



DG TECHNOLOGIES
Vehicle Network Solutions

lodestar[®]

USER MANUAL



© 2018 DG Technologies
33604 West Eight Mile Road
Farmington Hills, MI 48335
Phone: (248) 888-2000, FAX: (248) 888-9977
<http://www.dgtech.com>

This document is copyrighted by the Dearborn Group Inc. Permission is granted to copy any or all portions of this manual, provided that such copies are for use with the product provided by the Dearborn Group, and that the name "Dearborn Group Inc." remains on all copies as on the original.

The accompanying software, provided for use with the lodestar® and lodestar® interface, is copyrighted by Dearborn Group Inc. Permission is granted to copy this software for back-up purposes only.

I M P O R T A N T

It is essential that you read this document carefully before using the hardware.

Damage caused by misuse of the hardware is not covered under the seller's product warranty.

When using this manual, please remember the following:

- This manual may be changed, in whole or in part, without notice.
- Dearborn Group Inc. assumes no responsibility for any damage resulting from any accident--or for any other reason--while the hardware is in use.
- Specifications presented herein are for illustration purposes only and are not necessarily representative of the latest revisions of hardware or software. Dearborn Group Inc. assumes no responsibility for any intellectual property claims that may result from the use of this material.
- No license is granted—by implication or otherwise—for any patents or any other rights of Dearborn Group Inc., or of any third party.

lodestar® and GRYPHON® are registered trademarks of Dearborn Group Inc. Other products that may be referenced in this manual are trademarks of their respective manufacturers.

Table of Contents

1	Introduction	5
1.1	Technical support.....	6
1.2	Related documents	6
2	Hardware Overview / Getting Started	7
2.1	Contents of the LODESTAR® Package.....	7
2.1.1	LODESTAR® Hardware provided.....	7
2.1.2	LODESTAR® Software provided	7
2.2	Hardware specifications / setup	8
2.2.1	LODESTAR® hardware specifications	8
2.2.2	Power connection.....	8
2.2.3	Vehicle Network connections	8
2.3	Hardware overview	9
2.3.1	LODESTAR Front Panel	10
2.3.2	LODESTAR Rear Panel	11
2.3.3	I/O Connections.....	14
3	Configuring the Host PC Connections	15
3.1	USB Connection to the PC.....	15
3.2	Wired Ethernet Default IP address.....	15
3.3	Configuring the wired Ethernet IP Address	16
3.4	Reset Pushbutton.....	16
3.5	Firmware Updating.....	17
4	The Lodestar Internal Web Pages	18
4.1	Home Page	18
4.1.1	Login Screen	19
4.2	Configuration Tab.....	20
4.2.1	Date & Time	20
4.2.2	Device Name Tab.....	21
4.2.3	Network	22
4.2.4	DNS Configuration	24
4.2.5	Default Route Configuration	25
4.2.6	Programs Tab.....	26
4.2.7	LCD Tab	27
4.2.8	Password Tab	28
4.2.9	Update Tab.....	29
4.3	Pinouts Tab	30
4.4	Channels Tab	31
4.5	System Tab	33
4.6	Utilities Tab.....	34
4.7	Documentation Tab.....	35

This manual contains the following sections:

Section 1 – Introduction – Provides an overview of the manual, summarizing the contents of the remaining sections and appendices. Also, provides a reference to related documentation and technical support resources.

Section 2 – Hardware Overview / Getting Started – Describes key features of the Iodestar® hardware.

Section 3 – Configuring the Host PC Connections – Describes how to set up the USB and Ethernet connections, IP address and how to modify the Iodestar® TCP/IP parameters.

Section 4 – On Board Web Pages – Describes the onboard web page interface along with available utilities and their use.

1 INTRODUCTION

The Lodestar family of hardware interfaces provides remote connectivity for multiplexed automotive and automation communication networks. These products use an Ethernet or USB connection to the user's PC to provide a high-speed user interface for applications such as diagnostics, monitoring, and troubleshooting, as well as for custom applications. An embedded Linux operating system and standard Transmission Control Protocol/Internet Protocol (TCP/IP) services ensure inter-connectivity with many existing PCs, workstations, and network hardware systems.

The LODESTAR® includes the following features:

User interface

- Web-page interface
- LCD and Keypad

Hardware

- Processor: ARM Cortex A8, 1 GHz core speed.
- RAM: 512 Mbytes SDRAM
- NAND Flash Memory: 512 Mbytes
- Internal storage: Micro SD card, to 64 GBytes
- One RJ45 Ethernet connector
- Two USB Type A Host connectors on the front of the unit for USB peripherals
- One USB Device Type B connector on the front of the unit for connection to a Host PC
- 6 Channels of High Speed CAN / CAN FD
- 1 Channel Single Wire CAN
- 1 Channel Fault Tolerant CAN
- 2 Channels LIN

Software

- Linux OS
- On-board Web server
- TCP/IP support of standard services into the LODESTAR® (FTP, SSH, etc.)
- Module drivers and applications

Users can utilize one of DG's existing PC programs, or write their own client based or stand-alone applications for communication with the hardware.

The LODESTAR® utilizes the Gryphon® Communication Protocol, which is a client/server communication protocol specification that defines the format of messages passed over a TCP connection between the LODESTAR® and a client.

Typical applications for the LODESTAR® include:

- PC-to-vehicle network adapter.
- Stand-alone node running custom applications.
- LAN gateway to one or more vehicle networks.
- End Of Line (EOL) test applications

1.1 TECHNICAL SUPPORT

In the U.S., technical support representatives are available to answer your questions between 9 a.m. and 5 p.m. EST. You may also fax or e-mail your questions to us. Include your voice telephone number for prompt assistance.

