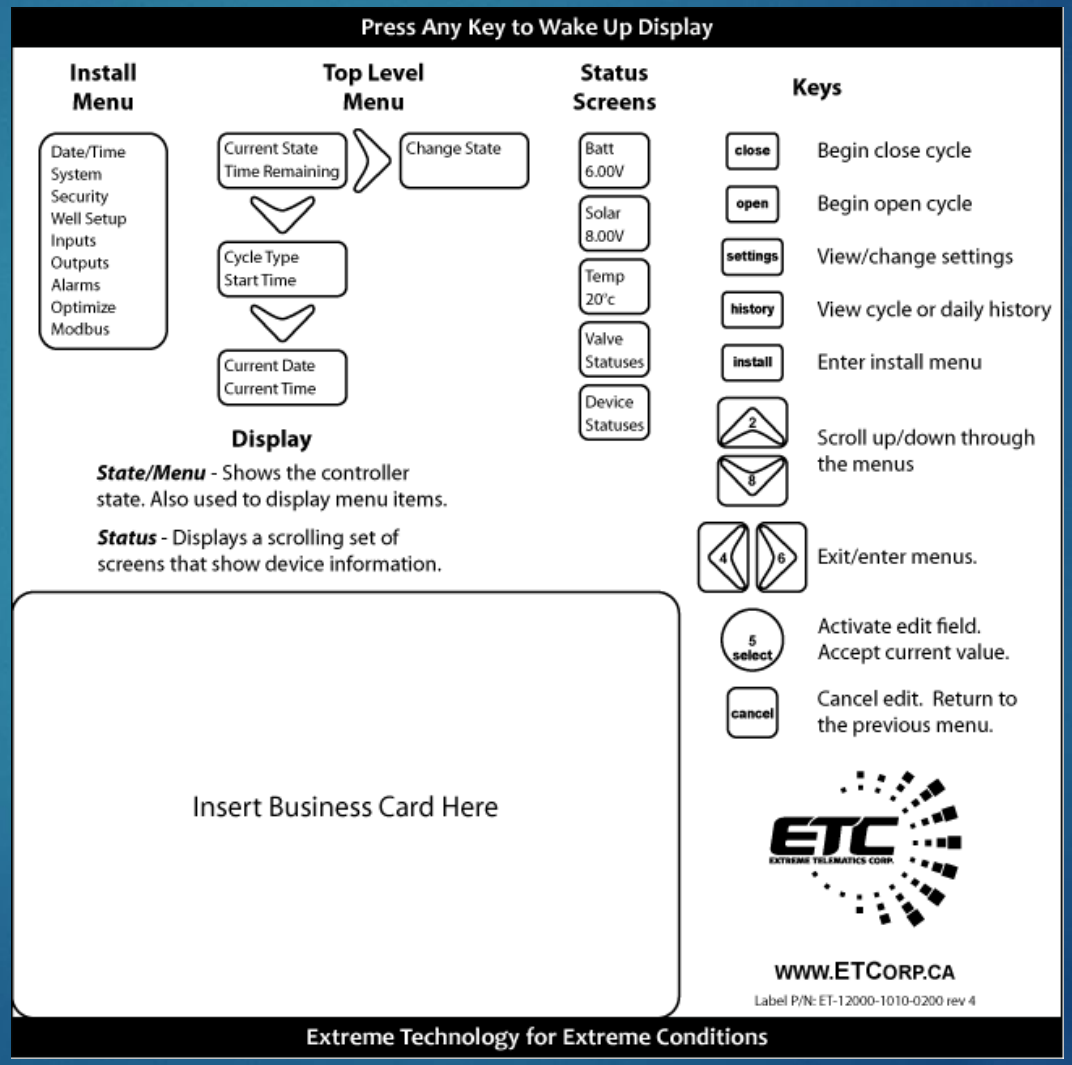
Simulator



Copyright Extreme Telematics Corp
8/5/2020

Simulator: Instruction Label

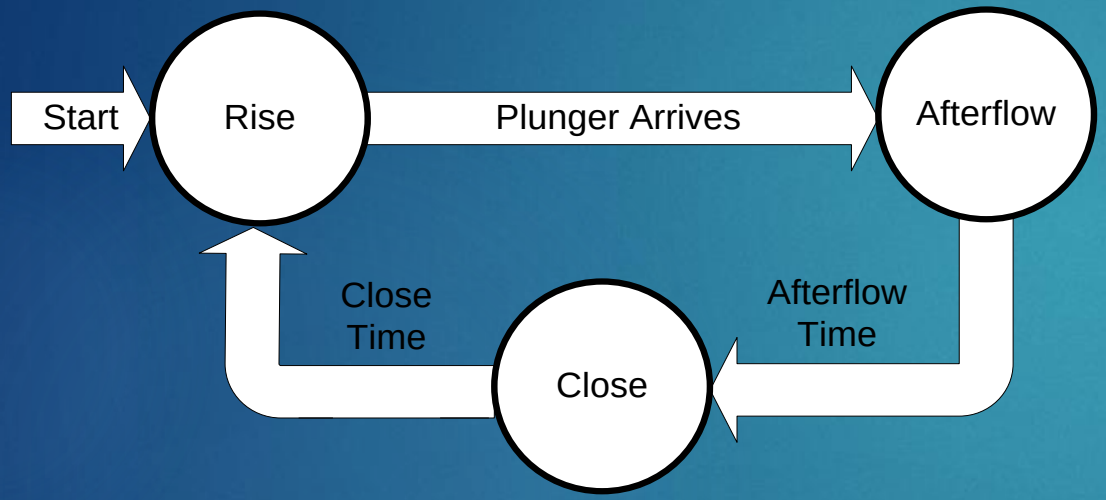




Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

The Plunger Cycle: The Basics

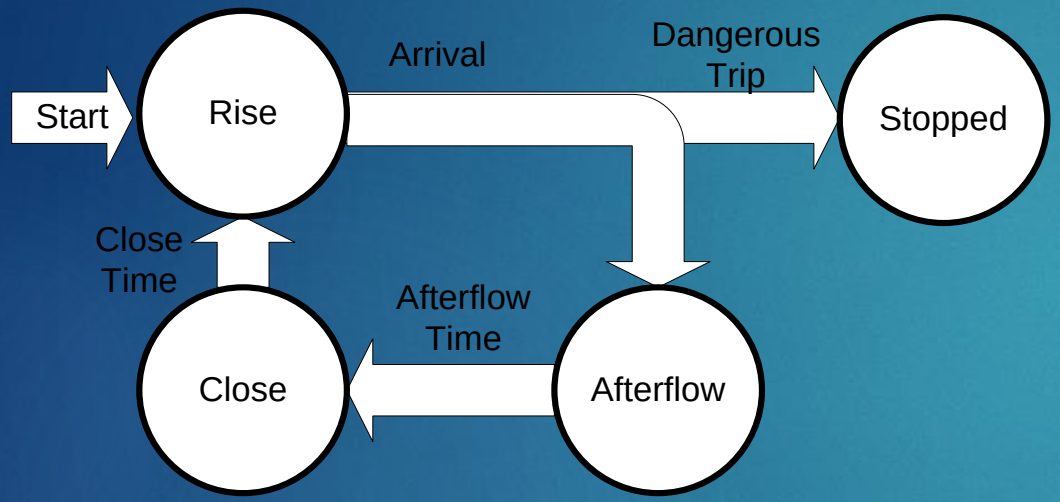


- Rise
  - Well is open, plunger rising
  - Start of a new cycle
  - Force by pressing open button
- Afterflow
  - The flow time after the plunger arrives
- Close
  - Allows plunger to fall
