

General Safety Instructions:



READ SAFETY INSTRUCTIONS

Servicing:

These products are not customer serviceable. TDK-Lambda and their authorised agents only are permitted to carry out repairs.

Critical Components:

These products are not authorised for use as critical components 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 EMEA.

Product Usage:

These products are designed for use within a host equipment which restricts access to authorised competent personnel.

This product is a component power supply and is only to be installed by qualified persons within other equipment and must not be operated as a stand-alone product.

This product is for sale to business to business customers and can be obtained via distribution channels. It is not intended for sale to end users.

This product is a component power supply and complies with the EMC directive. The EMC performance of a component power supply will be affected by the final installation, compliance to the stated EMC standards and conformance to the EMC Directive must be confirmed after installation by the final equipment manufacturer.

For guidance with respect to test conditions please visit our website at https://emea.tdk-lambda.com/EMC_guidance or contact your local TDK-Lambda sales office.

Environmental:

These products are IPX0, and therefore chemicals/solvents, cleaning agents and other liquids must not be used.

Environment:

This power supply is a switch mode power supply for use in applications within a Pollution Degree 2, overvoltage category II environment. Material Group IIIb PCB's are used within it.

Output Loading:

The output power taken from the power supply must not exceed the rating stated on the power supply label, except as stated in the product limitations in this handbook.

Input Parameters:

This product must be operated within the input parameters stated in the product limitations in this handbook.

End of Life Disposal:

The unit contains components that require special disposal. Make sure that the unit is properly disposed of at the end of its service life and in accordance with local regulations.



RISK OF ELECTRIC SHOCK

High Voltage Warning:

Dangerous voltages are present within the power supply. The professional installer must protect service personnel from inadvertent contact with these dangerous voltages in the end equipment.

WARNING: When installed in a Class I end equipment, this product must be reliably earthed and professionally installed.

The (+) or (-) output(s) can be earthed or left floating. The unit cover(s)/chassis must not be made user accessible. The mains input connector is not acceptable for use as field wiring terminals. Do not use mounting screws, which penetrate the unit more than 3mm (FPS/RFE1000), 6mm (HFE/RFE1600/2500 & racks). Special earthing screws are used on these products which connect the cover to the chassis. They must not be removed. If they are removed by mistake, they must be replaced with new ones and the product tested for earth bonding.

This unit must be securely mounted and its earth terminal/baseplate properly bonded to the main protective earth

before any connection to the MAINS supply is made. An internal fuse protects the unit and must not be replaced by the user. In case of internal defect, the unit must be returned to TDK-Lambda or one of their authorised agents. A suitable mechanical, electrical and fire enclosure must be provided by the end use equipment for mechanical, electric shock and fire hazard protection.

Energy Hazards:

Certain modules are capable of providing hazardous energy (240VA) according to output voltage setting. Final equipment manufacturers must provide protection to service personnel against inadvertent contact with these module output terminals. If set such, that hazardous energy can occur, then the module terminals or connections must not be user accessible.

Disconnect device: An appropriate disconnect device shall be incorporated in the building installation wiring. Refer to the user manual of the specific model for more details.

Rack mounting safety instructions:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

**HOT SURFACE****External Hot Surfaces:**

In accordance with local regulations for Health and Safety at work, manufacturers have an obligation to protect service engineers as well as users. In order to comply with this, a label must be fitted to these products which is clearly visible to service personnel accessing the overall equipment, and which legibly warns that surfaces of these products may be hot and must not be touched when the products are in operation.

The unit may be mounted in any orientation except inverted (mounted on its top) or vertical with the airflow downwards. The ventilation openings on these products must not be impeded. Ensure that there is at least 50mm spacing between any obstruction and the ventilation openings.

The unit cover/chassis is designed to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions, part or parts of the unit chassis may reach temperatures in excess of those considered safe for operator access.

Product Test Results

As part of TDK-Lambda's efforts to protect the global environment and as part of TDK's Sustainability Vision, we are happy to notify you that we have launched an online product test results database.

