

**USER MANUAL**  
**LAN Interface**  
**For**  
**HFE POWER SUPPLIES**  
**with**  
**PMBUS Option (/S)**

Manual Supplement

Refer to HFE1600/2500 and HFE1600/2500-S1U Instruction Manual for installing the power supplies, safety requirements and specifications.

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## 1. GENERAL INFORMATION

### 1.1 Introduction

The Local Area Network (LAN) option for the HFE series power supply allows the user to remotely program, measure and check status of the power supplies.

The LAN option is designed to communicate with single or multiple supplies in a rack or with multiple racks housing HFE power supplies.

The LAN option is also designed to communicate with multiple racks, each rack holding either HFE1600/S or HFE2500/S power supplies with PMBUS option.

The user can install and remove the HFE LAN module with no disruption to the operation of the HFE power supplies.

A computer's web page browser can be used to operate the module through a built-in web page server. For applications including factory and test automation, communication may be done using several standard network protocols and instrument commands.

### 1.2 Feature Summary

**\*Communicate** over standard TCP/IP networks

- a. LAN (Local Area Network)
- b. WAN (Wide Area Network)
- c. Communicate across the world using the Internet

**\*Web page** viewable with web page browsers, such as Internet Explorer

- d. Configure the network connection settings
- e. Graphical user Interface (GUI) that programs and reads the power supply output and status.
- f. Security settings to block multiple controllers and risky protocols.
- g. Optional password protection prevents unauthorized operation.

**\*LAN Protocols**

- h. VISA drivers, Telnet, TCP and UDP sockets are supported.
- i. VXI-11 Discovery and ping server are supported.
- j. SNMP is supported.
- k. Easily write custom automation programs.

**\*Full remote programming functions**

- l. Uses SCPI command language, an instrumentation standard.
- m. Compatible with VISA drivers and all the test & measurement utilities.
- n. TCP and UDP sockets will support PLCs, Linux and other non-VISA controllers.

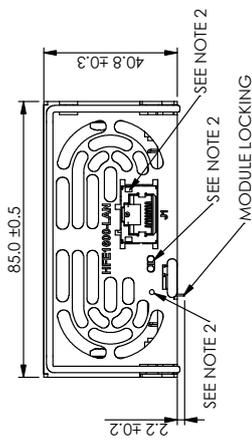
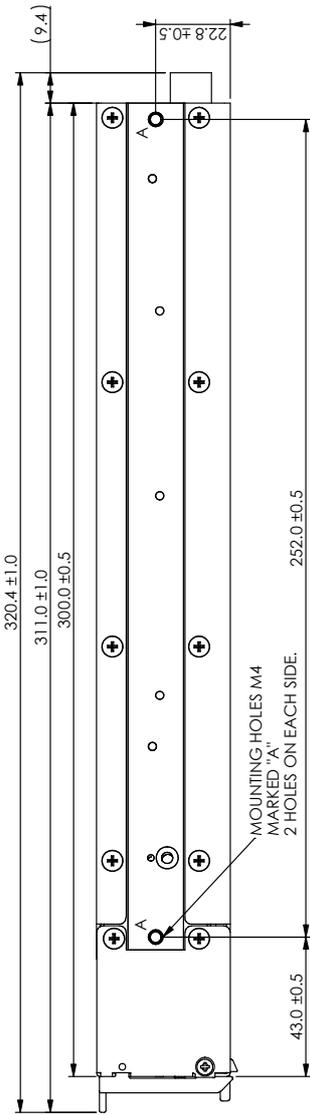
**\*Front Panel features**

- o. Ethernet RJ-45 connector.
- p. LAN Reset button.
- q. User may remotely "blink" the front panel to locate the LAN module.
- r. Link and Activity LED on RJ-45 connector.
- s. LAN Status LED's.

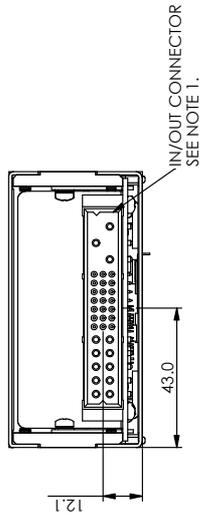
**\*I2C Multi-drop Chain**

- t. Allows connecting up to 16 power supplies (or housing of 2 racks of HFE1600-S1U/TB or HFE2500-S1U/TB).
- u. One LAN IP address shared by all power supplies.
- v. Can use combinations of HFE1600/S and HFE2500/S power supplies with the same LAN module.

