DBoxes
Troubleshooting Guide

Progressive International Electronics, Inc.

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General

- RX & TX Global LED's are on solid
  - Only occurs when jumpered for PIPort
  - Indicates that there is an open connection between the PIPort of the DBox and the PIPort of the PIcon II or Omega JR
  - Check that both devices are powered on.
  - Check the connections on both ends of the cable. Reseat the cable on both ends.
  - Apply pressure and/or wiggle the cables to see if a connection can be established.
  - Replace cable if possible.
  - **If above steps do not make the LED's go out, there is a hardware issue with at least one of the devices.**
- No response from the dispenser(s)
  - Check the ID of the dispensers to confirm that they are unique and the ones that are in the polling loop.
    - If a Gilbarco dispenser loses its programming, its IDs will be set to 7 & 11 by default.
    - If a Wayne dispenser loses its programming, its IDs will be set to 1 & 2 by default.
    - If there are 2 or more dispensers with the same address, there will be an address conflict which will cause many problems.
  - Check the controller to confirm that the programming is correct to talk to the dispensers that are physically there.
  - Check all jumpers to confirm they are set appropriately. **The RELAY BYPASS jumper must be set** if the Relay Switch is not wired to the Kill Switch. If neither of these are used, there will be no communication from the DBox to the dispensers.
  - Remove all but one set of dispenser wires and try to only communicate with one dispenser at a time. If you establish communications, then begin adding in additional dispensers one at a time.
- Dispenser ID
  - These dispenser brands require a unique Pump ID for each fueling position: Gilbarco, Wayne, Tokheim, PMC, Bennett (RS485 protocol), Deer, and Tatsuno.
  - These dispenser brands get their addressing from the position they are plugged into the DBox: Bennett (Current Loop protocol) and Kraus.
  - Mechanical dispensers are addressed using dip switches on the Mechanical Relay PCB.

CL Smart DBox
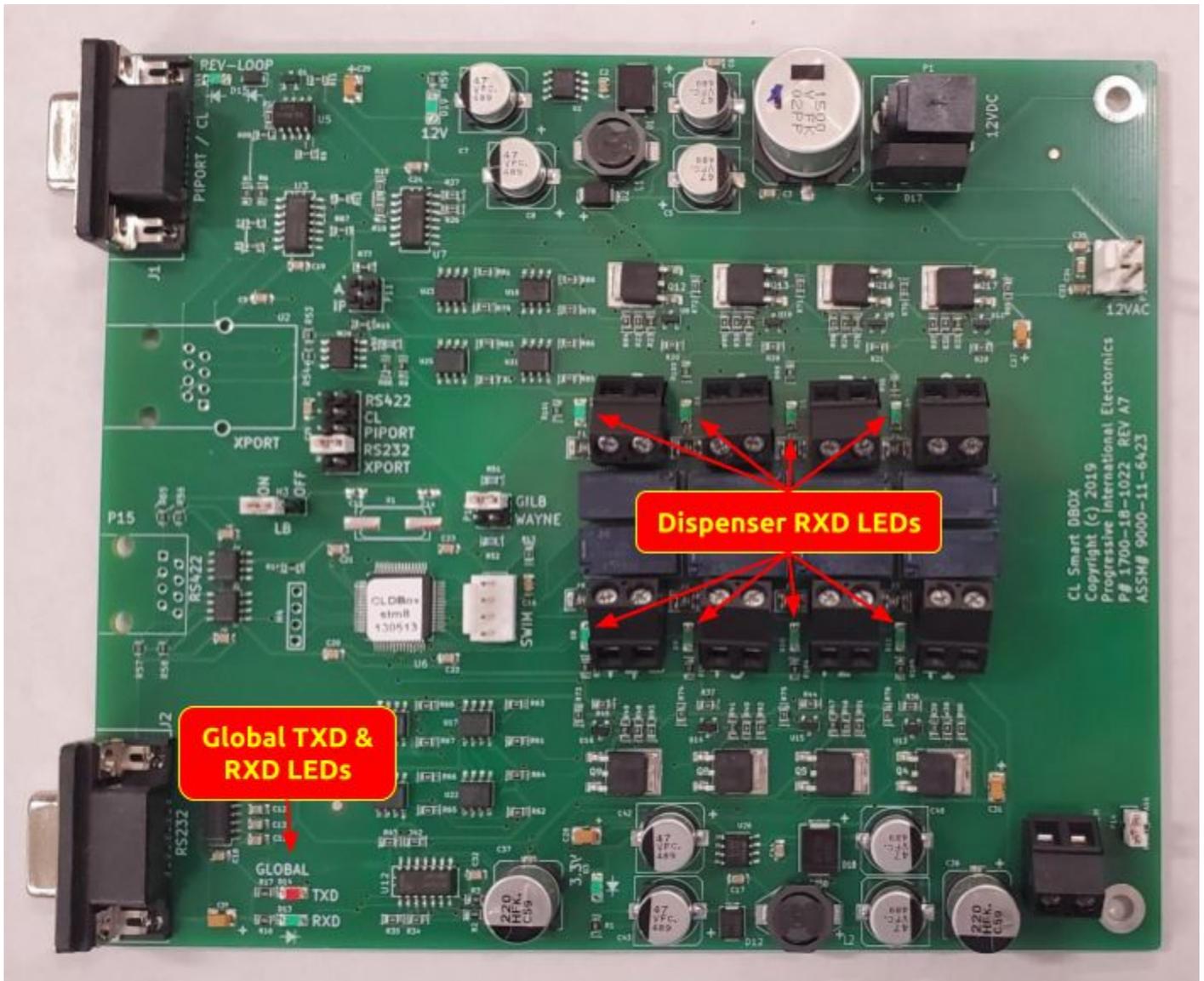
- No response from the dispenser(s)
  - There is a green LED associated with each of the 8 2-position terminal blocks that the pump wires connect to. This will be flashing when there is a response from the dispenser(s) that are connected to the associated terminal.
  - Reverse the polarity of the wires. Each has a positive (+) and a negative (-) for communication, and if they are reversed, it will not work.
  - Move the dispenser wires to an unused terminal in the DBox to rule out a defective channel.

