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**VX4334**  
**Relay Scanner Module**  
**Service Manual**

**Tektronix**

## WARRANTY

This Tektronix, Inc. product is warranted against defects in materials and workmanship, and is warranted to meet the performance specifications as listed in the current catalog and/or data sheet for this product. This warranty applies for three (3) years following the date of shipment. Tektronix will, at its option, repair or replace, at no cost to the customer, this product should it prove to be defective during the warranty period, provided the defect or failure is not due to misuse or abuse of the product. The customer is responsible for shipment of the defective product to the Tektronics repair facility. NO OTHER WARRANTY IS EXPRESSED OR IMPLIED, INCLUDING WARRANTY FOR FITNESS OF PURPOSE. TEKTRONIX INC. SHALL, IN NO CASE, BE LIABLE FOR CONSEQUENTIAL DAMAGES.

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## **W A R N I N G**

**These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.**

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# VX4334

## Relay Scanner Module

### Section 1

### Introduction

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The VX4334 Relay Scanner Module is a 4-wire scanner with 24 reed relays on a message based VXIbus C size module. In addition, it is designed to act as a scanner master that can control up to 11 slave scanners via the VXIbus local bus. The master/slaves system can be configured under program control into one or more scanner systems. The slaves are also C size modules, but connect only to the VXIbus local bus (plus power and ground), and are programmed by sending commands to the master.

Slave modules are added to a scanning system to increase the number of input channels in the system. They may all be joined together to form one large section with a common output, used separately with two sections per module or almost any combination in between.

The VX4334 allows programming the scanner system to:

- ▶ select a scanner channel
- ▶ assign symbolic names to scanner channels
- ▶ switch the module between being a 1-of-24 or two 1-of-12 scanners
- ▶ adjust the length of break-before-make delays and after-closure delays
- ▶ download scan tables, and trigger and delay programming for system controller autonomous operation
- ▶ enable or disable VXIbus interrupts for channel trigger inputs, downloaded program completion and errors
- ▶ enable using a VXIbus TTL trigger line for the encode signal.
- ▶ send a trigger on any of the eight VXIbus TTL trigger lines.
- ▶ return channel closure, error or status, symbolic name assignments or a listing of the downloaded program

The VX4334 has a four-character alpha-numeric front panel display that shows either the last channel closed or an error message.

The downloaded program that the module can store is a command sequence (also called a scan table) that can be executed multiple times with only one command. This command sequence can include the commands to set different delays for each of its slave modules, triggers, interrupt generation for up to six different events, as well as the close relay commands.

Refer to the Operating Manual for information on programming the module.

# Section 2

## Adjustment and Calibration

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No adjustment or calibration is required for this maodule.

*Section 3*

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# Section 3

## Assembly And Disassembly

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The VX4334 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

*Section 4*

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# Section 4

## Parts List

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The following lists give the name and part number for all field replaceable parts of the VX4334. To order replacement parts, call your Tektronics representative.

SERVICE MANUAL

VX4334

24 CHAN SCANNER 4-WIRE SCANNER MASTER

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form without the written permission of Colorado Data Systems, Inc.

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
	96000-00015	1	1 IN WHT FRONT AND SPINE VXI BUS MANUAL	0546	96000-00015
	40408-14334	1	LABEL VX4334 DRW-03252 REV 910	0026	40408-14334
FOR USE WITH P4,P7	45008-20418	4	SCREW LOCK ASSEMBLY FOR D CONNECTOR	0108	D-20418-2
C00,01,05,07,09,10,1181,1251,13 1371,1391,1461,1561,1581,26,28 35,49,65,761,762,85	20128-10006	22	CAP FXD CER .1UF 20% 50VDCW	0058	C322C104M5U5CA
C04,121,122,14,1541,90,99	22022-20008	7	CAP FXD TA 22UF 10-20% 20-25VDCW	0106	199D226X9025CA1
C06,16	20128-10004	2	CAP FXD CER .001UF 10% STABLE 100VDCW	0058	CK05BX102K
C1041	20128-10005	1	CAP FXD CER .01UF 20% 50VDCW	0106	1C2525U103M050B
C1071,1171	21528-10002	2	CAP FXD MICA 10PF 5% 100VDCW	0012	DM15-100D
CR00,1141	32000-05225	2	DIODE ZENER 3.0V .5W 5%	0074	1N5225B
CR02,1001,1011,1021,1022,1031 1041,1291,1301,1311,1321,1322 1331,1341,20,21,221,222,23,24,50 51,521,522,53,54,61,89	32000-04148	28	DIODE SILICON 75V 1A 5%	0078	1N4148
CR06	32000-04001	1	DIODE SILICON 50V 1A 5%	0357	1N4001
DCL2	40409-14334	1	LABEL VX4334 DRW-03253 REV 910	0026	40409-14334
DS001,101,102	32000-02303	3	DIODE LIGHT EMITTING GREEN WITH RESISTOR	0039	547-2303
DS002	32000-02003	1	DIODE LIGHT EMITTING RED WITH RESISTOR 0	0039	547-2003
DS20	32050-01414	1	DISPLAY 4 CHAR LED WITH MEMORY GREEN	0101	DLG1414
E40,43,70,73	92301-00440	4	SCREW PHIL PNHD 4-40X5-16 BRITIZINC	0137	4-40X5-16 PHIL PNH
E41,44,62,63,71,74	92302-00440	6	WASHER STAR NUMBER 4 INTERNAL ZINC	0137	4 IN STAR WASH ZIN

