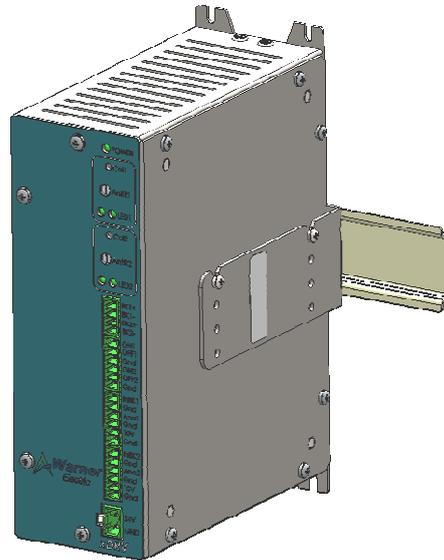---

Installation & Operation Manual

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.
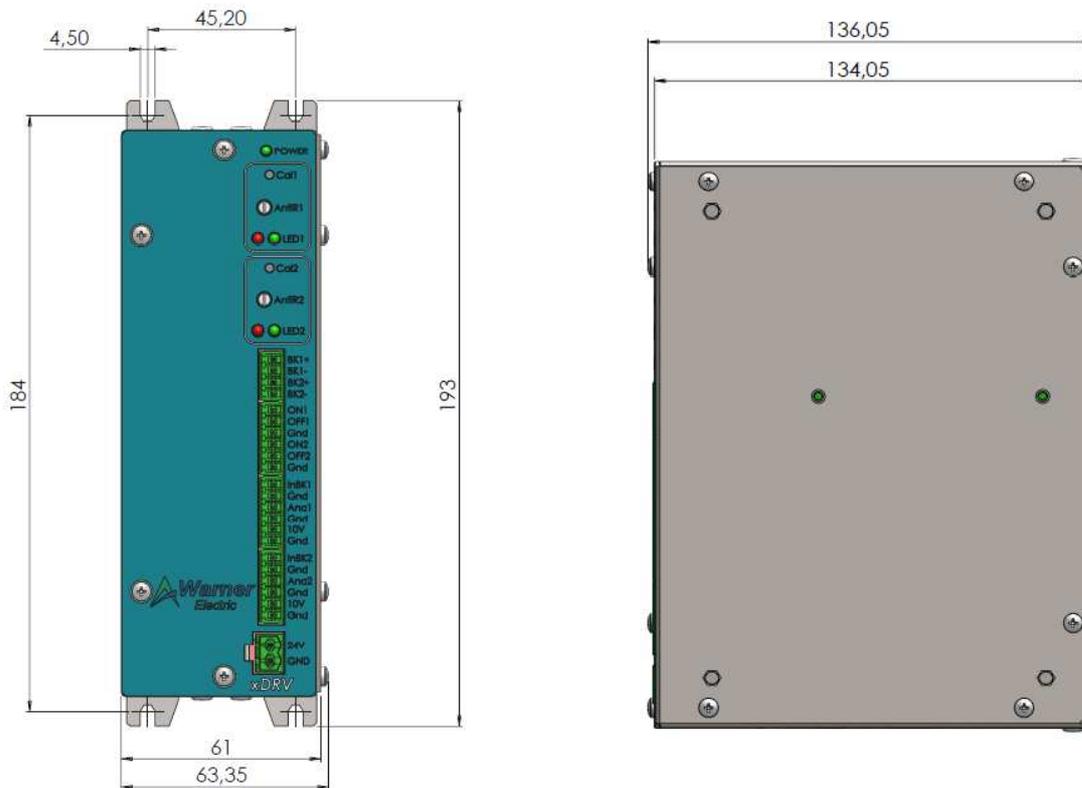

Figure 1:x2DRV housing dimensions

Ratings:

Main Supply Voltage (V)	24V DC +/- 5%
Output	4A with Anti Residual
Operating T°C	-10°C to 50°C no Condensation
Compliance	CE RoHS compliant REACH COMPLIANCE