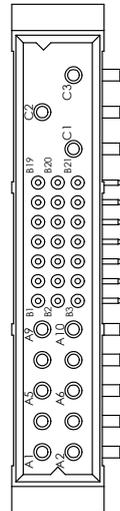
HFE 1600 LAN Outline Drawing



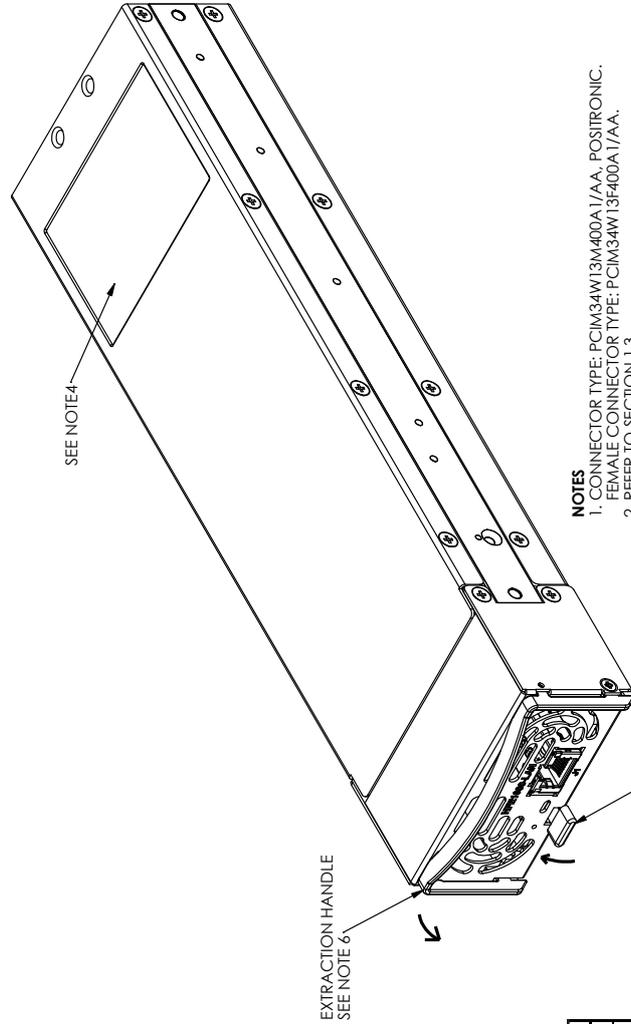
REAR VIEW



IN/OUT CONNECTOR REAR VIEW



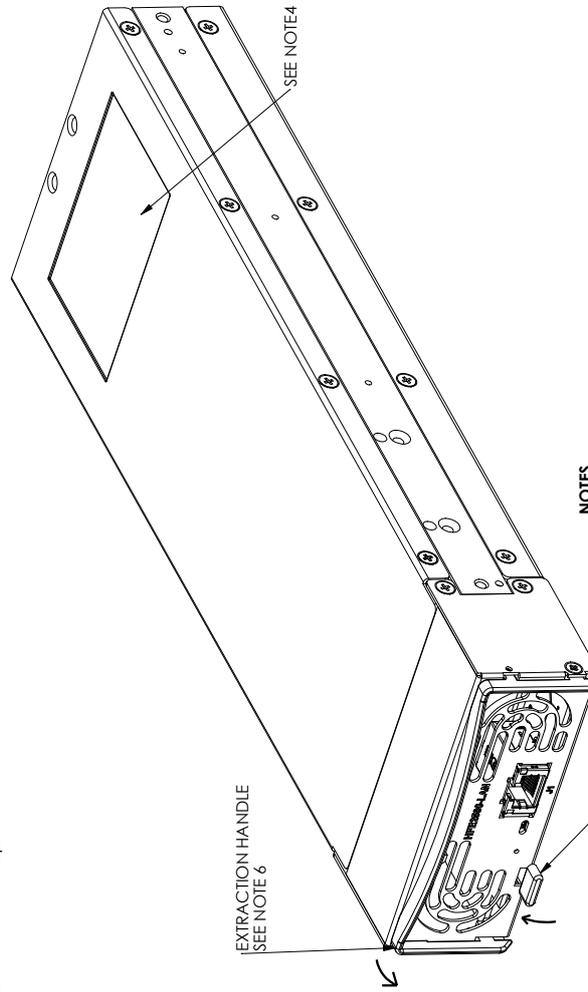
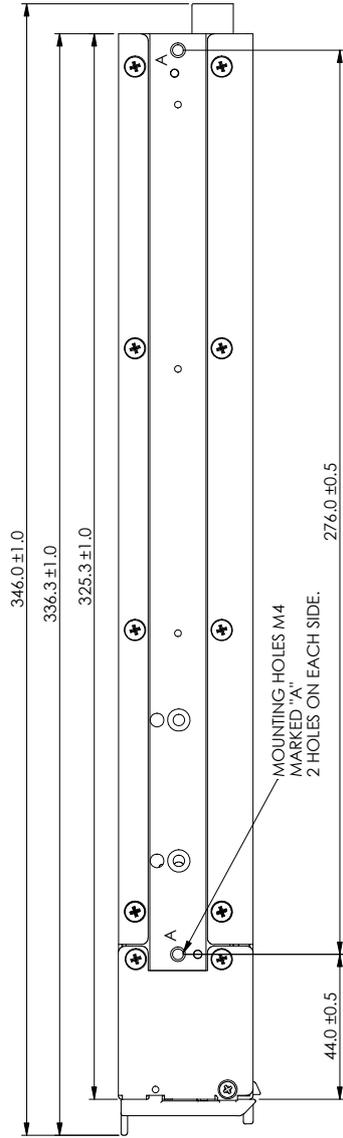
PIN No	FUNCTION	PIN No	FUNCTION
A1 ~ A5	NC	B12	NC
A6 ~ A10	NC	B13	SCL (SERIAL CLOCK)
B1	SIGNAL RETURN	B14	NC
B2	MODULE EXIST	B15	NC
B3	+12V_AUX_IN	B16	NC
B4	NC	B17	SDA (SERIAL DATA)
B5	NC	B18	NC
B6	NC	B19	NC
B7	NC	B20	SMB_ALERT
B8	NC	B21	NC
B9	NC	C1	NC
B10	NC	C2	NC
B11	NC	C3	NC



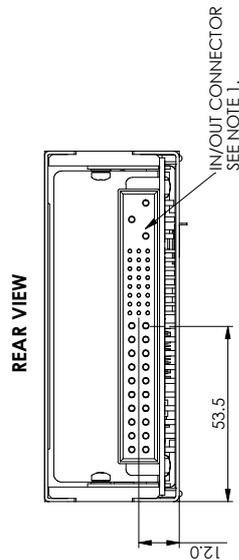
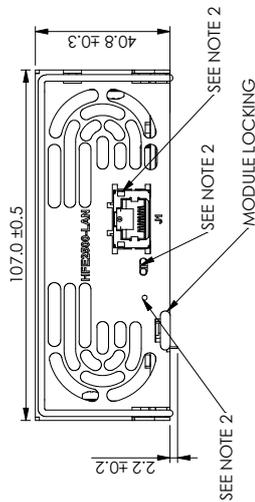
NOTES

- CONNECTOR TYPE: PCIM34W13M400A1/AA, POSITRONIC. FEMALE CONNECTOR TYPE: PCIM34W13F400A1/AA.
- REFER TO SECTION 1.3.
- MOUNTING SCREWS MUST NOT PENETRATE MORE THAN 7mm INTO THE UNIT.
- MODEL NAME, INPUT RATING AND SAFETY APPROVAL SYMBOLS ARE DESCRIBED ON TOP SURFACE LABEL.
- ALLOW MINIMUM 50 mm OF UNRESTRICTED AIR SPACE AT THE REAR OF UNIT. DO NOT OBSTRUCT AIR FLOW TO THE UNIT FRONT PANEL.
- TO EXTRACT THE MODULE, ELEVATE AND HOLD THE RELEASE KNOB AND PULL THE EXTRACTION HANDLE.

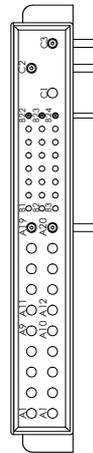
HFE 2500 LAN Outline Drawing



- NOTES**
1. CONNECTOR TYPE: PCIH47M400A1/AA, POSITRONIC. MATES WITH FEMALE CONNECTOR TYPE: PCIH47F400A1/AA. REFER TO SECTION 1.3.
  2. MOUNTING SCREWS MUST NOT PENETRATE MORE THAN 7mm INTO THE UNIT.
  3. MOUNTING SCREWS MUST NOT PENETRATE MORE THAN 7mm INTO THE UNIT.
  4. MODEL NAME, INPUT RATING AND SAFETY APPROVAL SYMBOLS ARE DESCRIBED ON TOP SURFACE LABEL.
  5. ALLOW MINIMUM 50 mm OF UNRESTRICTED AIR SPACE AT THE REAR OF UNIT. DO NOT OBSTRUCT AIR FLOW TO THE UNIT FRONT PANEL.
  6. TO EXTRACT THE MODULE, ELEVATE AND HOLD THE RELEASE KNOB AND PULL THE EXTRACTION HANDLE.



IN/OUT CONNECTOR REAR VIEW



PIN No.	FUNCTION	PIN No.	FUNCTION
A1-A10	NC	B14	NC
A11-20	NC	B15	NC
B1	SIGNAL RETURN	B16	NC
B2	MODULE EXIST	B17	SDA (SERIAL DATA)
B3	+12V_AUX_IN	B18	NC
B4	NC	B19	NC
B5	NC	B20	SMB_ALERT
B6	NC	B21	NC
B7	NC	B22	NC
B8	NC	B23	NC
B9	NC	B24	NC
B10	NC	C1	NC
B11	NC	C2	NC
B12	NC	C3	NC
B13	SCL (SERIAL CLOCK)		

## IN / OUT Connector Pin Assignment

### HFE 1600 - LAN

Connector Position	Signal Names	Description
B1	SIGNAL RETURN	Return for PMBus signals: SCL, SDA, SMB ALERT
B2	MODULE EXIST	Indicates that module is inserted into the shelf. "Active low" when connected to SIGNAL RETURN
B3	+12V AUX IN	<b>12V DC Input</b> referenced to SIGNAL RETURN. (11.2 ~ 12.5V, 500mA max)
B13	SCL	Serial Clock signal
B17	SDA	Serial Data signal
B20	SMB ALERT	PMBus INTERRUPT Signal

Table 1. HFE 1600-LAN Pin Assignment

*Note - If HFE LAN module is installed in the rack, +12V\_AUX (pin 38 of J1 connector on HFE/S1U rack) cannot be used as an auxiliary supply.*

### HFE 2500 - LAN

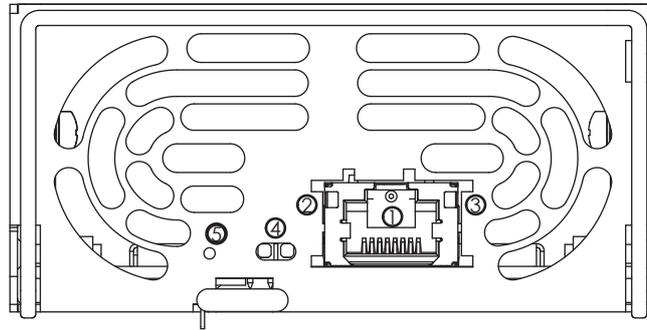
Connector Position	Signal Names	Description
B1	SIGNAL RETURN	Return for PMBus signals: SCL, SDA, SMB ALERT
B2	MODULE EXIST	Indicates that module is inserted into the shelf. "Active low" when connected to SIGNAL RETURN
B3	+12V AUX IN	<b>12V DC Input</b> referenced to SIGNAL RETURN. (11.2 ~ 12.5V, 500mA max)
B13	SCL	Serial Clock signal
B17	SDA	Serial Data signal
B20	SMB ALERT	PMBus INTERRUPT Signal

Table 2. HFE 2500-LAN Pin Assignment

*Note - If HFE LAN module is installed in the rack, +12V\_AUX (pin 38 of J1 connector on HFE/S1U rack) cannot be used as an auxiliary supply.*

### 1.3 Front Panel View

The module front panel, is shown below.



*Figure 1. LAN Front Panel*

1. **LAN Connector:** RJ45, 8 pin, 10/100Mbps and IEEE802.3 compliant.
2. **Link/Activity LED:** This LED, embedded in the RJ-45 socket, glows green and blinks when the connection is made to an active network and packets are being transmitted.
3. **Speed LED:** This Amber LED is ON at speed of 100Mbps and OFF at speed of 10Mbps.
4. **LAN Status LED:** There are two LED's next to the RJ-45 connector. It shows:
  - **Normal Operation: Steady green.** The module has an active LAN connection
  - **Device Identify: Blinking green.** The identify function is turned on from a remote computer using the web page or with command. It is used to identify one LAN module in a rack of instruments. This will also blink if there is a duplicate IP. The blinking is turned off by the web page or by sending a LAN specific command.
  - **LAN Fault: Steady red.** Shows the LAN mode is not enabled, the LAN connection was never made, or that the LAN connection was made and then broken.
5. **Reset Switch:** This switch resets the LAN to its default settings.

