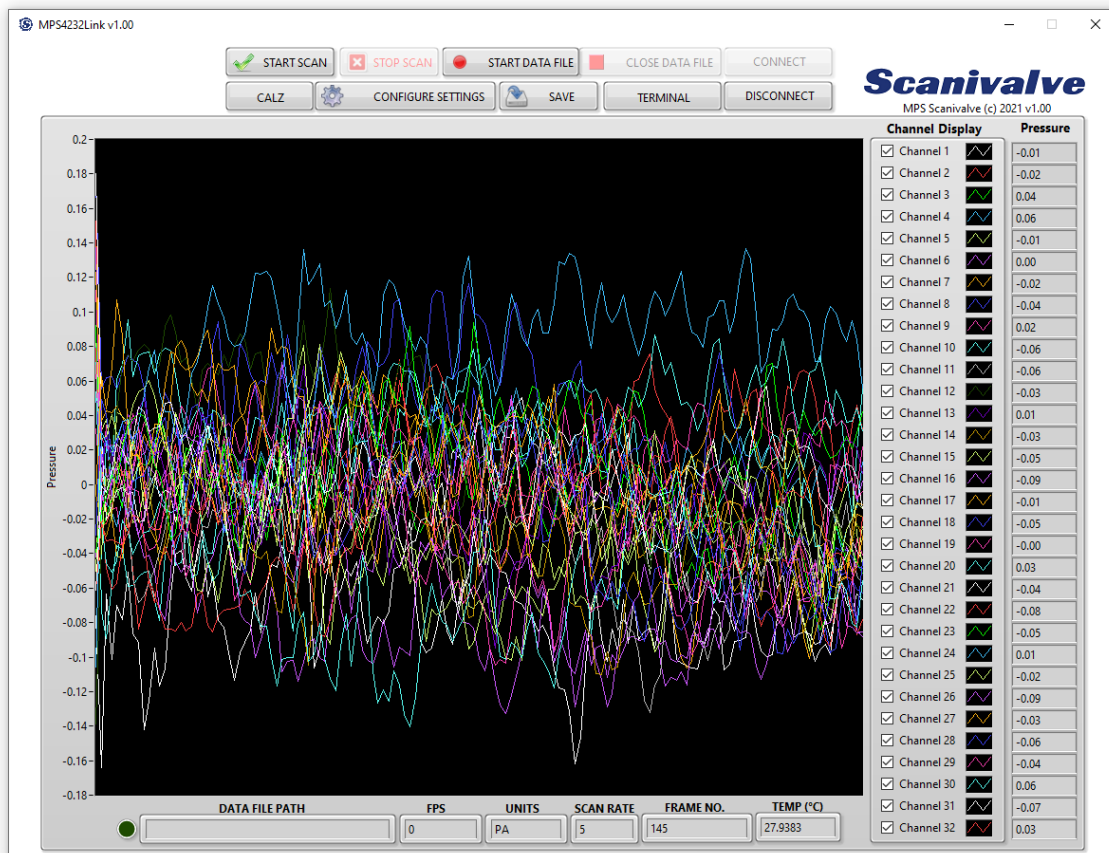


MPS4232LINK

SOFTWARE MANUAL

SOFTWARE VERSION 1.00



Scanivalve

PREFACE

WARNINGS, CAUTIONS, AND NOTES



The WARNING! symbol indicates that danger of injury to persons and the environment and/or considerable damage (mortal danger, danger of injury) could occur if the respective safety precautions are not taken.



The CAUTION! symbol indicates danger to the system and material if the respective safety precautions are not taken.



The ESD note symbol indicates that proper precautions for handling Electrostatic Sensitive Devices need to be taken when performing the related operation. This includes the use of grounded work surfaces and personal wrist straps to prevent damage to sensitive electronic components.

WARRANTY

Scanivalve Corporation, Liberty Lake, Washington, hereafter referred to as Seller, warrants to the Buyer and the first end user that its products will be free from defects in workmanship and material for a period of twelve (12) months from date of delivery. Written notice of any claimed defect must be received by Seller within thirty (30) days after such defect is first discovered. The claimed defective product must be returned by prepaid transportation to Seller within ninety (90) days after the defect is first discovered. Seller's obligations under this Warranty are limited to repairing or replacing, at its option, any product or component part thereof that is proven to be other than as herein warranted.

Surface transportation charges covering any repaired or replacement product or component part shall be at Seller's expense; however, inspection, testing and return transportation charges covering any product or component part returned and redelivered, which proves

not to be defective, shall be at the expense of Buyer or the end user, whomever has returned such product or component part.