  - Includes pressure build

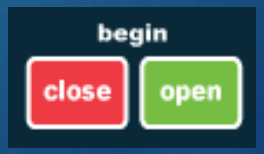
Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

The Plunger Cycle: Stopped



- Single Dangerous Trip
  - > 640 m/min (2100 ft/min)
- Multiple Consecutive Fast Trips
  - > 315 m/min (1034 ft/min)
- Multiple Consecutive Non-Arrivals
  - < 150 m/min (492 ft/min)
- Low Battery
  - < 5.5 V
- Hold Open/Closed
  - Press and hold close or open for 3 seconds



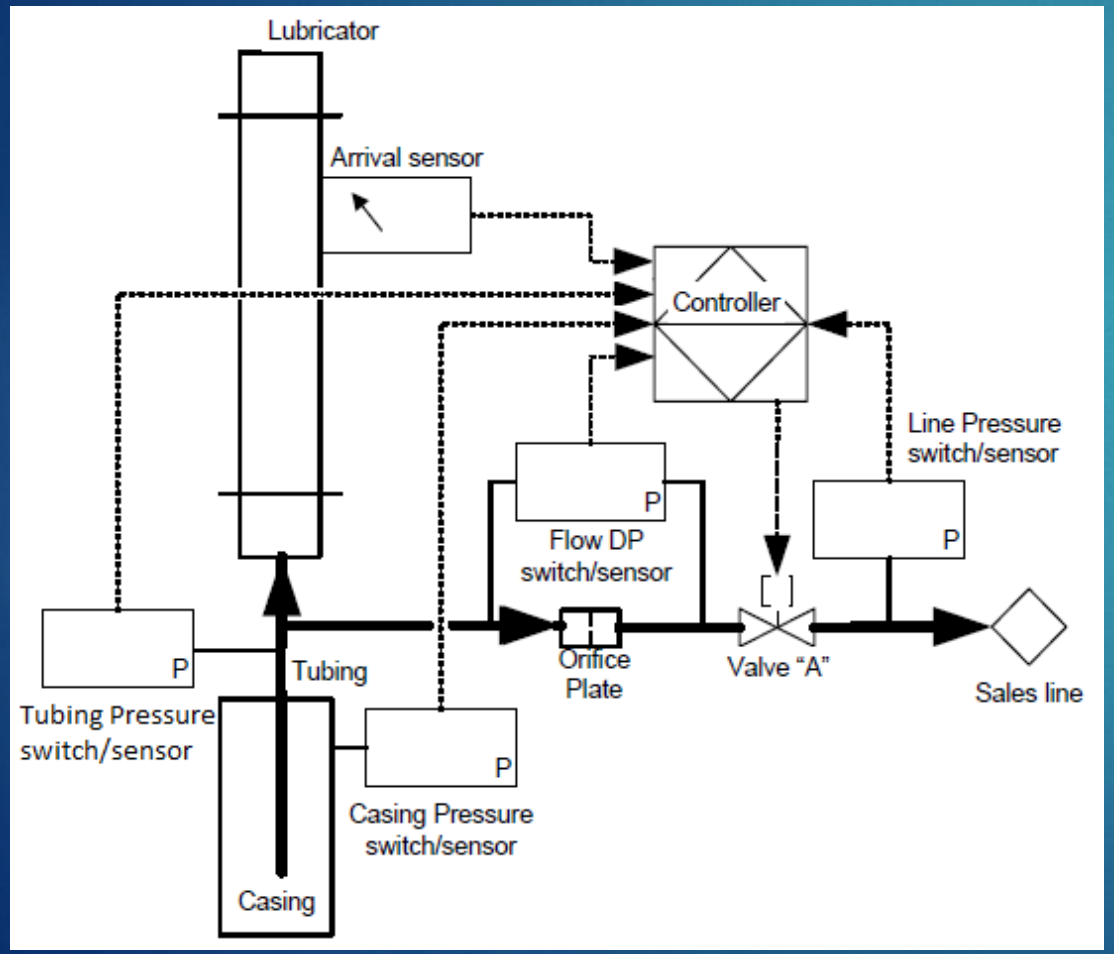
Copyright Extreme Telematics Corp
8/5/2020

