VXIBUS PRODUCTS

VXI-5501

VXI-5502

VXI PROTOTYPE MODULE KITS

- Choice of two prototyping boards and 4 VXI Shield Kits
  Fastest way to build any size VXIbus module.

- Uses register-based VXI interface that provides digital I/O lines and a VXI data expansion bus
  Easiest interface for controlling user's circuits.

- VXI-5501 has a Bare Copper-clad Board for RF and microwave modules.
  Provides ground planes for high frequency modules.

- VXI-5502 has a Prototyping Board with holes on 0.1 centers plus power and ground planes.
  Breadboard analog or digital circuits.

- CAD Design aids for PC board layout.
  Upward migration path to a PC board without major redesign.

- User configurable VXI response registers.
  Personalizes the finished module as your product.

DESCRIPTION

ICS's VXI-5501 and VXI-5502 Prototype Kits are flexible, low-cost solutions for developing prototype or short-run VXIbus modules. Both kits use ICS's VXI-5524 Register-based Interface card to interface with the VXIbus. The VXI-5524 provides the user with a simple but powerful interface for controlling his circuits from the VXIbus. The user circuits are constructed on the supplied bare or prototyping board that mates with the VXI-5524 to form a complete 'C' size, VXI module as shown below.

A choice of VXI hardware shield kits lets the user assemble one, two or three-slot wide modules which accommodate standard or oversize components or even wire-wrap tails. Applications are fabricating prototype VXIbus modules, packaging circuits in VXIbus modules and building short-run modules.

Each hardware kit includes the side shields, front panel, and all hardware to finish the module. The VXI-5501 Kit includes a bare copper-clad board for mounting RF devices. The VXI-5502 Kit includes a prototyping board with holes on 0.1 inch centers for mounting sockets or components.

The VXI-5502 is shown on the right with the shields removed to show how the prototyping board is mates to the VXI-5524 Register-based VXI Interface.

VXI Interface

ICS's VXI-5524 VXI Interface Card is a VXI register-based interface that meets the latest VXI-1 and VXI-2 Specifications for an Extended Register Based Device. The VXI-5524 Interface Card provides all of the VXI required registers and makes all of the device register addresses available to the user's circuits in a way that is the easiest for the user to use. The user can alter the default values in the VXI-5524's registers to personalize the finished VXI module as his product. The user's setting can be saved and recalled at power turn-on.

The VXI-5524 provides the user with a 48 line parallel digital interface for controlling or reading signals, a 16-bit wide data expansion bus for driving additional circuits, an interrupt input and two VXIbus Trigger lines. In some applications, the VXI-5524's registers provide all of the needed signals so that the user does not have to construct additional decoding or driver circuits. The user's interface also includes all seven VXIbus power lines, a selectable clock and ground.

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User Interface

Figure 1 shows a Block Diagram of the VXI-5524 and the User's Interface. The VXI-5524 provides the user with 48 Digital I/O lines, a Data Expansion Bus, a VXIbus interrupt and TTL Trigger lines. The 48 Digital I/O lines are configurable as inputs or outputs in 16 line groups by setting bits in the VXI-5524's Configuration Register. As outputs, each line can sink 40 mA or source 20 mA to drive most any TTL/CMOS compatible device. When configured as inputs, each line is a high impedance TTL gate with a 33 Kohm pullup to 5 Vdc for sensing open collector lines, contact closures or TTL/CMOS level signals.

The Data Expansion Bus is a 16 bit wide bus that extends the unused VXI register addresses and data lines to the user's circuits. Examples in the manual show how to decode the address lines and connect registers, FIFOs and other circuits to the Data Expansion Bus.

The VXI-5524 extends a selected pair of TTL Trigger lines to the user's interface. The TrigIn# line can be used to initiate an action such as data capture, data conversion, etc. in the user's circuits. The TrigOut# line can be used to pulse a VXIbus TTL Trigger line and initiate action in another module.

