MODRELAY Datasheet

Relay Out 8 Module

902140   **Relay Out 8 Module**

902140-R   **Relay Out 8 Module w/Rt Spade**

902140-S   **Relay Out 8 Module w/Spade**

902140-T   **Relay Out 8 Module w/Terminal**

902142-I2C   **Relay Out 8 Module**

902142-R-I2C **Relay Out 8 Module w/Rt Spade**

902142-S-I2C **Relay Out 8 Module w/Spade**

902142-T-I2C **Relay Out 8 Module w/Terminal**

Table of Contents

1   Functional Overview

The Delcom Relay Module includes 8 relays. The relay modules are controlled via one of the Delcom interface modules. The relays can either be controlled directly via a port pin on the interface processor or via I2C commands from the interface processor I2C Bus. Up to 2 modules (16 relays) can be controller by the interface module with direct pin control or up to 8 modules (64 relays) can be controller by the interface module using the I2C command mode.

The module allows for either USB host power or Auxiliary power selection. Under USB host power one must make sure not to consume more that the allow USB power limit (500ma). Each relay draws 40ma when it is actuated. Therefore if all relays can be actuated at the same time, then only 1 module (8 relays) can be power from the USB host power.

Relays are actuated by a low (0) logic signal. The default power on state is all relays off. Relay on/off delay limited by the interface communication overhead. For USB low speed interface the overhead is 10ms and for USB high speed it is 1ms. Each relay can handle 2A @ 30VDC, 0.6A @ 125VAC or 0.6 @ 110VDC.

