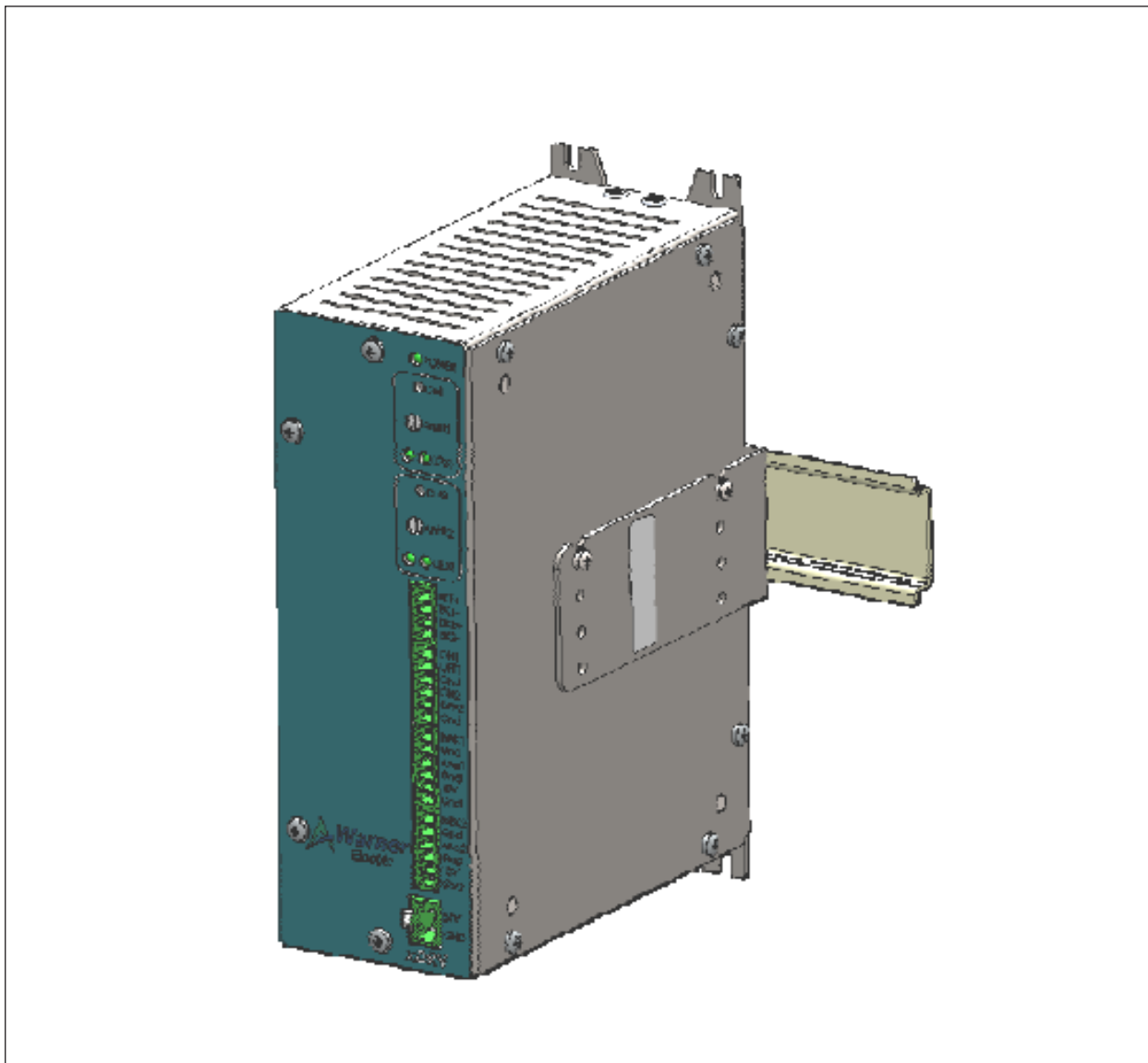


# Tension Control System X2DRV

Installation and Operation Manual

P-2098-WE-A4



An Altra Industrial Motion Company

**INTRODUCTION:**

The X2DRV is a solid state electronic control that will accept a variety of input signals and provides to the brake an output current and voltage proportional to the input. This double channel driver can be operated by a remote potentiometer, a voltage or a current loop input.

