Magnetek Material Handling
IMPULSE®•LINK 4.1 WDS

Wireless Diagnostic System

Instruction Manual

Table of Contents

Warning and Caution

DISCLAIMER OF WARRANTY

Magnetek's Electromotive Systems, hereafter referred to as Company, assumes no responsibility for improper programming of a drive that resulted from use of this software. This software should only be used by a trained technician who has read and understands the contents of this manual. Normal use of this software may result in the drive parameters becoming modified. Improper programming of a drive can lead to unexpected, undesirable, or unsafe operation or performance of the drive. This may result in damage to equipment or personal injury. Company shall not be liable for economic loss, property damage, or other consequential damages or physical injury sustained by the purchaser or by any third party as a result of the use of this software. Company neither assumes nor authorizes any other person to assume for Company any other liability in connection with the sale or use of this software.

![⚠ WARNING]

1. Read this user manual in its entirety before installing IMPULSE®•LINK 4.1 Wireless Diagnostic System (WDS) or operating the IMPULSE®•G+/VG+ Series 4, IMPULSE®•G+/VG+ Series 3, IMPULSE®•G+/VG+ Series 2, IMPULSE®•G+ Mini, IMPULSE®•P3 Series 2, OmniPulse DDC Variable Frequency Drives (VFD), OmniPulse DSD DC Drive, and/or the MagnePulse™ Digital Magnet Control.
2. DO NOT connect or disconnect wiring, or perform signal checks while the electrical power is turned ON.
3. Improper programming of a drive through the use of this software can lead to unexpected, undesirable, or unsafe operation or performance of the drive.

Failure to observe these and other precautions indicated in this manual will expose the user to high voltages, resulting in serious injury or death. Damage to equipment may also occur.

![⚠ CAUTION]

NOTICE
No patent liability is assumed with respect to the use of the information contained herein. Moreover, Magnetek is constantly improving its high quality product; therefore, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this document. Nevertheless, Magnetek assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained in this publication.

Chapter 1 - Introduction

Overview

IMPULSE®•LINK 4.1 Wireless Diagnostic System (WDS) is a user friendly, Windows® based, interactive drive communication software and wireless hardware package. It is designed for communication from your PC over your company-wide network to the following Magnetek drives:

- IMPULSE®•G+/VG+ Series 4
- IMPULSE®•G+/VG+ Series 3
- IMPULSE®•G+/VG+ Series 2
- IMPULSE®•G+ Mini
- IMPULSE®•P3 Series 2
- OmniPulse DDC
- OmniPulse DSD
- MagnePulse™ Digital Magnet Control (DMC)

IMPULSE®•LINK 4.1 WDS consists of:

1. A base unit consisting of a wireless modem connected to a PC using company-wide network.

2. A remote unit consisting of a wireless modem, which is wired to your IMPULSE® Drives and communicates wirelessly to the base unit.

3. IMPULSE®•LINK 4.1 WDS Software that allows access to all of the cranes in your facility from one location. A Wibu hardware key must be present in the computer's USB port to enable the software to access the drives.
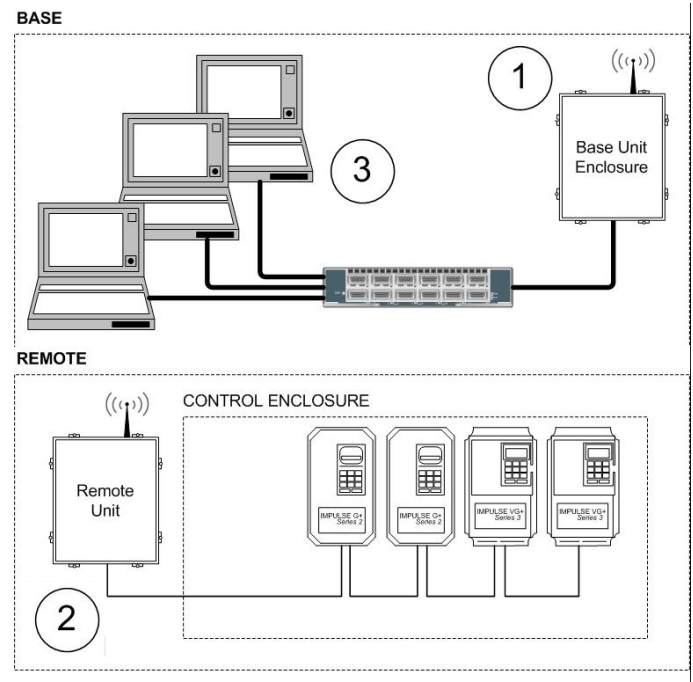
The Wireless Base Unit
Model number: WDS-EBASE
Description: NEMA 4 junction box (12″ x 10″) consists of a 120-volt GF1 power outlet, Ethernet wireless modem, externally mounted antenna to the junction box, Ethernet receptacle built-in to the junction box, and terminal block. Along with the NEMA 4 junction box is a 6′ crossover cable with Ethernet receptacle.

The Wireless Remote Unit
Model number: WDS-SREMOTE
Description: NEMA 4 junction box (12″ x 10″) consists of a 120-volt GF1 power outlet, wireless modem, externally mounted antenna to the junction box, and terminal block. Along with the NEMA 4 junction box, the remote unit comes with 50′ of Belden twisted shielded cable to connect the drives to the modem.

Software and Hardware Key
Model number: WDS-SWARE
Description: CD containing the IMPULSE®•LINK 4.1 WDS software, customer's drive profiles, and the hardware key.

Remote Antenna Kit
Model number: WDS-ANTENNAKIT
Description: Hardware and accessories to remotely mount the WDS antenna (up to 10 feet from WDS Wireless Remote Unit).

IMPULSE® Link•4.1 Wireless Diagnostic Ethernet Remote Unit
Model number: IL-WDS-REMOTE-DC
Description: 90-350VDC Supply, NEMA 4 enclosure (with wireless modem, antenna, and power supply) and 50 feet of serial cable (one remote unit required per crane).

Din Rail Power Supply
Model number: IL-WDS-PS
Description: Din Rail Power Supply for RS-232 to RS-485 Converter Power supply for the RS-232 to RS-485 Converter.

SPECIFICATIONS

Wireless Base Unit

Enclosure:	NEMA 4
Dimension (H x W x D):	12 x 10 x 5 inches (30.5 x 25.4 x 12.7 cm)
Temperature:	32 – 104 °F (0 to 40 °C)
Humidity:	0-95% Non-condensing
Voltage:	120 VAC single phase, 0.8 Amps
Wattage:	1 Watt
Communication:	Ethernet TCP/IP 10/100 Base-T
Frequency:	900 MHz, Frequency Hopping, Spread spectrum

Wireless Remote Unit

Environment:	NEMA 4
Dimension (H x W x D):	12 x 10 x 5 inches (30.5 x 25.4 x 12.7 cm)
Temperature:	32 – 104 °F (0 to 40 °C)
Humidity:	0-95% Non-condensing
Voltage:	120 VAC single phase, 0.8 Amps
Wattage:	1 Watt
Communication:	RS485 4-wire, 120 Ω Nominal Characteristic Impedance (Belden 9842)
Frequency:	900 MHz, Frequency Hopping, Spread spectrum
Range:	100 feet (30.48 meters) line-of-sight, 300 feet (91.4 meters) typical from base unit
Serial Cable:	Belden 9842 2 twisted pair shielded cable, 120Ω impedance

System Requirements

Supported Drives

IMPULSE®•LINK 4.1 WDS supports the following Magnetek drives:

- IMPULSE®•G+/VG+ Series 4
- IMPULSE®•G+/VG+ Series 3
- IMPULSE®•G+/VG+ Series 2
- IMPULSE®•G+ Mini
- IMPULSE®•D+HHP
- IMPULSE®•P3 Series 2
- OmniPulse DDC
- OmniPulse DSD
- MagnePulse™ Digital Magnet Control

NOTE: Although the IMPULSE® Series 2 drives are supported, a CMG5M communication board (P/N #140-10261) needs to be installed on each G+ or VG+ Series 2 drive. If a G5IN4 card is installed on an IMPULSE® Series 2 drive, an RS485/232 converter kit (P/N 144-12545) is required.

PC Requirements

1. Pentium class or equivalent 500MHz processor or better
2. 256 MB RAM or greater
3. Minimum of 100 MB free hard-disk space available
4. Windows 98 SE, 2000, XP, Vista, or Windows 7 (32-bit).
5. Available USB or RS232 port.

Network Requirements

If specified, customer-supplied IP addresses can be configured into each base unit during factory setup. A tool, the *WDS Configurator*, is also included on the CD to assist in scanning and configuring the IMPULSE®•LINK 4.1 WDS Modems. Although multiple users (computers) may have access to the drives on an Ethernet network, only one person can be accessing a particular bay at a time using the WDS Wibu key.

*NOTE: The maximum Ethernet cable length between devices is 328 feet (100 meters). The Ethernet* connector type is RJ-45.

Typical Ethernet Network

Single PC Connection
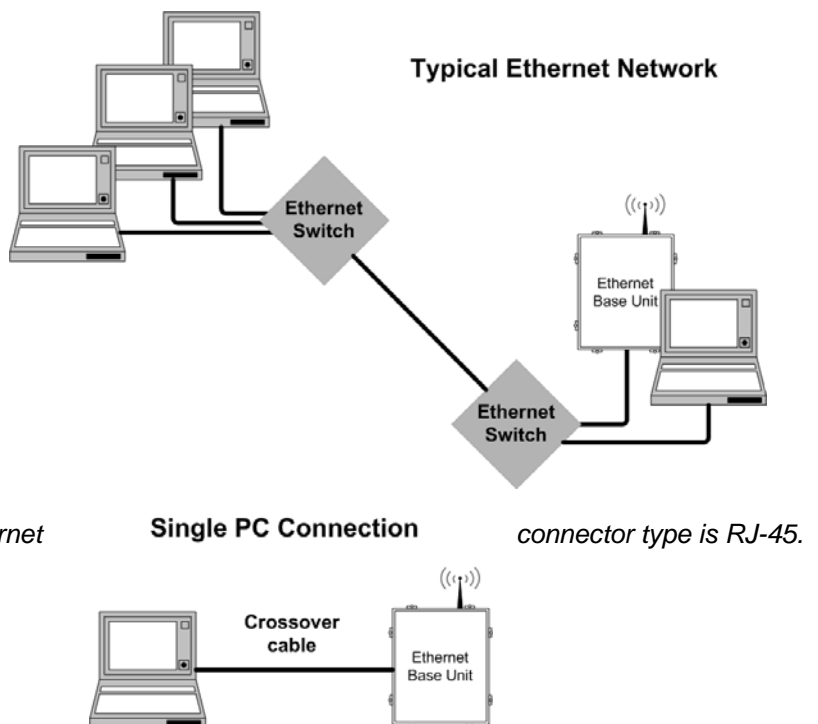
Chapter 2 - Installation

Software Installation

The IMPULSE®•LINK 4.1 WDS CD contains: the IMPULSE®•LINK 4.1 WDS Software and the communication profiles for the IMPULSE Drives used in your specific application.

- To run the IMPULSE®•LINK 4.1 WDS Setup, put the IMPULSE®•LINK 4.1 WDS CD into your CD drive (run setup.exe from the CD if it does not start automatically).
- Select the default choices during installation.
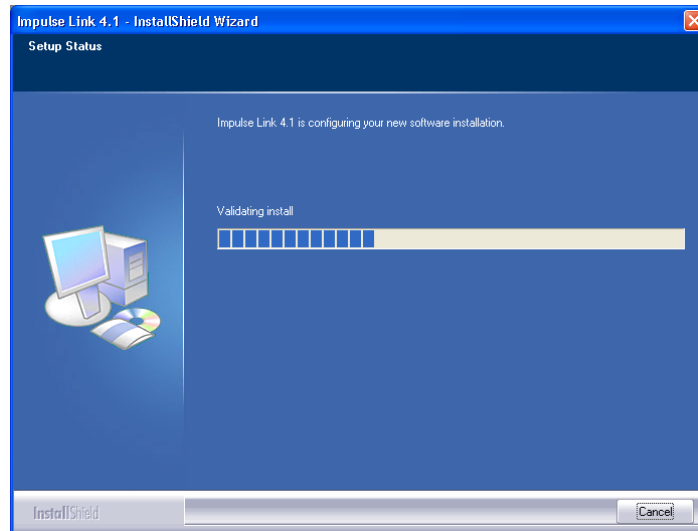
Installing your Hardware Key

Insert your WDS Wibu hardware key into any USB port on your computer. Windows will detect the hardware and begin installing the necessary drivers.
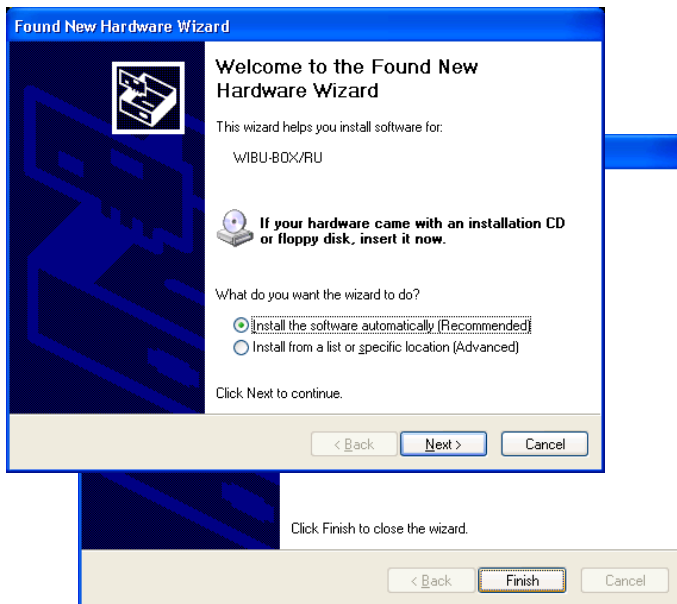

Select **Next**, leaving the *(Recommended)* choice selected. Wait while the hardware is installed. Windows will find the correct driver and install it.

