

DirecLink

Trailer Brake Controller

Base Model

DirecLink 50

Installation and
Users Guide



Tuson RV Brakes, LLC
475 Bunker Court
Vernon Hills, IL 60061

www.direclink.com

May 2016

Contents

1.	DirecLinkComponents.....	01
	1.1 Inside the box.....	01
2.	Quick Start.....	02
	2.1 About Quick Start.....	02
	2.2 Quick Start Steps.....	02
3.	Initial Connection and Test.....	03
	3.1 About the Test.....	03
	3.2 Electrical Connections.....	03
	3.3 Connection Sequence.....	03
	3.4 First Time Power-Up.....	04
4.	Final Installation of Modules and Cables.....	05
	4.1 Final Installation Sequence	05
	4.2 Final Installation Sequence (continued).....	06
5.	Main Screen - Initial Operation.....	07
	5.1 Main Screen (Home Page).....	07
	5.2 Heavy Trailers.....	07
	5.3 Confirm Trailer Connection.....	07
	5.4 Road Test and Fine Tuning Brake Scale.....	07
	5.5 DirecLink Sleep Mode.....	08
6.	Manual Braking.....	09
	6.1 Manual Braking.....	09
7.	7.0 Screen and Button Functions.....	10
	7.0 Screen and Button Functions.....	11
8.	DirecLink Menu Navigation Overview.....	12
	8.1 Menu Structure Overview – Menu Levels.....	12
9.	Configure Option Menu.....	13
	9.1 Configure Options.....	13
	9.2 Brake Scale.....	13
	9.3 Trailer Size.....	13
	9.4 Brake Level When Stopped.....	14
10.	Monitor Options Menu.....	

15		
	10.1 MPH/RPM.....	15
	10.2 Vehicle Battery Voltage.....	15
	10.3 Controller Amps.....	15
11.	Faults Codes and Trouble Shooting.....	16
	11.1 When Faults Are Detected.....	16
	11.2 Fault Codes and Descriptions.....	16
	11.3 Descriptions of Major Faults and Resolutions.....	17
	Limited Lifetime Warranty.....	
18		

1 DirecLink Components



1.1 Inside the box

Control Module	#1
Command Module	#2
OBDII Cable	#3
Delphi Harness	#4
Spiral Cable	#5
Flush Dash Mount	#6
Swivel Dash Mount	#7
Alcohol wipe	not shown
5 Cable Ties	not shown
Users Manual	not shown

Read and Save This Manual

- Before beginning installation, read and become familiar with these instructions.
- Save this manual and store it in your tow vehicle for future reference.
- Improper installation and operation could cause serious or fatal injuries and/or

Please Note:

The DirecLink trailer brake controller works with 2 - 8 electric drum brakes and electric-hydraulic trailer brake actuators. It automatically detects which type you have and configures itself accordingly.

2 Quick Start

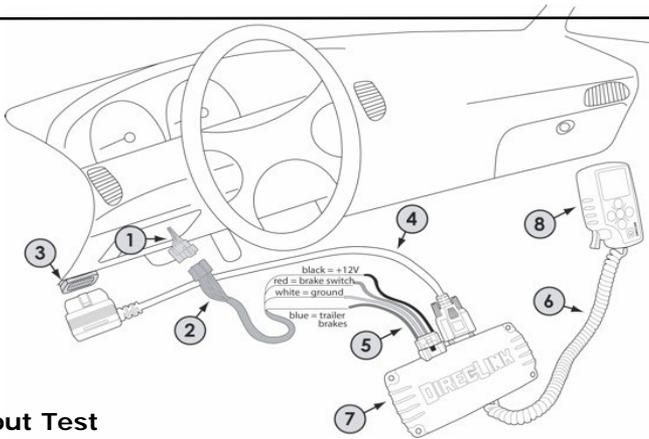
2.1 Quick Start

By following the steps outlined in sections 3-7 of this manual, you can install and use the basic features of the DirecLink trailer brake controller. However, we strongly encourage you to read and utilize the more advanced features of DirecLink which are outlined in sections 8 - 11 of this Installation and Users Guide.