This Warranty does not extend to any Seller product or component part thereof which has been subjected to misuse, accident or improper installation, maintenance or application; or to any product or component part thereof which has been repaired or altered outside of Seller's facilities unless authorized in writing by Seller, or unless such installation, repair or alteration is performed by Seller; or to any labor charges whatsoever, whether for removal and/or reinstallation of the defective product or component part or otherwise, except for Seller's labor charges for repair or replacement in accordance with the Warranty. Any repaired or replacement product or component part thereof provided by Seller under this Warranty shall, upon redelivery to Buyer, be warranted for the unexpired portion of the original product warranty.

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARISING

BY OPERATION OF LAW OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND IN NO EVENT SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

In the event of a failure:

1) Notify Scanivalve Corporation, Customer Service Department. Include model number and serial number. On receipt of this information, service data or shipping instructions will be forwarded. This may be transacted by telephone or e-mail.

2) On receipt of shipping instructions, forward the product, transportation prepaid. Repairs will be made and the product returned.

3) All shipments should be made via "Best Way." The product should be shipped in the original packing container or wrapped in protective material and surrounded by a minimum of four (4) inches of a shock absorbing material.

TRADEMARKS ® AND COPYRIGHTS ©

Scanivalve is a registered trademark of Scanivalve Corporation.

Microsoft® Excel® is a registered trademark of the Microsoft Corporation.

LabVIEW® is a registered trademark of National Instruments.

All other brand and product names are trademarks or registered trademarks of their respective companies.

PACKAGING FOR SHIPMENT

If the product must be shipped, whether being returned to Scanivalve or relocated to another location, it must be packaged properly to minimize the risk of damage. The recommended method of packing is to place the instrument in a container, surrounded on all sides with at least four inches of shock attenuating material such as Styrofoam peanuts.

IMPORTANT NOTICE

Please note that the product specifications and other information contained in this manual are subject to change without notice. Scanivalve Corporation makes an effort and strives to provide complete and current information for the proper use of the equipment. If there are any questions regarding this manual or the proper use of the equipment, contact Scanivalve Corporation.

CONTACT INFORMATION

If there are any questions or concerns regarding any Scanivalve product, please do not hesitate to contact us at the following:

Scanivalve Corp.
1722 N. Madson Street
Liberty Lake, WA 99019
Telephone: (800)935-5151 (509)891-9970
Fax: (509)891-9481
scanco@scanivalve.com
www.scanivalve.com

Scanivalve Corporation is an ISO 9001:2015 certified company.

TABLE OF CONTENTS

PREFACE	IV
Warnings, Cautions, and Notes	iv
Warranty	iv
Trademarks ® and Copyrights ©	v
Packaging for Shipment	v
Important Notice	v
Contact Information	v
 SECTION 1: SPECIFICATIONS	 2
General Specifications	2
 SECTION 2: INTRODUCTION	 3
MPS4232Link Overview	3
 SECTION 3: INSTALLATION	 4
Overview	4
Download	4
Install	4
Restart	4
 SECTION 4: OPERATION	 5
Overview	5
Connecting	6
Status Bar	6
Channel Display and Selection	7
Action Buttons	7
 APPENDIX	 10
Appendix A: VI Descriptions	10
Appendix B: Software Change Log	11

SECTION 1: SPECIFICATIONS

GENERAL SPECIFICATIONS

Minimum System Requirements:

- Windows 10 (64-bit)
- LabVIEW Runtime Engine 2022 *(requires 64-bit OS)*
- 2 GB RAM
- 1.5 GB Hard Drive Free Space
- 1920x1080 Screen Resolution ***(recommended)***

MPS4232 Software version Requirements:

- 1.00 and higher

Maximum Scan Rate:

- 1000Hz (Samples/Channel/Second)

Expected Data Format:

- SIM 0 - Standard 32 channel packets
- FORMAT B L - LabVIEW Binary Packet

Number of MPS Scanners Supported Per Instance:

- 1

Allowable number of Instances:

- Dependant upon network and system limitations

Note: Network limitations may directly affect high-speed data acquisition.

Note: Collecting data to a file at high scan rates can create CSV files too large to open in Microsoft® Excel®.

SECTION 2: INTRODUCTION

MPS4232LINK OVERVIEW

MPS4232Link can be used to configure and collect data from a single MPS4232 series pressure scanner manufactured by Scanivalve Corp. MPS4232Link is intended to be an entry level interface for the MPS scanner, while also serving as a functional LabVIEW® example program.

While using MPS4232Link, certain features of the MPS will be inaccessible or unused for ease of use. If the user wishes to access these features that are not used by the program, the source VIs for MPS4232Link that are included with the download can be modified to meet the end-use requirements.

