Magnetek Material Handling
IMPULSE® • LINK 4.1 WDS

Wireless Diagnostic System

Instruction Manual

MAGNETEK
MATERIAL HANDLING
Electromotive

December 2005
Part Number: 140-10330
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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 4.1Wireless Diagnostic System(WDS)or operating the IMPULSE®•G+/VG+ Series 2, IMPULSE®•G+/VG+ Series 3 , and/or IMPULSE®•P3 Series 2 Variable Frequency Drives (VFD).
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

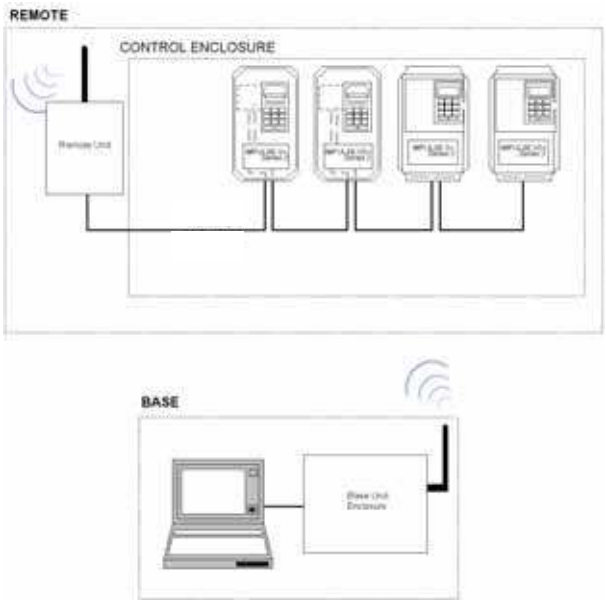
IMPULSE•LINK 4.1 WDS is a user friendly, Windows® based, interactive drive communication software and wireless hardware package. It is designed specifically for wireless communication between Magnetek's IMPULSE•G+/VG+ Series 2, IMPULSE•G+/VG+ Series 3, IMPULSE•P3 Series 2 drives and your PC or company-wide network.

IMPULSE•LINK 4.1 WDS consists of:

1. A base unit consisting of a wireless modem hardwired to a PC or 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. As well as, a hardware key that must be present in the computer's USB port to access the drives.



The Wireless Base Unit

Part number: 142-10266
Description: NEMA 4 junction box (12″ x 10″) consists of a 120-volt standard power outlet, Ethernet wireless modem (USB is available as an option), antenna mounted 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′ cross-over cable with Ethernet receptacle.

The Wireless Remote Unit

Part number: 142-10267
Description: NEMA 4 junction box (12″ x 10″) consists of a 120-volt standard power outlet, wireless modem, an antenna mounted to the junction box, and terminal block. Along with the NEMA 4 junction box, the remote unit comes with 50′ of twisted shielded cable to connect the drives to the modem.

Software and Hardware Key

Part number: 144-12386
Description: CD containing the IMPULSE•Link 4.1 WDS software and customer's drive profiles, and the hardware key.

SYSTEM REQUIREMENTS

Supported Drives

IMPULSE•LINK 4.1 WDS supports the IMPULSE•P3 Series 2, IMPULSE•G+/VG+ Series 2 and Series 3 drives. Although the IMPULSE Series 2 drives are supported; a CMG5M communication board (part #140-10261) needs to be installed on each Series 2 drive.

PC Requirements

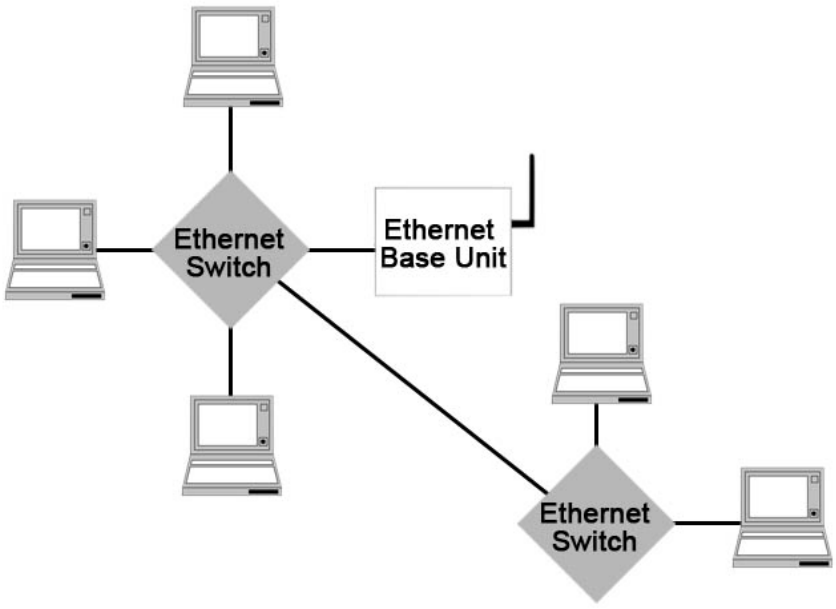
1. Pentium class or equivalent 500MHz processor or better
2. 256 MB RAM or better
3. Minimum of 100 MB free hard-disk space available
4. Windows 98 SE operating system or better

Network Requirements

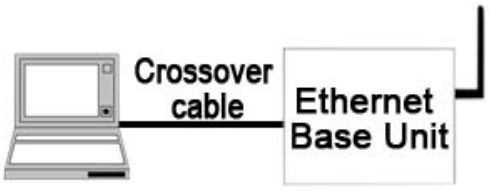
A customer supplied IP address **must** be provided for each base unit. Although multiple users (computers) may have access to the drives on an Ethernet network, only one person can be accessing a particular bay at a time.

The maximum Ethernet cable length between devices is 328 feet. The Ethernet connector type is RJ-45.

Typical Ethernet Network



Single PC Connection



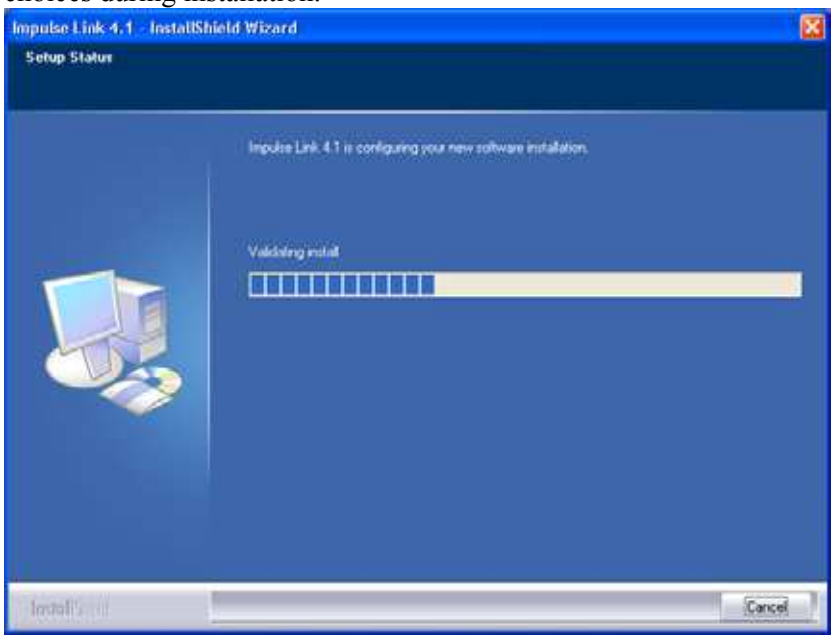
Chapter 2 - Installation

SOFTWARE INSTALLATION

The IMPULSE•LINK 4.1 WDS, consists of the hardware (Remote and Base Unit enclosures), as well as a CD containing the necessary software. The CD contains: the IMPULSE•LINK 4.1 WDS Software, Adobe Acrobat Reader™ for this technical manual, and the communication profiles for the IMPULSE Drives used in your specific application.

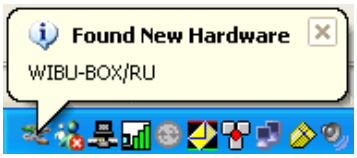
- To run the IMPULSE•LINK 4.1 WDS Setup, put the IMPULSE•LINK 4.1 WDS CD into your CD drive. Run setup.exe from the CD if it does not start automatically.

- Select the default choices during installation.



INSTALLING YOUR HARDWARE KEY

Insert your 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.

Free Updates, Patches

Additional features and bug fixes may be available from time to time. These may be downloaded from the Magnetek Material Handling website at www.magnetekmh.com/mg_support_downloads-software.htm.

