1. INTRODUCTION

The plunger lift controller is a is a versatile petroleum well controller that can be used in several different configurations. It can function as a timer based well intermitter, or when used with a plunger it can optimize a well based on pressures or plunger arrival time/velocity. In addition, the controller can be accessed remotely using the provided Modbus compatible RS485 communications port.

2. SAFETY INFORMATION

⚠ WARNING – EXPLOSION HAZARD
⚠ AVERTISSEMENT – RISQUE D'EXPLOSION

• CONSULT PRODUCT DOCUMENTATION ANYTIME THE CAUTION SYMBOL ⚠ IS FOUND FOR DETAILS ON THE NATURE AND MITIGATION OF THE HAZARD

• SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY / LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE

• BATTERIES MUST ONLY BE CHANGED IN AN AREA FREE OF IGNITIBLE CONCENTRATIONS / LES BATTERIES NE DOIVENT ÊTRE REMPLACÉES QUE DANS UN EMPLACEMENT EXEMPT DE CONCENTRATIONS INFLAMMABLES

•ONLY USE BATTERY ASSEMBLY ET-12001-1008-0001 OR ET-12001-1008-0002 / UTILISEZ UNIQUEMENT L'ASSEMBLAGE DE BATTERIE ET-12001-1008-0001 OU ET-12001-1008-0002.

•NO SERVICEABLE PARTS / PAS DE COMPOSANTS SERVICEABLES

•IF EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED / SI L'ÉQUIPEMENT N'EST PAS UTILISÉ TANT QU'AUX INSTRUCTIONS DU FABRICANT, LA PROTECTION PEUT ÊTRE RÉDUITE

•AVOID STRIKING OR EXCESSIVE FRICTION ON THE EQUIPMENT SURFACE DUE TO IGNITION HAZARD / ÉVITER DE FRAPPER OU FRICTION EXCESSIVE SUR LA SURFACE DE L'ÉQUIPEMENT EN RAISON DE RISQUES D'INFLAMMATION

•CLEAN ONLY WITH A DAMP CLOTH / NETTOYER SEULEMENT AVEC UN LINGE HUMIDE

•THIS DEVICE MUST NOT BE CONNECTED TO ANY APPARATUS WHICH USES OR GENERATES MORE THAN 250 VRMS / CET APPAREIL NE DOIT PAS ÊTRE CONNECTÉ À UN APPAREIL QUI UTILISE OU GÉNÈRE PLUS DE 250 VRMS

•FINAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NFPA 70, AND/OR THE CANADIAN ELECTRICAL CODE INCLUDING SPECIFIC REQUIREMENTS FOR HAZARDOUS LOCATIONS / L'INSTALLATION FINALE DOIT ÊTRE CONFORME AU CODE NATIONAL DE L'ÉLECTRICITÉ, NFPA 70 ET / OU AU CODE CANADIEN DE

•CABLE GLANDS MUST BE RECOGNIZED TYPE 4, SUITABLE FOR USE IN THE HAZARDOUS LOCATION WHERE INSTALLED, AND RATED FOR USE WITH THE CABLE TYPE INSTALLED / PRESSE-ÉTOUPES DOIVENT ÊTRE DE TYPE 4 RECONNU, APPROPRIÉS POUR L'UTILISATION DANS L'EMPLACEMENT DANGEREUX OÙ ILS SONT INSTALLÉS, ET HOMOLOGUÉS POUR L'UTILISATION AVEC LE TYPE DE CÂBLE INSTALLÉ

3. SPECIFICATIONS

Electrical Solar Input Supply Voltage: ⎓ 8-12V DC Solar Input Current: 160mA Max Battery: ⎓ 6V Battery Current: 190mA Max	Battery: Only approved 6V non-Spillable 5Ah (ET-12001-1008-0001) or 8Ah (ET-12001-1008-0002) Overvoltage Category: II
Environmental Operating Temperature: -40 to +65 °C (-40 to +149 °F) Pollution Degree: 2	Relative Humidity: 90% max non-condensing Operating Altitude: 2000m Max
Physical Controller Width: 215mm (8.5") Height: 215mm (8.5") Depth: 173mm (6.8") Weight: 5.4 Kg (12 lbs)	Solar Module Width: 120mm (4.75") Height: 222mm (8.75") Depth: 56mm (2.2") Weight: 1.9 Kg (4 lbs)
Certification Markings Intrinsically safe, associated apparatus Ex/Aex ia [ia] IIB T4 X Class I Zone 0 Group IIB Class I Div I Group C and D -40 °C ≤ Ta ≤ +65 °C	Enclosure Type 4 CSA File #11CA2472435X

4. MAINTENANCE, CLEANING, AND DISPOSAL

Routine inspections and maintenance are not required. Repairs can only be carried out by the manufacturer or an authorized representative.

Exterior surfaces may be cleaned only with a damp cloth.