To utilize the full potential of the MPS4232 scan rate, data is transmitted from the scanner in TCP Binary format and converted from binary to ASCII in real-time by MPS-4232Link. This data can be collected in a file and saved on the host computer, or can be displayed in real-time in the scrolling chart.

For detailed information on the MPS scanner hardware and software, please see the MPS4232 user manual.

Note: This software cannot be used with an MPS4264.

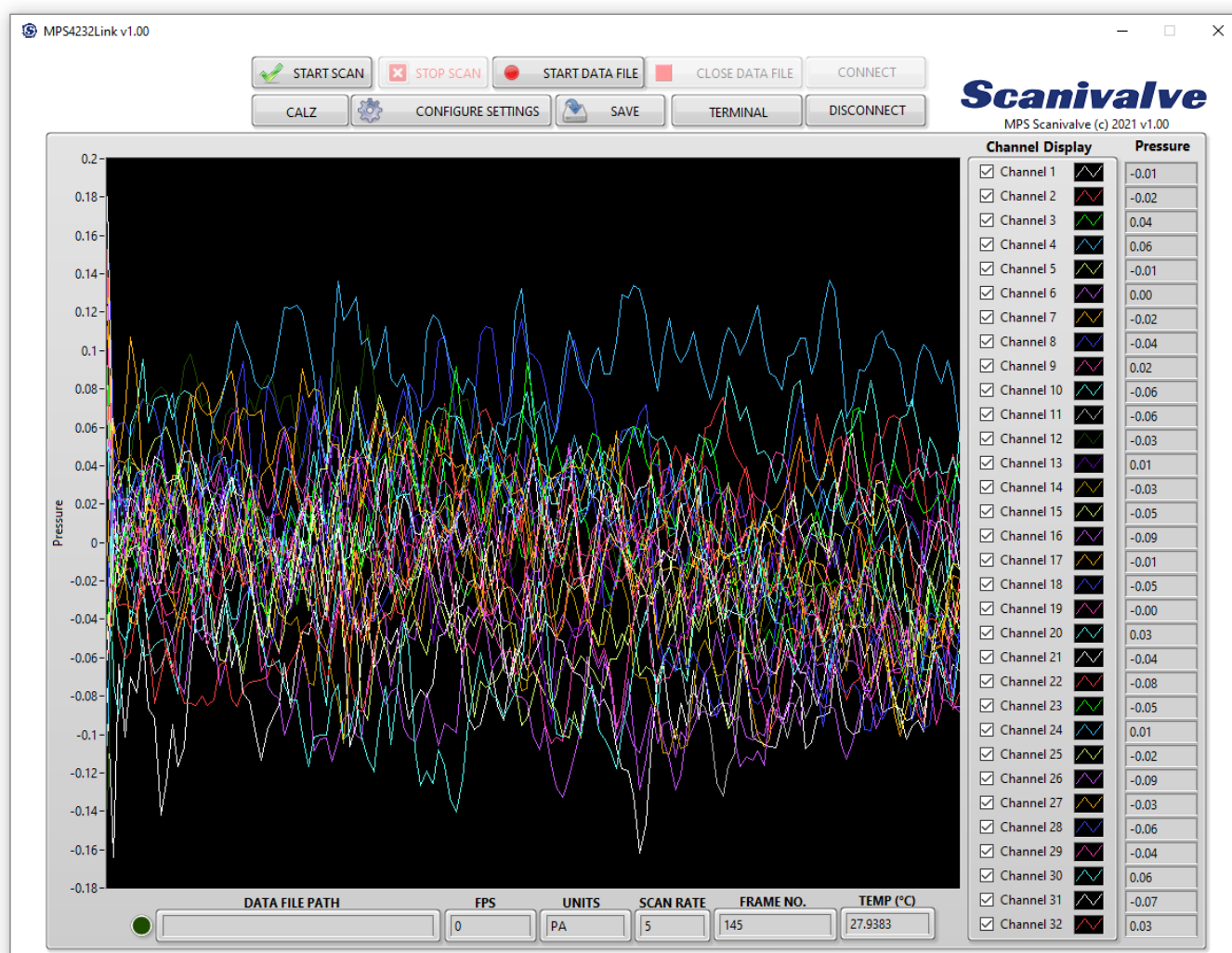


FIGURE 2.1- MPS4232LINK

SECTION 3: INSTALLATION

OVERVIEW

To install MPS4232Link, the software must be downloaded from the Scanivalve website, installed, and the computer rebooted after successful installation. This section covers the entire installation process in detail. If you encounter unexpected difficulties, contact your IT department or Scanivalve Technical Support.

the installer.