RS485 Smart DBox
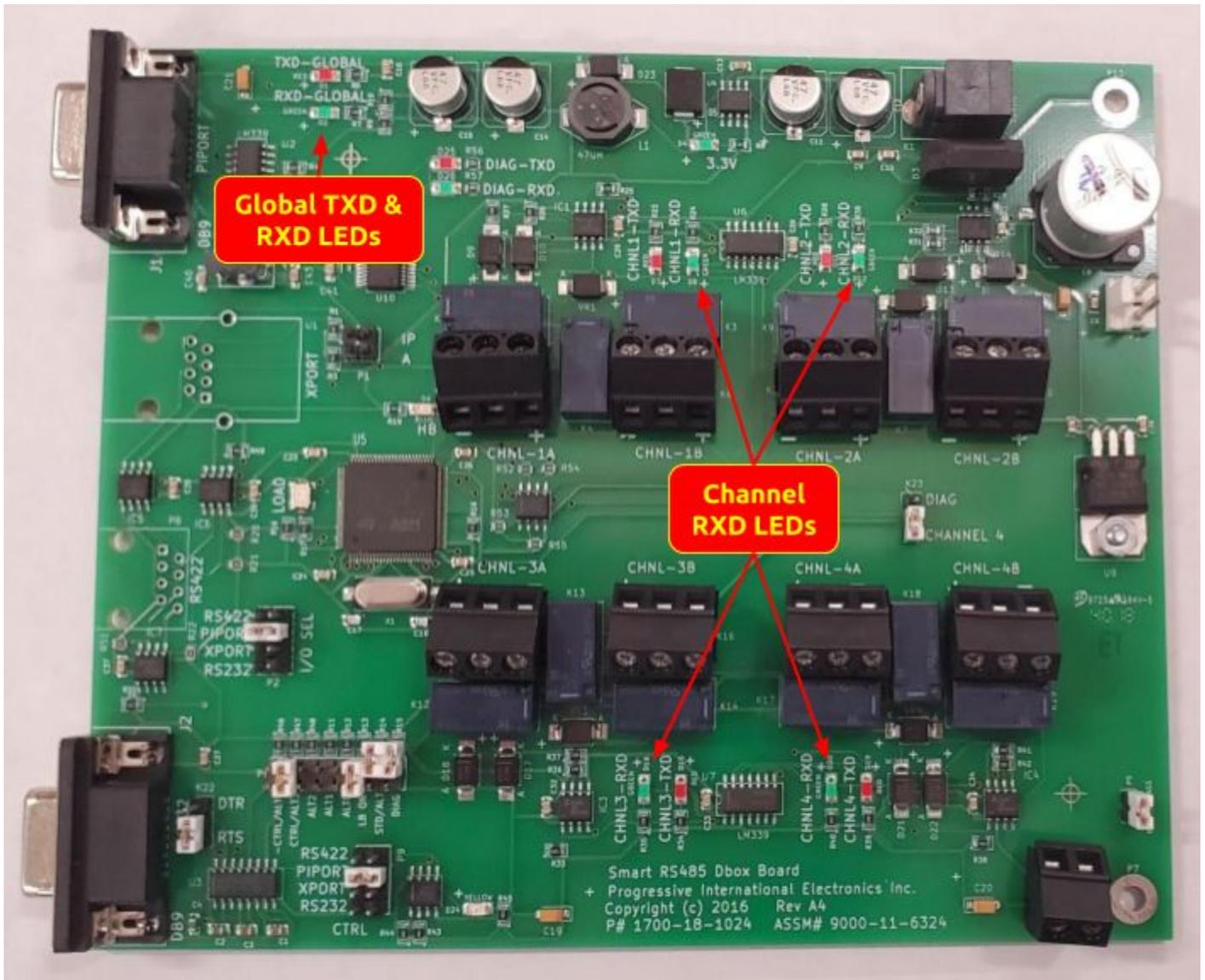
- No response from the dispenser(s)
  - Reverse the polarity of the wires. Each has a positive (+) and a negative (-) for communication and a ground, and if they are reversed, it will not work.
  - Move the dispenser wires to an unused terminal in the DBox to rule out a defective channel.
  - There is a TXD and RXD LED associated with each channel of the DBox. There are 4 channels that each contain two 3-position terminal blocks. The RXD will be flashing when there is a response from the dispenser(s) that are connected to the associated terminal.
    - It is recommended that if possible, connections are made using each of the 4 channels. If you have 4 sets of wires, put one set in each channel. This aids in troubleshooting.

- Gilbarco Emulation
    - When set for Gilbarco Emulation, the DBox will emulate a Gilbarco dispenser. The controller needs to be configured as if it is connected to a real Gilbarco dispenser.
    - The controller can connect to the DBox serially into the RS232 port of the DBox.
    - The DBox can also tie into the Current Loop output of a Gilbarco Universal DBox using a CL to PiPort Adapter, discussed below. The connection to the DBox would be in the PiPort.
    - Refer to the Gilbarco Emulation section of the PI DBox Manual for detailed information regarding jumper settings.

