

# TAMS 1848A 4 x 8 Matrix Switch

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## Introduction

The TAMS 1848A is a 4 by 8 matrix switch. See Figure 1.

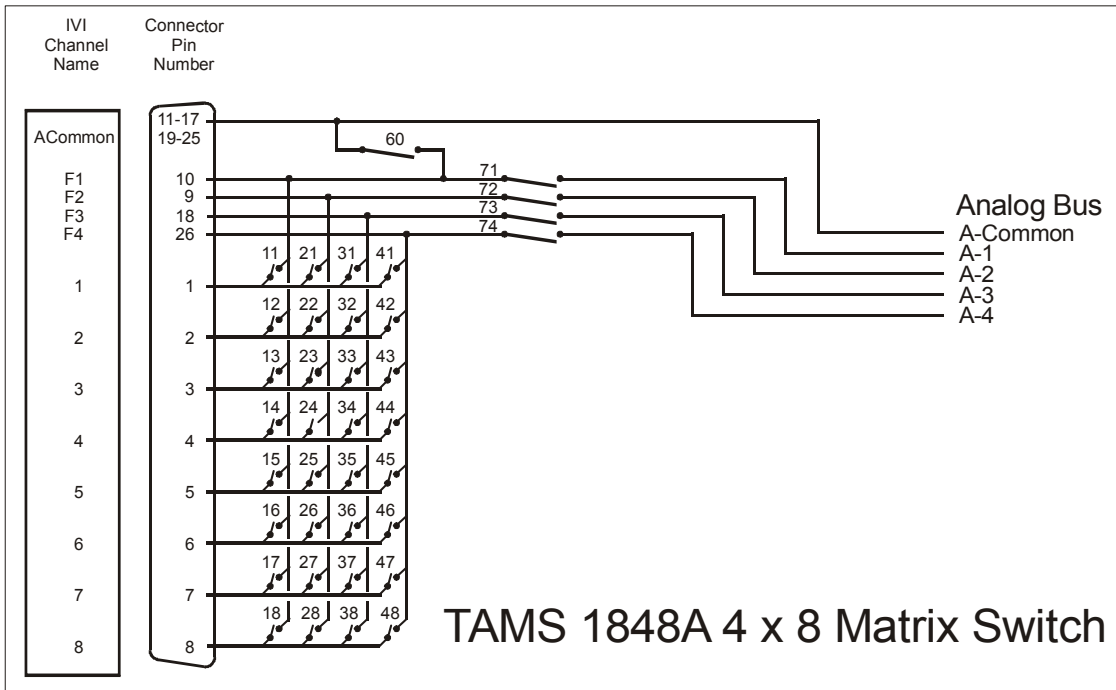


Figure 1 -- TAMS 1848A 4 x 8 Matrix Switch

The 4 x 8 matrix allows connection of any row (1 through 8) with any column (1 through 4). The matrix consists of 32 SPST relays (labeled 11 through 18, 21 through 28, 31 through 38, and 41 through 48 in figure 1) forming a 4 by 8 matrix switch, where any of the inputs 1 through 8 can be connected with any of the four “Analog Bus” lines. Five additional relays allow connect/disconnect of the matrix from the Analog Bus, as well as grounding selected terminals to the Analog Common to enable single ended measurements. So, for example, terminal 1 can be connected to Analog Bus terminals A-1, A-2, A-3, or A-4 via a “CLOSE” command.

Referring to figure 1, the rows of the matrix are identified as 1 through 8. The columns are identified as 1 through 4. Each relay is identified by its column and row. For example, relay 23 connects column 2 with row 3.

Large matrixes can be easily built by connecting the “Analog Bus” terminals together with short jumper cables. The relays 71 through 74 allow the matrix to be disconnected

from the Analog Bus in order to reduce the stray capacitance of the large matrix. Only close relays 71 through 74 for the devices that actually have active matrix connections. When the connections are not being used, open relays 71 through 74. See the Installation and Operation Manual, and the Application Note 1801.

Note that closing a relay in any column and row does NOT open any other relays. To automatically scan through a series of relays, see the Scanning Overview in the Direct IO manual at Help / Documentation / DirectIO.pdf.

The TAMS 1848A can only close a maximum of 30 relays at once.

Please observe all safety precautions listed in the Installation and Operation Manual.

## Relays types

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All relays are reed relays.

## Relay Operation

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### Direct IO

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Direct IO commands open and close the relays as follows:

```
CLOSE (@11,22) -- close relays 11 and 22, which
               -- connects terminals "1" to "10" and
               -- connects terminals "2" to "9"
               -- see figure 1
```

```
OPEN (@11, 22) -- open relays, disconnect terminals
```

```
CLOSE (@71:74) -- close relays 71, 72, 73, and 74
```

```
OPEN (@71:74)  -- open relays 71, 72, 73, and 74
```

## IVI driver and NI Switch Manager

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These drivers all use a “connect pin to pin” model. Instead of referencing the relay number, they reference the terminal or pin name, here called a “channel name”.

Consider this example:

```
ts1848a_Connect (h, "1", "A1");
```

This call connects channel “1” with Analog Bus channel “A1”. (The IVI standard does not let us use A-1, so we use A1 instead). In other words, it closes relays 11 and 71. This call opens those relays:

```
ts1848a_Disconnect (h, "1", "A1");
```

This call closes relay 60, connecting the Analog Bus Common to channel “A1”:

```
ts1848a_Connect (h, "F1", "ACommon");
```

The channels for the IVI driver and NI Switch Manager are shown in Figure 1.

The channels for the IVI driver and NI Switch Manager are shown in Figure 1. This is the list of all IVI channels:

```
"1", "2", "3", "4", "5", "6", "7", "8"  
"F1", "F2", "F3", "F4"  
"A1", "A2", "A3", "A4", "ACommon"
```

Channels 1, 2, 3, 4, 5, 6, 7, and 8 are the rows of the matrix.

Channels F1, F2, F3, and F4 are the columns of the matrix.

Channels A1, A2, A3, A4, and ACommon are the Analog Bus channels and the Analog Common.

Example commands:

```
ts1805a_Connect (h, "6", "F2")  
    -- close relay 26  
  
ts1805a_Connect (h, "6", "A2")  
    -- close relays 26 and 72  
  
ts1805a_Disconnect (h, "6", "A2")  
    -- open relays 26 and 72
```

## Connectors

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The TAMS 1848A uses standard “High Density D-subminiature” connectors. Mating cables are available from L-Com and other suppliers. See [www.l-com.com](http://www.l-com.com).



## **Appendix A: Specifications**

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### **Supported Configurations**

Operating systems: Windows 2000 and Windows XP

Microsoft Internet Explorer version 5.01 or later is required

USB versions: 2.0 and 1.1 Full speed

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### **Electrical**

USB connection: USB “B” type connector

USB current consumption: 350mA maximum

Switched voltage and current:

100VAC maximum

100VDC maximum

0.5 Amps maximum

Carrying current: 1.5A maximum

Switched power: 10W maximum

Total Channel Resistance: 0.3 Ohms initial, typical

(Measured from the front panel connector to the rear panel Analog Bus)

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### **General**

Operating Temperature: 0C to 40C

Storage Temperature: -40C to 70C

Transportation Temperature: -40C to 70C

Operating Altitude: 3000 meters maximum

Operating Humidity: 10 – 80% RH, non-condensing

Note: all specifications are subject to change without notice.

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