To reduce paper waste, starting in September 2022, TDK-Lambda Ltd. will stop printing individual product test results which used to be included in a unit's package. Test results will be available online on a dedicated page on our website, starting with all products manufactured as of April 2021.

To view your product's test results, enter the serial number and part number printed on your power supply's label on the following webpage:

<https://www.emea.lambda.tdk.com/uk/technical-data/>

We encourage you to avoid printing test results and instead store a digital copy in your ERP system.

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.

Table of Content

1. GENERAL INFORMATION	4
1.1 Introduction	4
1.2 Feature Summary	4
1.3 Front Panel View	8
2. SPECIFICATIONS	10
3. CONNECT TO NETWORK	13
3.1 LAN Cable.....	13
3.2 Type of Networks	13
3.3 Power-up the LAN Module	14
3.4 IP Address.....	14
3.5 Hostname.....	15
4. LAN SETUP	16
4.1 View the IP and MAC Addresses	16
4.2 LAN Reset	16
5. WEB PAGES	17
5.1 Benefit of Web Pages	17
5.2 Opening the HOME Page	17
5.3 The HOME Page	18
5.4 DC Power Page	19
5.5 LAN Page	24
6. PROGRAMMING USING VISA DRIVERS	30
6.1 VISA Description	30
6.2 VXI-11 Compatibility	30
6.3 Opening the VISA Connection	30
6.4 Communicating Using VISA	30
7. PROGRAMMING USING SOCKETS	31
7.1 Socket Description.....	31
7.2 Communicating Using Sockets	31
7.3 Controller Access: Single and Multiple Clients	31
7.4 Input Buffer Requirements	32
7.5 Message Terminators	32
7.6 Using TCP Sockets	32
7.7 Using UDP Sockets	32

8. COMMAND SET.....	33
8.1 Selecting an Individual Power Supply	33
8.2 Selecting a Group of Power Supplies.....	33
8.3 Output On/Off.....	33
8.4 Clear Faults	33
8.5 Programming the Output Voltage	34
8.6 Programming the Current Limit (HFE2500/S only)	34
8.7 Programming the Maximum allowed Programmable Output Voltage.....	34
8.8 Output Voltage Monitoring	35
8.9 Output Current Monitoring	35
8.10 Temperature Monitoring	35
8.11 Read Faults.....	35
8.12 Enabling / Disabling the Monitoring Filter	36
8.13 Programming and Monitoring Coefficients	36
8.14 Inventory Details of the Power Supply.....	36
8.15 Inventory Details of the LAN Module	37
8.16 LAN Specific Commands	37
8.17 Scan for Active Power Supplies	37
9. TROUBLESHOOTING	38

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. Compatible with VISA drivers and all the test & measurement utilities.
- m. TCP and UDP sockets will support PLCs, Linux and other non-VISA controllers.