Click **Finish** to close the *Completing the Found New Hardware Wizard* dialog.
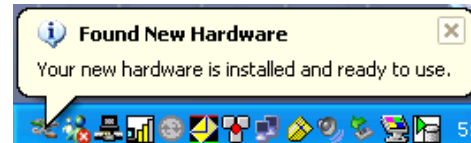
NOTE: If you try to run IMPULSE®•LINK 4.1 WDS and the hardware key is not inserted into a USB port on the computer, you will receive the following error message. Also, if you are running IMPULSE®•LINK 4.1 WDS and remove the hardware key, the same message will appear until the key is re-inserted into the USB port.
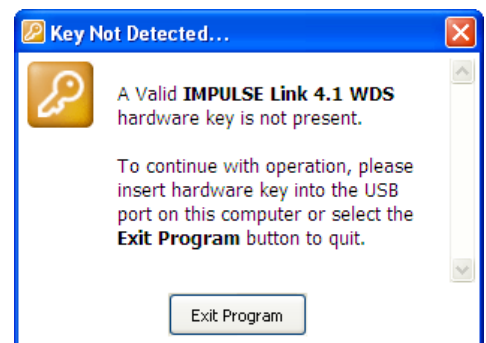
Software Updates
Additional features and software enhancements may be available from time to time. These may be downloaded from the Magnetek Material Handling website at www.magnetekmh.com/downloads.htm.

Software Removal
To remove the IMPULSE®•LINK 4.1 WDS Drive Interface Software, open the Control Panel's Add/Remove Programs dialog box, double-click the IMPULSE®•LINK 4.1 WDS entry and choose Remove All from the IMPULSE®•LINK 4.1 WDS Setup dialog box.

Importing your Drive Profiles

If you request your crane profile and Ethernet IP address to be configured at the factory, your profile will reside on the installation CD. When IMPULSE®•LINK 4.1 WDS is installed, the profiles will be imported automatically for you. Run IMPULSE®•LINK 4.1 WDS by double-clicking the "L" icon found on your desktop. A splash screen will appear for a few seconds while the subsystem loads.

To import the profiles manually:

1. Select "Communication" from the Settings Menu.
2. Right-Click on the "Communication Profiles" Folder and select "Import From File"
3. Browse to your CD-ROM drive, select the files (*.CPX) and choose "Open".
4. There will be a profile for each drive (Crane 1 Hoist, Crane 1 Bridge, etc.)
5. After the profiles are imported, select "OK" to save your communication profiles.
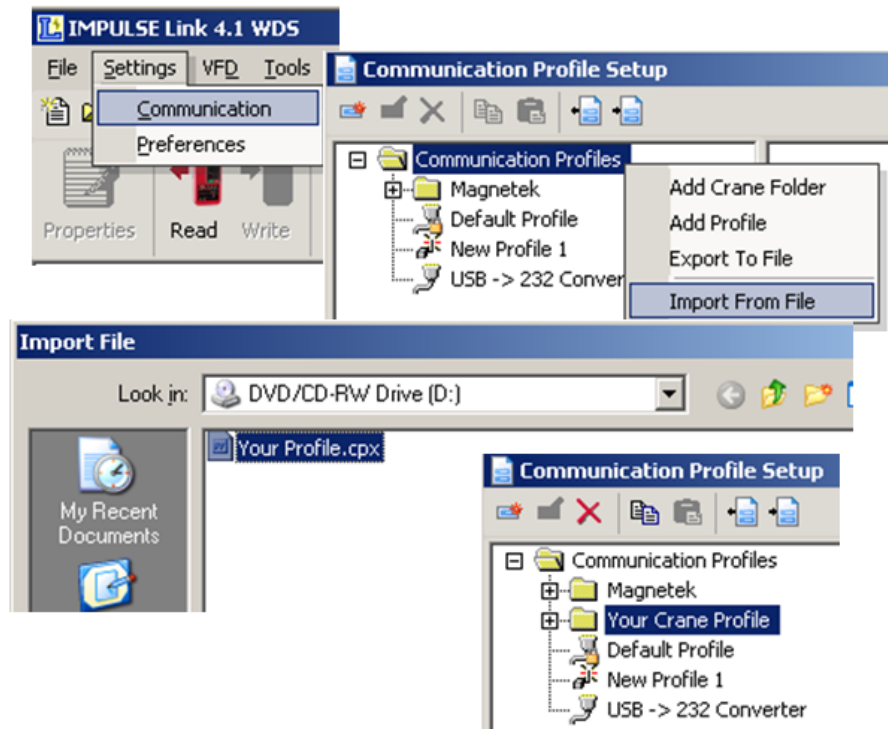
Creating Communication Profiles using the Wizard

If you need to create a communication profile, there is a wizard to assist you. In the Settings Menu, click "Communication," and then right-click on the folder "Communications Profile" and choose "Add Crane Folder".

Enter the name of your crane for the folder. Right-click on this new folder and choose "Add Profile". You will then see the following screen appear:
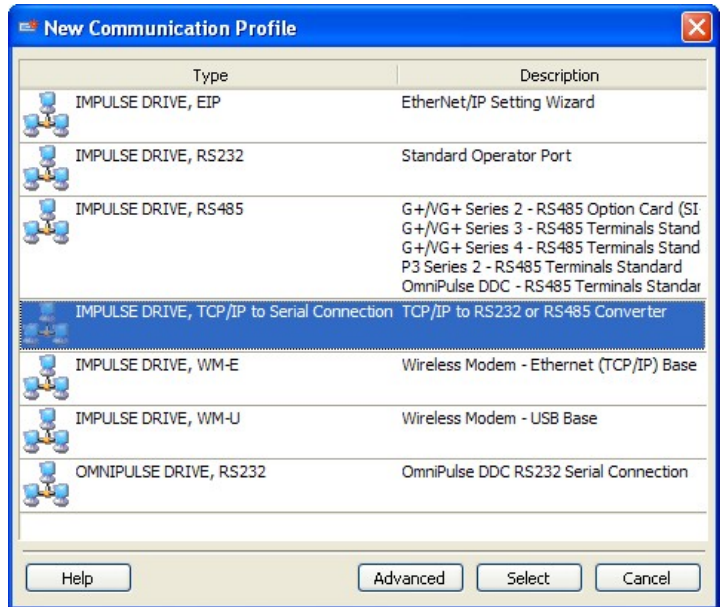
Highlight the "IMPULSE DRIVE, TCP/IP to Serial Connection" type for the X2 model or the "IMPULSE DRIVE, WM-E" type for the XT model and the WDS Wireless Ethernet Modem, and then click "Select". The wizard will then take you through the following four steps to set up a new communication profile.

  Step 1: Name, Description, Crane and Motion
  Step 2: IP Address for the Base Unit
  Step 3: Select IP Port 14001 as required
  Step 4: Slave Address (01H to 1FH) and Parity (0:None)
  Step 5: Finish
  Step 6: Click OK
  Step 7: To save, click OK on the Communication Profile screen

  NOTE: Profiles created will not be saved if Cancel is used
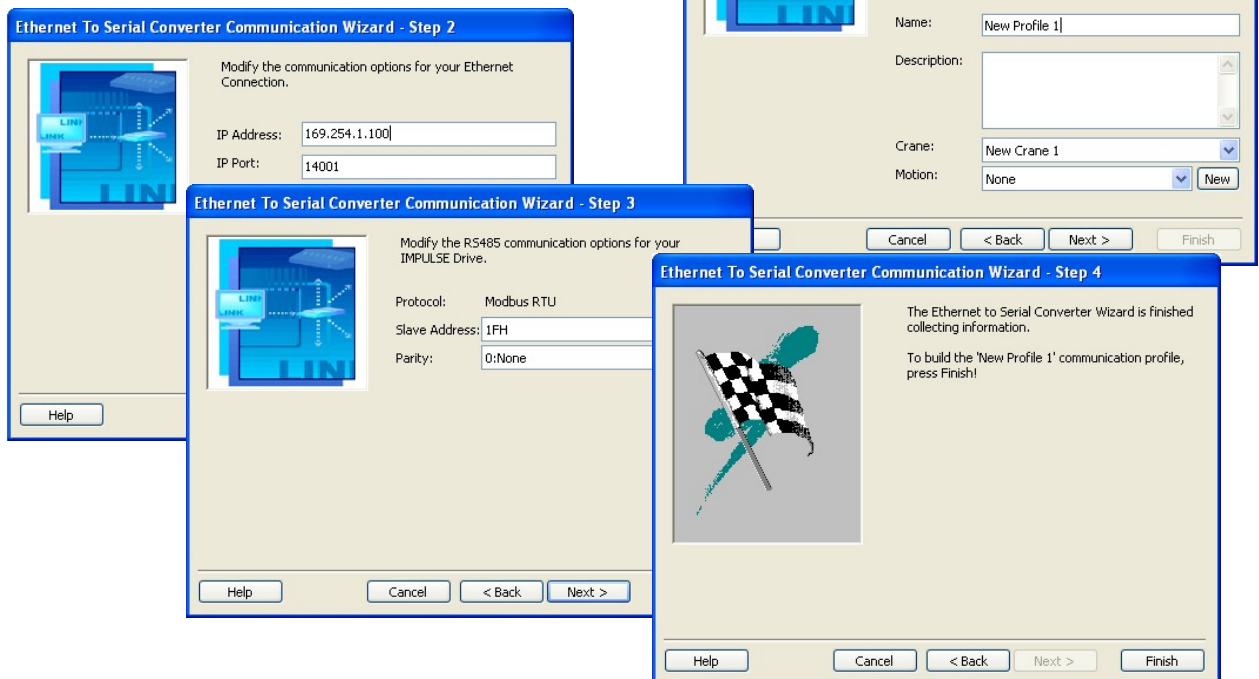
Hardware Installation

Mounting
Be sure that the base and remote units are mounted in a location protected against the following conditions:
- Extreme cold or heat. Use within the ambient temperature range of:
  - Base Unit   32° to 104°F (0° to 40°C)
  - Remote Unit   32° to 104°F (0° to 40°C)
- Direct sunlight
- Direct rain, moisture
- High humidity
  - 0 to 95% Non-condensing
- Oil sprays, splashes
- Salt spray
- Corrosive gases
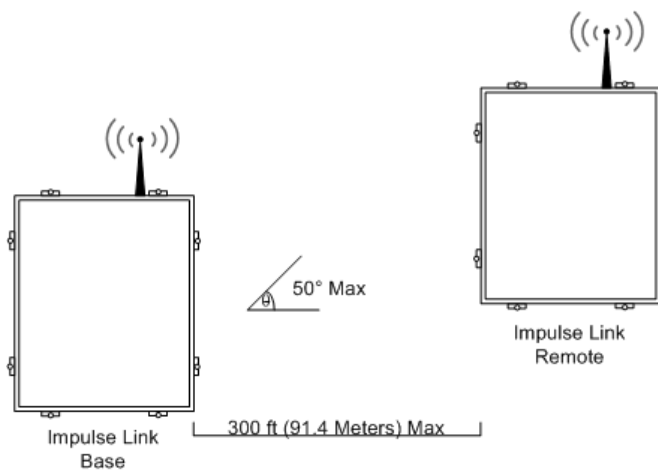
The base and remote units should be mounted on a flat, non-flammable vertical surface using four mounting screws. Line of sight should be maintained from both the remote unit's and base unit's antennas to avoid communication dropouts.

Wiring the Base Unit

The Base Unit contains an Ethernet wireless modem. The Base Unit has an Ethernet receptacle at the bottom of the enclosure. A 6′ cross-over cable with Ethernet connector is provided with the Base Unit.   This 6′ crossover cable can simply be plugged into the Ethernet port on a computer and then the opposite end can be plugged into the Base Unit's Ethernet receptacle.

The Ethernet field connector kit (shown below) provides strain relief and can be cut-off from the 6′ cross-over cable and connected to an alternative cable of desired length when connecting to an Ethernet switch or hub.
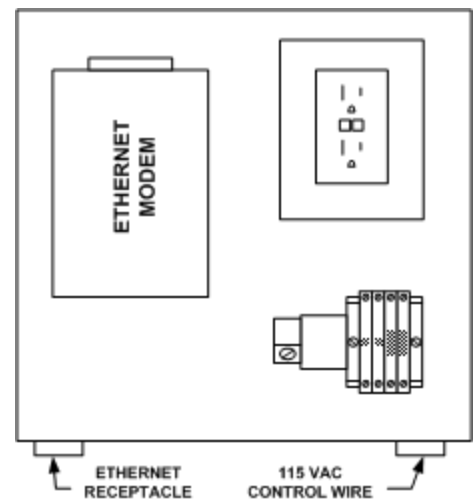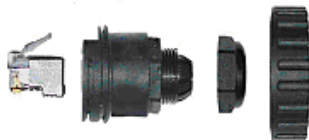
At the bottom right of the Base Unit enclosure is a cable grip for running the 115V control power wiring. The Ethernet receptacle is built in to the bottom left of the enclosure. Ethernet and control power wiring should never be run together.

The typical wiring diagram for the Base Unit can be found in Appendix A.

Wiring the Remote Unit

The Remote Unit contains two cable grips on the bottom of the enclosure. It is important that control and serial wiring are run separately. The Remote Unit comes with 50 feet of twisted shielded cable (Belden 9842) for wiring to your drives.

IMPULSE®•G+/VG+ Series 2 drive: The IMPULSE®•G+ and VG+ Series 2 require a CMG5M serial option board. Connect multiple IMPULSE®•G+/VG+ Series 2 drives, using terminals 1–4 on the CMG5M board as shown in Appendix C on page 40.

OmniPulse DDC drive: The OmniPulse DDC supports the 2-wire RS485 interface only. If any other IMPULSE® Series AC drive is connected to the network, it must be wired as RS485 2-wire.
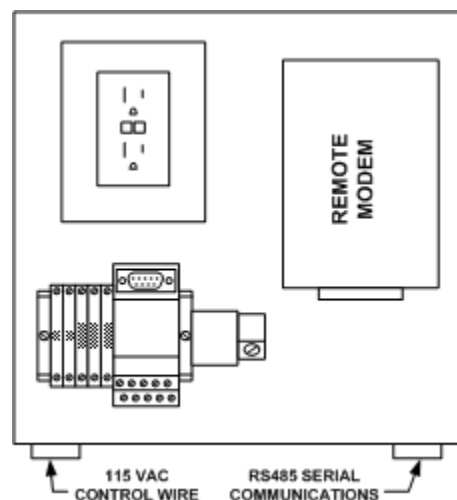
Wiring to the Drives

When wiring the IMPULSE®•P3 Series 2, IMPULSE®•G+/VG+ Series 3, IMPULSE®•G+/VG+ Series 4, or OmniPulse DDC drives, the serial communication terminals are located on the control interface board. See Appendix E for additional details.

1. Locate the correct terminals.
2. Use the twisted shielded wire provided with your *Remote Unit* for connecting as indicated in the table below.