EXTREME TELEMATICS CORP.

ALiEn2R
PLUNGER LIFT CONTROLLER

Model	ALiEn2 Lite	ALiEn2	ALiEn2 Expert
Operating Temp	0°F to +160°F	-40°F to +160°F	-40°F to +160°F
Valves Supported	1	2	3
Battery Standby Time	3+ Months	5+ Months	8+ Months
Arrival Sensors	Cyclops IS	Cyclops IS	Cyclops IS Sasquatch
Surface Velocity	N/A	N/A	Log Alarm
Other Inputs *Dry contact Switch or 0.5 – 4.5V sensor*	Line Pressure Tubing Pressure	Line Pressure Tubing Pressure	Line Pressure Tubing Pressure Casing Pressure Differential Pressure
Optimization	Upgrade to Adaptive Seeking Velocity Optimization Open on TP/DP	*Upgrade to Adaptive Seeking Velocity Optimization* *Open on TP/DP*	Adaptive Seeking Velocity Optimization Open on CP, TP, or CP – LP, Load Factor Close on CP, CP Rate of Change, DP, or Flow
Communications Interface	2 wire RS-485 Modbus Slave	2 wire RS-485 Modbus Slave	2 wire RS-485 Modbus Slave 2 wire RS-485 Modbus Master
Certification	UNCERTIFIED	Class I, Zone 0, Ex/AEx ia [ia] IIB Class I, Division 1, Groups C and D	Class I, Zone 0, Ex/AEx ia [ia] IIB Class I, Division 1, Groups C and D

Available Connections



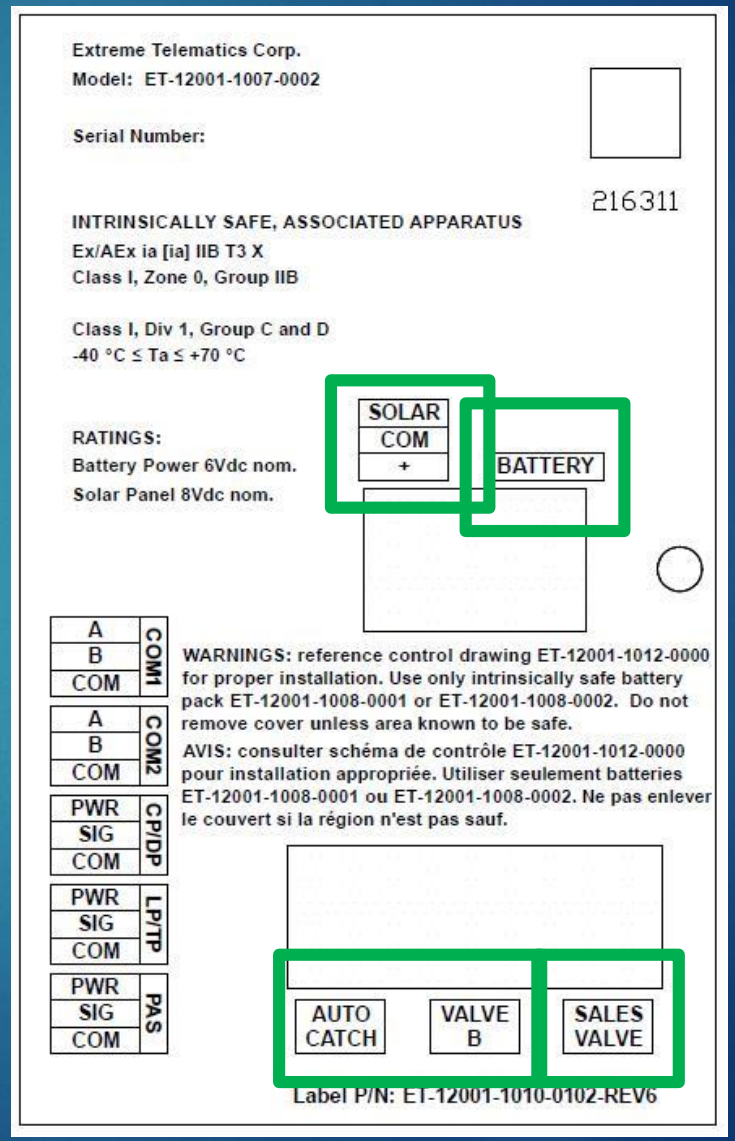
- Standard
  - Plunger Arrival Sensor (PAS)
  - Line Pressure (LP)
- Expert Model
  - Casing Pressure (CP)
  - Tubing Pressure (TP)
  - Differential Pressure (DP)