## Safety Approvals

### 1. Specification

Applicable safety standards	IEC/EN/UL 60950-1	
Withstand voltage	I/O connector AC pins C2, C3 - Ground	2000VAC/2828VDC
	I/O connector AC pins C2, C3 - LAN/ Rear connector	3000VAC/4242VDC
	LAN/Rear connector - Ground	500VAC/707VDC

### 2. Safety Approvals

UL 60950-1 and CSA22.2 No.60950-1 - UL Recognized. C-UL for Canada.

IEC 60950-1 - CB Report and Certificate.

EN 60950-1 - CE mark.

Marking by the CE Symbol indicates compliance to the Low Voltage Directive of the European Union.

A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is on file at our EU representative TDK LAMBDA UK, located at Kingsley Avenue, Ilfracombe, Devon EX34 8ES, UK. A "Declaration of Conformity" may be accessed via company website [www.uk.tdk-lambda.com/technical-data](http://www.uk.tdk-lambda.com/technical-data)

### SAFETY INSTRUCTIONS

**CAUTION:** The following safety precaution must be observed during all phases of operation, service and repair of this equipment. Failure to comply with the safety precautions or warnings in this document violates safety standards of design, manufacture and intended use of this equipment and may impair the built-in protections within. TDK Lambda shall not be liable for user's failure to comply with these requirements.

**CAUTION:** HFE1600/2500-LAN unit is not authorized for use as critical component in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the managing director of TDK-Lambda.

### ENVIRONMENTAL CONDITIONS

HFE1600/2500-LAN unit intended for use under following environments:

- \*Indoor use
- \* Pollution degree 2
- \* Max. operational altitude: 3000m above sea level
- \*Ambient temperature: -10°C ~ +70°C.

### PARTS SUBSTITUTIONS & MODIFICATIONS

Parts substitutions and modifications are authorized TDK Lambda service personnel only. For repairs or modifications, the instrument must be returned to TDK Lambda service facility.

## 2. SPECIFICATIONS

<p><b>2.1 GENERAL</b></p> <p>When using the HFE LAN, the ratings and accuracies are the same as for the programming and monitoring using PMBUS. Refer to the Instruction Manual for HFE power supply (/S option) for the specifications and calculations.</p>	
<p><b>2.2 ELECTRICAL</b></p> <p>Ethernet Auto-MDIX Auto-Negotiate</p>	<p>Meets IEEE 802.3u specifications Accepts patch or cross-over cable connection Selects fastest of 10Base-T or 100Base-T networks (10 or 100 Megabits per second)</p>
<p><b>2.3 NETWORK CONFIGURATION</b></p> <p>MAC Address</p> <p>IP Address</p> <p>DHCP Auto-IP</p> <p>Static IP Hostname Duplicate IP Detection Subnet Mask Default Gateway DNS Server LAN Reset</p>	<p>TDK-Lambda is assigned: 00:19:f9:xx:xx:xx xx:xx:xx is the unique address for each unit Can be detected with discovery tool Discovery tool is available on <a href="http://www.lxistandard.org/About/LXI-Discovery-Tools.aspx">http://www.lxistandard.org/About/LXI-Discovery-Tools.aspx</a> IP can be changed via the Web Page or via SNMP Get address from network server, leasing services. Create own IP address: 169.254.xxx.xxx xxx.xxx is created by the module. Any IP fixed by the operator. NetBIOS. Operator settable name. Reject duplicate setting. Mask set by DHCP or static Address set by DHCP or static Address set by DHCP Reset configuration by front panel or a command</p>
<p><b>2.4 LAN PROTOCOLS</b></p> <p>TCP IPv4 Instrument Protocols: VXI-11 VISA TCP Sockets UDP Sockets VXI-11 Discovery Ping Server HTTP SNMP</p>	<p>LAN packets follow Transmission Control Protocol Internet Protocol version 4</p> <p>Supports Core channel, not Abort or Interrupt channels VXI-11 compliant, uses RPC and Port mapper. Send commands to port 8003 Send commands to port 8005 Find connected instruments Verify LAN connection to instrument Web page server with Java scripts. Collects and manages information of devices connected to the network.</p>
<p><b>2.5 COMMANDS</b></p>	<p>Control, Measurement and Status (Refer to Section 8 for the full set)</p>

<p><b>2.6 WEB PAGES</b>                  Multiple users                  Identity                  LAN Configuration                  Active Control GUI                  Send Commands</p>	<p>Maximum 2 web pages can be open at once                  Identify power supply model, serial number, revision etc.                  View and set LAN configuration                  Program and read output settings                  Send commands, read errors</p>
<p><b>2.7 INDICATORS</b>                  Speed LED                   Activity LED                  LAN Status LED                  Blink Identify</p>	<p>Indicates the speed at which the communication is running.                  Lit –100MBps.                  Non Lit - 10MBps.                  Indicates when LAN packets are detected.                  Red/green, indicates module has valid IP connection                  Find the LAN Module by remotely blinking the front panel LED</p>
<p><b>2.8 SWITCHES</b>                  LAN Reset</p>	<p>Reset LAN settings via front panel</p>
<p><b>2.9 SECURITY</b>                  Web Page Password                   Single Client Only                  Block UDP Sockets                  Disable VXI-11 Discovery                  Disable Ping Server</p>	<p>Can set password to prevent unauthorized or accidental changes to LAN module settings or supply settings                  Set to prevent multiple programs from taking control                  Single client will block attacks through UDP sockets                  Stop intruders from finding the module                  Stop intruders from finding the module</p>

**COMPLIANCE**

1	Operating Temperature	-10 ~ +70C
2	Storage Temperature	-30 ~ +85C
3	Operating Humidity	10~90% RH, no condensation
4	Storage Humidity	10~95% RH, no condensation
5	Vibration	Built to meet IEC60068-2-64(Basic Transportation)
6	Shock	Built to meet IEC60068-2-27(Basic Transportation)
7	Immunity	Built to meet IEC61000-4-2(Level 2,3), -3(Level 2), -4(Level 2),
		-5 (Level 3,4), -6(Level 2), -8(Level 4), -11
8	Weight	Max 0.8 Kg
9	Size (W*H*D)	HFE1600 - 85 x 41 x 300mm
		HFE2500 - 107 x 41 x 325mm

**Table 3. Compliance**

Specifications 5,6,7 in Table 3 are relevant only if the LAN module is installed in HFE1600/2500-S1U racks

**2.10 LAN Command Speed**

The following communication speeds are typical values only. In addition to the variability in the LAN interface, there are timing variations within the controller and the network routing.

**VISA Drivers Speed**

Commands and queries sent using VISA drivers generally take 10 mSec longer than the same message sent using TCP sockets.

**TCP Sockets Speed**

Typical Command or query speeds:

**System Queries** ~ 40mSec

Examples:

MEAS:VOLT?  
MEAS:CURR?  
MEAS:TEMP?

**Instrument Select for Multi-drop** ~ 40mSec

Example:

INST:NSEL?

### 3. CONNECT TO NETWORK

#### 3.1 LAN Cable

The LAN cable must be supplied by the customer. It may be a standard straight “patch” CAT-5 (or better) network cable or it may be a “crossover” cable where the pins are reversed on one end. The cable type is auto-detected by the module.

#### 3.2 Types of Networks

There are basically two types of networks that are discussed here:

1. **NETWORK WITH A SERVER:** this is the typical local area network with a computer acting as a server and network administrator to keep it running. The server will assign the IP address and other settings to the LAN module.

