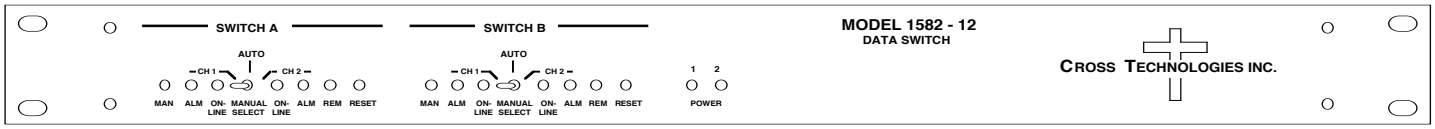
Instruction Manual

Model 1582-12
Data Switch

December 1999, Rev 0



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CROSS TECHNOLOGIES, INC.

6170 Shiloh Road
Alpharetta, Georgia 30005

(770) 886-8005
FAX (770) 886-7964
Toll Free 888-900-5588

WEB: www.crosstechnologies.com
E-MAIL: info@crosstechnologies.com

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1582-12 DATA SWITCH

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CROSS TECHNOLOGIES, INC.
6170 SHILOH ROAD
ALPHARETTA, GEORGIA 30005

PHONE (770) 886-8005
FAX (770) 886-7964
web www.crosstechnologies.com
e-mail info@crosstechnologies.com

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INSTRUCTION MANUAL 1582-12 DATA SWITCH

1.1 Equipment Description - The 1582-12 Data Switch has two independent switches (A and B) in a single 1 3/4" chassis. Each switch provides Auto, Manual, or Remote relay switching between CH1 and CH2 clock signals (RS232C or RS422) on pins 3 and 8 with pin 5 ground and the other pins of the DB9 connectors tied together.

Alarm conditions on CH1 and CH2 are either detection of if clock is lost for a preset 0.1 to 0.9 seconds on the CH1 and CH2 input or a contact closure (to ground or an open, selectable). Switching logic can be selected as follows:

1) CH1 Prime Mode - Switches from CH1 to the CH2 only if CH1 alarms and CH2 is good. Switches back to CH1 when it is no longer in alarm or when both CH1 and CH2 are in alarm

2) Latch to CH2 Mode - Switches from CH1 to CH2 if CH1 alarms and CH2 is good. Latches to CH2. Push Reset or ground Remote Reset pin to return to CH1 if it has no alarm or both CH1 and CH2 are in alarm.

3) Minimum Auto switching, Return to Last State Mode - Switch goes to the last state (CH1 or CH2) it was in when in Auto after Manually or Remotely switching and returning to Auto. Auto switching occurs only if current channel alarms and the other channel is clear.

4) Minimum Auto switching, Initial Channel Select (ICS) Mode- Switch stays on channel last selected by Manual or Remote selection after return to Auto if both channel alarms are clear or both channels are in alarm. Auto switching occurs only if current channel alarms and the other channel is clear.

When power is first applied and there are no alarms, CH1 is selected. On power loss CH1 is the selected channel. The Manual Select switch and contact closures to Remote Select pins (when in Auto), select CH1 or CH2 independent of alarms. LEDs indicate alarm and switch conditions for CH1 and CH2, REMOTE or MANUAL operation, and power on.

Data connectors are DB9, female. Contact closure inputs and outputs are via barrier strip. Dual power supplies provide redundant power to the 1582-12. The chassis is a 1 3/4", rack mount.

Factory set mode is generally (**4) Minimum Auto switching, Initial Channel Select (ICS) Mode.**

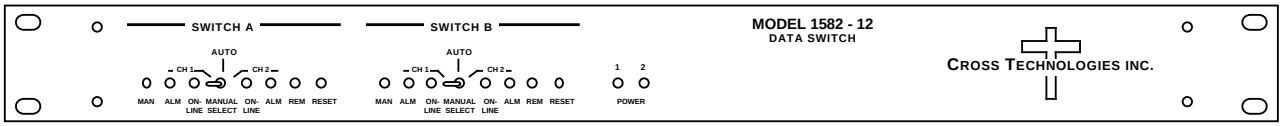

FIGURE 1.0 1582-12 DATA SWITCH

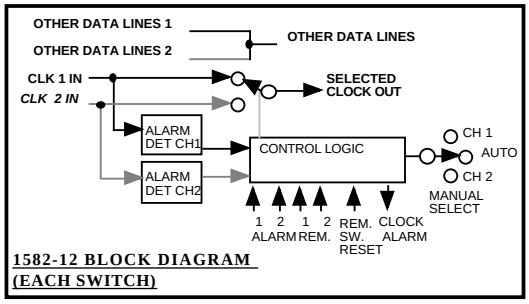

FIGURE 1.1 1582-12 BLOCK DIAGRAM (EACH SWITCH)