The VXI-5524 has an IRQ input that latches three Cause code lines when pulsed. The Cause lines are new with the VXI-2 Specification and gives a register-based device a way of communicating the cause of the interrupt when it is queried by the Slot 0 Controller. VXIbus IRQ line selection and interrupt enable is controlled by bits set in the new Interrupt Control Register.

The VXI-5524 passes all seven VXIbus voltages and a 10 MHz clock on to the user's interface. The user can select either the VXI-5524's internal 10 MHz oscillator or the VXIbus ECL 10 MHz clock as the clock source.

VXI-5524 Register Map

Figure 2 shows the VXI-5524's register map. Each VXIbus module is assigned 32 (16-bit) register addresses in the VXI A16 address space. The register addresses values in Figure 2 are offsets from the module's logical address. i.e. The Device Type Register is 0x02 HEX which is the module's logical address plus 2.
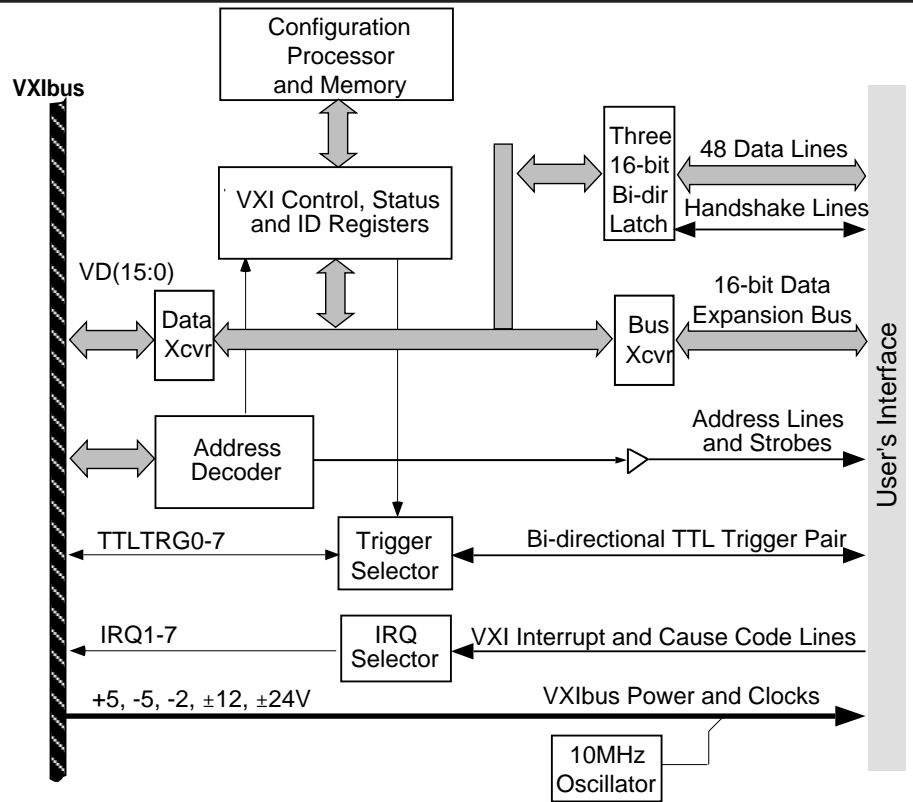
The lower 16 register addresses are used for the VXIbus interface, the upper 16 register address are for the device. The VXI-5524 uses the top three register addresses for the Digital I/O lines. Register addresses 0x20 through 0x38 are made available to the user's circuits with the Data Expansion Bus.

The Configuration and Interrupt Control registers configure the Digital I/O lines and control the Trigger and Interrupt operation. The ID, Type, Serial Number and Version registers identify the VXI module and its capability. The user can change these registers to configure the interface and personalize the finished module as his product . All register values are then saved in an EEPROM on the VXI-5524 and are automatically recalled at power turn-on time or when the board is reset.

