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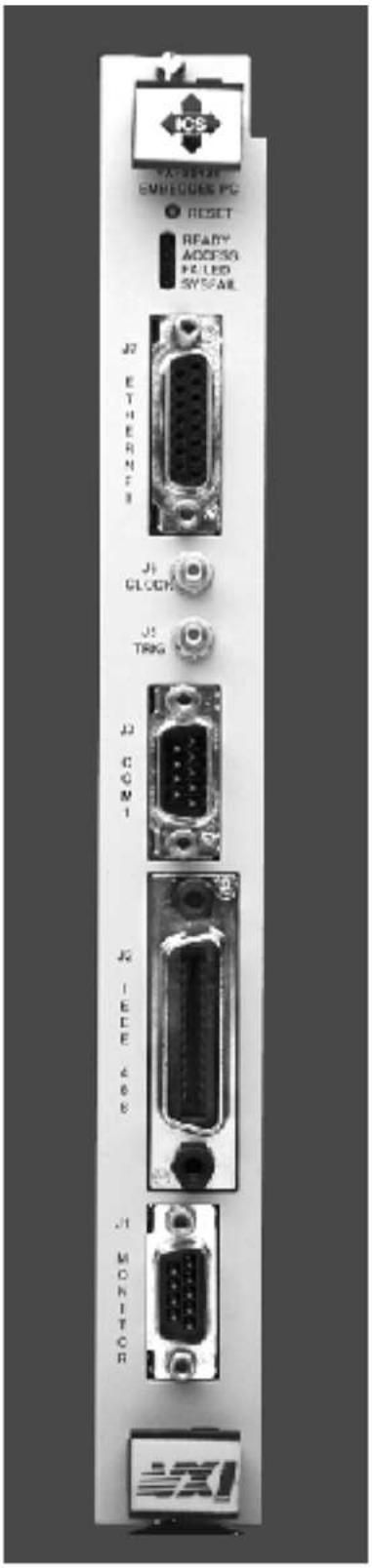
VXIBUS PRODUCTS

VXI-5543E

NEW!

VXIBUS SLOT 0 CONTROLLER WITH ETHERNET

- Embedded Computer combines DOS PC with fast solid-state-drive
  Faster program execution plus increased shock resistance.
- LAN, GPIB and Serial Interfaces use industry standard commands for control of the VXIbus.
  Standard commands and protocol simplifies system integration
- Includes LAN Server Control software and FTP Software kernel.
  No additional programming required to control the VXI chassis over a network.
- Includes Visa Transition Library with VXIbus and GPIB bus drivers.
  Plug & Play compatibility.
- Expansion capability for controlling multiple chassis.
  Eliminates VXIbus extender and saves a slot.
- All hardware functions ar controlled by software.
  No need to dismantle the unit to change or examine configuration settings.
- Optional Kit for developing LAN controlled VXI-5543E programs in a PC.
  The easy way to develop VXI-5543E programs.



DESCRIPTION

Introduction

The Model VXI-5543E is a single slot wide, C size, Slot 0 Controller for VXIbus systems. Based on an Intel 386 Processor, the Model VXI-5543E is an complete embedded computer with full AT architecture that can be used to control VXI, GPIB and serial devices with programs stored in its solid-state-drive or by executing commands received from an external host. The VXI-5543E can be remotely controlled by connection to an IEEE 802.3 compatible LAN, from its GPIB Interface or from an RS-232 or RS-485 serial communications link.

Front Panel Interfaces

The Model VXI-5543E's front panel contains multiple interfaces for communicating with external devices and for controlling the VXI-5543E's configuration. The front panel has an IEEE-802.3 LAN interface, two serial communication ports, and a GPIB interface. The IEEE-802.3 interface is the standard 15-pin AUI female connector. External transceivers adapt the AUI interface to IEEE 802.3 10Base-T twisted pair or to 10Base2 coaxial systems.

The primary serial port is a programmable RS-232 or RS-485 interface with baud rates up to 115.2 Kbaud. The second serial port is an RS-232 Monitor interface for interfacing a terminal or PC to the VXI-5543E's redirected DOS output.

The GPIB Interface operates as a full featured IEEE 488.2 controller when controlling GPIB devices or as an IEEE-488.1 device interface when accepting commands.

When controlled from a LAN, the VXI-5543E can control modules in its VXI chassis, control external GPIB devices and use its serial interface to link with and control modules in a second VXI chassis.

