

Maintenance Instructions:

Horner PLCs

To accompany main manual for systems with Horner PLCs

20 January 2026

Note: Horner PLCs are used both in winches as well as some stand-alone A.G.O. instrumentation products like the TWC-1 tensiometer wire counter sheave system.

The “*main electronics system [supplying the PLC]*” is the general term used in this guide to refer to whatever electrical system that the Horner PLC is installed in, whether that be winch electronics, the TWC-1 electronics, or something similar.

It does *not* refer to the site’s electrical system that is supplying power to the electronics that the Horner PLC is installed in.

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Horner PLC Maintenance

Horner PLCs used in A.G.O. winch instrumentation systems (e.g. winch-integrated wire counting system with drum encoder; TWC-1 stand-alone tensiometer system) include a small coin-cell battery to ensure the PLC maintains power long enough to store all its variables to non-volatile memory after the main electronics supplying the PLC are shut down. This battery is not rechargeable and will need to be replaced periodically.

PLC memory backup battery	
Battery type	CR2450N 3V Lithium Coin Battery
Recommended minimum replacement frequency	Yearly After long-term storage

Warnings

DO NOT USE THE PLC IF THE BATTERY IS LEAKING OR HAS BEEN DAMAGED.

Lithium batteries may explode or catch fire if mistreated.

Do **NOT** recharge, disassemble, heat above 100°C (212°F), incinerate, or puncture the battery.

Explosion hazard: Batteries must only be changed in an area known to be non-hazardous.

Disposal of lithium batteries must be done in accordance with federal, state, and local regulations. Be sure to consult with the appropriate regulatory agencies **BEFORE** disposing batteries.

Do **NOT** make substitutions for the battery.

Be sure to only use the authorized part number to replace the battery.
CR2450 batteries (no "N") are **NOT** compatible with this PLC.

Replacing the battery and backing up the software

The PLC includes a small SD card for saving the software prior to battery removal.

Failure to backup the PLC software to the SD card prior to battery removal will result in program loss and PLC system non-functionality.

Backing up the PLC software

- From the PLC's home screen, press the **F4** "Menu" button on the PLC's keypad.



2. Press the **SYSTEM ACCESS** button on the PLC's touch screen.

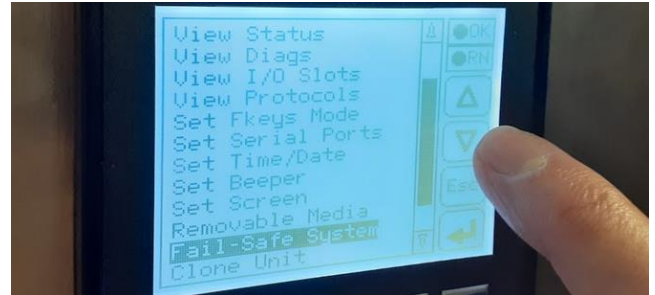


3. Press the **SYSTEM** button on the PLC's keypad.



4. **SCROLL** to the "Fail-Safe System" using the arrow buttons on the PLC's touch screen.

Press the **↵ RETURN** button on the PLC's touch screen to enter the "Fail-Safe System" menu.

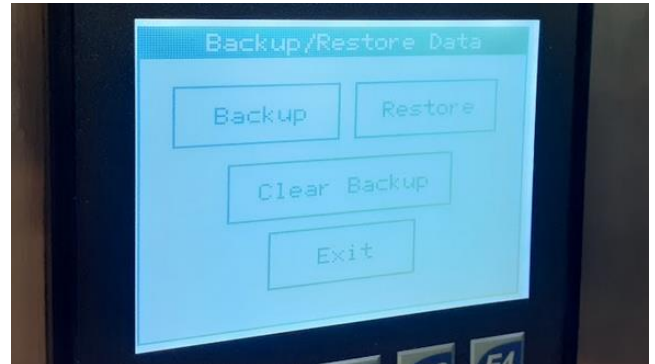


5. With **BACKUP/RESTORE DATA** highlighted on the Fail-Safe System menu, press the **↵ RETURN** button on the PLC's touch screen.



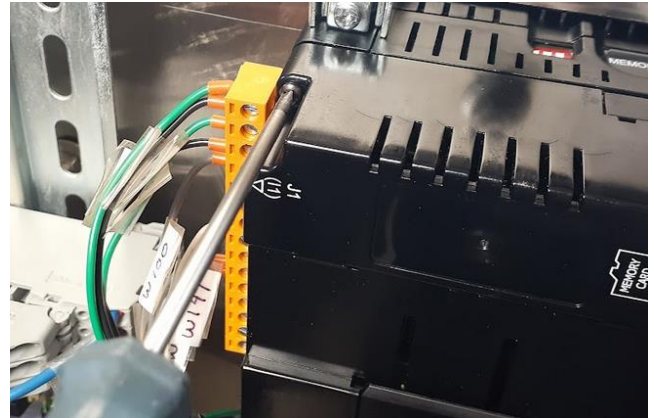
6. Press the **BACKUP** button on the PLC's touch screen to backup the software to the SD card prior to replacing the battery.