Figure 1   VXI-5524 Block Diagram

Reg Addr	Register	Use
3E	Digital I/O Reg-CH 48:33	R/W
3C	Digital I/O Reg-CH 32:17	R/W
3A	Digital I/O Reg-CH 16:1	R/W
38		
36		
34		
32		
30	Data Expansion	
2E	Bus Area	
2C		
2A		
28		
26		
24		
22		
20		
1E	Sub Class	R
1C	Interrupt Control	R/W
1A	Interrupt Status	R
18		
16	Reserved by	
14	VXI-2 Specification	
12		
10		
0E	Version Number	R
0C	(Serial Number Lo)	
0A	Serial Number Hi	R
08	Attribute Register	R
06	Configuration Processor	W (8 bits only)
04	Status/Control	R/W
02	Device Type	R
00	ID/(Logical Address)	R

Figure 2   VXI-5524 Register Map

Bare Board

Provides bare copper ground planes on top and bottom of the board for mounting RF or microwave modules. Board includes signal and power pads for making connection to user's circuits. Board also includes LEDs on the front panel that show VXIbus status and a Reset button. The standard front panel has a small cutout for the LEDs and a hole for the push-button.

Proto Board

Provides a sea of floating pads on 0.1 inch centers for mounting components and sockets. Multilayer PC board includes three split power planes for distributing power and a ground plane to assure quiet circuits. Board includes signal and power pads for making connections to user's circuits and pad patterns for selecting power plane voltages. Power plane access is via four strips of pads distributed across the PCB. Board also includes LEDs on the front panel that show VXIbus status and a push-button that can be used to reset the VXI-5524. The front edge of the board includes pads for mounting a 9 to 37-pin 'D' shell connector and a 96-pin DIN connector on the PCB. The standard front panel has openings for the LEDs and the push-button switch.

Kit Sizes

VXI-5501 and VXI-5502 Prototype Module Kits are available with various VXI Shield Kits to make 1, 2 or 3-slot wide modules. Two slot kits can be ordered with the extra space on the circuit side of the PC board for wirewrap tails. Refer to Table 1 for inside component clearance dimensions and ordering suffix letter.