Wireless Remote Unit Terminal Block	IMPULSE®•G+/VG+ Series 2 CMG5M Board Terminals	IMPULSE®•G+/VG+ Series 4 IMPULSE®•G+/VG+ Series 3 IMPULSE®•G+ Mini IMPULSE®•P3 Series 2 Control Terminals	OmniPulse DDC MagnePulse DMC	Description
8 or R+	1	R+	T1-9 – RS485B (T/R+)	RS-485 signal
2 or R-	2	R-	T1-8 – RS485A (T/R-)	RS-485 signal
7 or S+	3	S+	N.C.	RS-485 signal
3 or S-	4	S-	N.C.	RS-485 signal
Shield	TC2	TB4, IG	Chassis Ground	Shield connection

3. Set the terminating resistor.

NOTE: Reference the drawings included in the WDS Remote unit or the wiring diagrams in the Appendix of this document for more information.

Terminating Resistor

There is a dipswitch that is used to connect a terminating resistor (120 Ohms) to the serial communications for proper network balancing (see Appendix E for location). This terminating resistor needs to be ON at the beginning and end of the line for the RS485 communications. The Impulse Link Remote Unit has the terminating resistor enabled from the factory. Use a daisy-chain wiring configuration for connecting multiple drives. The terminating resistor should be turned ON, for one-to-one connections or on the last drive, when multiple drives are wired in parallel. Below is an overview of the daisy-chain configuration.

One-to-one connection
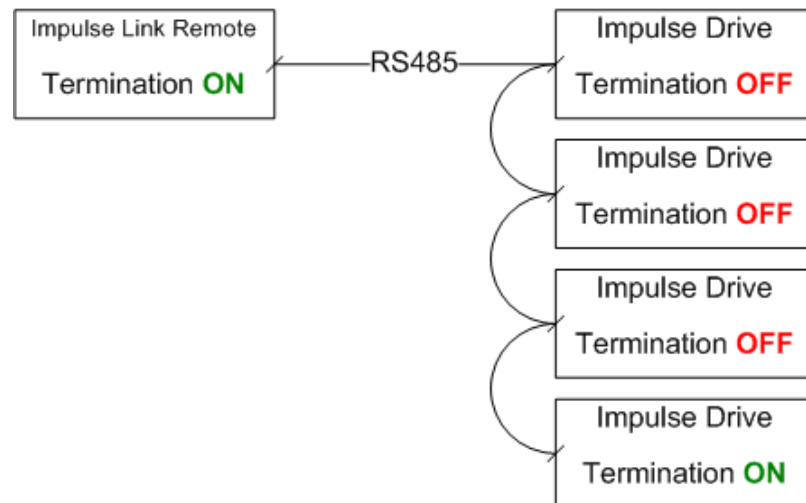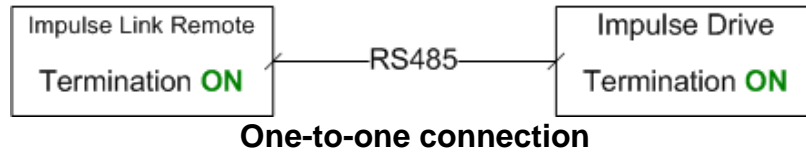
Multiple drive connection

Chapter 3 - Navigation

The IMPULSE®•LINK 4.1 WDS Software is a Windows-based software with easy to use menus and drop-down functions. The user is able to access utilities for uploading/downloading parameters, comparing parameters, saving parameters to a file, accessing the DataLogger function and more from the easy to navigate toolbar. The main screen allows the user to access more commonly used features at click from the main screen.

New – Displays the controller properties dialog to create a new factory default parameter set, based on the drive type, software number, model, and kVA.

Open – Opens or finds a file containing a parameter set for a specific drive type and software number.

Save – Saves the active file with its current file name and location.

Print – Prints the active parameter set. Select Print options, in the Print window/dialog box.

Print Preview – Shows how a file will look when you print it.

Show Error Log – shows the status of IMPULSE®•LINK 4.1 WDS.
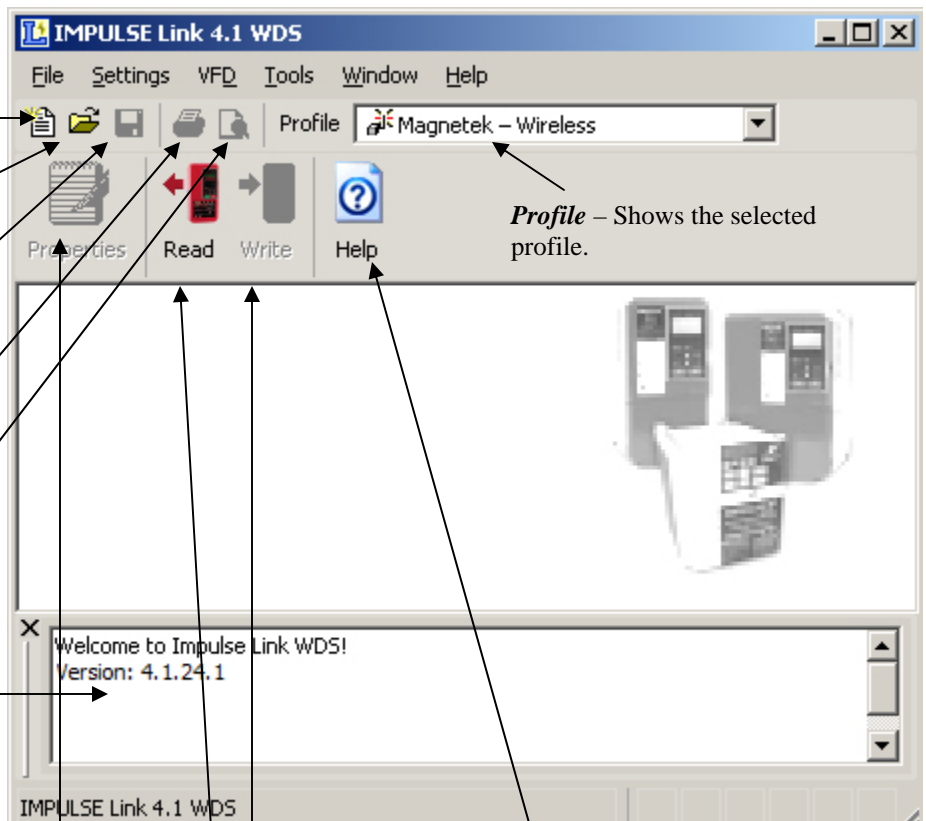

Profile – Shows the selected profile.

IMPULSE LINK Help – Provides information on communication profile settings and troubleshooting, complete Index of VFD fault codes, and a Search function.

Write to VFD - Saves all parameter values from memory to the VFD.

Read from VFD - Loads all parameter values from the VFD to memory.

Properties – Displays the properties box to view the properties of the active file.

The following gives a brief summary each of the functions that can be accessed from the navigation toolbar.
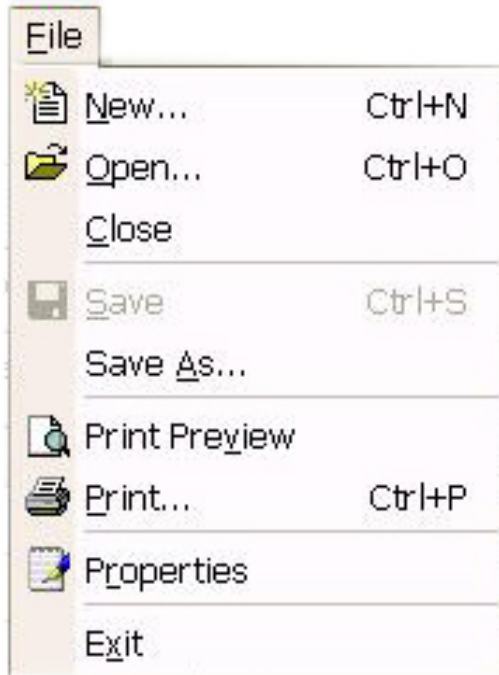
New – Displays the controller properties dialog to create a new factory default parameter set, based on the drive type, software number, model, and kVA.

Open – Opens a *.par file containing a parameter set for a specific drive type and software number.

Save – Saves the active file with its current file name and location.

Save As – Saves the active file with a different file name or location.

Print Preview – Shows how a file will look when you print it.

Print – Prints the active parameter set. Select Print options, in the Print window/dialog box.

Properties – Displays the properties box to view the properties of the active file.
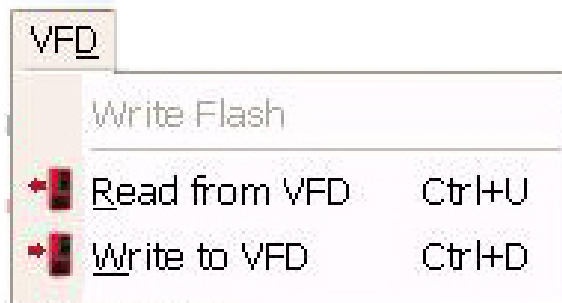
Exit – Closes this program after prompting you to save any unsaved files.
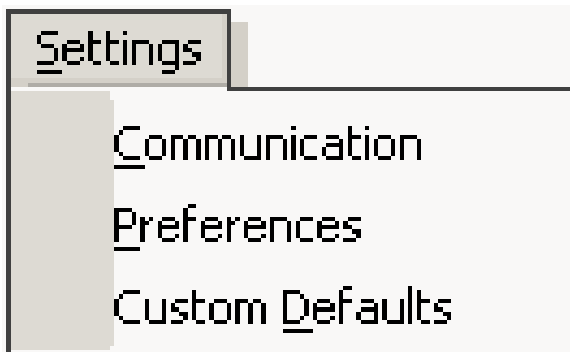
Communication – Allows communication profiles to be added, removed, edited, copied, imported and exported.

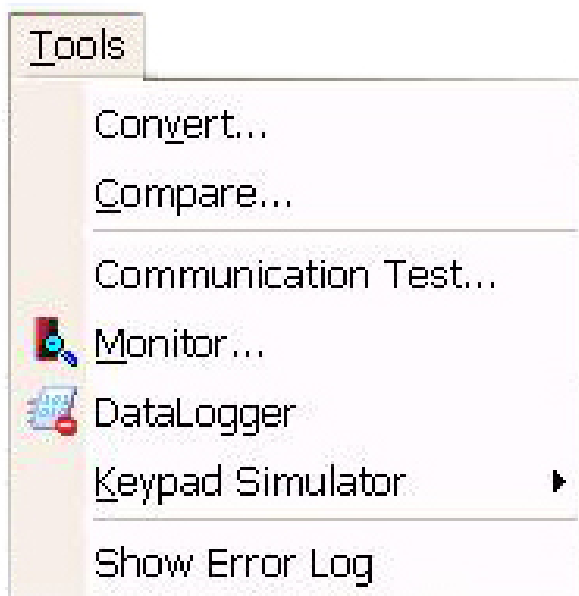**Preferences** – IMPULSE®•LINK 4.1 WDS settings for access level.

Custom Defaults – Contains screen for maintaining "custom default" parameter files.

Write Flash - Allows a binary file to be written to VFD flash memory. (FACTORY USE ONLY)

Read from VFD - Loads all parameter values from the VFD to memory.

Write to VFD - Saves all parameter values from memory to the VFD.

Convert – Allows for parameter files to be converted from one software/Flash ID to another (must be within the same drive series).

Compare Parameters - Allows for comparison between two different parameter files.

Communication Test – performs a communication test with the VFD.

Monitor – Displays a select number of monitor parameters (U-parameters), updated continuously.

DataLogger – Opens the DataLogger function (described in more detail in Chapter 5).

Keypad Simulator – Emulates the keypad and allows for navigating the keypad menu remotely (this is not available unless hardwired to the keypad port).

Show Error Log – shows the status of IMPULSE®•LINK 4.1 WDS.

Window - Allows for easy parameter window recall and organization. All open files are enumerated at the bottom of this menu for switching between files more easily.
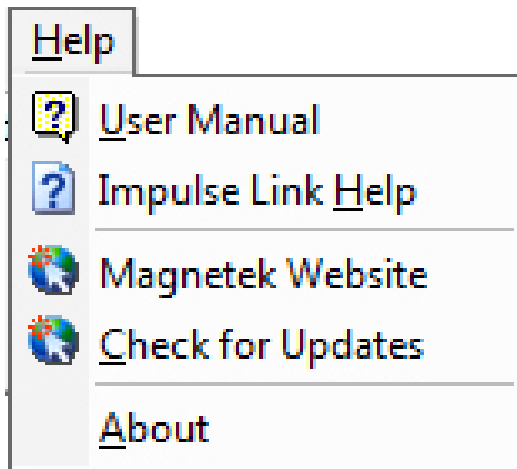
Users Manual – Displays the User Manual. (A .pdf reader, such as Adobe Acrobat Reader, must be installed)

IMPULSE LINK Help – Provides information on communication profile settings and troubleshooting, complete Index of VFD fault codes, and a Search function.

Magnetek Website – provides a link to the Magnetek Material Handling website.

Check for Updates – provides a link to the download software page of the website that offers updates.

About - Displays the version number of this Magnetek product, copyright and legal notices.

Chapter 4 - Parameter Maintenance

IMPULSE®•LINK 4.1 WDS software provides flexibility in programming, uploading, downloading, and saving parameters. With full parameter descriptions and visual programming, modifying parameters from your computer has never been easier.