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Controller Wiring: Basics

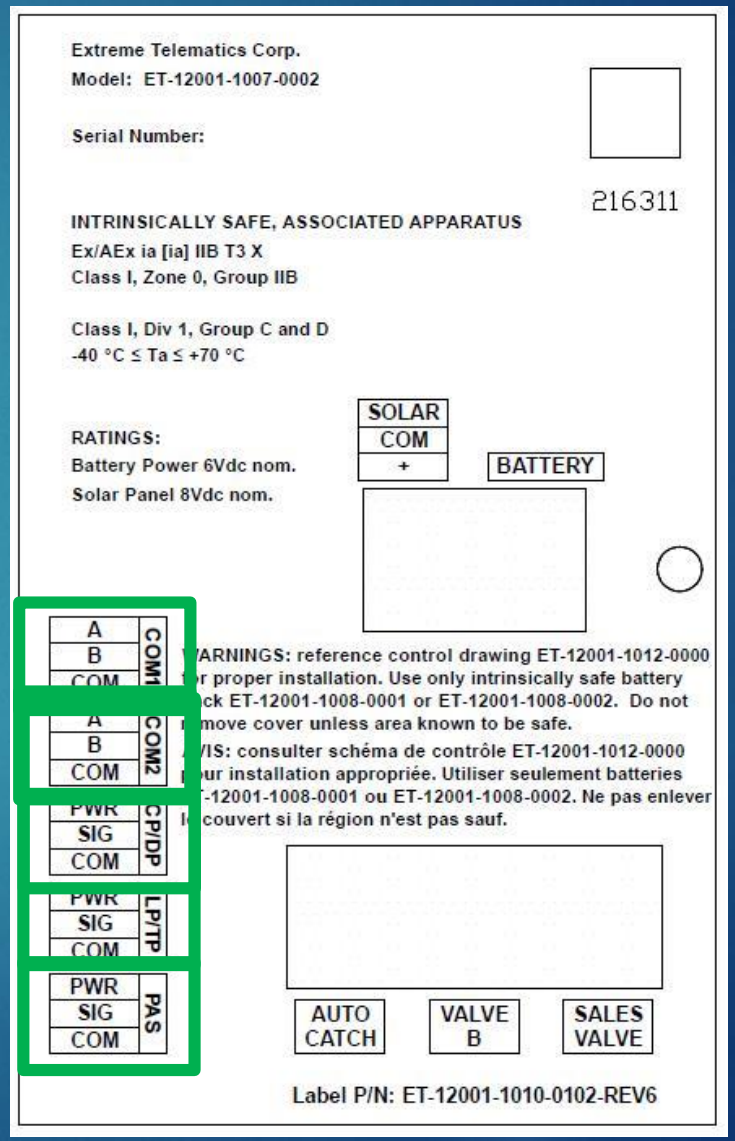
- Battery
  - Plug this in before solar
  - Must use approved battery
- Solar
  - Must use approved 1.1W solar panel
- Sales Valve
  - Main production valve
- Valve B (Expert)
  - Used for flow to tank or flow tee
- Auto Catch (Expert)
  - Independent Auto Catch Control
  - Engage on arrival
  - Release after close



Copyright Extreme Telematics Corp
8/5/2020

Controller Wiring: Inputs

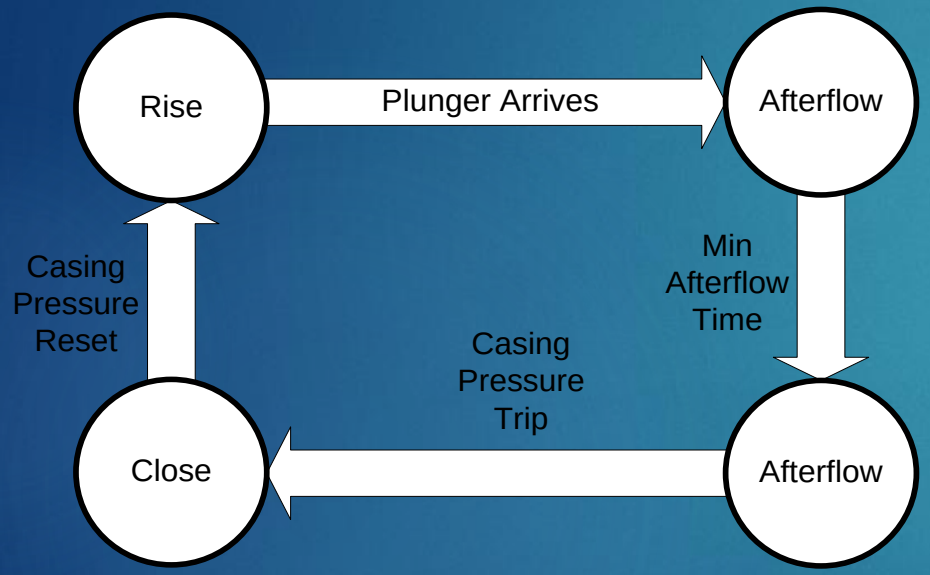
- COM 1
  - Modbus Slave – SCADA System Connection
  - Firmware upgrade port
- PAS
  - 2 or 3 wire sensors supported
  - 3 wire delivers power to avoid battery replacements
  - Cyclops (3 Wire) recommended
- LP/TP and CP/DP (Expert)
  - 2 wire Murphy switch
  - 3 wire transducer delivers an actionable value
  - Pressure splitter available
- COM 2 (Expert)
  - Modbus Master – Interact with Sasquatch



Copyright Extreme Telematics Corp
8/5/2020

EXTREME TELEMATICS CORP.