- CL to PiPort Adapter
    - This adapter is used for specific installations. Most involve the need to connect from a Gilbarco Universal DBox to the RS485 Smart DBox. The DBox will be set for Gilbarco Emulation and will be connected to a dispenser(s) that use RS485 protocol.
    - Refer to this document for more information for this product

RS485 DBox
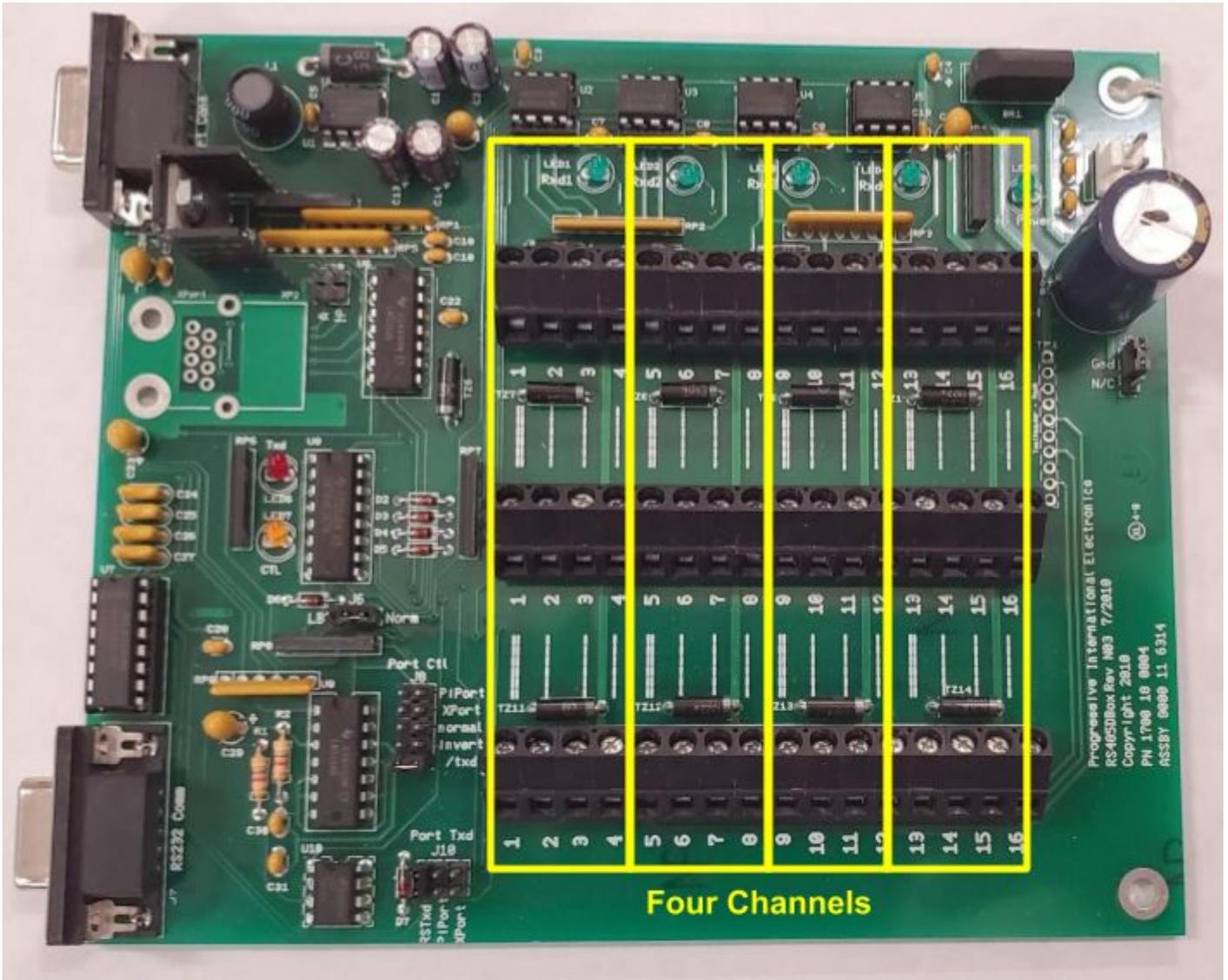
- No response from the dispenser(s)
  - There are three 16-position terminal strips in this DBox: Positive, Negative, and Ground
  - There are four channels in the DBox. It is recommended that if possible, connections are made using each of the 4 channels. If you have 4 sets of wires, put one set in each channel. This aids in troubleshooting.
    - Positions 1-4 are channel 1 and LED1 Rxd1 represents the receive from a dispenser on that channel
    - Positions 5-8 are channel 2 and LED2 Rxd2 represents the receive from a dispenser on that channel
    - Positions 9-12 are channel 3 and LED3 Rxd3 represents the receive from a dispenser on that channel
    - Positions 13-16 are channel 4 and LED4 Rxd4 represents the receive from a dispenser on that channel
  - Reverse the polarity of the wires. Each has a positive (+) and a negative (-) for communication and a ground, and if they are reversed, it will not work.