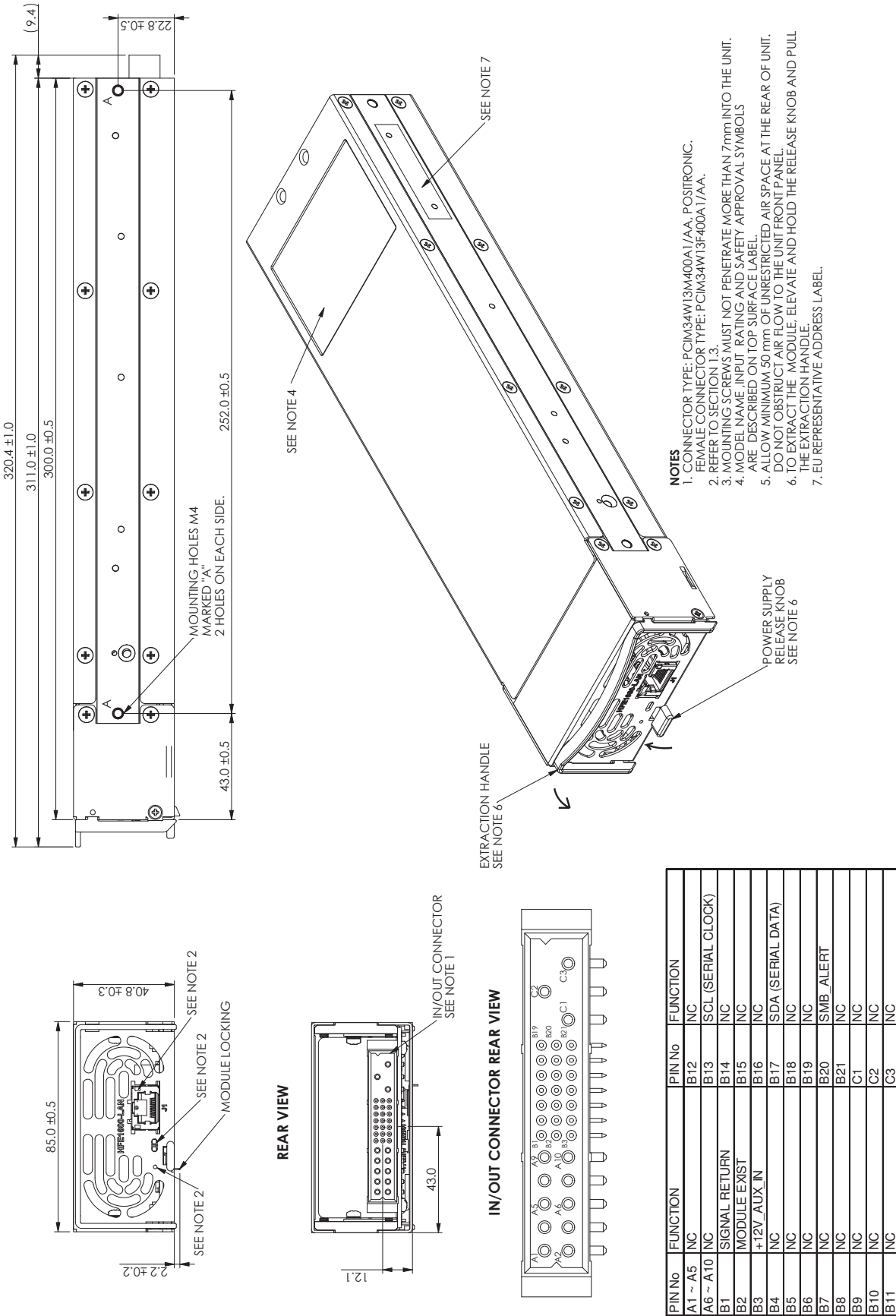
***Front Panel features**

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

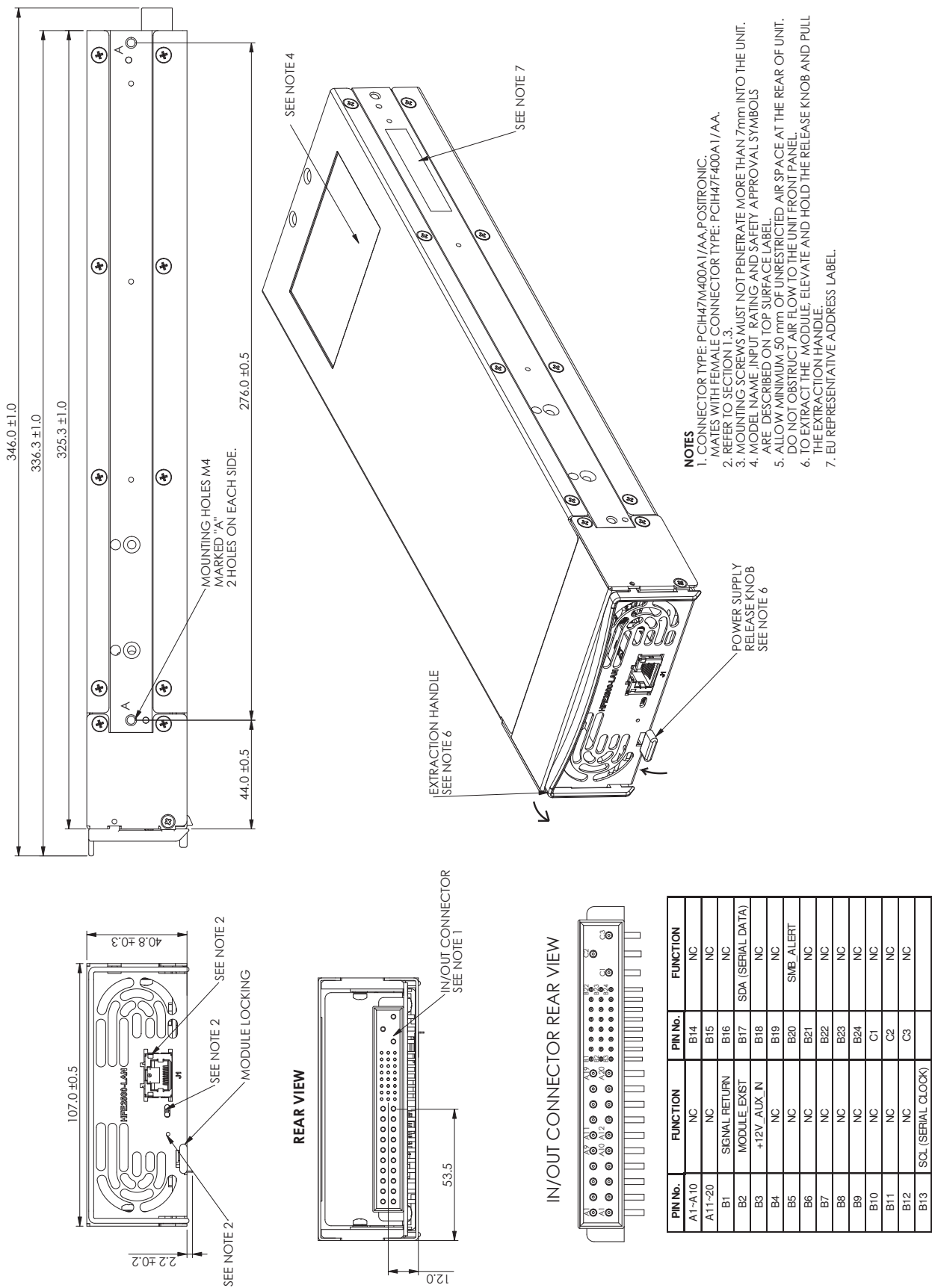
***I2C Multi-drop Chain**

- s. Allows connecting up to 16 power supplies (or housing of 2 racks of HFE1600-S1U/TB or HFE2500-S1U/TB).
- t. One LAN IP address shared by all power supplies.
- u. Support up to 9 HFE1600/S or 7 HFE2500/S power supplies in 2 racks.

HFE 1600 LAN Outline Drawing



HFE 2500 LAN Outline Drawing



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	12V DC Input 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	12V DC Input 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.

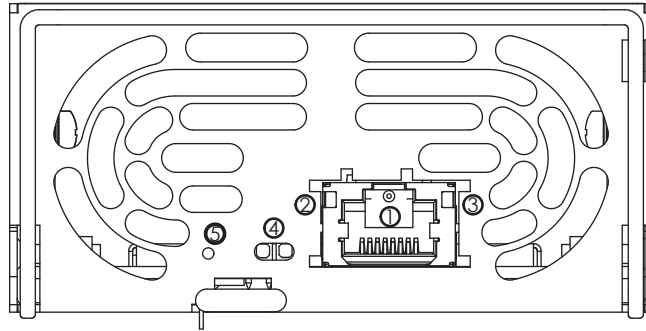


Figure 1. LAN Front Panel

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. The led 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 62368-1 UL62368-1 CSA22.2 No.62368-1 EN62368-1.	
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

UL62368-1 and CSA22.2 No.62368-1 - UL Recognized. C-UL for Canada

IEC 62368-1 - CB Test Report and Certificate.

EN 62368-1 - TUV Mark, CE Mark.

Marking by the CE Symbol indicates compliance to the EMC Directive, the Low Voltage Directive and RoHS Directive of the European Union.