2.2 Quick Start Steps

1. Initial Connections and Test
2. Final Installation of Modules and Cables
3. Setting Brake Scale
4. Manual Braking

3 Initial Connection and Test



3.1 About Test

The purpose for the initial test, prior to securing the cables and mounting the modules is to verify that the required wiring connections are available and functioning properly. By checking this functionality first, it is easier to make any repairs or corrections while all wiring and components are easily accessible.

3.2 Electrical Connections

The required electrical connections are indicated by the numbers in the diagram above:

1. Vehicle specific trailer wiring connector (already in vehicle or can be purchased)
2. Vehicle specific trailer wiring harness (must buy separately)
3. Vehicle OBDII connector (already in vehicle)
4. OBDII to DB9 Cable (included with DirecLink)
5. Delphi 4 Wire Harness (included with DirecLink)
6. Spiral Cable (included with DirecLink)
7. DirecLink Control Module
8. DirecLink Command Module

3.3 Connection Sequence

With the vehicle ignition turned OFF and the trailer DISCONNECTED from the vehicle, make the wiring connections in the following order:

First: connect 2 with 5. If your vehicle is not equipped with a harness that plugs directly into the DirecLink's Delphi connector, than you must use the Delphi 4 wire harness included in your package. The diagram above shows the functions of the four wires of the Delphi harness. These wires must be connected to the vehicle by function and NOT by color. The label attached to the Delphi harness contains common wire function and color for various vehicle manufacturers. If your vehicle is not listed on this label, consult your owner's manual to determine your vehicle's wiring function by color. Once you have determined the correct wire connections for the four wire harness, use a crimp-type connector to securely fasten the wires together.

Once you have finished securely connecting 2 with 5 as outlined above, complete the connection sequence as follows:

- Second: connect 1 with 2
- Third: connect 3 with 4
- Fourth: connect 4 with 7

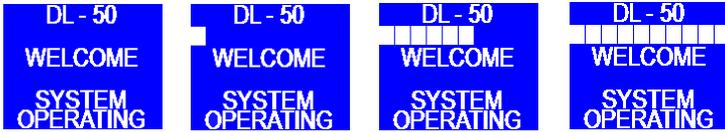
- Fifth: connect 5 with 7
- Sixth: connect 6 with 7*
- Seventh: connect 6 with 8

* Use any of the 3 RJ connectors in Item 7; select the connector that makes routing of the spiral cable to item 8 as easy as possible.

3 Initial Connection and Test

3.4 First Time Power-Up

- 3.4.1 After the electrical wires and cables have been installed per the previous section, the next step is to wake-up the DirecLink and verify correct operation. While viewing the Command Module display screen, start the vehicle and depress and release the brake pedal. It is not necessary to press any buttons since the following configuration process is fully automated. If all electrical connections are correct the display will turn on with a blue background and white text reading as shown in below:



- 3.4.2 After POWER-UP, the system will automatically initial and check itself. Once the system is completed initial and checking, the screen below will be displayed and system is on the working status.

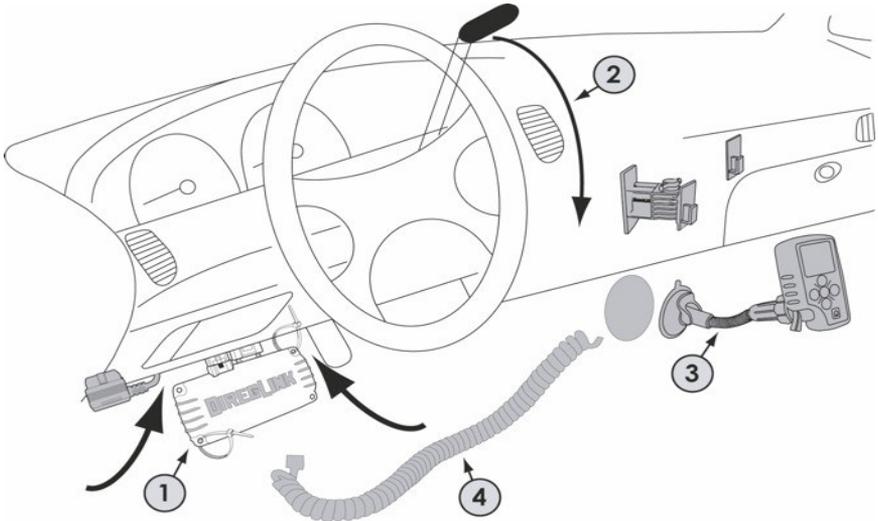


* Not all models with all years have been tested and verified to operate with the DirecLink, however significant sample testing has been performed spanning the range of vehicles in the supported vehicles networks (listed above) and indicate a wide compatibility with the manufacturers and years listed.