Read From VFD

This function allows you to load the parameter values from the drive's memory. This can be accomplished through the 'VFD' drop down menu or the 'Read' Icon *(as shown below).*
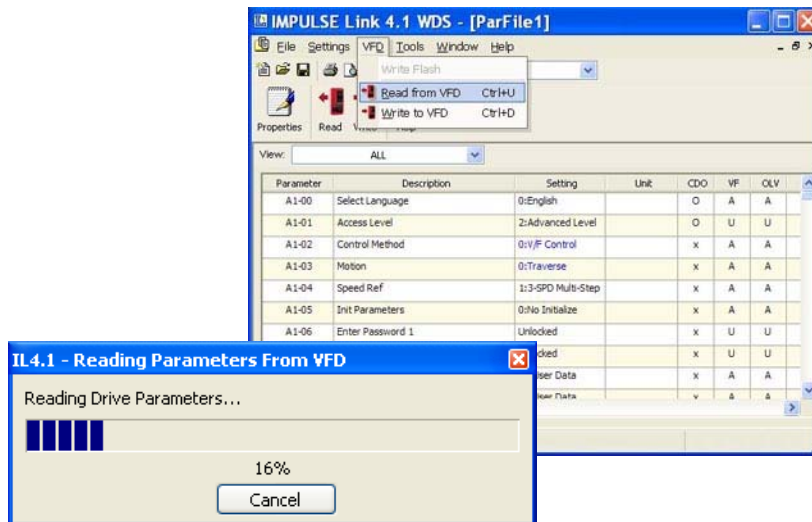
Write to VFD

This function saves all parameter values from memory to the VFD. This can be accomplished via the drop down on the 'VFD' menu or using the 'Write' Icon as shown here. Writing to the VFD may result in undesirable operation of your crane, causing **danger, personal injury or death**! To proceed with the write to VFD function you will need to accept that you acknowledge the warning message as shown here. Once you have checked the *I Accept* button, the *Continue Write to VFD* button will be available.
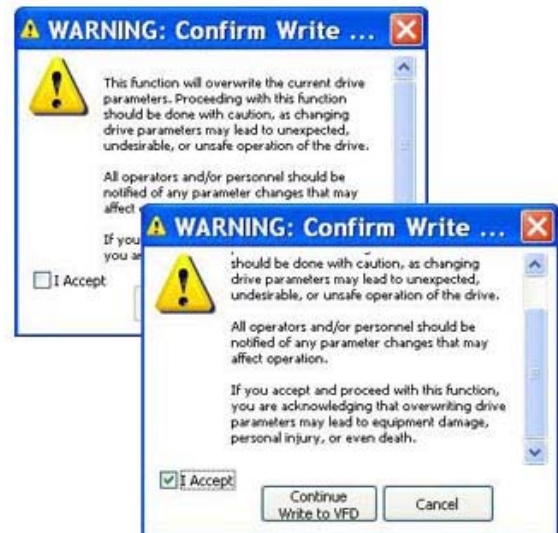
Parameter File Display

Parameter Value Text Color

Modified Constant
A parameter with **blue** text implies that its value is different than its default setting.
- This list should match the modified constants list in the drive, with the exception of A1 parameters.

Read-Only
A **grayed-out**, highlighted parameter implies that it cannot be modified.
- The Access Level of the current parameter set is lower than what is needed for this specific parameter (i.e. changing this parameter from the drive keypad would not be allowed with the current access level).

Over Maximum
A parameter with **red** text implies that its value is greater than its maximum. An invalid value in the PAR file could result in this error.

Under Minimum
A parameter with green text implies that its value is less than its minimum. An invalid value in the PAR file could result in this error.

Modifying Parameters

1. Begin modifying a parameter by double-clicking on the row of the parameter.
2. A drop-down list or edit box will appear in the *Setting* column.
3. Press Enter to accept the change or Escape to cancel.

Parameter	Description	Setting	CD
F5-04	DO Ch4 Select	F:Not Used	x
F5-05	DO Ch5 Select	F:Not Used / 10:Minor Fault	x
F5-06	DO Ch6 Select	11:Reset Cmd ...	x
F5-07	DO Ch7 Select	12:Timer Output / 13:Fref/Fout A...	x
F5-08	DO Ch8 Select	14:Fref/Set Ag... / 15:Freq Detect 3	x
F5-09	DO-08 Selection	16:Freq Detect 4	x
F6-01	Comm Bus Flt Sel	17:Trq Det 1 N.C.	x

Drop-down List Example.
This is displayed for drive parameters with a finite list of options.

Parameter	Description	Setting	CDO
E1-01	Input Voltage	230	x
E1-03	V/F Selection	1:60 Hz Saturation	x
E1-04	Max Frequency	60.0	x
E1-05	Max Voltage	230.0	x

Edit Box Example
This is displayed for drive parameters with a numeric range.

Notes:
1. If a change is made, ENTER is not pressed to accept it, and the user clicks on another row or column, the value will revert back to what it was before the change.
2. If a parameter is changed to an invalid value, under the minimum value or over the maximum value, a warning message will be displayed and the value being edited will revert back to what it was before the change.

Visual Programming

Visual Programming is an additional editing option targeted towards more complicated parameters or parameters with extended settings that require using a table to calculate the value.

Parameters with a Visual Programming option display an icon.

To Edit:
1. Left-click once on the Visual Programming icon.
2. Click on the appropriate selections.
3. Choose OK to accept the change or Cancel to abort.

Parameter	Description	Setting	
H1-01	Terminal S3 Sel	0:Multi-Step Ref 2	
H1-02	Terminal S4 Sel	1:Multi-Step Ref 3	
H1-03	Terminal S5 Sel	25:External Fault	
H1-04	Terminal S6 Sel	F:Not Used	
H1-05	Terminal S7 Sel	F:Not Used	

External Fault Response Selection

| External Fault Selection								Setting Result
Input Level Selection		Detection Method		External Fault Action				
N.O.	N.C.	Always	During Run	Ramp to Stop	Coast to Stop	Fast-Stop*	Alarm Only	
	X	X			X			25

OK   Cancel

Parameter File Comparison

The Parameter File Comparison function found in the Tools drop-down menu allows for comparison of two different parameter files. Use the Load button to select the file you want to view on the left and right side.
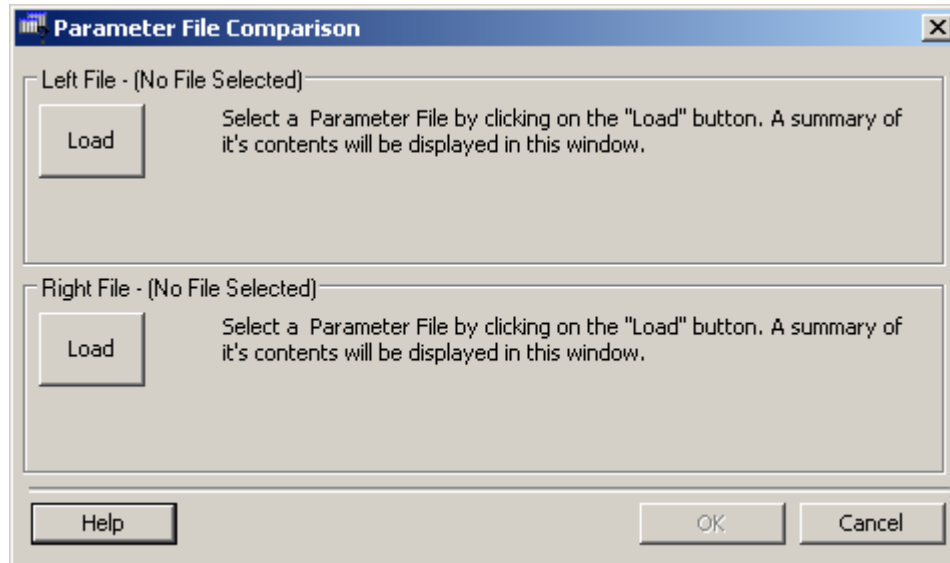
Once the parameter files are loaded, you can use the "Show" drop-down to compare:
- all parameters of each file,
- only parameters with equal values, or
- only parameters with different values.
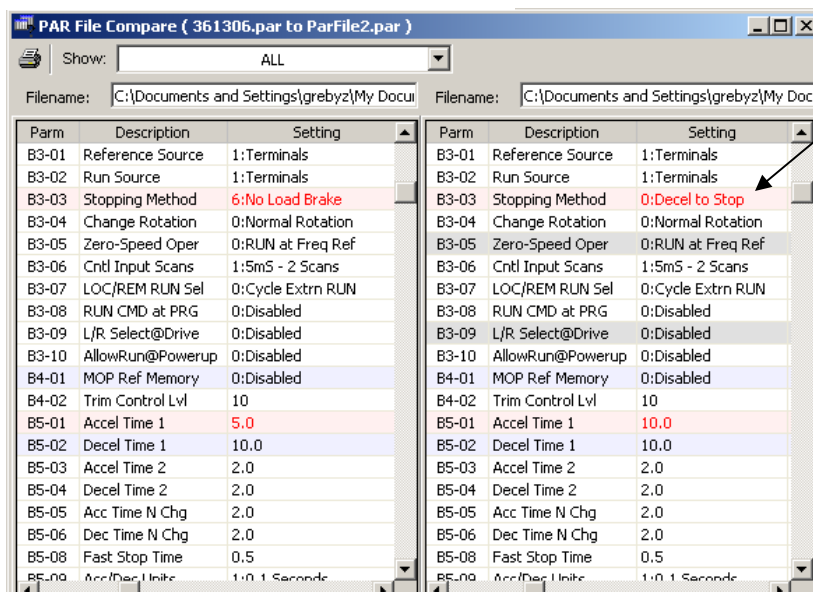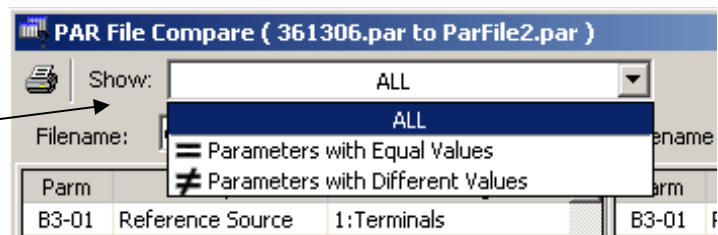
Parameters shown in **Red** are parameters with different values.

Custom Defaults

This function allows for the comparison of your current drive parameters to a custom default set versus factory default. This allows for a quick analysis of incorrect or non-uniform parameter settings within a file, without having to compare multiple files.

Setting Up Your Custom Defaults:

Custom Defaults are organized into Groups and Files. Each Group contains files with a unique combination of drive type, flash ID and model. Maintenance screens are provided for adding and removing these files.
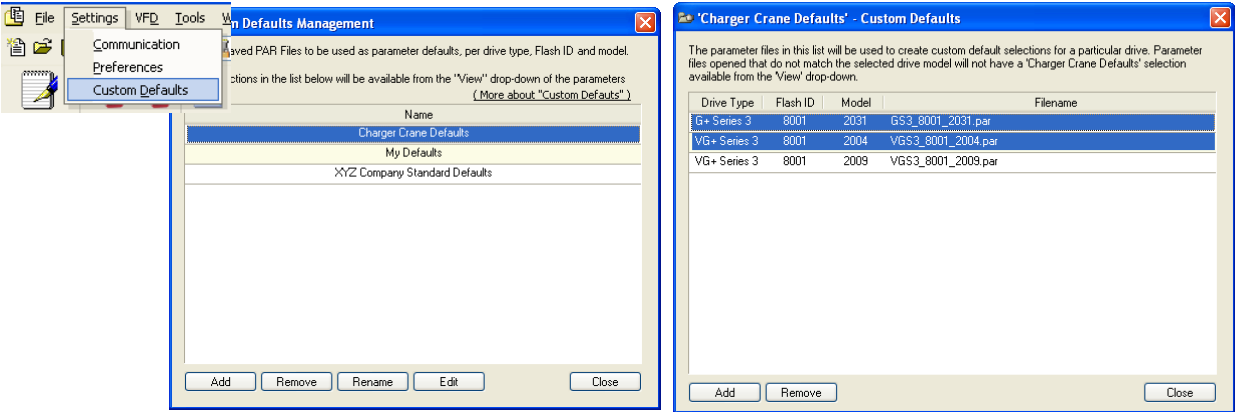

Alternatively, the user may also copy the entire "CustomDefaults" sub-directory from computer to computer. When IMPULSE®•LINK 4.1 first loads, it scans the "CustomDefaults" sub-directory for valid PAR files.

NOTE: The default IMPULSE®•LINK 4.1 WDS path is "C:\Program Files\Electromotive Systems\Impulse Link 4.1\"
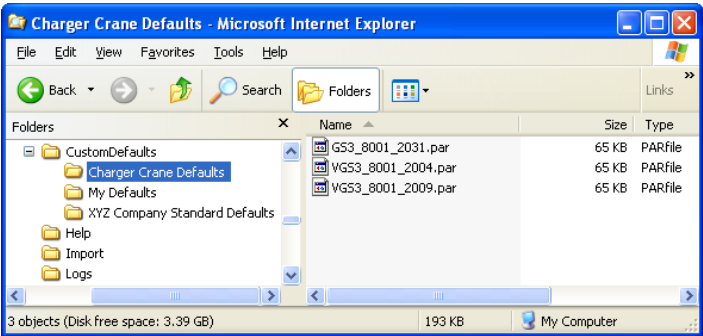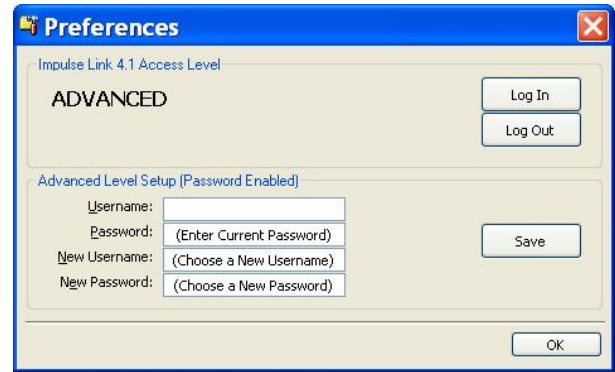

Using Custom Defaults:

Using Custom Defaults is not much different than viewing Modified Constants. If the selected PAR file matches the drive type, flash ID and model within one of the Groups, the Group will appear in the drop-down. When a Group is selected, an additional column is displayed and the parameter file is filtered by whether the value matches the custom default (rather than the factory default).
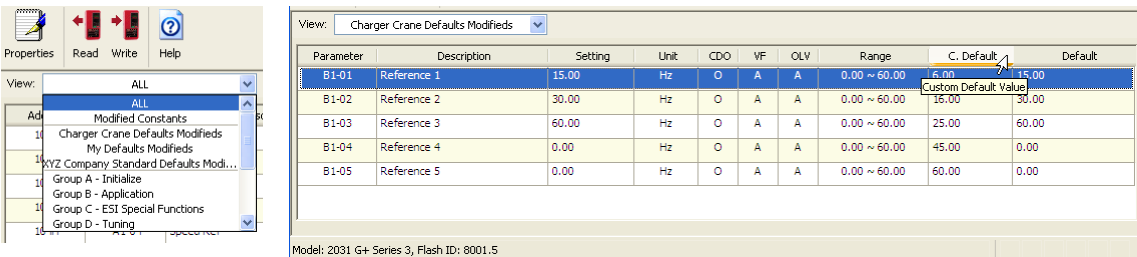
Security / Password Protection

The 'Preferences' drop-down menu in IMPULSE®•LINK 4.1 WDS software allows you to set the access level, username and password.