Phone: (248) 888-2000

E-mail: techsupp@dgtech.com

Fax: (248) 888-9977
<http://www.dgtech.com/tech-supp/>

Web site: <http://www.dgtech.com/tech-supp/>

1.2 RELATED DOCUMENTS

For further information regarding programming with the hardware, you may wish to consult one or more of the following resources:

Dearborn Group Inc. – Phone: (248) 888-2000

Linux-related Web sites:

Introductory Linux information; a good place to get started. <http://www.linux.com/>

Linux Documentation Project - Regularly updated HOWTOs and FAQs <http://www.tldp.org/>

General Linux Q & A discussion board (with searchable archives) <http://www.linuxquestions.org/>

Linux Foundation <https://www.linuxfoundation.org/>

2 HARDWARE OVERVIEW / GETTING STARTED

Please read this section before using your hardware. It describes the hardware information necessary for successful installation and operation. Each section describes an individual hardware configuration. Once you understand your hardware connection, move to **Section 3** for connecting to your PC via Ethernet or USB.

2.1 CONTENTS OF THE LODESTAR® PACKAGE

2.1.1 LODESTAR® Hardware provided

- LODESTAR® unit
- 12 VDC Universal A/C power adapter
- RJ45 Ethernet cable – The LODESTAR® is shipped with a standard Cat5e Ethernet cable. **(Note that the hardware can detect and switch to use either type of cable: straight-through or cross-over.)**
- Optional Wi-Fi USB adapter
- Open ended cable with HD15 male connector

2.1.2 LODESTAR® Software provided

Installation program with:

- 32-bit C, C++ and VB libraries and samples
- J2534 API and samples
- LODESTAR® User Manual (PDF)
- Various utility programs
- Hercules Analyzer Software
- Data Logger Software

The Installation Programs and Documentation are provided on a Virtual USB drive, which is mounted to your PC when the LODESTAR unit is connected via a USB cable. The LODESTAR will power on when it is connected to a Host PC via a USB cable.

After the LODESTAR has booted, you will see in Windows file explorer that a new USB mass storage drive has appeared. It is named "BEACON_USB". This USB mass storage drive will act like any other USB drive. You can copy files to it or from it.

See the separate document "Software Installation Quick Start Guide" for more information.

2.2 HARDWARE SPECIFICATIONS / SETUP

2.2.1 LODESTAR® hardware specifications

Overall dimensions

Height:	2.25 in.
Width:	7.25 in.
Depth:	7.00 in.

Electrical

Typical current:	= 1600 mA at 12.0 VDC input
------------------	-----------------------------

Input voltage	
Minimum operational input voltage:	6 VDC
Maximum input voltage:	32 VDC

2.2.2 Power connection

The LODESTAR® can be powered via:

- The power jack on the back panel (12 VDC adapter is provided).
- The specified power pins on one of the network modules.
- USB connection to a Host PC ^{Note 1}

The LODESTAR® will automatically begin the boot up process when power is applied.

Note 1:

When the LODESTAR is powered by only the USB connection the LCD front panel display and the CAN circuitry will not function.

2.2.3 Vehicle Network connections

The LODESTAR® has a total of 8 CAN channels and 2 LIN channels. These network channels are built into the Lodestar.

- CAN channels #1 to 6 support High Speed CAN, including CAN FD

Two of the CAN channels are dedicated to certain versions of CAN, as shown below.

- CAN channel #7 supports Single Wire CAN
- CAN channel #8 supports Fault Tolerant CAN

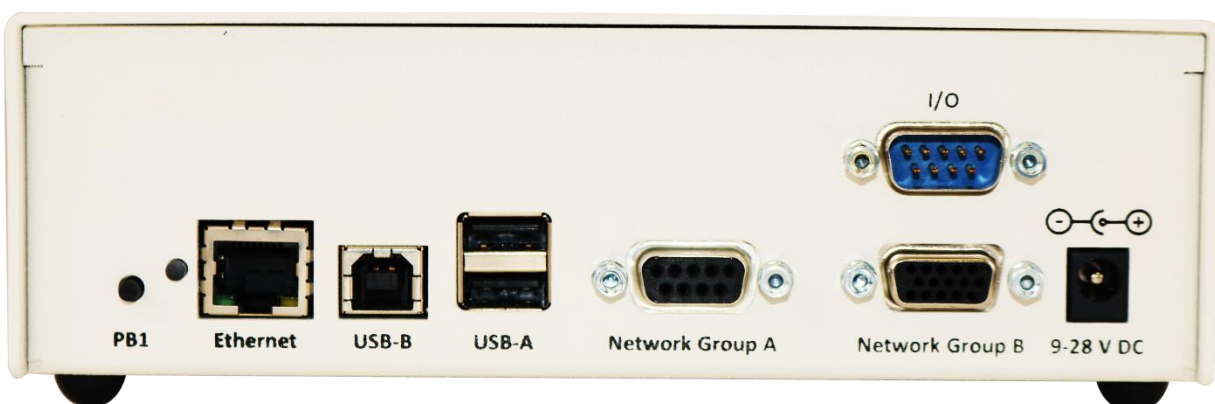
Note: The pinout information for the vehicle connectors in your Lodestar is shown below, and it also may be found in the internal web pages of the Lodestar.

2.3 HARDWARE OVERVIEW

Figure 1 Front panel of the LODESTAR® unit:



Figure 2 Rear panel of the LODESTAR® unit:



2.3.1 LODESTAR Front Panel

The Lodestar product has on the front panel an LCD display with 3 LED indicators, a membrane keypad, and an internal audio beeper. The LCD will display useful information about the Lodestar device. The keypad may be used to navigate through the various pages of the LCD display.

! Note that the LCD display will only be active if the Lodestar is powered by a 12 VDC power source. This may be either the external 12 VDC wall adapter or through one of the vehicle network connectors. If the Lodestar is powered only by a USB connection to the host PC, then the LCD display will remain powered off. To use the LCD display, the Lodestar must be booted while powered on from a 12 V power source. If using the USB host connection, make sure the 12 VDC power source is attached first, and then plug in the USB cable.

2.3.1.1 LCD Display

The LCD is a back-lighted dot matrix display with a resolution of 192 x 64 pixels.

2.3.1.2 LED Indicators

There are three red/green LED indicators to the left of the LCD display. During boot up, these LEDs will all be on, displaying an orange color.