1.2 Technical Specifications (Each Switch)

Data Characteristics

Input/Output	RS422 or RS232C
Data rate	9.6 to 512 kB/s
Connectors, data	DB9, female
Pins Switched	3,8
Pins tied together	1,2,4,6,7,9
Ground pin	5

Switch Characteristics

Type	Relay
Isolation	>40 dB to 1 MB/s
Switch after clock loss	0.1 to 0.9 seconds in 0.1 second steps (selectable)
Switch time	≤10 milliseconds after command to switch
Contact resistance	≤10Ω, < 1Ω typ
Configuration	DPDT
Connectors, alarm	Barrier Strip

LEDS CH1, CH2 ON-LINE; MANUAL; REMOTE; ALARM CH1,CH2; POWER CH1,CH2

Controls

MANUAL SELECT	Manually select CH1, CH2, or Auto operation. If operating in the ICS mode, the last channel manually selected (CH1 or CH2) will be the initial channel if both channel alarms are clear or both channels are in alarm.
SWITCH RESET	Resets switch to CH1 if it is good and switch is in the latch mode, Also Resets REMOTE by returning operation to Auto

Indicators, LEDs

CH1 ON-LINE	Turns green when Channel 1 is selected
CH2 ON-LINE	Turns green when Channel 2 is selected
MANUAL	Turns red when the Manual Select switch manually selects channel 1 or 2.
ALARM CH1	Turns red when CH1 clock alarms or on external alarm input (closure or open, selectable)
ALARM CH2	Turns red when CH2 clock alarms or on external alarm input (closure or open, selectable)
POWER CH1	Turns green when power is applied to AC1 input on the rear panel
POWER CH2	Turns green when power is applied to AC2 input on the rear panel
REMOTE	Turns amber when REMOTE control is active

Other

Mechanical	19 inch standard chassis 1.75"high X 12" deep
Power	Redundant power supplies; 90 - 260 VAC, 47 - 60Hz, 30 watts

*Specifications subject to change without notice

2.0 Installation

2.1 Input/Output Connectors -The following are the input and output connectors.

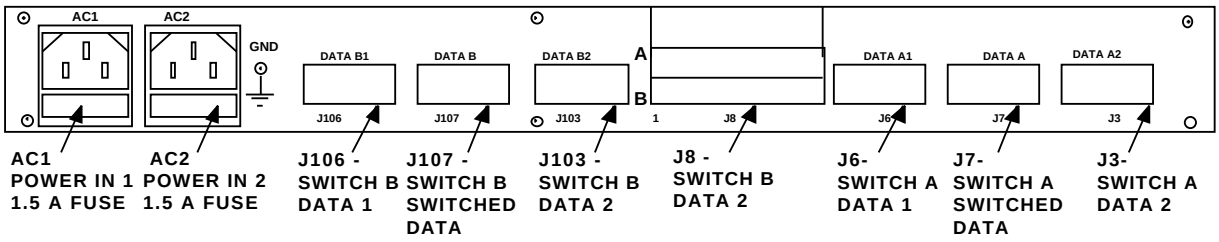

FIGURE 2.0 1582-12 REAR PANEL

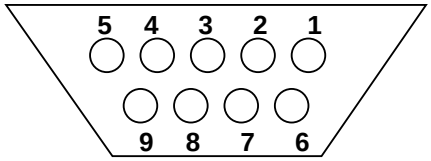

FIGURE 2.1 DB9 PIN OUTS

TABLE 2.0 INPUT / OUTPUT CONNECTORS

J3, J6, J7, J103, J106, J107 - DATA CONNECTORS (FIGURE 2.1)