There are four different relay and power connector options. 1 – No connector, user solders directly to the power. 2 – Terminal connectors (order suffix T), 3 – Spade connectors (order suffix S), and 4 – Right angle spade connectors (order suffix R).
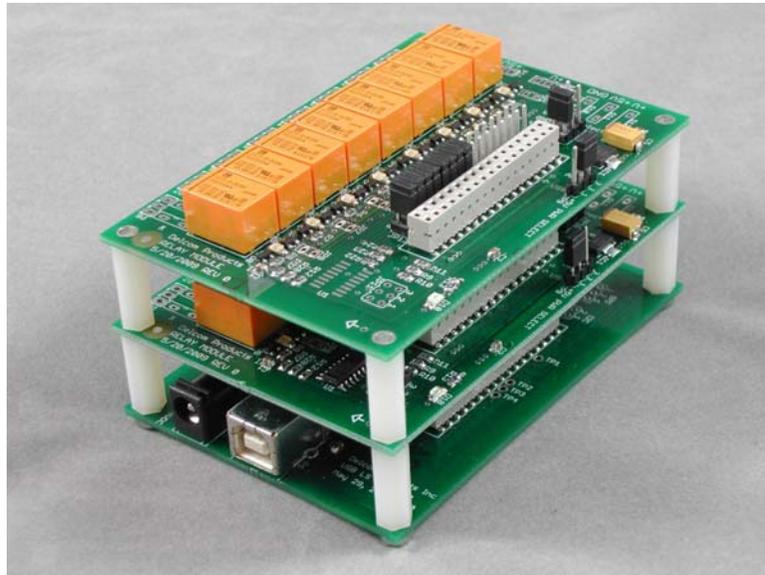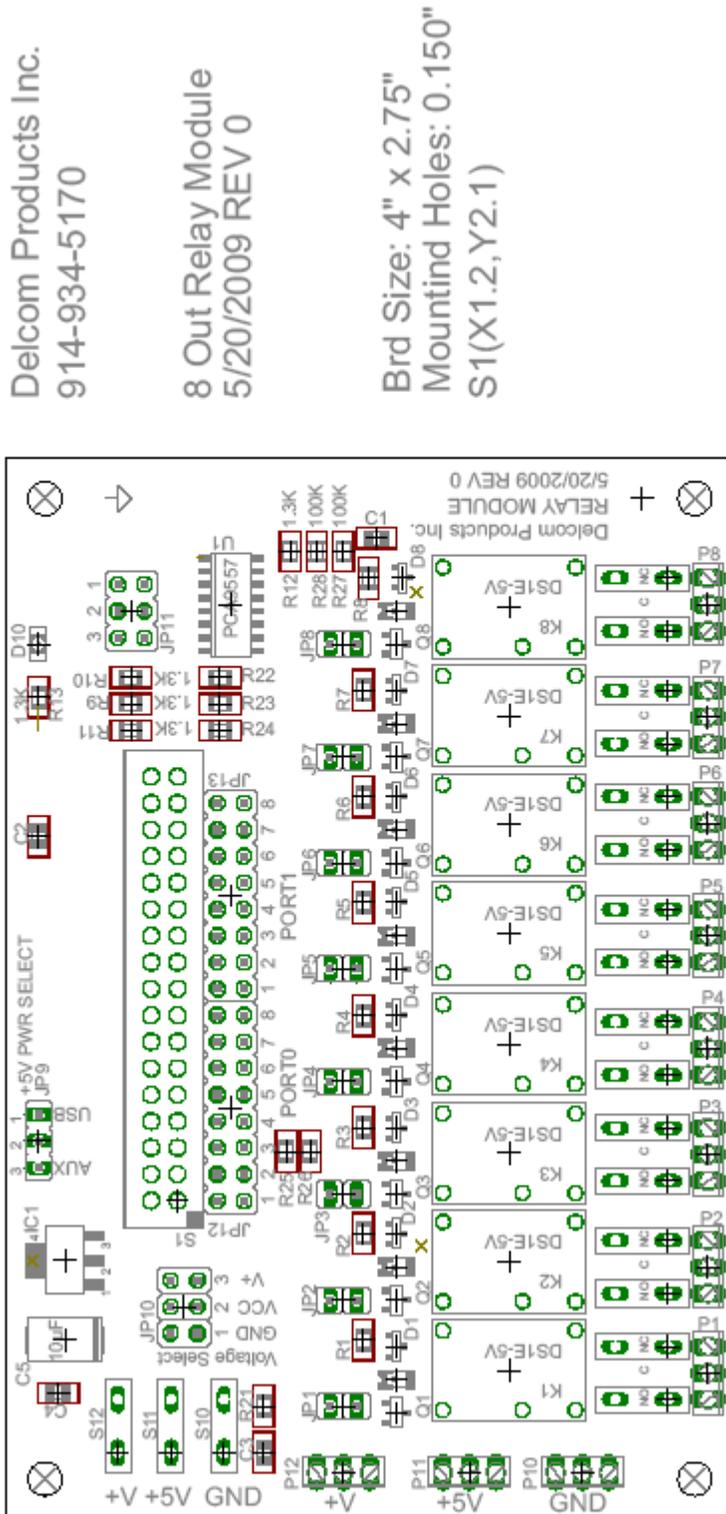
2   Schematic
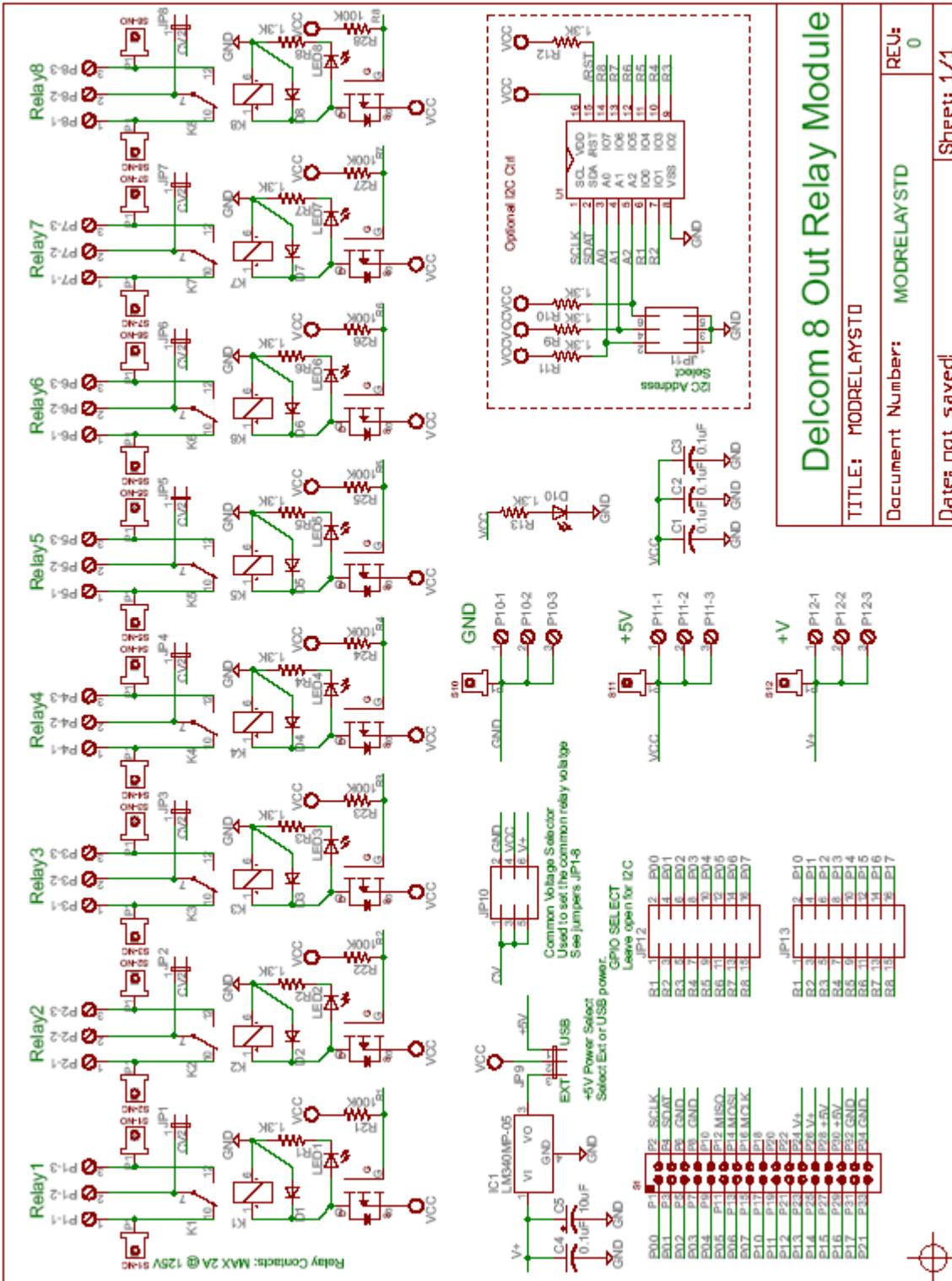
3　Layout

