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## VXIBUS PRODUCTS



# VXI-5500

## PROTOTYPING MODULE

### DESCRIPTION

The VXI-5500 provides parallel interface and prototyping space within a C-sized VXI card for users who want to interface their own circuits or devices to the VXI Bus. The VXI-5500 is a multilayer PCB with a VXIbus message based interface along its back end. Over two thirds of the board's area is a grid of holes on 0.1 centers that accept standard wire wrap or dip solder sockets. Isolated power planes under-ly all holes to minimize noise and let the user divide the prototyping area into four individual circuit sections. The power planes can be connected to any VXIbus voltage. The user interfaces his circuits to the VXIbus through a 56 line parallel interface.

### VXI-5500 Configuration Features

The firmware in the VXI-5500 lets the user configure the parallel interface to match his circuitry. A "save" command stores the configuration in non-volatile memory for recall at power turn-on. Other configuration commands let the user store his model number,

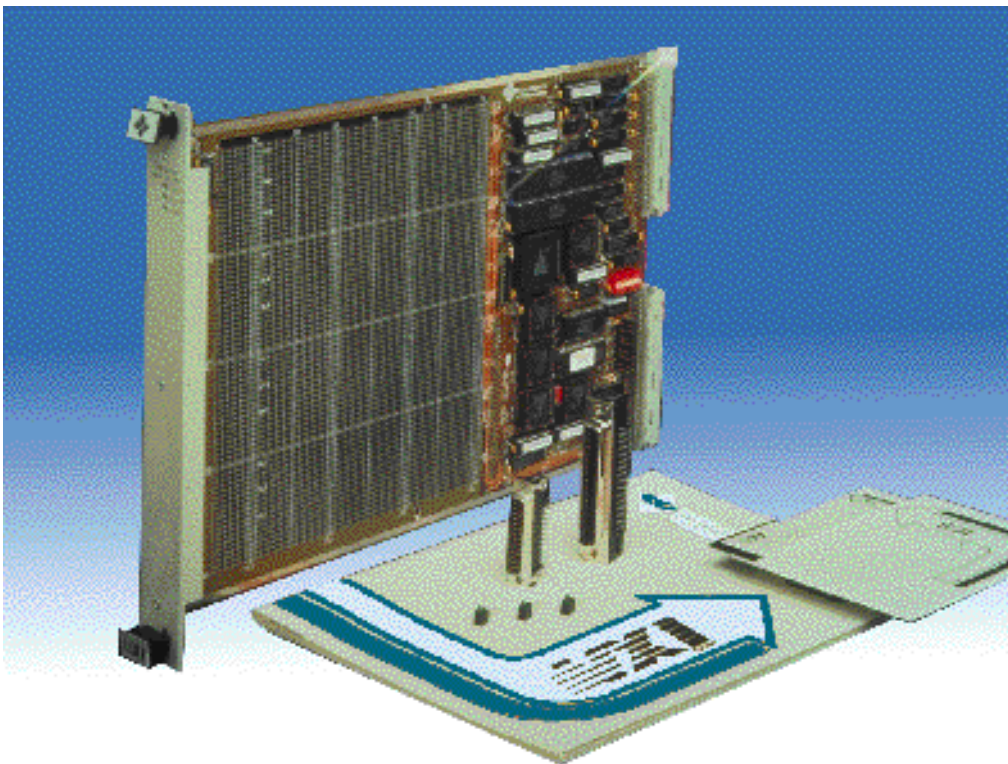
VXI manufacturer ID number, serial number and data fields.

After configuration, data transfer commands let the user send byte wide or longer messages to the prototype circuits and to return data and status to the VXIbus.

For users who need a customized module, ICS can add user defined commands and functions to the VXI-5500 firmware or modify the front panel for more connectors.

### Complete Package with full Manual

The VXI-5500 is a complete, C-size module including all shields and hardware. POWER, ACCESS and FAILED LEDs on the front panel provide status information about the VXIbus interface. Although the VXI-5500 is normally supplied as a single slot wide unit, dual slot front panels and shields are available for wire wrap applications that need additional room on the circuit side of the board. The VXI-5500 manual includes interface setup, configuration guides, and programming commands. Full parts list and schematics to document your unit.



