



VX4801
Programmable Digital I/O Module
Service Manual

Tektronix

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VX4801

Programmable Digital I/O Module

Section 1

Introduction

The VX4801 Module provides 48 optically isolated TTL- or CMOS-compatible bidirectional digital I/O lines. The 48 programmable I/O signal lines are organized as six 8-bit bytes. Each of the six bytes can be independently configured under full program control. All commands and responses are in ASCII hex notation.

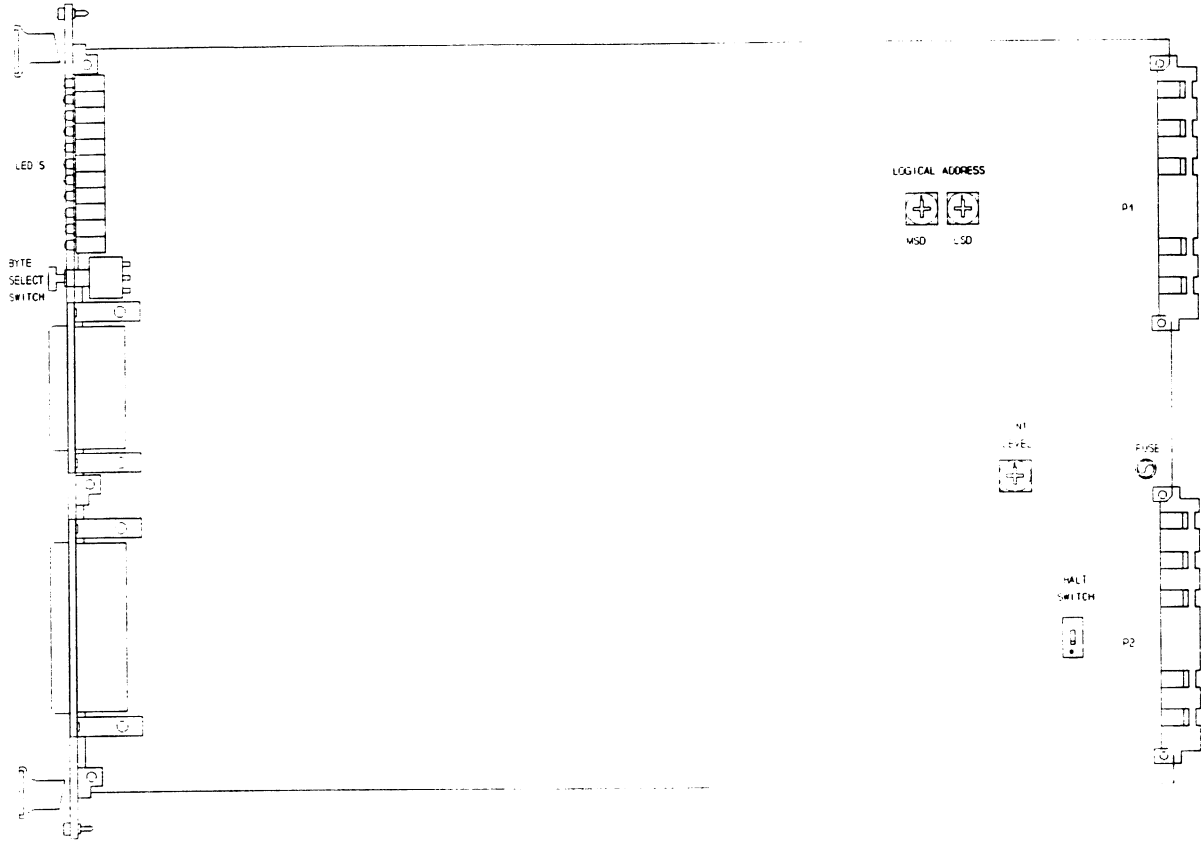
The data output can be controlled as bits, as individual bytes, and as groups of bytes. Output is controlled on a command basis, or on a qualified basis using external handshakes. Data input is also fully under program control. The module can report the state of all input bytes, groups of input and/or output bytes, and single bits of a byte. Input data can be updated on a command request basis, or on a qualified basis using external handshakes.

User-defined masks can be overlaid on the data prior to output. Masks may also be applied to individual input bytes before they are returned to the system controller.

The sense of inputs, outputs, and handshake lines can be set to either active high or active low under program control. The active edge can also be programmed for handshake lines. External (handshake) control signals are provided for output and input data control.