The X2DRV is a 24VDC double channel driver, 4Amps current capability.

When associated with an XCTRL, power supply, Input and (Communication) will be made by the internal connector. This manual has been designed to cover the full range of installation, start-up and operation of your tension control system.

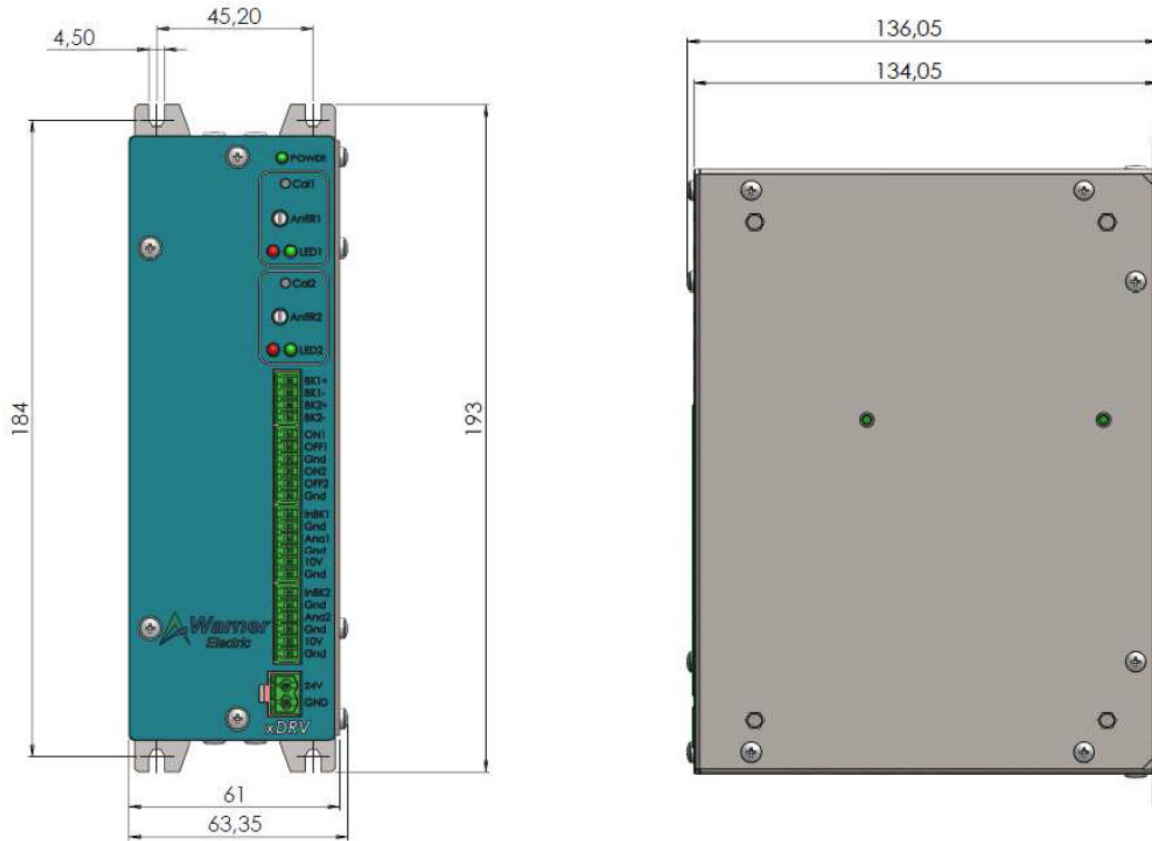





Figure 1: X2DRV housing dimensions

**RATINGS:**

<b>Main Supply Voltage (V)</b>	24V DC +/- 5%
<b>Output</b>	4A with Anti Residual
<b>Operating T°C</b>	-10°C to 50°C no Condensation
<b>Compliance</b>	  

## GENERAL INFORMATION:

Control chassis should be kept clear of all areas where foreign material, dust, grease, or all might affect the operation of the control. Installation must be made in accordance with the instructions found in this manual. Failure to do so may damage the Driver.

This driver supports the following Warner brakes : TB's, ATT's, MPB's, MPC's. POB's, POC's and MTB's brakes cannot be driven by this device.