DOWNLOAD

MPS4232Link can be downloaded from the Scanivalve website at no charge. Visit www.scanivalve.com/support/software-downloads as shown in Figure 3.1 and select the MPS4232Link download. Download should begin automatically. Note which folder the files are being downloaded to.

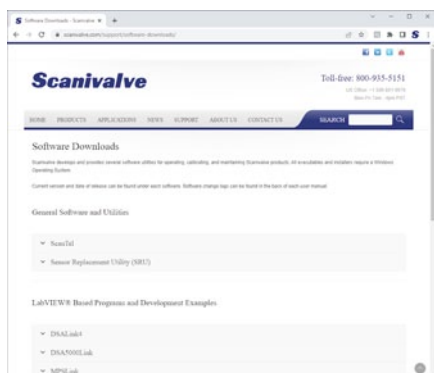


FIGURE 3.1- SCANIVALVE SOFTWARE DOWNLOADS

INSTALL

Once the files are downloaded, navigate to the folder where the downloaded files are located. Navigate through the “installer” folders until you find the MPS4232Link Installer. Run the installation application. Follow the instructions as outlined by the setup wizard.

If the NI LabVIEW Runtime Engine 2022 is not already installed on the computer, this installer will direct you to install it. Follow the wizard to complete the installation.

RESTART

The LabVIEW® Runtime Engine may require that you restart the computer before running MPS4232Link. If the LabVIEW® Runtime Engine is already installed, a restart may not be necessary. When convenient, and before attempting to use MPS4232Link, restart the computer if prompted by

SECTION 4: OPERATION

OVERVIEW

This section explains general operation and proper use of the MPS4232Link software. A compatible Host IP Address and a valid connection is required for the program to run. If an incorrect IP Address is input or the connection is invalid, MPS4232Link will not operate. See “Using a Static IP Address” section of the MPS4232 manual for information on communications and changing the IP addresses to establish a compatible network.

An overview of the MPS front panel is shown in Figure 4.1, and details of each function are included in this section. For details regarding the individual LabVIEW® VIs, see Appendix A.

Note: This software cannot be used with an MPS4264.

