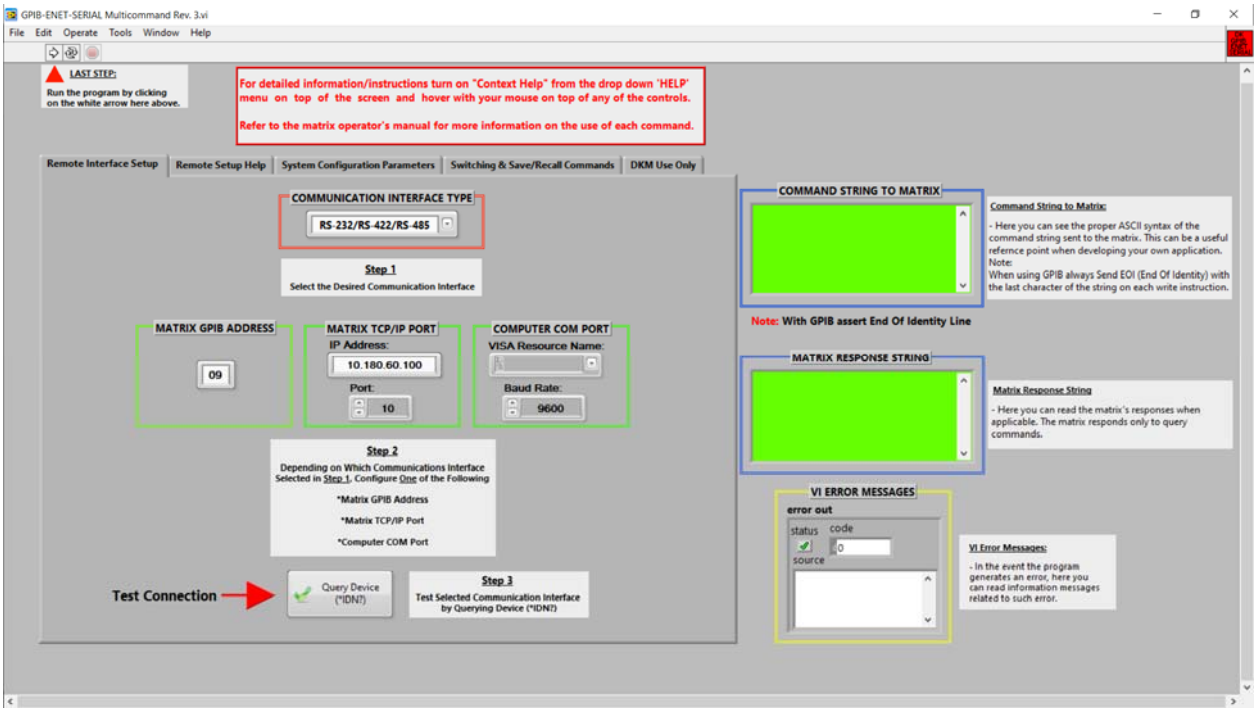
“There Is No Substitute for Experience”

DOW-KEY MICROWAVE
UNIVERSAL MATRIX DRIVER



QUICK START GUIDE

Rev 4

Information in this publication supersedes that in all previously published material. Specifications and price change privileges reserved.

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Manual Revision History

The revision history shown below lists all revisions and addendums created for this manual. The revision level increases numerically as the manual undergoes subsequent updates. Addendums are released between revisions and contain important change information that the user should incorporate immediately into the manual. When a new revision is created, all addendum associated with the previous revision of the manual are incorporated into the new revision of the manual. Each new revision includes a revised copy of this history page.

Revision 1 (Document Number 49101-174) ……. June 2010

Revision 2 (Document Number 49101-174) ……. March 2016

- Added 'Manual Command Line' feature along with 'Read Response?' button

- Added the following new supported commands:
  - ROUTE:SAVEPOSITIONS x
  - ROUTE:RECALLPOSITIONS x
  - ROUTE:POSITIONS?
  - SET:DHCP ON
  - SET:DHCP OFF
  - GET:DHCP
  - SYST:FIRMWARE?
  - SYST:FIRMREV?
  - SYST:TEMPERATUREx?
  - SYST:TEMPTHRx?
  - SYST:TEMPTHRx y