UKCA Marking, when applies to a product covered by this handbook, indicates compliance with the Electrical Equipment (safety) Regulations 2016, Electromagnetic Compatibility Regulations 2016 and Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment regulation 2012.

A CE "Declaration of Conformity" in accordance with the preceding directives and standards has been made and available on file at our EU representative TDK LAMBDA EUROPE GmbH, located at Karl-Bold-Str. 40, D-77855 Achern.

A UKCA "Declaration of Conformity" in accordance with the preceding directive and standards has made and is on file at our UK representative TDK-Lambda UK Limited, Kingsley Avenue, Ilfracombe, Devon EX34 8ES. Both "Declaration of Conformity" may be accessed via company website www.emea.tdk-lambda.com/manual.

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

2.1 GENERAL 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.	
2.2 ELECTRICAL Ethernet Auto-MDIX Auto-Negotiate	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)
2.3 NETWORK CONFIGURATION MAC Address IP Address DHCP Auto-IP Static IP Hostname Duplicate IP Detection Subnet Mask Default Gateway DNS Server LAN Reset	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 http://www.lxistandard.org/About/LXI-Discovery-Tools.aspx 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
2.4 LAN PROTOCOLS TCP IPv4 Instrument Protocols: VXI-11 VISA TCP Sockets UDP Sockets VXI-11 Discovery Ping Server HTTP SNMP	LAN packets follow Transmission Control Protocol Internet Protocol version 4 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.
2.5 COMMANDS	Control, Measurement and Status (Refer to Section 8 for the full set)

2.6 WEB PAGES Multiple users Identity LAN Configuration Active Control GUI Send Commands	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
2.7 INDICATORS Speed LED Activity LED LAN Status LED Blink Identify	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
2.8 SWITCHES LAN Reset	Reset LAN settings via front panel
2.9 SECURITY Web Page Password Single Client Only Block UDP Sockets Disable VXI-11 Discovery Disable Ping Server	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

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:CURRE?

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.

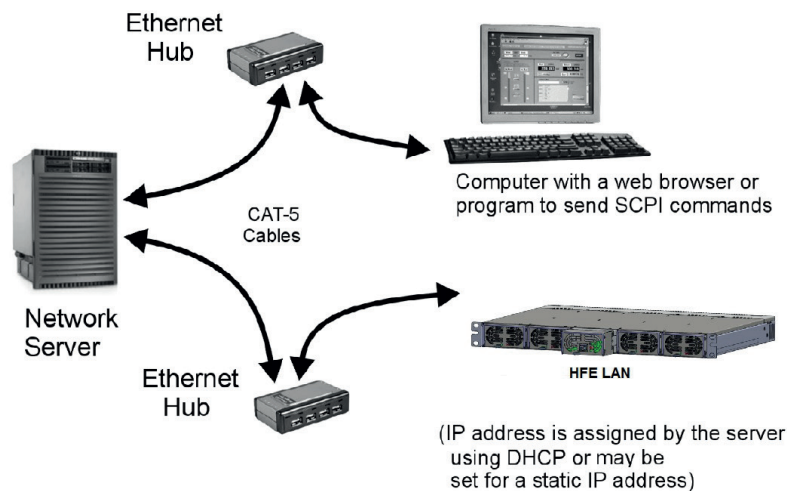


Figure 2. Server Network Connection

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.

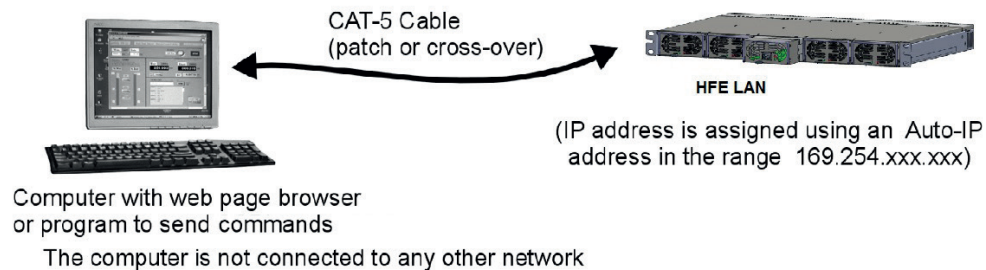


Figure 3. Peer-to-Peer Connection

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:

IP Address	DHCP	Auto-IP	Static IP
Mode Select	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.
Assignment	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.
Range	Any address	169.254.xxx.xxx	Any address
Lifetime	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
Duplicate Addresses	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 >

Hostname	DHCP, Auto and Static IP
Default Hostname	HFE-LAN-nnn
Hostname Protocol	Hostname by NetBIOS
Hostname on Web Pages	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 seen on the "Home" page via a web browser and 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

5. WEB PAGES

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

5.1 Benefit of Web Pages

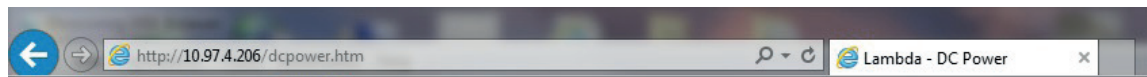
The HFE LAN web pages are useful for:

- 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

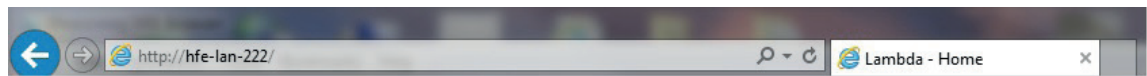
Once the front panel LAN Status LED has turned green (see Section 1.3), you may open the HFE LAN web page.

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	
TDK-LAMBDA Model:	HFE-LAN
Manufacturer:	TDK-LAMBDA
Serial Number:	11111111111111111222
Firmware Revision:	01.00

LAN	
IP Address	10.97.4.207
MAC Address	00:19:F9:00:00:5A
Hostname	HFE-LAN-222
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

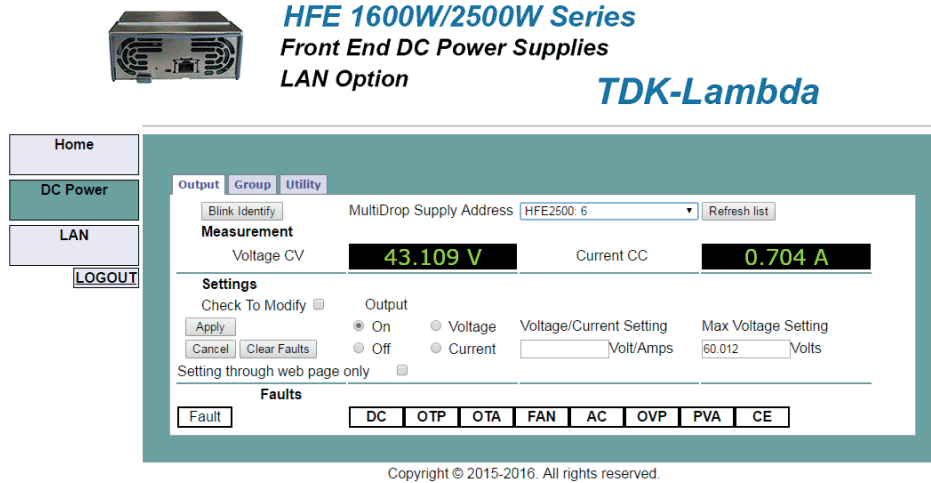


Figure 5. DC Power Page

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.

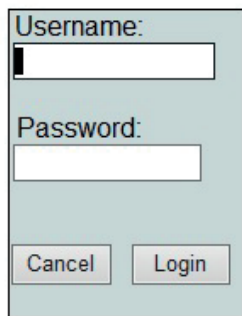
Blink Identify: When this button is clicked, the LAN module LAN LED (Green) blinks. This function allows the user to quickly identify which module is being communicated to in a rack of instruments. The blink identify is turned OFF by clicking this button again or with a LAN specific command.

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 login dialog box with a light blue background. It contains two text input fields: the first is labeled "Username:" and the second is labeled "Password:". Below the fields are two buttons: "Cancel" on the left and "Login" on the right.