Press the **RESTORE** button on the PLC's touch screen to restore the software from the SD card after replacing the battery.



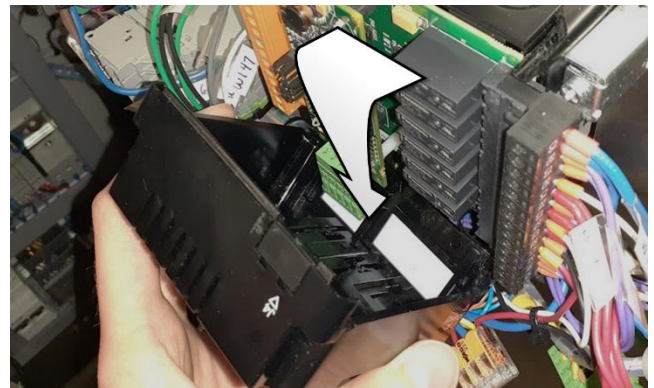
Changing the PLC battery

7. **POWER OFF** the PLC's main electronics system and disconnect it from its power source.
8. **UNSCREW** the screws securing the PLC's back cover using a small Phillips head (+) screwdriver.



9. Carefully **SLIDE** the cover off and down over the bottom connector.

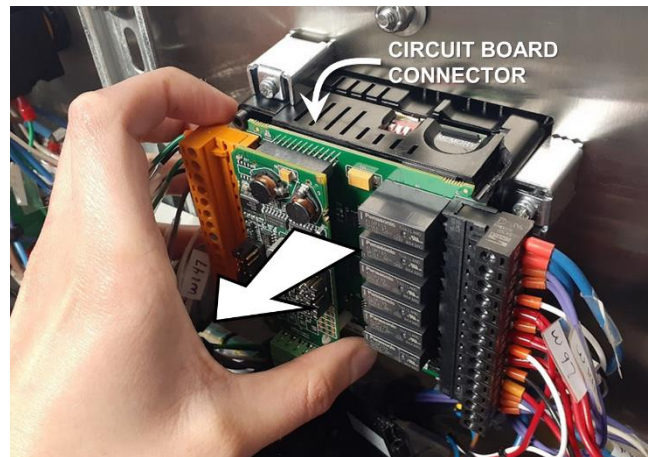
The cover can rest on the wires connected to the PLC while the battery is replaced.



10. Gently **PULL** the circuit board off of the pins at the top of the PLC.

Both circuit boards (the long narrow one as well as the large main square one) will need to come off to access the PLC's battery.

It will likely take some effort to dislodge the header connector from the pins. You may need to remove the plastic panel at the top side of the PLC to help get some good leverage on the circuit board without endangering the components attached to it.



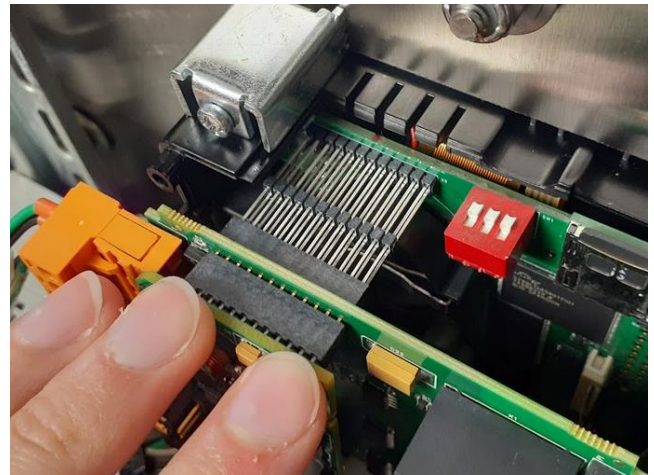
11. **REMOVE** and **REPLACE** the battery.

A thin tool like a small flat-head screwdriver can be used to lift the old battery out of the holder.



12. Carefully **REINSTALL** the two circuit boards removed in Step 10.

Ensure the pins line up with the headers on both circuit boards and push them securely together.



13. **REPLACE** the top plastic side panel if removed during Step 10. Slide the back cover back into place and screw it down with the screws removed in Step 8.
14. Power on the PLC's main electronics system and **FOLLOW** Steps 1 – 6 to restore the PLC's software from its SD card.

Troubleshooting

This section is a (non-exhaustive) guide to troubleshooting some basic errors that may occur with the Horner PLC, especially in relation to its battery status. Instructions for some of the more specific troubleshooting actions are in the following sections.