## INSTALLATION INSTRUCTIONS:

### HARDWARE PIN OUT:

1	BK1+	Power Output	Brake 1 Output + Integrated Anti-residual control. Voltage or Current controlled.
2	BK1-	Power Output	Brake 1 Output –
3	BK2+	Power Output	Brake 2 Output + Integrated Anti-residual control. Voltage or Current controlled.
4	BK2-	Power Output	Brake 2 Output –
5	ON1	Digital input	Full power : 24VDC applied to brake 1 Active low / GND: NPN type Input
6	OFF1	Digital input	Power Off brake 1 : 0V applied to brake 1 with anti-residual Active low /GND: NPN type Input
7	Gnd	Ground	
8	ON2	Digital input	Full power : 24VDC applied to brake 2 Active low /GND: NPN type Input
9	OFF2	Digital input	Power Off brake 2 : 0V applied to brake 2 with anti-residual Active low /GND: NPN type Input
10	Gnd	Ground	
11	InBK1	Analog input	Brake 1 Input signal control. Selectable: 0/+10V DC or 4/20mA.
12	Gnd	Ground	
13	Ana1	Analog input	Brake 1 Auxiliary input : To compensate Brake1 signal in Open Loop control Selectable: 0/+10V DC or 4/20mA. Teachable Span (item 9 page 4).
14	Gnd	Ground	
15	10V	Power out	External interface Power Supply. 10VDC, 100mA Output Used to Power an external potentiometer to get an Open Loop control (local torque adjust)
16	Gnd	Ground	
17	InBK2	Analog input	Brake 2 Input signal control. Selectable: 0/+10V DC or 4/20mA.
18	Gnd	Ground	
19	Ana2	Analog input	Brake 2 Auxiliary input : To compensate Brake2 signal in Open Loop control Selectable: 0/+10V DC or 4/20mA. Teachable Span (item 9 page 4).
20	Gnd	Ground	
21	10V	Power out	External interface Power Supply. 10VDC, 100mA. Used to Power an external potentiometer to get an Open Loop control (local torque adjust)
22	Gnd	Ground	
23	24V	Power supply	24VDC Power supply Input
24	GND	Ground	GROUND

This installation and Operating Manual has been arranged for the systematic installation and start-up of your Tension Control System. Please check off each step before proceeding to the next step.

**SYSTEM WIRING AND SETTING:**

**WARNING:** Contact with electrical voltages present in the driver covered in this manual can cause injury. To avoid these consequences, make sure all power is off during installation.

These wiring precautions will help you properly install and wire a trouble-free system.

1. Use proper gauge wire for all pin :
  - Data input : 0,5mm<sup>2</sup> (20AWG) or 0,75mm<sup>2</sup> (18AWG)
  - Brakes wires : 0,75mm<sup>2</sup> (18AWG) or 1mm<sup>2</sup> (17AWG)
2. Shielded cable is recommended for all connections.
3. Do not use this driver for purposes other than those intended. Such use could damage the driver.