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	Analog input	Full power : 24VDC applied to brake 1 Active low / GND: NPN type Input
6	OFF1	Analog input	Power Off brake 1 : 0V applied to brake 1 with anti-residual Active low /GND: NPN type Input
7	Gnd	Ground	
8	ON2	Analog input	Full power : 24VDC applied to brake 2 Active low /GND: NPN type Input
9	OFF2	Analog 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 : 0,5mm² (20AWG) or 0,75mm² (18AWG)
   - Brakes wires : 0,75mm² (18AWG) or 1mm² (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
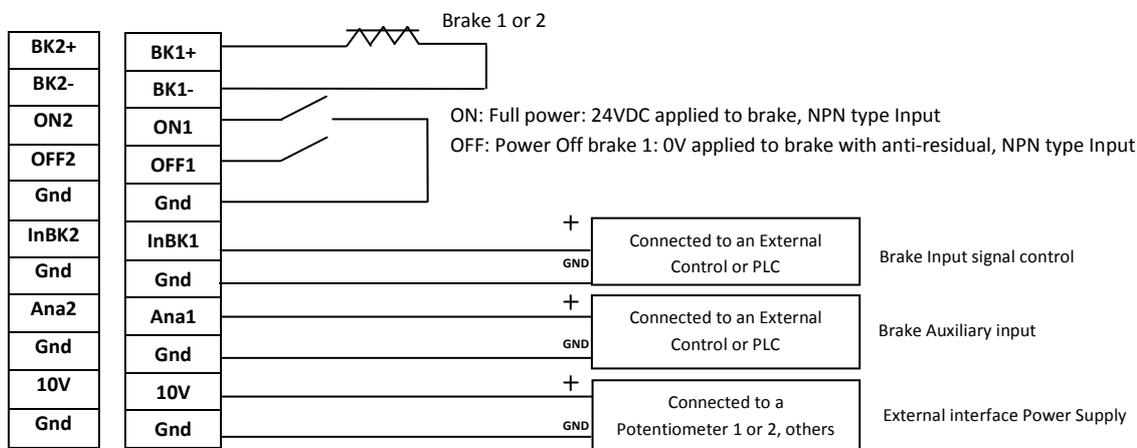
Wiring:

ON: Full power: 24VDC applied to brake, NPN type Input

OFF: Power Off brake 1: 0V applied to brake with anti-residual, NPN type Input

Brake Input signal control

Brake Auxiliary input

External interface Power Supply

Figure 2: x2DRV wiring – one or two brakes

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

24V	Power Supply +24VDC
GND	Power Supply Ground

CAUTION: Improperly setting the 24VDC can damage the power supply and/or the driver
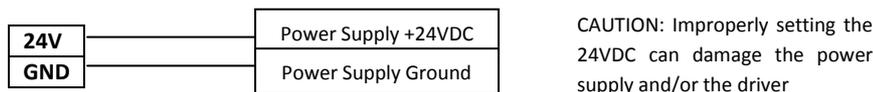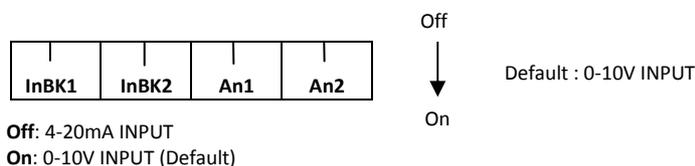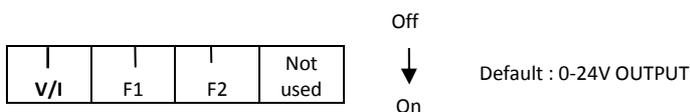
Figure 3: Power supply wiring

2. Connect wiring from brake magnets to Pin BK1 and/or BK2 of the x2DRV as shown figure 2
3. Select the Input type with the red switches located along the bottom of the control:

Default : 0-10V INPUT

Off: 4-20mA INPUT
On: 0-10V INPUT (Default)

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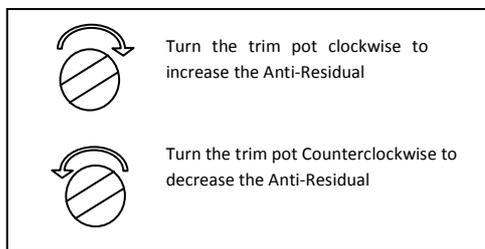