The Plunger Cycle: Close -> Rise

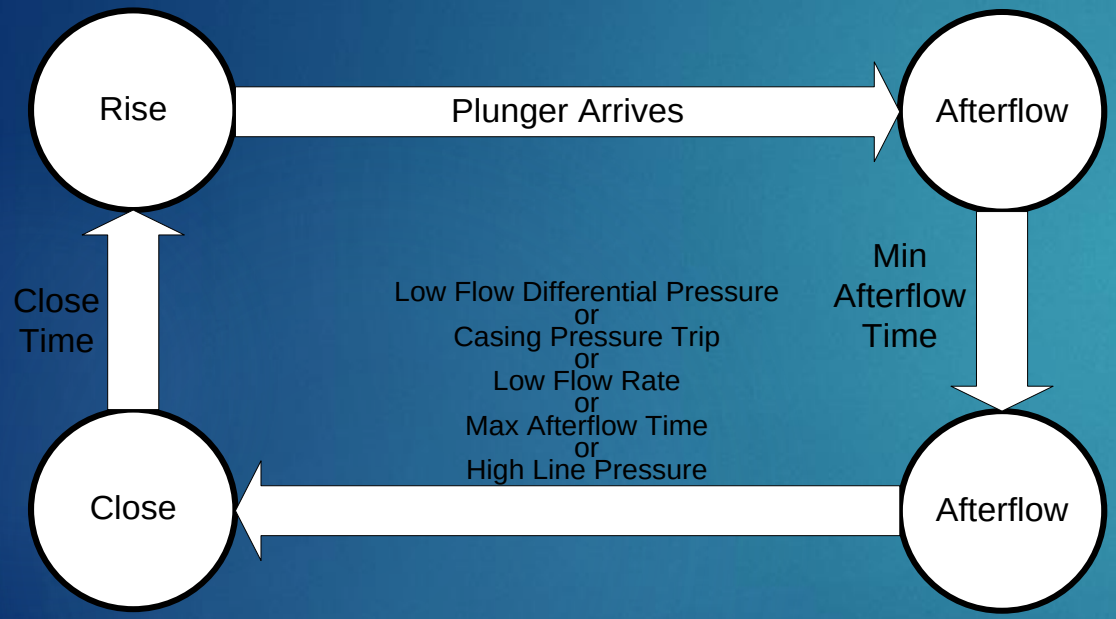


- Controller checks pressure conditions before opening the well
- Conditions to Open
  - Low Line Pressure
  - High Casing Pressure
  - High Casing – Line Pressure
  - High Tubing Pressure
  - Low Load Factor

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

The Plunger Cycle: Afterflow -> Close

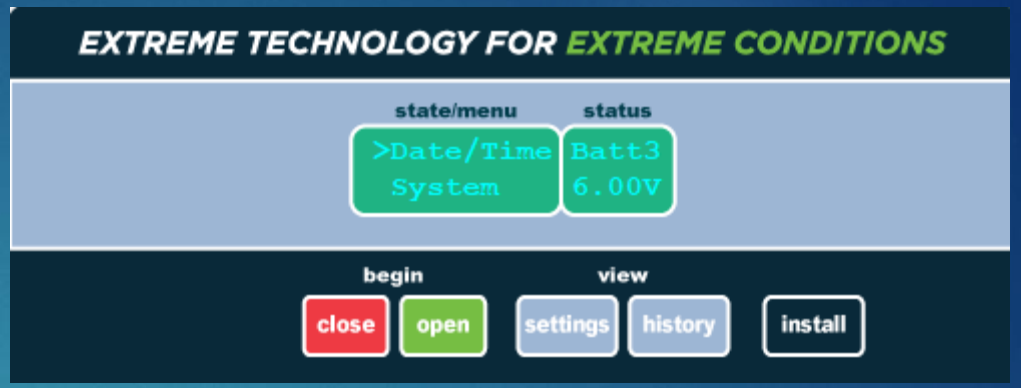


- Controller runs minimum afterflow time and then runs on pressure
- Conditions to Close
  - High Line Pressure
  - Low Casing Pressure
  - Low Casing Pressure Rate Drop
  - Low Differential Pressure
  - Low Flow Rate

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Install>Date/Time

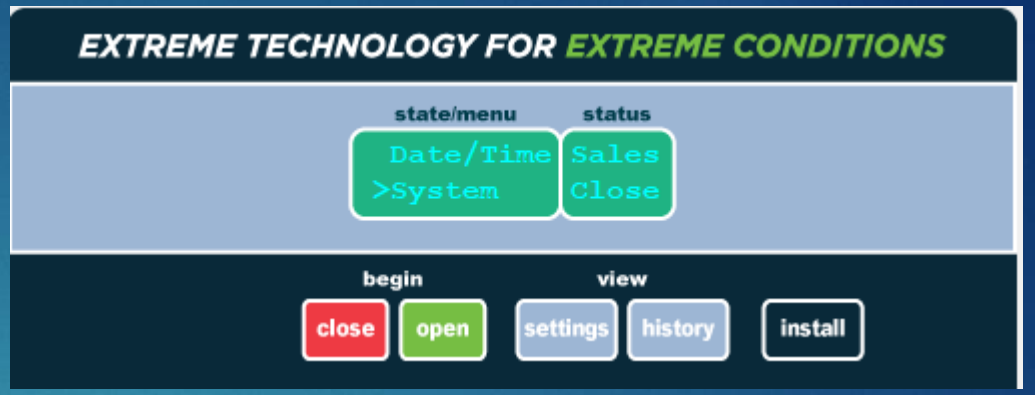


- Screens to set
  - Date
  - Time
  - Daylight Savings Time
- Time needs to be reset any time that power is lost
  - Battery disconnected

