

INSTRUCTION MANUAL

MODEL 1582-14 DATA SWITCH

Data, drawings, and other material contained herein are proprietary to Cross Technologies, Inc., but may be reproduced or duplicated without the prior permission of Cross Technologies, Inc. for purposes of operating the equipment.

When ordering parts from Cross Technologies, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

First Edition **November 2004** **Rev 0**

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

INSTRUCTION MANUAL
MODEL 1582-14 DATA SWITCH

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
Warranty	2
1.0 General	3
1.1 Equipment Description	3
1.2 Technical Specifications	4
2.0 Installation	5
2.1 Mechanical	5
2.2 Rear Panel Inputs and Outputs	5
2.3 Front Panel Controls and Indicators	6
2.4 PC Board Settings	7
2.4.1 On-Card Jumpers	7
2.4.2 On-Card Settings	8
2.5 Time Out Alarm Settings	9
2.6 Switch Mode Setup	10
2.7 Operation	10

WARRANTY - The following warranty applies to all Cross Technologies, Inc. products.

All Cross Technologies, Inc. products are warranted against defective materials and workmanship for a period of one year after shipment to customer. Cross Technologies, Inc.'s obligation under this warranty is limited to repairing or, at Cross Technologies, Inc.'s option, replacing parts, subassemblies, or entire assemblies. Cross Technologies, Inc. shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are not other warranties, express or implied, except as stated herein.

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

MODEL 1582-14 Data Switch

1.0 General

1.1 Equipment Description - The 1582-14 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 RS422 clock or data signals on pins 3 and 8 with pin 5 ground and the other pins not connected.

Clock or data transitions are detected from pin 3 and a clock (or data) presence alarm is activated if transitions are lost for a set period of time. The time period from a loss of transitions (on pin 3) to a presence alarm is set with BCD switches on the PCB.

Alarm conditions on CH1 and CH2 are detected 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, 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.

Factory set mode is generally **(1) CH1 Prime Mode**.

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 1582-14. The chassis is a 1 3/4" rack mount.

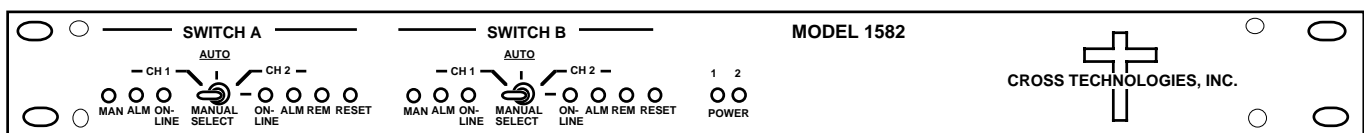


FIGURE 1.1 Model 1582-14 Front Panel

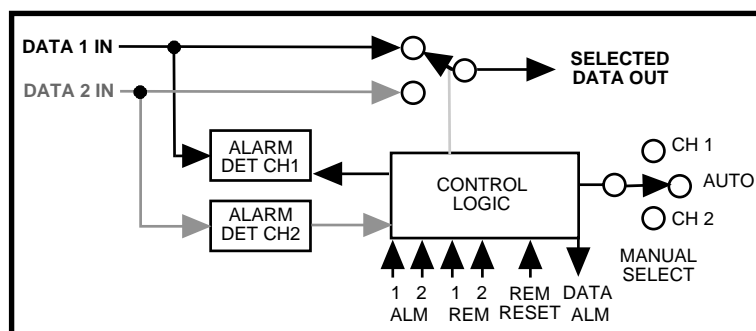


FIGURE 1.2 Model 1582-14 Data Switch Block Diagram (Each Switch)

1.2 Technical Specifications

TABLE 1.0 1582-14 Data Switch Specifications*

Data Characteristics

Input/Output	RS422
Data rate	128 kbps, max
Connectors, data	DB9, female
Pins Switched	3, 8
Ground pin	5

Switch Characteristics

Type	Relay, non-latching
Isolation	>40 dB
Switch after alarm	0.1 to 0.9 seconds (selectable in 0.1 second increments)
Switch time	≤10 milliseconds
Contact resistance	≤10Ω, < 1Ω typ
Configuration	SPDT
Connectors, alarm	Barrier Strip
LEDS	CH1, CH2 ON-LINE; CH1, CH2 ALARM; POWER 1, 2; MANUAL; REMOTE

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 1	Turns green when power is applied to AC1 input on the rear panel
POWER 2	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 Mechanical - The 1582-14 is rack mounted by attaching the front panel to a rack through the four holes at the edges of the panel.