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 reset 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. (This will not create an OVP fault.)

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



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

TDK-Lambda

Home

DC Power

LAN

LOGIN

Username:

Password:

Cancel Login

Output
Group
Utility

MultiDrop Supply Address HFE2500: 7

Refresh list

Set Group

Settings

Apply

Cancel

Output

☒ On ☐ Voltage

☐ Off ☐ Current

Voltage/Current Setting

Volt/Amps

Max Voltage Setting

Volts

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Fig 6. Group Page

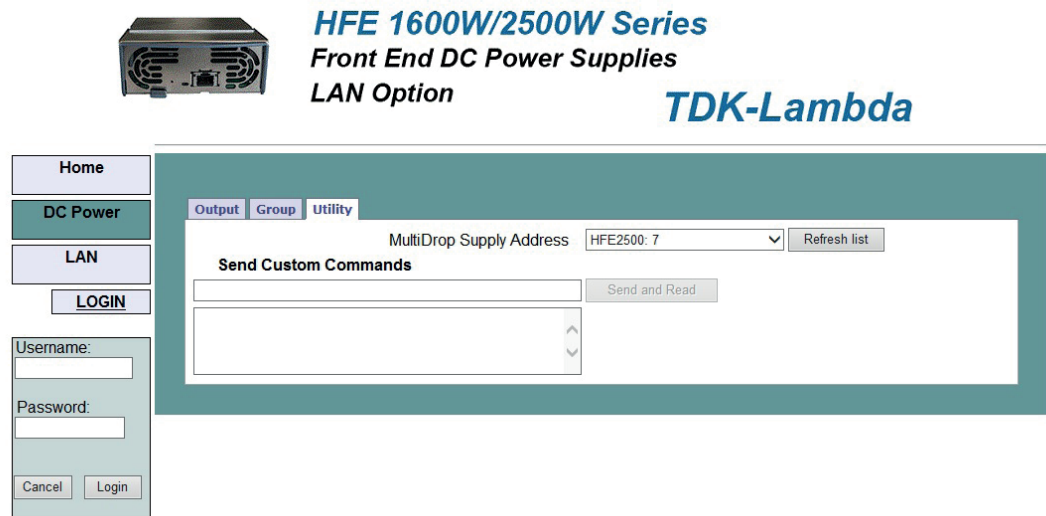
This section can be used for programming a group of supplies. As soon as the supplies are selected from the drop down menu, they will appear in the box next to it. Click on "Set Group". Select the operation – ON/OFF, Voltage or Current Setting or Max Voltage Setting. Click "Apply".

Note – This section must be used for supplies of the same type.

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:



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

TDK-Lambda

Home

DC Power

LAN

LOGIN

Configure
Advanced
SNMP Settings
Users

Present LAN Configuration	
IP Address Source:	DHCP/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
Multicast DNS:	Enabled

Modify

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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



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

TDK-Lambda

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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.



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

TDK-Lambda

The screenshot shows the 'LAN Modify' web interface. On the left is a navigation menu with 'Home', 'DC Power', 'LAN' (selected), and 'LOGOUT'. The main content area is titled 'LAN Modify' and contains the following fields and options:

- 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

At the bottom are 'Apply' and 'Close' buttons.

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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:



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

TDK-Lambda

The screenshot shows the 'LAN Advanced' web interface. On the left is a navigation menu with 'Home', 'DC Power', 'LAN' (selected), and 'LOGOUT'. The main content area has tabs for 'Configure', 'Advanced' (selected), 'SNMP Settings', and 'Users'. Below the tabs is a table titled 'Present LAN Configuration':

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

At the bottom of the table is a 'Modify' button.

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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.

Note: *Disabling VXI-11 discovery disables VXI-11 communication.*

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.



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

TDK-Lambda

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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/technical-centre/software-tools.aspx>

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.



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

TDK-Lambda

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

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.

Note: AC Fail trap may not be detected at high load condition due to power supply's short hold up time.

Note: If a power supply generates a trap, any further traps from the same or other power supplies will not be seen until the fault register of the supply which generates the trap is cleared.



