

fSTOP V2-2B BarTech Receiver Manual



READ ALL INSTRUCTIONS BEFORE OPERATING.

Document Number: PLC850-0009

Document Version: 003

Copyright 2016 by PLC Electronic Solutions Ltd.
#9 - 3871 North Fraser Way, Burnaby, BC V5J 5G6

www.plcelectronicsolutions.com

1-877-832-3476

CONTENTS

1. INTRODUCTION	3
2. INSTALLATION	4
2.1. NECESSARY HARDWARE	4
2.2. OPTIONAL HARDWARE.....	4
2.3. fSTOP V2-2B BARTECH RECEIVER.....	5
3. fSTOP V2-2B BARTECH RECEIVER SETUP.....	6
3.1. POWER.....	6
3.2. fSTOP V2-2B BARTECH RECEIVER OPERATION	6
3.2.1. <i>Setting the Channel</i>	6
3.2.3. <i>Rx Data</i>	7
3.2.5. <i>Focus Settings</i>	8
3.2.5.1. Setting Focus Motor Direction	8
3.2.5.2. Setting Focus Torque	8
3.2.5.3. Automatic/Manual Focus Motor Calibration	9
3.2.5.4. Setting Focus Limits	11
3.2.7. <i>Iris/Zoom Settings</i>	12
3.2.7.1. Selecting Iris or Zoom	12
3.2.7.2. Setting Iris/Zoom Motor Direction	12
3.2.7.4. Setting Iris/Zoom Torque.....	13
3.2.9. <i>Resetting Calibration</i>	14
3.2.10. <i>Resetting to Factory Defaults</i>	14
4. CONNECTOR PINOUTS	15
4.1. POWER (10V-30V) CONNECTOR	15
4.2. AUX CONNECTOR.....	15
4.3. RUN/S (CAMERA RUN/STOP) CONNECTOR.....	15
4.4. FOCUS & IRIS/ZOOM DIGITAL MOTOR CONNECTOR	15
5. SPECIFICATIONS.....	16
6. TROUBLESHOOTING.....	17
6.1. AUTOMATIC CALIBRATION	17
6.2. MANUAL CALIBRATION	17
6.3. CONNECTIVITY.....	17
6.4. INTERFERENCE ISSUES	18
6.5. IRIS SLIDER CALIBRATION.....	18
6.6. IRIS SLIDER MAINTENANCE	18
7. LIMITED WARRANTY.....	19
8. TECHNICAL SUPPORT	19

1. Introduction

PLC Electronic Solutions made it possible. In conjunction with **BarTech Engineering** and customer feedback we have developed the most technologically advanced 2-channel receiver ever for a camera remote follow focus application. The **fSTOP V2-2B BarTech Receiver** contains the following features:

- Super compact - same size as our 1-channel receiver
- Always super-fast motor response! No motor speed compromises at lower input voltages even down to 10 volts.
- DSP Core for ultra-precision motor control
- Wireless update rate of over 300 frames per second - fastest in the industry!
- Full block auto polarity reverse technology - It does not matter what polarity cable you power the receiver with!
- 16 bit High Resolution mode on par with industry standard systems that cost over CAD \$30,000.00.
- Focus and Iris / Zoom control.
- Works with most standard Digital Motors (Heden, Preston, M-One, Scorpio, and more)
- Automatic lens end stop calibration
- Manual calibration, DSLR lens compatibility for setting end stops on infinity rotating lenses
- Can easily set focus limits at the push of a button.
- Lens Calibration and current Position Memory up to 1 day after power down.
- Digital channel readout with receive signal strength indicator
- Integrated Camera Run/Stop outputs

We hope that you will enjoy using the **fSTOP V2-2B BarTech Receiver** as much as we enjoyed bringing you this new technology. Please feel free to contact us if you have any questions or comments.