Revision 3 (Document Number 49101-174) ……. January 2017

- Typo in section 1.4. Default name and location was ***'C:\Program Files\GPIB-ENET-SERIAL Multicomand Rev.1'*** should be ***'C:\Program Files\GPIB-ENET-SERIAL Multicomand Rev.2'***

Revision 4 (Document Number 49101-174) ……. December 2020

- Initial Release of ***'GPIB-ENET-SERIAL Multicommand Rev. 3 vi'***

  - Rearranged front panel with 'Tab View' and grouped similar commands

  - Added 'Remote Setup Help' tab

  - Supports up to switch ID 255, was up to ID 20

  - Added 'DKM Use Only' tab for assistance with certain system configuration issues

1 Getting Started

1.1 Introduction

The Dow-Key Universal Matrix Driver is a software program created with National Instruments LabView© 2015 that provides a convenient means to control most Dow-Key RF Switch Matrix products. Excluded are:

- Matrix models that communicate via SNMP
- Matrix models that communicate via customer-specified controls and commands
- Solid State Matrix products

Be sure to read the Operator's Manual of the Matrix model you wish to control in order to understand the various matrix commands available to you.

The installation CD contains two Matrix Driver software programs: one limited to controlling matrices whose internal configuration is of the Dow-Key 4101-10x10 or CB-10x10 model designs, and another with the ability to control a wider product range. The user is encouraged to use the latter, and this guide only addresses the second one.

10x10 Multicommand
This folder contains the source code for the 10x10 software program; its .**exe** subdirectory contains the 10x10 software program executable; and the **Installer** subdirectory beneath .**exe** contains the 10x10 software program's installer, **Setup.exe**.

GPIB-ENET-SERIAL Multicommand
This folder contains the source code for the Multicommand software program; the **.zip** folder **'Executable Rev. 3'** subdirectory contains the Multicommand software program executable; and the **Volume** subdirectory contains the installer, **Setup.exe**.

The source code is provided as a reference from which users may create their own control programs. However, Dow-Key retains its copyright of the source code: the user may not redistribute the source code provided or executable software programs derived from either the source code provided or modifications thereof without Dow-Key's express permission.

1.2 Minimum System Requirements

PC running Microsoft Windows© XP or later version or operating system

1.3 Installation

The Dow-Key '**GPIB-ENET-SERIAL Multicommand Rev. 3'** executable requires the following National Instruments installers:

- NI LabVIEW Runtime 2015 SP1 f9
- NI-488.2 Runtime 15.5
- NI-VISA Runtime 15.5

Running the installer will install all necessary files and the above mentioned runtime engines. The installer can be found at:

…\Universal LabView Driver\Executable Rev. 3\Volume > **Setup.exe**.

1.4 Starting the Dow-Key Universal Matrix Driver

Unless you have specified a different location, the installer will place the executable file in this default location:

C:\Program Files\GPIB-ENET-SERIAL Multicomand Rev. 3

Locate and double click ***GPIB-ENET-SERIAL Multicommand Rev. 3.exe*** to launch the program**.** Once launched, you will notice all settings/controls placed within various tabs which are organized such as to have similar functions grouped together for convenience. For example, all switching related functions are located in the **"Switching & Save/Recall Commands**" tab.

Details for the various tabs are described in the following sections.

2 Remote Interface Setup

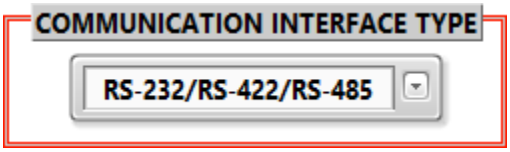
2.1 Introduction

This tab is where the initial communication setup occurs so the user can establish communication with the matrix via Ethernet, Serial, or GPIB. Once the appropriate parameters are set, you can test connectivity to the matrix. The following describes each of the fields that can be configured.

> *Note: When using the driver tool, hovering over certain areas on the screen will display help information. Also, turning on the 'Context Help' will reveal additional information. It can be enabled via the top menu bar at* ***HELP>SHOW CONTEXT HELP.*** *Also via* ***CTRL+H***

2.2 Communication Interface Type Menu (Red)

This drop-down menu allows you to choose the method of communication to use. Available selections are GPIB, Ethernet, and Serial.