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

TDK-Lambda

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 six or more characters long. Characters allowed: a to z, A to Z and 0 to 9.

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.



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

TDK-Lambda

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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 Not logged-in	Max 2 copies of web pages may be open at any time. You may view but cannot change the module operation.	
Web Page Logged-in as "admin"	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.	
VISA Connection	Only one VISA port may be open at one time. Only one copy of web page may be opened.	
TCP Socket UDP Socket	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.

Table 8: One client/Multiple clients rules.

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

Table 9: Terminator

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

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: INST:NSEL <xx>
 INST:NSEL?
 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: INST:COUP <x1,x2,.....>
 INST:COUP all
 Parameter: x1, x2 – Supplies to be selected
 all – All Supplies in the chain are selected
 Example: INST:COUP 2,4
 INST:COUP 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: OUTP <0/OFF or 1/ON >
 OUTP?
 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.

Example: OUTP:PROT:CLE

8.5 Programming the Output Voltage

This command sets the Voltage Limit.

Syntax: VOLT<nn.nn>
 VOLT?

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: CURR<nn.nn>%
 CURR?

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 higher than this value. (refer to table 7)

Syntax: VOLT:PROT:LEV <nn.nn>
 VOLT:PROT:LEV?

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.

(Note: This does not create an OVP fault.)

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: MEAS:VOLT?

Example: MEAS:VOLT? May return 46.002

8.9 Output Current Monitoring

This query returns the measured current.

Syntax: MEAS:CURRE?

Example: MEAS:CURRE? May return 50.147

8.10 Temperature Monitoring

This query returns the internal temperature.

Syntax: MEAS:TEMP?

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: STAT:QUES:COND?

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"

Table 10: Faults

8.12 Enabling / Disabling the Monitoring Filter

Syntax: DISP:FILT 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.

Function	Command
Voltage Monitoring Coefficient	MEAS:VOLT:COEF?
Current Monitoring Coefficient	MEAS:CURR:COEF?
Temperature Monitoring Coefficient	MEAS:TEMP:COEF?
Voltage Programming Coefficient	VOLT:COEF?
Current Programming Coefficient	CURR:COEF?

Table 11: Coefficients

8.14 Inventory Details of the Power Supply**8.14.1 PMBUS Revision**

Syntax: SYST:VERS?

Example: SYST:VERS? Will always return 1.1

8.14.2 Manufacturer Name

Syntax: SYST:ID?

Example: SYST:ID? Will always return TDK-LAMBDA

8.14.3 Model Name

Syntax: SYST:MDL?

Example: SYST:MDL? May return HFE1600-48/S

8.14.4 Nominal Output

Syntax: SYST:XVM?

Example: SYST:XVM? May return 48V

8.14.5 Software Revision

Syntax: SYST:REV?

Example: SYST:REV? May return 1.5

8.14.6 Manufacturing Location

Syntax: SYST:LOC?

Example: SYST:LOC? May return CHINA

8.14.7 Manufacturing Date

Syntax: SYST:DATE?

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

8.14.8 Serial Number

Syntax: SYST:SER?

Example: SYST:SER? May return DOD705BED0171W

8.15 Inventory Details of the LAN Module

8.15.1 Software Revision

Syntax: SYST:COMM:LAN:VERS?

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

8.15.2 Serial Number

Syntax: SYST:COMM:LAN:SER?

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

8.16 LAN Specific Commands

8.16.1 Read the Hostname

Syntax: SYST:COMM: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: SYST:COMM: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: SYST:COMM: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: SYST:COMM:LAN:RES

Example: SYST:COMM:LAN:RES

Note: Reset does not affect SNMP enable/disable setting

8.16.5 Blinking the Blink Identity LED

Syntax: SYST:COMM:LAN:IDLED 1 or ON, 0 or OFF

Example: SYST:COMM:LAN:IDLED 1

8.17 Scan for active power supplies

This command scans for active power supplies, returns the location in the rack.

Syntax: SYST:SCAN?

Example SYST:SCAN? may return PS:0,2,4

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.

