

# Installation of the RS-422 Citel Surge Protection Device

**CAUTION** This procedure should NOT be attempted in a rainy environment!

For many years, the I/O Silver Board has served as the Surge Protection Device (SPD) between the FuelMaster® Unit (FMU) and external devices, such as tank monitors. We have found that the Citel DLA2-12D3 SPD is a more effective means of limiting surge damage for RS-422 connections.



Figure 1 Citel Protector Mounted on DIN Rail

## Parts Listing

Part Number	Part Description
191F0235-20	Wired TMU Interface Kit, RS422
267189	Surge Protector Replacement Module, RS422
191F0234-20	RS422 Surge-to-Board TMU Interface Cable

## Installing the SPD

1. Attach the DIN Rail to the interface plate or FMU backplate.
2. Attach the SPD to the DIN Rail, oriented so the wiring diagram faces toward you (on interface plate) or so the EQUIP side faces left (on FMU backplate).
  - a. Hook the SPD onto the DIN Rail.
  - b. Utilize a flat head screwdriver to open the spring-loaded interlock.
  - c. Push the SPD toward the Rail until in place; then, release the interlock to catch the rail.
3. Connect the 10-pin 191F0234-20 cable. The FMU cable attachment location differs between Legacy and FMLive units.
  - a. If Legacy, connect the 10-pin 191F0234-20 cable to the J4 connector of the Sat I/O board (Figure 2).



Figure 2 Cable to Sat I/O Connection

- b. If FMLive, connect the 10-pin 191F0234-20 cable to the grey Tank Monitor connector at the top of the EAPro (Figure 3). Ensure the slider below the connector is to the left.

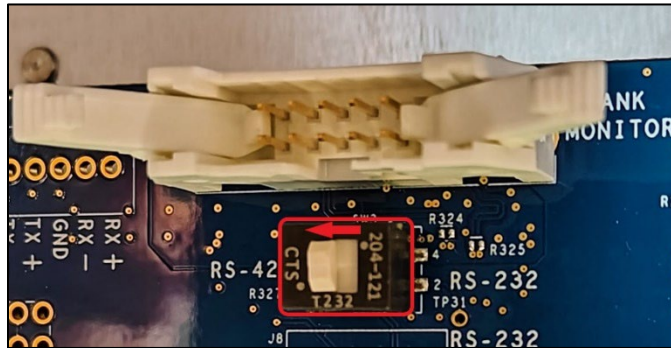


Figure 3 EAPro Connector

4. Connect the SPD.

**NOTE**

There are two sides to the SPD: LINE and EQUIP. The LINE side connects to the external serial device (e.g., the TMU). The EQUIP side connects to the FMU.

- a. On the EQUIP end, insert the black conductor into the terminal with the shield symbol (5b), the white conductor into the 1b terminal, the green conductor into the 2b terminal, the orange conductor into the 4b terminal, and the red conductor into the 3b terminal, as seen in Figure 4.

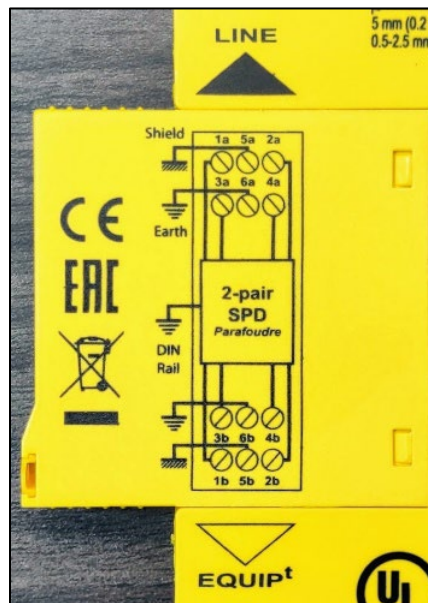


Figure 4 Wiring Diagram on the RS422 SPD

- b. Connect the incoming cable to the LINE side of the SPD. Citel recommends using #20-13 AWG cabling stripped no more than .2" (5mm).
- c. Insert the ground signal into the terminal with the shield symbol (5a), the TMU TX+ signal into the 1a terminal, the TMU TX- signal into the 2a terminal, the TMU RX+ signal into the 3a terminal, and the TMU RX- signal into the 4a terminal. See Figure 4 for more information regarding wiring. The table below shows the pinout for a Patton 222 Converter on the TMU side.

Signal	Citel Terminal	Converter Terminal
TMU TX+	1a	-RCV
TMU TX-	2a	+RCV
Ground	Shield (5a)	Tape off
TMU RX+	3a	-XMT
TMU RX-	4a	+XMT

- 5. Tighten the set screws on all conductors until tight.