Software Removal

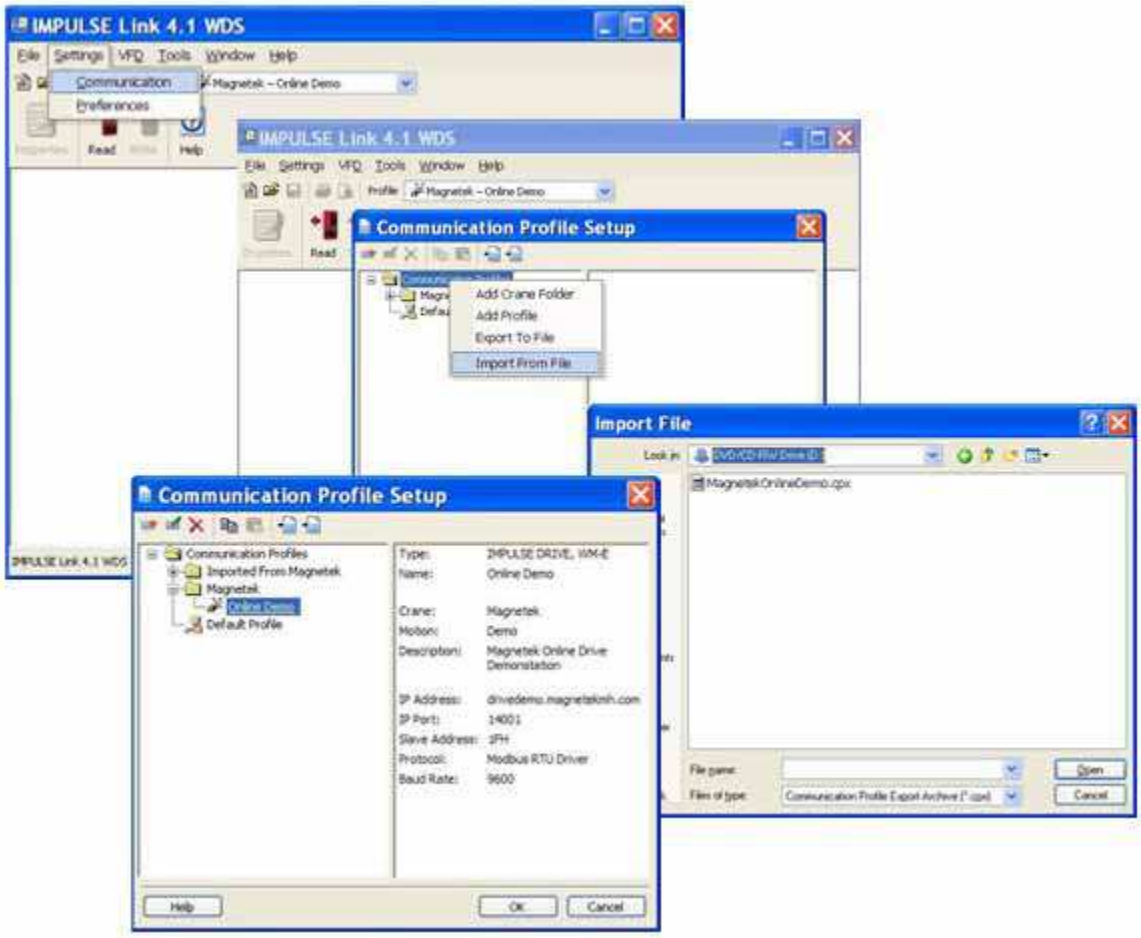
To remove the IMPULSE•LINK 4.1 WDS Drive Interface Software, open the Control Panel's Add/Remove Programs dialog box, double-click the IMPULSE•LINK 4.1 WDS entry and choose Remove All from the IMPULSE•LINK 4.1 WDS Setup dialog box.

IMPORTING YOUR DRIVE PROFILES

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.

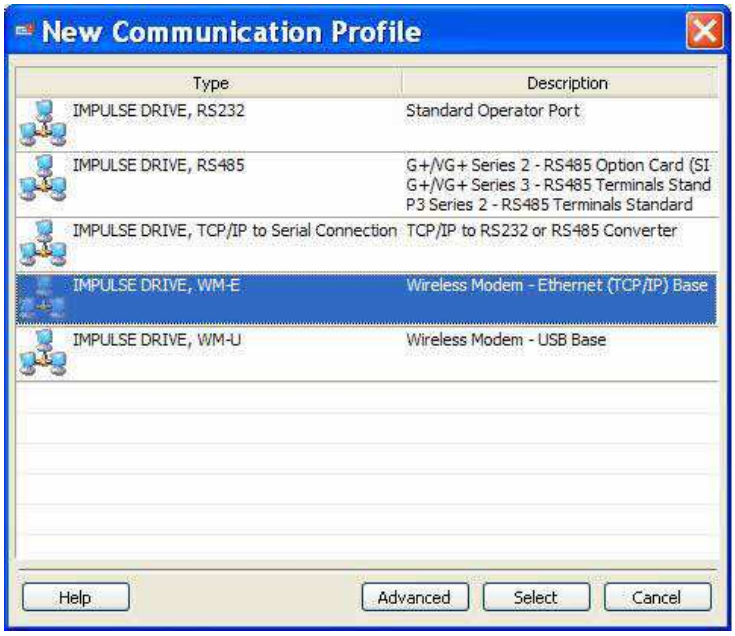
Your drive profiles have been pre-configured for you and reside on the installation CD.
To import the profiles:

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 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.



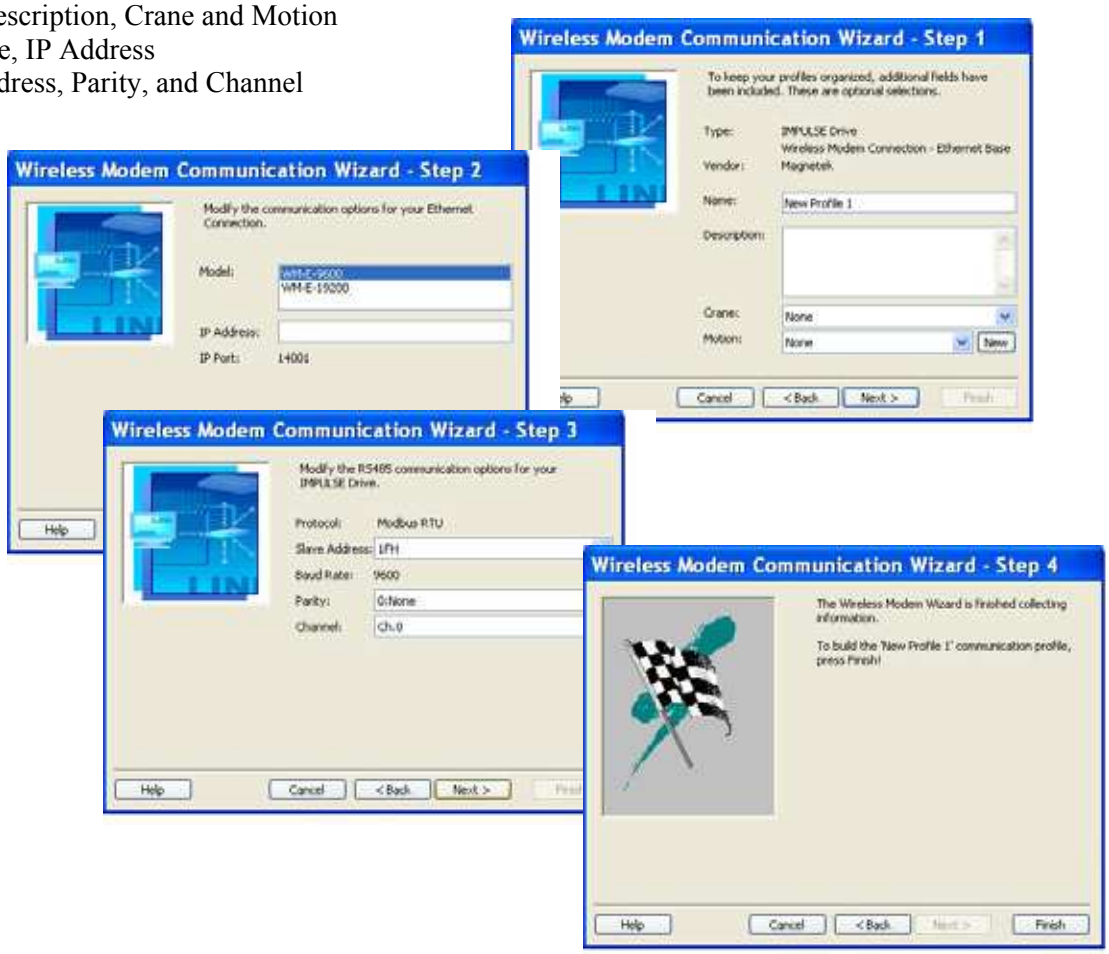
CREATING COMMUNICATION PROFILES USING THE WIZARD

If you need to create a communication profile, there is a wizard to assist you. In the Settings Menu, click "Communication", and then "New". You will then see the following screen appear:



Highlight the IMPULSE DRIVE, WM-E for the standard 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: Baud Rate, IP Address
Step 3: Slave Address, Parity, and Channel
Step 4: Finish



HARDWARE INSTALLATION

Mounting

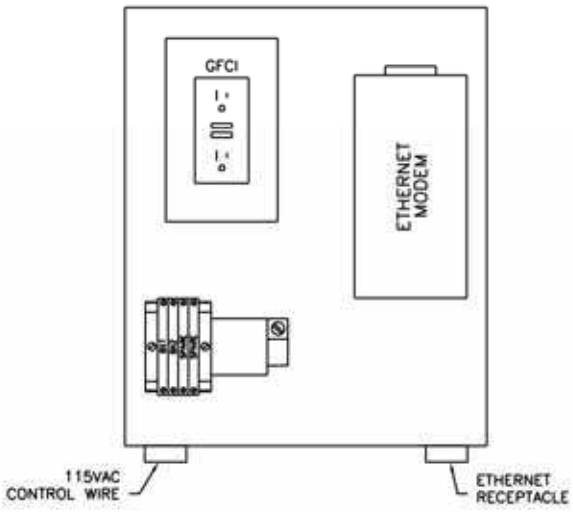
Be sure that the base and remote units are mounted in a location protected against the following conditions:

- Extreme cold or heat. Use within the ambient temperature range of: +14 °F to 113°F (-10 °C to 45°C)
- Direct sunlight (not for use outdoors)
- Rain, moisture
- High humidity
- 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 standard Base Unit contains an Ethernet wireless modem (USB is available by special order). 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′ cross-over 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.