4   Connections

S1   Extension Connector
This connector proves all the power and data signals to be used by the connecting modules. Modules are added by stacking them on this connection.

P1-P8   Relay Outputs
This connector connects to the three output pins of the relay. The are Normally Open(NO), Normally Close (NC) and Common(C).

P10   Ground Output
This connector is connected to ground.

P11   +5 Volts Output
This connector is connected to +5Volts

P11   +V Volts Output
This connector is connected to +V. The +V rail is connected to the auxiliary power supply on the interface board. The +V is typically set to +12VDC.

5   Jumpers

JP1-8   Relay Common Enable
This jumper connects the common pin on the relays to the voltage selector jumper (JP10). Jumping this pin will connect the relay common pin to the common voltage rail.

JP9   5 Volt Power Selector Jumper
This jumper is used to select where the +5volts on the board will come from. Jumping pins 1 & 2 will select the USB host as the source. Jumping pins 2 & 3 will select the auxiliary power supply as the power source.

JP10   Common Voltage Selector Jumper
This jumper is used to select the common relay voltage (also see JP1-8). Jumping pins 1 & 6 will select ground as the common voltage. Jumping pins 2 & 5 will select VCC (+5Volts) as the common voltage. And jumping pins 3 & 4 will select V+ (+12VDC) as the common voltage.

JP11   I2C Address Jumper
This jumper is used to set the I2C address. This jumper is only used with the I2C option.

JP12   Relay Port0 Control Enable
This jumper is used to connect the relay to the Port0 processor bus. This jumper is only used in non-I2C version. Install appropriate jumper to connect relays 1-8 to port0 pins 1-8.

JP13   Relay Port1 Control Enable
This jumper is used to connect the relay to the Port1 processor bus. This jumper is only used in non-I2C version. Install appropriate jumper to connect relays 1-8 to port0 pins 1-8.

6   LEDs

There are 9 LEDs on the relay board. The red LED (D10) will light up when the +5volts is present. The yellow LEDs (D1-D8) will light up when the corresponding relay is actuated.

7   Software Control

The relay is controller from the one of the Delcom interface modules. See the interface module for more information on software control. Software commands can be sent via the OS API get and set functions or via the Delcom DLL. Examples below are abbreviated for simplicity.