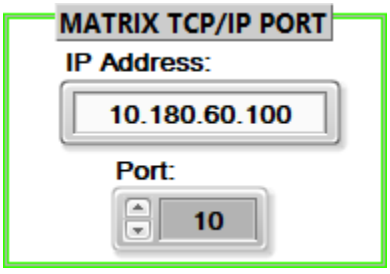


2.3 Matrix GPIB Address (Green)

When using GPIB, here you will enter the GPIB address assigned to the matrix you are trying to control. See matrix operator's manual for help setting/retrieving the GPIB address.

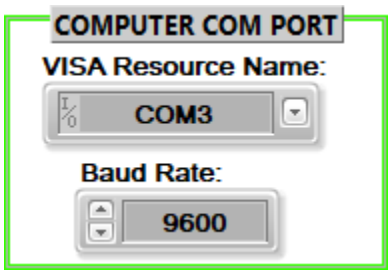
2.4 Matrix TCP/IP Port (Green)

When using Ethernet, here you will enter the IP address & TCP Port assigned to the matrix you are trying to control. See matrix operator's manual for help setting/retrieving the IP address & TCP Port.



2.5 Computer COM Port (Green)

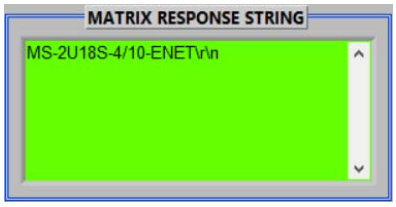
When using Serial, here you will enter the COM port assigned to the matrix you are trying to control. Here you will also enter the baud rate which should match the baud rate set on the matrix (factory default: 9600bps). See matrix operator's manual for help setting/retrieving this information.



2.6 Query Device (Green)

When the above necessary fields have been filled in for the desired communication interface, test the connection by clicking:

followed by  at the top left of the window to execute the *IDN? query. If the query is successful, the matrix will respond with its model name in the 'Matrix Response String' box (Where "\r" stands for carriage return (0×0D) and "\n" stands for line feed (0×0A)):



3 Remote Setup Help

3.1 Introduction

This tab contains reference information for Ethernet connectivity. Depending on the network environment, you may need either a **Straight Thru** or a **Crossover** RJ45 Ethernet cable. The following describes each scenario.

Note 1: There is no functionality associated with this tab.

*Note 2: When using the driver tool, hovering over certain areas on the screen will display help information. Also, turning on the 'Context Help' will reveal additional information. It can be enabled via the top menu bar at **HELP>SHOW CONTEXT HELP.** Also via **CTRL+H***

3.2 Direct: PC to Matrix

This scenario involves a direct connection between the control PC and the Matrix using a **Crossover** RJ45 cable. In this scenario, the user needs to manually assign an IP address on the control PC and Matrix so they are both on the same local network. For example:

Control PC: 10.180.60.1
Matrix: 10.180.60.x *(Where 'x' ≠ 1)*

When changing IP address on the Matrix, cycling the power is required. For help with configuring the IP address on the matrix, see the matrix operator's manual. For other networking help, see your IT department for guidance.

3.3 Network: PC to Matrix thru ENET Switch

This scenario involves a connection between the control PC and the Matrix thru an Ethernet switch using a **Straight** RJ45 cable. In this scenario, the user may still need to manually assign an IP address on the control PC and Matrix so they are both on the same local network. For example:

Control PC: 10.180.60.15
Matrix: 10.180.60.x *(Where 'x' ≠ 15)*

If the Ethernet switch is part of a larger network with a centralized server that assigns IP addresses automatically (DHCP), the server will assign an IP address to the control PC. In order for the Matrix to obtain an IP address automatically from the server, the matrix DHCP setting needs to be turned **ON (Dynamically)**.

When changing DHCP ON/OFF on the Matrix, cycling the power is required. For help with setting the IP address on the matrix, see the matrix operator's manual. For other networking help, see your IT department for guidance.

4 System Configuration Parameters

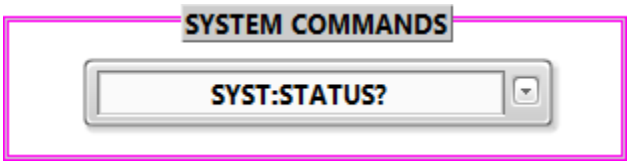
4.1 Introduction

This tab contains system level (SYST:) commands which are used to change configuration of various parameters for the matrix. These parameters are occasionally used and not necessarily needed for normal switching activities. The following describes each function.