Problem	Possible Causes	Actions
1. The PLC will not turn on.	The main supply electronics for the PLC are not plugged in to a power source.	Connect the main electronics system's power cord to an appropriate power source.
	The PLC is not receiving power from the power supply in the main electronics.	Ensure all PLC connectors and wires are secure in the PLC. With the main electronics system powered on, use a voltmeter to carefully measure the voltage between wires W47 and W48 coming out of the power supply inside the electrical cabinet. The power supply may need replacing if this does not measure between 22 and 28 VDC.
2. The PLC says "Register Backup Issue Detected" or "Check Battery"	The PLC battery may be dead.	Power down the main electronics system, replace the PLC's battery, power on the main electronics system, and manually restore the program from the "Removable Media" menu in the "System" menu.
3. The PLC says "Application missing" after turning on the main electronics system.	The PLC did not auto-load its software.	Power down the main electronics system, replace the PLC's battery, power on the main electronics system, and manually restore the program from the "Removable Media" menu in the "System" menu.
4. The PLC is frozen on the "AGO Environmental Electronics" logo.	"Auto-run" is not enabled and the PLC is in "Idle" mode.	Toggle the PLC from "Idle" to "Run" mode in the "View Status" menu in the "System" menu.

Manually restoring the PLC program from the SD card

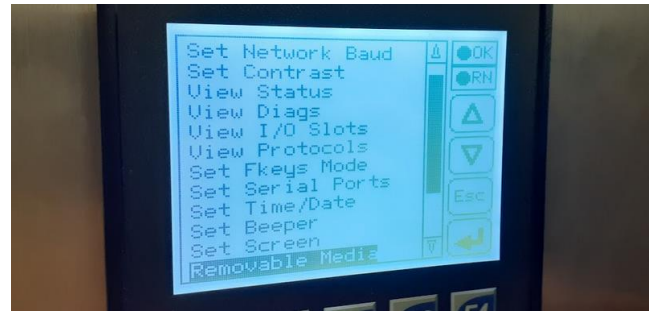
Under normal circumstances, the PLC should independently auto-load its software from its SD card on main electronics system start up. If it does not, the PLC will say "Application Missing" after it boots up, and the program will need to be manually restored from the SD card.

0. **To start:**
 - Power down the main electronics system supplying the PLC.
 - Replace the PLC's battery and ensure its SD card is inserted securely.
 - Power on the main electronics system.
1. Press the **SYSTEM** button on the PLC's keypad.



2. **SCROLL** to the “Removable Media” menu using the arrow buttons on the PLC’s touch screen.

Press the **↵ RETURN** button on the PLC’s touch screen to enter the “Removable Media” menu.



3. Only one program should be listed.

WITHOUT TOUCHING ANY OTHER BUTTONS, press the **↵ RETURN** button on the PLC’s touch screen to load the program from the SD card.



4. Press the **ESC** button on the PLC’s touch screen to exit out of the “Media Directory” menu. Continue pressing the **ESC** button until you can return to the standard Home screen showing cable payout and line speed.

Toggleing the PLC from “Idle” to “Run” mode

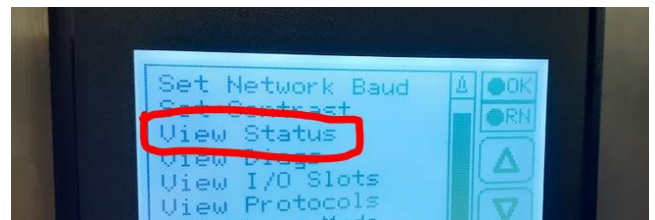
Under normal circumstances, the PLC should always automatically be in “Run” mode, meaning that once it loads its program from the SD card, it will automatically start running it. If for some reason the PLC is in “Idle” mode instead of “Run” mode, it will be frozen on the “AGO Environmental Electronics” loading screen when the PLC boots up. If it is ever necessary to manually toggle the PLC back into “Run” mode, it should not revert back to “Idle” mode without intentional human input.

1. Press the **SYSTEM** button on the PLC’s keypad.



2. **SCROLL** to the “View Status” menu using the arrow buttons on the PLC’s touch screen.

Press the **↵ RETURN** button on the PLC’s touch screen to enter the “View Status” menu.



3. **SCROLL** to the “Mode:” parameter using the arrow buttons on the PLC’s touch screen.

Press the **↵ RETURN** button on the PLC’s touch screen to begin changing the parameter.

TOGGLE the parameter from “Idle” to “Run” using the arrow buttons on the PLC’s touch screen.

Press the **↵ RETURN** button on the PLC’s touch screen to set the mode after changing it to “Run”.

4. Press the **ESC** button on the PLC’s touch screen to exit out of the “Media Directory” menu. Continue pressing the **ESC** button until you can return to the standard Home screen showing cable payout and line speed.

