

Lambda Genesys Instrument Driver Readme

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1. Overview

Instrument Driver Technology: Plug and Play
Supported Language(s): LabVIEW 6.1
Supported Regional Settings: English and Universal desktops
(period or comma separator for number decimal point)

Supported Models: Lambda Genesys Series DC Power Supplies
Models Tested: 750 and 1500 Watt, and Half-Rack,
with the IEEE option installed

Interfaces: IEEE-488
IEEE-488 with Multi-Drop

Firmware Revision Tested: 2.0-C

Certified: No
NI Supported: No
Source Code Available: Yes

Driver Revision: REV_C00, 09/2005, LV_6.1
Original Release Date: April 2005
Current Revision Date: Sept 2005

2. Required Software

Some software components need to be installed before using this instrument driver. The minimum versions of these components are listed below, and can be downloaded from the Download Site.

LabView 6.1 or later
VISA 2.6 or later

Note: VISA has additional software requirements. For example, for the IEEE-488 port, NI-VISA requires that NI-488.2 be installed on your system. Check with VISA help for additional support software and hardware requirements.

3. Installation Instructions

Obtain a copy of the driver software. It is packaged in a file with a name similar to:

"GENie.zip"

- A) Use Windows Explorer and navigate to folder:
... \Program Files \National Instruments \LabVIEW... \instr.lib
- B) Create a new folder: GENie
- C) Use the ZIP utility, such as WinZip.exe, to extract the driver files into the "GENie" folder
- D) You will now have a "... \instr.lib \GENie \\" folder containing:
"GENie.llb"
"_GENie.llb"
five MNU menu files
"lambda genesys readme.htm" (this file) and two GIF pictures

The menu files and VI libraries (LLB) make up an instrument driver. The menu files allow you to view the driver VIs from the Functions palette. The " GENie.llb" VI library contains the instrument driver VIs. The "_GENie.llb" VI library contains support drivers not normally used by the programmer and they do not appear on the Function pallet (see next)

4. Accessing the Driver in LabVIEW

There is normally no need to view the library file because the driver functions may be picked from a palette menu.

- A) Right-click on a blank place on the VI diagram
See the "Functions" palette open. Navigate:
Functions ->
Instrument I/O ->
Instrument Drivers ->
Lambda GENESYS IEEE DC Power
- B) Alternately, click diagram's menu bar:
Window -> "Show Functions Palette" and navigate the above menus

5. Using the Instrument Driver

LabVIEW:

To verify communication with your instrument and test a typical remote instrument operation, you should first open the Getting Started or Example VIs the instrument driver. Look over each of the controls and set them appropriately. Generally, with the exception of the address field, the defaults for most controls will be sufficient for your first run. You will need to set the instrument resource name appropriately. After running the VI, check to see that reasonable data was returned and an error was not reported in the error cluster.

After you have verified basic communication with your instrument, you might want to customize instrument control for your needs. If your application

needs are similar to the Getting Started or Example VI, the simplest means of creating a customized VI is to save a copy of the Getting Started or Example VI by selecting "Save As" from the File menu. You can then modify this example to meet your specific needs.

For more details, reference the LabVIEW Help under:
 Help » VI, Function, and How-To Help.

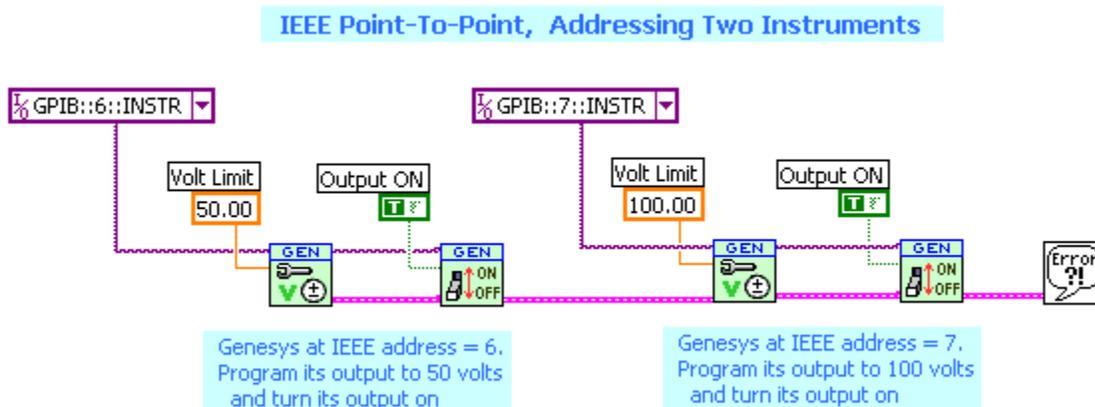
6. Addressing the Instruments

Each driver has two address inputs for the two ways that multiple Genesys power supplies may be used on the IEEE-488 bus. The inputs are "VISA" and "Slave Addr (none)".