Default : 0-24V OUTPUT

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 figure

6. Set the Anti-residual with the white screw as shown figure 4 as describe below:
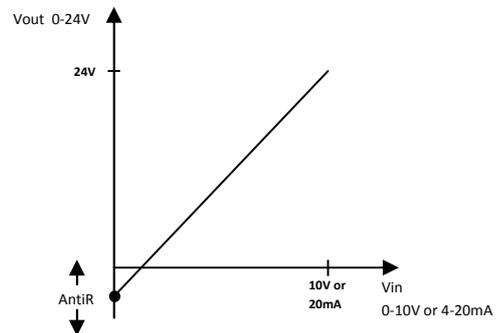
    a. Apply the brake at 0V or 4mA on InBK (1 or 2) or activate the Brake-Off (OFF1 or OFF2)
    b. Check the Brake armature floats away from the Brake magnet with no sticking
    c. If the armature sticks to the magnet, set the Anti-Residual (AntiR1 or AntiR2) as shown below until the armature is free with no sticking
    d. 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)
    e. If Brake releases freely, make no further adjustments as the Anti-Residual is now set

AntiR (1 or 2)   **Potentiometer for Anti-residual setting**

Figure 4: Anti-residual calibration

Turn the trim pot clockwise to increase the Anti-Residual

Turn the trim pot Counterclockwise to decrease the Anti-Residual

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 figure 2 to supply a potentiometer or others as describe figure 5.*
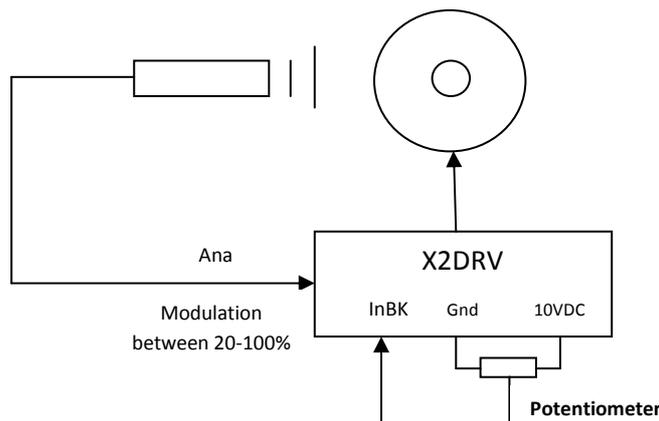

Figure 5: Typical Open Loop application with diameter compensation

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 Ana 1 or 2 without any connection (unplugged).

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

Cal — **Auxiliary Input Calibration: Ana1 & Ana2**

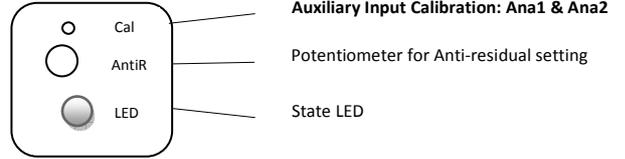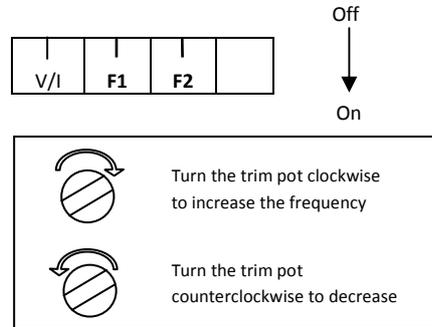AntiR — Potentiometer for Anti-residual setting

LED — State LED

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 describe 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)	

Off ↓ On

V/I | **F1** | **F2** |

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 more) the Driver output will shut down and the red LED will turn ON. To reset the system remove power to the Driver and turn it on again.

X2DRV Block Diagram:

POWER SUPPLY 24V DC +/- 5%, 4A

10 VDC out

LED1 State Brake
LED2 State Brake

InBK1 0-10V or 4-20mA

Ana1 0-10V or 4-20mA (Teach In)

Open Loop Digital Control
InBK1 → − → Prop.1
Ana1 → Calibration → X Gain

Power Layers

OUTPUT Control:

Pulse width modulated 4 Amps with Anti-residual Mode

Brake 1 0-24V or 0-4A
AntiR1 Anti-Res Potentiometer

InBK2 0-10V or 4-20mA

Ana2 0-10V or 4-20mA (Teach In)

Open Loop Digital Control
InBK2 → − → Prop.2
Ana2 → Calibration → X Gain

Brake 2 0-24V or 0-4A
AntiR2 Anti-Res Potentiometer

Brake 1 ON | Brake 1 OFF
Brake 2 ON | Brake 2 OFF

Digital

0-10V or 4-20mA Input Selectable | Tension/Current Output Control | Frequency

Hardware interface
| Setting | Analog Input |
| Digital Input (Active low) | Analog Output |