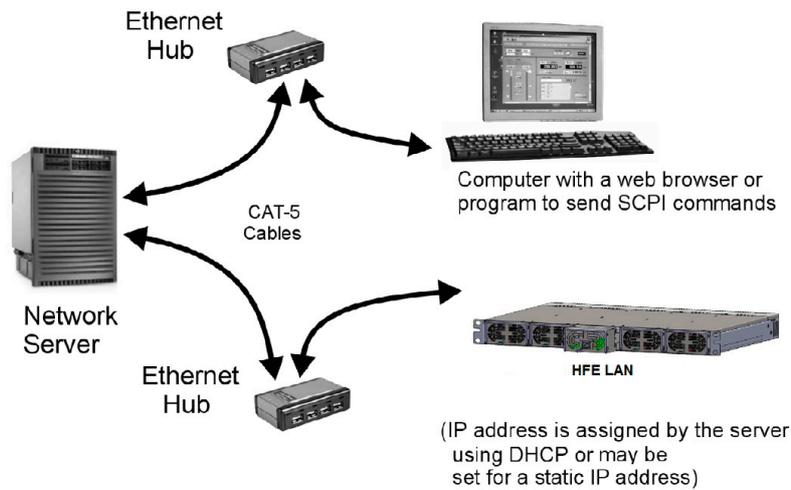


Figure 2. Server Network Connection

2. **PEER-TO-PEER NETWORK:** this is typically the situation when connecting the LAN module directly to a computer that is not a network server. The LAN module will configure its own IP address and settings.

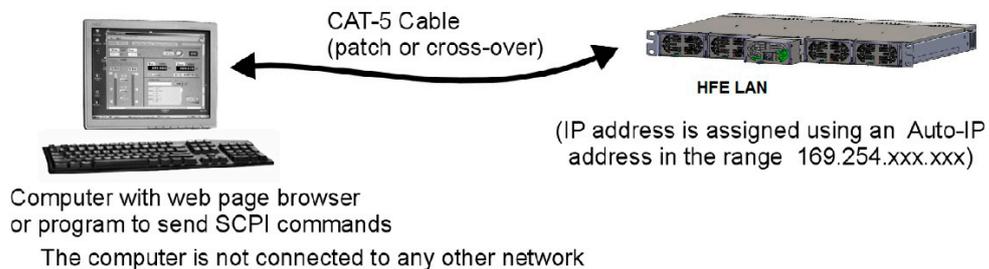


Figure 3. Peer-to-Peer Connection

**3.3 Power-up the LAN Module**

The LAN module will automatically detect if it is connected to or disconnected from a network. It will also automatically look for a network server and receive or create an IP address. It will also broadcast its IP address and hostname to all other devices on the network.

1. Insert the module into any slot of the HFE rack. The front panel LAN status LED will initially be red.
2. The LAN cable may be connected before or after the module is inserted.
3. **For a server network, wait about 10 seconds.**  
See that the front panel LAN Status LED turns green.
4. **For a peer-to-peer network, wait about 60-90 seconds.**  
See that the front panel LAN Status LED turns green.

When the LAN Status LED turns green, the module has received an IP address. Run the discovery tool to check the IP address received by the module. If the LAN Status LED does not turn green, see troubleshooting section.

*Note – There should be at least one HFE supply in the rack for the module to operate.*

**3.4 IP Address**

The simplest and most reliable way to open a network connection is using the module’s IP address. This is a group of four numbers separated by periods (for example: 10.1.15.123). This IP address may be viewed by running the discovery tool.

There are three modes by which the module can get an IP address, as show in this table:

<b>IP Address</b>	<b>DHCP</b>	<b>Auto-IP</b>	<b>Static IP</b>
<b>Mode Select</b>	DHCP is default after “LAN Reset”	Default after “LAN Reset” if no DHCP server is used	May be set in the “LAN Modify” web page (see section 5.5.2) or by SNMP.
<b>Assignment</b>	Assigned by the network server	Assigned by the LAN module.	Assigned in the “LAN Modify” web page (see section 5.5.2) or by SNMP.
<b>Range</b>	Any address	169.254.xxx.xxx	Any address
<b>Lifetime</b>	Address may change as the DHCP server assigns addresses dynamically to many instruments	Address may change for the LAN module	Fixed for the LAN module
<b>Duplicate Addresses</b>	The DHCP server should prevent duplicate IP addresses	Finds available auto-IP address	Returns to original IP (before change), LAN Status LED blinks. If duplicate IP is detected at AC ON, the IP defaults to DHCP or Auto-IP, LAN Status LED blinks.

*Table 4: Assignment of IP address by different Protocols*

### 3.5 Hostname

The hostname is an address in the form of text instead of numbers (for example: HFE-LAN-222). In order to work with the Hostname, a naming service (such as NetBIOS) must be running in the LAN computer.

A custom hostname can be created through the web page (see section 5.5.2) or SNMP. For example, if the hostname is changed to "TDK-LAMBDA", a control program can send a command to "TDK-LAMBDA".

The Hostname can be up to 15 characters. First character must be a letter. Last character must be a letter or digit. Intervening characters must be either a letter, digit or hyphen. After a "LAN Reset", the module will create a default hostname based on the model and serial number of the module.

The default hostname is in the following format:

HFE-LAN – < last 3 digits of serial number >

<b>Hostname</b>	<b>DHCP, Auto and Static IP</b>
<b>Default Hostname</b>	HFE-LAN-nnn
<b>Hostname Protocol</b>	Hostname by NetBIOS
<b>Hostname on Web Pages</b>	Shows Host name on "Home" page and "LAN Configure" page

*Table 5 – Host Name format in different Protocols*

## 4. LAN SETUP

### 4.1 View the IP and MAC Addresses

When the module is running, the IP and MAC addresses can be viewed by following these steps:

#### To view the IP address-

1. Run the discovery tool. It will detect the module and show its IP Address, Manufacturer Name, Serial Number and Firmware Revision. IP address can also be read via a LAN specific command

#### To view the MAC address-

1. There is a label on the cover of the module indicating the MAC address.
2. MAC address can also be seen on the "Home" page via a Web browser and can be read via a LAN specific command.

### 4.2 LAN Reset

LAN reset can be done via a LAN specific command or via the front panel reset switch.

The default LAN settings are:

- o DHCP enabled
- o If DHCP fails to get a lease, auto-IP settings will be obtained.
- o Hostname: HFE-LAN-last 3 digits of Serial Number.
- o Description: TDK-LAMBDA HFE-LAN Last 3 digits of Serial Number.
- o Controller Access One Client Only
- o Ping Server: Enabled
- o Keep-Alive 1800 Seconds (30 minutes)
- o Auto-Negotiate: Automatically select network speed
- o VXI-11 Discovery: Enabled
- o Password: None
- o mDNS: Enabled
- o DNS-SD: Enabled
- o SNMP: Enabled

## 5. WEB PAGES

*Note – All figures in the web page section are examples only.*

### 5.1 Benefit of Web Pages

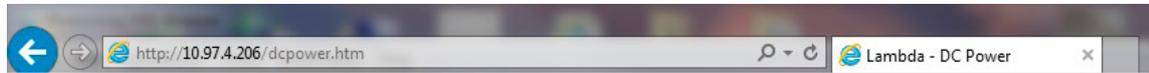
The HFE LAN web pages are useful for:

- Reading the module's model name, revision and LAN setup information
- Configuring the LAN connection
- Programming and reading the Power Supplies condition and reading the inventory details

### 5.2 Opening the HOME Page

Once the front panel LAN Status LED has turned green (see Section 1.3), you may open the HFE LAN web page.

1. Read the IP address of the module (see section 4.1)
2. Open a web page browser program such as Internet Explorer or Chrome. Type the module's IP address as shown below.



The module's Home page will appear. If it does not, see Troubleshooting section.

3. Alternately, the hostname may be used for addressing the web page as shown below (if the module is set for "DHCP/Auto-IP", and NetBIOS naming service is running on the computer). See Section 3.5 for a description of the hostname



The module's Home page will appear. If it does not, see Troubleshooting section.

### 5.3 The HOME Page

The following page appears when the web page is first opened or when it is refreshed:



**HFE 1600W/2500W Series**  
**Front End DC Power Supplies**  
**LAN Option**

**TDK-Lambda**

Home		
DC Power		
LAN		

Welcome		LAN	
TDK-LAMBDA Model:	HFE-LAN	IP Address	10.97.4.207
Manufacturer:	TDK-LAMBDA	MAC Address	00:19:F9:00:00:5A
Serial Number:	11111111111111111222	Hostname	HFE-LAN-222
Firmware Revision:	01.00	Auto-MDIX	Yes
		Auto-Negotiate	Auto select
		Multicast DNS	Enabled
		SNMP Service	Enabled

VISA	
Description:	TDK-LAMBDA HFE-LAN 222
VISA Name using IP Address:	TCPIP0::10.97.4.207::INSTR
VISA Name using Hostname:	TCPIP0::HFE-LAN-222.local::INSTR

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Figure 4. HOME Page

**VISA Name Using IP Address:** For automation programming, VISA is a type of communication driver. For LAN instruments, the IP address may be used in the VISA resource descriptor.

**VISA Name Using Hostname:** For automation programming, an alternate VISA resource descriptor using the module's hostname. See section 3.5

**Hostname:** A unique name for a device on a network. The default hostname is described in section 3.5, it is configured in section 5.5.2.