* SUPPORTED VEHICLE NETWORKS
(1997 to Present) Ford, General Motors and Chrysler
(2008 to Present) Nissan and Toyota

- 3.4.3 The "SYSTEM OK" is displayed on the screen indicates that the DirecLink has successfully established communication with your vehicle and is now operational.

4 Final Installation of Modules and Cables

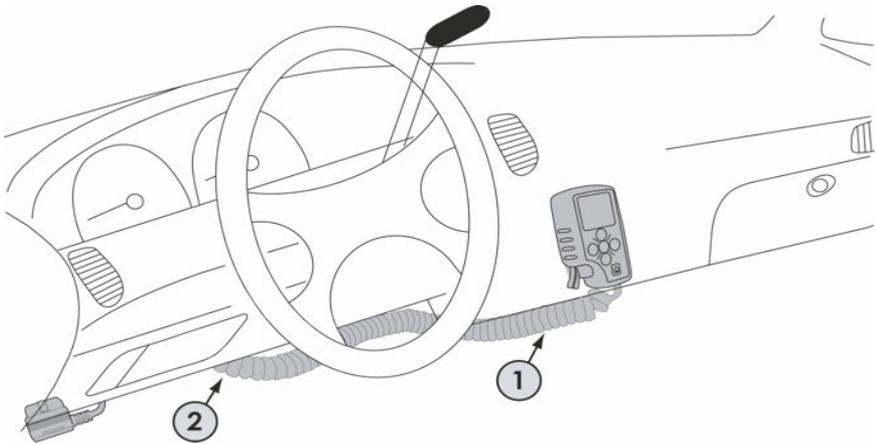


4.1 Final Installation Sequence

After successfully completing the initial connections and power-up described in section 3, perform the final installation in the following sequence:

1. Using the cable ties provided, secure the OBDII cable, Delphi harness and the control module up underneath the dash with the RJ connectors (phone style connectors) facing out toward the driver to make it easy to plug in the spiral cable. Route the cable ties through at least two of the four corner holes in the control module case and attach them to solid objects under the dash such as support brackets. Be sure all cables are securely fastened to prevent interference with the driver's feet. The control module can be mounted in any orientation without affecting operation.
2. Select the location to mount the command module. There are two different styles of dash mounts that are included with the DirecLink; flush mount and swivel mount. Both use a peel-off adhesive back for mounting. It is very important to clean the selected mounting surface with an alcohol wipe (included) and let the surface dry before attaching the mount. In selecting a good mounting location be especially aware of the gear shift lever. Make sure that the selected location does not interfere with the entire travel of the gear shift lever when shifting from park all the way down to low gear.
3. After the command module is mounted in an easily viewable and reachable location, attach the spiral cord to any of the three RJ connectors on the control module and connect it to the bottom of the command module.

4 Final Installation of Modules and Cables



4.2 Final Installation Sequence

When the DireLink is properly mounted, the only parts visible are the command module, spiral cable and possibly the OBDII connector (depending on the location of the connector in the vehicle).

1. The spiral cord should be routed to the control module in a manner that keeps the cord somewhat tight and against the dash to avoid interfering with the vehicles moving parts or the driver's legs.
2. If needed, a cable tie can be used under the dash by the control module to take any excess slack out of the spiral cable. Do not make the spiral cable too tight and keep enough slack to be able to remove the command module from the mount and hold in your hand to operate the buttons.



Warning!

All wiring must be connected as instructed in this manual for the DireLink to operate correctly. Failure to connect all the wires correctly may cause a loss of trailer brakes resulting in serious or fatal injury and/or property damage.



Warning!