During normal operation, the top LED will be green and the other two LEDs will be off. If the 'Identify' function has been invoked (Configuration>Device Name), then the bottom LED will flash red/green. In addition, the internal beeper (if enabled) will sound to help identify the Lodestar unit.

2.3.1.3 Keypad

The keypad may be used to navigate through the information pages on the LCD display.

Hold Button

Press the bottom left button with the dot symbol on it to stop the LCD display pages from scrolling. The middle LED will light up with an orange color to indicate the scrolling function has been disabled.

Press the Hold Button again to resume the scroll function.

UP/Down Manual Paging

When in Hold mode, you may Press the Up Arrow or Down Arrow to manually page through the main Menu screens.

Left Arrow

The left Arrow button will take you back to the Main Menu Screen of the display.

Right Arrow

The Right Arrow button will select a Menu Program to run.

2.3.2 LODESTAR Rear Panel

2.3.2.1 Status indicator

There is a multi-color (RGB) LED indicator on the back panel. This LED indicator will provide information about the state of the Lodestar.

LED colors:

- Solid Green: Normal boot up
- RGB cycling: Normal operating condition
- Alternating red/blue at 2Hz: Unit identify function has been triggered (from web page-configuration -> device name -> Turn Identify ON)
- Solid red: Default settings are being restored
- Solid purple: Reflashing in process
- Blinking red: Reflashing failed / other error

2.3.2.2 Power jack connector

One way of powering the LODESTAR® is through the standard 2.5 mm x 5.5 mm power jack (with positive center pin). The LODESTAR® operates with an input voltage between 6 and 32 VDC. Typical operating voltage supplied by the included power adapter is approximately 12 VDC.

Another means of powering the LODESTAR® is through the specified pins on one of the network modules. (Please see section 2.3.2.6 for details.)

2.3.2.3 USB Type A connectors

The two USB type A connectors on the front panel allow the user to connect USB devices such as Memory sticks or Wi-Fi adapters to the LODESTAR®.

2.3.2.4 USB Type B connector (optional)

Your Lodestar product is equipped with a USB type B connector. The single USB type B connector on the front panel allows the user to connect the LODESTAR® to a Host PC.

2.3.2.5 Ethernet RJ45 connection

A CAT5e RJ45 Ethernet cable is provided with the LODESTAR® tool package. This cable may be used to connect the Ethernet port on the front panel of the LODESTAR® to the Ethernet port on the host PC or hub.

Either a straight through or crossover cable may be used with the Lodestar. The LODESTAR® can detect which cable is being used and will accommodate the use of either cable.

The Lodestar supports 10/100 Ethernet.

2.3.2.6 Protocol Connections

The vehicle bus signals are provided on 2 different connectors.

There is a high-density 15 pin D connector, labeled 'Network Group A', and a 9 pin D connector labeled 'Network Group B'. The pin numbers of the two connectors are shown in the table below.

You may also access pin out information on the "Modules/Pinouts" internal web page of the LODESTAR®.

Either the of the two connectors may be used to provide power to the LODESTAR® hardware.

Before applying voltage to pins marked **V + IN** and **V – IN/GND** (positive and negative), make certain that you have the correct pin out information for the module being used to power the unit.

Table 1 Network Group B

	HD 15 pin D connector Network Group A						
pin #	Function						
1		CAN 7 Lo		CAN 2 Lo			
2			CAN 1 Lo				
3				CAN 3 Hi			
4	SW CAN Lo (GND)						
5	Signal GND						
6				CAN 2 Hi			
7			CAN 1 Hi				
8				CAN 4 HI			
9				CAN 4 Lo			
10	Power GND						
11					CAN 3 Lo		
12	SWCAN (Channel #7)		CAN 7 Hi				
13			FTCAN Lo (Channel #8)				
14			FTCAN Hi (Channel #8)				
15	Vin (Vbatt) (fused)						

Table 2 Network Group A

9 pin D connector Network Group B				
pin #	Function			
1		CAN 6 Lo		
2	CAN 5 Lo			
3			LIN CH 1	
4	Power GND			
5	Power GND			
6		CAN 6 HI		
7	CAN 5 HI			
8				Lin CH 2
9	Vin (Vbatt) (fused)			

2.3.3 I/O Connections

There is a 9 pin D connector labeled 'I/O'. This connector provides one trigger input and two trigger output signals, as well as clock and data for an IIC serial connection.

The Trigger Input and Trigger output signals are 3.3V logic level signals.

The IIC Clock and Data signals are 3.3V logic level signals.

The Trigger and IIC Inputs and Outputs may be used by User Developed applications hosted on the Lodestar unit. Please contact DG Technologies Tech Support for details if you wish to create your own applications using the I/O signals.

The pin numbers of the I/O connector are shown in the table below.

Table 3 Input/Output Group

9 pin D connector I/O Group	
pin #	Function
1	GND
2	Trigger Input
3	GND
4	Trigger Out #2
5	GND
6	Trigger Out #1
7	IIC clock SCL
8	no connect
9	IIC Data SDA

3 CONFIGURING THE HOST PC CONNECTIONS

To access information externally from the hardware, a communication connection to the LODESTAR® must be established via a USB, wired Ethernet, or Wi-Fi link. This connection will allow you to send and retrieve data, execute an onboard application, or run one of the DG applications.

3.1 USB CONNECTION TO THE PC

You must have access to a PC with a USB connection. The LODESTAR supports a USB 2.0 high speed connection and has a full-sized USB type B connector for this connection.

A standard USB cable is provided with the LODESTAR® package. This cable connects the USB port on the front panel of the LODESTAR® to the USB port on the host PC.

The LODESTAR uses RNDIS on the PC to provide a TCP/IP communication path between the LODESTAR and the PC. The Lodestar will act as a server and assign an address to your PC. The address will be of the form 10.X.X.X and the address assigned is unique to each Lodestar.