Function	Pin #	Description
CLOCK	3,8	RS422 or RS232C Levels
GROUND	5	Ground
TIED TOGETHER	1,2,4,6,7,9	CH1 TO CH2 TO OUTPUT

J8 - MONITORS AND CONTROLS CONNECTOR, A FOR SWA, B FOR SWB (FIGURE 2.0)

Function	Pin #	Description
ALARM 1 IN	13	Ground or Open (selectable by JP2, JP102) gives Ch 1 alarm
ALARM 2 IN	14	Ground or Open (selectable by JP2, JP102) gives Ch 2 alarm
REMOTE 1 IN	1	When in Auto, momentary ground on this pin selects Ch 1
REMOTE 2 IN	2	When in Auto, momentary ground on this pin selects Ch 2
REMOTE RESET IN	4	When in LATCH mode, ground resets switch to Ch 1, resets Remote to Auto
MANUAL INDICATION	8	*Open collector output (< 5Ω) to gnd when in Manual mode.
SWITCH 1 MON	11	**Relay closure to J8 pin 6 (<5Ω) when selected data is channel 1 data..
SWITCH 2 MON	12	**Relay closure to J8 pin 6 (<5Ω) when selected data is channel 2 data.
SWITCH MON COMMON	6	Common pin for SWITCH 1, 2 MONITOR
CLOCK ALARM	9	*Open collector (< 5Ω) to gnd when clock on CH1 or CH2 is lost
GROUND	3,7,10	Ground
NO CONNECTION	5, 15	Not connected
		*Max voltage able to be connected to this is +20 VDC @ 30ma
		**Max voltage to be connected to this is +30 VDC@ 100 ma

AC1, AC2 - POWER IN - Provides AC inputs for dual power supplies.

2.2 Controls and Indicators -The following are the controls and indicators.

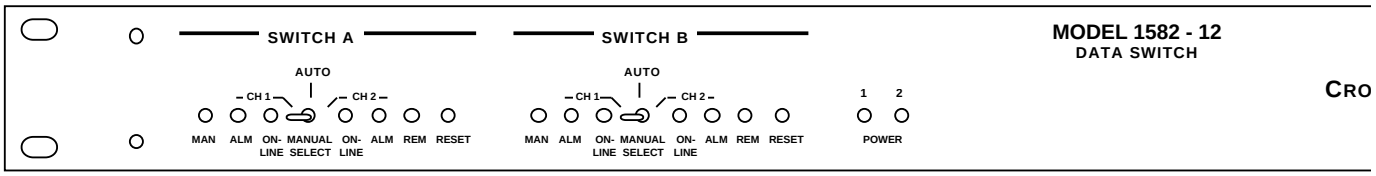

FIGURE 2.2 1582-12 CONTROLS AND INDICATORS

TABLE 2.1 FRONT PANEL CONTROLS AND INDICATORS

Item	Description
	FOR SWITCH A AND SWITCH B
CH1 ON-LINE LED	Turns green when Channel 1 is selected
CH2 ON-LINE LED	Turns green when Channel 2 is selected
MANUAL LED	Turns red when the Manual Select switch manually selects channel 1 or 2.
ALARM CH1 LED	Turns red when Channel 1 clock times out or on external alarm input
ALARM CH2 LED	Turns red when Channel 2 clock times out or on external alarm input
REMOTE LED	Turns amber when REMOTE control is active
MANUAL SELECT switch	3-position switch as follows: LEFT - manually select Channel 1 center - Auto - switch position determined by alarm and Remote closures RIGHT - manually select Channel 2
If operating in the ICS mode, the last channel manually selected (CH1 or CH2) will be the initial channel when Manual Switch is returned to Auto if both channel alarms are clear or both channels are in alarm.	
SWITCH RESET	Resets switch to CH1 if it is good and switch is in the latch mode, Also Resets Remote selection to normal Auto operation
	COMMON FOR THE CHASSIS
POWER CH1 LED	Turns green when power is applied to AC1 input on the rear panel
POWER CH2 LED	Turns green when power is applied to AC2 input on the rear panel

2.3 PC Board Settings -

2.3.1 On-Card Jumpers - NOTE: **Dot** position means jumper goes from center pin to the pin nearest the dot on the PCB. Also the first jumper designation is for switch A (J1) and the second is for switch B (J101)

JP1, JP101 - 3-pin jumper that works with JP3, JP103

In the **dot** position when channel 1 alarms the 1582-12 will switch to channel 2 until channel 2 alarms. At this point, if channel 1 is still in alarm, the switch will stay on channel 2. When the channel 1 alarm clears if channel 2 is still in alarm, the switch will switch to channel 1.

