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PROGRAMMABLE POWER

QUICK REFERENCE GUIDE: REFLEX POWER™ NETWORK COMMUNICATION AND OUTPUT CONNECTIONS

The ReFlex Power™ system is designed to run single or multiple power supplies and/or loads through one Controller module; the system is operated by computer with an Ethernet connection. This quick reference guide provides brief instructions for connections and communication startup. For full connections information and programming information, please refer to the ReFlex Power™ manuals and technical notes referenced at the end of this guide.

OVERVIEW

This Quick Reference Guide assumes that, with all power disabled, you have assembled your ReFlex Power system and main power connections per the ReFlex Power Operation Manual (Part Number M380056-01) on the CD provided with your system. This guide provides instructions to first, enable all modules to output voltage by connecting their discrete signals. Next, connect the control computer to the ReFlex Power™ system; power on the system; then launch the Ethernet communication program and find/set the IP and Port addresses, and run/control the ReFlex Power™ system via SCPI commands.

ENABLING OUTPUT

Disable the Remote Inhibit of the Controller module and enable the outputs of each power and/or load module with a jumper plug to as follows:

- For the ReFlex Power™ Controller module, connect Pins 1 and 9 on the front panel interface connector, using either Loop-back Connector Assembly 5380509-01 or Cable Assembly 5380441-01 or -03.
- For all other ReFlex Power™ modules, connect Pins 1 and 6 on the front panel interface connector, using either Loop-back Connector Assembly 5380508-01 or Cable Assembly 5380443-01 or -03.

Refer to Mating Connector Technical Notes for additional information.

CONNECTING THE CONTROL COMPUTER TO THE REFLEX POWER™ SYSTEM

Connection requires RJ45-type connectors with Category 5 or 5e, (Cat 5) cables; two straight through for Network connection or one crossover for direct connection.
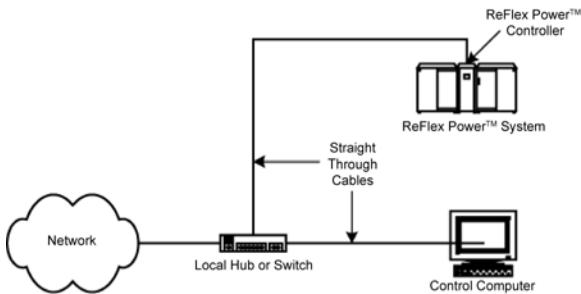

Figure 1. Ethernet Network Connection

Network Connection

Using two straight through cables, connect the control computer and the Controller from their respective Net/LAN connectors, to either a local switch or hub (Figure 1).
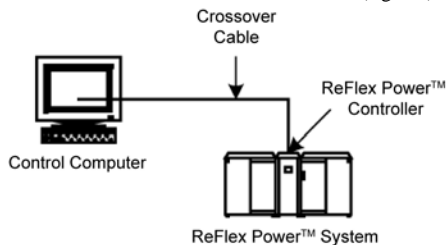

Figure 2. Ethernet Direct Connection

Direct Connection

If the control computer's Ethernet interface does not support Auto-MDIX, then use a crossover cable to connect the control computer directly to the Controller from their respective Net/LAN connectors (Figure 2). Using a cross-over cable

may require changing your computer settings to establish communications (explained in "Launching Ethernet Communication" in this guide).

POWERING ON THE SYSTEM

Toggle the Power switch on the Controller's front panel to power on the ReFlex Power™ system. Once the system completes its power-on cycle, the Controller indicators normally illuminate as follows:

Power = on; Fault = off; and Bus = blinking on and off at this stage.

After power-on and Ethernet connections are made, the Controller LAN indicators illuminate as follows: Net = on; LAN = on; Com = on during network traffic but otherwise it is off.

LAUNCHING ETHERNET COMMUNICATION

Since the ReFlex Power™ Controller is **LXI**™ (LAN eXtensions for Instrumentation) class C compliant, its Ethernet interface default is DHCP and Auto-IP enabled. Execute the LXI_Browser_setup.exe file supplied on the ReFlex Power™ CD-ROM (P/N M380399-01). This installs the LXI Browser tool on your computer; double-click the LXI™ Browser icon to find and display (Figure 3) the IP Address of the ReFlex Power™ Controller.
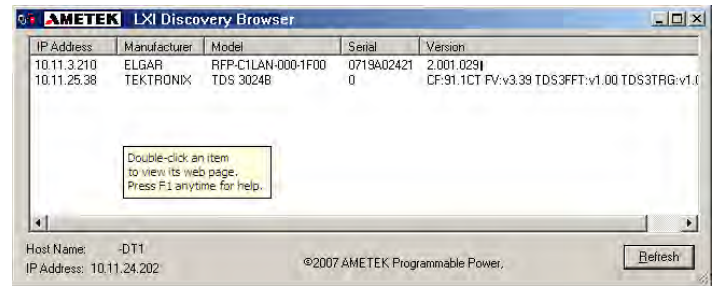