- All VXI functions provided in VXI interface. *Just place your circuit in the prototyping space.*
- Message Based C-sized VXIbus interface is VXI 1.4 and 488.2 Compliant . *The latest VXI revision and common 488.2 commands.*
- User configurable parallel CMOS interface *Adapts to the needs of the prototyping circuit.*
- Unique multilayer prototyping area includes user assigned power and ground planes. *Separate low noise areas for analog and digital signals.*
- Kit includes full module shields, blank Front Panel and layout drawings. *Includes all hardware for a completed module.*
- User programmable VXI ID, model number, serial number and two data fields for historical data. *Complete VXI customization makes the 5500 your module.*
- VXIbus interface available separately for low volume VXIbus products. *Upward migration path for PCB version of the prototype circuit.*

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## PARALLEL INTERFACE

The VXI-5500 provides the user with a 56 line parallel interface that the user can configure to control or communicate with his circuitry. The 56 lines can be partitioned into three logical channels for passing data or controlling circuits. The lines are partitioned in 8-bit byte increments and can be defined as latched outputs or inputs. Signal polarity, format, data transfer handshakes are also user configurable. Other signals in the Parallel Interface are: VXIbus 10 and 16 MHz clocks, a reset strobe, clear strobe, data handshake lines, VXIbus triggers and 8 local bus lines. The Parallel Interface is arranged as a 3 x 32 grid along the interface edge of the prototyping area.

## BLOCK DIAGRAM

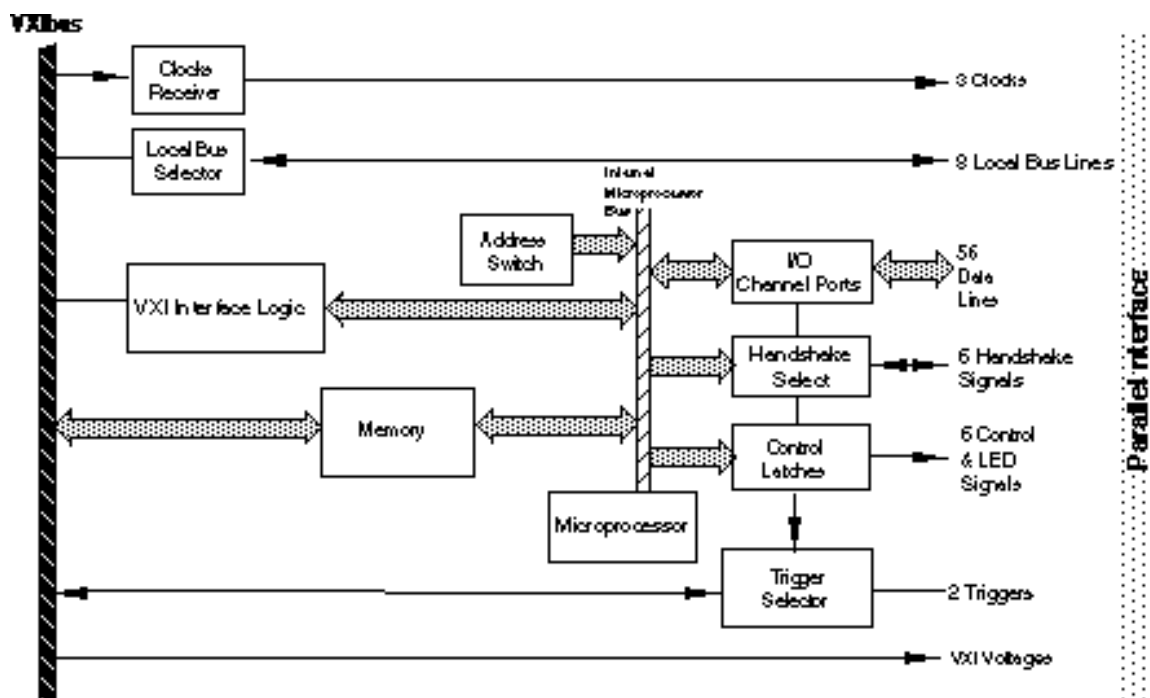


Figure 1 VXI-5500 Block Diagram

## PROTOTYPING AREA

Four power and ground planes under each prototyping area to minimize noise.  
Four power islands in each section for powering the prototype circuits