In the **non-dot** position, operates in conjunction with **JP3** as noted below

JP1, JP101 normal position - non-dot and operates in conjunction with JP3, JP103 as noted below.

JP2, JP102 - Input alarm condition 3-pin jumper

In the **dot** position open is normal operation, ground is alarm

In the **non-dot** position ground is normal operation, open is an alarm.

JP2, JP102 normal position - dot

JP3, JP103 - LATCH to CH2 mode on / off - 3-pin jumper effective when JP1 is in the non-dot position.

With **JP3** in the **dot** and **JP1** in the **non-dot**, when channel 1 alarms, the 1582-12 switch switches to channel 2 and stays there until the reset button is pushed on the front panel or by an external closure to ground on the remote RESET pin on J8, and then it switches to channel 1. (If channel 1 alarms are cleared). If in the ICS mode and originally set to CH2 the 1582-12 will not switch if CH2 alarms. Only the RESET functions (front panel pushbutton or J8 closure to ground) will return the switch to CH1.

With JP3 in the **non-dot** and JP1 in the **non-dot**, when channel 1 alarms the 1582-12 switches to channel 2 until the alarm on channel 1 clears and then the 1582-12 switches back to channel 1 automatically.

JP3, JP103 normal position - dot .

JP4, JP104 - CH2 alarm enable / ignore - 3-pin jumper

dot position - Failure in CH1 will cause the 1582-12 to switch to CH2 even if CH2 is in alarm. LEDs will correctly show CH2 alarm status

Non-dot position - Failure in CH1 will cause the 1582-12 to switch to CH2 only if CH2 is not in alarm.

JP4, JP104 normal position - non-dot

JP9, JP109 - CH2 Clock Detection Filter- 3-pin jumper that filters out non-data spikes if clock is not present.

Non-dot position - presence of clock is detected on the first few positive transition of clock from CH2.

Dot position - presence of clock is detected after about 1 ms of positive transitions of clock from CH2.

JP9,109 normal position - Non-dot.

JP10, JP110 - CH1 Clock Detection Filter- 3-pin jumper that filters out non-data spikes if clock is not present.

Non-dot position - presence of clock is detected on the first few positive transition of clock from CH1.

Dot position - presence of clock is detected after about 1 ms of positive transitions of clock from CH1.

JP10,110 normal position - Non-dot.

JP15, JP16, JP17, JP18 - Alarm clock frequency 3-pin jumper FACTORY SET to provide clock for the time out alarm circuitry. **DO NOT ADJUST THESE!** Figure 2.3 shows the correct positions**..**

2.3.2 On-Card Switches -

S3, S103 - Initial Channel Select (ICS) Mode- 4-position DIP switch Selects the Initial Channel Select mode when JP1,2,3, JP101,102,103,in Dot and JP4, JP104 in Non-dot.

S3, S103 positions 1,2,3,4 to ON - ICS is enabled. In the ICS mode, the initial channel can be either CH1 or CH2 by switching the front panel Manual Select switch to either CH1 or CH2 and then back to the Auto position.or by grounding either Remote 1 or Remote 2 pins on J8 and then grounding the Remote reset pin on J8 causing the 1582-12 to go back to Auto in the channel last selected remotely if both channel alarms are clear or both channels are in alarm. The initial channel can also be selected if both channel alarms are clear or both channels are in alarm..

S3, S103 positions 1,2,3,4 to OFF - ICS is disabled (Minimum Auto switching, Return to Last State Mode) The 1582-12 goes to the last state (CH1 or CH2) it was in when in Auto after Manually or Remotely switching and returning to Auto. Auto switching occurs only if current channel alarms and the other channel is clear.