VXI-5543E Software

The VXI-5543E includes a set of versatile programs and software that makes the VXI-5543E easy to use and minimizes the user's program effort. The VXI-5543E's control programs let the user control the VXI chassis via any of the VXI-5543E's front panel interfaces. When additional functions are required, the user can use the existing programs as a template for his own program. Custom programs can use ICS's VISA Transition Library Drivers which conform to the VXI*plug&play* Alliance Specification VPP-4.2 and provide the user with a set of industry standard commands. ICS's VTL Library controls GPIB and VXIbus devices and includes enhancements for control of serial devices.

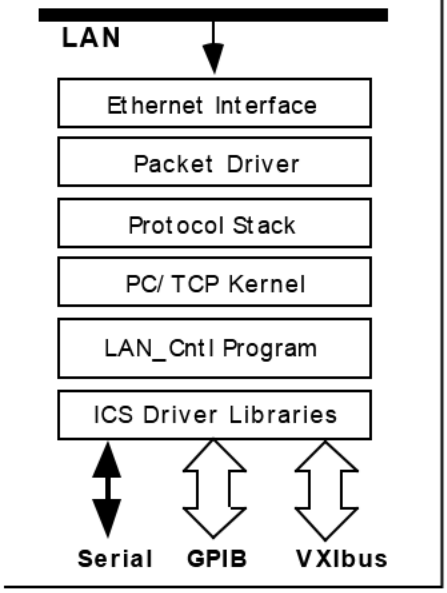
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AN Software

The VXI-5543E's LAN software pro-des the user with a complete function-g LAN-VXI controller for operating XI, GPIB and serial devices over a net-ork as shown in Figure 1. Figure 2 ows the VXI-5543E's software organi-tion. The packet driver and protocol ack in the standard VXI-5543Es use CP/ IP protocol since TCP/ IP is the ost popular network protocol for con-ol applications. The PC/ TCP Kernel ensed from FTP Software handles the twork communication. The LAN_Cntl ogram parses the received commands d uses the ICS Driver Libraries to ntrol the GPIB, Serial and VXIbus de-ces. The LAN_Cntl program uses a CP/ IP communication protocol that is odeled on the VXI-11 Specification for CP/ IP Instrument Protocol.

Other network protocols such as ovel's ODI or Microsoft's NDIS can be commodated by changing the packet ivers and protocol stacks. The ODI d NDIS drivers and protocol stacks e included with the VXI-5543E soft-are.



IGURE 2 VXI-5543E SOFTWARE

ICS's LAN_Cntl program handles S's command syntax or the VXI-5 stem Command Set. (See Table 1) th command sets give the user access the Resource Manager Tables in the XI-5543E and control of the GPIB, Se-al and VXI devices.

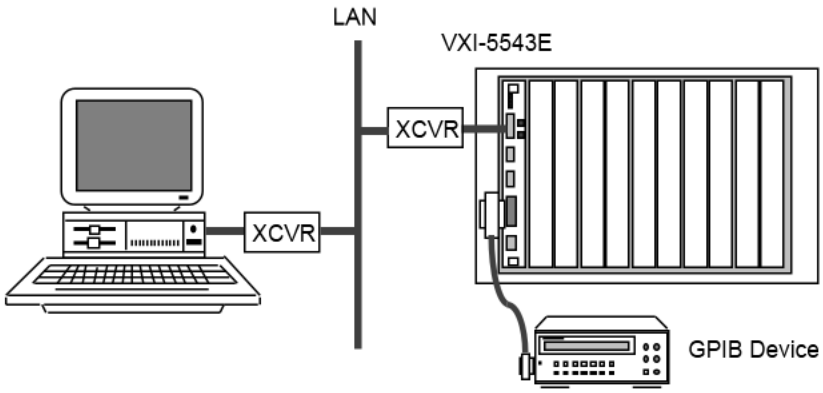


FIGURE 1 VXI-5543E LAN CONNECTION DIAGRAM

Serial Control Program

The VXI-5543E can also be controlled over a serial link using the Serial Control Program to pass data and commands to the VXI and GPIB devices. The Serial Control program operates through the RS-232/ RS-485 Serial Interface and its functions are similar to those in the LAN_Cntl program. It is available with either the ICS Command Syntax or the VXI-5 System Command Set.

GPIB Control Program

The VXI-5543E can also be controlled from its GPIB interface using the GPIB Control Program. The GPIB Control Program operates in a similar fashion to the LAN_Cntl program and provides control of the VXIbus and devices connected to the serial port. The GPIB Control program is available with the ICS's Command Syntax or the VXI-5 System Command Set.

Interactive Monitor Program

The VXI-5543E's Interactive System Monitor Program gives the user manual control of any VXI, GPIB or Serial device by plugging a PC or terminal into the VXI-5543E's Monitor Port. The System Monitor Program is an easy to use, menu driven program that has access to the Resource Manager table and is ideal for testing new devices, trying out unfamiliar commands and for debugging system problems. The System Monitor Program can also be used to view the VXI-5543E's configuration file.