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Install>System

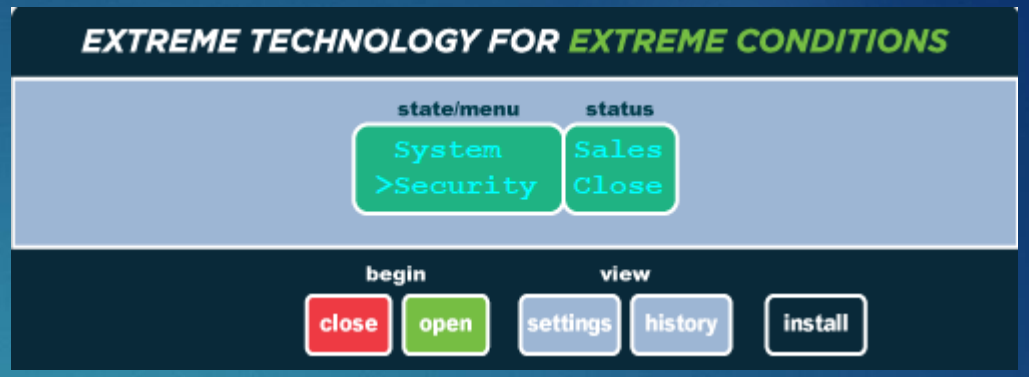


- System level settings and info
- Display Brightness
- Auto Off
  - Screen Timeout
  - 30 second default
- Units – Imperial/Metric
- Serial Number
- Software Version
- Hardware Version
- Auto Logout
  - Goes back to main menu, logs out user
  - 10 min default
- Error Log

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Install>Security



- Allows installer to turn on security to lock out install menu
- Disabled by default
- Operator ID and Installer ID
  - Default is 000-0000
- If you forget your ID, ETC can unlock
  - Need serial number

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

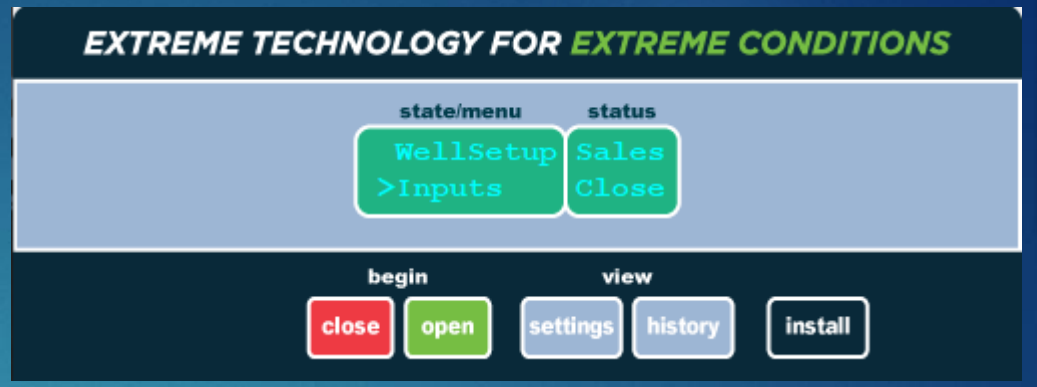
Install>Well Setup

Copyright Extreme Telematics Corp
8/5/2020

- Basic setup of times/velocities
- Time and velocity will calculate the other based on well depth
- Settings
  - Well Depth
  - Danger Time/Velocity
  - Fast Trip Time/Velocity
  - Rise Time/Velocity
  - Close Time/Velocity
  - Min/Max Close Time
  - Non-Arrival Close Time
  - Min/Max Afterflow Time
  - Afterflow Time

ETC
EXTREME TELEMATICS CORP.

Install>Inputs

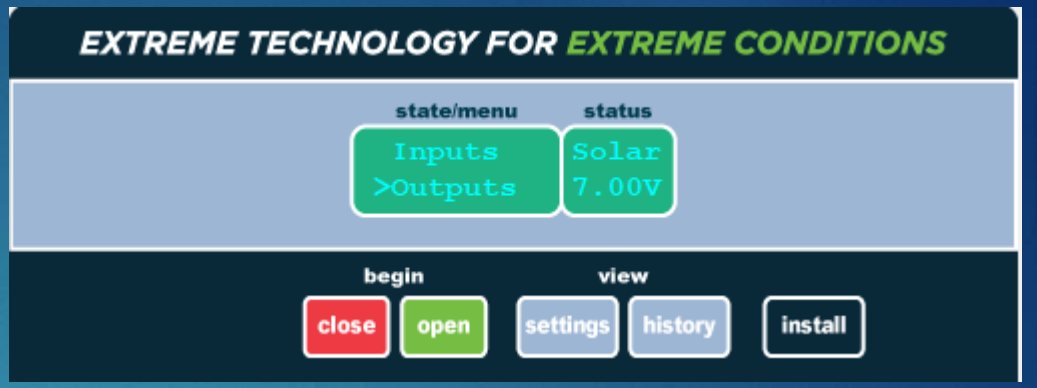


Copyright Extreme Telematics Corp
8/5/2020

- Menu to turn on and configure inputs
- PAS
  - Enable
  - When to apply power
  - Delay – Required by some less reliable sensors
  - Switch polarity – Normally Open vs. Normally Closed
- Line/Casing/Tubing/Differential/Flow
  - Disabled/Switch/Sensor/Virtual
  - Switch Polarity
  - Range
- Device Logs
  - Keeps history of readings

ETC
EXTREME TELEMATICS CORP.