For more information about the RNDIS and Windows, see the separate document titled “Beacon RNDIS Driver Installation QuickStart”

3.2 WIRED ETHERNET DEFAULT IP ADDRESS

Ethernet communicates by having each individual device on a network using a unique Internet Protocol (IP) Address. Along with these addresses, there are the Netmask, Broadcast and Default Route Addresses to configure.

The Lodestar hardware has predefined default parameter values. If you are using the tool in a point-to-point connection with your PC, these parameters typically do not need to be changed. You ***may*** need to change these default parameters, however, ***if your PC is not configured as a DHCP Client, or if you want to connect the LODESTAR® to a network.***

The default network configuration of the Lodestar is as a DHCP Server.

The following table lists the LODESTAR®’s default addresses:

<i>Parameter name</i>	<i>LODESTAR® default value</i>
IP (Internet Protocol) Address	192.168.001.001
Netmask	255.255.000.000
Broadcast	192.168.255.255
Default Route	192.168.002.001
Table 3.2: TCP/IP Settings	

Note: To enable communication with a LODESTAR® unit at this address, the IP address of your PC must be configured to: **192.168.001.XXX**, where XXX is any value other than 001.

Prior to establishing a LODESTAR® connection with your building's existing LAN, you should contact your company's network administrator and coordinate new values for your LODESTAR®.

3.3 CONFIGURING THE WIRED ETHERNET IP ADDRESS

To configure the hardware's TCP/IP Ethernet parameters for your wired connection, access the on-board Web server on the LODESTAR®, and utilize the Lodestar's Web page, which includes a configuration tool used to set IP parameters and passwords. The page may be accessed through any Web browser on a computer connected to the LODESTAR® unit.

Note: This option requires that the *current* TCP/IP parameters allow communication over the network.

If communication over the network is **not** possible (as is often the case when reconfiguration is required), then the TCP/IP parameters can be reset to the factory default settings (Server, with DHCP) by using the reset pushbutton.

3.4 RESET PUSHBUTTON

The reset pushbutton is located on the front panel of the Lodestar, just to the left of the LED.

To reset the Lodestar settings to factory defaults:

- Power up the unit.
- When the LED on the front panel lights (Green), press and hold the button until LED turns Yellow. Yellow color indicates that defaults are being restored.

NOTE: The unit will also go through the restore-defaults process during the first boot, so you'll see a Yellow LED / longer boot time during the first boot after reflashing with a new firmware image.

Those parameters that can be reset, such as the Zeroconf name and the network settings, will be set back to factory defaults.

3.5 FIRMWARE UPDATING

Firmware for the Lodestar may be updated using a USB memory stick.

The reflash file will be supplied as a compressed ZIP file. The ZIP file should be extracted to a convenient place on your PC. When the ZIP file is extracted it will produce a folder called "USBDrive". The contents of this "USBDrive" folder should be loaded onto the root of an empty USB memory stick, formatted as a FAT 32 drive.

To initiate a USB reflash:

- With power off, insert the USB stick in one of the 2 USB ports on the front panel.
- Press and hold the pushbutton on the front panel, and keep it held while plugging power in.
- Keep holding button for ~10 sec; USB reflash will attempt to start. The LED will indicate the progress of the reflash operation.
- Rose color: Reflashing in process
- Green color: Reflashing complete
- Red color: Reflashing failed / other error

After the reflash process has completed successfully, power cycle the Lodestar before using it again.

If the reflash was not successful, you can try the process again. The boot code within the unit is not modified or deleted during the reflash process.

! Note that the reflash process does erase the contents of the internal uSD memory card, including any data or user programs stored there. Please be sure to back up any data or programs that need to be saved, before initiating the reflash process.

4 THE LODESTAR INTERNAL WEB PAGES

The Lodestar hosts an internal web page that allows you to control many aspects of the Lodestar and to get information about the Lodestar. The following sections will walk you through the internal web pages and explain the various items.

To access the internal web pages, use any web browser on your PC, such as Firefox, to access the Lodestar. Simply type the Lodestar's IP address into the address bar of the browser.

The Home page of the Lodestar web page will appear:

4.1 HOME PAGE

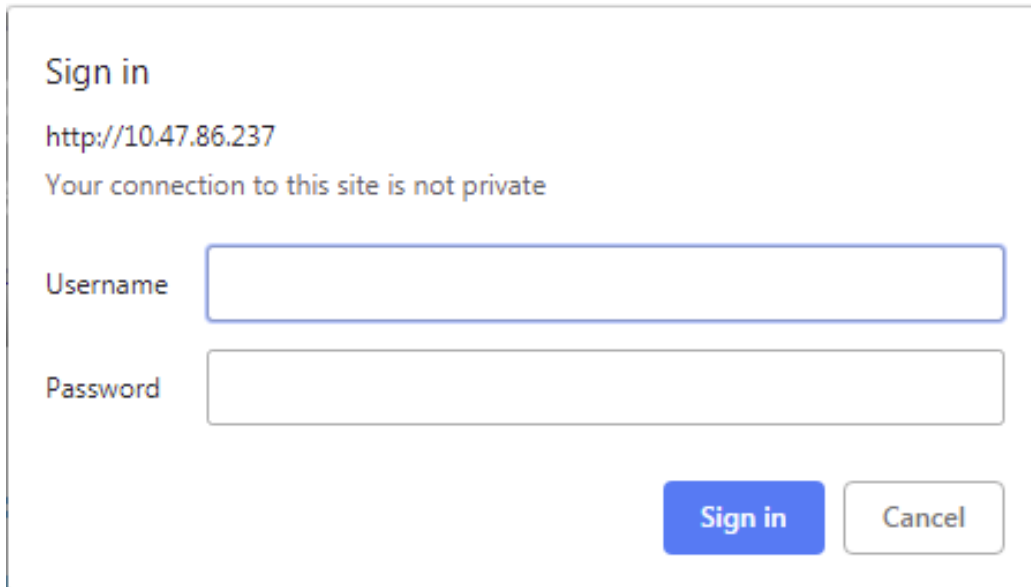


Next, click on *Configuration*. Once you enter this section, a box will prompt you for a user name and password.