By logging out of the *Advanced* mode, you will be in the User mode. While in the User mode, the drives can only be monitored. Write to VFD and Reset functions are NOT available.
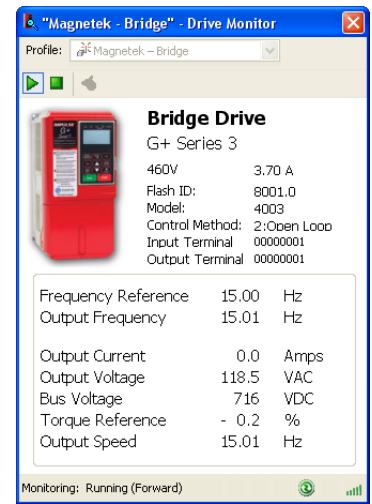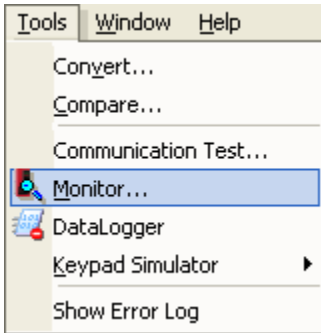
Chapter 5 - Monitor / DataLogger Function

Monitor

There is a 'Monitor' function in the 'Tools' drop–down, which displays a select number of monitor parameters (U-parameters) that are continually updated.

DataLogger

The DataLogger function provides monitoring of multiple IMPULSE® drives simultaneously while it also records run, fault and alarm events to file.

NOTE: A displayed fault may be clicked on to bring up corresponding help content.

A DataLogger file (DS3) contains a limited number of events. When the maximum has been reached, the oldest entry is replaced. For each event, there are corresponding voltages, currents and frequencies recorded at the time the event occurred. For faults and alarms, additional data that occurred just prior to the event is also logged. This is known as *Trace data.*

Available Events:
- 1400 run events
- 200 alarm events
- 200 fault events.

A DataLogger file may be e-mailed for additional troubleshooting assistance.
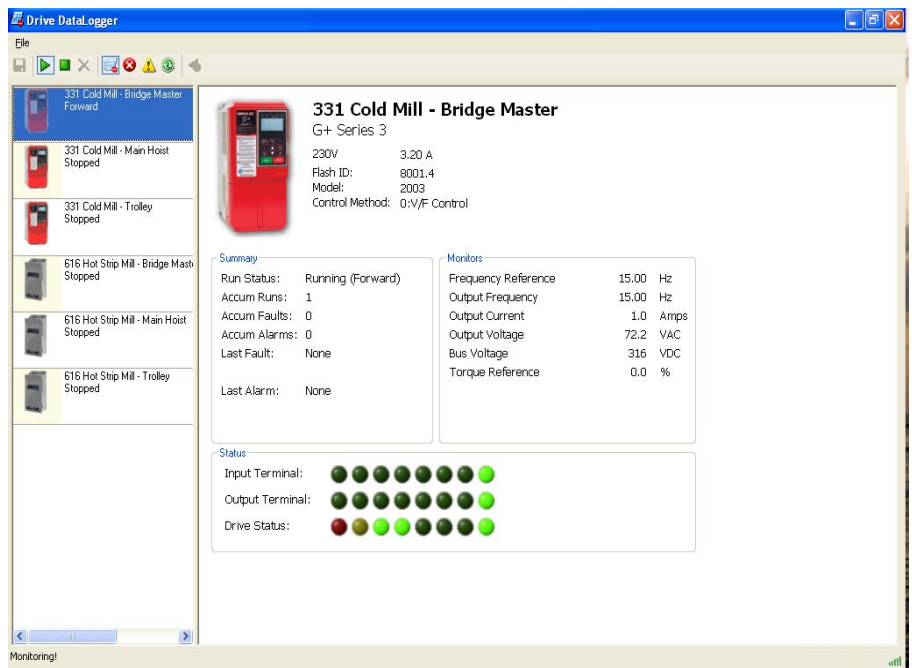
NOTE: The DataLogger function does not support data logging of IMPULSE®•P3 Series 2 drives.

To Begin
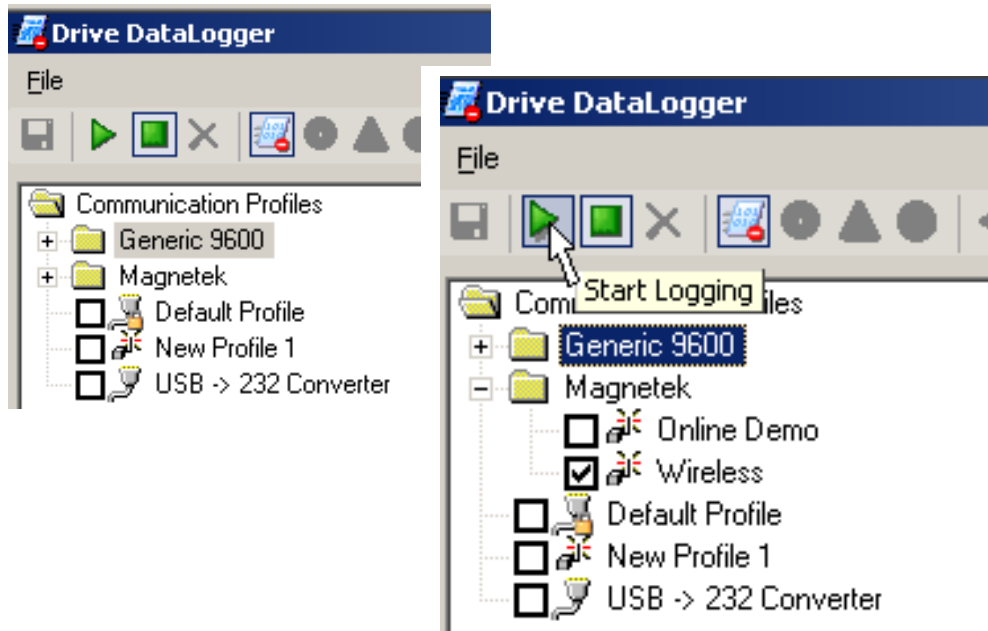
1. Click the check box of the drive(s) you want to monitor.
2. Click the play button.

The left window will change to show a button for each of the drives you selected and the overall status of the drive after it initializes connection.

Each button will display a different color base on the status of the drive profile.

White background with black text – normal operation of the drive.

Yellow background with black text – there is an alarm present on the drive.

Red background with white text – there is a fault present on the drive.
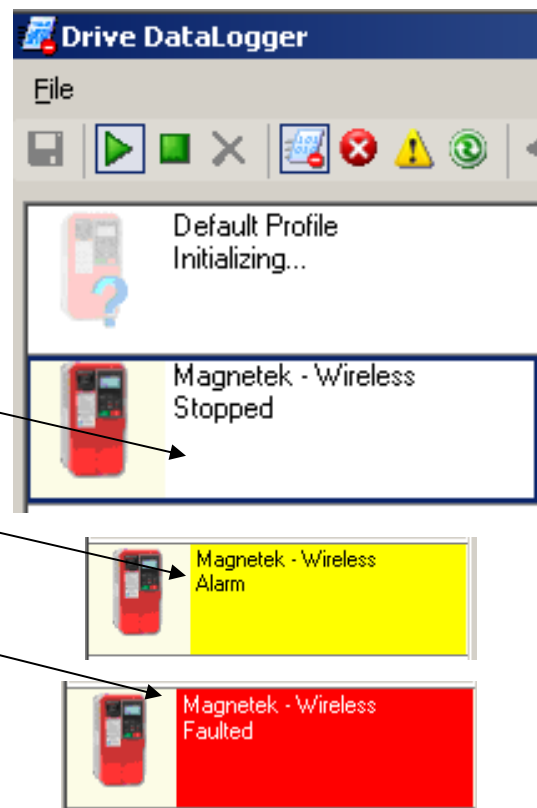
This button also contains a brief description of the status. The following table lists these brief text messages displayed along with a description for each.

Brief Text Displayed	Description
Alarm	Drive has an Alarm
Communication Error <error code>	IMPULSE®•LINK is having trouble communicating with the drive. An error code will be shown to further assist
Connected!	IMPULSE®•LINK has established connection to the drive
Connecting…	IMPULSE®•LINK is preparing the communication with the drive
Disconnected	Communication has been lost between IMPULSE®•LINK and the drive
Drive Not Supported	The drive selected is not supported by the DataLogger function
Faulted	Drive has a fault
Forward	Drive is being issued "Forward" command to run.
Initializing…	IMPULSE®•LINK is trying to establish communication with the drive
Reverse	Drive is being issued "Reverse" command to run.
Stopped	Drive is stopped
Zero Spd	Drive is at "Zero Speed"

By clicking the button in the left window for the drive, the right window will show the profile of the drive selected at the top along with continually updated information. There are 4 main areas displayed.

1) Profile of the drive selected showing
2) Summary
3) Monitor, and
4) Status

Profile - Displays the drive profile and other information about the drive

Magnetek - Wireless
G+ Series 3

230V	3.20 A
Flash ID:	8001.3
Model:	2003
Control Method:	0:V/F Control

Summary – Displays current status of drive including last fault or alarm

Summary
Run Status:	Stopped
Accum Runs:	2
Accum Faults:	11
Accum Alarms:	5
Last Fault:	EF5 - Ext Fault S5
	01/16/2008 11:47:42
Last Alarm:	EF5 - Ext Fault S5
	01/16/2008 11:36:33

Monitor – Displays selected monitor parameters (U-Parameters).

Monitors
Frequency Reference	15.00	Hz
Output Frequency	0.00	Hz
Output Current	0.0	Amps
Output Voltage	0.0	VAC
Bus Voltage	321	VDC
Torque Reference	0.0	%

Status – Shows the status of input and output terminals along with a visual of the drive status.

Status
Input Terminal:
Output Terminal:
Drive Status:

In the summary window if a Fault or Alarm condition occurs, the DataLogger allows you to click on the Alarm or Fault, and displays troubleshooting information (as shown here).

Summary
Run Status: Stopped
Accum Runs: 2
Accum Faults: 11
Accum Alarms: 5
Last Fault: EF5 - Ext Fault S5
                01/16/2008 11:47:42
Last Alarm: EF5 - Ext Fault S5
                01/16/2008 11:45:33

Impulse Link 4.1 Help

Show Back Home Print Options

External Fault 5

Fault Code	Fault or Indicator Name/Description	Corrective Action
EF5 External Fault 5	**External Fault 5:** External fault occurs on Terminal S5.	1. Check constant H1-03 for proper programming. 2. Check the condition of the input terminal S5.

The Status window allows for the viewing of input and output terminal status. By using your mouse, you can scroll over the LED to view the meaning. See the example below.
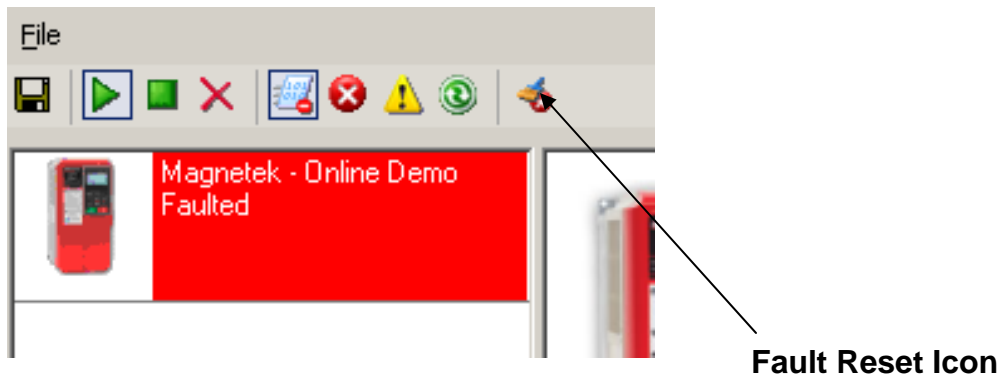
Status
Input Terminal: ● ● ● ● ● ● ● ●

Terminal 5 is ON

Fault Reset

In the event of a fault condition, you will see the fault icon on either the DataLogger window or the Monitor window as indicated below.

Fault Reset Icon

NOTE: You can reset a fault in the Monitor window or DataLogger window, as long as the drive doesn't have a Run command and the fault condition no longer exists. Once you click on the fault reset icon (as shown above), a warning message will prompt you to accept that you acknowledge the warning. When resetting a drive remotely, you need to be sure that all personnel and/or operators are notified. Once you have checked the "I Accept" box, the "Continue Fault Reset" button will be available.

Fault / Alarm / Run history

Click on any one of the three icons (Fault/Alarm/Run) at the top of the DataLogger will change the view to show three new tabs. Each tab will allow you to view the Fault, Alarm, or Run History for the drive.

In this window you can view the History for each tab. Clicking on the plus (+) sign will show additional information related to the fault or alarm.

Fault #		Description	Run #	Date	Time
⊞	1	EF5 - Ext Fault S5	None	01/16/2008	15:53:20
⊞	2	EF5 - Ext Fault S5	12	01/16/2008	15:53:31
⊞	3	EF5 - Ext Fault S5	None	01/16/2008	15:57:31
⊞	4	EF5 - Ext Fault S5	None	01/16/2008	15:58:50
⊠	5	EF5 - Ext Fault S5	13	01/16/2008	16:27:57
⊞	6	EF5 - Ext Fault S5	None	01/16/2008	16:28:34

⊟	5	EF5 - Ext Fault S5		13	01/16/2008	16:27:57	60.00	60.0	
			Trace No	Date	Time	U1-01	U1-02	
			5	01/16/2008	16:27:57	60.00	59.43	
			4	01/16/2008	16:27:56	60.00	60.00	
		Trace Data	3	01/16/2008	16:27:56	60.00	60.00	
			2	01/16/2008	16:27:56	60.00	59.93	
			1	01/16/2008	16:27:55	60.00	58.30	

Chapter 6 - Additional Menu Features

Print Preview

IMPULSE®•LINK 4.1 WDS provides a compact printing mode that displays all drive parameters in only 1-2 pages. It also prints a more detailed mode that lists descriptions as well as units for each parameter.

Compact Parameter Print Preview

Detailed Parameter Print Preview

Print

Printer Name – Allows the user to select from any printer installed on his/her system. The user's default printer is initially selected.