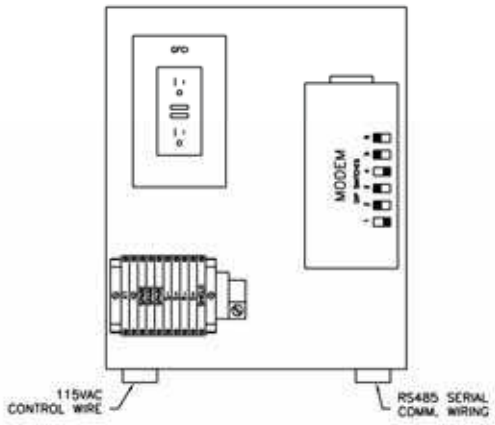
The Ethernet field connector kit (shown below) provides strain relief and can be cut-off from the 6′ cross-over cable and connected to an alternative cable of desired length when connecting to an Ethernet switch or hub.

At the bottom, left 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 right of the enclosure. Ethernet and control power wiring should never be run together.

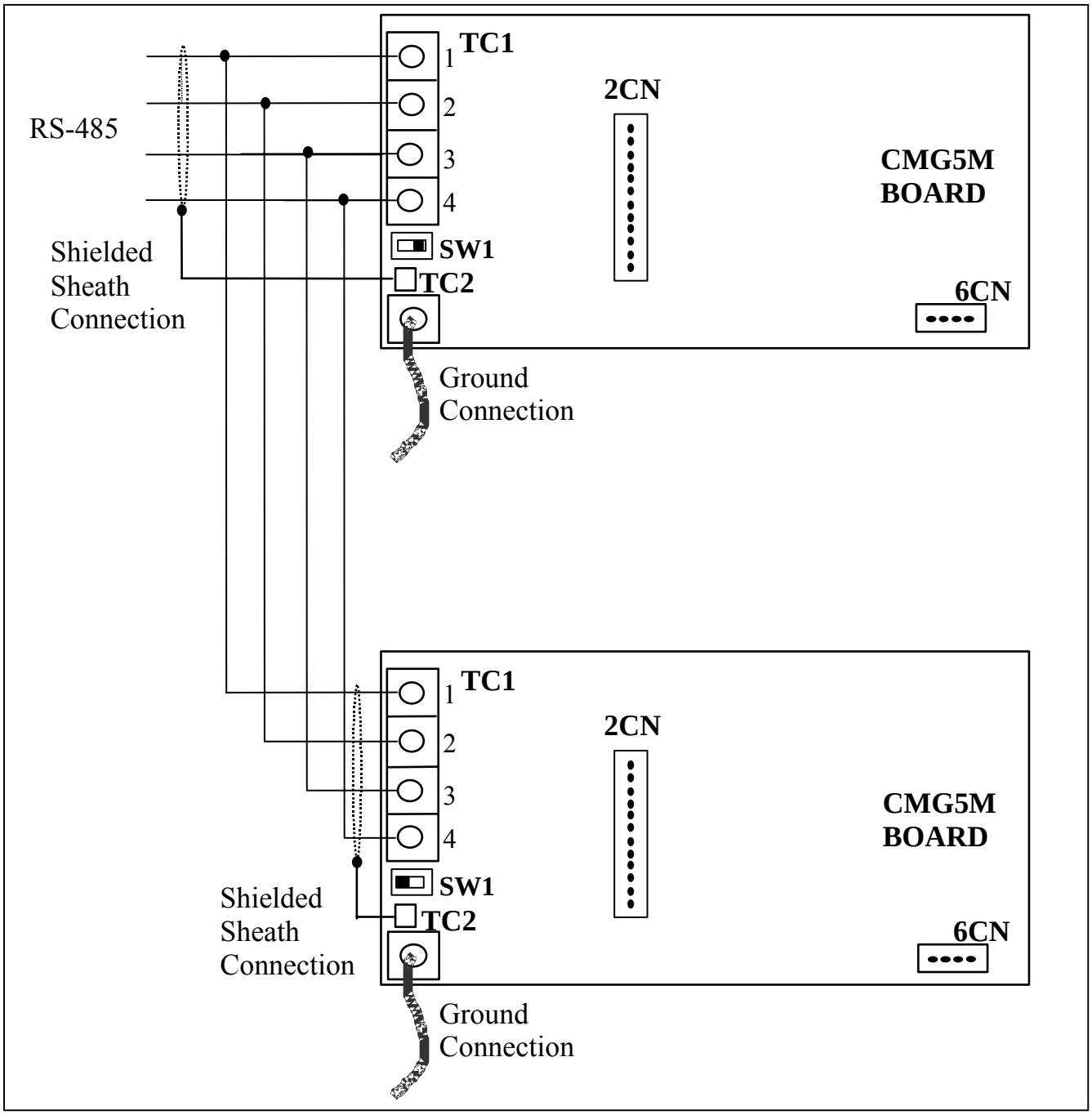
The typical wiring diagram for the Base Unit can be found in Appendix A.

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 for wiring to your drives.



If you are connecting to IMPULSE•G+/VG+ Series 2 drives, each drive requires a CMG5M board. Connect multiple IMPULSE• G+/VG+ Series 2 drives, using terminals 1–4 on the CMG5M board as shown below:



Both the IMPULSE•G+/VG+ Series 3 and IMPULSE•P3 Series 2 drives have RS-485 communication built-in. Therefore, no option board is required on these drives. When wiring the IMPULSE•P3 Series 2 or IMPULSE•G+/VG+ Series 3 drives the serial communication terminals R+, R-, S+, S- are located on the control interface board.

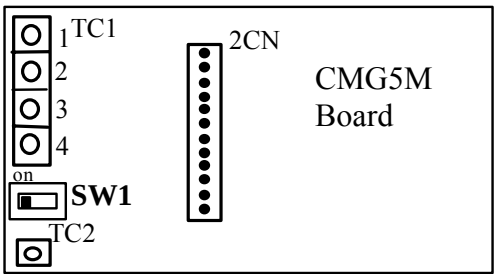
Wiring to the Drives

1. Locate the correct terminals (1–4 on the CMG5M board for Series 2 drives and R+, R-, S+, S- for IMPULSE•P3 Series 2 and IMPULSE•G+/VG+ Series 3 drives).
2. Use the twisted shielded wire provided with your Remote Unit for connecting as indicated in the table below.

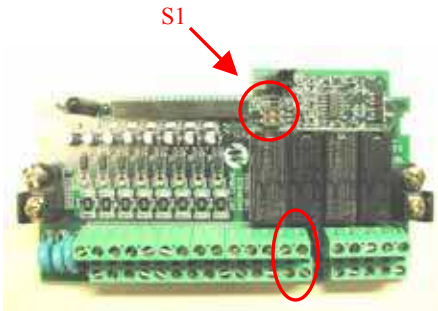
IMPULSE• G+/VG+ Series 2 CMG5M Board Terminals	IMPULSE• G+/VG+ Series 3 and IMPULSE• P3 Series2 Control Terminals	Description	Wireless Remote Unit Terminal Block
1	R+	RS-485/input for parallel connection	R+
2	R-	RS-485/input for parallel connection	R-
3	S+	RS-485/output for parallel connection	S+
4	S-	RS-485/output for parallel connection	S-
TC2	IG	Signal common for shield connection	Shield

3. There is a dipswitch that connects a terminating resistor (approximately 100 Ohms). This resistor should be turned ON, for one-to-one connections or on the last drive, when multiple drives are wired in parallel.

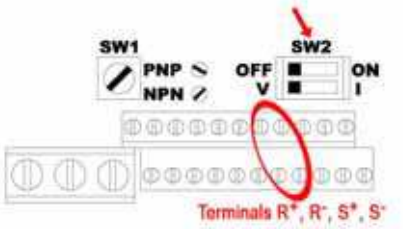
On the IMPULSE•G+/VG+ Series 2 drives, this dipswitch is labeled SW1 and is found on the left side of the board CMG5M (as shown here). Notice the 'ON' position is on the left side of the switch.



