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**VX4353**  
**Relay Switching Module**  
**Service Manual**

**Tektronix**

## **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.**

## 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 Tektronix 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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# VX4353

## Relay Switching Module

### Section 1

### Introduction

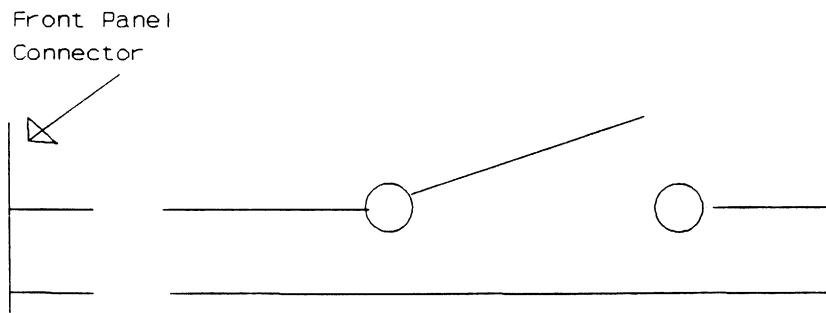
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The VX4353 Relay Switching Module is a printed circuit board assembly for use in a mainframe conforming to the VXIbus Specification, such as the VX1400 "C" size mainframe used in the Tektronix/CDS IAC System. The module provides 32 independently controlled single-pole, single-throw relays. Individual relays or all relays can be opened or closed under program control.

The amount of delay between successive operations and the relay closure dwell time can be controlled by software. Delay times from 0 to 65535 milliseconds can be selected. The module is programmed by transmitting ASCII characters from the system controller through the VXI system to the module.

The module's commands also provide access to system information. The position of any individual relay (open or closed) may be read back by the system controller and is also displayed by LEDs on the module's front panel. Other commands return the programmed time delay and identification information about the module.

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



*Figure 1: Typical SPST Relay*

*Section 1*

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# Section 2

## Adjustment and Calibration

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No adjustment or calibration is required for this module.

*Section 2*

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# Section 3

## Assembly And Disassembly

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The VX4353 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

*Section 3*

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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 VX4353. To order replacement parts, call your Tektronics representative.

SERVICE MANUAL

VX4353

32 CHAN SWITCH SPST RELAY MOD. HI-PREFM

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
	VX4353SA1	1	VX4353 PCB ASSEMBLY	0026	VX4353SA1
	VX4353SA2	1	VX4353 LED PCB ASSEMBLY	0026	VX4353SA2

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
FOR USE WITH P4,P9	45008-20418	4	SCREW LOCK ASSEMBLY FOR D CONNECTOR	0108	D-20418-2
C00,05,07,09,1001,1011,1061,1071 11,1141,1181,1191,1201,1241,1251 1261,1281,1291,17,19,20,24,25,26 36,38,40,41,45,47,54,59,64,66,68 75,79,80,81,87,94,99	20128-10006	42	CAP FXD CER .1UF 20% 50VDCW	0058	C322C104M5U5CA
C04,1292,14	22022-22008	3	CAP FXD TA 22UF 10-20% 35WVDC	0106	199D226X0035EE2
C1091	21018-15009	1	CAP FXD ELECT 150UF 75% -10% 16VDCW	0025	NLW150-16
C76,77	21528-10002	2	CAP FXD MICA 10PF 5% 100VDCW	0012	DM15-100D
CR1291	32000-04001	1	DIODE SILICON 50V 1A 5%	0357	1N4001
CR79	32000-04148	1	DIODE SILICON 75V 1A 5%	0078	1N4148
DCL1	40408-14353	1	LABEL VX4353 -03256 9105	0026	40408-14353
DCL2	40409-14353	1	LABEL VX4353 -03257 9105	0026	40409-14353
DS01,03	32000-02303	2	DIODE LIGHT EMITTING GREEN WITH RESISTOR	0039	547-2303
DS02	32000-02003	1	DIODE LIGHT EMITTING RED WITH RESISTOR 0	0039	547-2003
E40,43,50,53	92501-25007	4	SCREW M2.5X7 CHEESEHEAD SS DIN 84	0420	BY DESCRIPTION
E42,45,52,55	92500-25025	4	HEX NUT M2.5 ZINC	0266	21100-144
F792	42202-73050	1	FUSE MICRO 5AMP 125V FAST PLUG IN CLEAR CAP	0061	273 005
FP10,11,E41,E44,E51,E54	92505-25005	6	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
FP15	92500-25008	1	SCREW M 2.5 X 8 SELF TAP	0266	21100-710
FP18,20	92500-25011	2	COLLAR SCREW M 2.5 X 11 SL NICKEL	0266	21100-379