2. Installation

2.1. Necessary Hardware

- fSTOP V2-2B BarTech Receiver
- fSTOP Power Cable
- Digital Motor
- Digital Motor Cable
- BarTech Focus Device (BFD) Handset

Note: Camera output power or battery must be able to source up to 3.0 Amps.

2.2. Optional Hardware

- A PLC Electronic Solutions **BarTech Iris Slider Upgrade (PLC955-0028)** for two channel control of focus and iris. This will allow you to utilize both channels and the 16-bit technology.



The PLC Electronic Solutions **BarTech Iris Slider Upgrade** can be retrofitted to existing BFD Handsets with serial number T1.0450 and up.

2.3. fSTOP V2-2B BarTech Receiver



- a. Attach the Antenna (PLC477-0012) to the **fSTOP V2-2B BarTech Receiver (PLC955-0029)**.



- b. Plug one end of the **fSTOP Power Cable** into the power output connector of a camera or battery and the other end into the 2-pin Lemo connector on the **fSTOP V2-2B BarTech Receiver** marked **PWR**.
- c. Attach the motor to the gear-ring of the desired focus, iris or zoom gear on the lens. Plug one end of the 7-pin motor cable into the digital motor and the other end into the 7-pin connector (either **FOCUS** or **IRIS/ZOOM**) of the **fSTOP V2-2B BarTech Receiver** as desired.
- d. Attach the second motor to the gear-ring of the desired focus, iris or zoom gear on the lens. Plug one end of the 7-pin motor cable into the digital motor and the other end into the other 7-pin connector (either **FOCUS** or **IRIS/ZOOM**) of the **fSTOP V2-2B BarTech Receiver** as desired.

Do not power up the system at this time.

****You must ensure that the Camera Power output connector is able to source 3.0 Amps if you wish to power the fSTOP V2-2B BarTech Receiver directly from the Camera otherwise motor performance will suffer.****

3. fSTOP V2-2B BarTech Receiver Setup

3.1. Power

The **fSTOP V2-2B BarTech Receiver** can use anywhere between **10 – 30 volts** and incorporates full-block auto polarity reverse technology. This means you can use either standard or reverse-polarity power cables without the risk of damage to your fSTOP V2-2B BarTech Receiver.

Your power source must be able to source up to 3.0 Amps otherwise motor performance will suffer.

3.2. fSTOP V2-2B BarTech Receiver Operation

All settings when selected will be saved in memory after being left idle for 10 seconds.

3.2.1. Setting the Channel

- On the **BFD Handset** choose one channel from 0 to 7 by rotating the selector until the arrow points to the desired channel. The selector can be turned in either direction.
- Using the **UP/DOWN** buttons on the **fSTOP V2-2B BarTech Receiver** select the same channel as your BFD Handset. The current channel is shown on the display.



- The focus wheel on the **BFD Handset** controls the focus motor on the **fSTOP V2-2B BarTech Receiver**. If you have the **BarTech Handset Iris Upgrade**, the additional slider will control the iris motor.

As a general rule, you can further reduce the potential for video transmitter interference by choosing the channel with the highest number.

3.2.3. Rx Data

The **Rx DATA** light on the **fSTOP V2-2B BarTech Receiver** will flash blue to indicate received data.

The **Rx DATA** light goes solid red to indicate that there is no data being received.



The signal lights indicate the strength of the signal being received, all lights 3 indicating a good signal and 1 yellow light indicating poor signal strength.



3.2.5. Focus Settings

3.2.5.1. Setting Focus Motor Direction

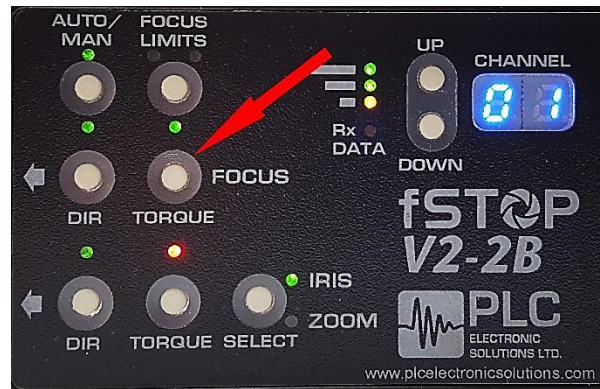
The **FOCUS** direction (**DIR**) button on the **fSTOP V2-2B BarTech Receiver** sets the direction of travel of the motor. Pressing the **DIR** button will recalculate the position and slowly move the motor to the new position. The **DIR** light will change between green and red.