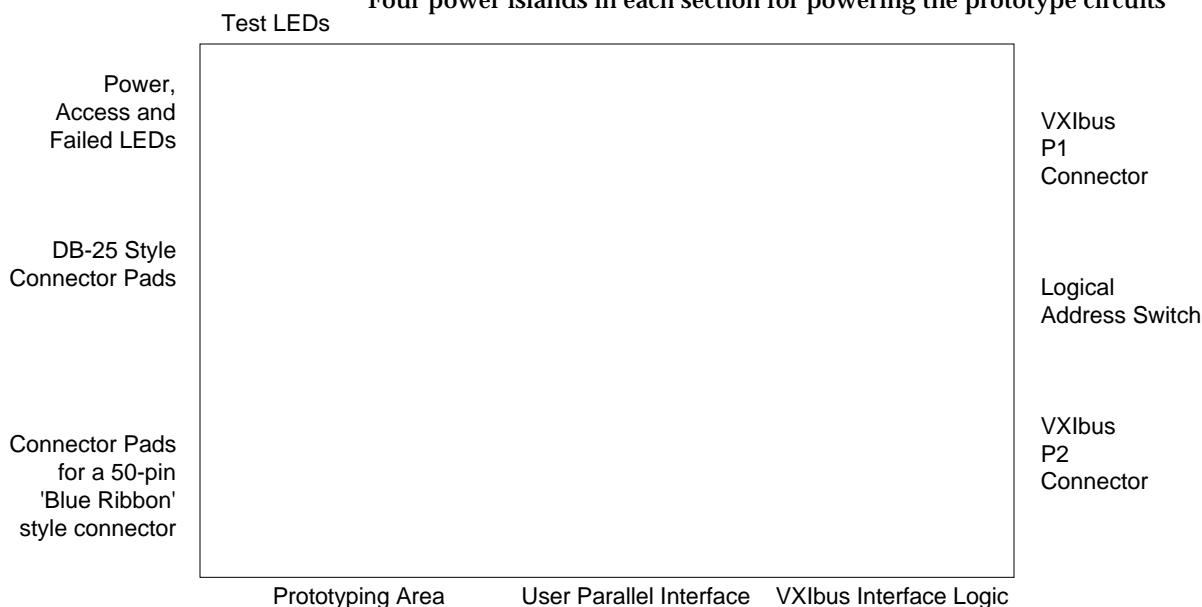


Figure 2 VXI-5500 Layout

## COMMANDS

Use the VXI-5500 commands to configure the User's Parallel Interface from the VXIbus and then to control or transfer data to/from the prototype circuits.

### I/O Configuration Commands

*These commands partition the parallel interface and set the signal polarities, functions and channel handshaking.*

| <u>Command</u> | <u>Function</u>                          |
|----------------|--|
| BF             | Sets BCD/HEX or Binary data format       |
| HS             | Enables/disables data transfer handshake |
| PL             | Set data polarity                        |
| PA             | Assigns a data port to a channel         |
| SA             | Sets status line polarity                |
| TR             | Selects VXI trigger pair                 |
| N              | Sets input conversion table              |
| CS             | Select channel n (1 n 3)                 |
| CC             | Configure execute command                |
| Q              | Read current configuration               |
| SC             | Save current configuration               |
| LRC            | Recall default configuration             |

### Data Transfer Commands

*These commands transfer data to or from a selected channel.*

| <u>Command</u> | <u>Function</u>             |
|----------------|-----------------------------|
| D              | Output HEX/BCD/Binary data  |
| PO             | Output data to a port       |
| PB             | Sets an output data bit     |
| TC             | Input data from a channel   |
| O              | Set GPIB message terminator |

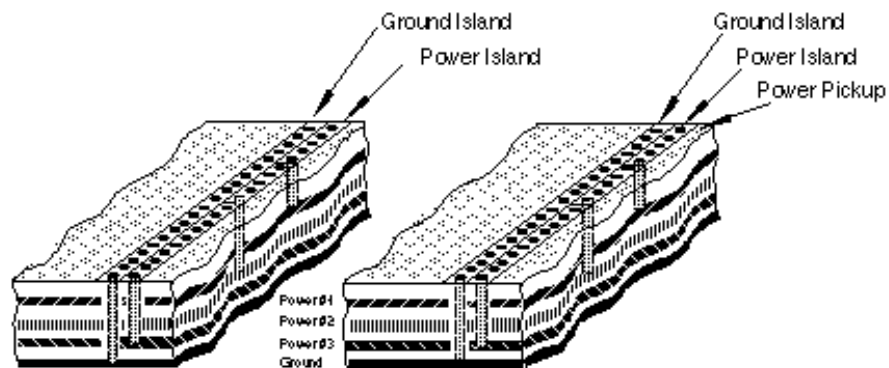
### VXI Configuration Commands

*These commands configure the VXI-5500 to be your product.*

| <u>Command</u> | <u>Function</u>                        | <u>Size</u> |
|----------------|--|-------------|
| ID             | Set manufacturer's ID number           | 3 HEX       |
| TY             | Set manufacturer's model number        | 4 HEX       |
| WU, WO         | Saves historical data field #1 or #2   | 250 ASCII   |
| RU, RO         | Recalls historical data field #1 or #2 | 250 ASCII   |

## POWER

Power for the prototype circuits is distributed on internal PCB layers to minimize noise and maximize power availability. The PCB has one continuous ground plane but each prototyping sections has three individual power planes. Power is brought up to the surface in power island strips as shown in Figure 3. The voltage in each layer is selected by jumpering the first power island to the power pickup strip.



