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INSTRUCTION MANUAL

MODEL 1582-04 DATA SWITCH

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>WARRANTY</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty</td>
<td>2</td>
</tr>
<tr>
<td>1.0 General</td>
<td>3</td>
</tr>
<tr>
<td>1.1 Equipment Description</td>
<td>3</td>
</tr>
<tr>
<td>1.2 Technical Specifications</td>
<td>4</td>
</tr>
<tr>
<td>2.0 Installation</td>
<td>5</td>
</tr>
<tr>
<td>2.1 Mechanical</td>
<td>5</td>
</tr>
<tr>
<td>2.2 Rear Panel Inputs and Outputs</td>
<td>5</td>
</tr>
<tr>
<td>2.3 Front Panel Controls and Indicators</td>
<td>6</td>
</tr>
<tr>
<td>2.4 PC Board Settings</td>
<td>7</td>
</tr>
<tr>
<td>2.4.1 On-Card Jumpers</td>
<td>7</td>
</tr>
<tr>
<td>2.4.2 On-Card Settings</td>
<td>8</td>
</tr>
<tr>
<td>2.5 Time Out Alarm Settings</td>
<td>9</td>
</tr>
<tr>
<td>2.6 Switch Mode Setup</td>
<td>10</td>
</tr>
<tr>
<td>2.7 Operation</td>
<td>10</td>
</tr>
<tr>
<td>2.8 Environmental Use Information</td>
<td>12</td>
</tr>
</tbody>
</table>

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MODEL 1582-04 Data Switch

1.0 General

1.1 Equipment Description

The 1582-04 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 RS232C 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 1 to 9 minutes 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 1582-04. The chassis is a 1 3/4” rack mount.

**FIGURE 1.1 Model 1582-04 Front Panel**

**FIGURE 1.2 Model 1582-04 Data Switch Block Diagram (Each Switch)**
1.2 Technical Specifications

**TABLE 1.0 1582-04 Data Switch Specifications**

**Data Characteristics**
- **Input/Output**: RS232C
- **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 to 9 minutes (selectable in 1 minute increments)
- **Switch time**: \( \leq 10 \) milliseconds
- **Contact resistance**: \( \leq 10\Omega, < 1\Omega \) 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; 100-240 ±10% VAC, 47 - 60Hz, 30 watts

*Specifications subject to change without notice*
2.0 Installation

2.1 Mechanical
The 1582-04 is rack mounted by attaching the front panel to a rack through the 4 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 1582-04 Rear Panel I/O's](image)

**TABLE 2.0 Rear Panel Input/Output Connectors Pinout**

<table>
<thead>
<tr>
<th>Function</th>
<th>Pin #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA 3</td>
<td>8</td>
<td>RS232C Levels</td>
</tr>
<tr>
<td>GROUND</td>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>NO CONNECTION 1</td>
<td>1</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 2</td>
<td>2</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 3</td>
<td>3</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 4</td>
<td>4</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 5</td>
<td>5</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 6</td>
<td>6</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 7</td>
<td>7</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 8</td>
<td>8</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 9</td>
<td>9</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 10</td>
<td>10</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 11</td>
<td>11</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 12</td>
<td>12</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 13</td>
<td>13</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 14</td>
<td>14</td>
<td>Not connected</td>
</tr>
<tr>
<td>NO CONNECTION 15</td>
<td>15</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

*Max voltage able to be connected to this is +20 VDC @ 30 ma.

*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.

![Diagram of front panel controls](image)

**TABLE 2.1 Front Panel Controls and Indicators**

For SWITCH A and SWITCH B

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1 ON-LINE LED</td>
<td>Turns green when Channel 1 is selected</td>
</tr>
<tr>
<td>CH2 ON-LINE LED</td>
<td>Turns green when Channel 2 is selected</td>
</tr>
<tr>
<td>MANUAL LED</td>
<td>Turns red when the MANUAL SELECT switch manually selects Channel 1 or 2</td>
</tr>
<tr>
<td>ALARM CH1 LED</td>
<td>Turns red when Channel 1 clock times out or on external alarm input</td>
</tr>
<tr>
<td>ALARM CH2 LED</td>
<td>Turns red when Channel 2 clock times out or on external alarm input</td>
</tr>
<tr>
<td>REMOTE LED</td>
<td>Turns amber when REMOTE control is active</td>
</tr>
<tr>
<td>MANUAL SELECT Switch*</td>
<td>3-position switch as follows:</td>
</tr>
<tr>
<td></td>
<td>• LEFT - manually select Channel 1</td>
</tr>
<tr>
<td></td>
<td>• CENTER - AUTO - switch position determined by alarm and remote closures</td>
</tr>
<tr>
<td></td>
<td>• RIGHT - manually select Channel 2</td>
</tr>
<tr>
<td>Switch RESET</td>
<td>Resets switch to Channel 1 if it is good and switch is in the latch mode</td>
</tr>
<tr>
<td></td>
<td>Also resets REMOTE selection to normal AUTO operation</td>
</tr>
</tbody>
</table>

*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 1582-04 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 1582-04 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 1582-04 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 1582-04 switches to channel 2 until the alarm on channel 1 clears and then the 1582-04 switches back to channel 1 automatically.

JP4, JP104 - CH2 alarm enable / ignore - 3-pin jumper
dot position - Failure in CH1 will cause the 1582-04 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 1582-04 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 1582-04 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 1582-04 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 TIME-OUT** - Selects the time in minutes (1-9) of data absence in channel 1 before an alarm is indicated.

**S5, S105 - CH2 CLOCK TIME-OUT** - Selects the time in minutes (1-9) 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 flatblade screwdriver or tuning tool to carefully adjust these switches to the desired length in 1 minute increments (position 1 = 1 minute, position 2 = 2 minutes, etc.). (see Figure 2.3)
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
   - **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.
   - 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.
   - 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 1582-04 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.
2.8 Environmental Use Information

A. Rack-Mounting - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.

B. Mechanical Loading - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.

C. Elevated Operating Ambient Temperature - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra.

D. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between unit may be required.

E. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used, when addressing this concern.

F. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).

G. Top Cover - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw MUST BE REINSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.