3.2.5.2. Setting Focus Torque

The **fSTOP V2-2B BarTech Receiver** allows for the user to set a desired motor control torque. Generally, the increased torque will allow for more accurate control on stiffer lenses. However, the trade-off of increased torque is increased noise generated by the motor.

- Make sure that the **BFD Handset** is communicating with the **fSTOP V2-2B BarTech Receiver**. The **Rx DATA** light on the **fSTOP V2-2B BarTech Receiver** will flash blue to indicate received data.
- In order to adjust the torque move the **BFD Handset** knob to the torque percentage you would like to set, i.e. fully clockwise is 100%, fully counter clockwise is 1%. This means that there are 100 potential settings for the user.
(Assuming the direction switch on the **BFD Handset** is set to **REV**).
- Press and Hold in the focus **TORQUE** button on the **fSTOP V2-2B BarTech Receiver** and wait for the torque light to go OFF and then turn back ON after about 1 second.



- d. The torque is set and saved into memory. The torque light will change color to indicate the current torque setting:

Green = 0-33%

Orange = 34-66%

Red = 67-100%

The **TORQUE** light constantly on indicates that the motor is engaged.

The **TORQUE** light pulsing indicates that the motor power has shut off to conserve energy and can now be back driven with certain motors (Heden™). This will happen after being idle for about 10 seconds.

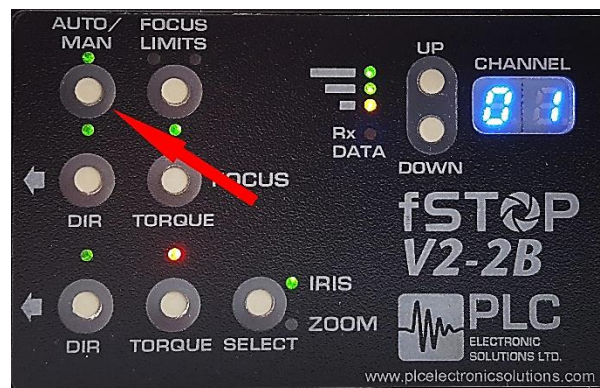
The torque setting is retained in memory even if the power to the **fSTOP V2-2B BarTech Receiver** is removed.

3.2.5.3. Automatic/Manual Focus Motor Calibration

Automatic Motor Calibration

Automatic motor calibration is for lenses with end stops (most camera lenses).

- a. Set the **AUTO/MAN** button so that the light is **ON** to set the focus to Automatic mode.



- b. Ensure that the torque is set to the minimum usable setting before connecting the motor to a lens. See section **3.2.3.2. Setting Focus Torque**.

- c. After installing the motor and **fSTOP V2-2B BarTech Receiver** power up the camera system. The motor will automatically calibrate by moving the lens gear to both end stops. It is now ready to communicate with your **BFD Handset**.

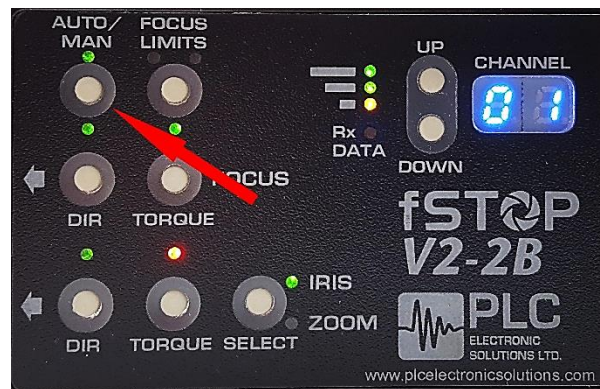
*The **fSTOP V2-2B BarTech Receiver** has built-in positional memory. Calibration settings will be stored in its memory until either the motor is removed, the **CAL** button is pressed, or the unit is powered down for more than 1 day.