Dispose of packaging in accordance with local waste disposal regulations. The battery contains lead and must be recycled appropriately. The enclosure and other metal components are made of mild steel and aluminum and can be recycled where facilities exist.

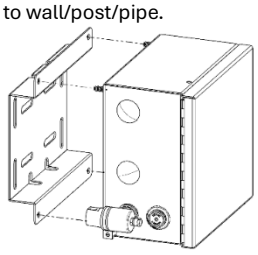
5. INSTALLATION

⚠ Please read carefully before installing

Installation to be performed by qualified personnel only.

Enclosure Mounting

The enclosure must be mounted to avoid building a static charge from nonconductive process flow, strong air currents, or potential charging through friction. Each controller is supplied with a universal mounting bracket that allows for several mounting options. Simply mount the bracket to the desired surface securely and then attach the controller to the bracket. Hardware is included to mount the enclosure to the bracket, but the installer must supply the necessary hardware to mount the bracket to wall/post/pipe.



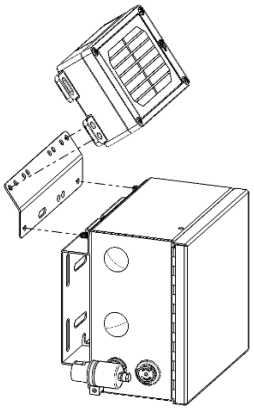
Wall/Post Mounting - Use the holes of the mounting bracket to securely attach to a wall or post with appropriate screws.

Pipe Mount - The mounting bracket has two sets of slots, one set horizonal and one set vertical, for mounting to a pipe. Using U-bolts or pipe clamps through the slots allows for flexibility in the mounting position to a horizontal or vertical pipe.

Valve Mount - The mounting bracket can also be secured to the diaphragm chamber of a pneumatic valve. Remove two adjacent bolts from the valve, place the mounting bracket over the holes, and replace the bolts by running through the slots of the bracket and back into the holes.

Solar Module Mounting

The solar module can be mounted on top of the controller with the supplied angled mounting bracket, or it can be remotely mounted to a pipe, post, or other flat surface. The solar module must be mounted so that it will receive the most amount of direct sunlight during the shortest days of the year. Depending on the latitude at the location of installation, more northern locations will do best with the solar module mounted in a south facing vertical position, and more southern locations are better with the solar module mounted at an angle. It is important that the solar module receives direct sunlight throughout the day to maintain the internal battery charge.



Remote Mounting - The included angled mounting bracket can be used to mount the solar module to a flat surface at a 35-degree angle, or the solar module can be mounted directly to a post or wall. It can also be mounted to a pipe or pole with U-bolts through the slotted holes.

Tighten the solar module cover screws to 1.4 Nm (12 in-lbs).

Wiring

The controller ships with three pre-punched 1/2" size conduit/cable gland openings on the bottom. One opening is optional and comes with a removable plug. All openings on the controller must be fitted with either a cable gland or hole plug and all must be recognised as Type 4.

Wiring must be appropriately rated for the location of installation in accordance with the national electrical code, NFPA 70, the Canadian electrical code, and/or regional and local rules. Installation requires cable and matching cable glands rated for use in the type of hazardous location where installed.

Manufactured by
Extreme Telematics Corporation
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Electrical Connections

The inner door contains the electronics module and it has removable terminal blocks to aid in the connection of field installed wiring for sensors and communications, see Table 1. The battery and solenoid connectors are factory installed and must not be modified to extend or replace the wiring. An internal grounding stud provides electrical grounding, and there is an external bonding lug which supports up to 4 AWG wire.

Solenoid Connections

Instrument air supply connection is to the port marked IN, connection to the pneumatic actuator is made on the port marked CYL, and a vent line can be connected to the port on the top of the solenoid coil. Solenoids are interchangeable and can be connected to any of the three solenoid connection points on the electronics module.

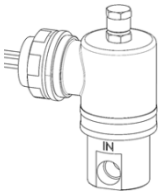

Table 1: Controller Connections

COM1 – RS485 Modbus	A – RS485 A	Solar	+ - Positive Input
	B – RS485 B		COM - Common
	COM – Common	Battery	Battery Connection - Keyed for Polarity Protection
COM2 – RS485 Modbus	A – RS485 A		
	B – RS485 B		
	COM – Common		
CP/DP – Casing Pressure / Differential Pressure	PWR – 5V Output	Auto Catch	Connection Point for an Auto Catch Solenoid
	SIG –Signal Input		
	COM		
LP/TP – Line Pressure / Tubing Pressure	PWR – 5V Output	Valve B	Connection Point for Multipurpose Valve B Solenoid
	SIG –Signal Input		
	COM		
PAS – Plunger Arrival Sensor	PWR – 5V Output	Sales Valve	Connection Point for Salve Valve Solenoid
	SIG –Signal Input		
	COM		