Print Mode - Allows the user to choose the printing style.
- o *Compact* mode (1-2 pages) provides parameter name and setting value.
- o *Detailed* mode provides parameters, descriptions, setting, values and units as well as 'modified' information.
- o *As shown* prints all of the information as shown on the screen.

OK Button – Prints the active parameter set to the selected printer in the chosen format.

Cancel – Closes this dialog box without printing. Changes to Customer Name, Application and Job Number are **not** saved.

Text placed in the Customer Name, Application and Job Number fields appear on the printout.

NOTE: Only parameters that are viewable in the Parameters Window will be printed.

Parameter File Conversion

'Convert' under the 'Tools' menu allows for parameter files to be converted from one software/Flash ID version to another (within the same drive series).

Source – Specifies the file to be converted.

Flash ID – Specifies the software type that the file will be converted to.

Destination Filename – Specifies the Destination filename.

Convert - Converts the parameter file specified in "Source" to the format specified in the software version in the Flash ID. The converted file is saved to the filename and path specified in "Destination Filename".

Keypad Emulator – The keypad emulator communicates with an IMPULSE® drive exactly as the physical keypad does. This allows for remote keypad menu navigation.

NOTE: This function is only available when IMPULSE®•LINK 4.1 WDS is connected via the drive's keypad 1CN connector (instead of the standard RS485 connection) – primarily for training purposes.

If you attempt to run the keypad simulator while connected via the standard RS485 connection a CF00 Comm Error will occur.

Digital Operator Emulator NOTES:

1. To Activate, Select the correct drive profile from the dropdown and click the ▶ button.
2. The Keypad will automatically close if any communication function, such as Upload and Download, or a new offline parameter set is created from the Controller Properties window.
3. The RUN command has been disabled for safety reasons.
4. If the drive is put into "Program Mode" and not returned to "Run Mode", the user will be unable to run the drive.

Viewing Parameters

The 'View' drop-down box allows filtering of parameters based on parameter group organization and the parameter value (modified from factory defaults or from custom defaults).
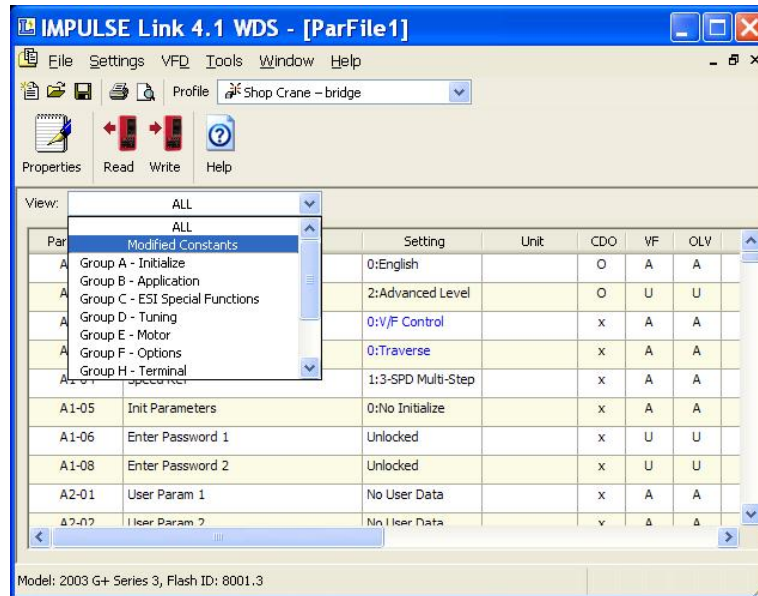
Copying to the Clipboard

IMPULSE®•LINK 4.1 provides the ability to copy displayed parameter information to a preferred word processor or spreadsheet.

To do this, select one or more rows and either press Ctrl-C or right-click to display the context menu, shown to the right. The copied information is available to be pasted in either HTML format or ASCII text.

Tip: Change from full row selection mode to single cell selection mode by doing the following.
1. Click and hold the left mouse button over any row.
2. Drag the mouse down while the left-mouse button is still being held. An icon will replace your mouse pointer.
3. While still holding the left mouse button, click the right mouse button. The icon will become skinnier and you will no longer be restricted to selecting the whole row.

Repeat to return to full row mode.

Chapter 7 - Troubleshooting

The IMPULSE®•LINK 4.1 WDS Help section provides the following:

- Reference to Drive faults and corrective actions.
- Reference to IMPULSE®•LINK error codes and corrective actions.
- Communication profile settings overview.
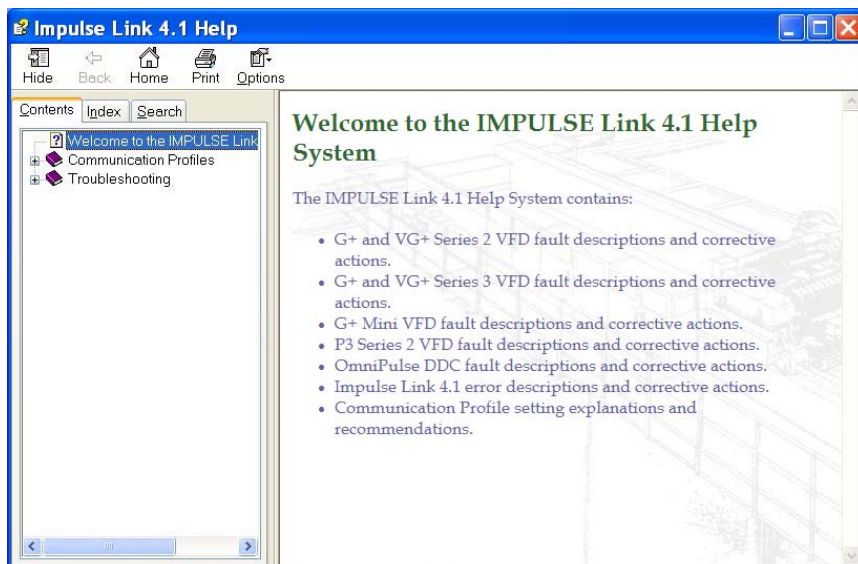
Drive Faults References

IMPULSE®•LINK 4.1 WDS offers built-in Help screens for the drive faults and/or alarms. The Help screens provide advanced diagnostics allowing you to troubleshoot your drive from your PC. When you 'click' on the fault, the help screen provides the fault code, fault name/description, and the corrective action.

PGO - PG Open

Or you can simply go to the Help Icon and go to the Drive Fault References for a complete list of G+ Mini, P3 Series 2, G+/VG+ Series 2, 3, and 4 drive faults, as shown below:
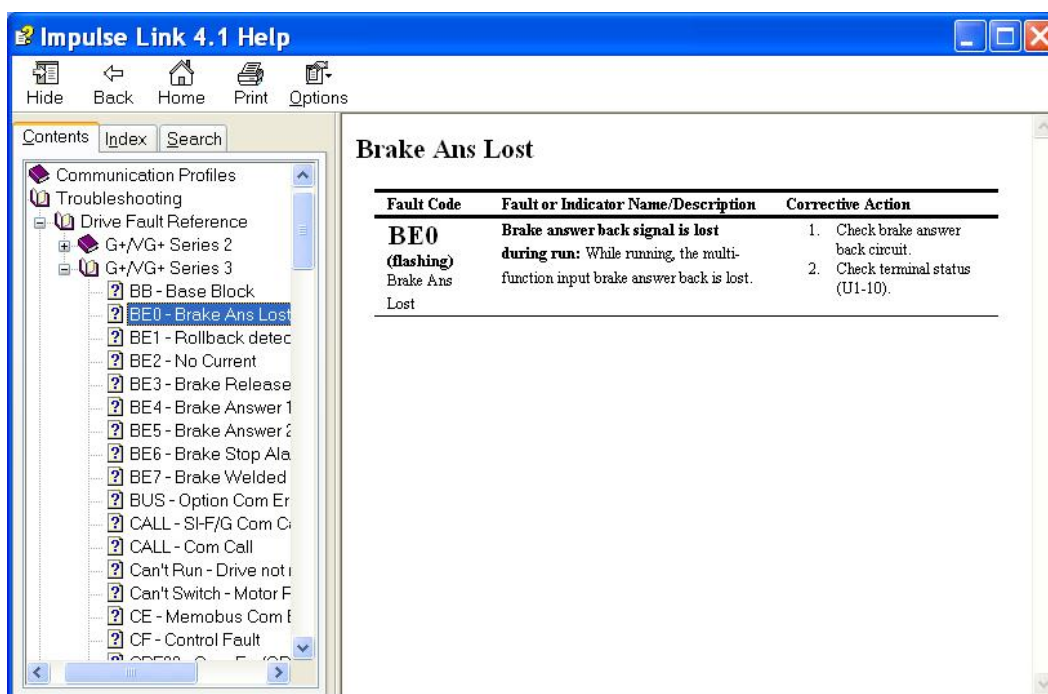
Communication Error References

The Help function provides an overview of the possible errors that could occur while running IMPULSE®• LINK 4.1 WDS, as shown here:
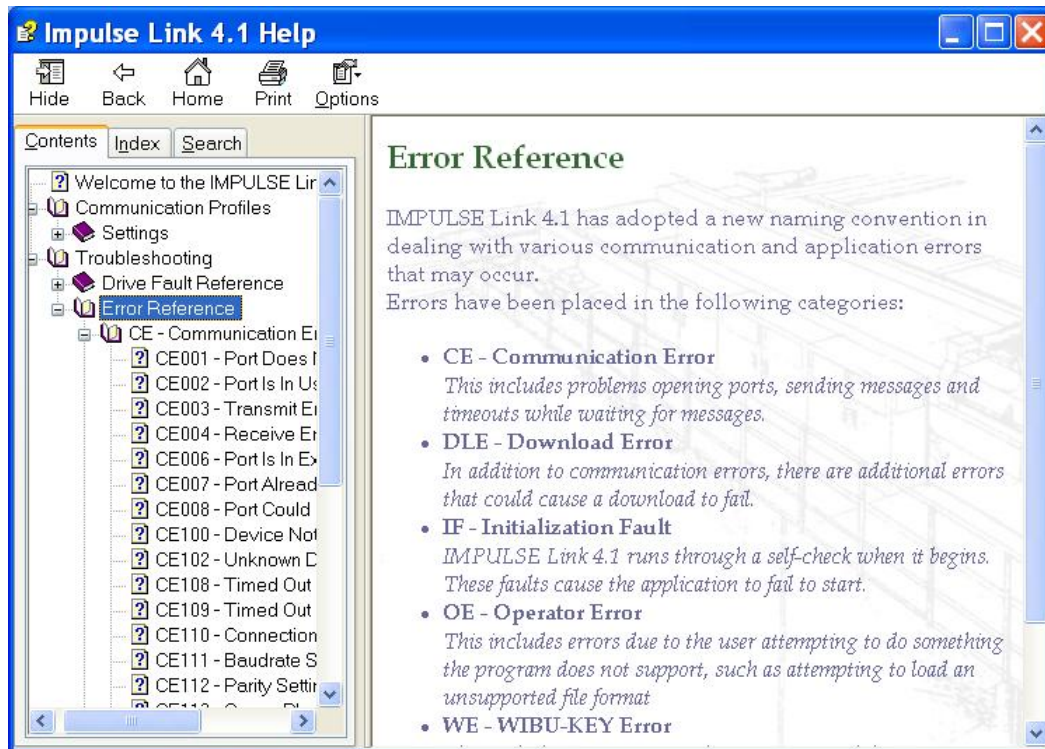
By clicking on the type of error, you will be provided the fault code with description and correction action.
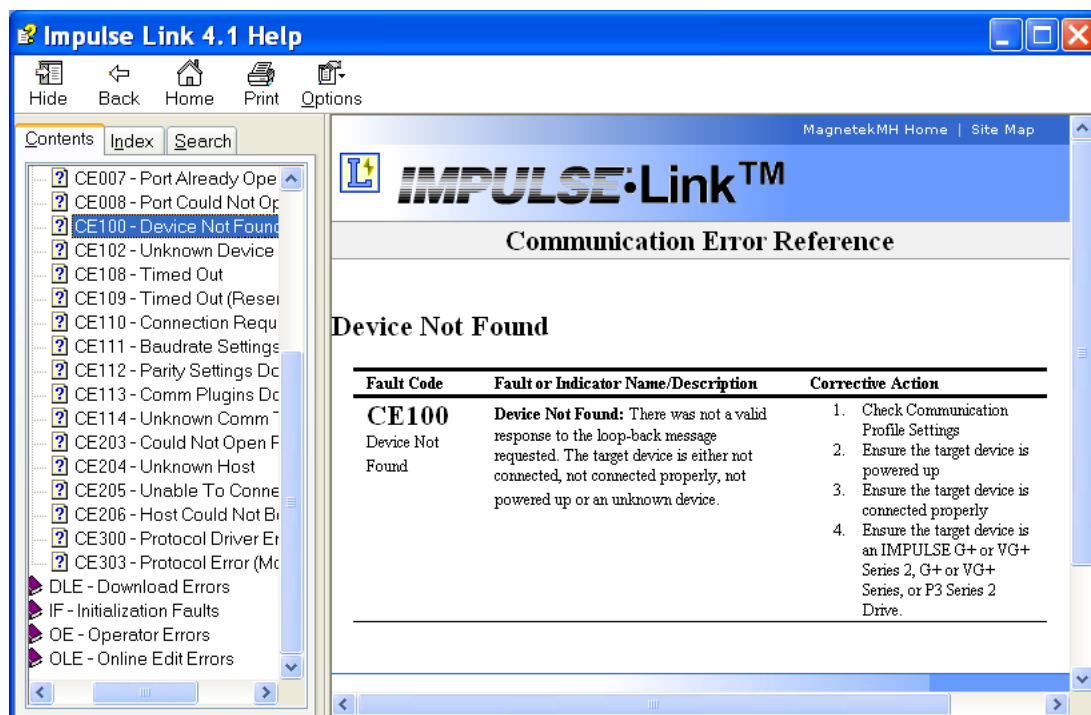
Communication Profile Test

The Communication Profile Test Utility is a tool to assist in troubleshooting communication difficulties. It performs the following sequence:

1. Opens the communication port with the selected settings. If the port opens successfully, the port exists and IMPULSE®•LINK has access to it.
2. Sends a loop-back test message to establish whether a valid device exists with the settings in the profile. If the loop-back fails, the device may not be powered, present or supported.
3. Identifies the drive model and version. If the discovered type is unknown, IMPULSE®•LINK does not support it.