Tokheim DBox
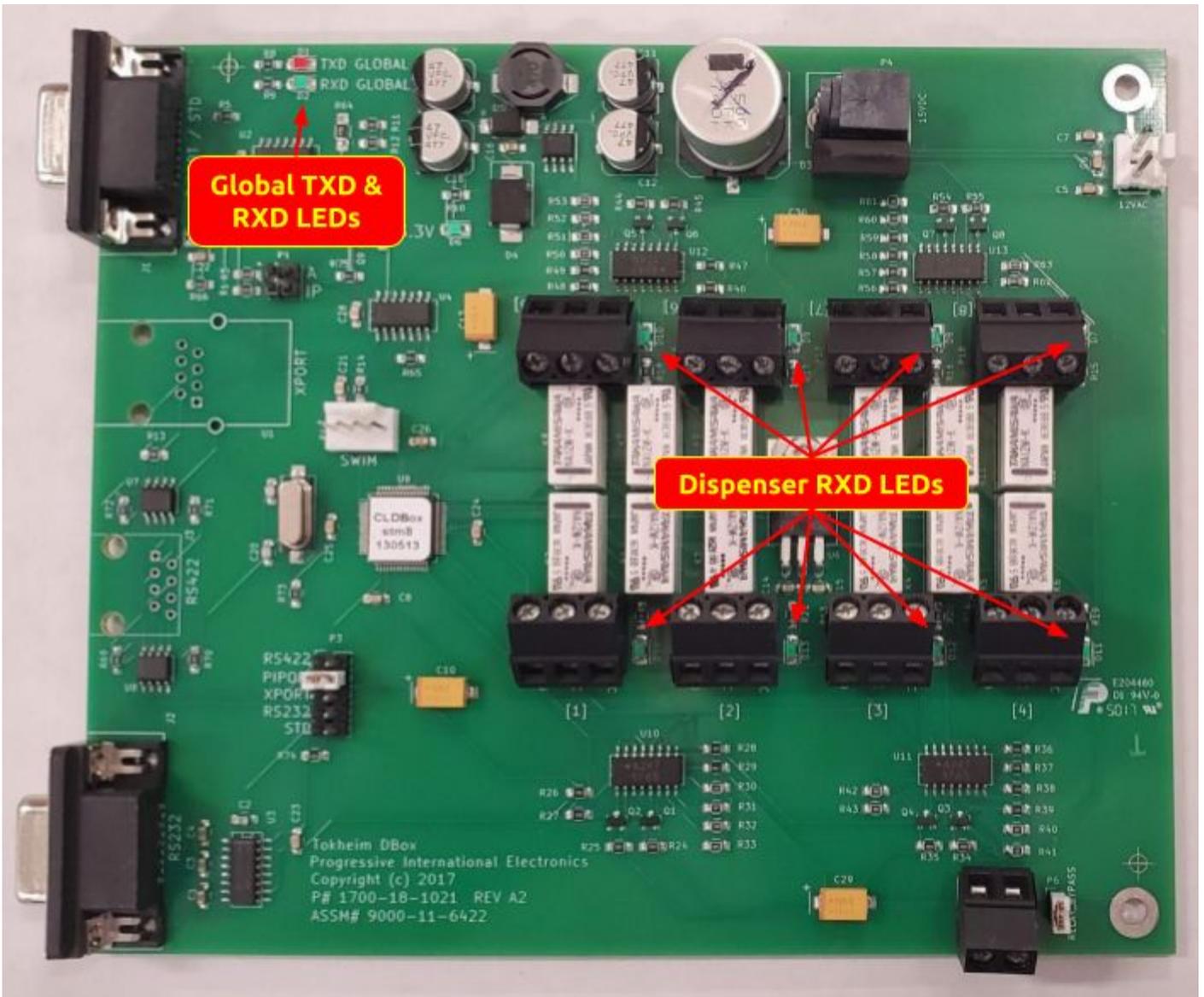
- No response from the dispenser(s)
  - There is a green LED associated with each of the 8 3-position terminal blocks that the pump wires connect to. This will be flashing when there is a response from the dispenser(s) that are connected to the associated terminal.
  - Confirm that the wires are connected properly. Each has a DCC, TTC, and TTD for communication, and if they are not correct, it will not work.
  - Move the dispenser wires to an unused terminal in the DBox to rule out a defective channel.

