

TE-1056 (9099) Ethernet Converter for Environmental Chambers

Model 1056 (ICS 9099) adds these new features over the previous Model 1055 (ICS 8099)

- 2x to 5x faster than the 8099
- Webserver supports F4T native commands
- New webserver "device control" page lets you enter individual commands directly, great for debugging
- Supports Raw Socket connection



TestEquity Model 1056 Ethernet Interface Converter is a specialized Ethernet to Serial Interface that provides Modbus RTU packet communication to adapt the F4 or F4T Controller used on TestEquity chambers to a network. The converter lets you send simple ASCII read-write messages over the network to control and query the chamber's controller. The converter does all of the Modbus RTU packet formatting. An internal webserver provides a web page to read and control the chamber's set points and event outputs. The converter is packaged in a small minibox case. It can be used with any TestEquity chamber by plugging the converter cable into the chamber's serial interface connector. The TestEquity Model 1056 is based on an ICS Electronics 9099 Ethernet-to-Modbus Interface which has been customized to ensure compatibility with all models of TestEquity Chambers. TestEquity Model 1056 (ICS 9099) is 100% compatible with programs that were written for TestEquity Model 1055 (ICS 8099) Ethernet-to-Modbus Converter.

Internal Webserver

An internal webserver provides web pages for setpoint entry and readback, readback of actual chamber temperature and humidity, and Event Output setting/readback. Webserver pages for the F4T controllers add the ability to set manual ramp rate parameters. You CANNOT enter profiles or stop/start profiles with the Webserver.

Why use the 1056 Ethernet Converter when the F4T Controller includes an Ethernet Interface?

The 1056 Ethernet Interface Converter converts the controller's RS-232 Modbus interface to Ethernet. The converter takes care of the Modbus packet formatting so the command structure is simplified. The most compelling reason why you would want to use 1056 Ethernet Interface Converter instead of the F4T's native Ethernet interface is if you wanted to program using simple ASCII commands instead of Modbus packets.

The native Ethernet interface which is included with the F4T controller for no extra charge accepts SCPI commands for for reading/writing set points, turning chamber functions on/off, and starting/stopping/pausing stored profiles via Ethernet port 5025. The complete

command set for all functions remain available via Modbus. Also Watlow Composer software will only work with the native F4T Ethernet interface, NOT the 1056 Ethernet Converter.

Easy Programmability

The converter and chamber appear as a virtual instrument to the application and are easily controlled by the different programming techniques that are in common use with today's Test and Measurement systems.

If you program with LabVIEW, National Instruments' VISA library recognizes VXI-11.3 instruments like the converter as a TCP/IP resource. NI's Measurement and Automation Explorer finds and communicates with the converter as with any other VXI-11.3 compliant device. If you include the converter in a LXI system, the converter and its chamber will appear as an LXI compatible instrument and can be found with the VXI-11 Discovery procedure.

If you program with VEE, Keysight's (Agilent) IO Library treats the converter as any other LAN instrument and makes it available to your program. If you are a Visual Basic or C/C++ programmer, you can write your program to make calls to any VXI-11 compatible VISA library. You can also write your program using a raw socket connection to the converter. If you use Linux or any flavor of UNIX such as SunOS, IBM-AIX, HP-UX, or Apple's OS X, you can communicate with the 9099 through RPC over TCP/IP.

Operation

The user sends commands to the converter that sets the Modbus device address, specifies the register to be read or written to and the data value. The converter converts these commands into the Modbus packet format, adds the CRC checksum and transmits the messages to the F4, F4T, or EZ-Zone controller in the chamber. Received packets are checked and the responses to queries are returned to the network client. The converter command syntax includes an optional question mark to enable automatic response reading by included VXI-11 Keyboard Control program and other smart programs. Modbus communication faults, exception messages and other errors are reported to the user through a Modbus error register in the converter's 488.2 Status Structure. The user can set up the 8099's IEEE-488.2 Status Reporting Structure to generate a Service Request (similar to a GPIB SRQ) on an error or simply read the Modbus Error register if a problem occurs.

VXI-11.3 Operation

VXI-11 is a Ethernet instrument control protocol developed by the VISA committee when they established the VXI and VISA standards. VXI-11 provides GPIB like control of Ethernet instruments using RPC on TCP/IP. VXI-11 is a packet protocol designed to give the user error free communication with the instrument. Every VXI-11 command receives a response packet with command status information and the appropriate response data. The converter has an expanded IEEE-488.2 Status Reporting Structure that includes a register for reporting Modbus communication faults. The converter's Status Reporting Structure can be used to generate Service Requests using a Reverse Interrupt channel when an error occurs

Alternately, the user can periodically query the Modbus Error and other register to check for command and communication errors.

Raw Socket Operation

The converter accepts telnet compatible, raw socket communication so that a non-VXI-11 user can send simple read-write messages over the network to control and query the chamber controller. This makes it easy to communicate with the converter without a VISA library. Reverse channel notification of an error is not possible with the raw socket protocol..

