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GE Fanuc Automation

# VMIVME-5531L Specifications

## VMEbus Fiber-Optic Repeater Link

### Features:

- High-performance, easy-to-use method of linking two or more VMEbus systems together via fiber-optic cable
- Software transparent allows direct communication from primary chassis to secondary chassis with no software overhead (unidirectional link control with bidirectional data transfers)
- Plug-and-play operation
- Supports 8-, 16-, and 32-bit data transfers (6U slave)
- Supports 16-, 24-, and 32-bit addressing (6U slave)
- Supports 8-, 16-bit data, 16-, 24-bit address (3U slave)
- Total electrical isolation between VMEbus systems
- Maximum 6,560 ft (2,000m) fiber-optic cables
- Advantages over standard repeaters
  - — Small cables
  - — High-noise immunity
  - — High-voltage isolation
  - — No EMI generated by cables
- The VME-to-VME link consists of two boards and two fiber-optic cables (master board: 6U, slave board: 6U or 3U)

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| Ordering Options | | | | | | | |
|---|---|---|---|---|---|---|---|
| November 11, 2005 800-5531-000 D | | A | B | C | D | E | F |
| VMIVME-5531L | – | | | | | | |

**A =**
0 = 6U Slave
1 = 3U Slave

**BC=**

| | |
|---|---|
| 00 = Not Used | 09 = 1,000 ft (304.8m) |
| 01 = 5 ft (1.5m) | 10 = 1,500 ft (457.3m) |
| 02 = 25 ft (7.6m) | 11 = 2,000 ft (609.7m) |
| 03 = 50 ft (15.2m) | 12 = 2,460 ft (750.0m) |
| 04 = 100 ft (30.4m) | 13 = 3,280 ft (1,000m) |
| 05 = 150 ft (45.7m) | 14 = 4,100 ft (1,250m) |
| 06 = 200 ft (60.9m) | 15 = 4,920 ft (1,500m) |
| 07 = 350 ft (106.7m) | 16 = 5,740 ft (1,750m) |
| 08 = 500 ft (152.4m) | 17 = 6,560 ft (2,000m) |

| Boards Only | | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| VMIVME-5531M | – | 0 | 0 | 0 | | | |

**ABC = 000 (Options reserved for future use)**

| | | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| VMIVME-5531S | – | | 0 | 0 | | | |

**A =**
0 = 5531S (6U Form Factor)
1 = 5531S (3U) (3U Form Factor)

**BC = 00 (Options reserved for future use)**

| Note |
|---|
| Link: Includes one VMIVME-5531M Board, one VMIVME-5531S Board, and two cable assemblies. |

| Connector Data | |
|---|---|
| **Compatible Connector** | **ST Connector** |
| PC Board Fiber-Optic Connector | Fiber-Optic Receiver HFBR-2416 (Hewlett-Packard)<br>Fiber-Optic Transmitter HFBR-1414 (Hewlett-Packard) |

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
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## Functional Characteristics

**Overview:** The VMIVME-5531 Link is a high-performance, yet easy-to-use method of linking two or more VMEbus systems together via fiber-optic cable. The Repeater Link is a two-board set which allows VMEbus slave I/O boards residing in one VMEbus chassis to be controlled by a VMEbus master residing in another chassis. The VMEbus chassis in which VMEbus masters reside is referred to as a primary chassis, while the VMEbus slave boards reside in a secondary chassis. The two-board set is configured as shown in Figure 1 with one board designated for the primary chassis while the other board is designated for the secondary chassis. A master VMEbus chassis can communicate with several secondary chassis by using multiple REPEATER Links in a star configuration as shown in Figure 2.
The link is software transparent. Any VMEbus master in the primary chassis may access (read or write) to any slave board in the secondary chassis. Only noninterrupter slave boards are allowed in the secondary chassis.

The link between the primary chassis and secondary chassis is automatically established when a VMEbus master (typically a CPU board) addresses any board in the secondary chassis.

Any time a master in the primary chassis issues a VMEbus read/write cycle it will be repeated to the secondary chassis. If a slave board in any secondary chassis responds to that address, the data transfer (read or write) will occur between the chassis and a Data Transfer Acknowledge (DTACK) will be generated to the master (in primary chassis) to complete the cycle.

A link consists of two boards (VMIVME-5531M and VMIVME-5531S) and two cables which enable a VMEbus system to be expanded beyond a single chassis. Refer to Figures 3, 4, and 5 for a block diagram of each board.

