

# **Model HM-610 UTILITY INPUT PANEL**

## **INSTALLATION & SERVICE MANUAL**



## 1.0 INTRODUCTION

The Sentry Model HM-610 is a special purpose panel for monitoring 12 contact closures from external equipment or switches. Inputs can be selected to monitor Normally Open (N.O.) or Normally Closed (N.C.) contacts. Each input is equipped with two LED indicators: Yellow to show On/Off status, and red to indicate trouble when the E.O.L is disconnected from a N.O. switch contact.

Normally Open contacts are supervised with an End-Of-Line resistor, (Sentry model HM-585). A trouble signal will be sent to the console if the EOL is not sensed at any N.O. input and a red LED will light at the open input. Normally-Closed inputs supervise themselves, open circuits send an alarm. Orange LED's indicate the On/Off status of the individual inputs.

Four outputs are provided to control external, low voltage DC indicators.

## 2.0 INSTALLATION

*Refer to dimensions and mounting hole locations on page 7.*

- a. Remove the PC board from the enclosure by removing four screws.
- b. Position enclosure in desired location.
- c. Mark the four mounting hole locations.
- d. Attach enclosure to wall with suitable hardware.
- e. Install PC board assembly.
- f. Complete wiring. Note that all terminal strips are removable to aid in easy wiring.

## 3.0 CONNECTIONS

### • DATA & POWER

The lower terminal block includes the terminals for DC power and data. Connect power, 12 V DC: Positive to terminal #1, negative or Common to #2.

Connect the data line to terminals #3 and #4, marked d- & d+.

### • INPUTS

Connect the contact to be monitored to any pair of terminals on a input terminal strip.

*Note: all inputs have two terminals, a signal input and common. The lower terminal of the input pair is connected to common.*

The board must be set for normally-open (N.O.) or normally-closed (N.C.) operation, *see section 6.0 "Input Configuration" for additional information.* Section 9.0 "Remote Call Switches" details the hookup to remote latching call switches.

### • OUTPUTS

Outputs 1 - 4 are controlled by the console. They provide 12 Volts to power low current indicators. Each output consists of a pair of terminals on the lower block; one terminal is the switched positive (left), and the other connects to DC common, (right).

*Refer to the Panel Layout drawing on page 3.*



- **OUTPUT CONTROL**

Standard Sentry system operation will: turn on output 1 when an input is active at inputs 1,2, or 3; turn on output 2 when 4,5, or 6 is active, etc. The outputs will turn off when the input signal turns Off, or if the serial data is lost for 20 seconds or more.

| <u>OUTPUT</u> | <u>INPUTS</u> |
|---------------|---------------|
| 1             | 1, 2, 3       |
| 2             | 4, 5, 6       |
| 3             | 7, 8, 9       |
| 4             | 10, 11, 12    |

Output groups can be connected with diodes to activate a single common device, such as an audio alarm. A wiring diagram for a typical hook-up is shown in drawing number 431-610-01.

- **COMMON CONNECTIONS**

Note that all 12 input connector pairs and the 4 outputs include a common terminal connected to DC common of the DC power supply terminals.

- **OPEN COLLECTOR DEVICES**

If the Utility Input Panel is wired to monitor a device with open-collector outputs, the collector connection must be connected to the input's signal terminal, the device's common to the input's common terminal. Also note: the right terminal of each output pair is connected to common.

#### **4.0 TROUBLE SHOOTING**

The Sentry console will provide a message "Utility Comm Trouble" with the data line number and the address of the panel if the panel loses data communication with the console. This is caused by poor wiring connections, loss of DC power, improper address settings, or panel failure.

The left most red LED (DS25) indicates DC voltage is applied and the on-board fuse is good. The green LED flashes to show data communication response. A green flash means the panel is communicating with the console properly.