Design Aids

Use our ORCAD template as the starting point for your circuit schematic or to layout a custom PC Board. Request a copy of Disk 123153 which includes the ORCAD templates and .dxf drawing files to modify the VXI front panels.
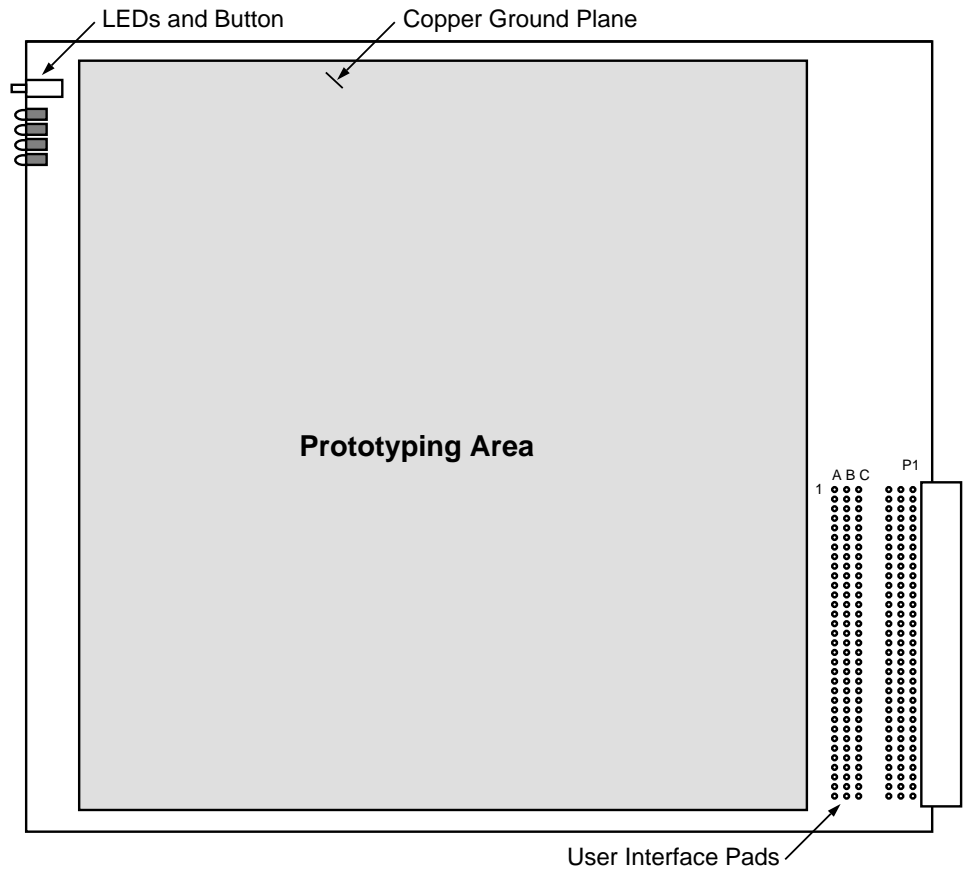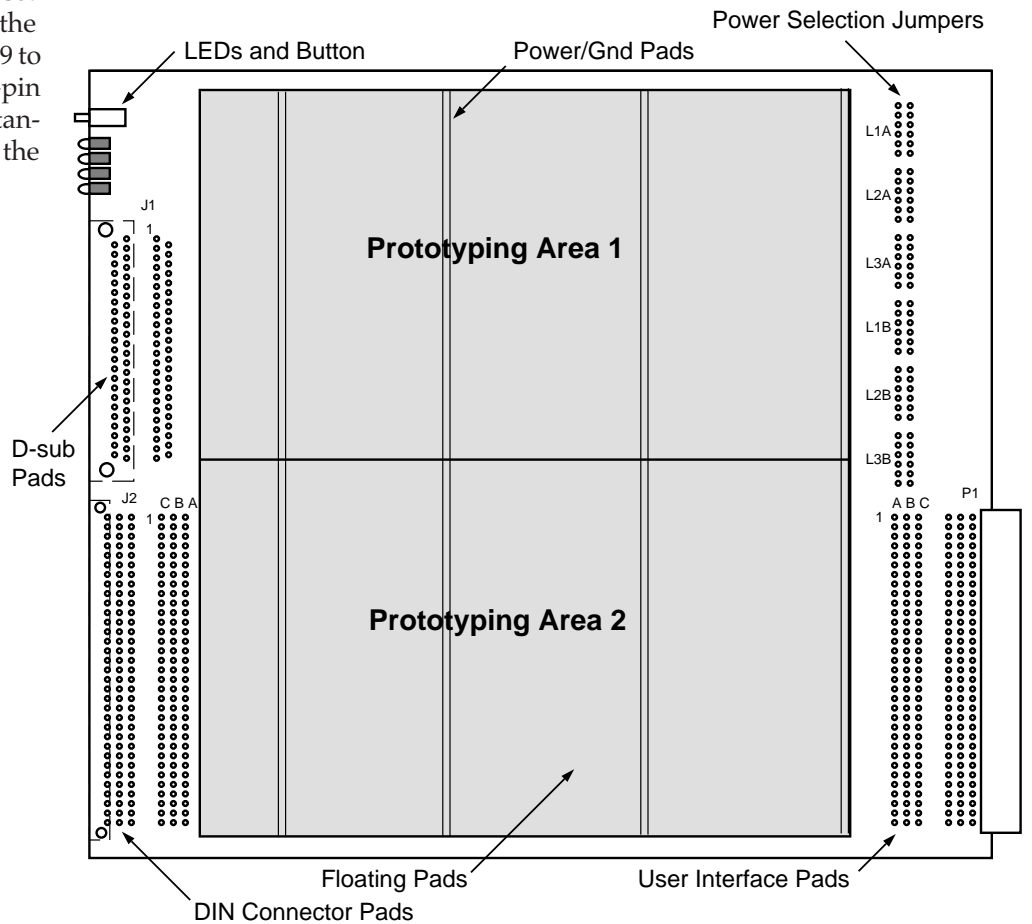