**VMEbus Compliance:** Complies with VMEbus specification revision C.1
A32, A24, A16: D32, D16, D08 (EO)
VMIVME-5531M is DTB slave (for use in Primary Chassis)
VMIVME-5531S is DTB master (for use in Secondary Chassis)

**Form factors:** [1]
- — double height, single slot: 5531M
- — double height, single slot: 5531S
- — single height, single slot: 5531S

**VMEbus Signals Repeated to Secondary Chassis:** [1,2] A1 to A31, D0 to D31, DS0*, DS1*, WRITE*, SYSRESET*, AM2, AM4, AM5, and LWORD*

**VMEbus Signals Returned to Primary Chassis:**
(D0 to D31, DTACK*)[3] (D0 to D15, DTACK*)[4]

**Address Modifiers:** (09, 0D) [4] 3, 29, 2D, 39, 3D

**Read Cycle Overhead:** 4.0µs maximum.

**Write Cycle Overhead:** 4.0µs maximum.

**Transfer Rate (Maximum) (10-foot Cable Length):** Assuming a slave board in the secondary chassis responds in 250ns:
1 Mbyte/s minimum (D32)

Note: Applies to 6U.

## Cable Specifications

**Mode:** Multi

**Length:** 5 to 6,560 ft (1.5 to 2,000m)

**Fiber Size:** 62.5 micron

[1] 3U Slave repeats A1 to A23, D0 to D15, DS0*, DS1*,WRITE*, SYSRESET*, AM2, AM4, AM5, and LWORD*

[2] The following signals are regenerated at the secondary chassis instead of being sent over the fiber-optic cable: SYSCLK, AM0, AM1, AM3, and IACK*.
[3] Applies to 6U
[4] Applies to 3U



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**Clad Size:** 125 micron

**Buffer Size:** 900 micron

**Maximum Attenuation at 1,300 nm:** 9.0dB (including connectors)

**Bandwidth at 1,300 nm:** 500 MHz-km

**Boot Length:** 20 to 60mm

**U.L./NEC Rating:** OFNP

**Connector Style:** ST, 2.5mm Bayonet, both ends

**Quantity Required:**[5] 2 per link

## Physical/Environmental Specifications

**Dimensions:** Double height (6U) board 160 x 233.35mm or single height (3U) board 160 x 100.0mm (Slave only)

**Power Requirements:**
VMIVME-5531S: 2A typical at 5VDC 3.0A maximum
VMIVME-5531M: 2A typical at 5VDC 3.0A maximum

**Temperature:**
Operating: 0 to +65° C
Storage: -20 to +85° C

**Altitude:** Operating: 0 – 10,000 ft (3,000m)

**Humidity:**
Operating: relative humidity 20% to 80%, noncondensing

**Cooling:** Forced air convection

**MTBF**: 424,895 hours

**MTBF:** 431,525 hours

## Trademarks

Registered trademarks are the property of their respective owners.

[5] Cables conforming to this specification are supplied with VMIVME-5531L. To order cables separately, please refer to specification number VMICBL-000-F3-xxx



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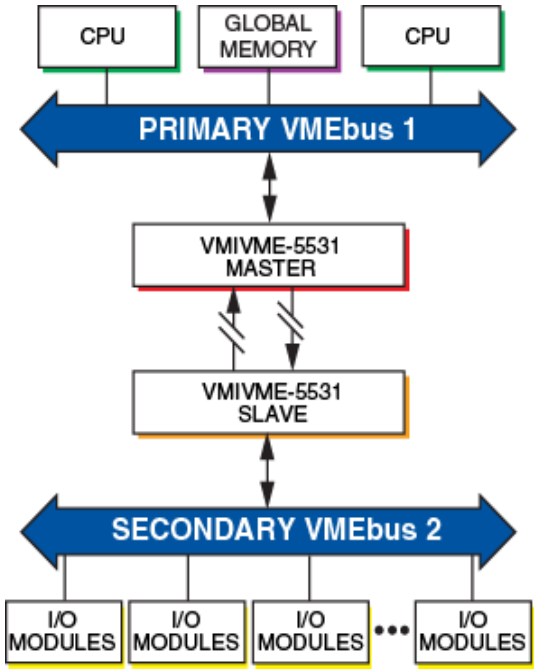



