**Model VCDS
General Purpose VME to VXI Adapter
User's Manual**

February 22, 2008

Revision History

6/01/05	NR	Initial Draft of VCDS User Manual.
9/1/05	NR	First Release
10/1/05	NR	Second Release – removed statement regarding address pipeline bus cycles
2/22/08	NR	Third Release – added connector information and pinouts

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Chapter 1: Introduction

Description

The VCDS is a single-width, C-size VXI module that adapts most B-size VME modules for use in a VXI mainframe. The VCDS is a functional replacement for the Colorado Data Systems Model CDS 73A-851. The VCDS Module maintains the proper VMEbus environment, timing, and backplane line length by buffering the VME address bus, data bus, and control signals and routing them to the installed module.

The VXIbus specification fully defines all pins of all backplane connectors. Since the outer rows of P2 are classified as user definable by VME, the potential exists for pin use conflicts. To avoid this problem, pins P2-A1 through P2-A32 and pins P2-C1 through P2-C32 are isolated from the VXIbus backplane.

Slot Zero Operation

The VCDS has the ability to be utilized in slot zero of the VXI chassis when a VME controller is installed. The adapter has no MODID functionality, so it will not act as a true slot zero controller.

Non Slot Zero Operation

The VCDS default configuration is for use in any of the slots other than zero in the VXI chassis. The module installed in the VCDS may act as a bus master or slave or both. VMEbus 'monitor modules' that are neither masters nor slaves on the VME bus are not supported by the VCDS.

VCDS Specifications

Item	Specifications
VMEbus Interface	Data Transfer bus: D8, D16, D32 or D64.
	Address bus: A16, A24 or A32.
	The module installed in the VCDS may act as a bus master or slave or both.
	VMEbus monitor modules that are neither masters nor slaves on the VME bus are not supported by the VCDS.
	The module installed in the VCDS may be an interrupter or interrupt handler, but not both, on any given interrupt level. The module may be an interrupter on one level and an interrupt handler on another level.
	If the installed module has bus master capability, the VCDS converts the module's bus request protocol to the Fair Requestor [the Request or No Request (RONR)] protocol specified by the VXIbus specification. The installed module must generate bus requests on a single bus request level.
Triggering	VXIbus TTL trigger protocol synchronous, asynchronous, and start/stop are supported. TTL semi-synchronous protocol is not supported.
	VXIbus ECL trigger protocol synchronous, asynchronous, and start/stop are supported. ECL semi-synchronous protocol is not supported.
Number of Slots	One slot is required.
Power Requirements:	All required dc power is provided by the Power Supply in the VXIbus chassis.
Voltage	+5 volt supply +4.75 V dc to +5.25 V dc
	+24 volt supply +23.5 V dc to +24.5 V dc
	-24 volt supply -23.5 V dc to –24.5 V dc
Current (Peak Module, I_{PM})	With no VME module installed:
	5 volt supply 2.5 A
	-5.2 volt supply 270 mA
	-2.0 volt supply 96 mA
Radiated Emissions	The VCDS provides shielding for the installed VME module. The user must verify compliance with the VXIbus Radiated Emissions specifications.
Conducted Emissions	The VCDS provides ac isolation from the dc power busses on the VXIbus backplane. The user must verify compliance with the VXIbus Conducted Emissions specification.
Weight	1 kg. (2.13 lb).
Mounting Position	Any orientation.
Mounting Location	Installs in an instrument module slot (slots 0-12) of a C- size VXIbus chassis
Equipment Supplied	1 – VCDS card
	1 – Extraction Tool
Environmental and Mechanical	
Temperature range	
Operational	0°C to +50°C
Storage	-25°C to +75°C
Relative humidity	0 to 85%, non-condensing to 40°C
Cooling requirements	10 CFM
Dimensions	340 mm x 233.35 mm x 30.48 mm (C-size VXIbus)
Front-panel potential	Chassis ground

Technical specifications contained within this publication are subject to change without notice.