Please note: All inputs are case sensitive, and this password is the same as the default root password

4.1.1 Login Screen

The default user name is *sysadmin*; the default password is *dgbeacon*



Sign in

http://10.47.86.237

Your connection to this site is not private

Username

Password

Sign in Cancel

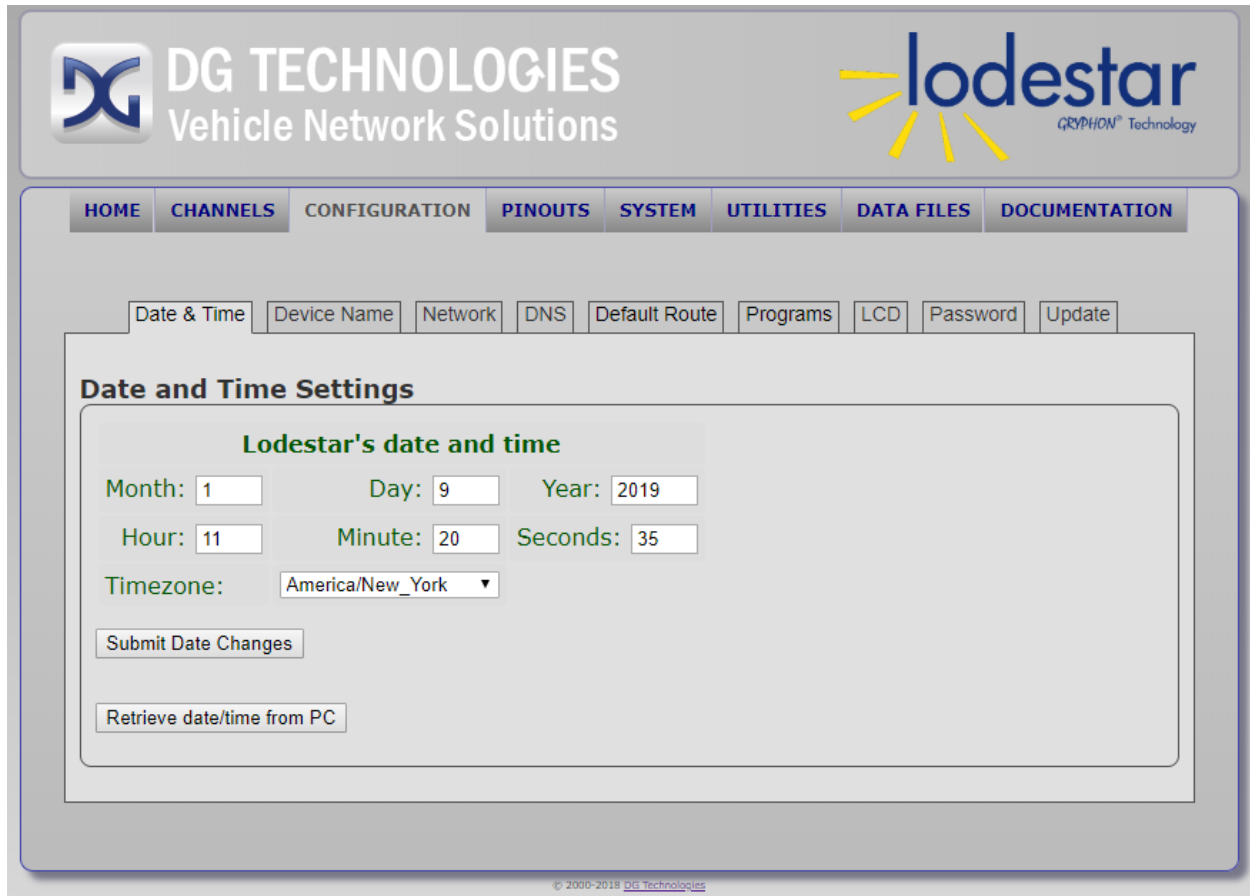
Once logged in, the **DG Lodestar System Administration** page will appear. On this page, you may: access the **DG Lodestar Configuration** page, configure the connection parameters, change the time and date, or change the sysadmin password.

The first entry is **Time and Date**. The other entries are: **Zeroconfig Name & Device Locator**, **DNS Configuration**, **Default Route Configuration**, **Network Configuration**, **Startup Programs / Services**, **Change Sysadmin Password**, and **Optimization**.

4.2 CONFIGURATION TAB

The configuration tab is the section for setting system parameters for the Lodestar.

4.2.1 Date & Time



The screenshot shows the 'CONFIGURATION' tab selected in the top navigation bar. Below the navigation bar, there is a row of tabs: 'Date & Time', 'Device Name', 'Network', 'DNS', 'Default Route', 'Programs', 'LCD', 'Password', and 'Update'. The 'Date & Time' tab is active. The main content area is titled 'Date and Time Settings' and contains a section titled 'Lodestar's date and time'. This section has input fields for 'Month: 1', 'Day: 9', 'Year: 2019', 'Hour: 11', 'Minute: 20', and 'Seconds: 35'. There is also a 'Timezone:' dropdown menu set to 'America/New_York'. Below these fields are two buttons: 'Submit Date Changes' and 'Retrieve date/time from PC'. At the bottom of the page, there is a small copyright notice: '© 2000-2018 DG Technologies'.

- **Set Date and Time** – You can either have the Lodestar take the Date and Time from the host PC, or you can enter the new values manually. When you are done updating the Date and Time click **Submit Date Changes**. The new values and confirmation will then appear on the display.

4.2.2 Device Name Tab

The screenshot displays the LODESTAR web interface. At the top, there are logos for DG TECHNOLOGIES Vehicle Network Solutions and lodestar QONN Technology. Below the logos is a navigation bar with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. The CONFIGURATION tab is active, and within it, the 'Device Name' sub-tab is selected. A row of buttons includes 'Date & Time', 'Device Name', 'Network', 'DNS', 'Default Route', 'Programs', 'LCD', 'Password', and 'Update'. The main content area is divided into two sections: 'Zeroconf Device Name' and 'Device Locator'. The 'Zeroconf Device Name' section has a text input field containing 'Lodestar-0000011CE97E' and a 'Submit Zeroconf Changes' button. The 'Device Locator' section shows 'Identify is currently: OFF' and a 'Turn Identify ON' button. Below these is a section titled 'Other DG Devices Found on Network' with a 'Refresh' button. At the bottom of the interface, a small copyright notice reads '© 2000-2018 DG Technologies'.