**Figure 3** Power Distribution Arrangement showing Power/Ground Layers

## VXI-5500: SPECIFICATIONS

### VXI Capabilities

Static and Dynamic configuration capability  
 Message based, I4 class instrument  
 Message based slave device  
 A16 address space  
 Programmable interrupter  
 Normal handshake data transfer  
 Supports VXI instrument protocol and IEEE 488.2

### 488.2 Common Commands

\*CLS, \*ESE, \*ESE?, \*ESR?, \*IDN?, \*OPC, \*OPC?, \*RST, \*SRE, SRE?, \*STB?, \*TST? and \*WAI

### Indicators

POWER, ACCESS and FAILED LEDs mounted on upper end of the front panel, Drivers provided for three additional LEDs on the front panel. Two internal LEDs used for factory diagnostic tests.

### User Interface

A 3 row by 32 pad matrix with the data and control signals listed in Table 1.

#### Data Lines

56 LSTTL/CMOS I/O data lines and 3 pair of handshake lines with 2 mA sink and 250 mA source capability. Data line functions and handshake line assignments are set by user configuration commands. Data lines are bit, nibble and/or byte programmable from the VXIbus.

#### Status

2 status lines provide prototype circuit information to the VXI interface.

#### Reset

Single line to reset prototype logic at power on or by VXI command.

#### Clear

Single line to clear prototype

#### Additional VXI Signals

CLK10+ and CLK10-: ECL 10 MHz clocks  
 SYSCLK: TTL 16 MHz clock  
 TTLTRGO and TTLTRGI: One pair of trigger lines. Connected to selected pair of VXI trigger lines  
 LBUS0-7: Eight local bus lines, user strappable to row A or C pins.

#### User Power

All VXIbus voltages: + 5, - 5.2, +12, -12, +24, -24, and -2Vdc.

### Physical

#### Prototype Area

177.8 mm x 203.2 mm (7" x 8") pattern of holes on 2.54 mm (0.1 inch) centers.

#### Prototype Power Distribution

Prototype area is divided into four horizontal sections. Each section has 3 power planes for distributing any VXI voltage and has power islands for convenient connection to the prototype components.

#### Size, W x H x D

C-sized card

Single Slot module - 1.2 x 9.2 x 13.9 in (3.0 x 23.3 x 35.3 cm)

Dual Slot module - 2.4 x 9.2 x 13.9 in (6.0 x 23.3 x 35.3 cm)

#### Weight

1.8 kg. (4 lbs.)

#### Power Consumption

VXI interface logic uses 800 mA of +5 Vdc

#### Kit Includes

Prototype card assembly  
 Blank front panel  
 Side shields  
 All necessary hardware  
 Instruction manual.

Table 1 User's Parallel Interface Signals

| Pin No. | Row A       | Row B    | Row C    | Pin No. | Row A     | Row B | Row C |
|---------|-------------|----------|----------|---------|-----------|-------|-------|
| 1       | CLK16       | +5V      | +12V     | 17      | IO30      | IO31  | IO32  |
| 2       | GND         | GND      | -12V     | 18      | IO33      | IO34  | IO35  |
| 3       | SLFTST_IND- | IORST-   | IORDY0   | 19      | IO36      | IO37  | IO38  |
| 4       | ERROR_IND-  | IOCLR-   | IORDY1   | 20      | IO39      | IO40  | IO41  |
| 5       | STATUS0     | IORDY2   | IOST B0- | 21      | IO42      | GND   | IO43  |
| 6       | STATUS1     | IOST B2- | IOST B1- | 22      | IO44      | IO45  | IO46  |
| 7       | IO1         | IO2      | IO3      | 23      | IO47      | IO48  | IO49  |
| 8       | IO4         | IO5      | IO6      | 24      | IO50      | IO51  | IO52  |
| 9       | IO7         | IO8      | IO9      | 25      | IO53      | IO54  | IO55  |
| 10      | IO10        | IO11     | IO12     | 26      | IO56      | LBUS1 | LBUS0 |
| 11      | IO13        | GND      | IO14     | 27      | TTLTRIGO- | LBUS3 | LBUS2 |
| 12      | IO15        | IO16     | IO17     | 28      | TTLTRIGI- | LBUS5 | LBUS4 |
| 13      | IO18        | IO19     | IO20     | 29      | CLK10+    | LBUS7 | LBUS6 |
| 14      | IO21        | IO22     | IO23     | 30      | CLK10-    | -5.2V | -2V   |
| 15      | IO24        | IO25     | IO26     | 31      | GND       | GND   | +24V  |
| 16      | IO27        | IO28     | IO29     | 32      | +5V       | +5V   | -24V  |

### ORDERING INFORMATION

VXIbus Prototyping Module, C-size, single slot wide

VXI-5500

VXIbus Prototyping Module, C-size, dual slot wide with extra slot depth on circuit side

VXI-5500D

### Part Number



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