Note: Do not let the motor spin for more than 60 seconds, as it will fail calibration as it assumes that no lens is present. If this happens simply press the **CAL** button on the side of the **fSTOP V2-2B BarTech Receiver** or unplug the motor cable and then plug it in again to restart the calibration.

Manual Focus Motor Calibration

Manual motor calibration is for lenses with no or soft end stops (most SLR lenses).

- a. Set the **AUTO/MAN** button so that the light is **OFF** to set the focus to Manual mode.

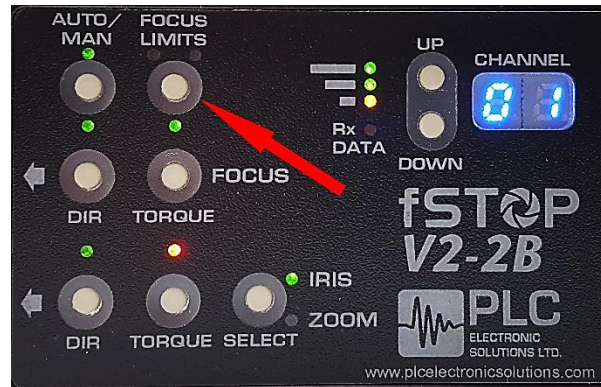


- b. After installing the motor and **fSTOP V2-2B BarTech Receiver** power up the camera system. The motor will allow a small movement to show that the unit is working.
- c. With the **BFD Handset** on and communicating with the **fSTOP V2-2B BarTech Receiver** (**Rx DATA** light flashing blue) center the knob.
- d. Press and release the **CAL** button, the **AUTO/MAN** light will flash and the display will flash "┌ ┐" indicating that the **fSTOP V2-2B BarTech Receiver** is now ready to be manually calibrated.
- e. Move the **BFD Handset** knob so that the motor moves to the first end-stop. Press either the **UP** or **DOWN** button to set the end-stop.
- f. Move the **BFD Handset** knob so that the motor moves to the second end-stop. Press either the **UP** or **DOWN** button to set the end-stop.
- g. The **AUTO/MAN** light will now stay OFF and the display will return to the current Channel indicating that manual calibration is complete.

*****Note:** There is a minimum Manual Calibration span required.

3.2.5.4. Setting Focus Limits

The **FOCUS LIMITS** button is used to limit the travel of the motor between 2 user-defined positions. When the limits are set the position of the focus knob on the **BFD Handset** is recalculated to the corresponding position between the 2 limits set by the user, i.e. fully clockwise will move the motor to one limit and fully counterclockwise will move to the other limit.



- When the **FOCUS LIMITS** lights are **OFF** no limits are set. With the **BFD Handset** communicating with the **fSTOP V2-2B BarTech Receiver** and the motor calibrated, Press in the **FOCUS LIMITS** button until the **FOCUS LIMITS** lights begin to flash. The display will also flash “**— —**” indicating that the **fSTOP V2-2B BarTech Receiver** is now ready for limits to be set.
- Move the **BFD Handset** knob so that the motor moves to the first end-limit. Press either the **UP** or **DOWN** button to set the first limit.
- Move the **BFD Handset** knob so that the motor moves to the second end-limit. Press either the **UP** or **DOWN** button to set the second limit.
- The **FOCUS LIMITS** lights will now remain solid green and the display will return to the current Channel indicating that focus limits have been set.