Figure 3. LXI Discover Browser Window

In the LXI™ Discovery Browser window, double-click the Controller IP Address to initialize the ReFlex Power™ Ethernet interface. The Home Page displays with the current information for the selected Controller.
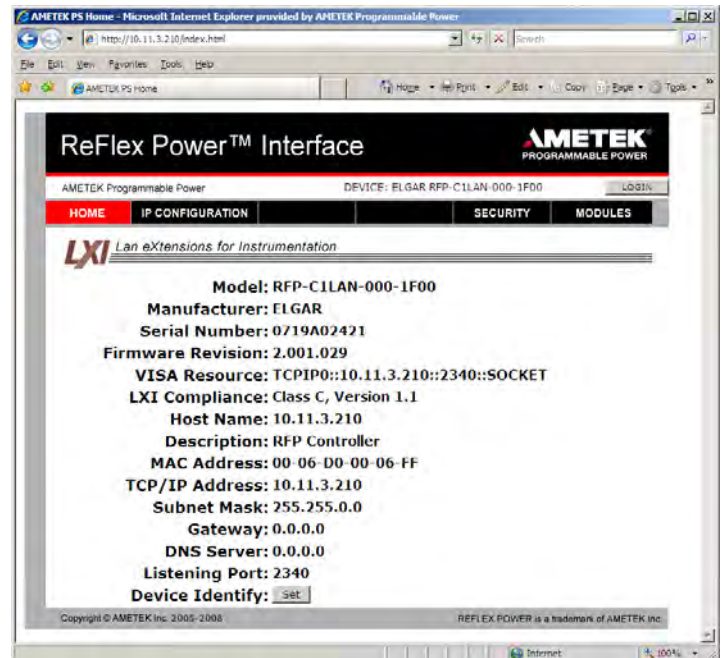

Figure 4. ReFlex Power™ Ethernet Interface Home Page

If a DHCP server is not found, an address in the range of **169.254.**[*1 thru 254*]**.**then [*0 thru 255*] will be selected.

Login

Click the LOGIN button to log in; clicking the IP CONFIGURATION tab also brings up the LOGIN page, but with an error message prompting you to log in (Figure 5). Default parameters are: User ID = **admin**; Password = **password**.
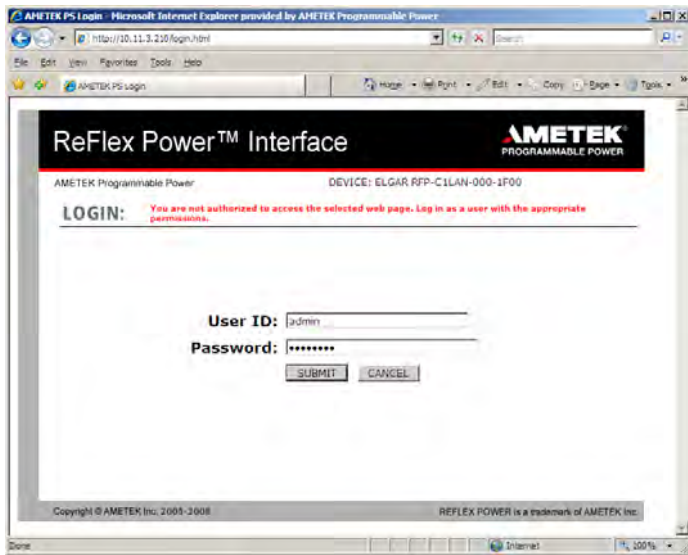

Figure 5. Login Page (with warning)

Click the IP Configuration tab to customize the Host Name and Description, and/or to change the configuration (Figure 6). If you change the IP Address, select Use a Static IP Address radio button and deselect Auto IP Enabled. Please ask your IT Administrator for support.