The white wire of the Delphi connector (connector #5 in the diagram on page 3) must be connected to the negative terminal of the tow vehicle battery. Improper ground will result in the loss of trailer brakes which may result in serious or fatal injuries and/or property damage.



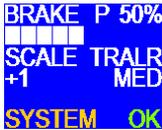
Warning!

DO NOT connect the black wire of the Delphi connector (connector #5 in the diagram on page 3) to any vehicle power supply line or fuse panel that could cause circuit overload or damage to tow vehicle wiring and vehicle electronics.

5 Main Screen - Initial Operation

5.1 Main Screen (Home Screen)

The HOME screen is the first screen in the main menu and it appears upon completion of a successful power-up or when the **HOME**  button is pressed.



The **Brake Scale** number represents the level of trailer braking that the DirecLink will apply to the trailer brakes when the tow-vehicle brakes are applied. The value can be adjusted from +1 to +20 with +1 being very light braking and +20 being very heavy braking. (The default level is set at +3.)

5.2 Heavy Trailers

If your trailer weighs more than 10,000 lbs., you should configure the DirecLink to LARGE trailer as explained in section 9 of this guide.

5.3 Confirm Trailer Connection

Now that the DirecLink has successfully powered-up and after properly hitching the trailer to the tow vehicle, you can verify the trailer's electrical connection. If the DirecLink has properly detected the trailer brake system, a green "C" will appear in the lower right hand corner of the display screen. If a red "NC" appears in the lower right hand corner of the display screen after the trailer's electrical plug has been attached to the tow vehicle's receptacle, see page 23 of this manual in the Faults and Trouble Shooting section, and do NOT tow the trailer.

5.4 Road Test and Fine Tuning Brake Scale

Once you have a green "C" in your display screen and the trailer is properly hitched to the tow vehicle, you are ready to make some slow speed stops to verify the correct level of Brake Scale.

Position the tow vehicle and trailer in a low traffic area on a hard, flat, dry surface and follow these steps:

1. Accelerate to approximately 25 miles per hour and make a normal stop. The trailer brakes should provide firm braking without the trailer tires locking. Inversely, the trailer should not push against the tow vehicle during braking.
2. If the trailer tires lock, reduce the Brake Scale until this is resolved. If the trailer pushes the tow vehicle raise the Brake Scale until this problem is resolved.
3. Once you are confident of the Brake Scale level, make several stops at 50 miles per hour and confirm the level of Brake Scale or readjust as needed.

5 Main Screen - Initial Operation

5.5 DirecLink Sleep Mode

Once the vehicle's engine is turned off, the DirecLink will go into "sleep mode" after 5 minutes causing the Command Module screen to turn off. Once the DirecLink enters "sleep mode" the brake pedal must be depressed to resume operation. The 5 minute "sleep mode" can be delayed if any button or the trigger on the Command Module is activated, or if the brake pedal is pushed while the engine is turned off.

6 Manual Braking

6.1 Manual Braking

The DirecLink is equipped with a “trigger” that provides the driver the ability to manually apply the trailer brakes from 0 to 100% braking force. As the trigger is pulled a bar appears from left to right on the display with a numerical percentage corresponding to the amount of manual braking being applied. When the trigger is released, the trailer brakes are released and the bar disappears from the display.

Trailer braking during manual operation using the trigger does NOT use the Brake Scale settings. The percentage braking force displayed is the percentage of braking force of the trailer brake system. Keep this in mind as you use the manual over-ride trigger as it is possible that you will lock your tires if you apply very high levels of manual braking.



Warning! Manual brake operation using the trigger manual over-ride may not disengage the Cruise Control on some vehicles.



Trailer brake lock-up may cause a loss of control of the trailer and/or the tow vehicle. This may cause serious or fatal injuries and/or property damage. Take care in applying trailer brakes in manual operation and always set your Brake Scale so the trailer tires do NOT lock up during braking.

Warning!