*****Note:** There is a minimum Limit span required.

Clearing Limits

Once the limits are set, indicated by solid green **FOCUS LIMITS** lights, press and hold the **FOCUS LIMITS** button down until the lights turn off.

Note: The limits are stored in the fSTOP V2-2B BarTech Receiver memory and will remain in memory for up to 1 day after power is removed.

3.2.7. Iris/Zoom Settings

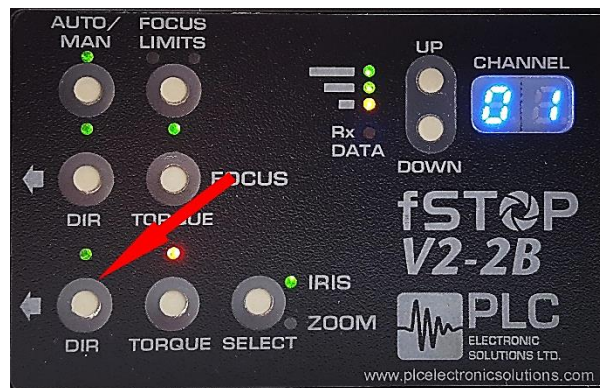
3.2.7.1. Selecting Iris or Zoom

By pressing the **SELECT** button toggles between Iris and Zoom. Iris is selected when the **IRIS** light is **ON**. Zoom is selected when the **ZOOM** light is **ON**.



3.2.7.2. Setting Iris/Zoom Motor Direction

The **IRIS/ZOOM** direction (**DIR**) button on the **fSTOP V2-2B BarTech Receiver** sets the direction of travel of the motor. Pressing the **DIR** button will recalculate the position and slowly move the motor to the new position. The **DIR** light will change between green and red.



3.2.7.4. Setting Iris/Zoom Torque

The **fSTOP V2-2B BarTech Receiver** allows for the user to set a desired motor control torque. Generally, the increased torque will allow for more accurate control on stiffer lenses. However, the trade-off of increased torque is increased noise generated by the motor.

- Make sure that the **BFD Handset** is communicating with the **fSTOP V2-2B BarTech Receiver**. The **Rx DATA** light on the **fSTOP V2-2B BarTech Receiver** will flash blue to indicate received data.
- In order to adjust the Torque move the **BFD Handset** knob to the torque percentage you would like to set, i.e. fully clockwise is 100%, fully counter clockwise is 1%. This means that there are 100 potential settings for the user.

(Assuming the direction switch on the **BFD Handset** is set to **REV**).

- Press and Hold in the iris/zoom **TORQUE** button on the **fSTOP V2-2B BarTech Receiver** and wait for the torque light to go **OFF** and then turn back **ON** after about 1 second.



- The torque is set and saved into memory. The torque light will change color to indicate the current torque setting:

Green = 0-33%

Orange = 34-66%

Red = 67-100%

The **TORQUE** light constantly on indicates that the motor is engaged.

The **TORQUE** light pulsing indicates that the motor power has shut off to conserve energy and can now be back driven with certain motors (Heden™). This will happen after being idle for about 10 seconds.

The torque setting is retained in memory even if the power to the **fSTOP V2-2B BarTech Receiver** is removed.

3.2.9. Resetting Calibration

Pressing the **Calibrate (CAL)** button will re-calibrate both of the motor channels.

- a. Press the **CAL** button while the **fSTOP V2-2B BarTech Receiver** is powered will do a soft reset of the unit.



- b. When the button is depressed and released it will reset the unit. The motors will then start their calibrate functions again immediately if in automatic calibration mode. If focus is in manual calibration the unit will be ready for settings in manual calibration mode. Limits will also be erased.

3.2.10. Resetting to Factory Defaults

Resetting the **fSTOP V2-2B BarTech Receiver** to factory defaults will restore all of the settings (calibration, torque, direction, etc.) to factory defaults.