6. CONTROL DRAWING

Table 2: Entity Parameters

SOLAR INPUT	COM1, COM2		CP/DP, LP, PAS
Ui / Vmax = 15.5Vdc	Ui / Vmax = 8.0Vdc	Uo / Voc = 5.88V	Ui / Vmax = 7.88V
Ii / Imax = 160mA	Ii / Imax = 160mA	Io / Isc = 53.1mA	Io / Isc = 92.1mA
Ci = 0.1uF	Ci = 0.0uF	Ca / Co = 10uF	Ca / Co = 10uF
Li = 0uH	Li = 0uH	La = 50uH	La = 50uH
Pi / Pmax = 1.6W	Pi / Pmax = 0.8W	Po / Pout = 105mW	Po / Pout = 181.5mW

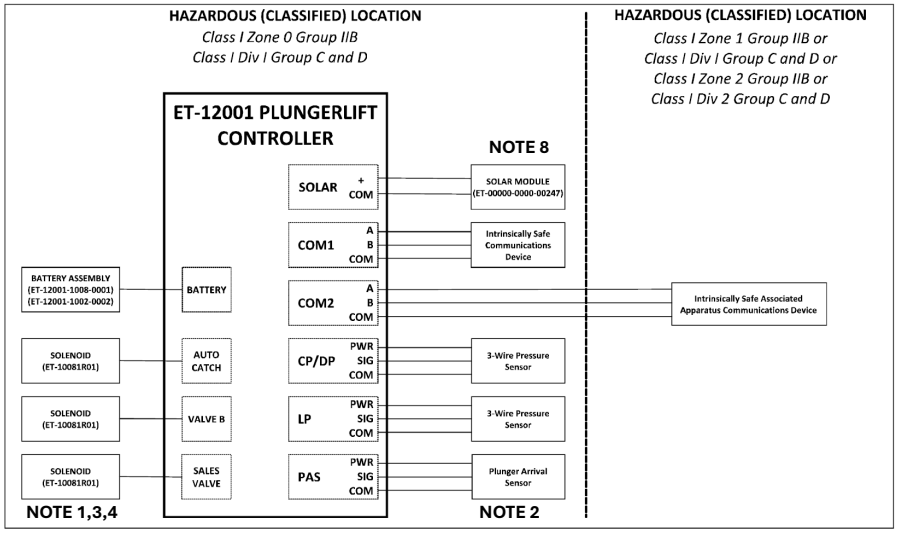

Figure 1

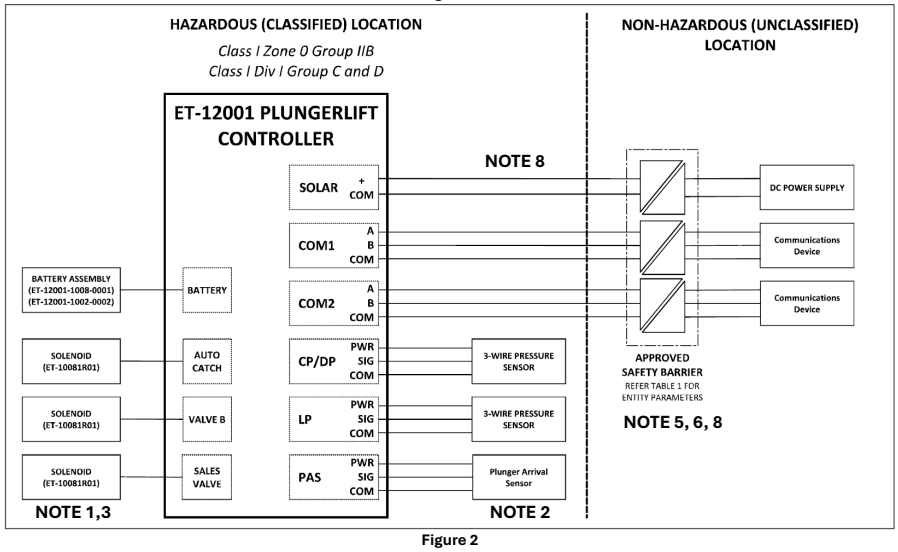

Figure 2

Notes:

1. ET-12001 Plunger Lift Controller may be configured with one to three latching solenoid valves, and either a 5Ah or 8Ah battery assembly.
2. All connected devices must be approved intrinsically safe or intrinsically safe associated apparatus and have entity parameters compatible with those in table 2.
3. Use only ET-12001-1008-0001 or ET-12001-1008-0002 battery assemblies.
4. Use only ET-10081R01 Solenoid with the plunger lift controller.
5. Approved safety barriers must not be connected to any device that uses or generates in excess of 250V RMS or DC.
6. For COM1 / COM2, a single dual-channel or two single-channel safety barriers may be used, where in either case, both channels have been approved for use together with combined entity parameters.
7. A combination of connections per Figure 1 and Figure 2 is permitted if equipment installed is approved for use in the specific hazardous location where installed.
8. Wiring between the controller and solar module must have a capacitance and inductance value such that:
   Total Cable Capacitance ≤ 10µF
   Total Cable Inductance ≤ 50µH

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