Chapter 2: Installation

Installation Requirements and Cautions

The VCDS Module is a C-size VXIbus instrument module and therefore may be installed in any C-size VXIbus chassis slot.

Note: The following system level restriction must be observed when using the VCDS Module:

> If a bus master is installed in the VCDS, the VCDS must be installed in a slot to the <u>right</u> of any other bus master that issues bus requests on the same level as the bus master installed on the VCDS.

CAUTION: In order to maintain proper chassis cooling unused chassis slots must be covered with blank front panels supplied by the chassis manufacturer.

CAUTION: Verify that chassis is able to provide adequate cooling and power for the VCDS Module. Refer to the chassis Operating Manual for instructions on determining cooling and power compatibility.

Installation Procedure

CAUTION: The VCDS Module is a piece of electronic equipment and therefore has some susceptibility to electrostatic damage (ESD). ESD precautions must be taken whenever the module is handled.

Any module to be installed in the VCDS must conform to the VME Rev C.1 rules 7.34 and 7.35 to insure it will pass through the opening in the front panel of the VCDS. These rules specify the maximum lead length and height of components on a VME module.

VCDS installation procedure when used with a 6U size VME module is as follows:

- Be sure all switches are correctly set. (See the sections below.) Install the VCDS Module in any slot other than slot 0 for non slot zero operation, or slot 0 for slot zero operation.

- Slide the VME module through the cutout in the VCDS front panel.

Note on address selection of an installed VME module:

The installed VME module must not reside in the upper quarter of A16 address space (0C000h to 0FFFFh). It may reside in the lower three quarters of A16 address space (0000h to 0BFFFh).

If the installed module uses any A24 or A32 address space, be sure that the address space used by the VME module does not coincide with A24/A32 address space assigned to VXIbus modules by the VXIbus Resource Manager.

Controls

The following controls are provided to select the functions of the VCDS Module's operating environment. See Figure 1 for their physical locations. The following tables summarize the switch locations and definitions. The paragraphs explain the selections in more detail.

Interrupt Select Switch (Switches 1 and 2)

The VCDS has an Interrupt Select switch for each interrupt level on the VXIbus. These switches determine whether the installed module is to act as an interrupt handler (receiver) or as an interrupter (driver) for each of the VME or VXIbus levels, IRQ1* through IRQ7*.

If an Interrupt Select switch is set to position 'RCV', the module installed in the VCDS may be an interrupt handler (receiver) on the corresponding interrupt level but may not be an interrupter (driver) on that level.

If an Interrupt Select switch is set to position 'DRV', the module installed in the VCDS may be an interrupter (driver) on the corresponding level, but may not be an interrupt handler (receiver) on that level.

If the installed module is neither an interrupter not an interrupt handler on a particular interrupt level, the switch position for that level has no effect.

Switch	Selection	Position	Definition
1	IRQ1*	RCV	Installed VME module acts as interrupt handler for IRQ level
1	IRQ2*	RCV	Installed VME module acts as interrupt handler for IRQ level
1	IRQ3*	RCV	Installed VME module acts as interrupt handler for IRQ level
1	IRQ4*	RCV	Installed VME module acts as interrupt handler for IRQ level
1	IRQ1*	DRV	Installed VME module acts as interrupter for IRQ level
1	IRQ2*	DRV	Installed VME module acts as interrupter for IRQ level
1	IRQ3*	DRV	Installed VME module acts as interrupter for IRQ level
1	IRQ4*	DRV	Installed VME module acts as interrupter for IRQ level

Switch	Selection	Position	Definition
2	IRQ5*	RCV	Installed VME module acts as interrupt handler for IRQ level
2	IRQ6*	RCV	Installed VME module acts as interrupt handler for IRQ level
2	IRQ7*	RCV	Installed VME module acts as interrupt handler for IRQ level
2	IRQ5*	DRV	Installed VME module acts as interrupter for IRQ level
2	IRQ6*	DRV	Installed VME module acts as interrupter for IRQ level
2	IRQ7*	DRV	Installed VME module acts as interrupter for IRQ level

TTL Trigger Direction Switches (Switch 7)

The VCDS has a Direction switch for each VXIbus TTL trigger line. These switches correspond to VXIbus signals TTLTRG0* through TTLTRG7*.