- a. Make sure that the **fSTOP V2-2B BarTech Receiver** is powered down and the **AUTO/MAN** button is in the **AUTO** setting.
- b. Power up the **fSTOP V2-2B BarTech Receiver** while holding in the **CAL** button until the “**F.r.**” flashes on the display. Once “**F.r.**” is solid, release the **CAL** button. V2-2 factory defaults settings are now restored.

4. Connector Pinouts

4.1. Power (10V-30V) Connector

Lemo# ECG.0B.302.CLL - The plug for making cables is **Lemo# FGG.0B.302.CLAD52**

- 1 Power (10V – 30V)
- 2 Ground

4.2. AUX Connector

Lemo# ECG.0B.307.CLV - The plug for making cables is **Lemo# FGG.0B.307.CLAD52**

- 1 Camera On/Off for RED™ cameras
- 2 RS232 Rx-in
- 3 RS232 Tx-out
- 4 Ground
- 5 VCC +5V out (max 100 mA)
- 6 Camera LANC
- 7 Analog Input

4.3. RUN/S (camera run/stop) Connector

Lemo# ERD.0S.304.CLL - The plug for making cables is **Lemo# FFA.0S.304.CLAK52**

- 1 Transmit (Tx) – RS 232 Data In/Out and Factory re-programming
- 3 Receive (Rx) – RS 232 Data In/Out and Factory re-programming
- 2 Camera (ON/OFF) contact closure
- 4 Camera (ON/OFF) contact closure

4.4. Focus & Iris/Zoom Digital Motor Connector

Lemo# EGG.1B.307.CLL - The plug for making cables is **Lemo# FGG.1B.307.CLAD52**

- 1 Motor –
- 2 Motor +
- 3 Chan A Encoder
- 4 VCC +5V out (max 100 mA)
- 5 Ground
- 6 Chan B Encoder
- 7 Motor Detect

5. Specifications

Dimensions (antenna removed): approx. 3 15/16"L x 2 1/8"W x 1"H
(10cm L x 5.4cm W x 2.7cm H)

Weight: 6 1/8 oz. (173 g)

Input Voltage: 10 to 30 Volts

Power Consumption: 0.2 A @ 12 volts, 0.08 A @ 24 volts
Standby, not driving motor

RF Reception: 8 channels 902-928 MHz

Channel	Frequency (MHz)
0	903.37
1	906.37
2	907.37
3	909.37
4	912.37
5	915.37
6	919.37
7	921.37

Resolution: 16-bits (65536 steps), all steps always used.

Transmission Latency: 2.7 milliseconds

Position Update Rate: 300 transmissions / second

Antenna: ANT 916MHZ RA 1/4WAVE RPSMA

Linx Technologies# ANT-916-CW-RAH

Digi-Key# ANT-916-CW-RAH-ND (www.digikey.com)

Motor Compatibility:

Digital Motors:

- Preston: DM1, DM1X, DM2
- Scorpio: All Digital motors with 7-pin Lemo connector
- Heden: All Digital motors with 7-pin Lemo connector
- Loon Video: M-One Digital motor

6. Troubleshooting

6.1. Automatic Calibration

A motor will not calibrate to the full span of the lens.

- Try increasing the torque settings. See section **3.2.5.2 Setting Focus Torque** or **3.2.7.4 Setting Iris/Zoom Torque**.

A motor moves to the first stop and continues to turn.

- Try decreasing the torque settings. See section **3.2.5.2 Setting Focus Torque** or **3.2.7.4 Setting Iris/Zoom Torque**.

6.2. Manual Calibration

The focus motor does not move in manual calibration mode.

- If a manual calibration has been set into the **fSTOP V2-2B BarTech Receiver** memory without moving the motor the span will be set to 0 so the motor will not move. Simply press the **CAL** button and start the manual motor calibration again. See **3.2.5.3. Automatic/Manual Focus Motor Calibration** for directions.

6.3. Connectivity

The **fSTOP V2-2B BarTech Receiver** does not receive any signal from the transmitter.