NOTE: If any of the above steps fail, an error message is prompted to the user with an error code (i.e. CE100). For further troubleshooting reference the error code in the help section.
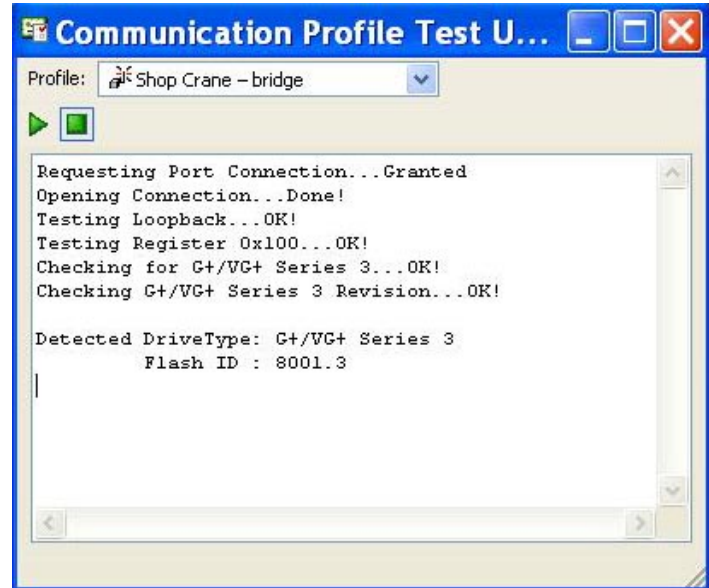
Show Error Log

This function, also found in the Tools drop-down menu, brings up an additional window showing various status details of IMPULSE®•LINK 4.1 WDS.
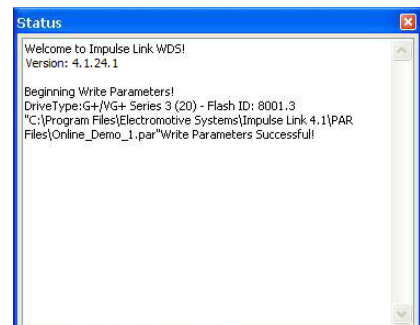
Chapter 8 - Appendices

Appendix A: Serial Wiring for IMPULSE®•LINK WDS Base Unit

WDS BASE UNIT ENCLOSURE

TB

CUSTOMER SUPPLIED
120 VAC

TB

IMPULSE
LINK
ETHERNET
BASE

ANTENNA MOUNTED
ON OUTSIDE
OF ENCLOSURE

X1

X2

GFCI

LINE

H   W

H   W

LOAD

9 VDC ADAPTOR TO PLUG
INTO 120 VAC
DUPLEX RECEPTACLE

RECEPT

WDS BASE UNIT
ENCLOSURE SURFACE

ETHERNET
RECEPTACLE

ETHERNET INPUT
FROM CUSTOMER
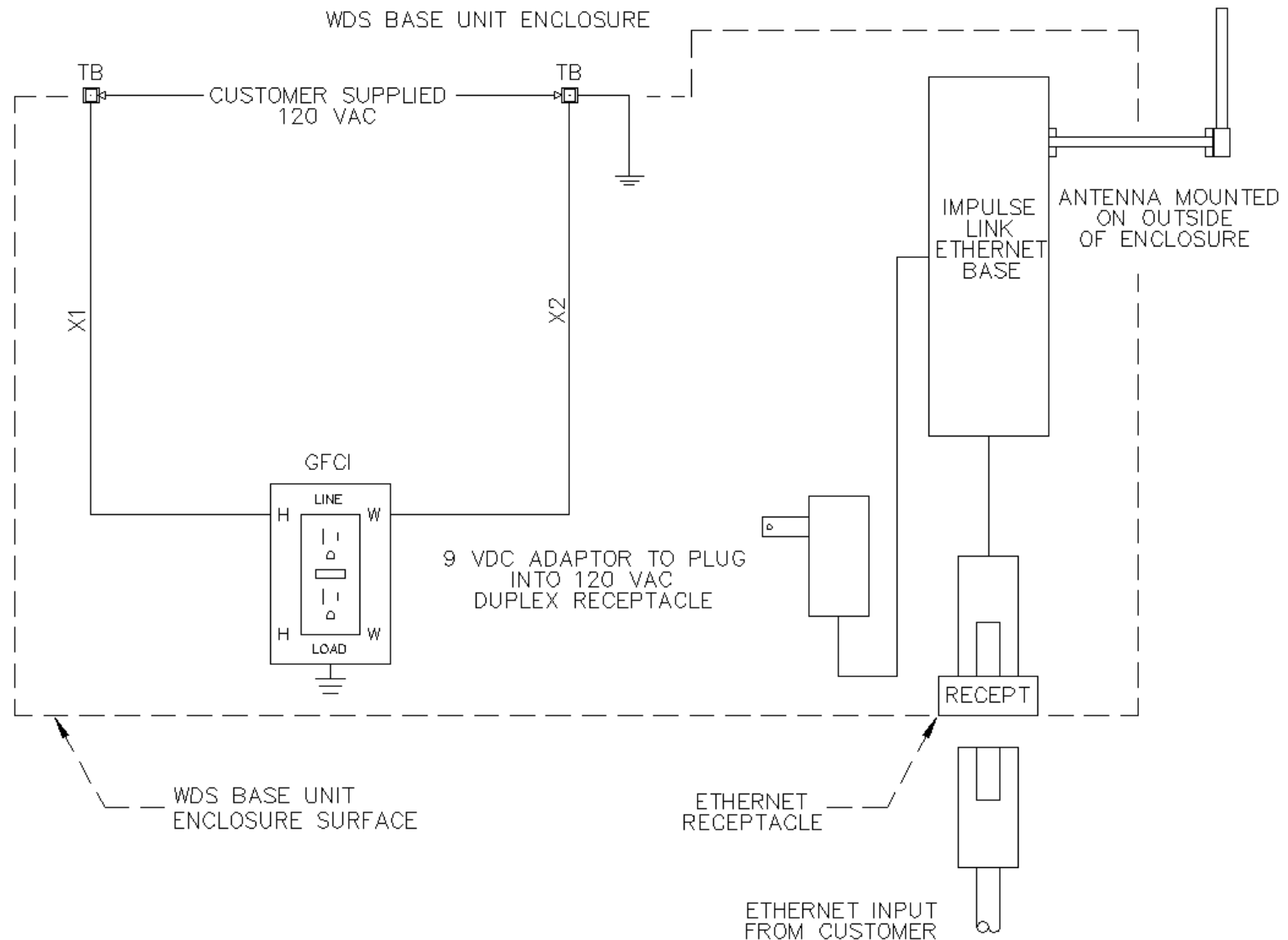
Appendix B: Serial Wiring for IMPULSE®•LINK WDS Remote Unit
(G+/VG+ Series 4, G+/VG+ Series 3, P3 Series 2, and G+ Mini)

TERMINATION RESISTOR

ON

AUX HOIST

SHIELD
S+
S−
R+
R−

MAIN HOIST

SHIELD
S+
S−
R+
R−

TROLLEY

SHIELD
S+
S−
R+
R−

BRIDGE

SHIELD
S+
S−
R+
R−

SET TERMINATION SWITCH IN THE LAST DRIVE IN THE DAISY−CHAIN TO ENABLE TERMINATING RESISTOR (SEE APPENDIX F)

MOTION	ADDRESS H5−01
BRIDGE	01H
TROLLEY	02H
MAIN HOIST	03H
AUX HOIST	04H

CABLE BELDEN 9842

REMOTE WDS ENCLOSURE SURFACE

TB

120 VAC FROM CONTROL PANEL

TB

GFCI

LINE
H   W

H   W
LOAD

9 VDC ADAPTOR TO PLUG INTO 120 VAC DUPLEX RECEPTACLE

ANTENNA MOUNTED ON OUTSIDE OF ENCLOSURE

IMPULSE LINK SERIAL REMOTE

S−/24/WHITE/BLUE   3
S+/24/BLUE/WHITE   7
R−/24/WHITE/ORANGE   2
R+/24/ORANGE/WHITE   8
SHIELD

DB−9 PIN FEMALE

CONNECTOR

3
7
2
8

CABLE

DB−9 PIN FEMALE

3
7
2
8

DIP SWITCHES
1 2 3 4 5 6

Wiring for IMPULSE®•LINK WDS Remote Unit
(OmniPulse DDC and MagnePulse DMC)

SET TERMINATION SWITCH IN THE LAST DRIVE IN THE DAISY-CHAIN TO ENABLE TERMINATING RESISTOR (SEE APPENDIX F)

MOTION	ADDRESS G19
BRIDGE	01H
TROLLEY	02H
MAIN HOIST	03H
AUX HOIST	04H

Wiring for IMPULSE®•LINK WDS Remote Unit
(OmniPulse DSD)

Appendix C: Serial Wiring for IMPULSE®•G+/VG+ Series 2
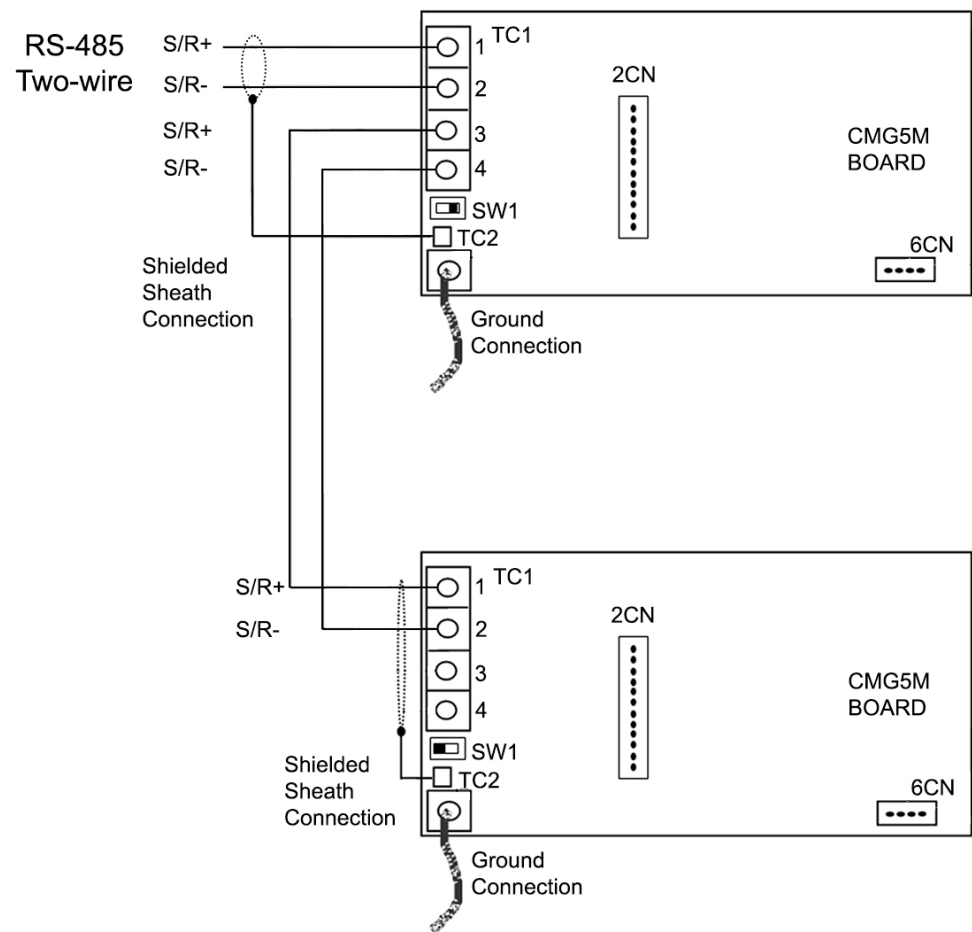
Appendix D: Termination Resistor Location

The following diagrams illustrate the location of the terminating resistor for each family of drives.
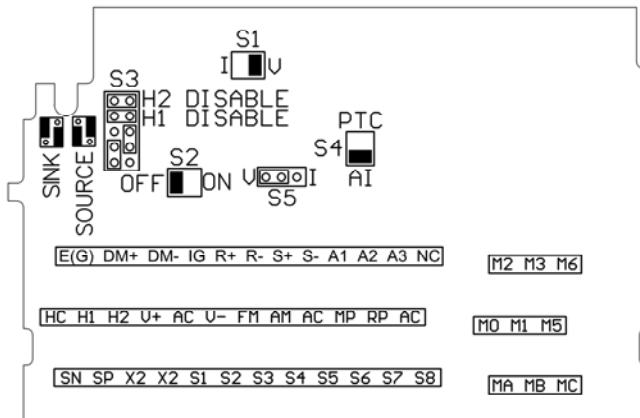
IMPULSE®•G+/VG+ Series 4: DIP switch *S2* is located on the interface board, as shown to the left.

S1

IMPULSE®•G+/VG+ Series 3: DIP switch *S1* is located on the interface board, as shown to the right.

(*Notice the 'ON' position of S1 is with the switch to the right side.*)
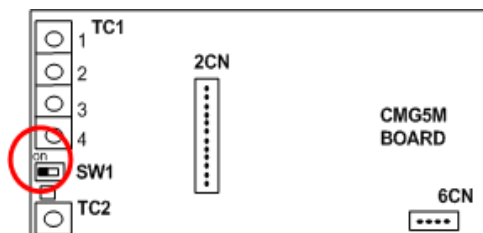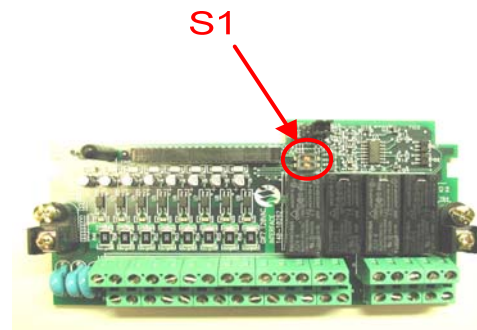
IMPULSE®•G+/VG+ Series 2: DIP switch *SW1* is found on the left side of the CMG5M RS485 option card.

(*Notice the 'ON' position is on the left side of the switch.*)

IMPULSE®•G+ MINI drives, the DIP switch is labeled *S2* and is located above the control terminals and to the right of CN5.