If a Trigger Direction switch is set to position 'RCV', the corresponding VXIbus trigger signal is an input (receiver) to the module installed in the VCDS. If a Trigger Direction switch is set to position 'DRV', the corresponding VXIbus trigger signal is an output (driver) from the installed module.

If the installed module does not monitor or drive a particular TTL trigger signal, the switch position for that signal has no effect.

Switch	Selection	Position	Definition
7	TTL0*	RCV	Trigger signal is an input to installed VME module
7	TTL1*	RCV	Trigger signal is an input to installed VME module
7	TTL2*	RCV	Trigger signal is an input to installed VME module
7	TTL3*	RCV	Trigger signal is an input to installed VME module
7	TTL4*	RCV	Trigger signal is an input to installed VME module
7	TTL5*	RCV	Trigger signal is an input to installed VME module
7	TTL6*	RCV	Trigger signal is an input to installed VME module
7	TTL7*	RCV	Trigger signal is an input to installed VME module
7	TTL0*	DRV	Trigger signal is an output from installed VME module
7	TTL1*	DRV	Trigger signal is an output from installed VME module
7	TTL2*	DRV	Trigger signal is an output from installed VME module
7	TTL3*	DRV	Trigger signal is an output from installed VME module
7	TTL4*	DRV	Trigger signal is an output from installed VME module
7	TTL5*	DRV	Trigger signal is an output from installed VME module
7	TTL6*	DRV	Trigger signal is an output from installed VME module
7	TTL7*	DRV	Trigger signal is an output from installed VME module

ECL Trigger Direction Switches (Switch 8)

The VCDS has a Direction switch for each VXIbus ECL trigger line. These switches correspond to VXIbus signals ECLTRG0* and ECLTRG1*.

If a Trigger Direction switch is set to position 'RCV', the corresponding VXIbus trigger signal is an input (receiver) to the module installed in the VCDS. If a Trigger Direction switch is set to position 'DRV', the corresponding VXIbus trigger signal is an output (driver) from the installed module.

If the installed module does not monitor or drive a particular ECL trigger signal, the switch position for that signal has no effect.

Switch	Selection	Position	Definition
8	ECL1*	RCV	Trigger signal is an input to installed VME module
8	ECL2*	RCV	Trigger signal is an input to installed VME module
8	ECL1*	DRV	Trigger signal is an output from installed VME module
8	ECL2*	DRV	Trigger signal is an output from installed VME module

SYSRESET* Direction Switch (Switch 2)

If this switch is set to position 'RCV', the installed module can monitor SYSRESET* (P1-C12) on the VXIbus backplane. If this switch is set to position 'DRV', the installed module can drive SYSRESET*. The SYSRESET* Direction switch should normally be set to position 'RCV'.

Switch	Selection	Position	Definition
2	SYSRESET*	RCV	Installed VME module can monitor SYSRESET*
2	SYSRESET*	DRV	Installed VME module can drive SYSRESET*

SYSCLK Selection (Switch 4)

Positions 'VMESYSCLK' and 'INTSYSCLK' of Switch 4 are for selecting which SYSCLK is passed to/received from the VXI backplane. These switches are mutually exclusive. They cannot both be selected.

In slot zero operation, either selection is valid. If using the internal clock (from the VCDS card) is desired, Switch 4 position VMESYSCLK should be to the right (VME SYSCLK not passed to the VXI backplane) and Switch 4, position INTSYSCLK is to the left (internal SYSCLK passed to the VXI backplane).

To select the VME board's SYSCLK, Switch 4 position VMESYSCLK should be to the left (VME SYSCLK passed to the VXI backplane) and Switch 4, position INTSYSCLK should be to the right (internal SYSCLK not passed to the VXI backplane).