- Check that the **BFD Handset** and **fSTOP V2-2B BarTech Receiver** are set to the same channel and powered **ON**.
- Look for the **Rx DATA** light flashing on the **fSTOP V2-2B BarTech Receiver**. If the **Rx DATA** light is flashing blue the **BFD Handset** and **fSTOP V2-2B BarTech Receiver** are communicating.
- The signal lights indicate the strength of the signal being received, all lights 3 indicating a good signal and 1 yellow light indicating poor signal strength. If it is poor try moving closer.

6.4. Interference Issues

I am having interference issues.

- To AVOID INTERFERENCE when using two **BFD Handsets** simultaneously: Use the below channel combinations with a ✓.

	BFD #1 Channel								
BFD #2 Channel		0	1	2	3	4	5	6	7
	0	X	X	✓	✓	✓	X	✓	✓
	1	X	X	X	✓	✓	✓	✓	✓
	2	✓	X	X	X	✓	✓	X	✓
	3	✓	✓	X	X	X	✓	✓	X
	4	✓	✓	✓	X	X	X	✓	✓
	5	X	✓	✓	✓	X	X	X	✓
	6	✓	✓	X	✓	✓	X	X	X
	7	✓	✓	✓	X	✓	✓	X	X

6.5. Iris Slider Calibration

If the Iris is not making it all the way to the end stops.

- a. To calibrate the **BarTech Iris Slider** make sure that all of the switches are in the down position on the BarTech Handset. I.e. Power is OFF, Motor Direction is in REV, Camera is in CON, and Camera Run/Stop is in STOP.
- b. Switch on the Power switch.
- c. Now switch up all of the other switches. When this is completed both the Power and Camera Run/Stop LED's should start rapidly flashing.
- d. Slide the **BarTech Iris Slider** knob all the way from one end to the other a few times.
- e. Move all of the switches but the Power switch into the down position. The Power and Camera Run/Stop LED's will stop rapidly flashing which indicates that the calibration is complete.

6.6. Iris Slider Maintenance

The Iris Slider is sticky or has dirt in the slider guide.

- To clean the **BarTech Iris Slider** guide unscrew the 2 Phillips screws on the end of the slider in the plastic stopper. Slide out the stopper and slider knob. Clean the guide and knob with alcohol and replace the slider knob with the rounded end going in first. Slide in the stopper and screw it back into place. The slider works on a magnetic system. No wires are attached when you remove the slider.

Note: Be careful not to over tighten the screws.

7. Limited Warranty

PLC Electronic Solutions Ltd. warrants this equipment for 1 year from the date of original purchase against defects in materials or workmanship, provided it was purchased from an authorized dealer. This warranty does not cover equipment, which has been abused or damaged by careless handling or shipping, nor does it cover products subjected to customer alteration, modification, negligence or misuse. This warranty does not apply to used or demonstrator equipment.

Should any defect develop within the warranted time period, PLC Electronic Solutions Ltd. will at its sole option, repair or replace the defective instrument without charge. To obtain warranty service, the defective instrument must be returned within 1 year from the original purchase date to PLC Electronic Solutions Ltd., along with a brief description of the defect claimed. PLC Electronic Solutions Ltd. will pay for ground shipping of any unit deemed to be covered under warranty. Under no circumstances will PLC Electronic Solutions Ltd. be liable for greater than the original purchase cost of the PLC Electronic Solutions Ltd. product.

8. Technical Support

Address any technical question to:

PLC Electronic Solutions Ltd.

9-3871 North Fraser Way

Burnaby, BC V5J 5G6

Canada

1-877-832-3476 (M-F 8:00 am/4:00 pm PST)

E-mail: info@plcelectronicsolutions.com

BarTech Engineering

5285 East Appian Way

Long Beach, CA 90803

USA

Tel: (562) 987-9159 (M-F 9:00 am/ 5:00 pm PST)

Fax (815) 364 5240

E-mail: jim@bartechengineering.com