S3, S103 normal position - 1,2,3,4 to ON

S4, S104 - CH1 CLOCK TIMEOUT - Selects the time in tenths of seconds (0.1-0.9) of data absence in channel 1 before an alarm is indicated.

S5, S105 - CH2 CLOCK TIMEOUT - Selects the time in tenths of seconds (0.1-0.9) of data absence in channel 2 before an alarm is indicated.

2.4 Mechanical - The 1582-12 is rack mounted by attaching the front panel to a rack through the four holes at the edges of the panel.

2.5 Time out alarm settings - Switches S4 (CH2, SWITCH A), S5 (CH1, SWITCH A), S104 (CH2, SWITCH B), S105 (CH1, SWITCH B), determine the length of time after clock is removed before a loss of clock alarm is indicated. Use a small flat blade screwdriver or tuning tool to carefully adjust these switches to the desired length IN 0.1 second increments (position 1 = 0.1 sec, position 2 = 0.2 seconds, etc.)..(Section 2.3, Figure 2.3).

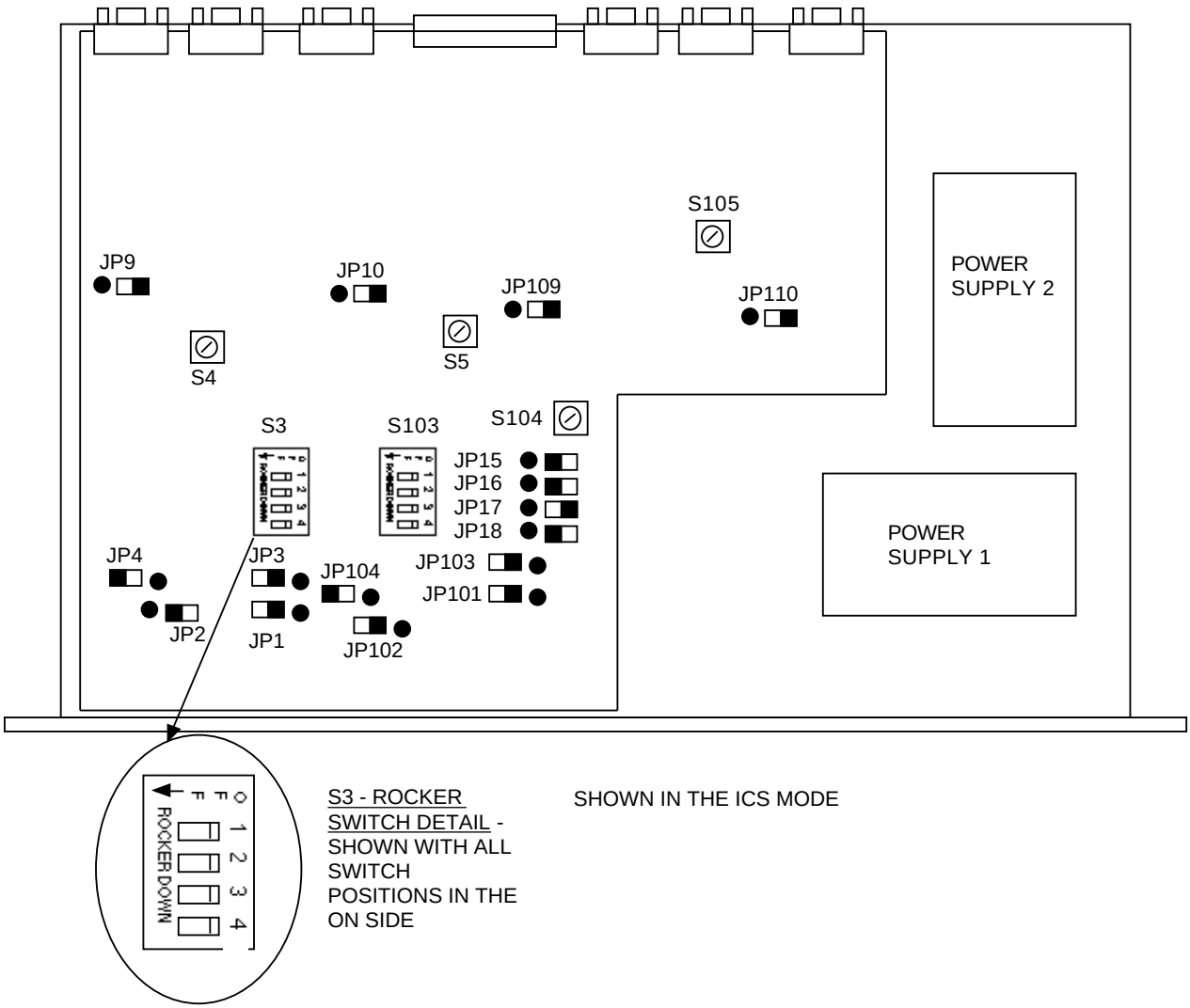

Figure 2.3 PCB SETTINGS PARTS LOCATIONS

2.6 Switch Mode Setup

- The following gives the switch mode settings of the on board controls that can be changed in the field: **SWITCH A** JP1, JP2, JP3, JP4; S3; **SWITCH B** - JP101, JP102, JP103, JP104, S103 (Section 2.3, Figure 2.3). All shown with external **alarm = ground**.

1) CH1 Prime Mode - Switches from CH1 to the CH2 only if CH1 alarms and CH2 is good. Switches back to CH1 when it is no longer in alarm or when both CH1 and CH2 are in alarm

Non-dot - SWITCH A - JP1, JP3, JP4; **SWITCH B** - JP101, JP103, JP104

Dot - SWITCH A - JP2; **SWITCH B** - JP102

S3 (SWITCH A), S103 (SWITCH B) - ALL TO OFF.

2) Latch to CH2 Mode - Switches from CH1 to the CH2 if CH1 alarms and CH2 is good. Latches to CH2. Push Reset or ground Remote Reset pin to return to CH1 if it has no alarm or both CH1 and CH2 are in alarm.

Non-dot - SWITCH A - JP1, JP4; **SWITCH B** - JP101, JP104