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
E42,45,64,72,75	92303-00440	5	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
E60	47000-74065	1	BRACKET 73A FRONT PANEL CENTER DRW 01676 REV 890	0026	47000-74065
E61	92301-10440	1	SCREW PHIL PNHD 4-40 X .1875 BRITE ZINC	0137	4-40X3-16 PHIL PNH
F99	42202-73040	1	FUSE MICRO 4AMP 125V FAST PLUG IN CLEAR CAP	0061	273 004
FP1	47006-14332	1	FACE PLATE VX4332 DRW-02330 9107	0026	47006-14332
FP10,11	92505-25005	2	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
FP17	92500-25025	1	HEX NUT M2.5 ZINC	0266	21100-144
FP18,20	92500-25011	2	COLLAR SCREW M 2.5 X 11 SL NICKEL	0266	21100-379
FP19,21	92510-00464	2	SLEEVE CAPTIVE SCREW GRAY	0266	21100-464
FP2,22,4,8	40406-00140	1	EJECTOR HANDLE C-TOP VX1400	0266	20817-328
FP23,3,5,9	40406-00141	1	EJECTOR HANDLE C-BOTTOM VX1400	0266	20817-327
FP30	47000-74103	1	KEY VXI TTL RIGHT 01670 REV 9003	0502	47000-74103
FP31,32	92500-25005	2	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
FP6,7	92502-25008	2	SCREW PHIL M 2.5 X 8 CSK BRITE ZINC	0137	PHIL M 2.5 X 8 CSK
K1001,1011,1021,1022,1031,1041 1301,1311,1321,1322,1331,1341,20 21,221,222,23,24,50,51,521,522 53,54	83000-05054	24	RELAY REED 4 PST 250 OHM 200V 0-	0138	7004-5054
K90,91	83500-20002	2	RELAY 4-A POLARIZED 130 OHM 5V -	0013	S4EB5V
L79	27051-50007	1	INDUCTOR 5 UH 5A .015 OHMS 50MHZ FR	0037	IHA-501
P1,2	45003-09600	2	CONNECTOR DIN 96 PIN MALE RT ANGLE SOLDER	0265	10-8457-096-002097