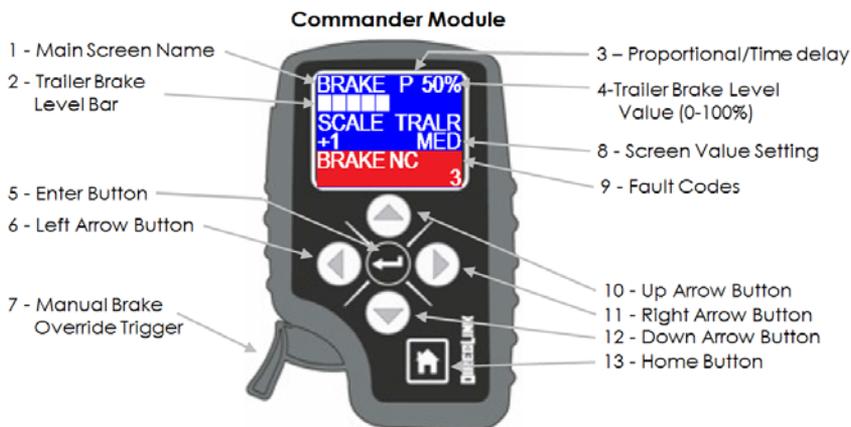
This concludes the Quick Start.

You are ready to use the basic functions of the DirecLink.

The DirecLink can be very precisely adjusted, it has more functionality and diagnostic capability. To learn more about these features, read the remainder of this manual. You will get more from

your DirecLink trailer brake controller and have a much better understanding of how it works.

7 Screen and Button Functions

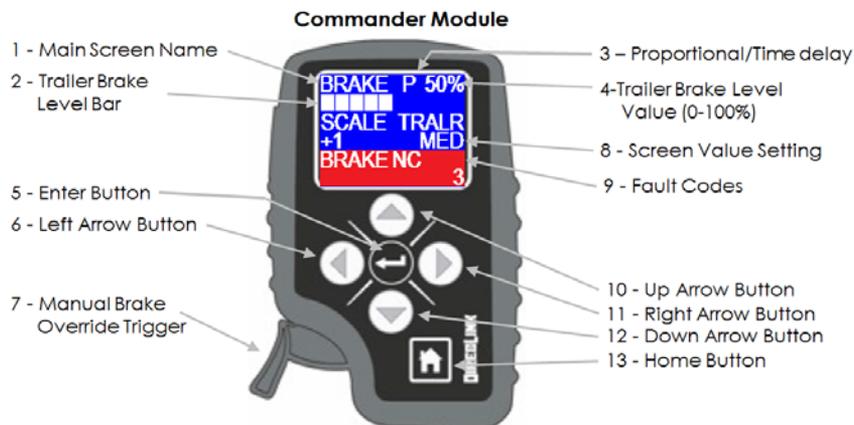


Feature	Description
1- Menu Screen Name	This area of the screen displays the title of the screen you are viewing.
2- Trailer Brake Level Bar	This moving bar indicates the level of trailer braking signal being sent from the DirecLink to the trailer from 0 to 100%.
3-Proportional/Time delay	The type of brake control is using. "P" represent proportional brake control. "T" represent time delay control. "M" represent manual control.
4-Trailer Brake Level Value	This numeric value corresponds with the Trailer Brake Level Bar and also indicates the level of trailer braking signal being sent from the controller to the trailer (from 0 to 100%).
5-Enter Button	This button is used to accept a value. Pressing the enter button communicates this selected value to the DirecLink.
6-Left Arrow Button	The left arrow button is used to navigate the configuration screens.
7-Manual Brake Override Trigger	The manual brake override trigger allows the operator to manually apply from 0 to 100% of the trailer brakes by sliding the spring-loaded trigger into the housing. Releasing the trigger also releases the trailer brakes.

8-Screen Value Setting

The screen value setting indicates the accepted and/or current value that is set for the menu screen being displayed. In the example above, the Trailer size is set to MED. Other menu screens have text values like Scale and others have percentage values that can be changed.

7 Screen and Button Functions



Feature	Description
9 - Fault Codes	The fault code section of the display is used to alert the driver of device operational problems many of which can cause the trailer braking system to not function at all or at a reduced performance level. The number indicate the total faults may exist on the device in the braking system.
10 - Up Arrow Button	The up arrow button is used to increase a data value for adjustment and is also used to scroll up the fault codes.
11 - Right Arrow Button	The right arrow button is used to navigate the configuration screens.
12 - Down Arrow Button	The down arrow button is used to decrease a data value for adjustment and is also used to scroll down the fault codes.
13 - Home Button	The home button is used for returning to the main menu screen.