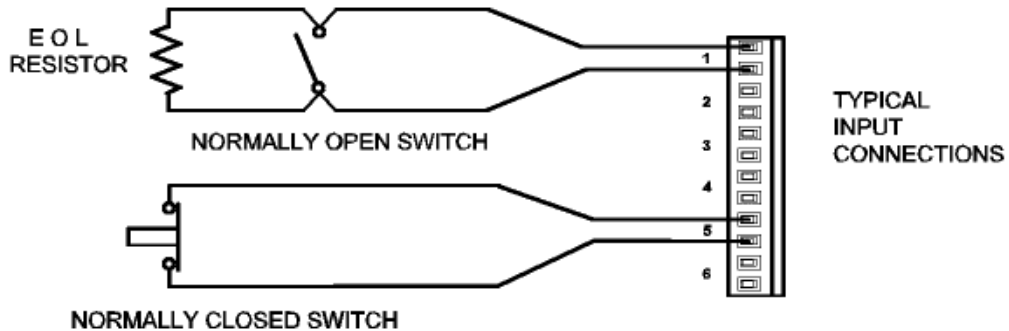
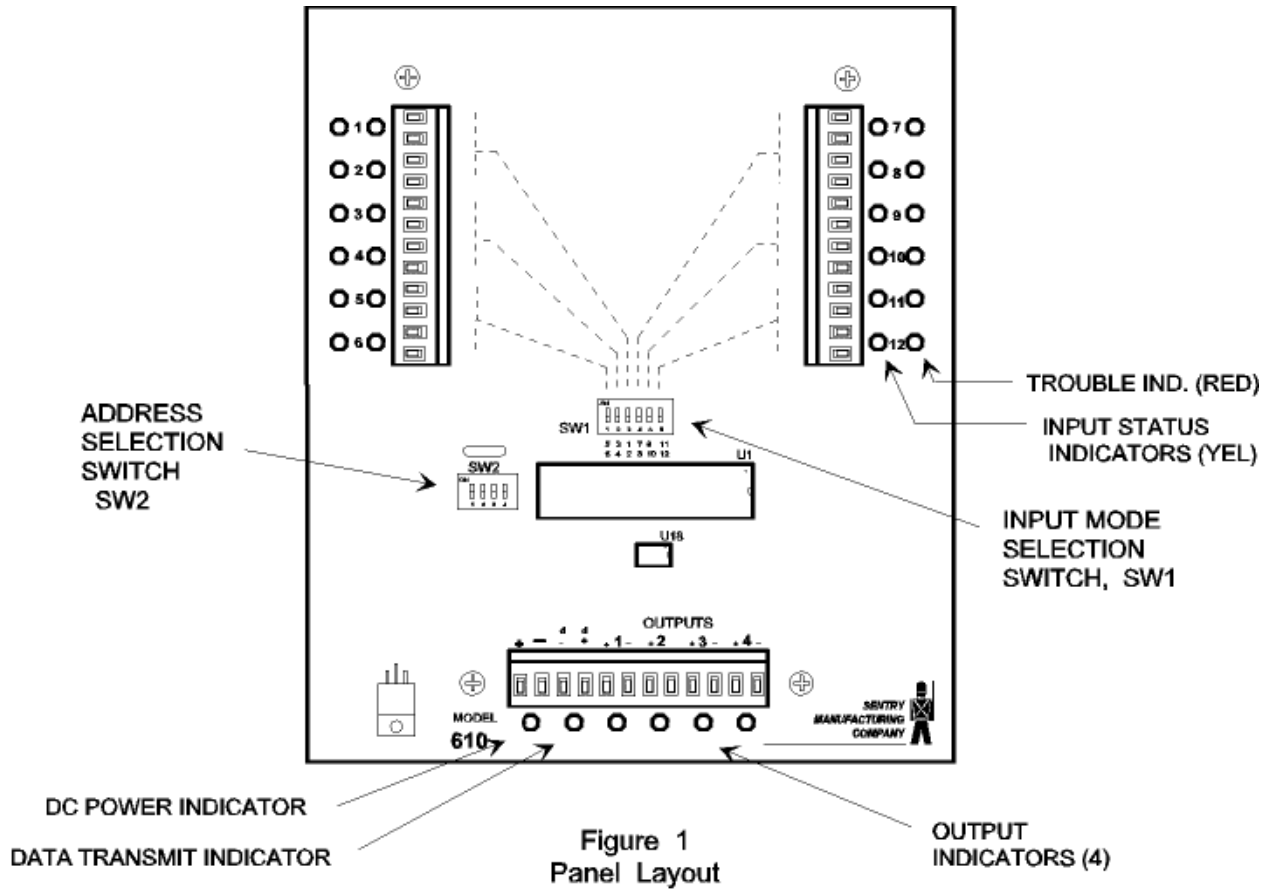
If the green LED fails to flash, or is On steady and the data line is otherwise indicating proper communication, electronic components designated U1 and U18 on the P.C. board may have been damaged. These parts are installed in sockets for easy replacement. See Figure 1 for location.