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
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
FP23,24,25,26,27,28,29,32	92519-25004	8	REAR SHIELD SPACER 73A DRW 01807 REV 890	0212	19501-A-0029
FP6,7	92500-25005	2	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
K01,02,1011,1021,11,1111,1121,12 1211,1212,1221,1222,21,22,311 312,321,322,41,42,511,512,521 522,71,72,81,82,911,912,921,922	83500-20003	32	RELAY 2-A 2-B POLARIZED 130 OHM 5V	0013	S2E85V
L89	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
P4,9	45008-50006	2	RT ANGLE DD-50 PIN PC MOUNT W HIGH CURRENT PINS	0004	206971-2
P6	45002-36102	1	RT ANGLE DUAL ROW MALE HEADER 36 PIN PC	0001	929667-01-18-1
PCB1	41140-43530	1	P.C. BOARD VERSION 4L 2 OZ COPPER	0498	41140-43530
Q19,59	51100-00300	2	TRANSISTOR VMOS N-FET	0102	VN0300L
Q691,692	51100-03906	2	TRANSISTOR PNP SWITCHING	0107	2N3906
R04,1261,1262,1271,142,144,39	10117-18005	7	18K RES COMP 1-4W 5%	0087	R25J-18K-5%
R08,18,28	12008-33004	3	3.3K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R3.3K
R1041,44,64,84	12001-12004	4	1.2K RES NETWORK 5% 1-4W 8-PAK	0016	898-3-R1.2K
R1191,1281,1292	10117-47004	3	4.7K RES COMP 1-4W 5%	0087	R25J-4.7K-5%
R1291	14024-82503	1	825 OHM RES FILM 1-4W 1% 100PPM	0035	RN55D8250F
R141,143,145,67,88,98	10117-10004	6	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R691,692	10117-33004	2	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
R791,792	10117-10005	2	10K RES COMP 1-4W 5%	0087	R25J-10K-5%
R87	10117-10007	1	1M RES COMP 1-4W 5%	0087	R25J-1M-5%
S1191	42050-10101	1	SWITCH DIP 1POS SPST	0093	JS-8794-01
S481,482	42050-10301	2	SWITCH DIP ROTARY HEX	0007	DRW-16C
SH1	47007-14353	1	SHIELD FRONT VX4353 CARD	0026	47007-14353
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
U05,1051,45,65,69,85	73005-74273	6	IC HCT OCTAL D-TYPE FLIP FLOP W RESET	0088	74HCT273N
U06,1281	73001-07431	2	IC LS DELAY ELEMENT	0107	74LS31
U07	73003-74574	1	IC TTL ALS OC TRI LATCH NON INV TI ONLY	0107	74ALS574
U08,18	73005-74574	2	IC HCT OCTAL TRISTATE LATCH NON-INVERT	0107	74HCT574
U09,19,96	73308-74645	3	IC TTL ALS OCTAL BUS TRANSCIEVER	0107	74ALS645-1
U1061	79805-06264	1	IC CMOS 8K X 8 SRAM 150NS	0401	HY6264LP-10
U1071	79813-00217	1	PROGRAMMED PROM U1071 VX4353	0000	
U1081	79008-74238	1	IC HCT 3-TO-8 LINE DECDR DEMULPLEXER	0107	74HCT238
U1091	77825-07432	1	IC TTL ALS QUAD 2-INPUT OR GATE	0107	74ALS32
U1141,1151,1251	79008-74138	3	IC HCT 3-TO-8 LINE DECDR DEMULPLEXER	0107	74HCT138



REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U1181	79814-00186	1	PAL PROGRAMMED 18P8L REV B 73A-256 AND 342	0000	
U1191	78403-07414	1	IC HCT HEX SCHMITT INVERTING BUFFER	0088	74HCT14
U14	74200-09602	1	IC TTL DUAL RETRIGGERABLE MONOSTABLE	0078	9602
U15,24,25,34,54,74,94	73309-74244	7	IC HCT OCTAL BUFFER NON-INVERTING	0107	74HCT244
U16	76606-07400	1	IC HCT QUAD 2-INPUT NAND GATE	0088	74HCT00
U17	79814-00416	1	PAL PROGRAMMED 16L8 REV A 73A-357B	0000	
U28,392	77203-07430	2	IC TTL ALS 8-INPUT NAND GATE	0107	74ALS30
U29,38,59,97	73308-74246	4	IC TTL ALS OCTAL BUFFER NON INV 48MA IOL	0107	SN74ALS244A-N
U35,55,75,95	73405-02803	4	IC HIGH-VLT-CUR DARLINGTON TRANS ARRAY	0531	ULN2803A
U36	79814-00467	1	PAL PROGRAMMED EP1800 REV A	0000	
U391	76602-07438	1	IC TTL S QUAD 2-INPUT NAND BUFFER W-OC	0107	74S38
U491	79814-00468	1	PAL PROGRAMMED 20L8 REV C 73A-SUPER 8	0000	
U492	71701-74682	1	IC TTL LS 8-BIT COMPARATOR	0107	74LS682
U56	76510-07410	1	IC TTL ALS TRIPLE 3-INPUT NAND GATE	0107	74ALS10
U57	79814-00415	1	PAL PROGRAMMED 16L8 REV A	0000	
U58	73308-74245	1	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS245
U76	79825-88002	1	IC SUPER 8 CPU ROMLESS 20 MHZ	0117	Z08800A20PSC
U86	73005-74573	1	IC HCT TRISTATE OCTAL D-TYPE LATCH	0107	74HCT573
U87	73006-74573	1	IC TTL AS OCTAL D-TYPE LATCH	0107	74AS573
U88	73003-07474	1	IC TTL ALS DUAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74ALS74

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U98	73005-07474	1	IC HCT DUAL D-TYPE FLIP FLOP	0092	74HCT74N
U99	77203-07408	1	IC TTL ALS QUAD 2-INPUT AND GATE	0107	74ALS08
VR35,55,75,95	32000-05248	4	DIODE ZENER 18V .5W 5%	0107	1N5248B
X1061,1071	45012-28100	2	SOCKET 28-PIN DIP LOW PRO	0089	ICO-286-S8A-TG
X36	45010-80186	1	SOCKET 68 PIN PLCC	0243	QILE68P-410T
X76	45010-48100	1	SOCKET 48-PIN DIP	0089	ICN-486-S5-G
X792	42300-28105	1	FUSE SOCKET MICRO VERTICAL .025 LEADS .1 CNT	0061	281 005
Y77	89500-20000	1	CRYSTAL 20.000 MHZ 50 PPM	0062	MP-1 20.000

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
DS1,10,11,12,13,14,15,16,17,18 19,2,20,21,22,23,24,25,26,27,28 29,3,30,31,32,4,5,6,7,8,9	32000-00323	32	DIODE LIGHT EMITTING 15MA GRN	0101	LDG1151
FP1	47006-14353	1	FACE PLATE VX4353 CARD 1.2W	0026	47006-14353
FP30,35,40	92300-07166	3	WASHER NYLON NUMBER 4 116 X 312 X 031	0212	2256-N116
FP31,41	92300-07164	2	WASHER NYLON NUMBER 4 FLAT	0020	120X250X062ACETAL
FP32,37,42	92300-00440	3	WASHER SPLITRING 4-40 3-16 OD	0137	4R
FP34,39,44	92303-00440	3	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
FP36	47000-74060	1	BRACKET 73A-35X FRONT PANEL DRW 01662 REV 880	0026	47000-74060
J6	45002-36101	1	DUAL ROW FEMALE HEADER 36P PC	0001	929852-01-18-10
PCB2	41730-35301	1	P.C. BOARD VERSION 4L 8810	0498	41730-35301