8 DirecLink Menu Navigation Overview

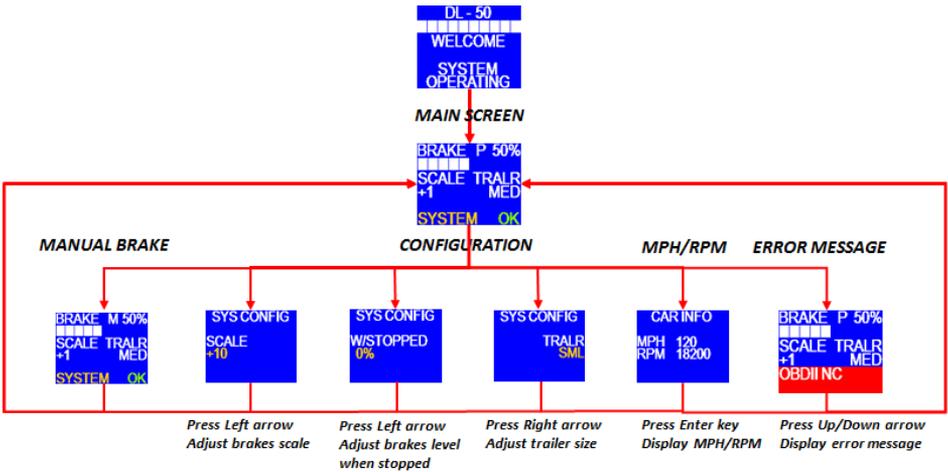
8.1 Menu Structure Overview - Menu Levels

The below diagram is the Menu structure overview. The system is beginning from the WELCOME screen then goes to MAIN screen for system operating.

The CONFIGURATION mode has three (3) different setting screens, they are: Brake Scale, Trailer Size and Brake Level w/Stopped. Please refer the next chapter for more detail setting.

The ERROR MESSAGE mode is providing any error on the system. Please refer to the Fault code and troubleshooting for more details.

The MPH/PRM mode is displaying the reading data from the vehicle.



The MANUAL BRAKE mode is displaying the current manual braking levels.

9 Configure Option Menu

9.1 Configure Options

The purpose of the **Configure Options** menu is to allow the driver to enable some additional features of the DireLink or readjust existing settings. There are three (3) screens that comprise the **Configure Options** menu, they are: Brake Scale, Trailer Size and Brake Level w/Stopped.

9.2 Brake Scale



The **Brake Scale** screen allows the driver to adjust the brake levels. The **Brake Scale** number represents the level of trailer braking that the DireLink will apply to the trailer brakes when the tow-vehicle brakes are applied. The value can be adjusted from +1 to +20 with +1 being very light braking and +20 being very heavy braking. (The default level is set at +3.)

To adjust the Brake Scale:

1. Press the **Left arrow** (←) on the keypad when on the **Main** screen.
2. A number will appear underneath the current setting.
3. Press the **Up** or **Down** (↑/↓) arrow to increment the value of the lower line up or down.
4. Set the lower line to your desired value and press the **ENTER** (↵) button.
5. The top line will change to your new selection.

NOTE: If you press the left, right arrows or home button before pressing ENTER to accept your new selection, your new selection will NOT be saved before changing to a different menu screen

9.3 Trailer Size



The **Trailer Size** screen allows the driver to select between **MED** (medium) and **LRG** (large) trailer sizes. The default setting is **MED**. The **MED** setting is a scaling factor that is applied to the **Brake Scale** setting. The **MED** setting is designed for trailers weighing up to 10,000 lbs. The **LRG** setting is designed for trailers that exceed 10,000 lbs. By having these two trailer size settings and having 20 levels of **Brake Scale** for each setting, that gives the driver 40 levels of **Brake Scale** to choose from in order to find the ideal trailer brake setting. Depending on the condition or configuration of your trailer's brake system, and regardless of its actual weight, you may select either the MED or LRG trailer setting to achieve optimal trailer braking

performance. The DirecLink will operate properly in either **Trail Size** setting regardless of the trailer size

9 Configure Option Menu

so do not hesitate to select the setting that provides your preferred level of trailer braking.