- * **Zeroconf Name & Device Locator** – Provides Zeroconf (Zero Configuration) Name change and Device Locator functionality.

The name created is linked to the IP address for the unit.

The **Identify ON / OFF** key is useful when more than one LODESTAR® units are being used in the same proximity. With this function turned **ON**, there are three indications to help you identify the unit. They are:

- The LED on the connector panel will flicker rapidly.
- The bottom LED on the front LCD panel will flash red/green.
- The internal beeper in the LCD display will sound (if enabled).

4.2.3 Network

On this page you can set the network parameters for the wired Ethernet and the Wi-Fi connection (if present)

The screenshot shows the LODESTAR web interface. At the top, there are logos for DG TECHNOLOGIES Vehicle Network Solutions and lodestar QRYPHON Technology. Below the logos is a navigation bar with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. The CONFIGURATION tab is active. Under CONFIGURATION, there are sub-tabs: Date & Time, Device Name, Network, DNS, Default Route, Programs, Password, and Update. The Network sub-tab is selected. The main content area is titled 'Network Configuration' and contains a section for 'Ethernet (eth0)'. Inside this section, it shows the 'Current IP address: 192.168.1.1'. Below this, there is a 'Configuration Type' section with four radio button options: 'Disable', 'Manual', 'Manual + DHCP Server' (which is selected), and 'Automatic (DHCP/Zeroconf)'. Under the selected option, there are 'Manual Configuration Parameters' for 'IP address' (192.168.1.1) and 'Netmask' (255.255.0.0). At the bottom of the configuration area, there are two buttons: 'Save Ethernet Changes' and 'Reset'. A small copyright notice '© 2000-2014 DG Technologies' is visible at the very bottom of the page.

- **Network configuration** – Enter your configuration type (DHCP Client, Static or DHCP Server) and any Static Configuration Parameters, as necessary. To make changes, provide new values where necessary, and click **Save Ethernet Changes**. Then turn the LODESTAR® unit off and back on, (i.e., reboot), to invoke the changes. Clicking on **Reset** will display the previous settings.

Note: If equipped with an 802.11 b, g, or n adapter, a Wireless Configuration section will appear as indicated in the view shown below.

WIFI (wlan0)

Current IP address:
10.0.0.1

Wireless Options
SSID:
WPA2 Password:
Operating Mode:

Configuration Type
Disable ☐
Manual ☐
Manual + DHCP Server ☒
Automatic (DHCP/Zeroconf) ☐

Manual Configuration Parameters
IP address: . . .
Netmask: . . .

4.2.4 DNS Configuration

The screenshot displays the web interface for DG Technologies' Lodestar Vehicle Network Solutions. The header includes the DG Technologies logo and the Lodestar logo with the tagline 'GRYPHON Technology'. A navigation bar contains links: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. Below this is a sub-menu with links: Date & Time, Device Name, Network, DNS, Default Route, Programs, LCD, Password, and Update. The main content area is titled 'DNS Settings' and contains the following fields and controls:

- Enable DNS:** A checkbox that is currently unchecked.
- Local domain name:** A text input field.
- Name server address:** A text input field.
- Save DNS Configuration Changes:** A button.
- Reset:** A button.

At the bottom of the interface, there is a copyright notice: © 2000-2018 DG Technologies.

- **DNS Configuration** – The initial setting for DNS is Not Enabled.

If you wish to use DNS on the Lodestar, check the Enable DNS box (Domain Name Service), fill in the required information and then click **Submit DNS Configuration Changes**. Confirmation of the changes will appear on the display.

The Domain Name Service allows the user to resolve Domain names into IP addresses.

The **Reset** button returns the **DNS Configuration Parameters** to the initial settings.

4.2.5 Default Route Configuration

The screenshot displays the Lodestar web interface for DG Technologies Vehicle Network Solutions. The top navigation bar includes links for HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. Below this, a secondary navigation bar contains tabs for Date & Time, Device Name, Network, DNS, Default Route (which is currently selected), Programs, LCD, Password, and Update. The main content area is titled "Default Route (Gateway) Settings" and contains the following elements:

- An "Enable Default Route:" checkbox, which is currently unchecked.
- A "Default Route:" label followed by four input fields separated by dots, representing an IP address.
- Two buttons at the bottom: "Submit Default Route Configuration Changes" and "Reset".

At the bottom of the interface, a small copyright notice reads: © 2000-2018 DG Technologies.

- **Default Route Configuration** – You may set up a new default route address. Check the **Enable Default Route** box and fill in the default address. Click on **Submit Default Route Configuration Changes** to accept the new default configuration. A conformation of the change will be displayed.

The **Reset** button will return the settings to the previous parameters.

4.2.6 Programs Tab

The screenshot shows the Lodestar web interface. At the top, there are logos for 'DG TECHNOLOGIES Vehicle Network Solutions' and 'lodestar GRYPHON Technology'. Below the logos is a navigation bar with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. The 'CONFIGURATION' tab is selected, and within it, the 'Programs' sub-tab is active. Below the navigation bar, there are several configuration options: Date & Time, Device Name, Network, DNS, Default Route, Programs, LCD, Password, and Update. The 'Programs' section is titled 'Startup Programs / Services' and contains a list of programs with checkboxes: CPULOAD (Sys Utilization), LIN (LIN LDF server), CONVERT (LIN Signal server), USDT (USDT Layer) (checked), J1939 (J1939 Protocol layer), LOGGER (Data Logger), and LCDSTAT (LCD status and menus) (checked). A 'Submit changes' button is located at the bottom of the list. At the very bottom of the page, there is a small copyright notice: '© 2000-2018 DG Technologies'.