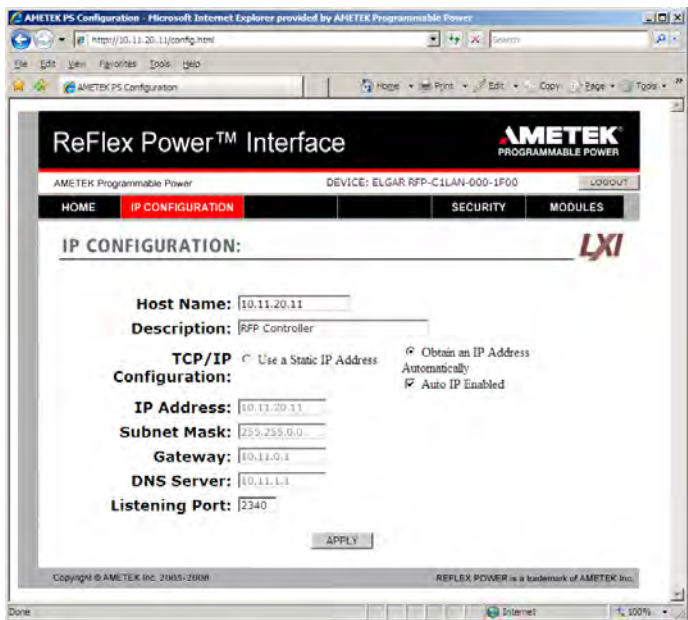Note: The TCP/IP Static IP Address must be: 169.254.[1 thru 254].[0 thru 255].

Figure 6. IP Configuration Page, Default

The Security page (not shown; see programming manual for details) is provided to view, add, remove and edit users and their permissions. The Modules page (also not shown here) displays the address (see "Module Location Identification (Address)" in this guide), and other identification of each module.

Next is to start control communications

LAUNCHING CONTROL COMMUNICATION

Once the Ethernet interface is up and running, start the communication program as follows:

Copy the EnetTest.exe file supplied on the ReFlex Power™ CD-ROM into any convenient directory on the control computer.

In its new location double-click the EnetTest.exe file.

This brings up the Elgar Net Test window (Figure 7) where the Host IP and Port addresses must be set before control communication can begin.
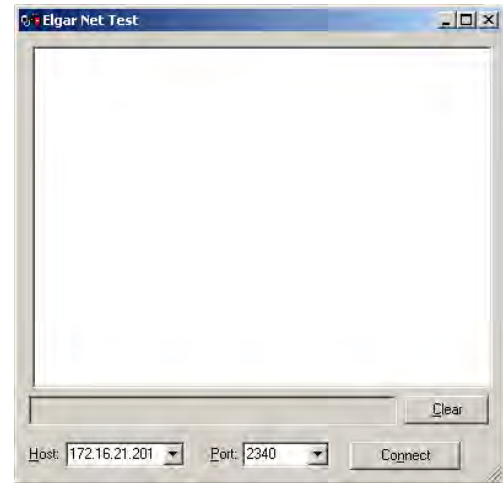

Figure 7. Net Test Window

In the Host and Port fields of the Net Test window:

Enter the Host IP address acquired by the LXI™ Discovery Browser (Section 2.4.3), or the static IP address that you entered in the Ethernet Configuration page (in the range of 169.254.[1 thru 254].[0 thru 255].

Set the Port address to: 2340 (required)

Click the Connect button.

The field to the left of the Clear button, now appears white (not grayed out, Figure 8), to allow SCPI command input.
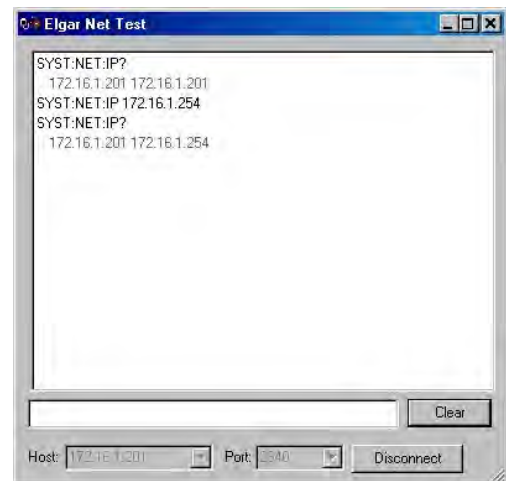

Figure 8. Query IP Address Example

Figure 8 displays an example of querying and changing the IP address to static. Note that the response to the IP address query after the address is changed, includes the current IP address followed by the new IP address. The following are commands associated with setting and querying the IP address:

SYSTem:NETwork:IP? Query to get the IP address from the Reflex Power System.