> *Note: When using the driver tool, hovering over certain areas on the screen will display help information. Also, turning on the 'Context Help' will reveal additional information. It can be enabled via the top menu bar at* ***HELP>SHOW CONTEXT HELP.*** *Also via* ***CTRL+H***

4.2 System Commands Menu

This drop-down menu allows you to choose the SCPI command to use. Based on which command is chosen, you need to fill in a certain field. See section 4.3 – 4.6 for details on which fields are required for a given SCPI command.



4.3 Set New GPIB Address

This field is used when you want to change the GPIB address. Using commands that end with '?' will query the current setting on the matrix. You can read the response in the 'Matrix Response String' box at the right. The associated commands from the drop down menu are:

- SYST:GPIBADDRESS?
- SYST:GPIBADDRESS x (Power Cycle Required to Take Effect)

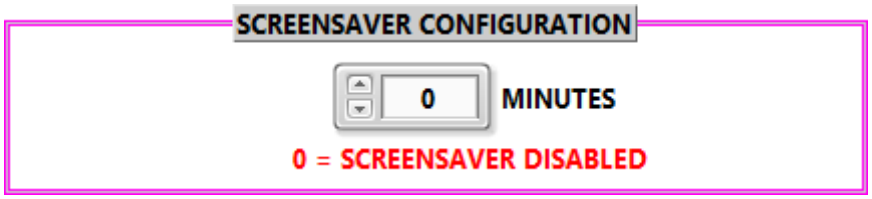
To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator's manual for guidance on using these commands.

4.4 Screensaver Configuration

This field is used when you want to change the Screensaver timeout. Using commands that end with '?' will query the current setting on the matrix. You can read the response in the 'Matrix Response String' box at the right. The associated commands from the drop down menu are:

- SYST:SCREENSAVER?
- SYST:SCREENSAVER x



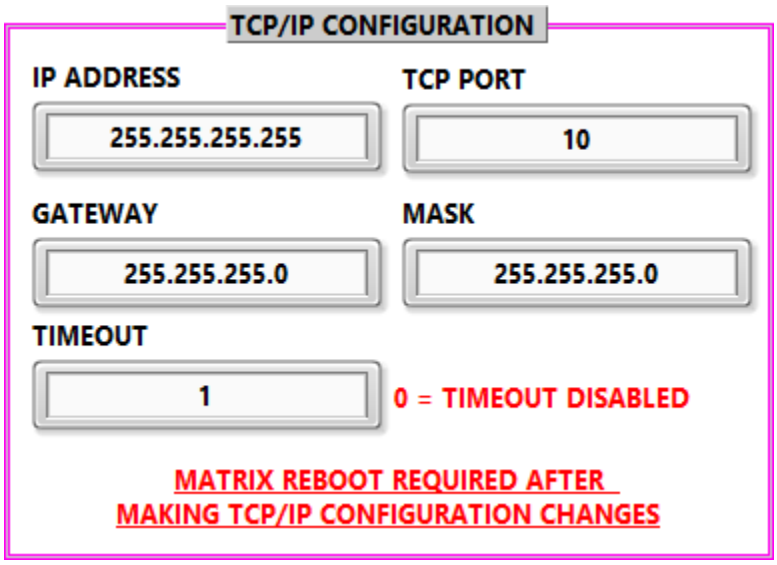
To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator's manual for guidance on using these commands.

4.5 TCP/IP Configuration

This field is used when you want to change various TCP/IP Configurations. Using commands that end with '?' will query the current setting on the matrix. You can read the response in the 'Matrix Response String' box at the right. The associated commands from the drop down menu are:

- SYST:IPADDRESS?
- SYST:IP ADDRESS xxx.yyy.zzz.aaa (Power Cycle Required to Take Effect)
- SYST:TCPPORT?
- SYST:TCPPORT x (Power Cycle Required to Take Effect)
- SYST:GATEWAY?
- SYST:GATEWAY xxx.yyy.zzz.aaa (Power Cycle Required to Take Effect)
- SYST:MASK?
- SYST:MASK xxx.yyy.zzz.aaa (Power Cycle Required to Take Effect)
- SYST:TIMEOUT?
- SYST:TIMEOUT x (Power Cycle Required to Take Effect)



