



VX4356
Relay Switching Module
Service Manual

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Tektronix

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VX4356

Relay Switching Module

Section 1

Introduction

The VX4356 Relay Switching Module provides 20 independently controlled double-pole, double-throw relays. Individual relays or all relays can be opened or closed under program control.

The amount of delay between successive operations and 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.

Section 1

Section 2

Adjustment and Calibration

No adjustment or calibration is required for this module.

Section 3

Assembly And Disassembly

The VX4356 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

Section 4

Parts List

The following lists give the name and part number for all field replaceable parts of the VX4356. To order replacement parts, call your Tektronics representative.

SERVICE MANUAL

VX4356

20 CHAN SWITCH DPDT RELAY MOD. HI-PREFM

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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
	VX4356SA1	1	VX4356 PCB ASSEMBLY	0026	VX4356SA1
	VX4356SA2	1	VX4356 LED PCB ASSEMBLY	0026	VX4356SA2

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
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	40408-14356	1	LABEL VX4356 DRW 03260 REV 910	0026	40408-14356
DCL2	40409-14356	1	LABEL VX4356 DRW 03261 REV 910	0026	40409-14356
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
E40,43,50,53,60,63	92301-40037	6	SCREW PHIL PNHD 4-40 X 3-8 ZINC SILVER	0137	4-40X3-8 PHIL PNHD
E41,44,51,54,61,64	92302-00440	6	WASHER STAR NUMBER 4 INTERNAL ZINC	0137	4 IN STAR WASH ZIN
E42,45,52,55,62,65	92303-00440	6	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
F79	42202-73050	1	FUSE MICRO 5AMP 125V FAST PLUG IN CLEAR CAP	0061	273 005
FP10,11	92505-25005	2	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
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

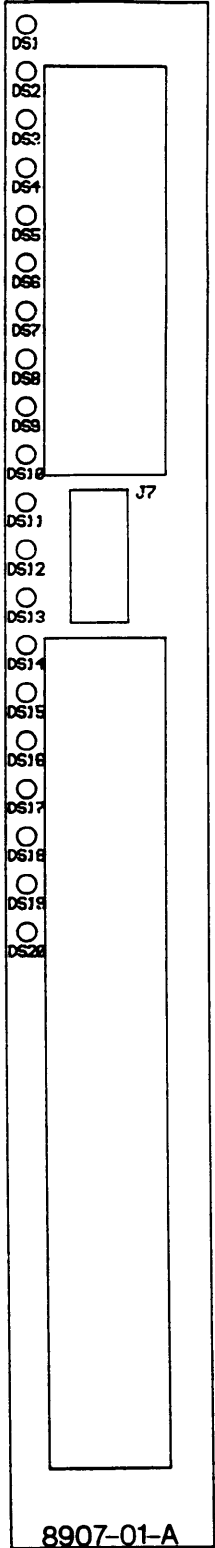
REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
FP2,22,4,8	40406-00140	1	EJECTOR HANDLE C-TOP VX1400	0266	20817-328
FP23,3,5,9	40406-00141	1	EJECTOR HANDLE C-BOTTOM VX1400	0266	20817-327
FP6,7	92500-25005	2	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
K01,1011,1021,1111,1121,12,1211 1221,21,22,31,32,41,61,62,71,72 81,82,91	83500-20003	20	RELAY 2-A 2-B POLARIZED 130 OHM 5V	0013	S2EB5V
L89	27051-50007	1	INDUCTOR 5 UH 5A .015 OHMS 50MHZ FR	0000	
P1,2	45003-09600	2	CONNECTOR DIN 96 PIN MALE RT ANGLE SOLDER	0265	10-8457-096-002097
P4,5,6	45008-44001	3	CONN DB-44P RT ANGLE PC MOUNT	0441	ODD44M4R70T20
P7	45002-21001	1	HEADER MALE RT ANGLE 3 ROW 21	0275	TSW-107-08-T-T-RA
PCB1	41140-43560	1	P.C. BOARD VERSION 4L 2 OZ COPPER 9204	0498	41140-43560
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
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	0069	RN55D8250F
R141,143,145,67,88,98	10117-10004	6	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R44,64,84	12001-12004	3	1.2K RES NETWORK 5% 1-4W 8-PAK	0016	898-3-R1.2K
R691,692	10117-33004	2	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%
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

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
SH1	47007-14353	1	SHIELD FRONT VX4353 CARD 02633 9109	0026	47007-14353
SH10,11,13,14,16,17,19,2,20,30 31,34,4,5,7,8	92500-25003	16	SCREW M2.5X4 90 DEG CSK DIN965 FLHD PHIL STAINLS	0420	BY DESCRIPTION
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
SH22	47007-74002	1	SHIELD BACK CONN MTG CONFIG DRW 01816 REV 920	0026	47007-74002
SH23,24,25,26,27,28,29,32	92519-25002	8	REAR SHIELD SPACER DR 01843 REV 9111	0026	92519-25002
U05,45,65,69,85	73005-74273	5	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 TRANSCIEIVER	0107	74ALS645-1
U1061	79805-06264	1	IC CMOS 8K X 8 SRAM 150NS	0401	HY6264LP-10
U1071	79813-00216	1	PROGRAMMED PROM U1071 VX4356	0000	
U1081	79008-74238	1	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	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 DEMULTIPLEXER	0107	74HCT138
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

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U14	74200-09602	1	IC TTL DUAL RETRIGGERABLE MONOSTABLE	0078	9602
U15,24,25,34,54,74	73309-74244	6	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	73405-02803	3	IC HIGH-VLT-CUR DARLINGTON TRANS ARRAY	0531	ULN2803A
U36	79814-00467	1	PAL PROGRAMMED EP1810 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
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

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
VR35,55,75	32000-05248	3	DIODE ZENER 18V .5W 5%	0107	1N5248B
X1061,1071	45012-28100	2	SOCKET 28-PIN DIP LOW PRO	0089	IC0-286-S8A-TG
X36	45010-80186	1	SOCKET 68 PIN PLCC	0243	Q1LE68P-410T
X76	45010-48100	1	SOCKET 48-PIN DIP	0089	ICN-486-S5-G
X79	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
DS 1, 2, 3, 4, 5, 6, 7, 8, 9,10 11,12,13,14,15,16,17,18,19,20	32000-00323	20	DIODE LIGHT EMITTING 15MA GRN	0101	LDG1151
FP1	47006-14356	1	FACE PLATE VX4356 CARD 1.2W DRW 02335 REV 910	0026	47006-14356
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
FP32,37,42,51,53	92300-00440	5	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	47000-74062	1	BRACKET 73A-356 FRONT PANEL DWG 01672 REV 891	0026	47000-74062
FP50,52	92303-00442	2	4-40 UNC SMALL PTRN 3-16 NUT BRIGHT ZINC	0137	BY DESCRIPTION
J7	45002-21000	1	HEADER FEMALE 3 ROW 21 PINS PC	0275	SSW-107-01-T-T
PCB2	41730-35601	1	P.C. BOARD VERSION 6L 8907	0498	41730-35601



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