NOTE: TestEquity 1056 Ethernet Interface Converter is NOT compatible with Watlow's WatView or Composer software.

SPECIFICATIONS

Supported Standards

VXI-11 Capabilities

Fully VXI-11.3 compliant
 VXI-11.3: Device Interface
 Sockets: 15 + 1 for UDP
 Channel types: Data, Abort and Interrupt
 Links: 64
 Interface Names: intr0 for general use

Raw Socket

Telnet compliant

RPC Protocol

Conforms to ONC RPC Version 2, VXI-11

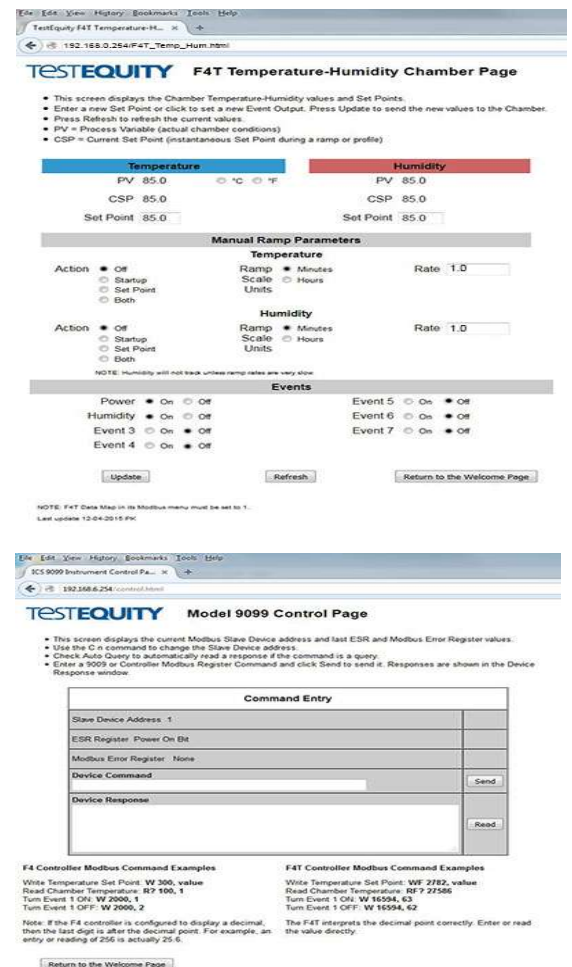
Ethernet Interface

Type: IEEE 802.3 compliant, Auto MDIX
 Speeds: 10BaseT (10 Mb/s), 100BaseT (100 Mb/s)
 IP Address: Static or DHCP with fallback to an AutoIP
 Factory setting: 192.168.0.254 Static IP
 Interface name: any [inst0]

WebServer Capabilities

Provides the following HTML 4.01 compatible web pages:
 Welcome, Configuration, Confirmation, Reboot, Control.

Preloaded TestEquity-specific web pages included for temperature and temperature-humidity chambers. Functions include Setpoint entry and readback, readback of actual chamber temperature and humidity, and Event Output setting/readback. Webserver pages for the F4T controllers add the ability to set manual ramp rate parameters.



IEEE 488.2 Capabilities

Runs all required 488.2 Common Commands, incorporates an extended IEEE-488.2 Status Reporting Structure and the Message Exchange Protocol.

SCPI Capabilities

The converter conforms to the SCPI 1994.0 Specification.

Serial Interface

Full duplex serial interface with single ended RS-232 and differential RS-422 (RS-485) signals. Signal selection made by jumpers on the converter. RS-485 half-duplex operation enabled with a SCPI command.

RS-232 Signals: Tx, Rx, RTS, CTS, DSR and DTR

RS-422 Signals: Tx and Rx pairs

Baud Rates: 300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K and 38.4K baud (Note: will be configured for 9600 baud to be compatible with controllers used on TestEquity chambers.)

Data Bits: 7 or 8 bits

Parity Stop Bits: Odd, even or none 1 or 2

Modbus RTU Commands

Modbus commands accept ASCII decimal values or HEX values starting with #h. Code is the Modbus RTU command code produced by the 9099. Integer and register values from 0 to 65,535. Floating Point per IEEE-754.

Indicators

PWR - Indicates power on

LAN - Unit connected to an active LAN

ACT - Transferring messages to/from the network

RDY - Unit has passed self test TALK Unit asked to send data

LSTN - Unit sent a command or data

SRQ - Device Service Request asserted

ERR - Blinks for a soft VXI-11 error and On for command errors

Controls

Power Front panel switch

LAN Rear panel push-button that resets Reset the network settings.

Physical

Size, L x W x H : 7.29 x 1.52 x 7.45 inches (1185.2 x 38.6 x 189.2 mm)

Weight: 3 lbs. (1.4 kg.)

Construction: Lead Free

Connectors

Serial: DB9 male connector with lock studs

Ethernet: RJ-45

Temperature

Operation -10° C to +70° C

Storage -20° C to +85° C

Humidity

0-90% RH without condensation

Power

9 to 32 Vdc @ 3 VA