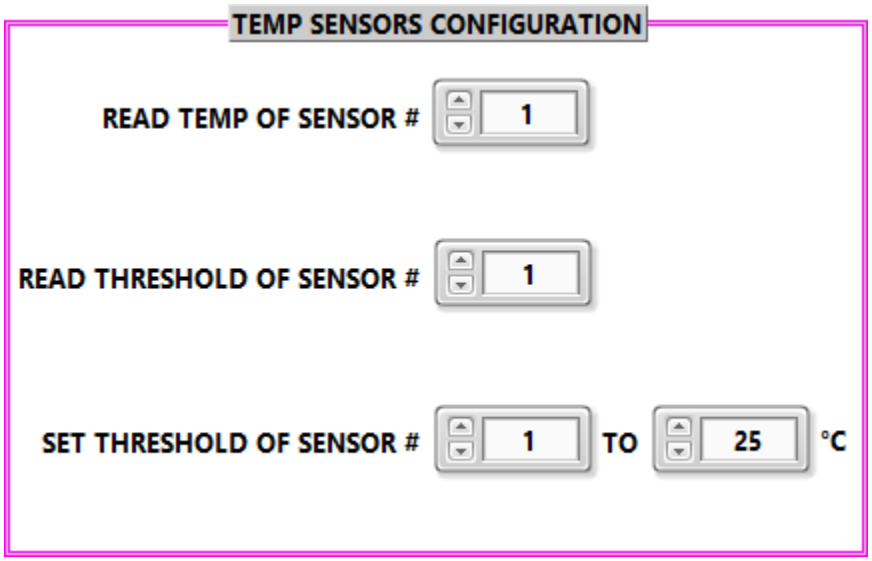
To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator's manual for guidance on using these commands.

4.6 Temp Sensor Configuration

This field is used when you want to change various Temp Sensor Configurations. Using commands that end with '?' will query the current setting on the matrix. You can read the response in the 'Matrix Response String' box at the right. The associated commands from the drop down menu are:

- SYST:TEMPERATUREx?
- SYST:TEMPTHRx?
- SYST:TEMPTHRx y



To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator's manual for guidance on using these commands.

5 Switching & Save/Recall Commands

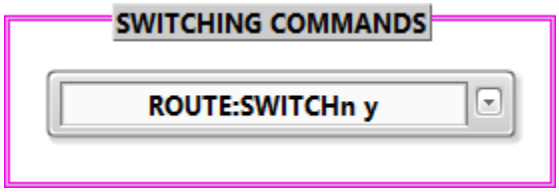
5.1 Introduction

This tab contains all switching related (ROUTE:) commands which are used to actuate positions on switches and save/recall 'presets' of switch configurations. The following describes each function.

> *Note: When using the driver tool, hovering over certain areas on the screen will display help information. Also, turning on the 'Context Help' will reveal additional information. It can be enabled via the top menu bar at* ***HELP>SHOW CONTEXT HELP.*** *Also via* ***CTRL+H***

5.2 Switching Commands Menu

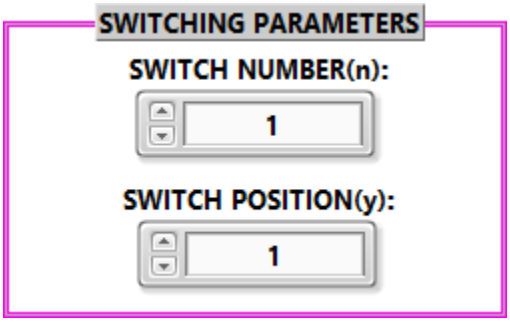
This drop-down menu allows you to choose the SCPI command to use. Based on which command is chosen, you need to fill in a certain field. See section 5.3 – 5.4 for details on which fields are required for a given SCPI command.



5.3 Switching Parameters

This field is used when you want to actuate a switch. Using commands that end with '?' will query the current setting on the matrix. You can read the response in the 'Matrix Response String' box at the right. The associated commands from the drop down menu are:

- ROUTE:SWITCHn?
- ROUTE:SWITCHn y



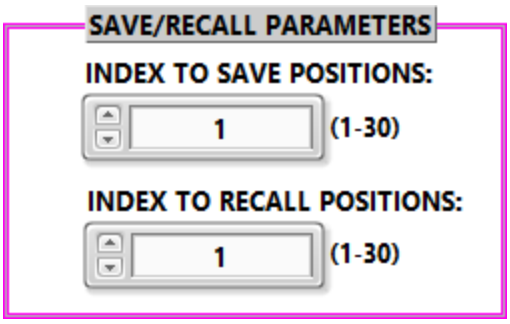
To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator's manual for guidance on using these commands.