Please see the USBHIDIO datasheet and the Delcom USB HID webpage for more details.
Datasheet   -> http://www.delcomproducts.com/downloads/USBIOHID.pdf
Examples   -> http://www.delcomproducts.com/productdetails.asp?PartNumber=900000
DelcomDLL -> http://www.delcomproducts.com/productdetails.asp?PartNumber=890510

7.1   Direct port pin control example

Example to sets port0 & port1 all high. All relays off.
```
// Delcom DLL Example
DelcomWritePorts(handle, 255, 255)

// API Example
MyPacket.Tx.MajorCmd = 101;
MyPacket.Tx.MinorCmd = 10;
MyPacket.Tx.DataLSB = 0xFF;
MyPacket.Tx.DataMSB = 0xFF;
HidD_SetFeature(handle, MyPacket, 8);
```

Example to set port0 pin1 low. Relay 1 on.
```
// Delcom DLL Example
DelcomWritePin(handle, 0, 1, 0)

// API Example
MyPacket.Tx.MajorCmd = 101;
MyPacket.Tx.MinorCmd = 11;
MyPacket.Tx.DataLSB = 0x01;
MyPacket.Tx.DataMSB = 0x00;
HidD_SetFeature(handle, MyPacket, 8);
```

Examples to set port0 pin1 high. Relay 1 off.
```
// Delcom DLL Example
DelcomWritePin(handle, 0, 1, 1)

// API Example
MyPacket.Tx.MajorCmd = 101;
MyPacket.Tx.MinorCmd = 11;
MyPacket.Tx.DataLSB = 0x00;
MyPacket.Tx.DataMSB = 0x01;
HidD_SetFeature(handle, MyPacket, 8);
```

7.2 I2C control example

The following examples show how to control the relays via the I2C commands. The I2C requires an initialize routine on power up. The I2C I/O pins boot up in a high impedance mode. User must first set the pins all high (all relays off) and then configure the I/O pins go in to output mode. Also see the I2C I/O chip data sheet, link below.
http://www.delcomproducts.com/downloads/PCA9557.pdf

I2C initialization routine.

Preset all I/O pins to high (all relays off).
```
DataExt[0] = 0x01;      // Select output register
DataExt[1] = 0xFF;      // Set all I/O high
DelcomWriteI2C(handle, 0x20, 2, &DataExt);      // Send Command
```

Configure I/O pins to all be outputs.
```
DataExt[0] = 0x03;      // Select configuration register
DataExt[1] = 0x00;      // All output mode
DelcomWriteI2C(handle, 0x20, 2, &DataExt);      // Send Command
```

Example to set port0 pin1 low. Relay 1 on.
```
DataExt[0] = 0x01;      // Select output register
DataExt[1] = 0xFE;      // Set all I/O high, except relay 1
DelcomWriteI2C(handle, 0x20, 2, &DataExt);      // Send Command
```

Examples to set port0 pin1 high. Relay 1 off and Relay 2 on.
```
DataExt[0] = 0x01;      // Select output register
DataExt[1] = 0xFD;      // Set all I/O high, except relay 2
DelcomWriteI2C(handle, 0x20, 2, &DataExt);      // Send Command
```

The examples above use the DelcomDLL. You can also use the API method as well.

8 Specifications

Description	Values
Board Size	4" x 2.75" (101.6mm x 69.85mm)
Vertical Spacing	0.78125" (19.84mm) Using 0.750" Stand Offs
Relay Current	2A @ 30VDC, 0.6A @ 125VAC, 0.6 @ 110VDC

9 Ordering Information

Part Number	Description
902140	Relay Out 8 Module
902140-R	Relay Out 8 Module w/Rt Spade
902140-S	Relay Out 8 Module w/Spade
902140-T	Relay Out 8 Module w/Terminal
902142	I2C Relay Out 8 Module
902142-R	I2C Relay Out 8 Module w/Rt Spade
902142-S	I2C Relay Out 8 Module w/Spade
902142-T	I2C Relay Out 8 Module w/Terminal

10 Accessories

Part Number	Package Type
902190	Power Transformer 12VDC 500ma (Wall Mount)
803514	USB 2.0 A-B Cable 2M

11 References

Delcom Website
http://www.delcomproducts.com

MODLSINT Schematic & PCB Drawings
http://www.delcomproducts.com/downloads/MODRELAYSTD_SCH.pdf
http://www.delcomproducts.com/downloads/MODRELAYSTD_PCB.pdf

Delcom Modules
http://www.delcomproducts.com/productdetails.asp?productnum=902100

Data Sheet
USB Data Sheet http://www.delcomproducts.com/downloads/USBIOHID.pdf
I2C Data Sheet http://www.delcomproducts.com/downloads/PCA9557.pdf

USBHIDIO Examples
http://www.delcomproducts.com/productdetails.asp?productnum=900000

Technical Support
techsupport@delcomproducts.com

Revision History

Rev	Date	Author	Description
0	09/28/2009	DL	Initial Release

Appendix A. Notices

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