Install>Outputs



Copyright Extreme Telematics Corp
8/5/2020

- Valve status and configuration
- Valve B
  - Tank – Dump to tank if plunger does not arrive in Tank Delay Time
  - Line – Connected to sales line. Open or Closed during Afterflow
  - Purge – Inject gas at end of close
  - GAPL – Inject gas at end of close
  - Flow Control – Open during Rise, Closed during Afterflow
- Auto Catch
  - Engage On Rise or On Arrival
  - Hold Time
- LP-TP Select – Use valve to control pressure splitter
- Outputs
  - Configure pressure input PWR pin as an Output
  - On alarm or mimic valve

ETC
EXTREME TELEMATICS CORP.

Install>Alarms

Copyright Extreme Telematics Corp
8/5/2020

- Counts to send controller into alarm and what to do
- Pre Non-Arrival Count
  - # of missed arrivals before going to Non-Arrival
  - Non-arrival will run the Non-Arrival Close Time
- Non-Arrival Count
  - # of non-arrivals before stopping controller
- Fast Trip Count
  - # of fast trips before stopping controller
- Low Battery Fail/Fast Trip Fail/Non-Arrival Fail/Danger Fail
  - What action to take on a failure
  - Fail Open or Fail Closed

ETC
EXTREME TELEMATICS CORP.

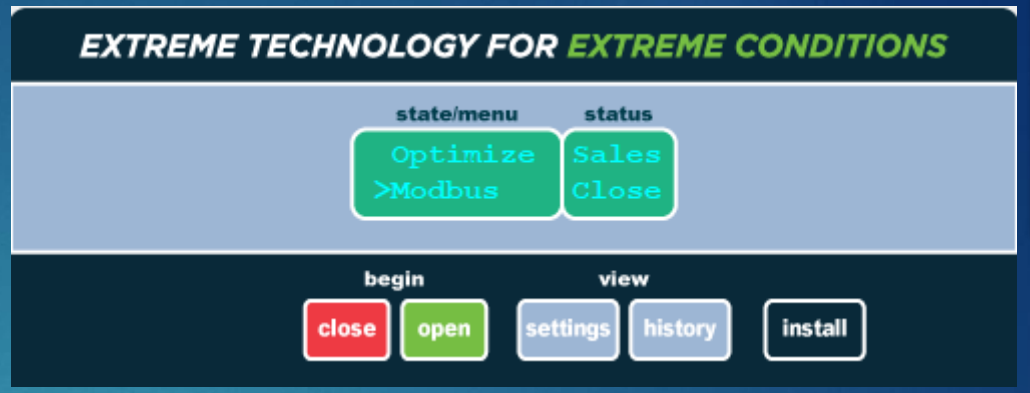
Install>Optimize

- Enable and setup optimization
- Optimization Type
  - Close (Oil)
  - Afterflow (Gas)
  - Close then Afterflow (Oil then Gas)
  - Pressure/Flow
- Adaptive Seeking Velocity Optimization
  - Proportional adjustments to Close and/or Afterflow
  - Based on Current Close/Afterflow
  - Scale Factor applied to dampen
- Pressure/Flow Optimization
  - Enable a given state for a specific device or device combination
  - Set stable time, trip, and reset

Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Install>Modbus



Copyright Extreme Telematics Corp
8/5/2020

- Enable a Modbus Slave on COM 1 to connect to SCADA
- Disabled by default
- Ensure settings match Modbus Master
  - Station Address
  - Protocol (RTU/ASCII)
  - Baud Rate
  - Data Bits
  - Parity
  - Stop Bits
- Time Format
  - Sets Modbus registers as elapsed seconds since Jan 1, 2000 or H:M:S

ETC
EXTREME TELEMATICS CORP.

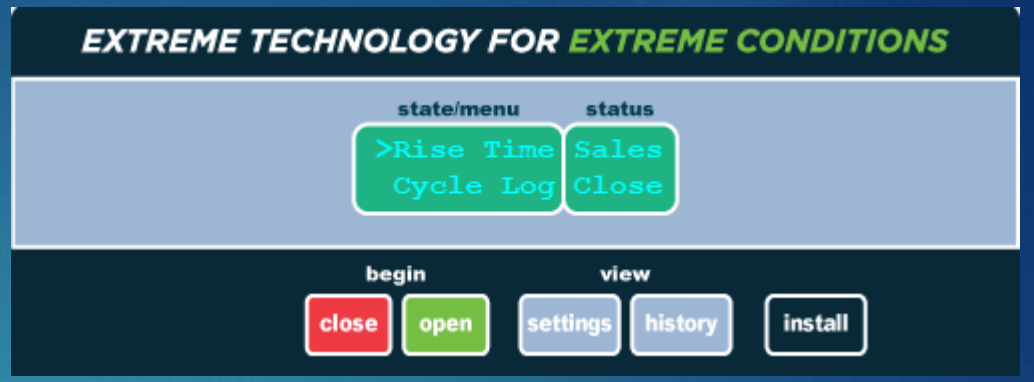
Settings

Copyright Extreme Telematics Corp
8/5/2020

- List of common settings for operators to access
  - Close Time
  - Non-Arrival Close Time
  - Rise Time
  - Fast Trip Time
  - Afterflow Time
- These settings are bound by Min and Max times in Well Setup

ETC
EXTREME TELEMATICS CORP.