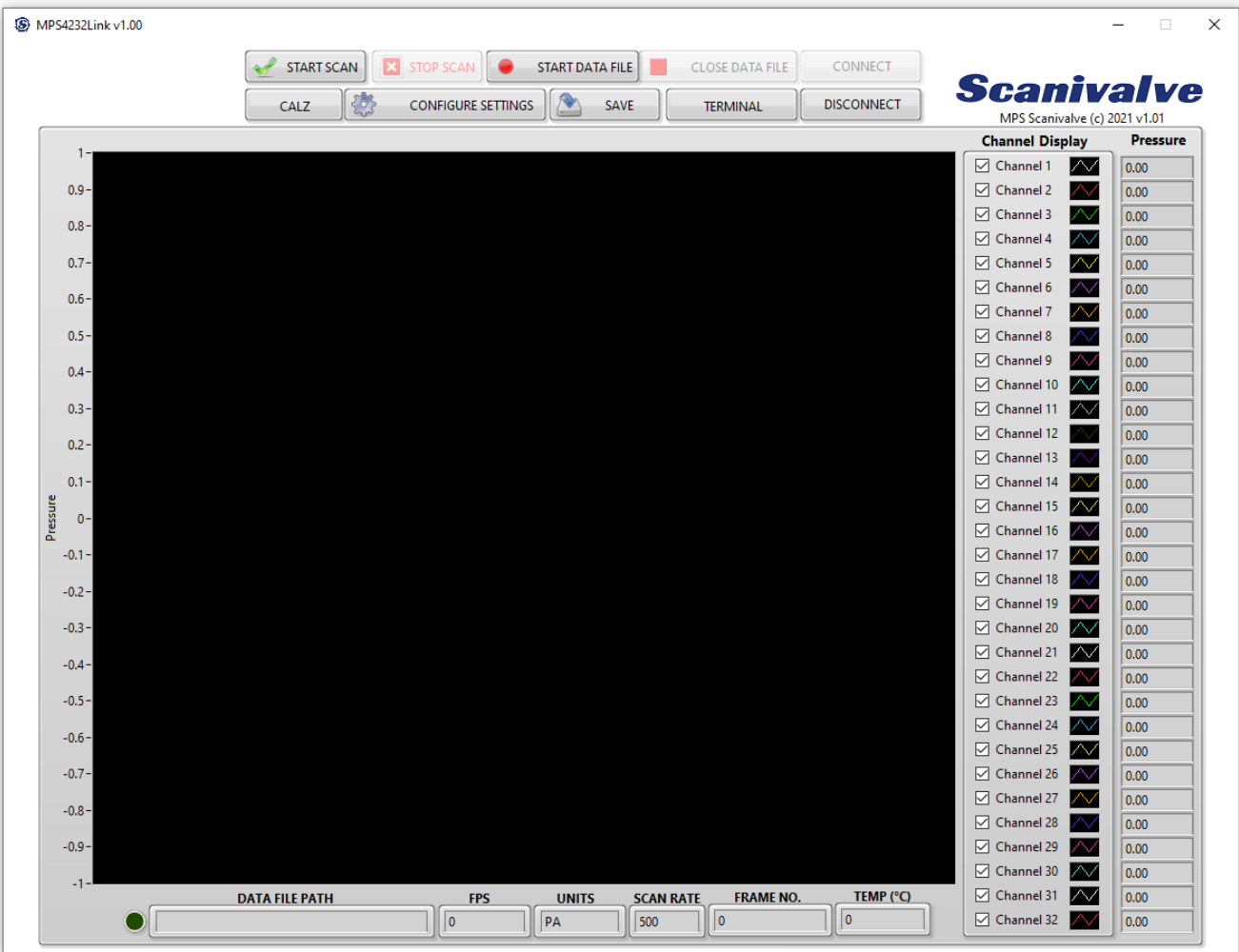


FIGURE 4.1- MPS4232LINK OVERVIEW

CONNECTING

To connect a MPS to MPS4232Link, the MPS must be powered on and allowed to finish booting up which can take up to 32 seconds. Once the MPS has finished the boot sequence, the IP Address of the MPS can be input into MPS4232Link and the connect button clicked.

If you do not input a correct or compatible IP Address, MPS4232Link will not run. If the Cancel button is clicked, the program will close.

The connect screen can be seen in Figure 4.2.



FIGURE 4.2 - CONNECT TO MPS4232

The host computer and MPS must have a compatible IP Address in order to successfully connect. The MPS and host computer must have the first two or three octets of their IP Addresses matching in order to be compatible.

Example of matching the first three octets (recommended):
 Host computer: **191.30.95.100**
 MPS module: **191.30.95.125**
 Subnet: 255.255.255.0

Example of matching the first two octets:
 Host computer: **191.30.1.100**
 MPS module: **191.30.95.125**
 Subnet: 255.255.0.0

The IP address of a Windows 7, 8, or 10 host computer can be changed* under:

Control Panel -> Network and Sharing Center -> Local Area Connection/Ethernet -> Properties -> Internet Protocol Version 4 (TCP/IPv4) -> Properties

* Changing the IP address of the host computer may require administrative rights.

The IP address of the computer can quickly be found using Windows Command Prompt and the command "ipconfig."

Remember that this will show all available network connections, including WIFI and, if applicable, multiple Ethernet ports.

Refer to the appropriate MPS manual for details on changing the IP Address of the MPS scanner.

If the application fails to leave the connect screen, then there is likely an issue with one of the following:

- Host and MPS IP address are non-compatible.
- The MPS is not powered on or booted up.
- The IP Address input in MPS4232Link is incorrect (whether entered wrong, or the IP address of the MPS isn't what was entered or expected).
- There is more than one device on the network using the same IP address.
- The network cable is unplugged.
- A firewall or anti-virus program is preventing a connection to the MPS.
- There is a hardware problem with the scanner.

If you are still unable to connect after troubleshooting the previously mentioned issues, please contact Scanivalve Technical Support.

STATUS BAR

After successfully connecting to an MPS, the status bar will populate with the current settings of the MPS.

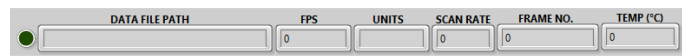


FIGURE 4.3 - STATUS BAR

The following areas are always shown in the status bar:

DATA FILE PATH - This area will show the directory destination where data is being collected. This will only show if the "Start Data File" button has been clicked. When a data file is open and ready to collect data from the MPS, the destination will show, and the green indicator will light bright green.

If the indicator is dark green and the file path is blank, data will not be collected to a file.

FPS - The current FPS setting, or Frames Per Scan, in the MPS module.

UNITS - The current Engineering Unit setting in the MPS module.

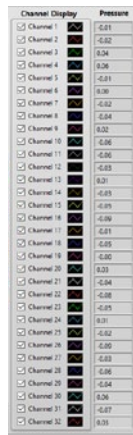
SCAN RATE - The current scan rate setting in the MPS module.