Program Development

There are several ways that the user can develop programs for the VXI-5543E. If the VXI chassis is to be controlled by an external PC or workstation, there is no need for an additional VXI-5543E program. The VXI-5543E running the LAN_Cntl Program can control the devices connected to its VXIbus, GPIB and Serial Interfaces. The test program is developed and run in the host computer using the host's debugging tools. The command syntax can be either ICS's or the VXI-5 standard command set.

Programs that are to be run in the VXI-5543E can be developed in an external PC using ICS's PC LAN Development Kit and down loaded to the VXI-5543E. The Kit includes the LAN interface, interconnection cable and all software necessary to develop and test programs that can run in the VXI-5543E. During program development, the Development Library links the PC to the VXI-5543E via the LAN interface. The VXI-5543E executes all of the user's commands just as if the program was running in the VXI-5543E. When the program has been fully debugged in the PC, it is compiled with the VXI-5543E's internal Driver Libraries and then down loaded onto the VXI-5543E's solid-state-drive. If the program is developed with ICS's VTL library, its output can be redirected to the VXIbus before the final recompilation.

Alternately, the user can specify the program's functions and let ICS's expert programming staff develop the program. ICS guarantees a tested program on schedule and within budget.

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TABLE 1
VXI-5 STANDARD KEYWORDS

```
VXI
:CONFigure
        :NUMber?
        :LADDress?
        :INFormation?
:HIERarchy?
:REGister
        :READ?
        :WRITe
:RESet?
:SELect
:WSProtocol
        :COMMand
        :MESSage
                :RECeive?
                :SEND
        :QUERy
                :ANY?
        :RESPonse?
```

Turn-on and operation

At power turn-on, the VXI-5543E performs its self test routine and determines if it is the Slot 0 Controller or a servant device. If the VXI-5543E is the Slot 0 Controller, its Resource Manager routine locates and initializes the other modules in the VXIbus chassis. The Resource Manager table is saved as a file on the VXI-5543E's solid-state-drive for later use by the other programs. The power-up sequence is controlled by an autoexec file on the solid-state-drive so control may be automatically passed to any program resident in the VXI-5543E's solid-state-drive or terminate at the DOS prompt. For standard VXI-5543Es, control is passed to the LAN_Cntl program.

Configuring the VXI-5543E

All of the VXI-5543E's configurab features are software controlled exce for the unit's VXIbus address. This mak it easy to view or change the VXI-5543E configuration without having to remo the unit from the chassis or remove i covers. The configuration paramete are stored in an .ini file on the sold-stat drive and can be changed with the su plied EDIT_INI program or with ar text editor. The .ini file settings can al be viewed by the System Monitor Pr gram.

VXI-5543E: SPECIFICATIONS

VXIbus and VME Capabilities

The Model VXI-5543E has the following VXIbus and VME bus capabilities:

VXIbus Specification Revision 1.4

VXIbus Resource Manager

Full VXIbus Slot 0 and non-Slot 0 controller operation

Static and Dynamic Addresses

VXIbus Message Based Commander/ Servant operation

Controls A16/ A24 or A32 address space

7 user programmed interrupt lines

Generates VXIbus triggers internally or from a front panel input

Generates CLK10 internally or from front panel input.

Embedded Computer

The Model VXI-5543E contains a 386/ SL, 25 MHz processor with floating point capability and AT system bus. Standard memory is one or two megabytes of FLASH PROM configured as a solid-state-disk (SSD) and two megabytes of RAM optionally expandable to 10 megabytes. An optional 486, 33 MHz processor is available with 4 or 16 megabytes of RAM.

Commands and Functions

The VXI-5543E includes the following software functions and commands:

Resource Manager
- Perform self test
- Initialize 5543 Interfaces
- Reset the VXIbus
- Identify all VXI modules
- Build list of devices with status information (commander table)
- Configure Interrupters
- Send begin normal operation
- Save Commander Table on the SSD

System Monitor
- Direct control of devices on GPIB bus/ VXIbus/ Serial interfaces
- Display Commander Table
- Execute the VXIbus, GPIB bus and Serial commands

VXI Bus Transactions
- Word serial VXIbus messages
- Word serial commands and queries
- VXI registers

Interrupt handler and triggers
- Generate and service interrupts
- Generate and receive TTL Triggers

GPIB
- Set GPIB controller addresses
- Execute 488.2 Dvr Library commands

Serial
- Set interface parameters
- Set RS-485 address byte
- Send/ receive serial messages

Included Software

The VXI-5543E includes the followir software:

MS DOS 6.2 Operating System
Resource Manager
VISA-2 VTL 3.0 Driver Library
ICS VXIbus Driver C Library
System Monitor
EDIT_INI Program

GPIB_CNTL Program
ICS GPIB IEEE-488.2 C Library

LAN_CNTL Program
Network Drivers for TCP/ IP, ODI ar NDIS protocols
FTP™ PC/ TCP Network Kernel

SER_CNTL Program
Real-Time Serial Drivers

Control programs include source ar executable code so they can be used functioning programs, as program e amples and as prototypes that the us can modify or expand on to create custom application.