History: Cycle Log



Copyright Extreme Telematics Corp
8/5/2020

- Rise Time
  - Last 25 Rise Times
- Cycle Log
  - Last 25 Cycles
  - Date and Time
  - Rise, Afterflow, Vent, Close, Afterflow Casing Pressure

ETC
EXTREME TELEMATICS CORP.

History: Total Logs

Copyright Extreme Telematics Corp
8/5/2020

- Daily
  - Today + past 14 days
  - Date and Time
  - Number of Cycles, Open/Close Time, Vent Time, Volume, Cycle Type Count
  - Day Start Time – Gas day start/cut off
- Total
  - Same as Daily, but all time cumulative stats

ETC
EXTREME TELEMATICS CORP.

History: Plunger Log

- Distance travelled
  - 2 x Well Depth per run
- Arrivals
  - Number of recorded arrival events

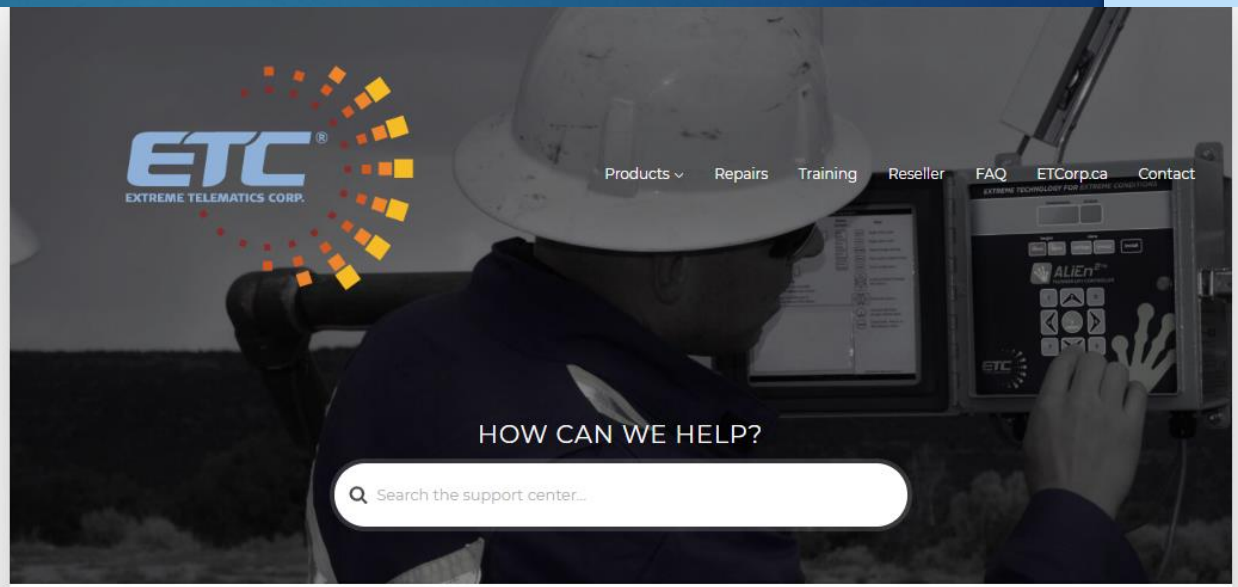
Copyright Extreme Telematics Corp
8/5/2020

ETC
EXTREME TELEMATICS CORP.

Copyright E
8/5/2020

Support Center

- Ask a question
- Access Training Programs
- Product Resources
  - Documentation
  - Tools
  - Accessories
  - Replacement Parts
- Submit an RMA
- Submit a Ticket
- Go To Support Center



POPULAR HELP TOPICS

MAINTENANCE

Articles related to maintenance of ETC products.

- How do I charge the ALiEn2/ALiEn2 Expert plunger lift controller battery?
- What is considered a low battery?
- What if my battery has no voltage?
- What battery can I use in the ALiEn2/ALiEn2 Expert plunger lift controller?
- What do I do if my solenoid does not seal?

TROUBLESHOOTING

Having trouble? Check out these articles to find resolutions to the most common issues.

POPULAR ARTICLES

- How do I submit an RMA to repair my ETC controller or sensor?
- Is there a software simulator for the ALiEn2/ALiEn2 Expert?
- What is considered a low battery?
- How do I use the ALiEn2/ALiEn2 Expert to switch an electric valve or signal an alarm?
- How do I charge the ALiEn2/ALiEn2 Expert plunger lift controller battery?
- How do I connect to an ETC controller or sensor in Vision?
- How do I see what the Cyclops/Sasquatch sees in real time using Vision?
- How do I upgrade the firmware on ALiEn2/ALiEn2 Expert?

About ETC

Copyright Extreme Telematics Corp
8/5/2020

Since 2001, ETC has specialized in low power, wide temperature range, hazardous locations approved electronics for the oilfield.

Devices Sold

12,000 Controllers

60,000 Sensors

- Mission
  - To democratize industrial automation
- Core Values
  - Honesty and Integrity
  - Value Creation
  - Innovation
  - Collaboration
  - Empowered Employees
- Learn more
  - https://etcorp.ca/about-us/