Figure 1. Single Link Application Diagram

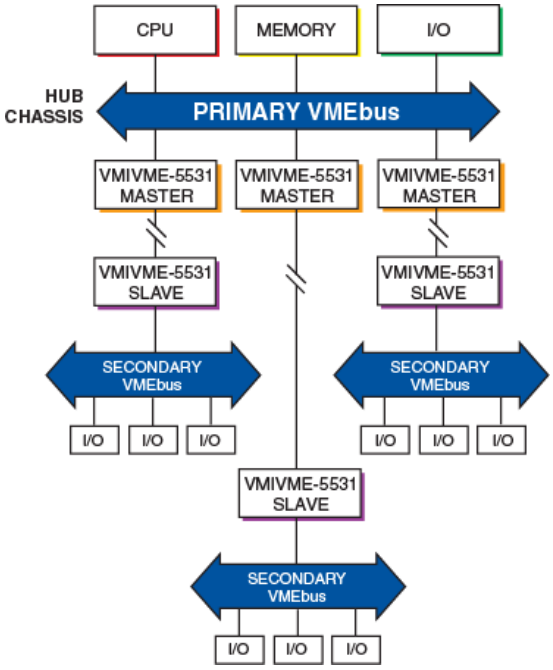



Figure 2. Star Configuration

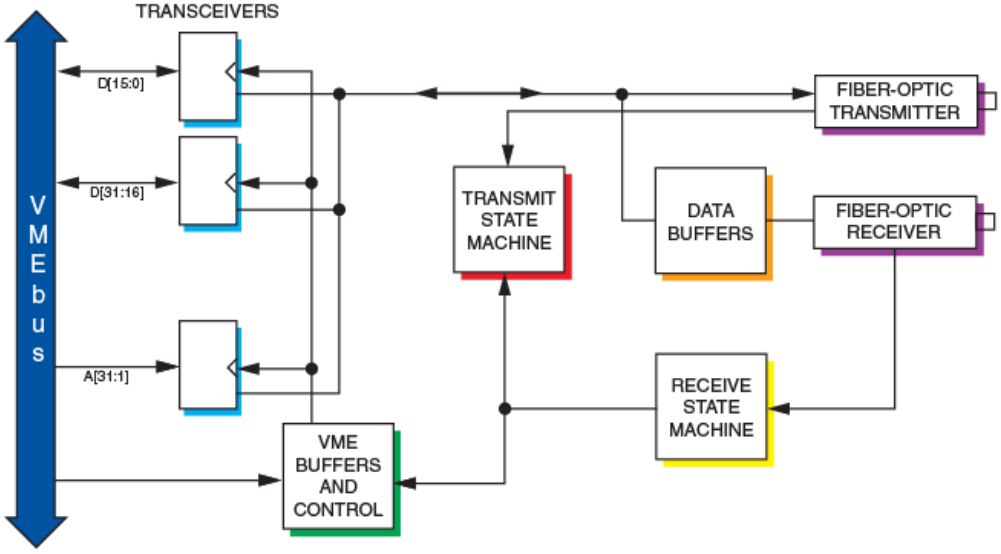



Figure 3. Block Diagram of 5531M Primary Chassis Repeater Link Board



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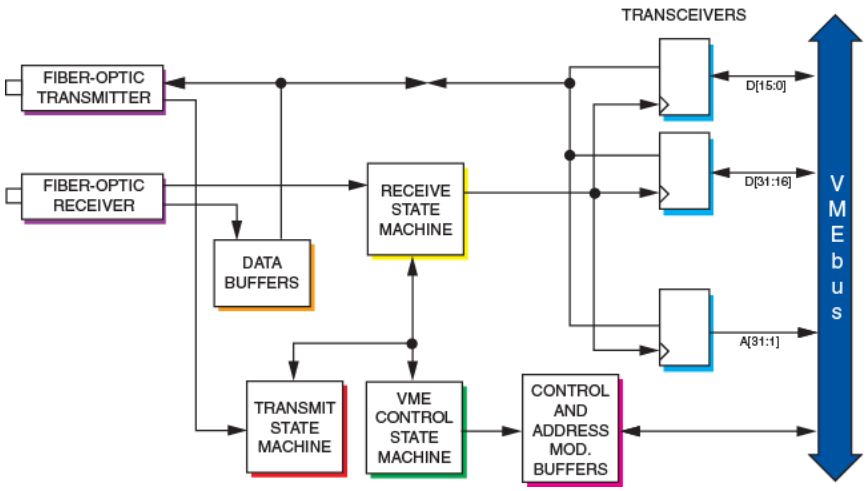



Figure 4. Block Diagram of 5531S Secondary Chassis Repeater Link Board (6U)

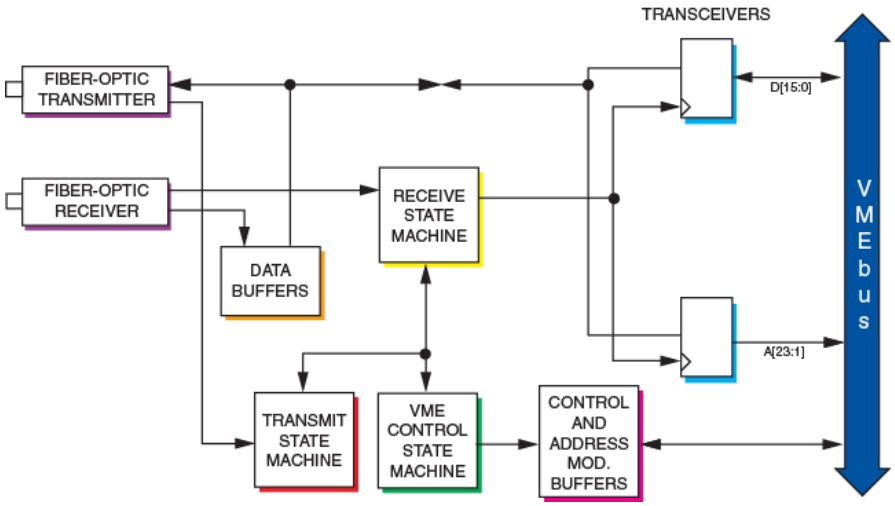



Figure 5. Block Diagram of 5531S Secondary Chassis Repeater Link Board (3U)

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