In non slot zero operation, internal SYSCLK should never be selected. VME SYSCLK should only be selected if the VME module installed in the VCDS is a master. To select the VME board's SYSCLK, Switch 4 position VMESYSCLK should be to the left (VME SYSCLK passed to the VXI backplane) and Switch 4, position INTSYSCLK should be to the right (internal SYSCLK not passed to the VXI backplane).

Switch	Selection	Definition
4	VMESYSCLK	Installed module's SYSCLK passed to VXI backplane.
4	/VMESYSCLK	Installed module's SYSCLK not passed to VXI backplane.
4	INTSYSCLK	VCDS adapter's SYSCLK passed to VXI backplane.
4	/INTSYSCLK	VCDS adapter's SYSCLK not passed to VXI backplane.

Slot 0/Non Slot 0 Operation (Switch 4)

Two Positions labeled SLOT 0 of Switch 4 are for selecting if this VCDS will operate in a slot zero position or a non-slot zero position. The default configuration of the VCDS is non-slot zero.

For slot zero operation, both positions should be to the left.

For non-slot zero operation, both positions should be to the right.

Switch	Selection	Definition
4	SLOT0	The VCDS will operate as a slot zero device
4	NON-SLOT0	The VCDS will operate as a non slot zero device

Additional Signal Connections (Switches 3 and 5)

The default configuration for all these signals is not connected.

Switch	Position	Definition
3	A	Grant In 1 (BG1IN*) not connected to Grant Out 1 (BG1OUT*)
3	B	Grant In 1 (BG1IN*) connected to Grant Out 1 (BG1OUT*)
3	C	Grant In 0 (BG0IN*) not connected to Grant Out 0 (BG0OUT*)
3	D	Grant In 0 (BG0IN*) connected to Grant Out 0 (BG0OUT*)
3	E	Cannot monitor Serial Clock (SERCLK)
3	F	Can monitor Serial Clock (SERCLK)
3	G	Installed VME module is not driving serial clock (SERCLK)
3	H	Installed VME module is driving serial clock (SERCLK)
3	J	Serial data (SERDAT*) not connected to P1-B22
3	K	Serial data (SERDAT*) connected to P1-B22
3	L	VME IACKIN* not connected to IACKOUT* of installed VME module
3	M	VME IACKIN* connected to IACKOUT* of installed VME module

Switch	Position	Definition
5	A	Not used
5	B	Not used
5	C	Not used
5	D	Not used
5	E	SUMBUS not connected to P2-A32
5	F	SUMBUS connected to P2-A32
5	G	Grant In 3 (BG3IN*) not connected to Grant Out 3 (BG3OUT*)
5	H	Grant In 3 (BG3IN*) connected to Grant Out 3 (BG3OUT*)
5	J	Grant In 2 (BG2IN*) not connected to Grant Out 2 (BG2OUT*)
5	K	Grant In 2 (BG2IN*) connected to Grant Out 2 (BG2OUT*)

To avoid unnecessary loading of the signal line, the SUMBUS signal should be enabled only in VXIbus applications where it is used.

The IACKIN*/IACKOUT* switch (Switch 3 positions M and L) should not be moved to position M if the installed module can be an interrupt handler or interrupter in either a VME or VXIbus application.

The BG0IN*/BG0OUT* through BG3IN*/BG3OUT* switches should not be moved to connect positions (Switch 3, B and D, Switch 5, H and K) if the installed module has bus master capability in either a VME or VXIbus application.

The SERDAT signal should be connected only in VXIbus applications where it is used, to avoid unnecessary loading of the signal.

Connectors

The following connector pinouts are provided for the on-board connectors that can be used for interfacing between VXI and VME.