On the IMPULSE•G+/VG+ Series 3 drives, the dipswitch is labeled S1 and 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.



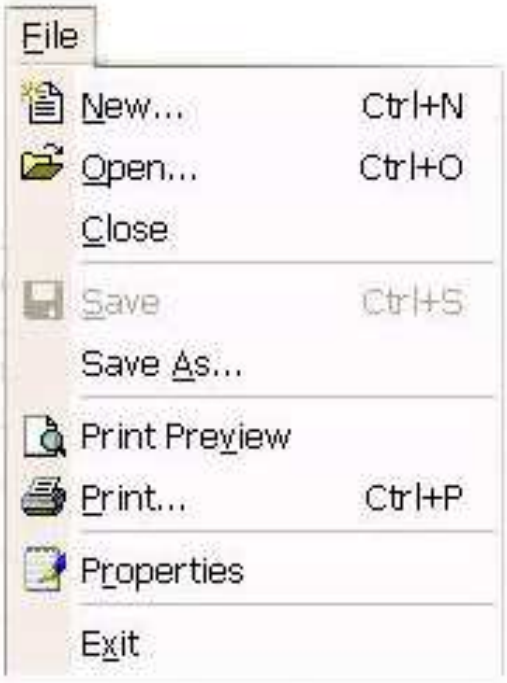
On the IMPULSE•P3 Series 2 drives, the dipswitch is labeled SW2 and is located above the control terminals, RS shown to the right. Notice the 'ON' position SW2 is with the switch to the right side.



A typical wiring diagram for the Remote Unit is shown in Appendix A.

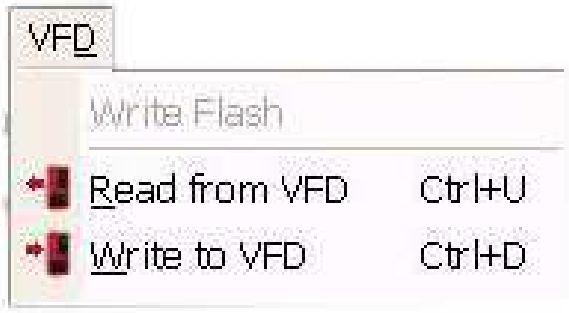
Chapter 3 - Navigation

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.



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.
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.

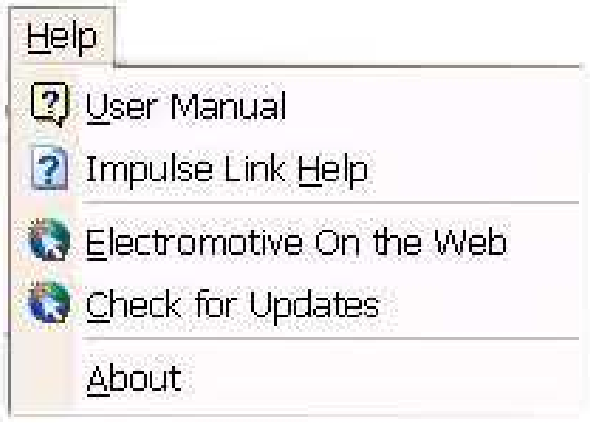
Communication – Allows communication profiles to be added, removed, edited, copied, imported and exported.
Preferences – IMPULSE•LINK 4.1 WDS settings for access level.



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 series).
Compare Parameters - Allows for comparison of sets of 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 organization when in multiple window mode. The functions in the Window menu such as: Cascade, Tile Horizontally and Vertically, Minimize All, and Close All, function just as they do in other Microsoft Windows-based applications.

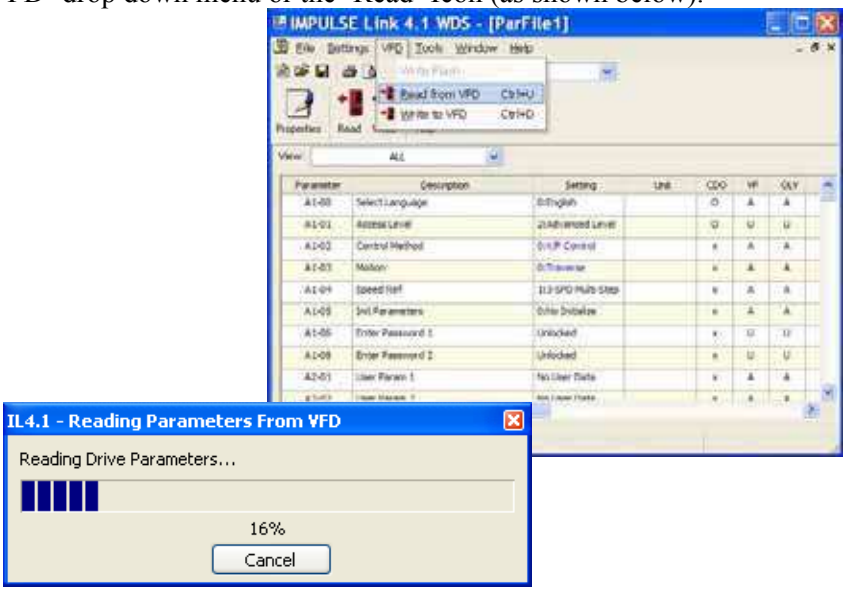


Users Manual – Displays the User Manual. (Acrobat Reader must be installed)
IMPULSE LINK Help – Provides information on communication profile settings and troubleshooting, complete Index of VFD fault codes, and a Search function.
Electromotive on the Web – provides a link to the Magnetek Material Handling 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 Electromotive Systems 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 the VFD - 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 - saves all parameter values from memory to the VFD. Again, this can be accomplished via the drop down on the 'VFD' menu or using the 'Write' Icon as shown here. Writing to 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.

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. This can happen for the following reason:.

- 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 / Under Minimum

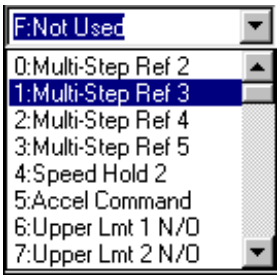
A parameter with **red** text implies that its value is either greater than its maximum value or less than its minimum. An invalid value in the FIF file could result in this error.

MODIFYING PARAMETERS

By double clicking on the row of the parameter you would like to edit, the setting column will appear as a drop-down box, a text box, or a visual programming window.

1. Drop-down list box of parameter setting choices

List box



This will appear for list parameters. Simply select the value from the list and:

- ENTER to accept the change
- ESC to cancel the change

2. Text box for entering a parameter value

Text box

This will appear for numerical parameters.
Simply type in the value of the parameter (in the base displayed) and:

- ENTER to accept the change
- ESC to cancel the change

3. Visual Programming Window (click once on the Visual Programming icon)

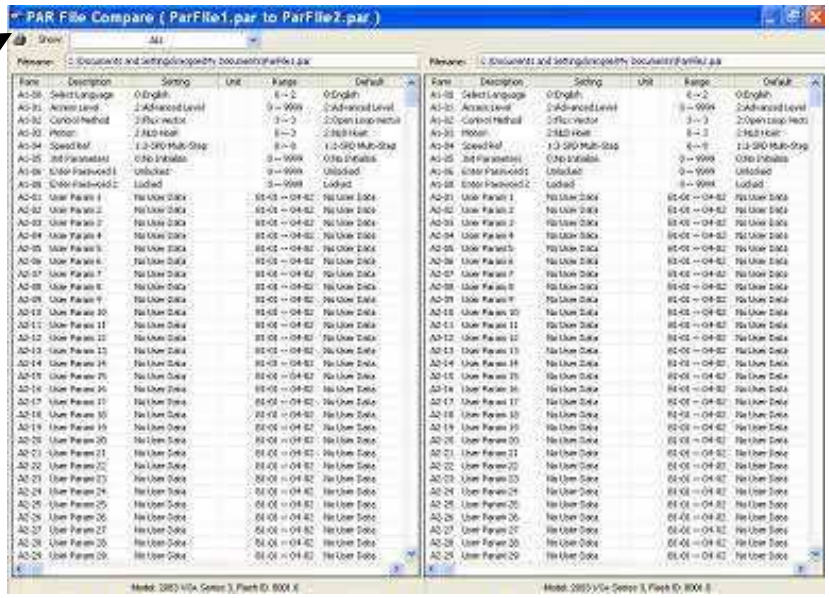
This Visual Programming Window will pop-up for hexadecimal and binary parameter values. The window provides the actual parameter value description, so that you won't need to use the technical manual to translate a hexadecimal or binary value. Simply click the mouse on the table to modify, and then click on the "OK" box or hit enter to accept the change. Click the "Cancel" box or ESC to cancel the change.

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, an appropriate message will be displayed and the value being edited will revert back to what it was before the change.

PARAMETER FILE COMPARISON

The Parameter File Comparison function found in the Tools drop-down menu allows for comparison of sets of parameter files.



The "Show" drop-down allows you to compare:

- all parameters of each file,
- only parameters with different values,
- or only parameters with equal values.