Kraus/Bennett DBox - Bennett
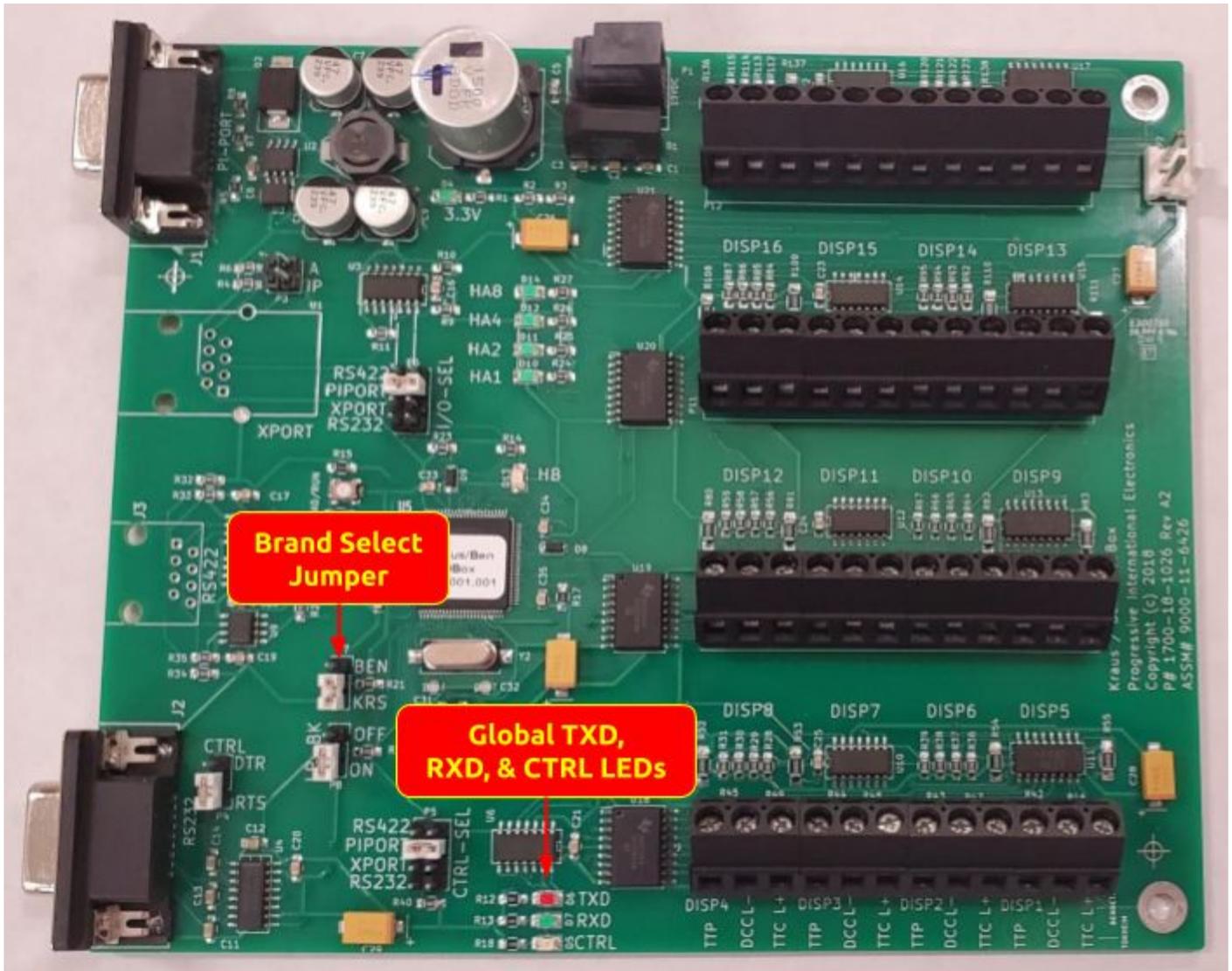
- No response from the dispenser(s)
  - Reverse the polarity of the wires. Each has a positive (+) and a negative (-) for communication, and if they are reversed, it will not work.
  - Addressing is defined by where the pump wires are wired into the DBox. Verify that there is no address programmed into the dispenser. Should be Address zero (0).
  - Move the dispenser wires to an unused terminal in the DBox to rule out a defective channel. You will have to configure that dispenser number in the controller.

Kraus/Bennett DBox - Kraus
- No response from the dispenser(s)
  - Confirm that the wires are connected properly. Each has a TTP, DCC, and TTC for communication, and if they are not correct, it will not work.
  - Addressing is defined by where the pump wires are wired into the DBox. Verify that there is no address programmed into the dispenser. Should be programmed for "Not Set".
  - Move the dispenser wires to an unused terminal in the DBox to rule out a defective channel. You will have to configure that dispenser number in the controller.

Hybrid Mechanical DBox
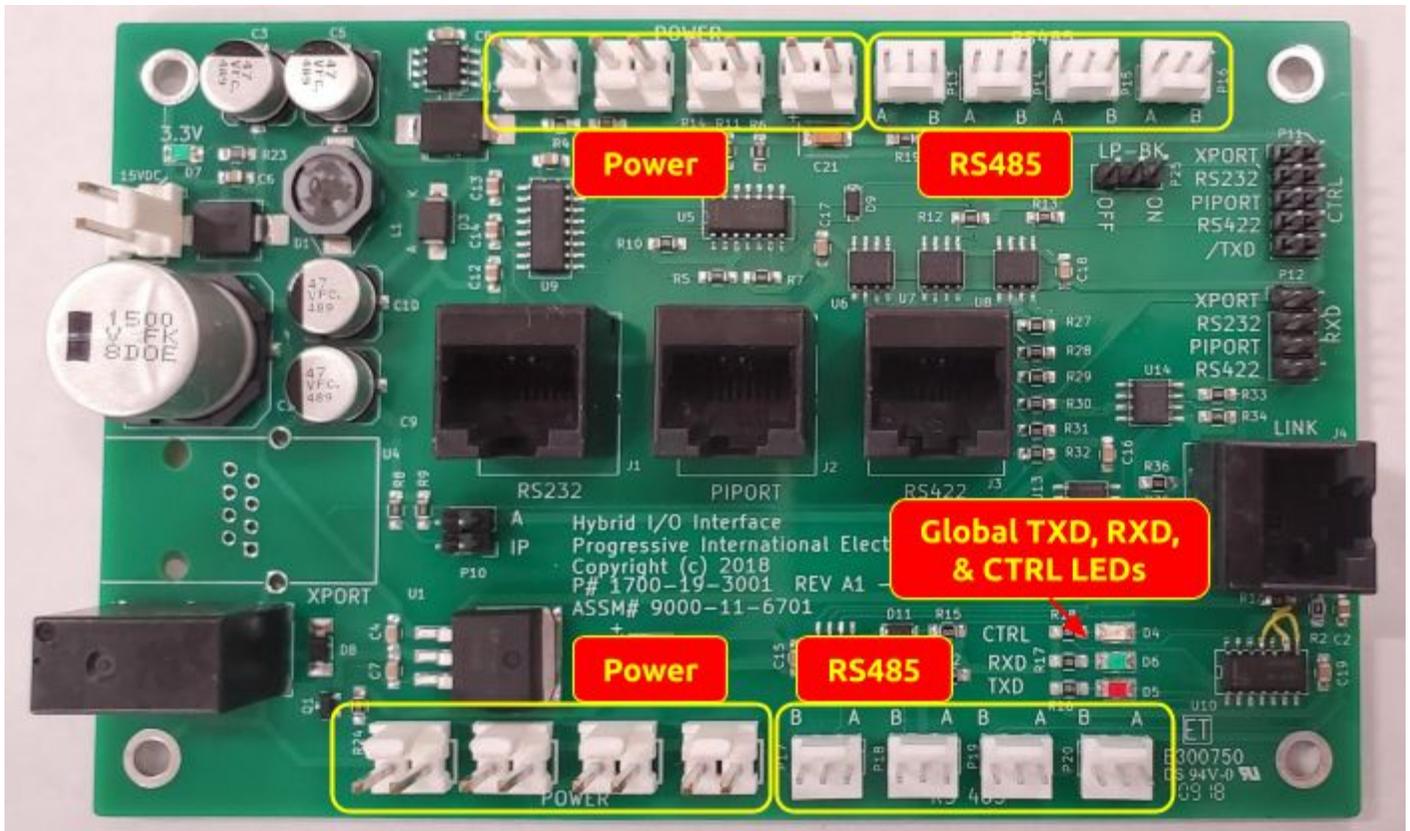
- Hybrid Interface PCB
  - Notes:
    - All Power and RS485 channels are interchangeable.
  - LEDs:
    - Global CTRL, RXD, and TXD should be flashing when connected to a controller that is configured to talk to at least one dispenser. If not flashing, confirm the controller is configured properly, and confirm the jumpers are set correctly. Refer to the table below.