FRAME NO. - When the module is scanning or in SCAN mode, this will show the current frame number in the scan. This value will reset every time a new scan is initiated.

TEMP (°C) - When the module is scanning or in SCAN mode, this will show the current averaged temperature of the module. There are 4 RTD's that make up the average temperature. This value will not update when the module is not scanning.

CHANNEL DISPLAY AND SELECTION

This column will allow you to configure which channels are shown in the scrolling graph area. Each channel will have an On / Off checkbox (checked means on, or will appear in the graph area), the associated color of the line for this channel, and the current pressure value (the units of the value are based on the UNITS setting in the status bar).



Channel Display	Pressure
<input checked="" type="checkbox"/> Channel 1	0.01
<input checked="" type="checkbox"/> Channel 2	0.02
<input checked="" type="checkbox"/> Channel 3	0.04
<input checked="" type="checkbox"/> Channel 4	0.06
<input checked="" type="checkbox"/> Channel 5	0.01
<input checked="" type="checkbox"/> Channel 6	0.06
<input checked="" type="checkbox"/> Channel 7	0.02
<input checked="" type="checkbox"/> Channel 8	0.04
<input checked="" type="checkbox"/> Channel 9	0.02
<input checked="" type="checkbox"/> Channel 10	0.06
<input checked="" type="checkbox"/> Channel 11	0.06
<input checked="" type="checkbox"/> Channel 12	0.03
<input checked="" type="checkbox"/> Channel 13	0.07
<input checked="" type="checkbox"/> Channel 14	0.03
<input checked="" type="checkbox"/> Channel 15	0.09
<input checked="" type="checkbox"/> Channel 16	0.09
<input checked="" type="checkbox"/> Channel 17	0.01
<input checked="" type="checkbox"/> Channel 18	0.05
<input checked="" type="checkbox"/> Channel 19	0.02
<input checked="" type="checkbox"/> Channel 20	0.03
<input checked="" type="checkbox"/> Channel 21	0.04
<input checked="" type="checkbox"/> Channel 22	0.08
<input checked="" type="checkbox"/> Channel 23	0.05
<input checked="" type="checkbox"/> Channel 24	0.01
<input checked="" type="checkbox"/> Channel 25	0.02
<input checked="" type="checkbox"/> Channel 26	0.02
<input checked="" type="checkbox"/> Channel 27	0.03
<input checked="" type="checkbox"/> Channel 28	0.06
<input checked="" type="checkbox"/> Channel 29	0.04
<input checked="" type="checkbox"/> Channel 30	0.06
<input checked="" type="checkbox"/> Channel 31	0.07
<input checked="" type="checkbox"/> Channel 32	0.05

FIGURE 4.4 - CHANNEL DISPLAY AND SELECTION

The values in the Pressure column will only update when the module is scanning.

Note: the graph area will only display 50,000 frames of data before it starts to scroll. This will reset when a new scan is executed.

ACTION BUTTONS

At the top of the screen are the action buttons that will execute actions or bring up additional dialog windows.



FIGURE 4.5 - STATUS BAR

To scan pressure data from the MPS, simply press the Scan button. Upon pressing the Scan button, the MPS will begin scanning at a rate and duration specified by the Scan Settings. The program will display data and/or write to a data file at the rate defined by the scan settings. The bar graph will autoscale to the largest pressure value currently seen by each MPS.

The Stop button is the only button which is not disabled while scanning.

STOP SCAN

Once clicked, this will execute a STOP command and stop any action in the MPS module. Primarily used to stop a scan.

START DATA FILE

The Start Data File button allows a user to log data directly to a .CSV which can be easily opened by Microsoft Excel. Upon pressing the Start Data File button, a window will open prompting the user to name and specify a location to save the file. A data file is not required to start a scan. However, if the data is to be written to a file for analysis, the Start Data File button must be pressed before initiating a Scan. If a data file is already started, the Start Data File button will be disabled.

CLOSE DATA FILE

The Close Data File button will close the currently open data file so a user can access their scan data. If there is no data file open, then MPS4232Link ignores the press of this button. It is recommended to close the data file once you have collected your desired data set.

CALZ

The CALZ button allows a user to perform a zero calibration of the MPS scanner. Upon pressing the CALZ button, the MPS will execute a CALZ command. This command can take up to eleven seconds to execute. A status window will appear when the button is pressed as shown in Figure 4.6, and disappear when the CALZ is complete.