Dot - SWITCH A - JP2, JP3; **SWITCH B** - JP102, JP103

S3 (SWITCH A), S103 (SWITCH B) - ALL TO OFF.

3) Minimum Auto switching, Return to Last State Mode - Switch goes to the last state (CH1 or CH2) it was in when in Auto after Manually or Remotely switching and returning to Auto. Auto switching occurs only if current channel alarms and the other channel is clear.

Non-dot - SWITCH A - JP4, **SWITCH B** - JP104

Dot - SWITCH A - JP1, JP2, JP3; **SWITCH B** - JP101, JP102, JP103

S3 (SWITCH A), S103 (SWITCH B) - ALL TO OFF.

4) Minimum Auto switching, Initial Channel Select (ICS) Mode- Switch stays on channel last selected by Manual or Remote selection after return to Auto if both channel alarms are clear or both channels are in alarm. Auto switching occurs only if current channel alarms and the other channel is clear.

Non-dot - SWITCH A - JP4, **SWITCH B** - JP104

Dot - SWITCH A - JP1, JP2, JP3; **SWITCH B** - JP101, JP102, JP103

S3 (SWITCH A), S103 (SWITCH B) - ALL TO ON.

Factory set mode is generally (**4) Minimum Auto switching, Initial Channel Select (ICS) Mode.**

2.7 Installation

a. Set the on board controls as desired (Section 2.3, 2.6, Figure 2.3).

b. Install the 1582-12 in the equipment rack.

c. Connect data to the DB-9 DATA connectors (J6, 7, 3 (CH1); J106, 107, 103 CH2))).

d. Connect to signals on the MONITORS AND CONTROLS connector, J8, as desired (see Figure 2.0, Table 2.0)

e. Connect power via two power cords

f. Manually switch between channels 1 and 2 and be sure switching occurs

g. Switch to Auto. Alarm channel 1 and note that automatic switching occurs. Remove alarm to channel 1 and note that the output switches as desired. Push RESET if in LATCH mode. Repeat for Channel 2.

h. Check that Ch 1 and Ch 2 are selected when in Auto and momentary ground is applied to J8 pins 1 and 2. Momentarily ground remote Reset pin 4 on J8 to return to Auto operation.