Hybrid Interface Jumper Settings

Interface Type	Interface Jumper	Control Jumper	Loopback Jumper
PIPort	PIPORT	PIPORT	LB ON
RS232	RS232	NTXD or /TXD	LB OFF
XPort	XPORT	XPORT	LB ON
RS422 (9000-11-6701 only)	RS422	RS422	LB ON

- Mechanical Relay/EMR3 PCB
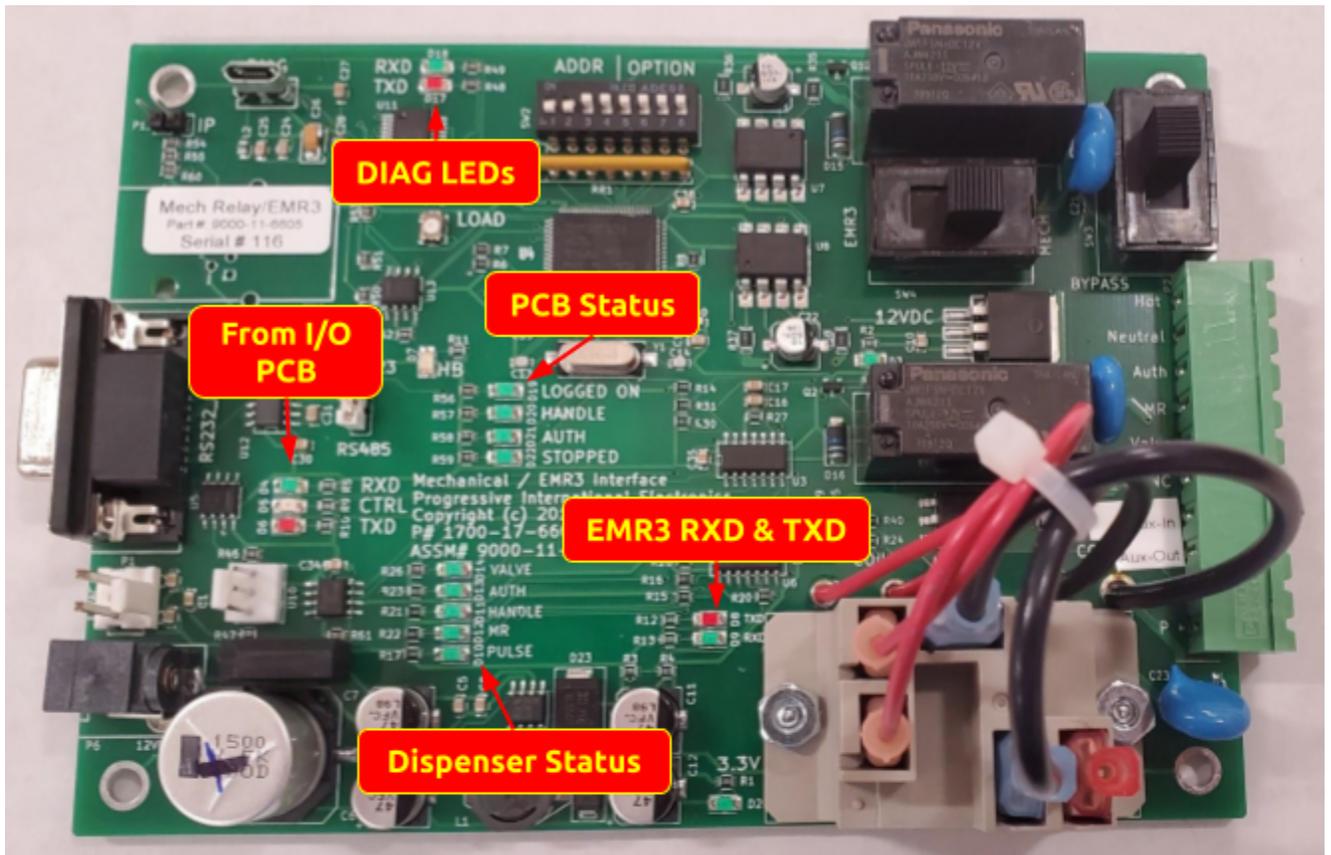
  - Wiring:
    - Refer to the Hybrid Mechanical DBox section of the [PI DBox Manual](#) for wiring diagrams and other detailed information.
    - The Mechanical Relay PCB is expecting different voltage readings to know when a dispenser status changes.
   - If there is an issue of any kind, use this [Voltage Reading](#) chart to determine if there is a wiring issue.
  - LEDs:
    - RXD, TXD, and CTRL should be flashing if the LEDs on the Hybrid Interface (I/O) PCB are flashing. If not, check the wires from the I/O PCB to the Mechanical Relay PCB.
    - Dispenser Status LEDs
      - These LEDs will be on to indicate there is a state change detected. These are hardware LEDs that reflect the loads on the wires.
      - Note: the Pulse LED will flash on and off with each pulse, so it may remain on at the end of a transaction.
    - PCB Status LEDs:
      - These LEDs are controlled by the processor on the PCB.
      - LOGGED ON should be on solid when everything is working.
      - The other LEDs reflect current states of the dispenser.
    - DIAG RXD and TXD:
      - These LEDs are only active when connected to the Diagnostic port.
    - EMR3 RXD and TXD:
      - These LEDs are only active when connected to an EMR3 register.