(Notice that the "ON" position is to the right side.)
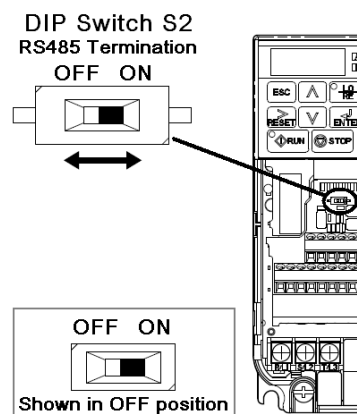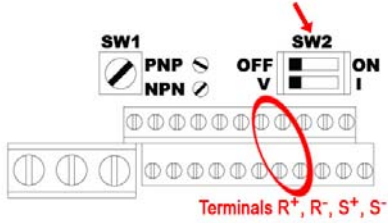
IMPULSE®•P3 Series 2: DIP switch *SW2* is located above the control terminals, as shown to the left.

(Notice the 'ON' position SW2 is with the switch to the right side.)

OMNI•PULSE•DDC: Terminal jumpers *LK2*, are located near the center of the control board. With the jumper on pins 1 and 2, the terminating resistor is connected. With the jumper on pins 2 and 3, the terminating resistor is not connected.

Display Connector

LK2

Pins 1 and 2 – 120 Ohm Connected
Pins 2 and 3 – 120 Ohm Not Connected
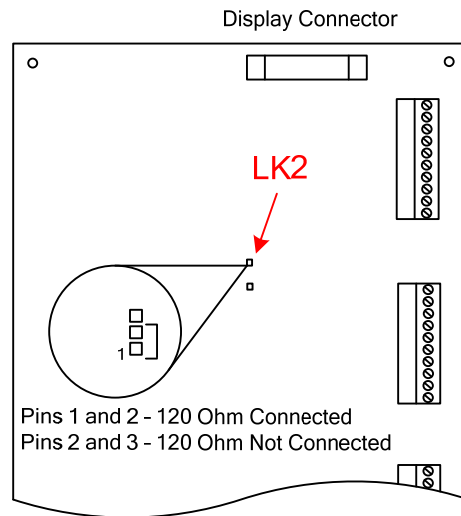
Appendix E: Quick Reference

	Parameter	Typical Setting

G+/VG+ Series 4

IG R+ R- S+ S-

Modbus Address	H5-01	(01 ~ 1F)
Baud Rate	H5-02	3: 9600 Baud
Parity Select	H5-03	0: No Parity

Note:
3 = 9600
4 = 19200

G+/VG+ Series 3

R+ R-

S+ S-
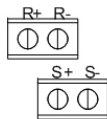
Shield: TB4

Modbus Address	H5-01	(01 ~ 1F)
Baud Rate	H5-02	3: 9600 Baud
Parity Select	H5-03	0: No Parity

Note:
3 = 9600
4 = 19200

G+/VG+ Series 2
(SI-K2 option card)

1 S/R+
2 S/R-
3 S/R+*
4 S/R-*
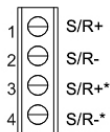
* See Appendix C for wiring connections

Modbus Address	H5-01	(01 ~ 1F)
Baud Rate	H5-02	3: 9600 Baud
Parity Select	H5-03	0: No Parity

G+ Mini

R+ R- S+ S- IG
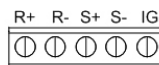
Shield: IG

Modbus Address	H05.01	(01 ~ 1F)
Baud Rate	H05.02	03: 9600 Baud
Parity Select	H05.03	00: No Parity

Note:
03 = 9600
04 = 19200

P3 Series 2

R+ R-

S+ S-
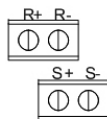
Shield: Chassis Ground

Modbus Address	n253	(01 ~ 1F)
Baud Rate	n254	2: 9600 Baud
Parity Select	n255	2: No Parity

Note:
2 = 9600
3 = 19200

OmniPulse DDC and MagnePulse DMC

RS485 B(T/R+)
RS485 A(T/R-)

1 2 3 4 5 6 7 8 9 10

X1:
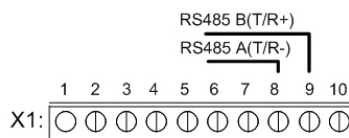
Shield: Chassis Ground

Baud Rate	G16	9600
RS232/RS485 Select	G17	RS485
Serial Format	G18	8N1
Modbus Address	G19	(1 ~ 31)

Appendix F: System Status LEDs

Model X2 Ethernet Modem (WDS Base Unit) LEDs and Buttons (144-17648)
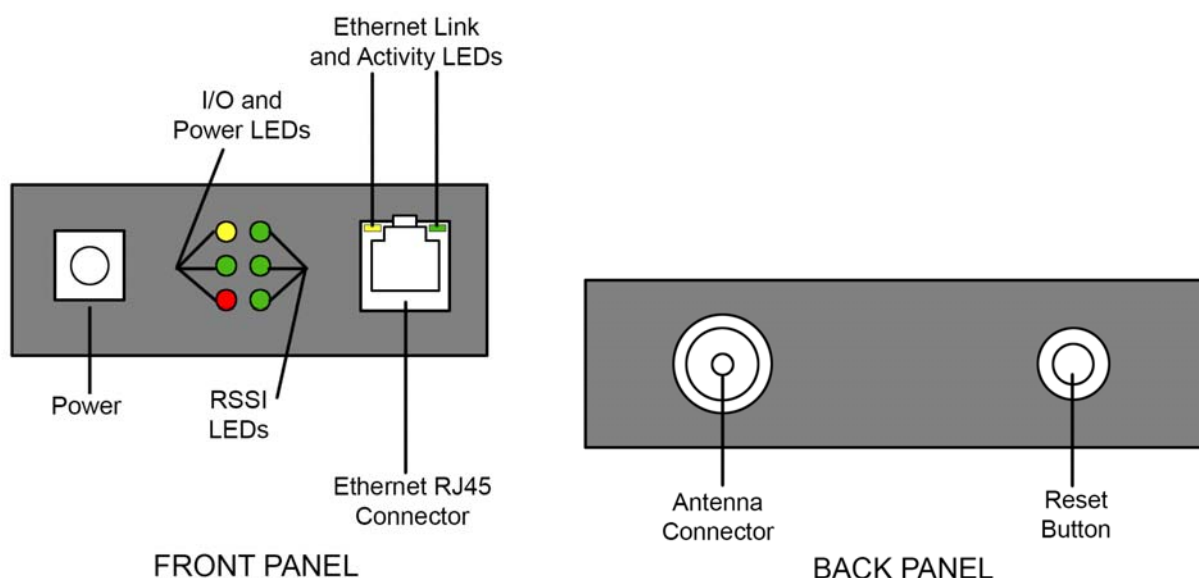
ConnectPort X2 LEDs and Buttons

LED/Button	Color and Light Pattern	Description
I/O and Power		The LEDs visualize gigantic status information and indicate module activity as follows:
	Yellow or Green (top LED)	Serial Data Out (to host)
	Green (middle LED)	Serial Data In (from host)
	Red or Green (bottom LED)	Power: Indicates both power to the interface board and the network association status for the RF module in the interface board.
	Solid Red	Ethernet modem powered and not associated to a WDS network.
	Blinking Red	Ethernet modem has associated to a WDS network.
RSSI LEDs	Green	RSSI LEDs indicate the amount of fade margin present in an active wireless link. Fade margin is defined as the difference between the incoming signal strength and the module's receiver sensitivity. • 3 LEDs On: Very Strong Signal (> 30 dB fade margin) • 2 LEDs On: Strong Signal (> 20 dB fade margin) • 1 LED On: Moderate Signal (> 10 dB fade margin) • 0 LEDs On: Weak Signal (< 10 dB fade margin)
Ethernet Link LED	Solid yellow	
Ethernet Activity LED	Blinking Green	
Reset button	--	**Single press:** Performs the equivalent of a power cycle. **Press and hold:** Resets device configuration settings to factory defaults (factory reset).

Model XT Ethernet Modem (WDS Base Unit) LEDs and Buttons (144-12229)

FRONT PANEL   BACK PANEL
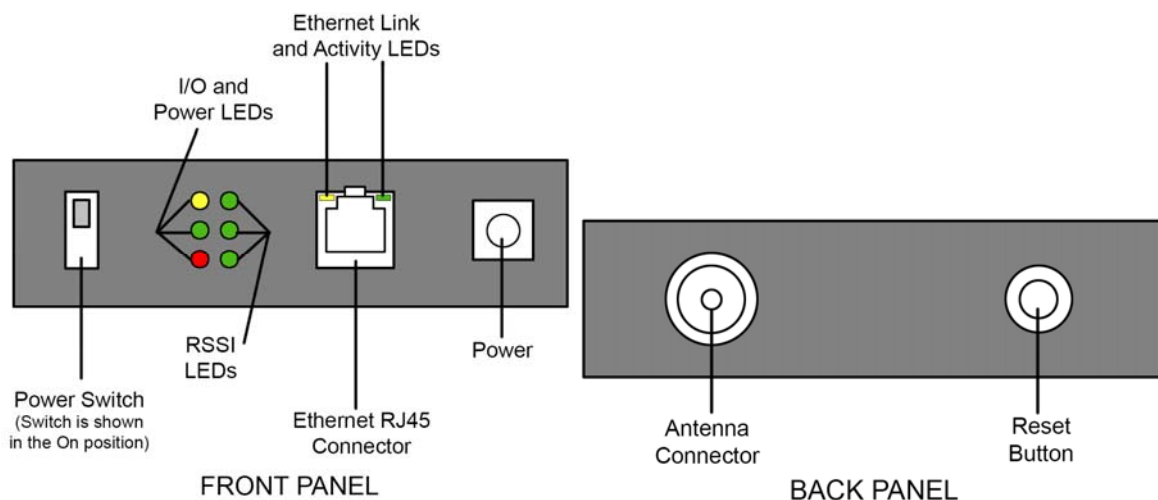
ConnectPort XT LEDs and Buttons

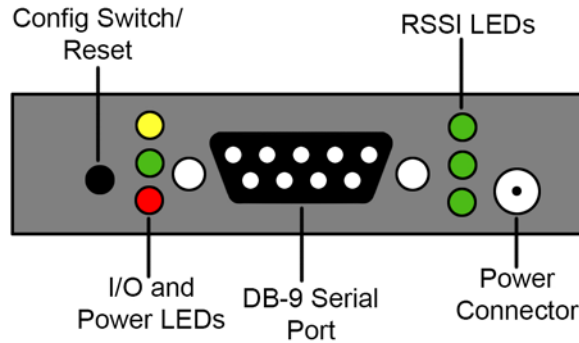| LED/Button	Color and Light Pattern	Description
I/O and Power		The LEDs visualize gigantic status information and indicate module activity as follows:
	Yellow (top LED)	Serial Data Out (to host)
	Green (middle LED)	Serial Data In (from host)
	Red (bottom LED)	Power: Indicates both power to the interface board and the network association status for the RF module in the interface board.
	Solid Red	Ethernet modem powered and not associated to a WDS network.
	Blinking Red	Ethernet modem has associated to a WDS network.
RSSI LEDs	Green	RSSI LEDs indicate the amount of fade margin present in an active wireless link. Fade margin is defined as the difference between the incoming signal strength and the module's receiver sensitivity. • 3 LEDs On: Very Strong Signal (> 30 dB fade margin) • 2 LEDs On: Strong Signal (> 20 dB fade margin) • 1 LED On: Moderate Signal (> 10 dB fade margin) • 0 LEDs On: Weak Signal (< 10 dB fade margin)
Ethernet Link LED	Solid yellow	
Ethernet Activity LED	Blinking Green	
Reset button	--	**Single press:** Performs the equivalent of a power cycle. **Press and hold:** Resets device configuration settings to factory defaults (factory reset).
Power Connector	--	7-28 VDC power connector (center positive, 5.5/2.1mm)

Model XT RS-232/485 Serial (WDS Remote Unit) Modem (144-12226)

Remote Modem (Model X2) LEDs and Buttons

LED/Button	Color and Light Pattern	Description
I/O and Power		The LEDs visualize gigantic status information and indicate module activity as follows:
	Yellow (top LED)	Serial Data Out (to host)
	Green (middle LED)	Serial Data In (from host)
	Red or Green (bottom LED)	Power: Indicates both power to the interface board and the network association status for the RF module in the interface board.
RSSI LEDs	Green	RSSI LEDs indicate the amount of fade margin present in an active wireless link. Fade margin is defined as the difference between the incoming signal strength and the module's receiver sensitivity. • 3 LEDs On: Very Strong Signal (> 30 dB fade margin) • 2 LEDs On: Strong Signal (> 20 dB fade margin) • 1 LED On: Moderate Signal (> 10 dB fade margin) • 0 LEDs On: Weak Signal (< 10 dB fade margin)
Serial Port	--	Standard female DB-9 (RS-232) connector. This connector can also be used for RS-485 and RS-422 connections.
Config (Configuration) Switch	--	The Config Switch provides an alternate method for entering into Command Mode. To enter Command Mode at the module's default RF data rate, hold the Configuration Switch down for two seconds. See **Appendix G**.
Reset button	--	**Single press:** Performs the equivalent of a power cycle. **Press and hold:** Resets device configuration settings to factory defaults (factory reset).
Power Connector	--	7-28 VDC power connector (center positive, 5.5/2.1mm)

Appendix G: Model XT Serial Modem (WDS Remote Unit) Switch Settings

The following are the DIP Switch settings for the Remote Unit. Power must be cycled for the changes to take effect.

Impulse Link DIP Switch Settings
(Switch settings are applied only while powering on.)

■ = On (up)
□ = Off (Down)

Standard Factory Default   Omnipulse DDC Factory Default

Serial Interface Switches 1 & 2

TX/RX Mode Switches 5 & 6

1 2
■ □ = RS-232

■ ■ = 2-wire RS-485

■ □ = 4-wire RS-485/422

□ ■ = Restore Defaults

RS-485/422 Termination

(Optional) Switches 3 & 4

3 4
□ ■ = 2-wire RS-485 Termination

□ ■ = 4-wire RS-485 Termination

□ ■ = None   ■ □ = Not Used

5 6
■ ■ = Multipoint – Base

■ □ = Multipoint – Remote

■ □ = Point-Point

■ ■ = User Defined

Magnetek   P/N 140-10426

RS232

| | 1 | 2 | 3 | 4 | 5 | 6 |

ON ↑

■ = On (Up)
□ = Off (Down)

RS485 (4-Wire)

| | 1 | 2 | 3 | 4 | 5 | 6 |

ON ↑

■ = On (Up)
□ = Off (Down)

RS485 (2-Wire)

| | 1 | 2 | 3 | 4 | 5 | 6 |

ON ↑

■ = On (Up)
□ = Off (Down)