Figure 3   VXI-5501 Bare Board

Figure 4   VXI-5502 Prototyping Board

VXI Specifications

VXI Capabilities
VXI-1 Revision 1.4 compliant
VXI-2 Revision 1.0 compliant
Static Address capability
Register based, servant device
A16 Address space, D16 Data
Programmable interrupter
Normal handshake data transfer
Includes VXI-2 Version, Serial Number,
    Interrupt and Subclass Registers.

Diagnostic Capability
Four LEDs for VXI status and trouble
    shooting.

Indicators

Four LEDs showing the state of the VX-
Ibus interface and VXI-5524's logic.

RDY   On after initialization
ACCESS   Blinks when address recog-
            nized
FAIL   On when initialization
            failed
SYSFAIL   VXIbus SysFail signal line

User Interface

Digital I/O Lines
48 TTL/CMOS latched data lines with
33 Kohm pullups, 20 mA source and 40
mA sink capability. Data line direction
set in 16-bit increments.

Expansion bus
16 data lines, 4 address lines, strobe and
write lines for addresses 0x20-0x38. All
signals have 20 mA source and 40 mA
sink capability.

Triggers
VXI TTLTRG line pair. TrigIn# may be
TTL Triggers 0, 2, 4, or 6. TrigOut# may
drive TTL Trigger lines 1, 3, 5 or 7.

Interrupter Capability
IRQ line and three Cause Code lines.

Other Signals
CLEAR#: low true pulse to reset user
logic. 20 mA source/40 mA sink.

RST#: low true input to reset VXI-5524
logic.

CLK10: VXIbus or VXI-5524 10 MHz
clock. 20 mA source/40 mA sink.

LED drive signals for operating four
front panel LEDs. 2 mA sink.

Physical

Size
C-Size Single slot module
1.2 in W x 9.187 in H x 13.9 in D
(30 mm W x 233 mm H x 353 mm D)

Bare or Proto Board
9.187 in H x 10.37 in D
(233 mm H x 263 mm D)

Weight
1.2 kg. (2.5 lbs.)Single slot module

Power Consumption for Interface
5 Vdc @ 300 mA
-5.2 Vdc at 45 mA
-2 Vdc at 9 mA

Included Accessories

Instruction manual with PCB layout
drawings, design rules for user's PCB
and example user circuits.

Programming guide and sample rou-
tines for user interface signals, and ex-
pansion bus data transfers.

Mounting bracket.

Component Clearance Table

Width Code Ltr	VXI Slots	Component Clearance	
		Circuit Side	Component Side
none	1	0.226 in	0.769in
D	2	0.226	1.969
W	2	1.426	0.769
T	3	0.226	3.169

ORDERING INFORMATION

	Part Number
VXIbus Prototyping Module, C-size, with bare board, single slot wide	VXI-5501
VXIbus Prototyping Module, C-size, with bare board, two slot wide	VXI-5501D
VXIbus Prototyping Module, C-size, with bare board, three slot wide	VXI-5501T
VXIbus Prototyping Module, C-size, with bare board, two slot wide for wirewrap tails	VXI-5501W
VXIbus Prototyping Module, C-size, with prototype board, single slot wide	VXI-5502
VXIbus Prototyping Module, C-size, with prototype board, two slot wide	VXI-5502D
VXIbus Prototyping Module, C-size, with prototype board, three slot wide	VXI-5502T
VXIbus Prototyping Module, C-size, with prototype board, two slot wide for wirewrap tails	VXI-5502W

Specifications subject to change without notice