- Switches:
  - MECH = Mechanical Dispenser. EMR3 = Veeder Root EMR3
  - AUTO = Console Control. BYPASS = Stand-Alone
- Jumpers:
  - RS232/RS485 should be jumpered for RS485 when the Mechanical Relay PCB is used in a Hybrid Mechanical DBox.
- Dip Switch:
  - Each Mechanical Relay PCB must be set with a unique address. This is set using switches 1-4.
  - The remaining switches are used for setting what pulser is used, what the resolution is, and whether it is in Manual Mode.
  - Refer to the Hybrid Mechanical DBox section of the PI DBox Manual for the dip switch settings chart.

- Hybrid Multi-Pump PCB
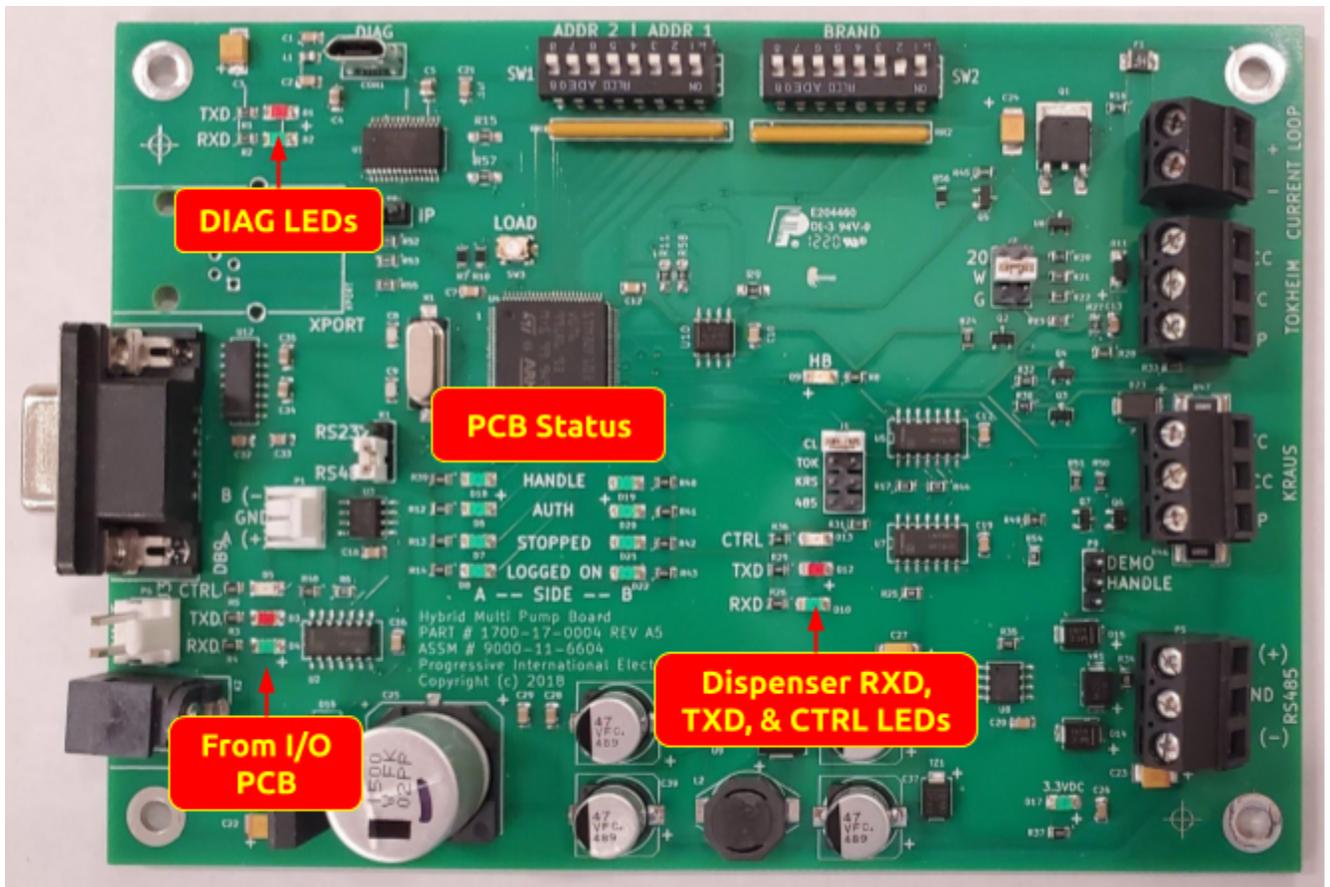
- Notes:
  - The Hybrid Multi-Pump PCB allows the PIcon II Console or the Omega JR to control electronic dispensers alongside mechanical dispensers in the same DBox.
  - Each PCB can connect to one (1) set of dispenser wires, allowing it to control up to two (2) fueling positions.