START SCAN

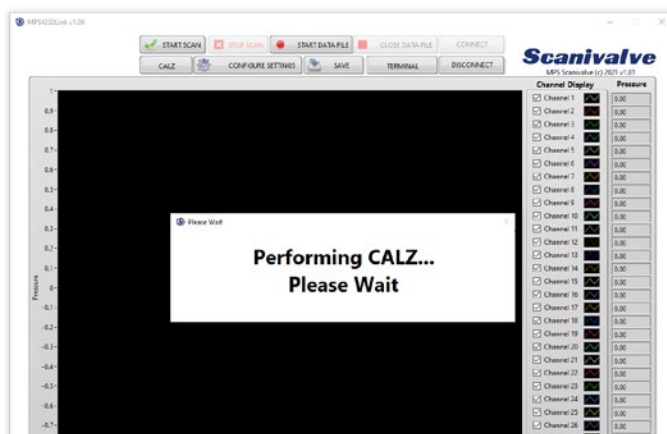


FIGURE 4.6 - CALZ

CONFIGURE SETTINGS

The Configure Settings button will open the Scan Settings window as shown in Figure 4.7. This window allows the user to change the scan rate, frames per scan, and units. When the settings are configured appropriately, simply click the Apply button and then the Close “X” when the settings change is complete. All other buttons are disabled on the home screen when the Configure Settings tab is active.

Also available for configuration are the X and Y scale for the graph area. By default, the AUTOSCALE option is checked.

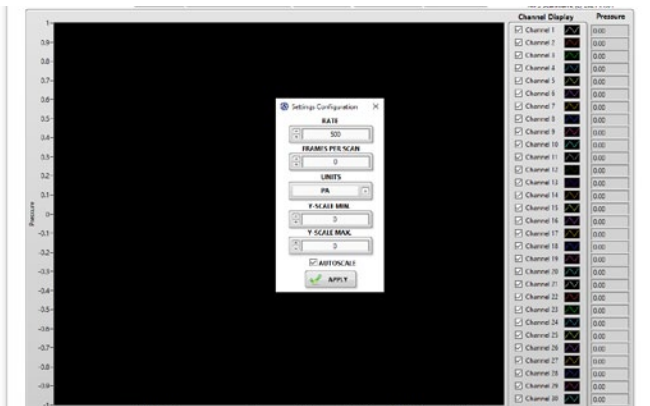


FIGURE 4.7 - SCAN SETTINGS

TERMINAL

This button will open a new dialog window that will provide simply terminal style emulator where ASCII commands can be sent to the MPS module. When a command is entered, press the ENTER key to execute the command. If the command warrants a response from the MPS, it will be displayed in the area below. See figure 4.8 for an example.

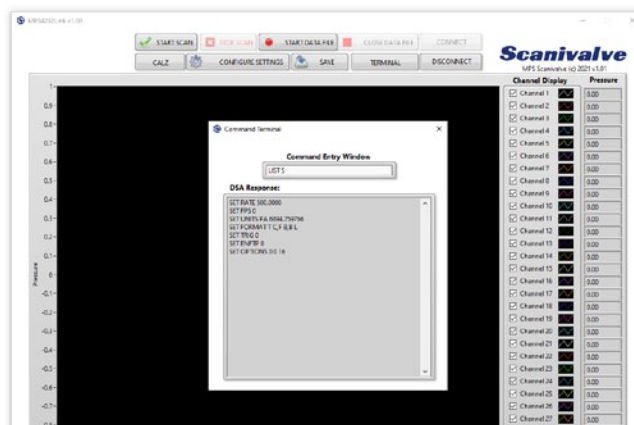


FIGURE 4.8 - TERMINAL

SAVE

The Save Settings button will save the current configuration settings to the MPS. Upon pressing the save button, a warning will appear while the MPS executes the save. The warning will disappear upon completion of the save, and normal operations can resume.

Note: the save can be very fast, so the dialog window may not appear for a long duration of time.

DISCONNECT

The Disconnect button is available on the home screen when all other tabs have been closed and the MPS is not scanning. It is unavailable while scanning and while tabs are open to prevent accidental misuse of the program. It is recommended to Disconnect from the MPS before closing the MPS4232Link application. Pressing the Disconnect button will enable the Connect button should a user wish to reconnect or connect to a different MPS scanners.

[Intentionally Left Blank]

APPENDIX

APPENDIX A: VI DESCRIPTIONS

MPS4232LINK

This is the main VI which calls each of the below VIs. MPS4232Link serves as a basic graphical user interface as well as a functional example program to collect data from the MPS4232 series scanner.