SECURITY / PASSWORD PROTECTION

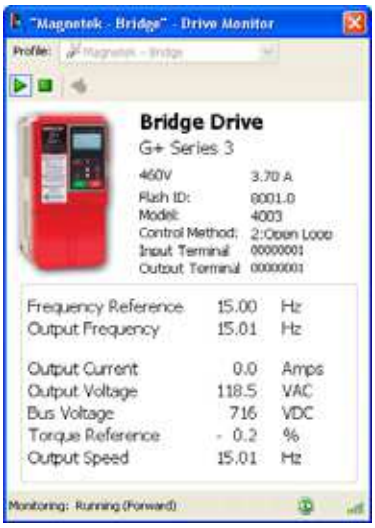
The 'Preferences' drop-down menu in IMPULSE•LINK 4.1 WDS software allows you to set the access level, username and password.

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.



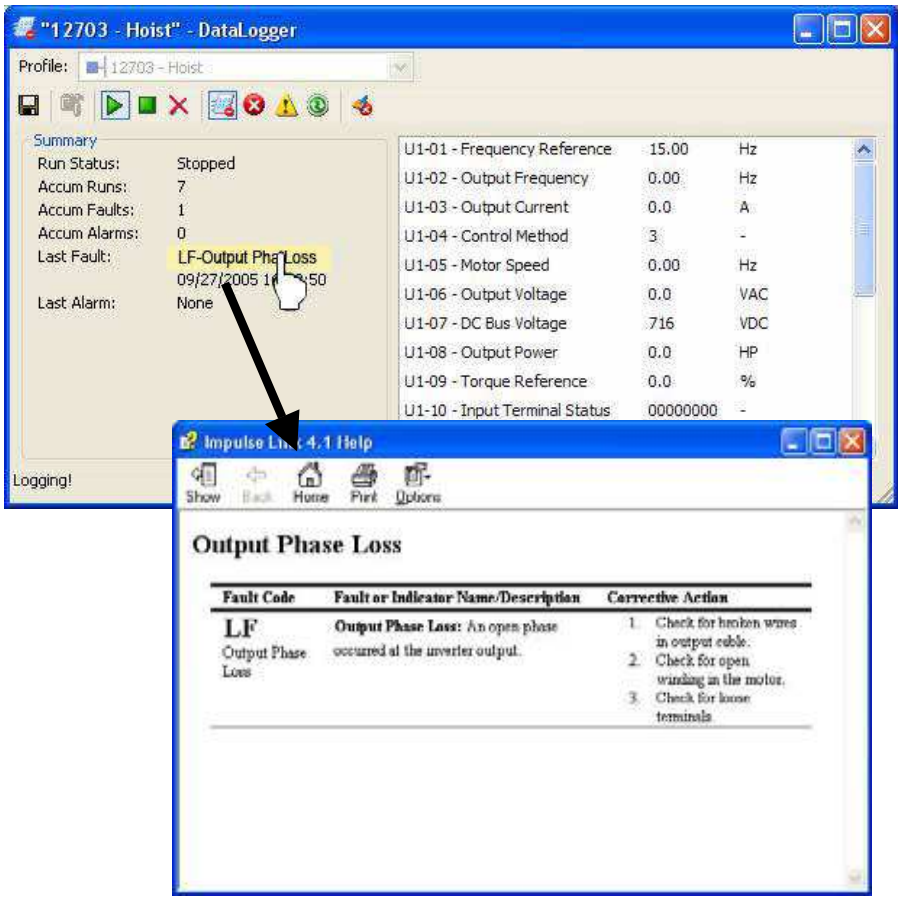
DATALOGGER

Although the DataLogger function also provides monitoring, it is primarily for troubleshooting of your IMPULSE•G+/VG+ Series 2 and Series 3 drives. The DataLogger function allows easy access to the Run, Alarm, and Fault histories. Past events are logged: Last 1400 Run Events, Last 200 Alarm Events, and last 200 Fault Events.

A Trace function allows for viewing drive data that lead to the Alarm and/or Fault condition.

DataLogger files containing the logged events and trace data can be saved, printed, and emailed for additional troubleshooting assistance.

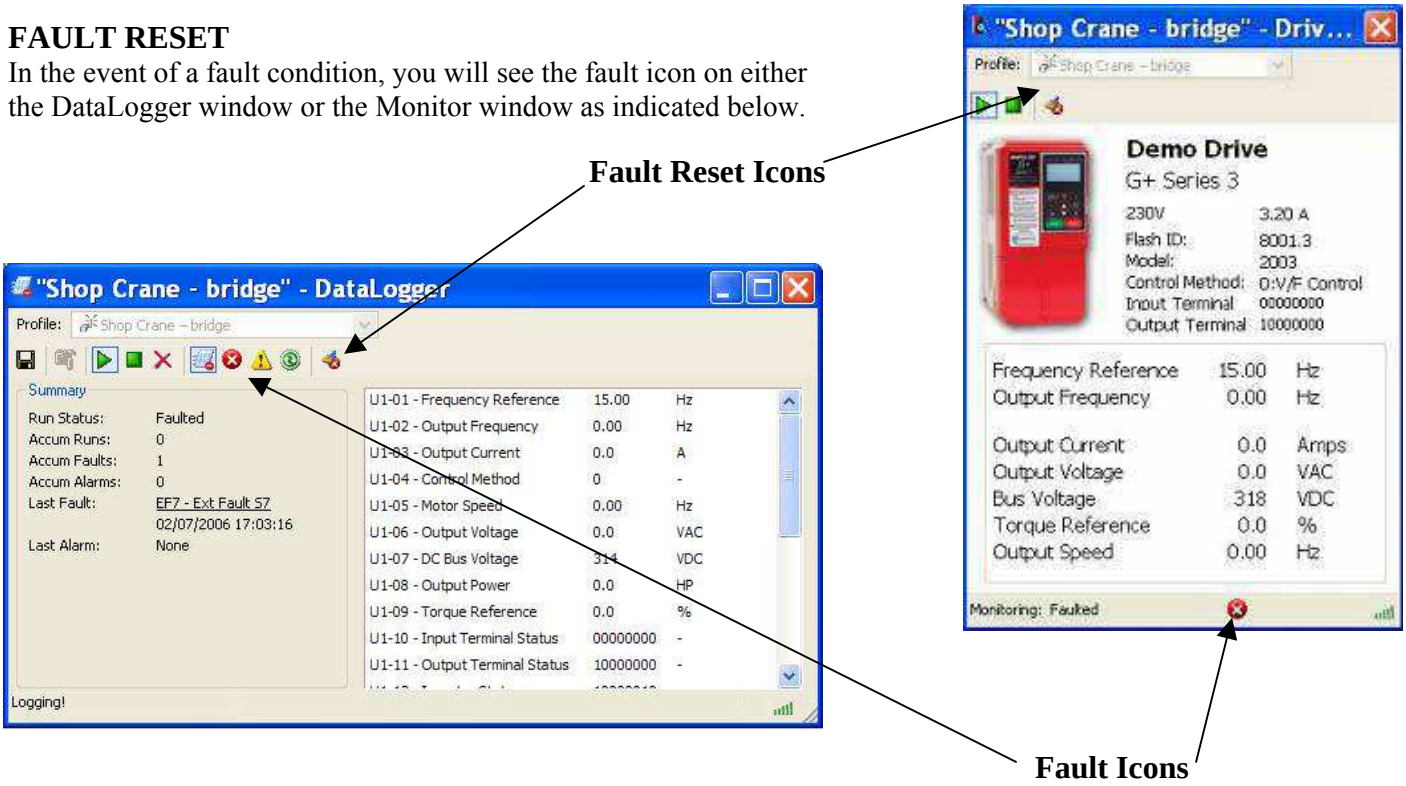
If a Fault or Alarm condition occurs, the DataLogger allows you to click on the Alarm or Fault, and displays troubleshooting information (as shown here).



NOTE: The DataLogger function does not support IMPULSE•P3 Series 2 drives.

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.



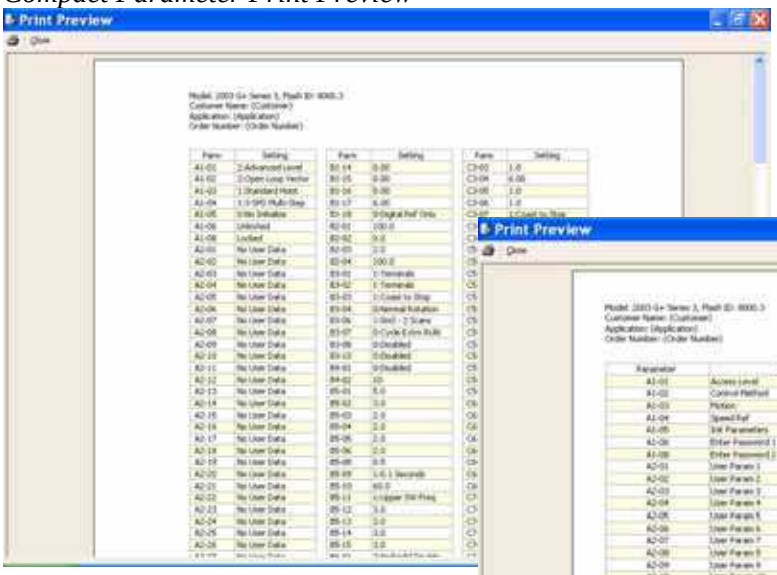
You can reset a fault in the Monitor window or DataLogger window, as long as the drive doesn't have a Run command and the fault condition no longer exists. Once you click on the fault reset icon (as shown above), a warning message will prompt you to accept that you acknowledge the warning. When resetting 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.