SYSTem:NETwork:IP <ipaddress> Sets the Reflex System IP address following the format: NNN.NNN.NNN.NNN

The new ReFlex Power™ System IP address is now static or fixed.

MODULE LOCATION IDENTIFICATION (ADDRESS)

To control a specific module, use its address identified by its location in the ReFlex Power™ Mainframe. Each Mainframe houses 12 address locations, one for each single-width slot; the first slot on the left is numbered 1; the last on the right is numbered 12. Additional mainframes continue the count; i.e., the second Mainframe addresses are numbered 13 through 24 from left to right.

The address for a double or triple-width module is always the rightmost slot position that it occupies; e.g., a triple-width module covering slots 17, 18, and 19 is identified by address 19. Figure 9 illustrates the addresses of two chassis.

A ReFlex Power™ System is extendable to multiple chassis, with the first mainframe chassis (primary) configured as output only; any intervening chassis would have both input and output inter-chassis connections, and the last would be configured as output only. Refer to the ReFlex Power™ Operation Manual (M380056-01) for additional information on multiple chassis interconnection requirements.

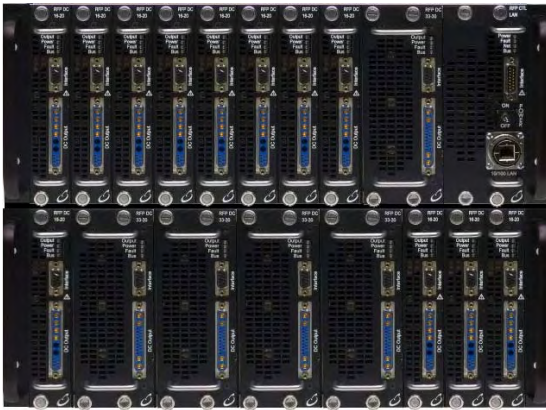*Figure 9. Address Location and Chassis Configuration*

Figure 10. Photo of Multi-Chassis ReFlex Power™ System

Figure 10 shows a two-chassis configuration with the module locations identified as follows: the top Mainframe has addresses 1 through 8 assigned to eight single-width modules; the 9th module is double-width with address 10; address 11 is not occupied, covered by a filler panel; another single-width module is located at address 12. The bottom Mainframe, with a single, four double-width and three more single-width modules, uses addresses 13, 15, 17, 19, 21, 22, 23 and 24.

COMMUNICATING WITH THE REFLEX POWER™ SYSTEM

Use the Elgar Net Test window to begin control communications. Some of the most common SCPI commands/queries are listed below; [n] is the module address:

`*IDN[n]?`	to display the device identification as an ASCII string
`*TST[n]`	to initiate Self Test
`*TST[n]?`	to get the results from the self test that the specific module last performed.
`*RST[n]`	to reset the specific module to its Power ON (PON) state
`*CLS [n]`	to clear all status reporting data structures

Refer to the ReFlex Power™ Programming Manual (M380056-03) for programming information and for specifics pertaining to the modules that are configured in your system.

FIRMWARE COMPATIBILITY

With the release of firmware version 3.000.000 and higher, the controller firmware revision and the firmware in the power and load modules must be at the same major revision level. Thus, it is not possible to mix revision 2.000.000 and revision 3.000.000 assets. When powering up a system with mixed revision assets installed, the red Fault LED will blink on a version 3 controller if a version 2 module is detected. If a version 3 Module detects a version 2 controller, the Module's red Fault LED will blink indicating the firmware miss-match. The *TST? response will also have an error bit set indicating miss-matched firmware.

RFP version 2 Modules can be upgraded to version 3, and version 3 modules can be downgraded to version 2.

The Order numbers for version 2 and version 3 Modules are different, contact Sales for further information.

REFERENCES

ReFlex Power™ Operation Manual (M380056-01)
ReFlex Power™ Programming Manual (M380056-03)
Technical Notes for ReFlex Power™ connector information:

Mainframe	W380318-01
Controller	W380269-01
AC Power Supply	W380272-01
Fixed Power DC	W380274-01
Low Power DC, 16V	W380270-01
Low Power DC, 65V	W380270-02
High Power DC, 33V	W380271-01
High Power DC, 450V	W380271-02
Loads	W380273-01

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