Note: In diagrams below, "GEN Initialize.vi" is not shown. This VI is required to enable reading back instrument errors.

POINT-TO-POINT ADDRESSING

This is the traditional IEEE where each Genesys power supply has its own IEEE cable connecting it to the IEEE Controller. Do not wire anything to the "Slave Addr" input (or keep the input at it's default "-1").



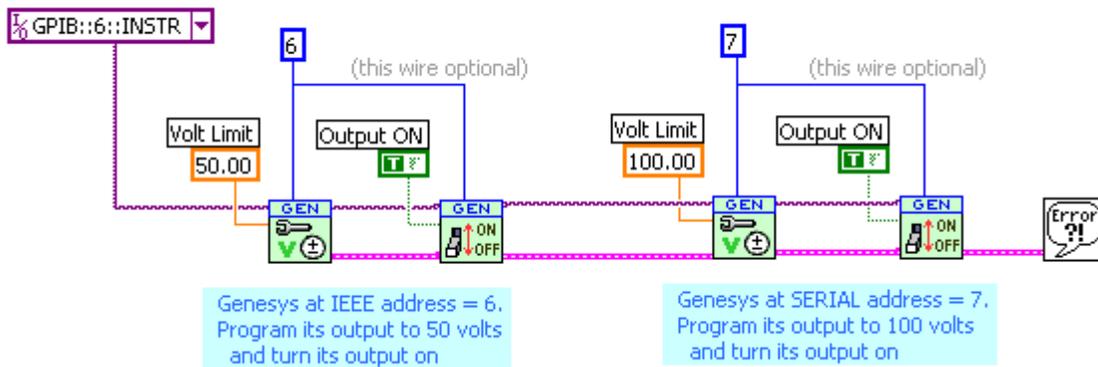
MULTI-DROP ADDRESSING

This is a configuration where one Genesys power supply has an IEEE connection, but it then 'daisy-chains' to other power supplies using the RS-485 (4-wire serial) bus. The IEEE ("Master") has an IEEE address, the other ("Slave") instruments have serial addresses that must be different than the Master's address.

To use Multi-Drop addressing:

- A. The Master device "VISA" input is set to the Master's IEEE address
- B. The Slave device "VISA" input is wired to the Master's "VISA out"
- C. The Slave device "Slave Addr" is set to the device's Serial address
- D. The "Slave Addr" is sticky (or latched or cached). If it is set once (to anything but the default -1), any more driver calls will be to the same slave until a new slave address is wired to any driver call.

IEEE Multi-Drop, Addressing Two Instruments



7. Custom Error Codes

Every driver checks for errors and any found are returned in the "error out" cluster. There are three sources of errors and only the highest priority error is returned:

ERROR TYPES

Priority	Type	Description
Highest	VISA Error	Returned by VISA functions such as Write or Read Examples: No device at the address detected. After query sent, no response received
	Device Error	Returned by the instrument's "SYSTEM:ERROR" queue Examples: see "CUSTOM DEVICE ERRORS" table below
Lowest	Response Error	Driver received response but it is invalid Examples: see "CUSTOM RESPONSE ERRORS" table below

Device errors are ones reported from a "SYSTEM:ERR?" query. This is done automatically by most drivers. If an error is returned, it is in the SCPI error format:

<number -500 to +500> <comma> <message string in quotes>

For a complete list of possible errors, refer to the:

Technical Manual for IEE Programming Interface
Section 3, "System:Error Messages"

The VISA standard allows custom error codes in the range:

-1073999873 to -1074001919 (BFFC0801 to BFFC0FFF hex)

The SCPI error number is converted to a VISA error number using this formula:

<absolute value of SCPI error number> + <BFFC0900 hex>

See "GEN Error Query.vi" for details on the code conversion.

All returns are errors; there are no warnings.