In order to switch between MED and LRG trailer settings:

1. Press the **Right** arrow when on the **Main** screen.
2. Either **MED** or **LR** will appear underneath the current setting.
3. Use the **Up** or **Down** arrow to toggle between **MED** and **LRG** on the lower line.
4. Set the lower line to your desired selection and press the **ENTER** button.
5. The top line will change to your new selection.

NOTE: If you press the left, right arrows or home button before pressing ENTER to accept your new selection, your new selection will NOT be saved before changing to a different menu screen.

9.4 Brake Level When Stopped



The Brake Level w/Stopped screen allows the driver to set a desired percentage level of trailer brakes to be applied when the tow vehicle-trailer is at a stop. The level can be set from 0% to 30%. When activated, the DirecLink adjusts the trailer brakes up to the setting when tow vehicle-trailer velocity is zero. This feature is helpful when stopping on steep grades or on slippery boat ramps. By having the trailer brakes applied when stopped it helps keep the tow vehicle and trailer stationary.

In order to set the Brake Level w/Stopped value:

1. Press the **Left** arrow when on the Brake Scale screen.
2. A number will appear underneath the current setting.
3. Press the **Up** or **Down** arrow to increment the value of the lower line up or down.
4. Set the lower line to your desired value and press the **ENTER** button.
5. The top line will change to your new selection.

NOTE: If you press the left, right arrows or home button before pressing ENTER to accept your new selection, your new selection will NOT be saved before changing to a different menu screen.

After setting the Brake Level w/Stopped value to something other than zero (0), you will notice that the Brake Bar on the screen will indicate the value you set when the tow vehicle-trailer comes to a stop.

10 Monitor Options Menu

The purpose of the **Monitor Options** menu is to allow the driver to view key vehicle and controller parameters providing information on the operational status of the DirecLink components and various network connections. The data that is displayed in the **Monitor Options** screen is able to be viewed only. None of the screens provide the ability to access or change the data.

10.1 MPH, RPM

The **MPH, RPM** screen displays those three parameters from the tow vehicle's network. The only time engine RPM is displayed is when velocity is zero. As soon as velocity is detected the engine RPM value disappears and only MPH is displayed. This screen is also used to indicate successful network communication between the DirecLink and the tow vehicle.

10.2 Vehicle Battery Voltage

This screen displays the vehicle battery voltage monitored from the black wire of the Delphi harness. The brake light voltage displays the voltage level of the red wire on the Delphi harness.

10.3 Controller Amps

The CAmp displays the amperage output of the controller to the "blue wire" during normal braking or running the manual override.

11 Fault Codes and Trouble Shooting

11 Fault Codes and Trouble Shooting

11.1 When Faults Are Detected

The DirecLink automatically monitors many critical operational parameters. When a fault is detected, a RED screen will appear with a description of the fault and the module containing the fault. The number on the bottom right corner is representing the total faults.



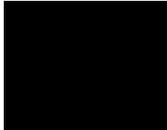
To clear a fault screen, the root cause of the fault must be corrected. The fault screens will provide information regarding the problems that need to be corrected. Section 11.5 provides a brief description of the main faults and methods of correcting them. The table below shows a summary of faults.

11.2 Fault Descriptions

Code Description	Additional Information
System OK	OK appears in center of bottom line
Blue Wire Short	Brake current/signal wire short
OBDII NC	Vehicle network is failed
Ground Open	Ground wire on Delphi Disconnected
Battery Off	Black wire on Delphi Disconnected
Low Battery Voltage	Low voltage on the black wire
System Error	Unexpected error