**Auto-MDIX:** The LAN module will automatically detect if a patch or cross-over LAN cable is used.

**Auto-Negotiate:** The LAN will automatically adjust its speed to the fastest available.

## 5.4 DC Power Page

When the “DC Power” tab is clicked, the following web page opens. This page and its submenus allows the user to make operations on the power supplies.

### 5.4.1 DC Power → Output Page



**HFE 1600W/2500W Series**  
**Front End DC Power Supplies**  
**LAN Option**

**TDK-Lambda**

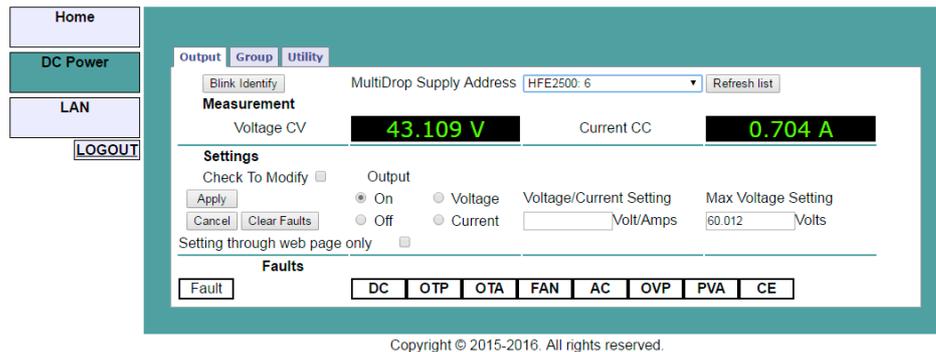


Figure 5. DC Power Page

### Measurement Section

**Multi Drop Supply Address:** Power Supply address will be from 0 to 12 depending on the slot in which the Power Supply is placed and the position of the DIP switch on the rear of the rack. Please refer to HFE1600-S1U and HFE2500-S1U user manuals for details on the slots and the DIP switch.

The address selected in this dropdown menu will correspond to the address of the Power Supplies installed in the rack.

Please refer to the table below for a link between the address in the drop down menu to address of the Power Supplies installed in the rack.

Drop Down Address	Actual HFE Address
HFE 0	0010000
HFE 1	0010001
HFE 2	0010010
HFE 3	0010011
HFE 4	0010100
HFE 5	0010101
HFE 6	001 0110
HFE 7	0010111
HFE 8	0011000
HFE 9	0011001
HFE 10	0011010
HFE 11	0011011
HFE 12	0011100

Table 6. Multi Drop Supply Address

**Refresh List:** When this button is clicked, the web page will make a scan to find connected HFE Power Supplies and put the discovered addresses into the list box.

Every time the “DC Power” web page is opened, it will automatically scan for all connected Power Supplies and display it in the drop down menu. If a Power Supply is added or removed after opening the “DC Power” web page, the “Refresh List” button will have to be clicked.

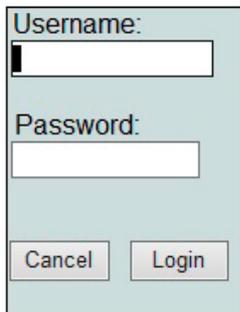
**Blink Identify:** When this button is clicked, the LAN module LAN LED (Green) blinks. This function allows the user to quickly identify which module is being communicated to in a rack of instruments. The blink identify is turned OFF by clicking this button again or with a LAN specific command.

**Measurements:** This section displays the selected Power Supply’s actual output voltage and current.

Please refer to HFE User Manual (/S option) for the range of Voltage, Current and Temperature Measurements for each model.

### **Settings Section**

To change the Power Supply settings or the LAN settings, a user must first log in.



A screenshot of a login form. It features a light blue background. At the top left, the text "Username:" is followed by a white text input field. Below this, the text "Password:" is followed by another white text input field. At the bottom left, there is a "Cancel" button, and at the bottom right, there is a "Login" button. Both buttons have a light gray background and black text.

### **Login Rules:**

Only one web page user may be logged-in at a time to modify the power supply settings. Only one additional web page user may view the web pages of a power supply at the same time.

If an automation program using VISA or socket connection is running, you may view the web pages but you cannot login to change settings. Only one web page user may view the power supply settings.

If a web page user is logged in, a VISA or socket connection cannot be opened by an automation program.

**Note - It is prohibited to run combinations other than that specified in login rules.**

**Login:** Click the "Login" button at the bottom-left side of the web page. Enter "admin" in the user name box. By default, password is empty. Click "Login".

A user may logout by clicking the "Logout" button, by closing the web browser or by leaving the web browser idle for "LAN Keep-alive" seconds.

The password may be set or changed on the LAN -> Users web page (see section 5.5.6). A front panel LAN reset or a LAN Specific command will clear the password.

**Check to Modify:** Click this button to make the changes. If this button is not clicked, no changes can be made.

After the changes are made, de-select the button.

**Output:** Click the On/Off button to make the Power Supply On or Off.

**Voltage / Current Setting:** In the case of HFE2500 supply, two programming buttons will be seen – Voltage and Current. For first time entry in the Output section, the Voltage/Current setting window will be blank. Click on Voltage or Current button to view the settings.

Enter the value in the window. Click "Apply". Deselect "Check to Modify" button and the programmed Voltage or Current setting will be seen in the Voltage/Current setting window.

Please refer to HFE User Manual (/S option) for the range of Voltage and Current programming for each model (\*1).

In the case of HFE1600 supply, there is voltage programming only, so only the voltage setting will be seen in the Voltage/Current setting window.

**Maximum Voltage Setting:** Maximum voltage setting can be entered in the Max. Voltage setting window. This is a protection window and will not allow programming voltage to go beyond the value set in the window.

Supply	Maximum Voltage (*1)
12V	15V
24V	30V
32V	40V
48V	60V

*Table 7. Maximum Voltage Setting Values*

Ex - If the above value is set to 49V, the output voltage cannot be set above 49V.

If Current programming is selected, this value has to be at maximum.

**Note - Any value programmed beyond the range will result in "Data out of Range" message on the display.**

**If the current programming value is sent without the "%" sign, "Percentage Symbol missing" will be seen on the display.**

**Note – If the "Check to Modify" button is not de-selected, the programmed values will not be seen after a new value is set.**

**Settings through Web Page only:** When this button is clicked, power supply settings and LAN settings can be carried out via the web page only. Settings cannot be carried out via other protocols. Only monitoring is available via other protocols.

The default setting is "disabled".

**Faults Section**

This section displays the selected power supply’s Fault register. If any fault occurs, the “Fault” LED will lit. It will be required to scan all the supplies in the chain to check which of the supply has generated the fault. If the supply is found, the respective fault LED will be lit.

Indicator	Faults
DC	DC Fail
OTP	Over Temperature Protection
OTA	Over Temperature Alarm
FAN	Fan Fail
AC	AC Fail
OVP	Over Voltage Protection
PVA	Programmed Voltage more than Allowed
CE	Command Error

*Table 8. Faults Indicator*

**Clear Faults:** If any of the fault occurs, the fault will get registered in the fault register. It will not be cleared even if the fault is not present. With this button, the fault register can be cleared. If the fault is present after the “Clear Faults” button is clicked, the fault will be registered again in the fault register.

**5.4.2 DC Power → Group Page**



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 LAN Option

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**Fig 6. Group Page**

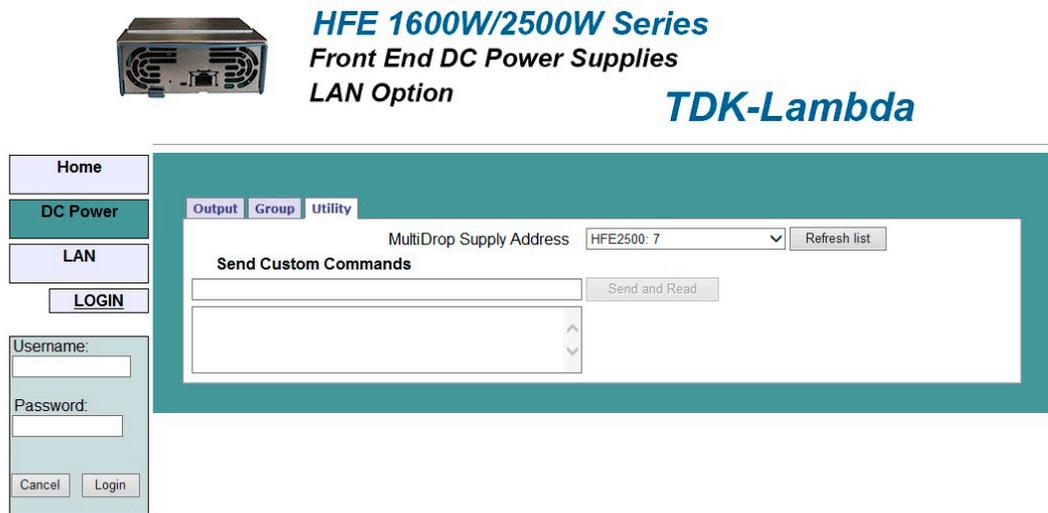
This section can be used for programming a group of supplies. As soon as the supplies are selected from the drop down menu, they will appear in the box next to it. Click on "Set Group". Select the operation – ON/OFF, Voltage or Current Setting or Max Voltage Setting. Click "Apply".

