

TC-3161 16 CHANNEL DIGITAL OUTPUT CARD FUNCTIONAL DESCRIPTION

REV 2.0 12/27/95

The TC-3161 is a 16 channel digital output card designed to drive medium current digital loads, such as relays, small lamps, motors, and hydraulic, pneumatic or other fluid valves. Each channel is designed to drive 500 MA. at up to 24VDC.

A high speed dual optocoupler is used to receive serial data from the Show Control I/O rack, thus allowing complete isolation of local power supplies and circuits when operated in a remote location. A TC-631 adapter card provides terminal-strip breakout for remote applications.

The 4.5" x 6.5" card is fitted with 22/44 gold-plated edge contacts, and may also be mounted in a standard I/O card frame using a TC-613 Dual Digital Backplane Adapter board.

NPN output transistors are used for each channel, as the card is designed to sink current to ground. On-board diodes are connected between the collectors and a common buss, providing kick-back suppression for inductive loads. Relays, valves, or other inductive loads located in remote locations (more than 25 feet) should have local squelching diodes installed directly across the coil.

3/4 Amp "pico" fuses are provided in series with the collector output for each channel to protect the card in case of a short or over current load. The entire card is normally fused on the +24 volt side for a maximum load of 4 AMPS.

Note that the fuses are installed in sockets and can be replaced with needle nose pliers. Do NOT attempt to unsolder the fuses if replacement is required.

Sixteen LED indicators located on the front of the circuit card are provided to display the output status of each channel. The LEDs mimic the actual output and are wired in parallel with the output transistors AFTER the fuse for each channel. Thus, an external short or blown fuse may be detected by the status of the LED for a given channel.

The card can be jumper selected to decode either the upper or lower 16 subchannels of multiplexed data configured for 32 logical output subchannels from a Synthesis Show Controller.

A disable switch is provided to clear and inhibit all channels from responding to data from the Show Control Unit when in the down or disable position.

Physical Dimensions:

4.5" x 6.5" printed circuit board
22/44 .156 center gold plated edge connector

Power Requirements:

+5 VDC @ 240MA
+12 to 24 VDC at 4 AMPS max. (based on application load)

Related Documents:

PIN3161.TXT Pin assignments and application information
TC3161.ASM Assembly diagram
SC-7.12 Pin assignments and cable diagram

JUMPERS/SWITCHES

SW1: Used for enabling or disabling the digital outputs and clearing the board of latched data.

- Pin 1. Connects to pins 1 (CLR1) and 13 (CLR2) of U4 (74HC74)
- Pin 2. Connects to ground
- Pin 3. N/C

U1: Will either contain a 8 pin dip header or an opto isolator (HCPL2531) and is used for input isolation when needed.

- Pin 1. + Opto In (Via R1 from pin 1 of J1 and pin B of edge connector)
- Pin 2. - Data In (TTL) (Pin 5 of J1 and pin 2 of edge connector)
- Pin 3. - Strobe In (TTL) (Pin 6 of J1 and pin C of edge connector)
- Pin 4. + Opto In (Via R2 from pin 1 of J1 and pin B of edge connector_)
- Pin 5. Connects to ground
- Pin 6. Isolated Strobe (TTL)
- Pin 7. Isolated Data (TTL)
- Pin 8. Connects to VCC

Note: If NOT using the HCPL2531 opto then tie pin 2 to pin 7 and pin 3 to pin 6.

JP1: Used to invert the DATA signal

- Pin 1. Connects to pin 11 (A5 Input) of U2 (74LS04)
- Pin 2. Connects to pin 1 (A Input) of U8 (74HC164)
- Pin 3. Connects to pin 10 (Y5 Output) of U2 (74LS04)

This jumper should be set across pins 1 and 2 for normal operation.

JP2: Used to invert the STROBE signal

- Pin 1. Connects to pin 8 (Y4 Output) of U2 (74LS04)
- Pin 2. Connects to pin 4 (A Input) of U3 (14538)
- Pin 3. Connects to pin 4 (Y2 Output) of U2 (74LS04)

This jumper should be set across pins 1 and 2 for normal operation.

JP3: Used to configure the subchannel addressing (1-16 or 17-32)

- Pin 1. Connects to pins 1 and 2 (A and B Input) of U8 (74HC164)
- Pin 2. Connects to pins 1 and 2 (A and B Input) of U8 (74HC164)
- Pin 3. Connects to pin 13 (OH MSB) of U7 (74HC164)

NOTE: THE SILK SCREEN IS REVERSED ON REV C TC-3161 CARDS. In all cases, the header jumper should be connected to the lower pins for channels 1-16, and on the upper pins for 17-32. This is corrected on revisions D and later.

J1: J1 is a 6 pin header used for external serial data when the board is not installed in a card frame, and for test points.

- Pin 1. + Opto 5 VDC (Connects to R1 and R2 and B of the edge connector)
- Pin 2. Data Output (Pin 3 of the edge connector)
- Pin 3. Ground
- Pin 4. Pullup resistor to VCC (can be used as tellback)
- Pin 5. Data Input (Pin 2 of the edge connector)
- Pin 6. Strobe Input (Pin C of the edge connector)

I/O PORTS**Free Edge Buss Connector
Rear View**

SOLDER SIDE			COMPONENT SIDE
+5VDC Logic	A	1	+5VDC LED Common
+5VDC Opto	B	2	Data In -
Strobe In -	C	3	Data Out
Output Common Buss	D	4	Output Common Buss
+ Control Buss	E	5	+ Control Buss (Diodes)
Common 1	F	6	1 Output 1
Common 2	H	7	2 Output 2
Common 3	J	8	3 Output 3
Common 4	K	9	4 Output 4
Common 5	L	10	5 Output 5
Common 6	M	11	6 Output 6
Common 7	N	12	7 Output 7
Common 8	P	13	8 Output 8
Common 9	R	14	9 Output 9
Common 10	S	15	10 Output 10
Common 11	T	16	11 Output 11
Common 12	U	17	12 Output 12
Common 13	V	18	13 Output 13
Common 14	W	19	14 Output 14
Common 15	X	20	15 Output 15
Common 16	Y	21	16 Output 16
Digital Ground	Z	22	Digital Ground

VCC = 5VDC @ 125 ma.
+24 @ 4 A. depending on load

NOTES