The Sentry Console will provide the message "Utility Panel Trouble" with the panel address if supervision is lost to any N.O. input. A red LED will light at the specific input when the circuit to the switch becomes open or the End-Of-Line device is disconnected.

Note: Normally-Closed inputs send an alarm when their contacts open. Any open in the wiring to the contacts will appear as an alarm condition, therefore the wiring is supervised. Open wiring can be easily checked by placing a temporary jumper across the input terminals under question.

#### **5.0 BOARD DESCRIPTION**

A diagram of the HM-610 showing the locations of the terminal block connections, dipswitches, and indicators is shown in *Figure 1*. The six position dipswitch SW1 controls the N.O./N.C. input mode in 6 groups of 2 inputs each. The four position dipswitch, SW2 selects the serial address of the panel.



**Figure 2  
Input Wiring**



## 6.0 INPUT CONFIGURATION

The 12 separate inputs are organized as 6 groups of 2 inputs. Each group is selected by a dipswitch to monitor normally closed (**N.C.**) or normally open (**N.O.**) contacts. The six position dipswitch allows independent control for each of the six groups.

The six switches of SW1 control the input mode for the six input groups as listed below:

|          |                |
|----------|----------------|
| Switch 1 | Inputs 5 & 6   |
| Switch 2 | Inputs 3 & 4   |
| Switch 3 | Inputs 1 & 2   |
| Switch 4 | Inputs 7 & 8   |
| Switch 5 | Inputs 9 & 10  |
| Switch 6 | Inputs 11 & 12 |

- Table 1 -  
Input Mode

For Normally Open (**N.O.**) inputs, set the switch to OFF.  
For Normally Closed (**N.C.**) inputs, set the switch to ON.

### Definitions:

**N.O.** In the N.O. mode, the orange indicator lights when the input contacts are closed. When the indicator is On, a signal is sent to the console. The N.O. contacts must be supervised with an End-Of-Line (EOL) resistor. If the EOL is disconnected or the wiring opens, the red LED will light to indicate trouble, and a separate trouble signal will be sent to the console.

**N.C.** In the N.C. mode, the orange indicator lights to show when the input contacts open. A signal is then sent to the console for that input. N.C. contacts are self supervising. An alarm signal will be sent if wiring to the switch is disconnected. Note the red trouble LED does not function in the N.C. mode.

**- A Normally-Open input is an event that will alarm at the console when the contact is closed.**

**- A Normally-Closed input is an event that alarms at the console when the contacts are opened.**

Latching Call Stations (model HM-545), close when the cord is pulled. These are Normally-Open switch types.

Door alarm contacts are usually Normally-Closed, meaning that when the door is closed, the contacts are closed. When the door opens, the contacts open.

## 7.0 UNUSED INPUTS

Inputs that are not used must be configured so that lack of an input is not interpreted as a trouble signal.