**Note – This section must be used for supplies of the same type. Mixing of models can create unexpected results.**

**No other copy of web page should be open.**

**The user setting must be set to "One Client only". Refer to Section 5.5.2**

### 5.4.3 DC Power → Utility Page



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**Fig 7. Utility Page**

This page is used to send any command and see the response. It is a learning tool for operations. It allows commands which are not present on the web pages. Type any message into the top text box. Click the "Send and Read" button. For commands, there is no response. For queries, the response is shown in the bottom text box.

## 5.5 LAN Page

This page and its subpages allow you to view and configure the module’s LAN settings.

### 5.5.1 LAN → Configure Page

When the “LAN” tab is selected, the “Configure” panel opens:



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**Front End DC Power Supplies**  
**LAN Option**

**TDK-Lambda**

Home

DC Power

LAN

LOGIN

Configure

Advanced

SNMP Settings

Users

**Present LAN Configuration**

<b>IP Address Source:</b>	DHCP/Auto IP
<b>IP Address:</b>	10.97.4.206
<b>Subnet Mask:</b>	255.255.254.0
<b>Default Gateway:</b>	10.97.4.1
<b>DNS Server:</b>	10.97.2.244
<b>Hostname:</b>	HFE-LAN-222
<b>Description:</b>	TDK-LAMBDA HFE-LAN 222
<b>Controller Access:</b>	One Client Only
<b>Multicast DNS:</b>	Enabled

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**Fig 8. LAN Configuration**

The following settings are shown on the “LAN → Configure” web page:

**IP Address Source:** Displays the way the IP address was selected. Options are DHCP/Auto-IP and Static IP.

**IP Address:** Displays the IP address assigned to the module through either DHCP, Auto-IP or Static IP sources.

**Subnet Mask:** Displays the subnet mask assigned to the module through either DHCP, Auto-IP or Static IP.

**Default Gateway:** Address of the network router to allow the module to communicate outside of the local subnet.

**DNS Server:** Address of the server running the Domain Naming Service. This is used for hostname addressing.

**Hostname:** The module hostname may be used instead of the IP address to create a communication link. The default hostname is derived from the model and serial number (see section 3.5) or it may be changed in the LAN → Configure → Modify web page (section 5.5.2).

**Description:** By default, this is “TDK-LAMBDA HFE-LAN last 3 digits of serial number”, but it may be changed in the LAN → Configure → Modify web page (section 5.5.2).

**Controller Access:** The “One Client Only” setting is the default setting for the highest networking security. This setting allows only one TCP socket or VISA connection to be open at a time. It disables the connectionless UDP sockets. See section 5.5.2.

**Multicast DNS:** Resolves Host Name to IP Address in networks that do not include a local server. By default, this is enabled.

**Modify:** Click this button to open the window shown below

**5.5.2 LAN → Configure → Modify Page**

If user is logged in, clicking the “Modify” button on the LAN → Configure window, the following window appears. On this window, you may enter new values for the LAN settings. The available fields depend on the selection of “DHCP Assigned / AUTO IP” or “Static IP”

Changes to these setting will not take place until the “Apply” button is clicked

*Note: After changing the LAN settings, the web browser will automatically close. Re-open it using the new address*



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**Fig 9. DHCP Settings**

**TCP/IP Mode:** This selects how the module gets its network settings. Select either:

**DHCP Assigned / AUTO IP:** If this mode is selected, the network server uses DHCP to assign the IP address, subnet mask, default gateway and DNS server. Since the server assigns these, they are disabled (gray) on the web page. If the server cannot make the assignment, the module shall revert to the Auto IP method described in section 3.4

In this mode, the user may only change the hostname and description.

**Static IP:** If this mode is selected, the IP address, subnet mask and default gateway must be entered in the window fields. The settings must be compatible with the requirements of the network server. These settings do not change even if the module is moved to different LAN connections.

In this mode, DNS server fields are disabled (gray)

In this mode, the user can also change the host name and description.



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The screenshot shows the 'LAN Modify' configuration window. On the left is a navigation menu with 'Home', 'DC Power', 'LAN', and 'LOGOUT'. The main content area is titled 'LAN Modify' and contains the following settings:

- TCP / IP Mode:**  Static IP,  DHCP Enabled / Auto IP
- IP Address:** 10.97.4.206
- Subnet Mask:** 255.255.254.0
- Default Gateway:** 10.97.4.1
- DNS Server:** 10.97.2.244
- Hostname:** HFE-LAN-222
- Description:** TDK-LAMBDA HFE-LAN 222
- Controller Access:**  One client only,  Multiple clients
- Multicast DNS:**  mDNS Enabled,  mDNS Disabled

Buttons for 'Apply' and 'Close' are located at the bottom of the configuration area.

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Fig 10. Static IP Settings

**Controller Access:** Select the security feature for one client only or multiple clients.

The multiple clients setting is needed to allow more than one controller connection at a time and to enable UDP socket connections.

**Multicast DNS:** Enable or Disable the mDNS.

**Apply:** Click this button to save the new settings.

**Close:** Click this button to close the window.

5.5.3 LAN → Advanced Page

Click the "LAN → Advanced" button to view and set four advanced LAN settings:



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The screenshot shows the 'LAN Advanced' configuration page. The navigation menu is the same as in Fig 10. The main content area has tabs for 'Configure', 'Advanced', 'SNMP Settings', and 'Users', with 'Advanced' selected. The page title is 'Present LAN Configuration'.

LAN Timeout:	1800
Ping Server:	ENABLED
Auto-Negotiate:	Auto Select
Vxi Discovery:	ENABLED
Auto-MDIX:	YES

A 'Modify' button is located at the bottom of the configuration table.

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Fig 11. LAN Advanced Page

**LAN Keep-Alive:** If you are logged in, this is how many seconds the web pages and all other protocols may be unused (idle) before the module automatically logs the user out.

The default is 1800 seconds = 30 minutes.

Range is 30-60000 sec.

**Ping Server:** 'Ping' is a network utility that allows the computer to verify communication with the LAN module. This service may be disabled in the "Modify" panel.

**Auto-Negotiate:** This shows what network speed the LAN card is allowed to operate at. Auto Select, 10Mbps and 100Mbps can be selected.

**VXI Discovery:** This is a protocol which allows the network server to detect what instruments are connected to the LAN. It may be disabled in the "Modify" panel for security reasons.

**Auto-MDIX:** This service is always enabled in the module. The module LAN connection will always detect a patch or cross-over cable.

**Modify:** After logging in, click this button to open the window shown below

#### 5.5.4 LAN → Advanced → Modify Page

In the window below, you may enter new values for the LAN settings. Changes to these settings will take place when the "Apply" button is clicked.



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**Fig 12. LAN Advanced Page**

### 5.5.5 SNMP Settings

Using SNMP, users can easily manage system performance and remotely find and solve system problems. The HFE LAN serves as an SNMP Agent. A SNMP Host system is used to communicate with this SNMP agent.

A key part of the SNMP protocol is the Management Information Base (MIB) that describes all Agent variables that can be accessed. The MIB will be needed by any SNMP Host that wishes to communicate with the HFE LAN and can be retrieved from: <https://uk.tdk-lambda.com/products/product-details.aspx?scid=304>

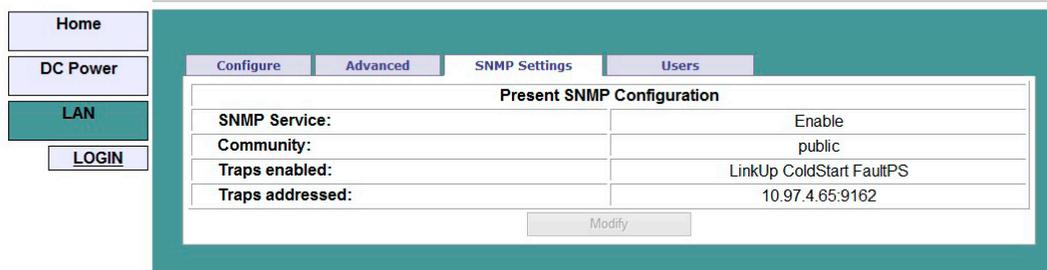
HFE LAN utilizes four operations to respond to Host: Get, GetNext, Set and Trap

- Get – Allows the Host to retrieve a value from the HFE LAN.
- GetNext – Allows the Host to retrieve the next value from a list of variables in HFE LAN.
- Set – Allows the Host to set a value within the HFE LAN
- Trap – Used by the HFE LAN to inform the Host of an event. The HFE LAN must be configured with appropriate address of the Host.