The VX4801 provides full access to system status information, which is especially helpful during system trouble-shooting, software de-bugging, and operational system checks.

The VX4801 Module is programmed by ASCII characters issued from the system controller to the VX4801 Module via the module's VXibus commander and the VXibus card cage backplane. Refer to the Operating Manual for information on programming the module.



VX4801 Controls and Indicators

Section 2

Adjustment and Calibration

This module does not require any adjustments or calibration.

Section 2

Section 3

Assembly And Disassembly

The VX4801 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

Section 3

Section 4

Parts List

The following lists give the name and part number for all field replaceable parts of the VX4801. To order replacement parts, call your Tektronix representative.

SERVICE MANUAL

VX4801

DIGITAL IO ISOLATED

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
FOR USE WITH S40	42050-12671	1	SWITCH CAP WHITE FOR 8125A	0024	8018-1
FOR USE WITH S4,S5	45008-20418	4	SCREW LOCK ASSEMBLY FOR D CONNECTOR	0108	D-20418-2
C01,02,04,06,07,09,10,1021,1051 1071,1121,1221,1251,1271,1291 1301,1311,1321,1322,1361,1461 1483,17,21,22,25,28,31,36,39,40 44,47,51,54,56,58,69,70,71,72,76 78,79,85,90,95,98,982	20128-10006	49	CAP FXD CER .1UF 20% 50VDCW	0058	C322C104M5U5CA
C03	20128-10005	1	CAP FXD CER .01UF 20% 50VDCW	0106	1C2525U103M050B
C05,1481,1482,1491,981	22022-22008	5	CAP FXD TA 22UF 10-20% 35WVDC	0106	199D226X0035EE2
C1341	22022-47008	1	CAP FXD TA 47UF 20% 20WVDC	0106	199D476X0025EE2
C1342,1362	22022-47007	2	CAP FXD TA 4.7UF 10-20% 16-25	0106	199D475X00168A1
C30	20128-10004	1	CAP FXD CER .001UF 10% STABLE 100VDCW	0058	CK05BX102K
C57,67	21528-10002	2	CAP FXD MICA 10PF 5% 100VDCW	0012	DM15-100D
CR1491	32000-04001	1	DIODE SILICON 50V 1A 5%	0357	1N4001
CR89	32000-04148	1	DIODE SILICON 75V 1A 5%	0078	1N4148
DCL1	40408-14801	1	LABEL VX4801 DRW 03321 REV 910	0026	40408-14801
DCL2	40409-14801	1	LABEL VX4801 DRW 03305 REV 910	0026	40409-14801
DS01	32000-03120	1	DIODE LED BI-LEVEL RED GRN 15 MA WITH RES	0039	553-0312
DS02,03,04,05,06,07,08,09,10,11	32000-03220	10	DIODE LED BI-LEVEL GRN GRN 15 MA WITH RES	0039	553-0322
E40,43,50,53	92301-00440	4	SCREW PHIL PNHD 4-40X5-16 BRITIZINC	0137	4-40X5-16 PHIL PNH

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
E41,44,51,54	92302-00440	4	WASHER STAR NUMBER 4 INTERNAL ZINC	0137	4 IN STAR WASH ZIN
E42,45,52,55	92303-00440	4	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
F89	42202-73040	1	FUSE MICRO 4AMP 125V FAST PLUG IN CLEAR CAP	0061	273 004
FP1	47006-14801	1	FACE PLATE VX4801 DRW 02357 REV 910	0026	47006-14801
FP10,11	92505-25005	2	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
FP14	92502-25008	1	SCREW PHIL M 2.5 X 8 CSK BRITE ZINC	0137	PHIL M 2.5 X 8 CSK
FP15	92500-25008	1	SCREW M 2.5 X 8 SELF TAP	0266	21100-710
FP16	92520-00183	1	VME PCB-FRONT PANEL HOLDER	0266	60807-183
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
FP6,7	92500-25005	2	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
L1341,1461	27051-00200	2	INDUCTOR WIDE-BAND FERRITE CHOKE	0042	VK 200 10-3B
L99	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
PCB1	41140-48010	1	P.C. BOARD VERSION 6L 9204	0498	41140-48010
Q19,793	51100-00300	2	TRANSISTOR VMOS N-FET	0102	VN0300L
Q791,792	51100-03906	2	TRANSISTOR PNP SWITCHING	0107	2N3906