Chapter 6 - Additional Menu Features

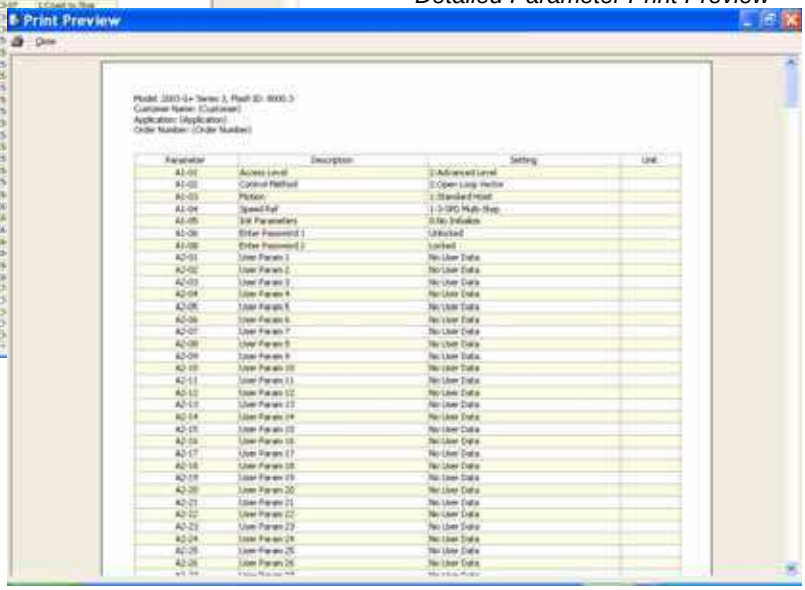
PRINT PREVIEW

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.

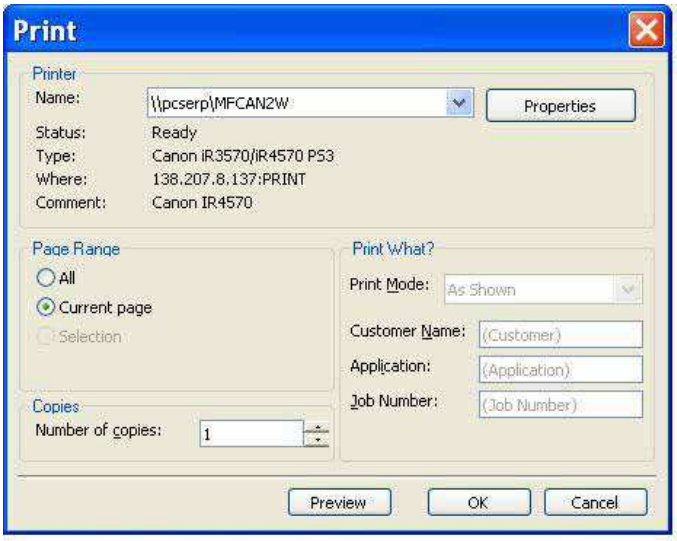
Compact Parameter Print Preview



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.

- *Compact* mode (1-2 pages) provides parameter name and setting value.
- *Detailed* mode provides parameters, descriptions, setting, values and units as well as 'modified' information.
- *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.

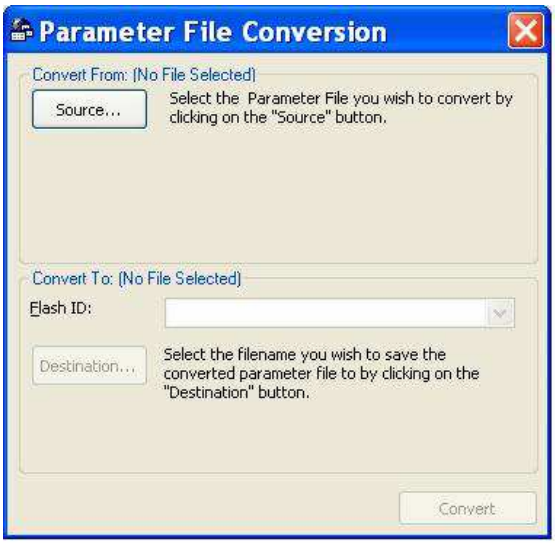
Cancel – Closes this dialog box without printing. Changes to Customer Name, Application and Job Number are **not** saved.

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).

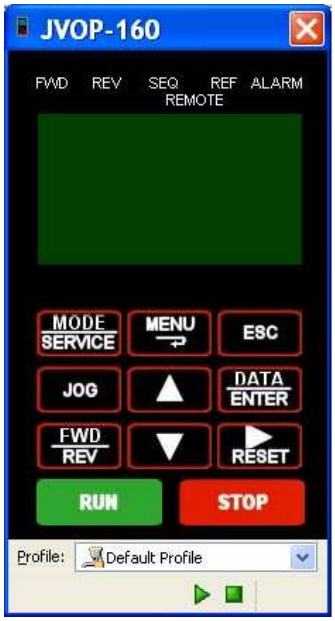


Source – Specifies the file to be converted.

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

Destination Filename – Specifies the Destination filename.

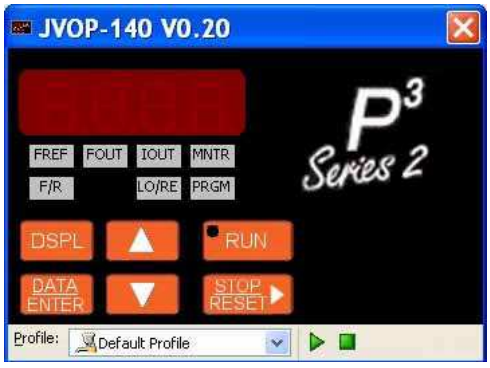
Convert - Converts the parameter file specified in "Source" to the format specified in the software version in the Flash ID. The converted file is saved to the filename and path specified in "Destination Filename".



Keypad Simulator – The keypad simulator emulates the P3 Series 2 or Series 2 or 3 keypad which allows for remote keypad menu navigation. **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

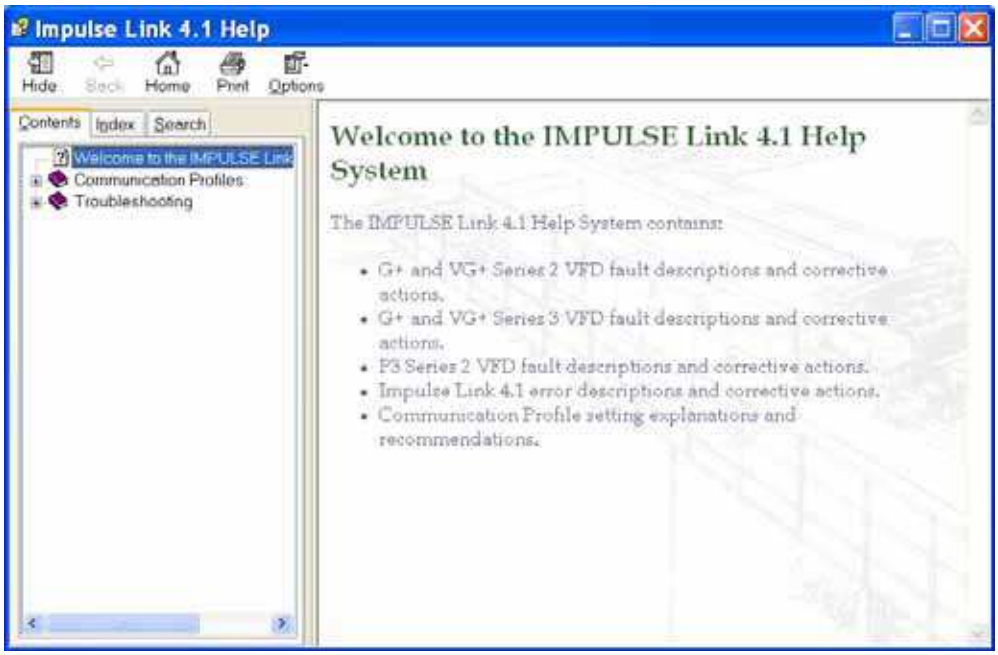
The 'View' drop-down box allows you to select how the parameters are viewed, as shown below (all, modified, or another sub group).

Copy & Paste-

The copy & paste function works just like a Microsoft Windows application. You can highlight multiple rows and/or columns using either the 'shift' key or your mouse and then right click to either copy or print that highlighted area. If you selected 'copy' when the area is highlighted, you can then open another Windows application and paste.