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
P4,7	45008-50003	2	RT ANGLE DD-50 PIN PC MOUNT	0193	147-1150P-02-D4338
P5	91100-10001	1	WIRE ASSY 10 PIN MALE	0000	
PCB1	41140-43340	1	P.C. BOARD VERSION 8L 9202	0498	41140-43340
Q01,02	51100-03904	2	TRANSISTOR NPN SWITCHING	0078	2N3904
Q04,29,71,742	51100-00300	4	TRANSISTOR VMOS N-FET	0102	VN0300L
Q1141,1481,69,94,99	51100-03906	5	TRANSISTOR PNP SWITCHING	0107	2N3906
Q741	51100-04402	1	TRANSISTOR PNP SILICON GP	0107	2N4402
R021,111,1282,1291,79,892	10117-10005	6	10K RES COMP 1-4W 5%	0087	R25J-10K-5%
R022,023,06,1171,132,25,34,35,36 661	10117-10004	10	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R04,10,1062,1092,1281,1592,831 832,921,922,932	10117-33004	11	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%
R1001,1011,1013,1021,602,611,613 621	10000-00000	8	USER INSTALLED RESISTOR	0026	10000-00000
R1002,1012,1014,1022,601,612,614 622	10117-00000	8	0 OHM RESISTOR	0054	ZEROHM
R1061,1091,1261,931	12008-33004	4	3.3K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R3.3K
R1071	10117-10007	1	1M RES COMP 1-4W 5%	0087	R25J-1M-5%
R112	10117-20004	1	2K RES COMP 1-4W 5%	0087	R25J-2K-5%
R1292	12006-33003	1	330 OHM RES NETWORK SIP 5% .7W 7-PKG	0027	750-81-R330
R131,133,1351,662,68,85,891	10117-18005	7	18K RES COMP 1-4W 5%	0087	R25J-18K-5%
R14,1591,281,282,283,67	10117-47004	6	4.7K RES COMP 1-4W 5%	0087	R25J-4.7K-5%
R1593	14024-82503	1	825 OHM RES FILM 1-4W 1% 100PPM	0035	RN55D8250F
R84	10117-39003	1	390 OHM RES COMP 1-4W 5%	0087	R25J-390-5%
R94	10117-33003	1	330 OHM RES COMP 1-4W 5%	0087	R25J-330-5%
S1191	42050-10104	1	SWITCH DIP 4POS SPST	0048	76S804S

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
S1281	42050-10101	1	SWITCH DIP 1POS SPST	0093	JS-8794-01
S1291	42050-10108	1	SWITCH DIP 8POS SPST	0048	76SB08S
S28	42050-10300	1	SWITCH DIP ROTARY BCD ENCODED	0007	DRW-10C
S481,482	42050-10301	2	SWITCH DIP ROTARY HEX	0007	DRW-16C
S6	91100-10000	1	WIRE ASSY 10 PIN FEMALE	0000	
SH1	47007-74334	1	SHIELD FRONT 334 CARD DRW 01835 REV 910	0026	47007-74334
SH10,13,4,7	92500-25012	4	SCREW M 2.5 X 12 CSK PHIL ZINC	0266	21100507
SH10,11,13,14,17,2,20,31,4,5,7,8	92500-25010	12	SCREW M 2.5 X 10 CSK OVAL PHIL NIK PL	0266	21100-500
SH12,3,6,9	92519-25019	4	STANDOFF HEX M2.5 X 19.5MM DRW 01801 REV 900	0026	92519-25019
SH15,18,21,33	92201-19451	4	STANDOFF HEX M2.5 THRU X .538L DRW 01673 REV 920	0026	92201-19451
SH16,19,30,34	92500-25017	4	SCREW 2.5MM X 16MM 90 DEG CSK FLHD PHIL STAINLS	0420	DIN965M2.5X16
SH22	47007-74002	1	SHIELD BACK CONN MTG CONFIG -01816 REV 9004	0026	47007-74002
SH23,24,25,26,27,28,29,32	92519-25004	8	REAR SHIELD SPACER 73A DRW 01807 REV 890	0212	19501-A-0029
U00	73300-07407	1	IC TTL HEX BUFFER	0107	7407
U01	73300-07406	1	IC TTL HEX INVERTER BUFFER-DRIVER	0107	7406
U02	74200-09602	1	IC TTL DUAL RETRIGGERABLE MONOSTABLE	0078	9602
U03,1451,47,79	73005-74273	4	IC HCT OCTAL D-TYPE FLIP FLOP W RESET	0088	74HCT273N
U05,1151,25,93	79814-00342	4	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U06,1251,15,83,94	79000-07445	5	IC TTL BCD-DEC DECODER DRIVER OC 30V 80 MA	0107	7445
U07,1591	78403-07414	2	IC HCT HEX SCHMITT INVERTING BUFFER	0088	74HCT14



REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U08,1581	73001-07431	2	IC LS DELAY ELEMENT	0107	74LS31
U09,19	73308-74645	2	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS645-1
U1051	79813-00272	1	PROGRAMMED PROM	0000	
U1061	79805-58256	1	IC CMOS 32K X 8 SRAM 120NS	0052	HM62256P-12
U1091	79814-00340	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U1161	73308-74246	1	IC TTL ALS OCTAL BUFFER NON INV 48MA IOL	0107	SN74ALS244A-N
U1171,16	75401-74164	2	IC TTL LS 8-BIT SERIAL SHIFT REGISTER	0107	74LS164
U1181,35,36,37	73005-07474	4	IC HCT DUAL D-TYPE FLIP FLOP	0092	74HCT74N
U1261	76606-07400	1	IC HCT QUAD 2-INPUT NAND GATE	0088	74HCT00
U1271	79814-00186	1	PAL PROGRAMMED 18P8L REV B 73A-256 AND 342	0000	
U1281	76510-07410	1	IC TTL ALS TRIPLE 3-INPUT NAND GATE	0107	74ALS10
U1351	79814-00348	1	PAL PROGRAMMED C16L8 REV B MASTER SCANNERS	0026	79814-00348
U1361	73311-74245	1	IC TTL AS OCTAL BUS TRANSCEIVER	0107	SN74AS245
U1371	73003-74574	1	IC TTL ALS OC TRI LATCH NON INV TI ONLY	0107	74ALS574
U1381	77203-07408	1	IC TTL ALS QUAD 2-INPUT AND GATE	0107	74ALS08
U1391	79010-74151	1	IC TTL AS 1-OF-8 DIGITAL MUX	0107	74AS151
U1461	79008-74238	1	IC HCT 3-TO-8 LINE DECDR DEMULPLEXER	0107	74HCT238
U1471,17	73005-74574	2	IC HCT OCTAL TRISTATE LATCH NON-INVERT	0107	74HCT574
U1481	79814-00371	1	PAL PROGRAMMED EP310-2 REV A 73A-SUPER 8	0000	

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U1491	73313-74756	1	IC TTL AS OCTAL BUFFER INVT OC	0107	74AS756
U1551	73003-74573	1	IC TTL ALS OCTAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74ALS573
U1561	73006-74573	1	IC TTL AS OCTAL D-TYPE LATCH	0107	74AS573
U1571	77825-07432	1	IC TTL ALS QUAD 2-INPUT OR GATE	0107	74ALS32
U18,29,58	73308-74244	3	IC TTL ALS OCTAL BUFFER NON-INVERTING	0107	74ALS1244
U26	79814-00341	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U27,56,57	73309-74244	3	IC HCT OCTAL BUFFER NON-INVERTING	0107	74HCT244
U28	76602-07438	1	IC TTL S QUAD 2-INPUT NAND BUFFER W-OC	0107	74S38
U38	79814-00468	1	PAL PROGRAMMED 20L8 REV C 73A-SUPER 8	0000	
U39,89	77203-07430	2	IC TTL ALS 8-INPUT NAND GATE	0107	74ALS30
U45	79814-00343	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U46	79814-00366	1	PAL PROGRAMMED C16L8 REV A 73A SCANNERS	0000	
U49	73313-74760	1	IC TTL AS OCTAL BUFFER NON-INV	0107	74AS760
U55	71210-04040	1	IC HCT 12-STAGE BINARY RIPPLE COUNTER	0088	CD74HCT4040
U59	71701-74682	1	IC TTL LS 8-BIT COMPARATOR	0107	74LS682
U65	79814-00347	1	PAL PROGRAMMED C16L8 REV A 73A-334	0026	79814-00347
U66	73006-07474	1	IC TTL AS DUAL D-TYPE FLIP-FLOP	0107	74AS74
U67,68	79008-74138	2	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	0107	74HCT138
U69	79814-00374	1	PAL PROGRAMMED C16L8 REV A 73A-332	0000	

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U78	79814-00187	1	PAL PROGRAMMED EP310-2 REV A 73A-256 AND 342	0000	
U84	75401-74165	1	IC TTL LS 8-BIT SHIFT REGISTER	0078	74LS165
U85	79825-88002	1	IC SUPER 8 CPU ROMLESS 20 MHZ	0117	Z08800A20PSC
U88	73308-74245	1	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS245
U98	79814-00435	1	PAL PROGRAMMED EP1800 REV A	0000	
X1051	45012-28100	1	SOCKET 28-PIN DIP LOW PRO	0089	IC0-286-S8A-TG
X20	45014-00000	1	SOCKET VERTICAL 14 PIN DIP	0268	14-6810-90C
X85	45010-48100	1	SOCKET 48-PIN DIP	0089	ICN-486-S5-G
X98	45010-80186	1	SOCKET 68 PIN PLCC	0243	QILE68P-410T
X99	42300-28105	1	FUSE SOCKET MICRO VERTICAL .025 LEADS .1 CNT	0061	281 005
Y97	89500-20000	1	CRYSTAL 20.000 MHZ 50 PPM	0062	MP-1 20.000