- **Startup Programs / Services** – A checkmark indicates that a program is currently active on this hardware unit. Any changes are subject to the capabilities of current firmware.

If you want a program to run that is not currently enabled, then check the box, and reboot the Lodestar. The program will run after the Lodestar has been rebooted.

4.2.7 LCD Tab

DG TECHNOLOGIES
Vehicle Network Solutions

lodestar
GLYPHON® Technology

HOME CHANNELS CONFIGURATION PINOUTS SYSTEM UTILITIES DATA FILES DOCUMENTATION

Date & Time Device Name Network DNS Default Route Programs LCD Password Update

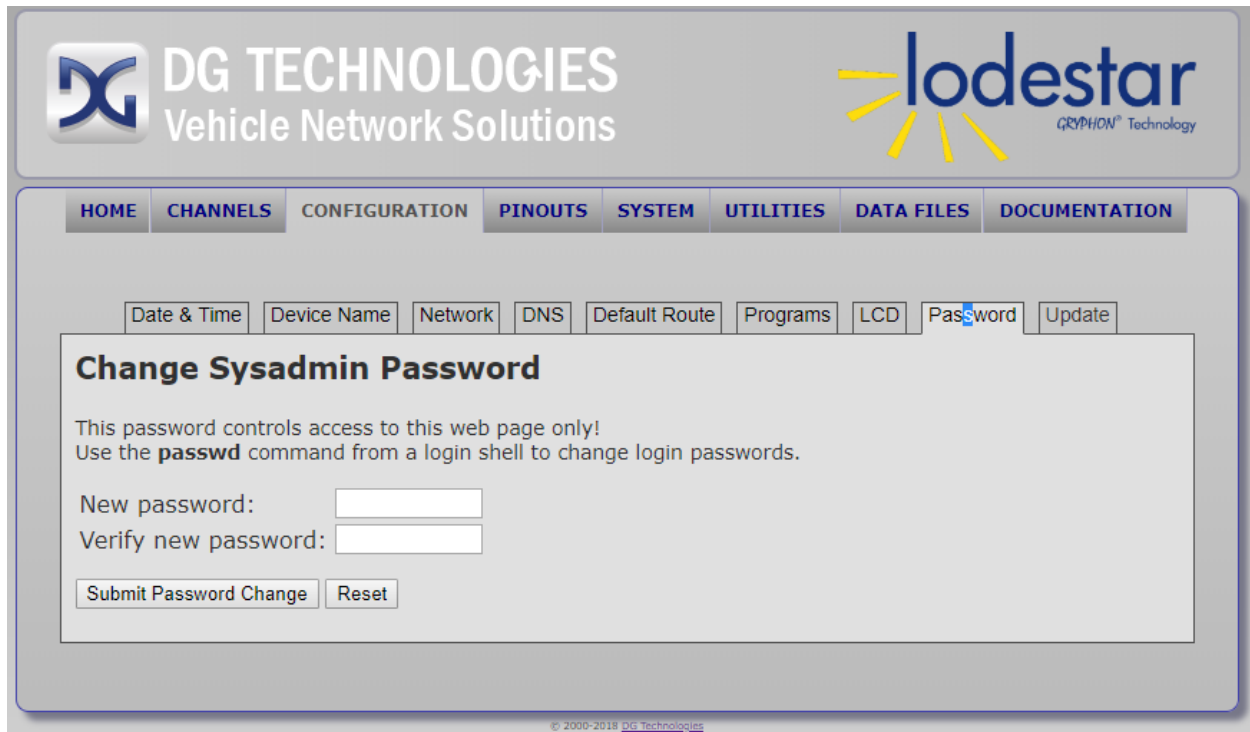
LCD Settings

LCD Brightness (0-255)
LCD Contrast (0-255)
Keypad Brightness (0-255)
Keypad Beep ☒

Test Revert Save

© 2000-2018 DG Technologies

- **LCD Settings** – This page allows you to change contrast and brightness settings for the LCD. You can try different settings and save or revert the changes on this page. You can also change the backlight brightness of the front panel keypad and enable or disable the beeper in the front LCD panel.



The screenshot displays the lodestar web interface. At the top, there is a header bar with the DG TECHNOLOGIES logo on the left and the lodestar logo on the right. Below the header is a navigation menu with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. Under the CONFIGURATION tab, there is a sub-menu with options: Date & Time, Device Name, Network, DNS, Default Route, Programs, LCD, Password, and Update. The Password tab is selected, and the 'Change Sysadmin Password' form is displayed. The form includes a title, a description of the password's scope, two input fields for 'New password' and 'Verify new password', and two buttons: 'Submit Password Change' and 'Reset'. A copyright notice is visible at the bottom of the interface.

DG TECHNOLOGIES
Vehicle Network Solutions

lodestar
GRYPHON® Technology

HOME CHANNELS CONFIGURATION PINOUTS SYSTEM UTILITIES DATA FILES DOCUMENTATION

Date & Time Device Name Network DNS Default Route Programs LCD Password Update

Change Sysadmin Password

This password controls access to this web page only!
Use the **passwd** command from a login shell to change login passwords.

New password:

Verify new password:

© 2000-2018 DG Technologies

- **Change Sysadmin Password** – You may enter a new sysadmin password and then click **Submit Password Change**.

Clicking on **Reset** will revert to the previous password.

Note: Please be advised that only the **sysadmin** password, **not the root password**, will change.

4.2.9 Update Tab

The screenshot shows the DG Technologies Vehicle Network Solutions web interface. At the top, there is a header with the DG Technologies logo and the Lodestar GRYPHON Technology logo. Below the header is a navigation bar with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES, DATA FILES, and DOCUMENTATION. The UTILITIES tab is selected. Under the UTILITIES tab, there is a sub-menu with options: Date & Time, Device Name, Network, DNS, Default Route, Programs, LCD, Password, and Update. The Update option is selected, leading to the 'Update Firmware' section. This section contains the text 'Update:' followed by 'Select update file:'. There is a 'Choose File' button, the text 'No file chosen', and an 'Upload File' button. At the bottom of the page, there is a copyright notice: '© 2000-2019 DG Technologies'.