## Troubleshooting the SPD

- Communication can be tested via a loopback test, which can be run by inserting a jumper wire or paper clip alongside the wires: between inserts 1a (or 1) and 3a (or 7), as well as inserts 2a (or 5) and 4a (or 11) (Figure 5).

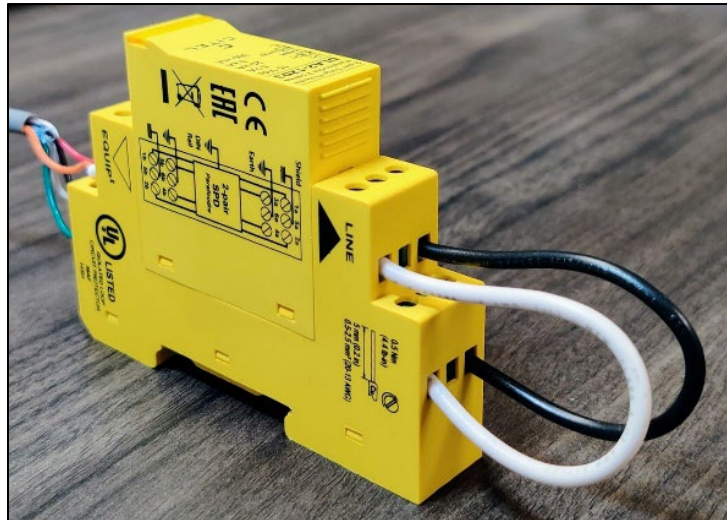


Figure 5 Loopback Wiring on the RS422 SPD

- Have a technician log into the FMU. Attempt to communicate with the device.
  - If this works, attempt the same test on the other end of the cable run.
    - ◆ If this works, there is a communication issue with the remote device.
    - ◆ If this does not work, there may be an issue with the cable between the FMU and the remote device.

- If not, attempt the same test on the EQUIP side of the SPD.
  - ◆ If this works, replace the SPD module. Order a replacement using the chart in the [Parts Listing Section](#). Pull the failed module up and swap in the new module to replace (Figure 6).

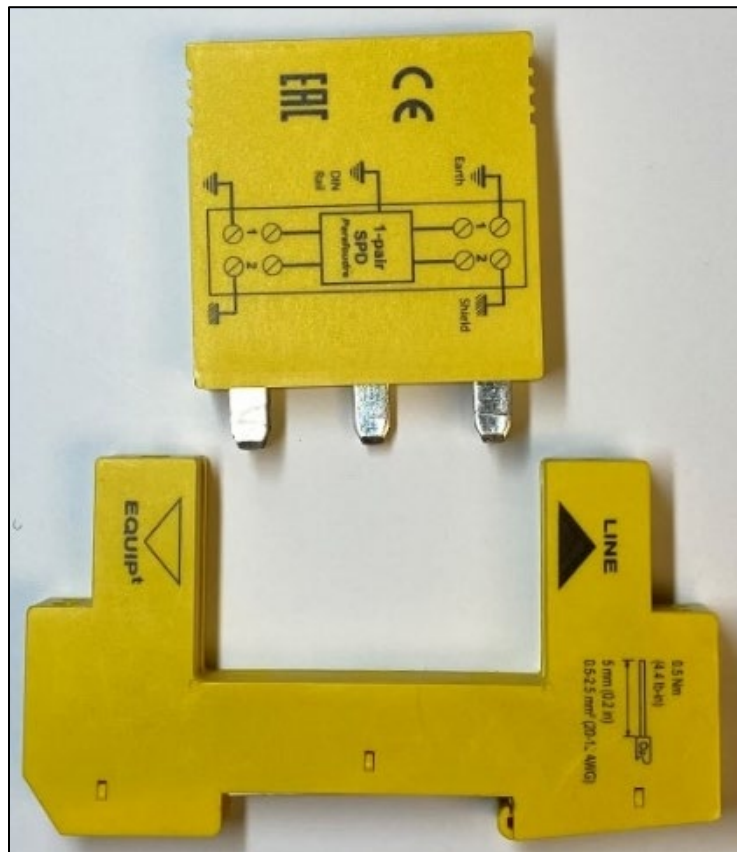


Figure 6 Swapping the Module

- ◆ If this does not work, replace the EAPro.

**TIP**

If any questions arise, contact Syntech Systems' Customer Satisfaction Center (CSC) at 1-800-888-9136, ext. 2, or email support@myfuelmaster.com.

## Change History

Date	Description
08/16/2022	Originally published.
07/07/2023	Added information pertinent to the RS-422 version.
02/07/2024	Separated the information for the RS-422 version to its own Product Bulletin.