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**Fig 13. SNMP**

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**SNMP Service:** Service can be enabled or disabled.

**Community:** Always public.

**Traps Enabled:** There are 3 types of traps

1. Link Up – Whenever a new link is made.
2. Cold Start – Whenever LAN settings are changed.
3. Faults PS - At any power supply fault.

Any of them can be enabled or disabled.

**Traps Address:** Address and port number of the Host where traps are received.



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Present SNMP Configuration	
SNMP Service:	Enable
Community:	public
Traps enabled:	LinkUp ColdStart FaultPS
Traps addressed:	10.97.4.65:9162

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**Fig 14. SNMP Settings**

**5.5.6 LAN → Users Page**

This page allows the user to create password protection for the web pages. There is no password protection for automation programming with VISA or sockets. By default, the “old password” is blank. The new password must be four or more characters long.

**Reset the password:** once a password is applied, it may be changed by using this screen, but it can only be removed by performing the “LAN Reset” function from the module front panel or by using LAN reset command.



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**Change Password**

Enter old password

Enter new password

Retype new password

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**Fig 15. User Settings**

## **6. PROGRAMMING USING VISA DRIVERS**

### **6.1 VISA Description**

In the test and measurement industry, Virtual Instrument Software Architecture (VISA) is a popular framework that includes hardware drivers, configuration utilities and connection managers. A variety of communication busses are supported. VISA drivers are available from several instrument vendors.

Any programming language that supports Windows COM or DLL libraries can call the VISA functions. VISA drivers may be downloaded for Windows, Linux and MAC OS. Some licensing issues may apply.

### **6.2 VXI-11 Compatibility**

VXI-11 is a protocol that allows communications between a computer port and an instrument. VISA is built upon the VXI-11 specification. The HFE LAN module is compatible with the VXI-11 protocols.

- o VXI-11 Device\_link Open link to instrument
- o VXI-11 Device\_write Write text to the instrument
- o VXI-11 Device\_read Read text from an instrument
- o VXI-11 Destroy\_link Close link to instrument

### **6.3 Opening the VISA Connection**

Test and automation programs may easily be written if they use the VISA libraries. The supported VISA functions include Open, Read, Write and Close.

A VISA resource descriptor is used to describe a particular module. For HFE LAN module, the descriptors are found on the module's Home web page. The VISA resource may use the module's IP address or hostname.

Example VISA resource descriptors for the HFE LAN module are:

Format: TCPIP[board]::IP address/Host Name[::LAN device name]::INSTR]

[board] is the LAN card number, zero is optional

[::LAN device name] is by default "inst0"

[::INSTR] is optional

Examples: TCPIP::10.225.26.60::inst0::INSTR

TCPIP1::HFE-LAN-222::INSTR

### **6.4 Communicating Using VISA**

The VISA Write function will send commands to the module, the VISA read will read the response returned from a query.

## 7. PROGRAMMING USING SOCKETS

### 7.1 Socket Description

The VISA drivers for the HFE LAN module with LAN are popular in the Test and Measurement world. However, some customers cannot use VISA because of installation or licensing issues or because the controller (i.e.: industrial PLC) does not have support for VISA.

If you cannot use VISA drivers, then the HFE LAN offers socket connections. This is low-level LAN protocol that is universally available in all operating systems and programming environments.

### 7.2 Communicating Using Sockets

Communicating through sockets involves opening a socket connection, sending text commands and reading the responses. The functions a programming language use to manage the socket is called the TCP or UDP stack.

There are two types of socket protocols which may be used, TCP and UDP. Each has its own port number.

### 7.3 Controller Access: Single and Multiple Clients

The web page has a security setting to limit or enable the types of connections and numbers of control computers (called "clients") that may be connected in parallel.

The rules for the One Client/Multiple Clients are:

	One Client Only	Multiple Clients
Web Page <b>Not logged-in</b>	Max 2 copies of web pages may be open at any time. You may view but cannot change the module operation.	
Web Page <b>Logged-in as "admin"</b>	You cannot log in if a VISA or socket port is already open. If you are logged in, any other connections are blocked. Only one additional copy of web page may be opened.	
<b>VISA Connection</b>	Only one VISA port may be open at one time. Only one copy of web page may be opened.	
<b>TCP Socket</b> <b>UDP Socket</b>	TCP socket may be opened. UDP sockets are blocked. Only one copy of web page may be opened.	Single connection of UDP or maximum 2 connections of TCP are allowed at the same time.

*Note - It is prohibited to run combinations other than that specified.*

### 7.4 Input Buffer Requirements

With a controller using TCP or UDP sockets, the module can receive commands much faster than it can process the commands. To make sure the HFE LAN is not overloaded, it is required that the controller sometimes sends a query and then waits for the response. The response is the acknowledgement from HFE LAN that it has finished processing all commands.



It is recommended that your controller routinely sends "SYST:ERR?". This query takes little time, and it verifies that all commands have been accepted correctly.

### 7.5 Message Terminators

**When using a program that sends separate commands out through a TCP socket, the socket drivers may combine all the messages into one long packet. Therefore, it is necessary to add a terminator character to the end of each command.**

**All SCPI commands must have a terminator character.**



	Terminator Character (and ASCII hex)
Commands from the Controller	One or more terminators required: Line-feed,      Carriage-return 0x0A              0x0D
Responses from the HFE LAN	All responses have Line-Feed at the end. 0x0A

### 7.6 Using TCP Sockets

This is the most popular socket type. It features a managed connection, message acknowledgements, transmission error detection and correction.

Open **TCP socket port 8003** to send commands.

Responses to queries are sent back automatically with a line-feed terminator appended.

If the web page LAN controller access is set to "Multiple Clients", then up to two controllers may open TCP sockets to one module at the same time.

### 7.7 Using UDP Sockets

This is a simpler socket type with reduced network traffic. It is a 'connectionless' protocol because messages are sent and there is no acknowledgement.

Open **UDP socket port 8005** to send commands.

Responses to queries are sent back automatically with a line-feed terminator appended.

Before opening a UDP socket, it is required to open the web page and set the controller access to "Multiple Clients" (see section 5.5.2).

## 8. COMMAND SET

*Note – Letters in lower case and words in square brackets are optional.*

### 8.1 Selecting an Individual Power Supply

This command can be used to select an individual power supply from a group of supplies. If there is only 1 power supply in the entire chain, the command is not required.

Syntax:       INSTrument:NSElect <xx>  
                   INSTrument:NSElect?  
 Parameter:   xx – address of the supply to be selected  
 Example:     INST:NSEL 6  
 Query:       INST:NSEL? Will return the address of the supply selected.

### 8.2 Selecting a Group of Power Supplies

This command can be used to select a group of supplies.

Syntax:       INSTrument:COUPlE <x1,x2,.....>  
                   INSTrument:COUPlE all  
 Parameter:   x1, x2 – Supplies to be selected  
                   all – All Supplies in the chain are selected  
 Example:     INST:COUP 2,4  
                   INSTRUMENT:COUPLE ALL  
 Query:       None

*Note – No copy of web page should be opened while operating with group commands.  
 To exit the group command, use INST:NSEL xx*

### 8.3 Output On/Off

This command turns an individual power supply or a group of power supplies On or Off.

Syntax:       OUTPut[:STATe] <0/OFF or 1/ON >  
                   OUTPut[:STATe]?  
 Parameter:   0 or OFF will set the power supply output to OFF  
                   1 or ON will set the power supply output to ON  
 Example:     OUTP 1 (or OUTP ON)  
 Query:       OUTP? Will return ON in the example, otherwise OFF

*Note – The Query returns the status of the command, not the status of the power supply.*

### 8.4 Clear Faults

This command is used to clear the status register of the power supply after any fault occurs. If the fault is still present after the “Clear Faults” command is sent, the fault will be registered in the fault register again.

Syntax:       OUTPut:PROTection:CLEar

Example:      OUTP:PROT:CLE

### **8.5 Programming the Output Voltage**

This command sets the Voltage Limit.

Syntax:       [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude] <nn.nn>  
              [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]?