**WIRING:**

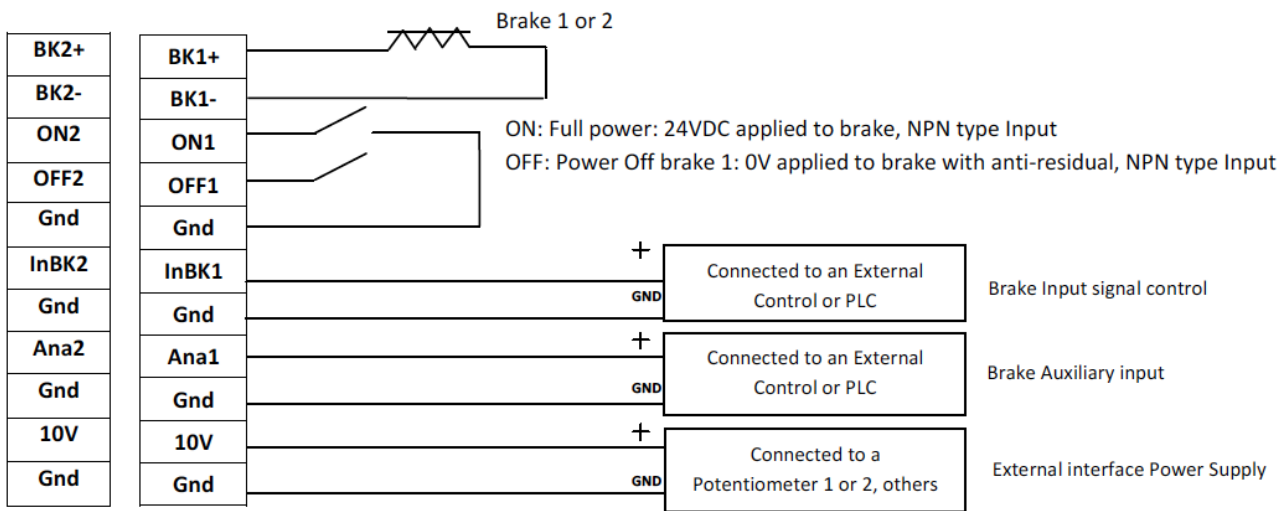
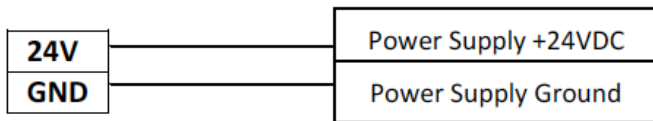


Figure 2: X2DRV wiring – one or two brakes

1. Wire 24V DC input power to pin 24V as shown in Figure 3.

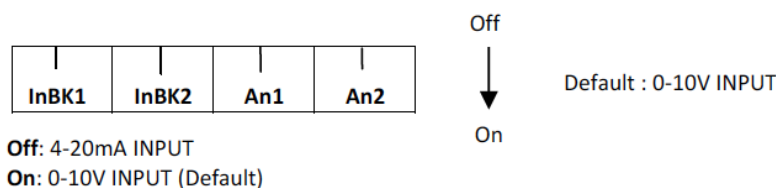


**CAUTION:** Improperly setting the 24VDC can damage the power supply and/or the driver

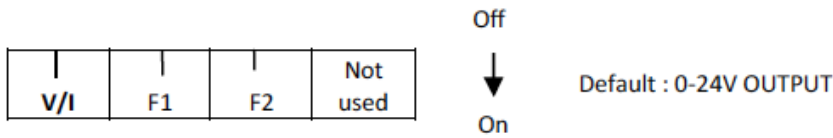
Figure 3: Power supply wiring

2. Connect wiring from brake magnets to Pin BK1 and/or BK2 of the X2DRV as shown in Figure 2.

3. Select the Input type with the red switches located along the bottom of the control:



4. Select the Output type with the red switches located along the bottom of the control:



**V/I Off:** Output controlled in Voltage: 0-10VDC or 4-20mA IN => 0-24VDC OUT (Default)

**V/I On:** Output controlled in Current: 0-10VDC or 4-20mA IN => 0-4A OUT

5. Wire Controller or PLC (0-10V or 4-20mA Input) to pin InBK1 or InBK2 as shown in figure.

6. Set the Anti-residual with the white screw as shown in Figure 4 as described below:

- Apply the brake at 0V or 4mA on InBK (1 or 2) or activate the Brake-Off (OFF1 or OFF2).
- Check the Brake armature floats away from the Brake magnet with no sticking.
- If the armature sticks to the magnet, set the Anti-Residual (AntiR1 or AntiR2) as shown below until the armature is free with no sticking.
- Reapply the Brake at 10V or 20mA on InBK (1 or 2) or by returning the Brake-Off (OFF1 or 2) Pin to its normal position and activating the Brake-On input (ON1 or 2).
- If Brake releases freely, make no further adjustments as the Anti-Residual is now set.