2.2 Rear Panel Inputs and Outputs - Figure 2.0 shows the input and output connectors on the rear panel.

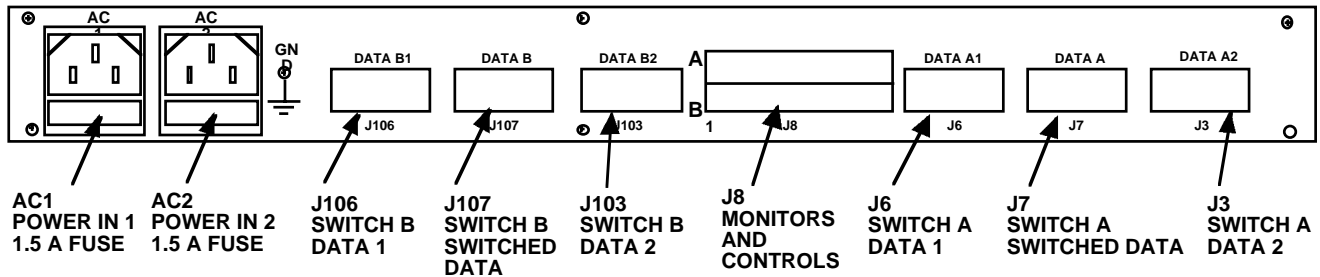


FIGURE 2.0 1582-14 Rear Panel I/O's

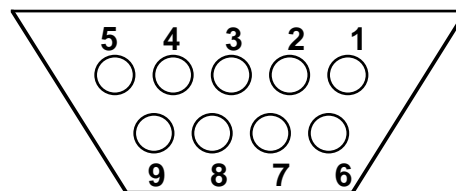


FIGURE 2.1 DB9 Pin-Outs

TABLE 2.0 Rear Panel Input/Output Connectors Pinout

J3, J6, J7, J103, J106, J107 - Data Connectors		
Function	Pin #	Description
DATA	3 8	RS422 Levels
GROUND	5	Ground
NO CONNECTION	1 2 4 6 7 9	Not connected
J8 - Monitors and Controls Connector		
Function	Pin #	Description
ALARM 1 IN	13	Ground or Open (selectable by JP2, JP102) gives CH1 alarm
ALARM 2 IN	14	Ground or Open (selectable by JP2, JP102) gives CH2 alarm
REMOTE 1 IN	1	When in AUTO, momentary ground on this pin selects CH1
REMOTE 2 IN	2	When in AUTO, momentary ground on this pin selects CH2
REMOTE RESET IN	4	When in LATCH mode, ground resets switch to CH1, resets REMOTE to AUTO
MANUAL INDICATION*	8	Open collector output (<math><5\Omega</math>) to GND when in MANUAL mode
SWITCH 1 MON**	11	Relay closure to J8 pin 6 (<math><5\Omega</math>) when selected data is CH1 data
SWITCH 2 MON**	12	Relay closure to J8 pin 6 (<math><5\Omega</math>) when selected data is CH2 data
SWITCH MON COMMON	6	Common pin for SWITCH 1, 2 MONITOR
DATA ALARM*	9	Open collector (<math><5\Omega</math>) to GND when clock on CH1 or CH2 is lost
GROUND	3 7	Ground
NO CONNECTION	5 10 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.

2.3 Front Panel Controls and Indicators - The following are the front panel controls and indicators.

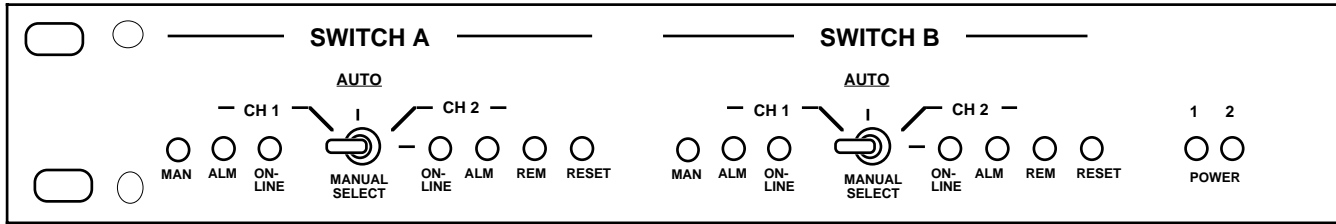


FIGURE 2.2 1582-14 Front Panel Controls and Indicators

TABLE 2.1 Front Panel Controls and Indicators

For SWITCH A and SWITCH B	
Item	Description
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
Switch RESET	Resets switch to Channel 1 if it is good and switch is in the latch mode
	Also resets REMOTE selection to normal AUTO operation
Common for the Chassis	
Item	Description
POWER 1 LED	Turns green when power is applied to AC1 input on the rear panel
POWER 2 LED	Turns green when power is applied to AC2 input on the rear panel

*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.

2.4 PC Board Settings

2.4.1 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 1582-14 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 1582-14 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 1582-14 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 1582-14 switches to channel 2 until the alarm on channel 1 clears and then the 1582-14 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 1582-14 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 1582-14 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..

JP25,JP125 - Clock or data presence alarm enable/disable 3-pin jumper FACTORY SET to enable clock or data presence alarm circuitry on CH1.

Dot position-enables clock or data presence alarm on CH1.

Non-dot position-disables clock or data presence alarm on CH1.