P3 Connector

Pin	Signal	Pin	Signal
1	VME P2-A17	21	VME P2-A27
2	VME P2-C17	22	VME P2-C27
3	VME P2-A18	23	VME P2-A28
4	VME P2-C18	24	VME P2-C28
5	VME P2-A19	25	VME P2-A29
6	VME P2-C19	26	VME P2-C29
7	VME P2-A20	27	
8	VME P2-C20	28	VME P2-C30
9	VME P2-A21	29	VME P2-A31
10	VME P2-C21	30	VME P2-C31
11	VME P2-A22	31	VME P2-A32
12	VME P2-C22	32	VME P2-C32
13	VME P2-A23	33	GND
14	VME P2-C23	34	GND
15	VME P2-A24	35	GND
16	VME P2-C24	36	GND
17	VME P2-A25	37	GND
18	VME P2-C25	38	GND
19	VME P2-A26	39	GND
20	VME P2-C26	40	GND

P4 Connector

Pin	Signal	Pin	Signal
1	VME P2-A1	21	VME P2-A11
2	VME P2-C1	22	VME P2-C11
3	VME P2-A2	23	VME P2-A12
4	VME P2-C2	24	VME P2-C12
5	VME P2-A3	25	VME P2-A13
6	VME P2-C3	26	VME P2-C13
7	VME P2-A4	27	VME P2-A14
8	VME P2-C4	28	VME P2-C14
9	VME P2-A5	29	VME P2-A15
10	VME P2-C5	30	VME P2-C15
11	VME P2-A6	31	VME P2-A16
12	VME P2-C6	32	VME P2-C16
13	VME P2-A7	33	
14	VME P2-C7	34	
15	VME P2-A8	35	
16	VME P2-C8	36	
17	VME P2-A9	37	
18	VME P2-C9	38	
19	VME P2-A10	39	
20	VME P2-C10	40	

P10 Connector

Pin	Signal	Pin	Signal
1	VXI ECL Trigger 0	21	LBUSA04
2	VXI ECL Trigger 1	22	LBUSC04
3		23	LBUSA05
4		24	LBUSC05
5		25	
6	GND	26	
7	GND	27	LBUSA06
8		28	LBUSC06
9	LBUSA00	29	LBUSA07
10	LBUSC00	30	LBUSC07
11	LBUSA01	31	GND
12	LBUSC01	32	GND
13		33	
14	GND	34	
15	LBUSA02	35	
16	LBUSC02	36	
17	LBUSA03	37	
18	LBUSC03	38	
19	GND	39	
20	GND	40	

P9 Connector

Pin	Signal	Pin	Signal
1	LBUSA08	21	VXI TTL Trigger 6
2	LBUSC08	22	VXI TTL Trigger 7
3	LBUSA09	23	GND
4	LBUSC09	24	GND
5		25	RSV2
6		26	RSV3
7	LBUSA10	27	
8	LBUSC10	28	GND
9		29	GND
10	LBUSC11	30	
11	GND	31	
12	GND	32	
13	VXI TTL Trigger 0	33	GND
14	VXI TTL Trigger 1	34	GND
15	VXI TTL Trigger 2	35	GND
16	VXI TTL Trigger 3	36	GND
17		37	GND
18	GND	38	GND
19	VXI TTL Trigger 4	39	GND
20	VXI TTL Trigger 5	40	GND

INSTALLATION CHECKLIST

Installation parameters may vary depending on the chassis being used. Be sure to consult the chassis Operating Manual before installing and operating the VCDS Module.

Revision Level: _____

Serial No. _____

Chassis Slot No. _____

Switch Settings:	DRV	RCV
Interrupt Select Switches:	___	___
IRQ1*	___	___
IRQ2*	___	___
IRQ3*	___	___
IRQ4*	___	___
IRQ5*	___	___
IRQ6*	___	___
IRQ7*	___	___
TTL Trigger Direction Switches:		
TTLTRG0*	___	___
TTLTRG1*	___	___
TTLTRG2*	___	___
TTLTRG3*	___	___
TTLTRG4*	___	___
TTLTRG5*	___	___
TTLTRG6*	___	___
TTLTRG7*	___	___
ECL Trigger Direction Switches:		
ECLTRG0*	___	___
ECLTRG1*	___	___
SERCLK Direction Switch:	___	___
SYSRESET* Direction Switch:	___	___

Other Signals:

SUMBUS	___Connected	___Not Connected
IACKIN*/IACKOUT*	___Connected	___Not Connected
BG0IN*/BG0OUT*	___Connected	___Not Connected
BG1IN*/BG1OUT*	___Connected	___Not Connected
BG2IN*/BG2OUT*	___Connected	___Not Connected
BG3IN*/BG3OUT*	___Connected	___Not Connected
SERCLK Input	___Monitor	___Not Monitor
SERCLK Output	___Drive	___Not Drive
SERDAT*	___Connected	___Not Connected

Performed by: _____ Date: _____

Chapter 3: Operation

Once the VCDS Module is installed, no operator intervention is required for proper operation.