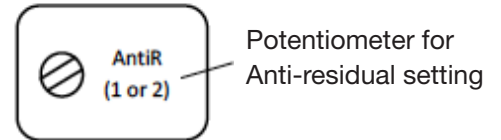
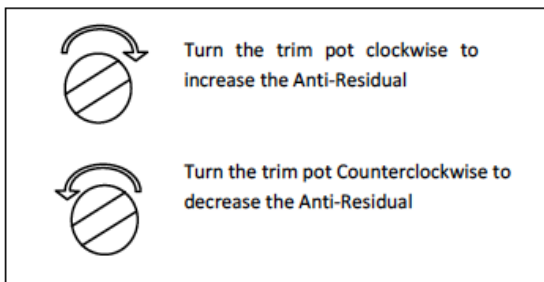
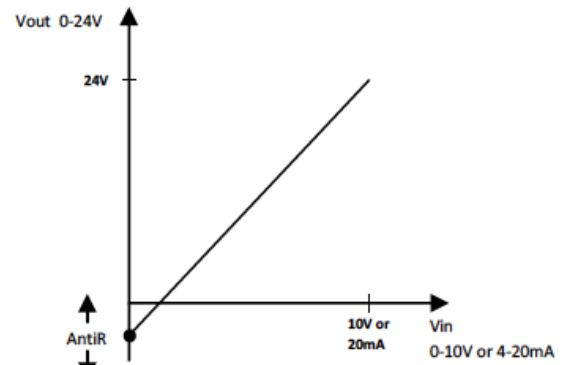


Figure 4: Anti-residual calibration



Anti-Residual adjustment



Voltage Output versus anti-residual control

7. (Optional): Pins ON1, OFF1, ON2, OFF2 are NPN type Input:

- When ON (1 or 2) is set to Ground => 24V is applied on BK (1 or 2) output
- When OFF (1 or 2) is set to Ground => 0V with Anti-residual is applied on BK (1 or 2) output

8. (Optional): To get an Open Loop control use the external interface power supply (10V DC) as shown in Figure 2 to supply a potentiometer or others as described in Figure 5.

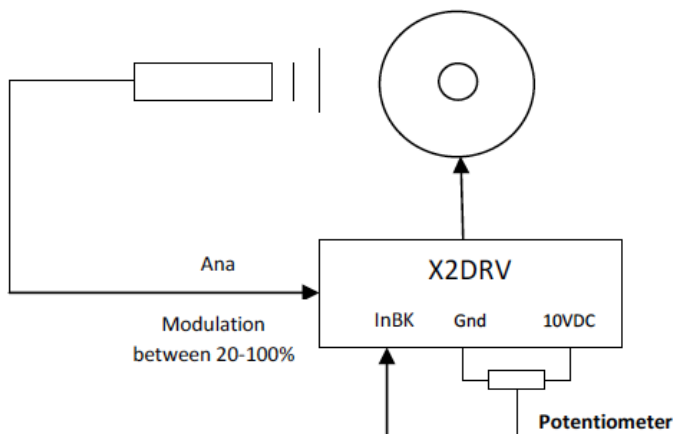








Figure 5: Typical Open Loop application with diameter compensation

## 9. Auxiliary Analog Sensor (Teachable Span)

In case of use an analog sensor or two, wire them to Pin Ana1 or Ana2 and teach their voltage or current span with starting the calibration as describe below (for this use the button Cal as shown figure 6). **If no calibration is done, Ana1 or Ana2 are ignored.** The Analog Input (Ana) compensates the Brake Input signal control (InBK) between 20-100%.

**To Disable Ana1 or Ana2 compensation, please calibrate Ana1 or 2 without any connection (unplugged).**

"Teachable Span" calibration procedure		
<b>Step 1</b>		
With the Auxiliary wired to Ana1 or Ana2 Press Cal button >5s.	 >5s Cal	(rd) Red LED on 
<b>Step 2</b>		
Put Min to Ana1 or Ana2 Short press to valid: Min is learnt	 Short press Cal	(rd) Slow flashing 
<b>Step 3</b>		
Put Max to Ana1 or Ana2 Short press to valid: Max is learnt and calibration is done	 Short press Cal	(rd) Quick flashing 

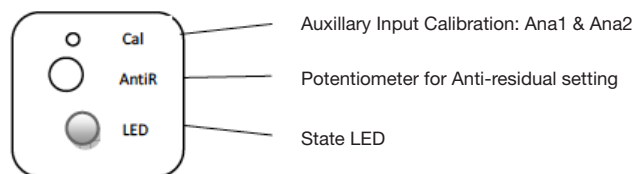












Figure 6: Anti-residual setting and calibration

10. (Optional): The frequency adjustment changes the modulation frequency to eliminate brake "hum" or "howl" when the brake is stationary. The frequency is factory set and normally requires no adjustments. Set the frequency as described below with the red switches below the chassis:

F1			F2	Set 0: Between 250 and 750 HZ
F1			F2	Set 1: Between 1000 and 3000 HZ
F1			F2	Set 2: Between 2500 and 7500 HZ
F1			F2	Set 3: Between 4250 and 10 KHZ (default)

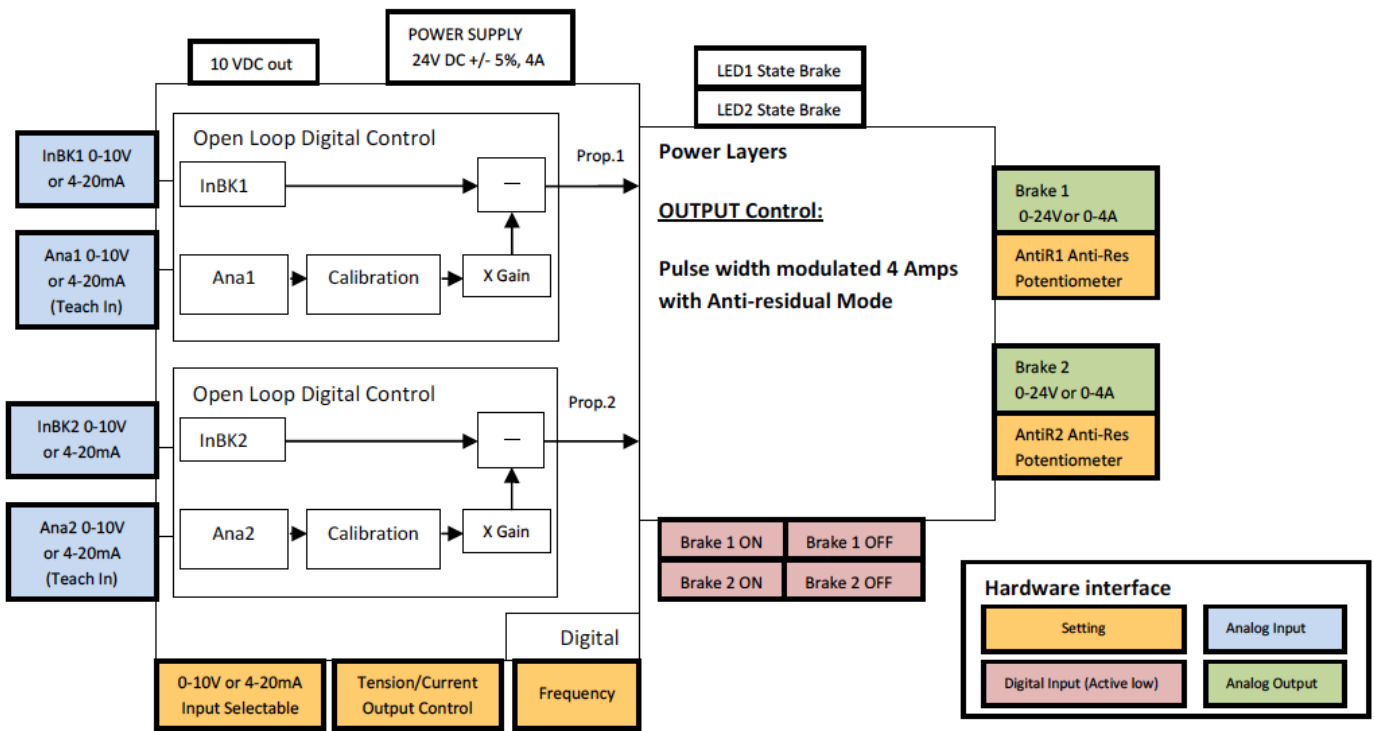
V/I	F1	F2	Off ↓ On
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 Turn the trim pot clockwise to increase the frequency  
 Turn the trim pot counterclockwise to decrease

11. Double check all wiring connections per Figure 2 and insure all terminals are tight.

**NOTE:** If an over-load occurs (current 4A or more) the Driver output will shut down and the red LED will be ON. To reset the system, remove power to the Driver and turn it on again.

**X2DRV BLOCK DIAGRAM:**



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