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
R03,301,302,894,895	10117-10005	5	10K RES COMP 1-4W 5%	0087	R25J-10K-5%
R041,1161,1191,1192,1471,1472 1481,1491	10117-10004	8	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R042,1473,1482,39,57,861,862	10117-18005	7	18K RES COMP 1-4W 5%	0087	R25J-18K-5%
R08,18,19	12008-33004	3	3.3K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R3.3K
R1001,1101,1201,1301,50,60,82	12008-22005	7	22K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R22K
R1041,25,641	12006-33003	3	330 OHM RES NETWORK SIP 5% .7W 7-PKG	0027	750-81-R330
R1042,24,642	12006-56003	3	560 OHM RES NETWORK 5% .7W 7-PKG	0027	750-81-R560
R1061,1291,1492,891,892,893	10117-47004	6	4.7K RES COMP 1-4W 5%	0087	R25J-4.7K-5%
R1493	14024-82503	1	825 OHM RES FILM 1-4W 1% 100PPM	0035	RN55D8250F
R15,84	10117-33003	2	330 OHM RES COMP 1-4W 5%	0087	R25J-330-5%
R44	14024-57603	1	576 OHM RES FILM 1-4W 1% 100PPM	0037	RN55D5760F
R66	10117-10007	1	1M RES COMP 1-4W 5%	0087	R25J-1M-5%
R896,897	10117-33004	2	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%
S1291	42050-10101	1	SWITCH DIP 1POS SPST	0093	JS-8794-01
S381,382	42050-10301	2	SWITCH DIP ROTARY HEX	0007	DRW-16C
S4	45008-25009	1	RT ANGLE DB-25 SOCKET PC MOUNT	0108	DBL-25S-2
S40	42050-12670	1	SWITCH MOM SPDT PC BRD MNT	0024	8125A
S5	45008-50004	1	RT ANGLE DD-50 SOCKET PC MOUNT	0193	147-1150S-02-4338
S89	42050-10300	1	SWITCH DIP ROTARY BCD ENCODED	0007	DRW-10C
SH1	47007-14801	1	SHEILD FRONT VX4801 DRW 02657 REV 910	0026	47007-14801
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

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
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
U00,12	79911-74157	2	IC TTL LS QUAD 2-TO-1 LINE DATA SEL-MUX	0107	74LS157
U01,02	73304-07474	2	IC HCMOS DUAL D-TYPE FLIP-FLOP	0107	74HC74
U03	77206-07408	1	IC HCT QUAD 2-INPUT AND GATE	0092	74HCT08N
U05,147	74200-09602	2	IC TTL DUAL RETRIGGERABLE MONOSTABLE	0078	9602
U06,37	73309-74244	2	IC HCT OCTAL BUFFER NON-INVERTING	0107	74HCT244
U07,392	77203-07430	2	IC TTL ALS 8-INPUT NAND GATE	0107	74ALS30
U08,101,102,103,112,113,122,123 131,132,140,141,142,18,40,41,51 70,80,81	73005-74574	20	IC HCT OCTAL TRISTATE LATCH NON-INVERT	0107	74HCT574
U09,19	73308-74645	2	IC TTL ALS OCTAL BUS TRANSCIEVER	0107	74ALS645-1
U10	71201-74161	1	IC HCMOS SYNCH 4-BIT BINARY COUNTER	0107	74HC161N
U100,110,120,130,50,60	73400-74245	6	IC AHCT OCTAL BUS TRANSCIEVER	0078	74ACT245
U104,114,124,14,24,34,44,64,74 84,94	51300-02630	11	DUAL OPTO-ISOLATOR 10 MHZ	0050	HCPL-2630
U105	76603-07410	1	IC TTL AS 3-INPUT NAND GATE	0107	74AS10
U106,88	73001-07431	2	IC LS DELAY ELEMENT	0107	74LS31
U107	79814-00467	1	PAL PROGRAMMED EP1810 REV A	0000	
U11,116,32	77203-07408	3	IC TTL ALS QUAD 2-INPUT AND GATE	0107	74ALS08