Parameter:   nn.nn. Please refer to HFE User Manual (/S option) for the range of Voltage programming for each model.

Example:      VOLT 46.5

Query:       VOLT? Will return 46.5 in the example.

Errors:       SYSTEM:ERROR? May return:  
              "Data out of range"

### **8.6 Programming the Current Limit (HFE2500/S only)**

This command sets the Current Limit.

Syntax:       [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <nn.nn>%  
              [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]?

Parameter:   nn.nn. Please refer to HFE User Manual (/S option) for the range of Current programming for each model.

Example:      CURR 90%

Query:       CURR? Will return 90% in the example.

Errors:       SYSTEM:ERROR? May return:  
              "Data out of range"  
              "Percentage Symbol Missing"

### **8.7 Programming the Maximum allowed Programmable Output Voltage**

This command is used to set the maximum Allowed Voltage. This acts as a Voltage limiter and does not allow the Voltage to be programmed to be higher than this value. (refer to table 7)

Syntax:       [SOURce:]VOLTage:PROTection:LEVel <nn.nn>  
              [SOURce:]VOLTage:PROTection:LEVel?

Parameter:   nn.nn - 12V Supply – 15V, 24V Supply – 30V  
              32V Supply – 40V, 48V Supply – 60V  
              These are maximum values.

Example:      VOLT:PROT:LEV 46

Query:       VOLT:PROT:LEV? Will return 46 in the example.

Errors: SYSTEM:ERROR? May return:  
"Data out of range"

*Note: If Current programming is done, the above setting has to be at maximum.*

### 8.8 Output Voltage Monitoring

This query returns the measured voltage.

Syntax: MEASure:VOLTage?

Example: MEAS:VOLT? May return 46.002

### 8.9 Output Current Monitoring

This query returns the measured current.

Syntax: MEASure:CURRent?

Example: MEAS:CURR? May return 50.147

### 8.10 Temperature Monitoring

This query returns the internal temperature.

Syntax: MEASure:TEMPerature?

Example: MEAS:TEMP? May return 71.065

*Note - Please refer to page HFE User Manual (/S option) for the range of Voltage, Current and Temperature Measurements for each model.*

### 8.11 Read Faults

This command is used to read the status of the Power Supply. The status information is stored in the "STATUS REGISTER". This command can read 8 different types of faults and warnings.

Syntax: STATus:QUEStionable:CONDition?

Example: STAT:QUES:COND? May return 326, Output Fail:HFE7.

Fault	Reply
DC Fail	326, Output Fail:"HFE Address"
Over Temperature Protection	322, Over Temperature Shutdown:"HFE Address"
Over Temperature Alarm	328, Over Temperature Alarm:"HFE Address"
FAN Fail	329, Fan Fail:"HFE Address"
AC Fail	321, AC Fail:"HFE Address"
Over Voltage Protection	324, Over Voltage Protection:"HFE Address"
Voltage more than allowed	-330, Data more than allowed:"HFE Address"
Command Error	-100, Command Error:"HFE Address"

**8.12 Enabling / Disabling the Monitoring Filter**

Syntax:     [:]DISPlay[:WINDow]:FILTer ON / OFF  
 Parameter:  ON will turn the filter ON.  
               OFF will turn the filter OFF.  
 Example:    DISP:FILT ON  
 Query:      DISP:FILT? Will return ON in this example

**8.13 Programming and Monitoring Coefficients**

These Coefficients are used internally by the LAN module. These are not required by the end user. They are part of the HFE PMBUS command set.

<b>Function</b>	<b>Command</b>
Voltage Monitoring Coefficient	MEASure:VOLTage:COEFFicient?
Current Monitoring Coefficient	MEASure:CURRent:COEFFicient?
Temperature Monitoring Coefficient	MEASure:TEMPerature:COEFFicient?
Voltage Programming Coefficient	[:] [SOURce]:VOLTage:COEFFicient?
Current Programming Coefficient	[:] [SOURce]:CURRent:COEFFicient?

**8.14 Inventory Details of the Power Supply**

**8.14.1 PMBUS Revision**

Syntax:     [:]SYSTem:VERSion?  
 Example:    SYST:VERS? Will always return 1.1

**8.14.2 Manufacturer Name**

Syntax:     [:]SYSTem:ID?  
 Example:    SYST:ID? Will always return TDK-LAMBDA

**8.14.3 Model Name**

Syntax:     [:]SYSTem:MDL?  
 Example:    SYST:MDL? May return HFE1600-48/S

**8.14.4 Nominal Output**

Syntax:     [:]SYSTem:XVM?  
 Example:    SYST:XVM? May return 48V

**8.14.5 Software Revision**

Syntax:     [:]SYSTem:REV?  
 Example:    SYST:REV? May return 1.5

**8.14.6 Manufacturing Location**

Syntax:     [:]SYSTem:LOCation?  
 Example:    SYST:LOC? May return CHINA

**8.14.7 Manufacturing Date**

Syntax: [:]SYSTem:DATE?

Example: SYST:DATE? May return 12/12/2016

**8.14.8 Serial Number**

Syntax: [:]SYSTem:SERial?

Example: SYST:SER? May return DOD705BED0171W

**8.15 Inventory Details of the LAN Module****8.15.1 Software Revision**

Syntax: SYSTem:COMMunicate:LAN:VERSion?

Example: SYST:COMM:LAN:VERS? May return 1.28.18

**8.15.2 Serial Number**

Syntax: SYSTem:COMMunicate:LAN:SERial?

Example: SYST:COMM:LAN:SER? May return 12345

**8.16 LAN Specific Commands****8.16.1 Read the Hostname**

Syntax: SYSTem:COMMunicate:LAN:HOST?

Example: SYST:COMM:LAN:HOST? May return HFE-LAN-222  
The hostname string is up to 15 characters long

**8.16.2 Read the IP Address**

Syntax: SYSTem:COMMunicate:LAN:IP?

Example: SYST:COMM:LAN:IP? May return 10.97.4.233  
The IP address string is up to 15 characters long

**8.16.3 Read the MAC Address**

Syntax: SYSTem:COMMunicate:LAN:MAC?

Example: SYST:COMM:LAN:MAC? May return 00:19:f9:00:24:3b  
The MAC address string, 17 characters long

**8.16.4 Reset LAN Settings**

**WARNING: Sending this command will disable the LAN connection to the module**

This command will reset the LAN settings to the factory default state. The effect of this includes changing the IP address and hostname, so LAN communication could be lost. Therefore, use this command as a diagnostic tool only.

Syntax: SYSTem:COMMunicate:LAN:RESet

Example: SYST:COMM:LAN:RES

**8.16.5 Blinking the Blink Identity LED**

Syntax: SYSTem:COMMunicate:LAN:IDLED 1 or ON, 0 or OFF

Example: SYST:COMM:LAN:IDLED 1

## 9. TROUBLESHOOTING

### **LAN Status LED Stays Red**

If LAN status LED stays red, then the module is not connecting to the network.

- A. Verify the LAN cable is connected to an active network. Look at the front panel link LED (part of the RJ-45 connector, see section 1.3) and verify it is green. If the LED is not lit, then the LAN cable is not connected properly.
- B. Wait longer and try to read the IP address again. In the Auto-IP mode the module will wait a full 60-90 seconds to assign an IP address after powerup.

### **Cannot Communicate to the Module**

If the LAN Status LED is green and the module has a valid IP address, and you still cannot open a web page, VISA or socket connection then try “pinging” the module. The ping utility verifies the computer can send a message and get a response from the module over the network.

Open a command line window by:

- A. Click the “Start” button, Select “Run...”
- B. A “Run” window opens. Type: cmd <Enter>. See the command window open
- C. Type “ping <IP address>”

Verify the ping packets had successful responses

If the “ping” does not get responses from the module, then there is a mismatch between the module and the computer LAN settings. Also, the ping function may be disabled in the module. In this case, do a module “LAN Reset” and try to connect again

### **Cannot Open Web using Laptop or Dual-LAN Card Computer**

If you have a computer with two network cards, the computer may not know which card to use when trying to open the HFE web page. Verify the two cards do not have over-lapping IP address ranges, otherwise it may be necessary to disable or disconnect the network card that is not being used.

If you have a laptop computer with an Ethernet jack and a wireless network, it may be necessary to disable the wireless LAN port.

### **Web Page “Refresh List” Does Not Find Slave Supplies**

When you are using a LAN chain of supplies, the web page Refresh List button should detect all the connected slave supplies. If it does not:

- A. Verify all slave supplies are set for unique addresses.

### **LAN Status LED is blinking**

While setting an IP Address, Duplicate IP has been detected. Stop the blinking by a LAN specific command or by the Blink Identity command on the Web page and try assigning a new IP Address.