EXAMPLES: CUSTOM DEVICE ERRORS

Decimal Code	Hex Code	Meaning

-1074001564	BFFC0964	-100,"Command error;address nn" general error, IEEE command not executed
-1074001560	BFFC0968	-104,"Data type error;address nn" value missing from command or wrong value type
-1074001442	BFFC09DE	-222,"Data out of range;address nn" attempt to program beyond instrument's ratings applies to volt limit, current limit , OVP and UVL
-1074001423	BFFC09F1	-241,"Hardware missing;address nn" in an IEEE Multi-Drop system, error while opening comm to a slave device at serial address "nn". Slave device not detected
-1074001363	BFFC0A2D	+301,"PV above OVP;address nn" attempt to program voltage above the Over-Voltage setting but within the instrument's ratings
-1074001357	BFFC0A33	+307,"On during fault;address nn" attempt to turn power supply output ON while a fault is keeping the output off
-1074001321	BFFC0A57	+343,"Internal timeout;address nn" in an IEEE Multi-Drop system, no response from an addressed slave device

CUSTOM RESPONSE ERRORS

Decimal Code	Hex Code	Meaning
-1074003951	BFFC0011	No response from "ID Query" in "Initialize.vi". May be an incorrect address setting or the instrument is not communicating
-1074001904	BFFC0810	Could not parse identity fields to find revisions
-1074001902	BFFC0812	Could not parse identity fields to get the model number ("GENvvv-ccc")
-1074001900	BFFC0814	Attempt to send query to "Write to Instrument". Cannot have "?" in command string
-1074001898	BFFC0816	Attempt to send command to "Read Instrument Data". Must have "?" in query string
-1074001896	BFFC0818	"BUSY" bit in Status Byte stuck high after command sent. Command not processed correctly

8. Unsupported Features and Restrictions

A. Unsupported Features

The following Genesys capabilities are not supported by these drivers:

- SRQ interrupts

- Event and Enable registers
- Triggered events
- Self-Test
- Calibration commands

B. Applicable Genesys Firmware Revisions

1. These drivers are *not* compatible with Genesys units having firmware revision "1.4-B" or earlier (made before July 2003)
2. For Multi-Drop systems, which use serial Slave addressing, all devices must have firmware revision "2.0-C" or later (made after Oct 2005)

Note: The Genesys firmware revision is found in the last field returned by the IEEE "*IDN?" query, the serial "IDN?" query or by running the driver "GEN Revision Query.vi"

C. Restriction for Service Requesting

These drivers are *not* compatible with any programs that enables the Genesys Service Request registers (the "*SRE nn" command). This is because the drivers automatically read the serial poll after each command so the Service Request signal will be cleared

D. Restriction for SYSTEM:ERROR Fault Event Reporting

The programmer may *not* use the System Error queue to report power supply Fault events. This is because the drivers clear the error queue prior to sending any command or query

9. IEEE Bus Activity

The user who attaches an IEEE bus analyzer while these drivers are being used will see the following bus activity with each driver call:

1. A serial poll is read from the addressed power supply. If a pending SYSTEM:ERROR or response Message exist, they are cleared.
2. The command or query is sent to the addressed supply
3. A serial poll is taken every 10 milliseconds until the BUSY bit goes low. The SYST bit or MAV bit will go high at this time if there was an error in the command or if a response message is available
4. If the SYST bit shows an error occurred, a "SYST:ERR?" query is sent and the response read
5. If the MAV bit was set, the response is read

10. Known Issues

There are currently no known issues with this instrument driver.

11. Customer Support

For technical support and driver upgrades, you can contact Lambda at the following telephone number:

Lambda Americas (732)922-9300 Ext 209
Customer Service dave.ransom@lambda.com
405 Essex Road
Neptune, New Jersey, 07753 USA

Or visit our support web page at:

<http://www.lambda-hp.com/service.htm>

Or contact your Lambda Representative

12. Revision History

RevDbeta1, 08/2003, LV_6.1

Original Release
Drivers are not "Plug and Play" compatible
by Walter Heyck
Lambda Americas

REV_B03, 07/2005, LV_6.1

- Re-wrote drivers to be "Plug and Play" compatible.
- Driver icons now use glyphs instead of text.
- Added function pallet menu (*.mnu) files).
- Made instrument errors return VISA compliant error values.
- Deleted separate "GEN Errors.txt" file, error descriptions now formulated in the driver Vis.
- Added this "readme.htm" file.

by Walter Heyck
Lambda Americas

REV_C00, 09/2005, LV_6.1

- Added IEEE Multi-Drop capability
- Added "Slave Addr (none)" control to most driver VIs

by Walter Heyck
Lambda Americas