CALZWAIT.VI

This VI is for MPS4232 executable use and features a popup window controlled by the StatusCheck.vi Boolean “Ready?” value letting the user know that the device is performing a CALZ. Create a Boolean Refnum from the “Ready?” terminal of StatusCheck.vi to control this VI. This VI will run until the scanner status returns “STATUS: READY”. Inputs are Error In and Boolean Refnum. Output is Error Out. Used in conjunction with StatusCheck.vi

COMMAND.VI

A VI used to send commands to the MPS4232 scanner over an appropriately established Telnet connection. A hard-coded 25ms delay is built into this VI. Inputs are Error In, Timeout, Command to device, and Connection ID. Outputs are Connection ID and Error Out.

CONFIGURECONNECTMPS32.VI

A VI used to connect to the MPS4232 scanner with error handling letting the user know whether the connection was successful. Read and Write Controls to Automatic Config File.vi is used to remember the previous IP Address that was input when the VI is called. Connect.vi is used to connect to the device over the telnet port (port 23). Inputs are IP Address, and Error In. Outputs are IP Address, Connection ID Out, and Error Out.

CONFIGUREMPS4232LINK.VI

A VI which is used to configure the MPS4232 settings appropriately for use with MPS4232Link. Inputs are Connection ID In, and Error In. Outputs are Connection ID Out, and Error Out.

CONNECT.VI

A VI used to connect to the MPS4232 scanner via the Telnet port (port 23). Inputs are IP Address, Timeout, and Error In. Outputs are Connection ID Out, and Error Out.

DELAY_MS.VI

A VI used to programmatically create a delay in a specific location. Inputs are Error In and Delay(ms). Outputs are Error Out.

DISCONNECT.VI

A VI used to disconnect from the MPS4232 scanner. Inputs are Connection ID and Error In. Output is Error Out.

GETSETTINGS.VI

A VI used to retrieve and parse common MPS4232 settings such as RATE, UNITS, FPS, and VER. Inputs are Connection ID In and Error In. Outputs are RATE, UNITS, FPS, VER, Connection ID Out, and Error Out.

READ AND WRITE CONTROLS TO AUTOMATIC CONFIG FILE.VI

A VI used to recall and save previous or new control values. This VI calls Read and Write Controls to Config File.vi. Inputs are Action, Control References, and Error In. Output is Error Out.

READ AND WRITE CONTROLS TO CONFIG FILE.VI

A VI to be used with Read and Write Controls to Automatic Config File.vi. Inputs are Error In, Control References, Configuration File Reference In, and Action. Outputs are Error Out and Configuration File Reference Out.

READ.VI

A VI used to read Telnet responses from the MPS4232 scanner. This VI is not intended to read data from the MPS scanner over the binary server. Inputs are Connection ID In, Timeout, and Error In. Outputs are Error out, Data Out, and Connection ID Out.

SAVEWAIT.VI

This VI serves no functional purpose outside of being a pop-up window letting the user know that a save is taking place. A 10 second delay is hard coded to allow time for the save to complete. Input is Error In. Output is Error Out.

SETTINGS.VI

A VI used to configure the MPS4232 settings, as well as the graphical interface scaling. This VI Calls Read and Write Controls to Automatic Config File.vi to recall graphical interface settings, GetSettings.vi to get current settings, and Command.vi to change MPS4232 settings. Inputs are Connection ID In and Error In. Outputs are Connection ID Out, Error Out, Autoscale?, Y-Scale Max?, and Y-Scale Min?.

STATUSCHECK.VI

A VI used to query the MPS4232 scanner for “STATUS: READY”. This VI can be used in conjunction with a while loop and stopped once the MPS4232 scanner is “READY”. This VI calls Command.vi to send the Status command, and Read.vi to read the response. Inputs are Connection ID, Timeout, and Error In. Outputs are Connection ID Out, Ready?, and Error Out.

TERMINAL.VI

A VI used to query and configure MPS4232 advanced settings. This VI is similar to a command line interface. This VI calls TerminalReadWrite.vi. Inputs are Connection ID In, and Error In. Outputs are Connection ID Out and Error Out.

TERMINALREADWRITE.VI

A VI used to ensure that unsupported Terminal commands are not used in Terminal.vi. This VI calls Command.vi to send commands, and Read.vi to read responses. Inputs are Terminal Command, Connection ID In, and Error In. Outputs are Connection ID Out, Error Out, and Data Out.

APPENDIX B: SOFTWARE CHANGE LOG

Version 1.00 - Initial Release (May 2022)

Scanivalve

***1722 N. MADSON ST.
LIBERTY LAKE, WA 99019***

***PHONE: 1-800-935-5151
1-509-891-9970
FAX: 1-509-891-9481***

***SCANCO@SCANIVALVE.COM
WWW.SCANIVALVE.COM***

***MPS4232LINK MANUAL
MAY 1, 2023***