11 Fault Codes and Trouble Shooting

11.3 Descriptions of Major Faults and Resolutions

Fault	Probable Cause of Faults and Trouble Shooting Methods
	This screen indicates that the black wire (12V +) of the four wire Delphi connector (connector #4 as outlined on page 1 of this manual) is either not connected properly, has an intermittent connection or there is no power from the vehicle electrical system. This fault completely disables your trailer brake system.
	This screen indicates that the white wire [ground (-)] of the four wire Delphi connector (connector #4 as outlined on page 1 of this manual) is either not connected properly or has an intermittent connection. This wire is to be connected to the negative terminal of the tow vehicle battery only. This fault completely disables your trailer brake system.
	This screen indicates that the blue wire trailer brake voltage or signal wire of the four wire Delphi connector (connector #4 as outlined on page 1 of this manual) is shorted to ground. This fault completely disables your trailer brake system.
	This screen indicates that the connection between the DirecLink and the OBDII connector is loose or disconnected. These are connections 3 with 4 or connections 4 with 7 as outlined on page 3 of this manual. Tightening or reconnecting the cables should resolve this problem. This fault results in the DirecLink operating in emergency mode as indicated by a "red" braking bar while vehicle braking.
	If the trailer connector is properly plugged into the tow vehicle's trailer wiring receptacle and the screen still displays a red NC, check the following; 1) The display to determine if any faults are indicated. 2) Verify that the wiring of the trailer connector and the tow vehicle receptacle absolutely correspond by wire function (NOT BY WIRE COLOR) 3) Ensure that the connector plug and receptacle are clean and free of corrosion. 4) Use the Monitor Menu to verify all electrical connections (including the Brake Light voltage) and verify the brake controller output in voltage and amps. 5) If the trailer braking system is electric drum brakes, ensure the trailer brake magnet ground is properly connected per the manufacturer's instructions.
	The DirecLink screen is dark/not functioning. There are three potential causes: 1) The vehicle is turned off and the DirecLink is asleep. Press the brake pedal to wake it up. 2) The spiral cable (cable #5 as outlined on page 1 of this manual) is not properly connected to either the control module or the command module which results in a lack of electrical power to the command module. If the spiral cable is properly connected, unplug it from the control module and re-plug it into one of the other two connectors on the front of the control module. If this does not resolve the problem, the cable might need to be replaced. To isolate the problem to the command module, check the LEDs on the front of the control module. If the PWR LED is solid green and the S-1 LED is flashing green, then the control module has power and is functioning properly. 3) If the LEDs on the front of the control module are not functioning as outlined above, this verifies that there is no power on either the OBDII connector or the Delphi connector. You must restore power to resolve this problem. If the "red" LED is flashing on the control module, there most likely is a wiring problem with the spiral cable or possibly with the wiring to the control module.

Limited Warranty

DirecLink Warranty

Tuson RV Brakes, LLC (hereafter referred to as Tuson) warrants the DirecLink trailer brake controller to be free of defects in material and workmanship, under normal use, for a period of one (1) years from the original consumer purchase date. At Tuson's sole option, Tuson will repair or replace the defective product with a like product. Replacement product or parts may include remanufactured or refurbished parts or components. This warranty applies only to the first consumer purchaser, is nontransferable, and is limited to components supplied with the DirecLink trailer brake controller product. The purchase or use of the DirecLink trailer brake controller constitutes acceptance of the conditions stated in this document. Tuson makes no guarantee, warranty, or representation regarding the suitability or legality of this product. It is the consumer's responsibility to ensure regulatory compliance before purchasing or using this product. The consumer agrees to operate this product in keeping with all laws governing its use. Under no conditions will Tuson be responsible for anything other than the repair or replacement of the original product.

Limitation of Liability and Warranty Exclusions

Tuson's liability is limited to the cost of repair or replacement of the DirecLink trailer brake controller. This limited warranty excludes, but is not limited to damage, deterioration, or malfunction due to negligence, abuse, accident, improper use, misuse, improper installation, failure to follow supplied instructions, alteration, modification, unauthorized repair or attempted repair, external causes, normal wear and tear, or any other cause which does not relate to a product defect. This limited warranty also excludes any incidental, consequential, or other claims, damages, or losses, even if advised of the possibility of such, including against the consumer by any other party. There are no other warranties, express or implied, including implied warranty of merchantability and fitness for a particular purpose. All disputes will be handled in accordance with Illinois state laws.

For assistance with your DirecLink trailer brake controller, please call 800-968-8766.

For more information about DirecLink, visit our website at www.direclink.com