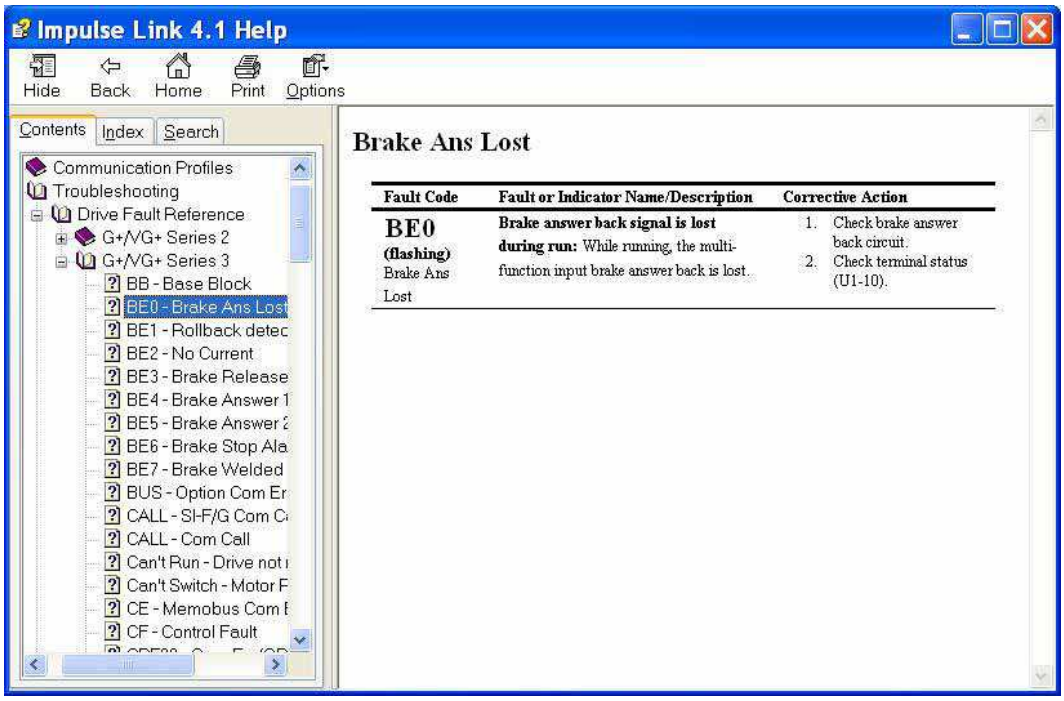
Chapter 7 - Troubleshooting

In the Troubleshooting section of the IMPULSE•LINK 4.1 WDS Help Menu, you can select either Drive Fault References or Error References. The Drive Fault References provide the fault code, description and corrective action for all of the G+/VG+ Series 2 and Series 3 faults and P3 Series 2 faults. Therefore, you will not need to consult your technical manual when you have IMPULSE•LINK 4.1 WDS running. The Error References are communication errors that could occur while running IMPULSE•LINK 4.1 WDS.



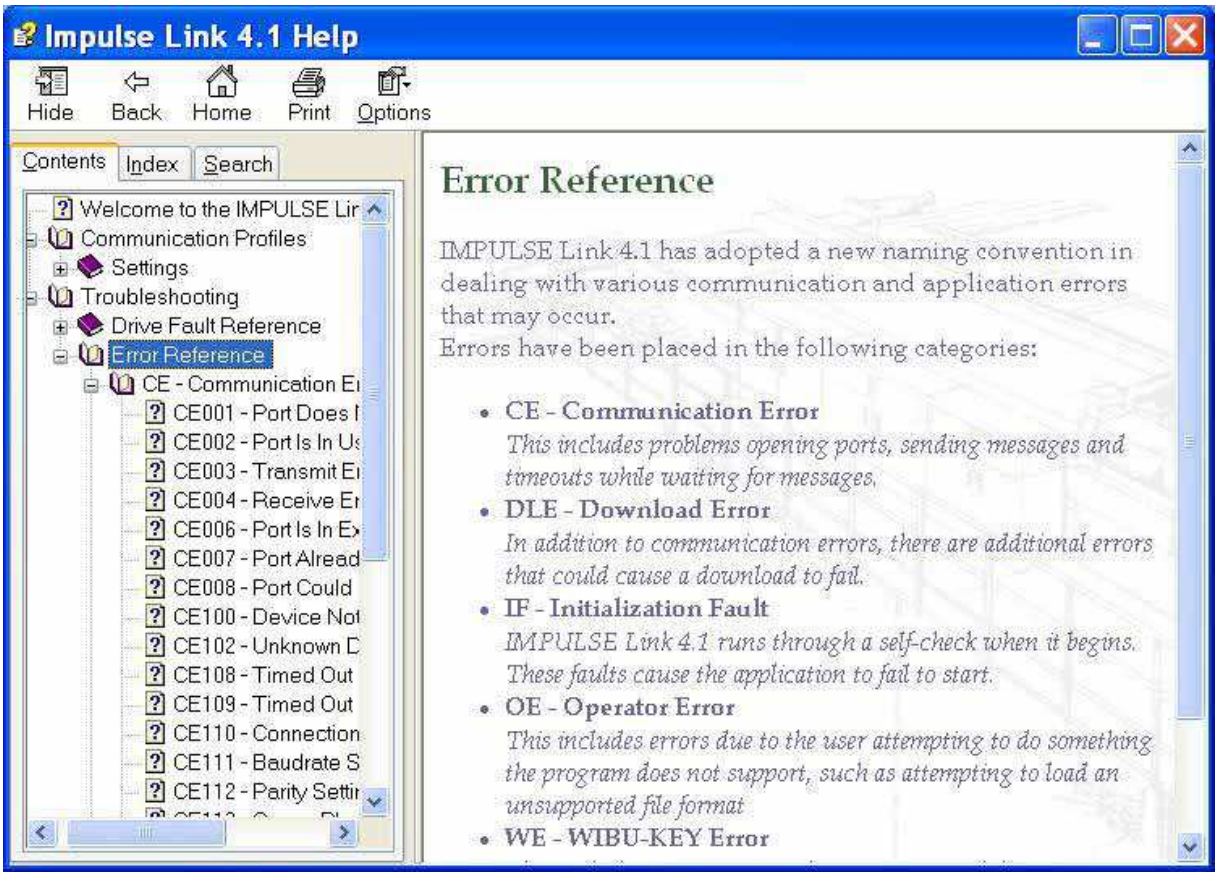
Drive Faults References- IMPULSE•LINK 4.1 WDS offers built-in Help screens for the drive faults and/or alarms. The Help screens provide advanced diagnostics allowing you to troubleshoot your drive from your PC. When you 'click' on the fault, the help screen provides the fault code, fault name/description,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

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

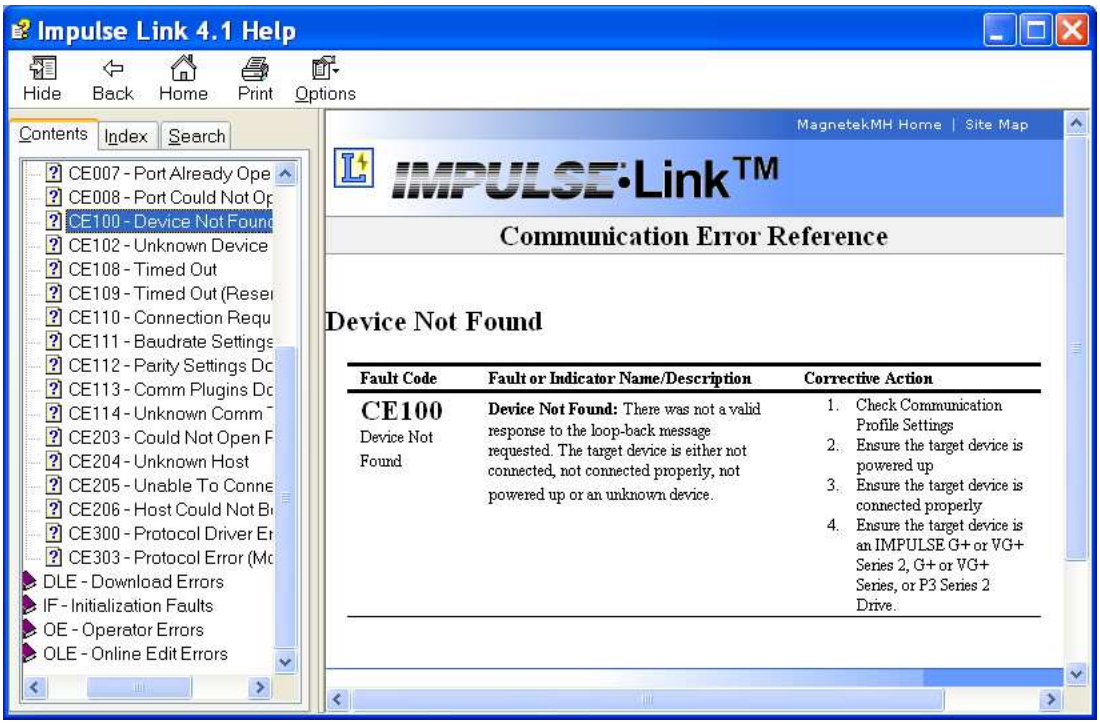


COMMUNICATION ERROR REFERENCES

The Help function provides an overview of the possible errors that could occur while running IMPULSE• LINK 4.1 WDS, as shown here:

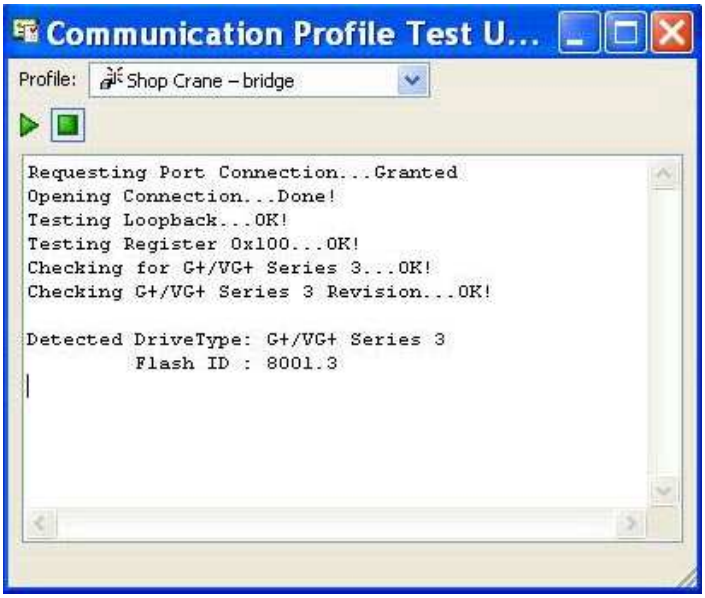


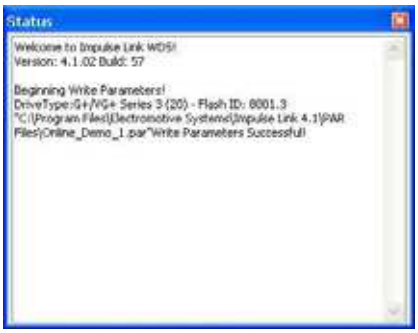
By clicking on the type of error, you will be provided the fault code with description and correction action.



COMMUNICATION PROFILE TEST

The Communication Profile Test Utility provides a loop back test to the drive to determine the status of communication. This function is found in the Tools drop-down menu.

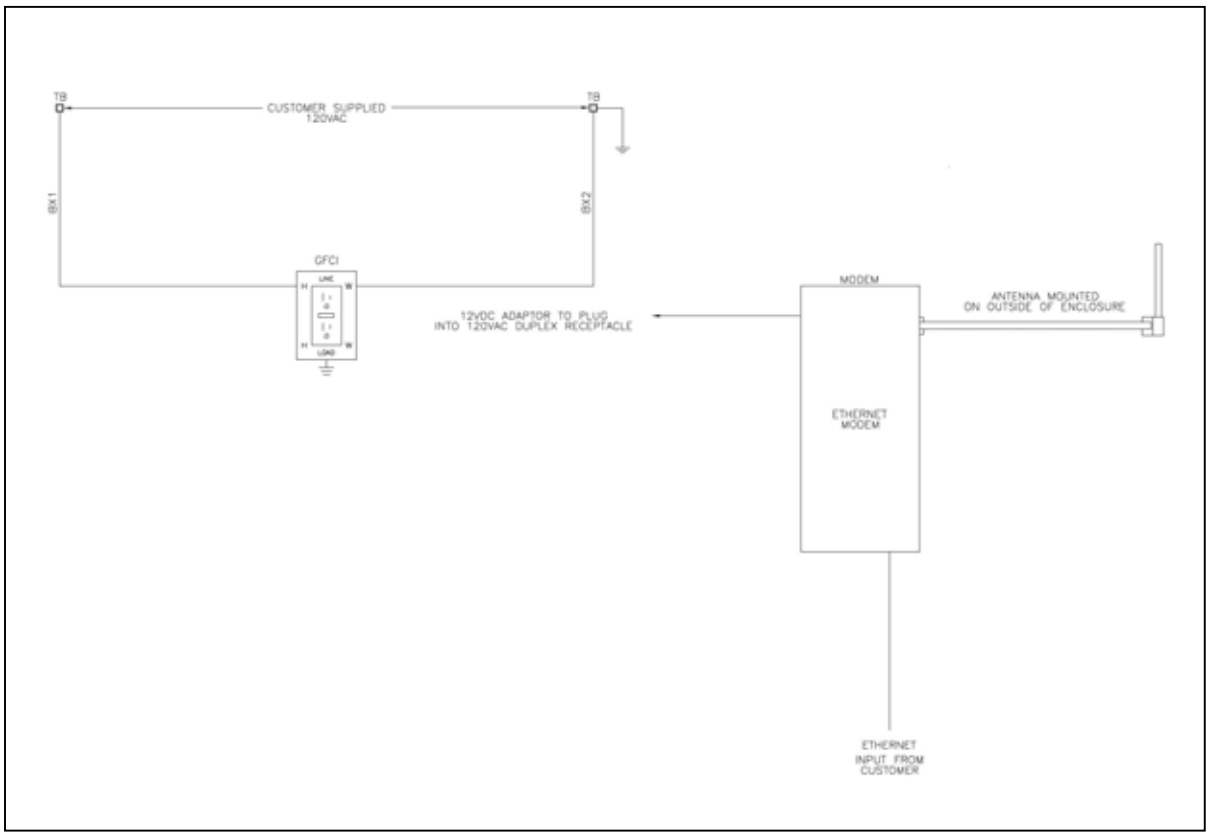
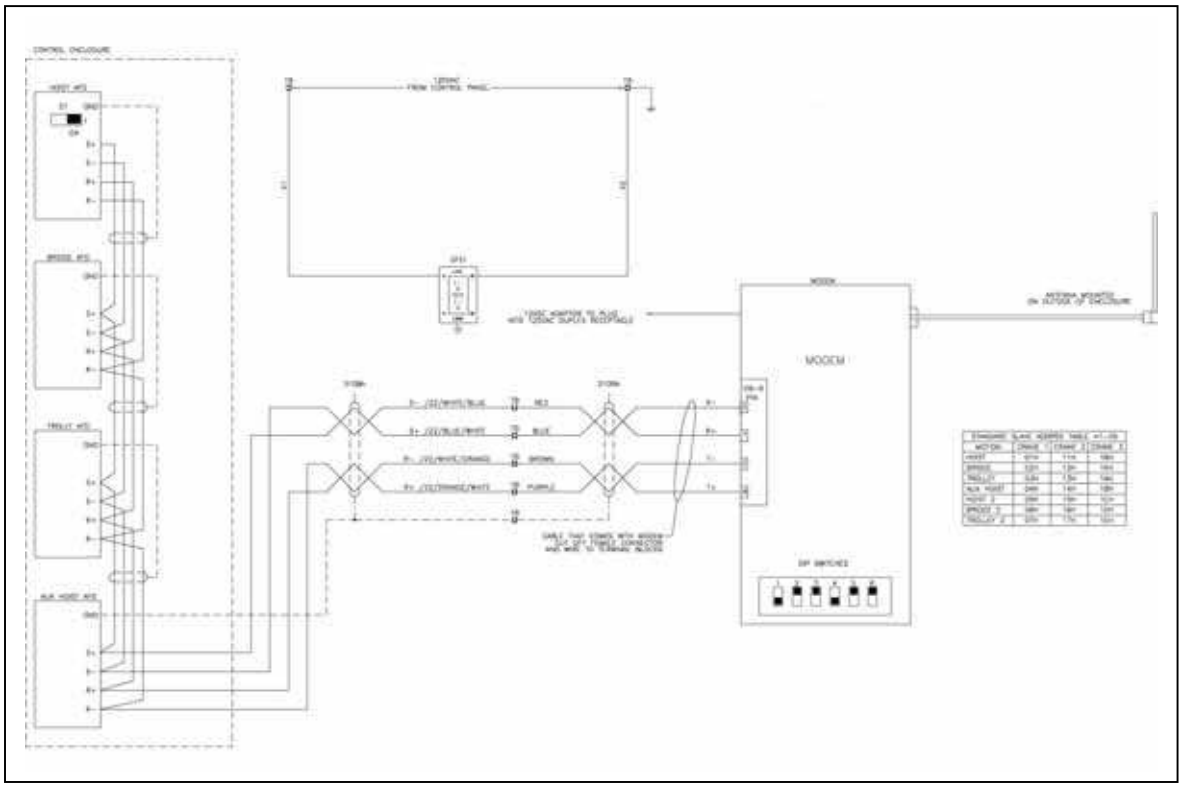




Show Error Log - This function also found in the Tools drop-down menu, brings up an additional window showing the status of IMPULSE•LINK 4.1 WDS.

Appendix A: Typical Wiring Diagrams

Typical Wiring of Base Unit



Typical Wiring of Remote Unit