PC LAN Development Kit

Allows user to develop and test VX 5543E programs in a PC. Includes LAN interface card, LAN cable, tran ceiver with diagnostic LEDs, ICS Deve opment Library and FTP Developme Kit and Kernel.

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NTERFACES

EE-802.3 Ethernet Interface

andard IEEE-802.3 AUI signals on 15- n connector. (Intel 595 Interface) TCP/ protocol standard. Includes ODI and DIS protocol stacks and drivers.

AN Control program uses TCP/ IP AN protocol and ICS or VXI-5 System ommand Set. The LAN Control pro- am will comply with the final VXI-11 CP/ IP Instrument Protocol Specifica- on for VXI*Plug&Play* compatibility.

TABLE 2 ETHERNET SIGNAL-PIN ASSIGNMENTS

Pin	Signal	Pin	Signal
1	GND	9	-CLSN
2	+CLSN	10	-TRMT
3	+TRMT	11	GND
4	GND	12	-RCV
5	+RCV	13	+12V
6	GND	14	GND
7	-	15	-
8	GND		

PIB Interface

ıe Model VXI-5543E's 488.2 GPIB in- rface functions as a bus controller to ntrol external devices and as a 488.2 evice when receiving VXIbus com- ands. The GPIB Interface has the fol- wing capabilities:

Controller: AH1, SH1, C1-C4 and C9

Device: AH1, SH1, TE6, LE4, RL0, SR1, DT1, DC1, PP0, and C0.

Compatibility: Fully compatible with IEEE-STD-488.1 and IEEE-STD-488.2 Standards. Includes 488.2 controller protocols

Data Transfer Rate: > 250 Kbytes/ sec

Serial Interface Capabilities

Two asynchronous communication interfaces. Primary serial port has programmable RS-232 and RS-485 (RS-422) capability. The Monitor Port has RS-232 capability and is used for the VXI-5543E's redirected DOS output.

Baud Rate: 300 to 115.2K baud

Character format: of 7 or 8 data bits, 1 or 2 stop bits.

Parity: Odd, even, or none

Flow control: Hardware and/ or X-on/ X-off protocol in user software.

RS-485 address chars: none, 1 or 2

Full or half duplex operation. Trans mitter tristated when idle in half-duplex mode.

Monitor Port Signals: AB, BA and BB only.

TABLE 3 SERIAL PORT SIGNAL-PIN ASSIGNMENTS

Pin	RS-232	RS-485
1	CF	RD(B)
2	BB	RD(A)
3	BA	SD(A)
4	CD	SD(B)
5	AB	-
6	CC	-
7	CA	-
8	CB	-
9	-	-

Displays and Controls

The front panel contains the following indicators and controls: (* denotes LEDs controllable by the user's program)

READY	On when unit has passed self test and is functional. Off when unit is in test mode. (Green LED*)
ACCESS	Blinks when unit receives serial data or a message packet. (Green LED*)
FAILED	On when unit fails self test. (Red LED*)
SYSFAIL	Indicates status of VME SYSFAIL signal. (Red LED)
RESET	Button resets CPU and all logic

Physical

Size
VXI C size, single slot wide module (3.05 x 233.5 x 353.00 mm)

Logical Address Switch
8-bit rocker switch accessible from the side of the unit.

Power	+5 Vdc at 2 Amp
	-12 Vdc at 100 mA
	+12 Vdc at 100 mA
Temperature	
Operating	-10 °C to + 55 °C
Storage	-20 °C to + 70 °C

Front Panel Connectors

Ethernet I/O	DA-15 pin female connector with sliding locking mechanism.
Serial Ports	Two DE-9 pin male connectors with lock studs.
GPIB	Standard 24 pin GPIB connector with metric lock studs.
Clock	Sub miniature SMB coax
Trigger	Sub miniature SMB coax

Included Accessories

Instruction Manuals
Backup Library and program disks
FTP Software kernel and drivers
GPIB 1 meter Straight-in Cable

RDERING INFORMATION

	Part Number
XIbus Slot 0 Controller with Ethernet interface and 1 MByte RAM	VXI-5543E-1
XIbus Slot 0 Controller with Ethernet interface and 2 MByte RAM	VXI-5543E-2
C LAN Development Kit	123151

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