- **Update Firmware** – From time to time, a firmware change may be released as a patch rather than a complete firmware update. This may be used to add a new feature or program, for example.


In order to use the update feature, the new firmware patch will need to be downloaded to your host PC. Clicking on the **Choose File** button will allow you to browse on your host PC to find the update file.

An update file will have a filename in the form of DGA8_Update_yyyymmdd.tgz, for example DGA8_Update_20181115.tgz

Click on the update file and then click on the Upload File button to begin the update process. A progress message will appear on the host PC to tell you when the process is complete. It usually only takes a few seconds to do an update. After updating the firmware, a power cycle is required.

4.3 PINOUTS TAB

**DG TECHNOLOGIES**
Vehicle Network Solutions

**lodestar**
GRYPHON[®] Technology

HOMECHANNELSCONFIGURATIONPINOUTSSYSTEMUTILITIESDATA FILESDOCUMENTATION

Pin	Channel	Function
1	2	CAN-L
2	1	CAN-L
3	3	CAN-H
4		GND
5		GND
6	2	CAN-H
7	1	CAN-H
8	4	CAN-H
9	4	CAN-L
10		POWER GND
11	3	CAN-L
12	7	SWCAN
13	8	FTCAN-L
14	8	FTCAN-H
15		VBAT +

Pin	Channel	Function
1	6	CAN-L
2	5	CAN-L
3	9	LIN
4		GND
5		GND
6	6	CAN-H
7	5	CAN-H
8	10	LIN
9		VBAT +

© 2000-2018 DG Technologies

Under the Pinouts tab is a list of all protocol channels, with their associated pin outs and channel ID assignments.

4.4 CHANNELS TAB

DG TECHNOLOGIES
Vehicle Network Solutions

lodestar
CAN/DM Technology

HOME CHANNELS CONFIGURATION PINOUTS SYSTEM UTILITIES DATA FILES DOCUMENTATION

Installed Channels

1 can0	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
2 can1	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
3 can2	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
4 can3	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
5 can4	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
6 can5	CANFD Ver:1.0 Bitrate: 500000 Termination: ON	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
7 can6	SWCAN Ver:1.0 Bitrate: 33333 Tool Resistance: OFF	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
8 can7	FTCAN Ver:1.0 Bitrate: 125000	Mode: CAN Sample Point: AUTO Error Events: ON	SJW: 1	Configure Driver info
9	S_LIN Ver:1.0 Bitrate: 19200			Configure Driver info
10	S_LIN Ver:1.0 Bitrate: 19200			Configure Driver info

© 2000-2018 DG Technologies

Under the Channels tab is a listing (by channel with version and serial number) of the modules installed on the hardware. It also contains Channel Statistics and driver information.

On this page, you may configure the following channel settings (by clicking the **Configure** button for the channel you wish to modify):

- Mode (CAN, CAN FD pre-ISO, CAN FD ISO)
- Bitrate
- Sample Point percentage
- SJW
- Termination ON or OFF
- Error reporting
- Save as startup defaults
- Bus speed (customized or one of several presets). For changes to become valid, check the **Apply** button on the Lodestar Channel Setup screen.

The screenshot displays the 'CANFD Ver: 1.0' configuration window. On the left, a large green '1' is shown above the text 'can0'. The main configuration area includes: 'Mode:' with a dropdown menu set to 'CAN'; 'Bitrate:' with a text input field containing '500000'; 'Sample Point' with a text input field containing '0' and a '%' symbol, with a small note '0 = Automatic' below it; and 'SJW' with a text input field containing '1'. Below these, 'Termination:' and 'Error Events:' are each followed by a checked checkbox. At the bottom, there are three buttons: 'Cancel' (red), 'Apply' (blue), and 'Save as startup defaults' (green).

4.5 SYSTEM TAB

DG TECHNOLOGIES
Vehicle Network Solutions

lodestar
GRYPHON™ Technology

HOME CHANNELS CONFIGURATION PINOUTS **SYSTEM** UTILITIES DATA FILES DOCUMENTATION

DG Lodestar System Information

Load Averages

1 minute	5 minutes	15 minutes
0.02	0.06	0.05

User Memory

Total = 521,949,184 bytes
Used = 27,422,720 bytes (5.3%)
Free = 494,526,464 bytes (94.7%)

```
gsched[424]: /gryphon/bin/gsched: version 20180615 All set and ready to go as client 0
```

Clear Update

Message Responder trace is OFF

© 2000-2018 DG Technologies

This page provides information about the current state of the Lodestar CPU and the Linux Operating System.

4.6 UTILITIES TAB

The screenshot displays the Lodestar web interface. At the top, there are logos for DG TECHNOLOGIES Vehicle Network Solutions and lodestar QYHON Technology. Below the logos is a navigation bar with tabs: HOME, CHANNELS, CONFIGURATION, PINOUTS, SYSTEM, UTILITIES (highlighted), DATA FILES, and DOCUMENTATION. The main content area is titled "Manage LDFs" and contains several utility buttons: Manage LDFs, Manage Playback Files, Manage Logger Config Files, Manage DBC Files, Programming Multiplexor, J3138 Tests, LIN Emulation, Data Playback, Manage Logger Data Files, and Display Logger Information. Below these buttons is a section titled "Upload an LDF to the Lodestar" which includes a "File to upload:" label, a "Choose File" button, the text "No file chosen", a "Description:" label, a text input field, and an "Upload the file" button.

This page provides links to a number of on-board utilities, including a utility to manage LIN Definition Files, utilities for use with the built-in data logger program, DBC file management and a programming multiplexor for interfacing to multiple ECUs in an End Of Line or programming environment.

4.7 DOCUMENTATION TAB



This page provides technical information for the Lodestar.

In addition to DG supplied technical information, it is possible for the user to load their own technical documentation, such as PDF files or even flash video files for technical instruction. These user-loaded files will be shown when List Available Documents is selected. Video files are streamed to the connected PC and viewed in the web browser.