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U111,121,25,61,71,90,91,92	73003-74573	8	IC TTL ALS OCTAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74ALS573
U115	76600-07420	1	IC TTL DUAL 4-INPUT NAND GATE	0107	7420
U119,126,139	73005-07474	3	IC HCT DUAL D-TYPE FLIP FLOP	0092	74HCT74N
U125	76603-07400	1	IC TTL AS 2-INPUT NAND GATE	0107	74AS00
U129	78403-07414	1	IC HCT HEX SCHMITT INVERTING BUFFER	0088	74HCT14
U13,22,82	77816-07486	3	IC HCT QUAD EXCLUSIVE OR	0107	74HCT86
U133,138,30,54	76606-07400	4	IC HCT QUAD 2-INPUT NAND GATE	0088	74HCT00
U137	76510-07410	1	IC TTL ALS TRIPLE 3-INPUT NAND GATE	0107	74ALS10
U143,17,23,26,43,93	73005-74273	6	IC HCT OCTAL D-TYPE FLIP FLOP W RESET	0088	74HCT273N
U145	20071-00505	1	DC-DC CONVERTER 5V TO 5V 1 AMP	0399	DUS505
U15	73003-74563	1	IC TTL ALS OCTAL LATCH WITH 3T INVERTING	0107	74ALS563
U16	76603-74645	1	IC TTL AS OCTAL BUS TRANSCEIVER	0107	74AS645
U20	73320-74240	1	IC ACT OCTAL BUFFER	0078	74ACT240
U21,68,73,83,85	79008-74138	5	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	0107	74HCT138
U27	79814-00439	1	PAL PROGRAMMED 5AC312 REV A 73A-SUPER 8	0000	
U28	73003-74574	1	IC TTL ALS OC TRI LATCH NON INV TI ONLY	0107	74ALS574
U29,58,35,79	73308-74246	4	IC TTL ALS OCTAL BUFFER NON INV 48MA IOL	0107	SN74ALS244A-N
U31,42	79009-74152	2	IC LS 1-OF-8 DATA SEL MUX	0073	74LS152
U33	79003-74138	1	IC TTL ALS 3-TO-8 DECODER	0107	74ALS138
U36	73006-74573	1	IC TTL AS OCTAL D-TYPE LATCH	0107	74AS573
U391	76602-07438	1	IC TTL S QUAD 2-INPUT NAND BUFFER W-OC	0107	74S38

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U45	73606-74574	1	IC TTL AS OCTAL TRI-STATE LATCH	0107	74AS574
U46	79008-74238	1	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	0107	74HCT238
U47	79825-88002	1	IC SUPER 8 CPU ROMLESS 20 MHZ	0117	Z08800A20PSC
U48	79814-00374	1	PAL PROGRAMMED C16L8 REV A 73A-332	0000	
U49	79814-00368	1	PAL PROGRAMMED 20L8 REV B 73A-332	0000	
U52,72	77826-74832	2	IC TTL AS HEX 2-INPUT OR	0107	74AS832
U53,62	76510-07411	2	IC TTL ALS TRIPLE 3-INPUT AND GATE	0107	74ALS11
U55	79813-00245	1	PROGRAMMED PROM U55 VX4811	0000	
U56	79805-06264	1	IC CMOS 8K X 8 SRAM 150NS	0401	HY6264LP-10
U59	71701-74682	1	IC TTL LS 8-BIT COMPARATOR	0107	74LS682
U63	73303-07404	1	IC HCMOS HEX INVERTER	0107	74HC04
U69	73313-74760	1	IC TTL AS OCTAL BUFFER NON-INV	0107	74AS760
U78	73308-74245	1	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS245
U86	79814-00350	1	PAL PROGRAMMED 18P8 REV B 73A-411	0000	
U95	73306-07404	1	IC TTL AS HEX INVERTER	0107	74AS04
U96	77825-74832	1	IC TTL ALS HEX 2-INPUT OR DRIVER	0107	74ALS832
X107	45010-80186	1	SOCKET 68 PIN PLCC	0243	QILE68P-410T
X47	45010-48100	1	SOCKET 48-PIN DIP	0089	ICN-486-S5-G
X55	45012-28128	1	SOCKET 28-PIN DIP MACHINED	0089	ICA-286-S-TG30
X89	42300-28105	1	FUSE SOCKET MICRO VERTICAL .025 LEADS .1 CNT	0061	281 005
Y67	89500-20000	1	CRYSTAL 20.000 MHZ 50 PPM	0062	MP-1 20.000