The commands normally used to interact with the VME Module installed on the VCDS will function as usual.

Appendix A: Troubleshooting

If a VME module installed in the VCDS Module does not function properly, use the following procedure before consulting the factory:

1. Check the switch settings on the VCDS Module. These settings must be set according to the capabilities of the installed module. For example, if the installed module generates interrupts on VME level 3, the IRQ3* switch on the VCDS Modules must be set to position.

2. If the VCDS switch settings are correct and the module still does not function properly, remove the module from the VCDS module and install it on a VME extender board. If a VME module is being used, be sure to isolate the VME module from P2 rows A and C.

3. If the module functions properly after following Step 3, call DynamicSignals for help in resolving the problem that appears when the module is installed on the VCDS.

4. If the module still does not function properly after following step 3, recheck the switch settings and jumper positions on the module. VME modules must not be placed in the upper quarter of A16 address space (0C000h through 0FFFFh with address modifiers 29h or 2Dh).

5. Also verify that any A24 or A32 address space used by the module does not coincide with address space assigned to another VXIbus module installed in the system.

Appendix B

Technical Support and Warranty

DynamicSignals warrants its standard hardware products to be free of defects in workmanship and materials for a period of one year from the date of shipment to the original end user. DynamicSignals warrants its software products to conform to the software description applicable at the time of purchase for a period of ninety days from the date of shipment. Products purchased for resale by DynamicSignals carry the original equipment manufacturer's warranty.

DynamicSignals will, at its option, either repair or replace products that prove to be defective in materials or workmanship during the warranty period.

Transportation charges for shipping products to DynamicSignals are prepaid by the purchaser, while charges for returning the repaired product to the purchaser, if located in the United States, are paid by DynamicSignals. Return shipments are made by UPS, where available, unless the purchaser requests a premium method of shipment at his expense. The selected carrier is not the agent of DynamicSignals, and DynamicSignals assumes no liability relating to the services provided by the carrier.

The product warranty may vary outside the United States and does not include shipping, customs clearance or any other charges. Consult your local authorized representative for more information regarding specific warranty coverage and shipping details.

Product specifications and descriptions in this document subject to change without notice. DynamicSignals specifically makes no warranty of fitness for a particular purpose or any other warranty either expressed or implied, except as is expressly set forth herein. This warranty does not cover product failures created by unauthorized modifications, product misuse or improper installation.

Products are not accepted for credit or exchange without prior written approval. If it is necessary to return a product for repair replacement or exchange, a Return Authorization (RA) Number must first be obtained from the Repair Service Center before shipping the product to DynamicSignals.

Please take the following steps if you are having a problem and feel you may need to return a product for service:

- ❑ Contact DynamicSignals and discuss the problem with a Technical Service Engineer.
- ❑ Obtain a Return Authorization (RA) Number.
- ❑ Initiate a purchase order for the estimated repair charge if the product is out of warranty.
- ❑ Include with the product a description of the problem and the name of the technical contact person at your facility.
- ❑ Ship the product prepaid with the RA Number marked on the outside of the package to:

DynamicSignals, LLC
Repair Service Center
900 North State Street
Lockport, IL 60441

Telephone: (815) 838-0005
Fax: (815) 838-4424

Ways to contact us:

DynamicSignals, LLC
900 N. State Street
Lockport, IL 60441-2200

Phone: (800) DATA NOW (1-800-328-2669)
        (815) 838-0005
 Fax: (815) 838-4424

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