- ○ LEDs:
  - ■ RXD, TXD, and CTRL should be flashing if the LEDs on the Hybrid Interface (I/O) PCB are flashing. If not, check the wires from the I/O PCB to the Hybrid Multi-Pump PCB.
  - ■ PCB Status LEDs:
    - ● These LEDs are controlled by the processor on the PCB.
    - ● LOGGED ON should be on solid when everything is working.
    - ● The other LEDs reflect current states of the dispenser(s).
  - ■ Dispenser RXD, TXD, and CTRL LEDs:
    - ● Communication LEDs to the dispenser.
  - ■ DIAG RXD and TXD:
    - ● These LEDs are only active when connected to the Diagnostic port.
- ○ Jumpers
  - ■ RS232/RS485 should be jumpered for RS485 when the Hybrid Multi-Pump PCB is used in a Hybrid Mechanical DBox.
  - ■ J1 is set for the interface type used. This corresponds to the connector that the pump wires are connected to.
  - ■ J2 is only used if J1 is set to CL.
  - ■ DEMO/HND is not used in production environments
- ○ Dip Switches
  - ■ Each PCB must be set with unique addresses using SW1. If it is a single-sided dispenser, set the address for Channel 1 and Channel 2 for the same address.
  - ■ All dispensers need to be addressed for fueling position 1 if it is a single-sided dispenser, or for 1 and 2 if it is a dual-sided dispenser.
  - ■ The dispenser brand must be set using SW2.
  - ■ Refer to the Hybrid Mechanical DBox section of the PI DBox Manual for the dip switch settings charts

XPort

Link for Lantronix Device Installer: http://pie-corp.com/utilities/setup_di_x86x64cd_4.4.0.0.exe

- General
    - Communications from the FuelDirect software to the XPort rely on accurate timing.
    - It is recommended that the PC that FuelDirect resides on and the DBox(es) are isolated from the rest of the network by being on their own switch.
        - High bandwidth devices such as IP Cameras on the network can affect timing and communications, so isolating PIE devices will improve reliability.
    - If the same location has multiple DBoxes, each must have a unique IP Address to avoid conflicts.
- Confirm IP Address
    - Ping the DBox to verify that it can be reached on the network
        - Open a command prompt and run the following command: ping <IP Address> and press Enter
            - If there is no reply, confirm that both the PC and the DBox are connected to the same network and that the DBox is powered on.
            - If you get a reply from that address, unplug the ethernet cable from the XPort and run the ping command again. If you do not reach it, you have the correct IP Address
    - Use Device Installer to find the device
        - Download and install Lantronix Device Installer
        - In Device Installer, click the Search button.
        - After the search is complete, in the right panel there should be an xPort device listed.
            - Confirm the device by comparing the Hardware Address in Device Installer to the hardware address printed on the top of the XPort.
            - If no device is found, power cycle the DBox and Search again. Older XPort devices are only visible to the program for 90 seconds after power up.
- Changing IP Address
    - Download and install Lantronix Device Installer
    - In Device Installer, click the Search button.
    - After the search is complete, in the right panel there should be an xPort device listed.
        - Confirm the device by comparing the Hardware Address in Device Installer to the hardware address printed on the top of the XPort.
        - If no device is found, power cycle the DBox and Search again. Older XPort devices are only visible to the program for 90 seconds after power up.
    - Select this device with a single click, then select Assign IP
        - Select Assign a specific IP address and press Next
        - Type in the new IP Address, Subnet Mask, and Gateway and press Next
        - Press Assign
        - When complete, the right panel should show the device with the new IP Address.

DBox Jumper Settings for connection to PIcon II or Omega JR

DBox	I/O (port)	LoopBack	Control	Brand	Relay Bypass
CL Smart DBox	PIPORT	ON	N/A	GILB/WAY	Jumpered
RS485 Smart DBox[1]	PIPORT	ON	PIPORT	N/A	Jumpered
Tokheim DBox	PIPORT	N/A	N/A	N/A	Jumpered
Kraus/Bennett DBox	PIPORT	ON	PIPORT	BEN/KRS	Jumpered

DBox Jumper Settings for connection to FuelDirect

DBox	I/O (port)	LoopBack	Control	Brand	Relay Bypass
CL Smart DBox	XPORT	ON	N/A	GILB/WAY	Jumpered
RS485 Smart DBox[2]	XPORT	ON	XPORT	N/A	Jumpered
Tokheim DBox	XPORT	N/A	N/A	N/A	Jumpered
Kraus/Bennett DBox	XPORT	ON	XPORT	BEN/KRS	Jumpered

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[1] K23 must be jumpered for CHANNEL 4 for normal operation.
[2] K23 must be jumpered for CHANNEL 4 for normal operation.