5.4 Save/Recall Parameters

This field is used when you want to save or recall a ‘preset’ of a particular switch configuration. Using commands that end with ‘?’ will query the current setting on the matrix. You can read the response in the ‘Matrix Response String’ box at the right. The associated commands from the drop down menu are:

- ROUTE:SAVEPOSITIONS x
- ROUTE:RECALLPOSITIONS x
- ROUTE:POSITIONS?



To execute each command, use the  arrow at the top left of the program.

Note: Refer to the operator’s manual for guidance on using these commands.

6 DKM Use Only

6.1 Introduction

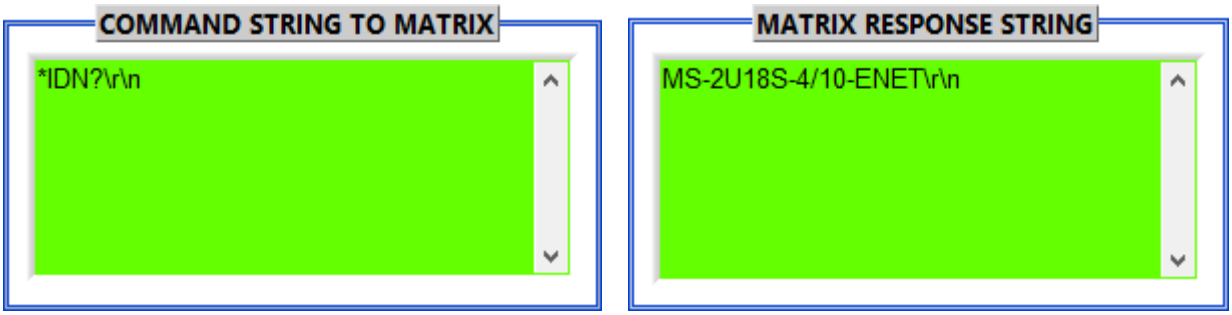
This tab contains a password protected sub-vi reserved for factory configurations. It is intended to be accessed Dow-Key Microwave personnel only or authorized users. These tools are not needed for normal operation of the matrix.

If you require assistance with your matrix please reach out to your local representative or DKM applications engineering team.

7 Other Features

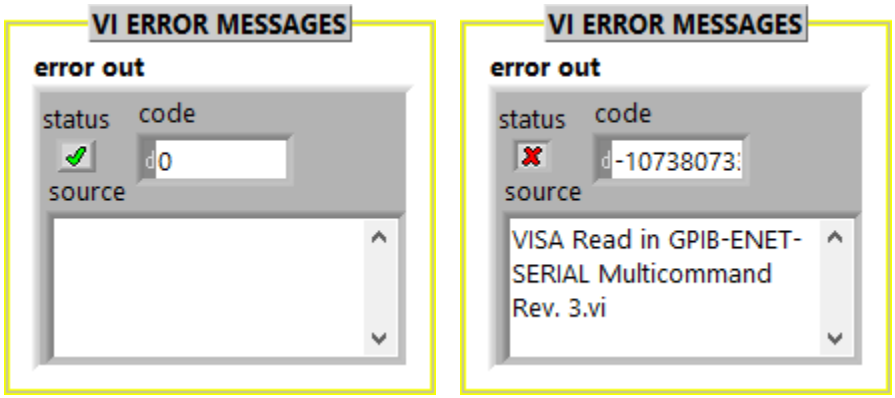
Blue Boxes – Monitor Command Strings and Responses

These boxes allow you to see the ASCII text strings sent (commands) to the matrix as well as the string that the matrix returned.



Yellow Box – Monitor System Errors

This box lets you know when an error has occurred in the program. LabView will generate a red ‘x’ along with an error code and with a brief error description. If no error has occurred, there should be a green ‘check’ along with a ‘0’ code and no description.



Note 1: Refer to the operator’s manual for guidance on using these commands.

Note 2: The LabView Error Codes described above should not be confused with Matrix Error Codes.