JP26,JP126 - Clock or data presence alarm enable/disable 3-pin jumper FACTORY SET to enable clock or data presence alarm circuitry on CH2.

Dot position-enables clock or data presence alarm on CH2.

Non-dot position-disables clock or data presence alarm on CH2.

2.4.2 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 1582-14 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 1582-14 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 seconds (0.1 to 0.9) of data absence in channel 1 before an alarm is indicated.

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

2.5 Time Out Alarm Settings - Switches S4 (CH2, SWITCH A), S5 (CH1, SWITCH A), S104 (CH2, SWITCH B), and 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 seconds, position 2 = 0.2 seconds, etc.). (see Figure 2.3)

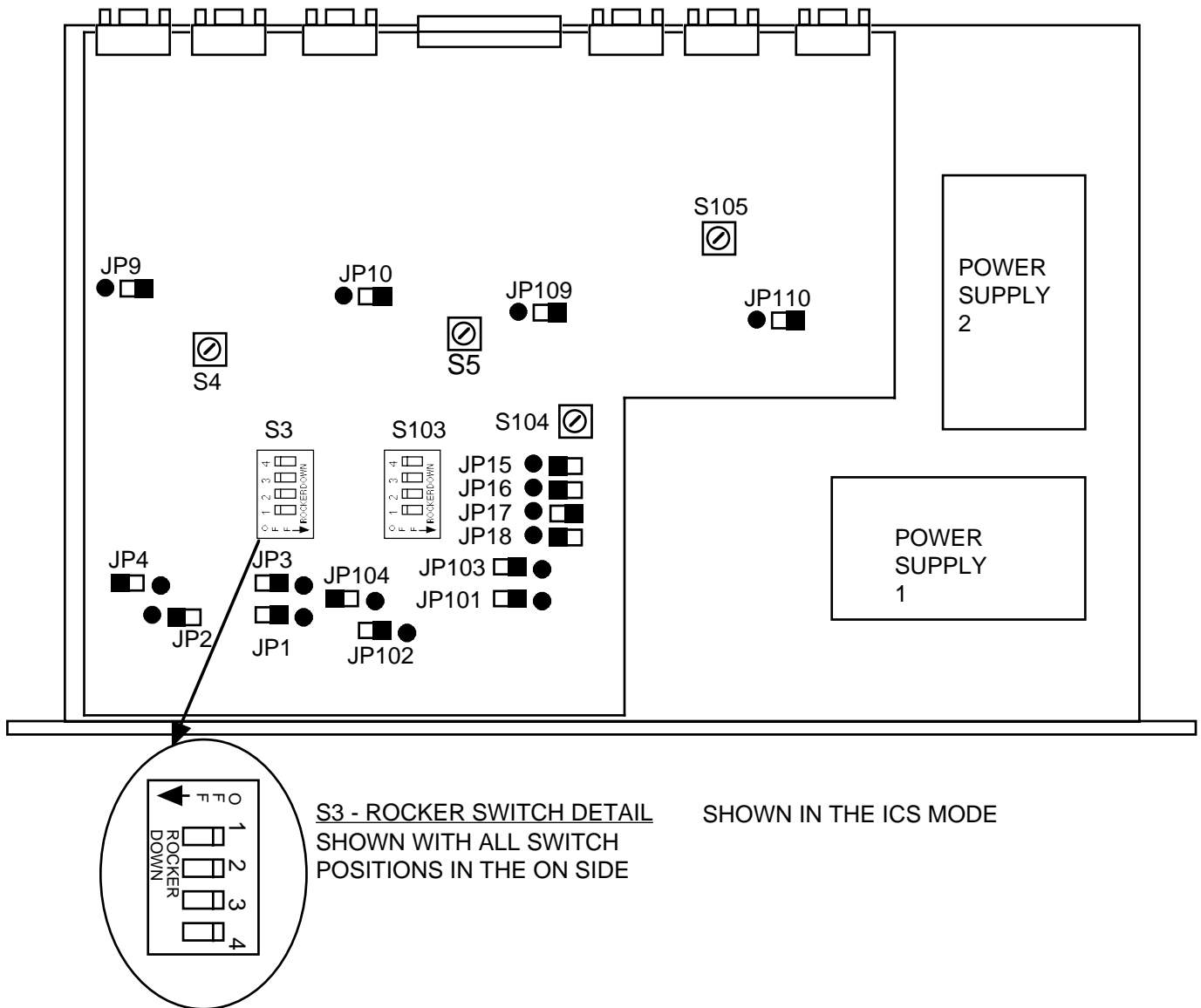


FIGURE 2.3 1582-14 PCB Settings Parts Locations

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, 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 **1) CH1 Prime Mode** ,

2.7 Operation

- a. Set the on board controls as desired (Section 2.4, 2.6, Figure 2.3).
- b. Install the 1582-14 in the equipment rack.
- c. Connect data to the DB-9 DATA connectors (J6, J7, J3 (CH1); J106, J107, J103 (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.