When both inputs of an input group are not used, simply switch the group to the N.C. mode by moving the associated Mode Select Switch to ON. See Table 1 for switch assignments. The orange LED's will indicate an active input but the console's program will not recognize unused inputs. If the orange indicators constantly lit on unused inputs will cause confusion, place a wire jumper between the terminals of the input and the indicator will go out.

If only one of the two inputs in a group are used and the used input is N.O., an EOL resistor is required on the unused input. This EOL keeps the unused input from sending a trouble signal.



**8.0 ADDRESSING**

The four position dipswitch, SW2 selects the desired address between decimal code 56 and 63.  
*Note: Addresses 0 and 63 are always reserved for other Sentry functions, do not use these addresses.*

Four switch positions select the panel's address. The table below shows the selections:

| 1   | 2   | 3   | 4   | Address |
|-----|-----|-----|-----|---------|
| Off | Off | Off | Off | 0       |
| On  | Off | Off | Off | 45      |
| Off | On  | Off | Off | 46      |
| On  | On  | Off | Off | 47      |
| Off | Off | On  | Off | 48      |
| On  | Off | On  | Off | 49      |
| Off | On  | On  | Off | 50      |
| On  | On  | On  | Off | 51      |
| Off | Off | Off | On  | 56      |
| On  | Off | Off | On  | 57      |
| Off | On  | Off | On  | 58      |
| On  | On  | Off | On  | 59      |
| Off | Off | On  | On  | 60      |
| On  | Off | On  | On  | 61      |
| Off | On  | On  | On  | 62      |
| On  | On  | On  | On  | 63      |

- Table 2 -  
Address Select

**9.0 REMOTE CALL SWITCHES**

The Model HM-610 Utility Input Panel is frequently used to monitor call switches in public building areas. The panel can work with any latching switch. The HM-610 is designed to use the Sentry, Model HM-545, Latching Call Station. This hookup requires that the call station's common (yellow) is connected to the input common, the switch lead (orange) gets connected to the input's signal terminal, and the indicator lead (white) is connected to the selected output signal terminal. Note the output common terminals are not used. Refer to drawing #431-610-02 "Functional Description, 545" and drawing #431-610-03, "Latching Station Wiring".

Since the Utility Panel has 12 inputs and 4 outputs, the typical call station hook-up involves wiring the indicators of 3 stations to 1 output. This scheme will provide an acknowledge indication to three stations when any one is pulled. The acknowledge indication is to notify the person pulling the switch that their call has been received at the console.

The console program is set to control output 1 for inputs 1,2,3; output 2 for 4,5,6; output 3 for 7,8,9; and output 4 for 10,11,12.

**9.1 SMOKE DETECTORS**

The HM-610 panel can monitor and supervise smoke detectors. See drawing #431-610-05, "Smoke Detector Wiring".



## **9.2 DOME LIGHTS**

When using dome lights with the HM-610 and HM-545 call station, the panel can only handle 4 bathrooms because of the limited 4 outputs. An alternate method is described in Drawing #431-610-04, Dome Light Wiring. This diagram shows a hook-up that allows 12 individual bathrooms, each with an individual dome light. This installation requires double-pole call switches by another manufacturer. One pole of the call switch places the call to the HM-610 panel and the other simply activates the dome light. If 12V dome lamps are used, the low voltage can come from the Sentry System. An End-Of-Line resistor is required to supervise the switch contacts.

## **10.0 OPERATION**

The left most red LED (DS25) indicates DC voltage is applied and the on-board fuse is good. The green LED flashes to show the panel is operating properly.

The other four red LEDs at the bottom indicate when an output is turned ON.

Inputs are selected to monitor either normally-open (N.O.) or normally-closed (N.C.) contacts. When N.O. contacts are used, an end-of-line device is required, (Sentry model HM-585). In this N.O. configuration, a trouble signal will be sent to the console if the EOL is not sensed at all N.O. inputs. A red LED will light at an input to indicate an open line when selected for N.O. An orange LED will light to indicate the ON, (active) condition of the individual input.

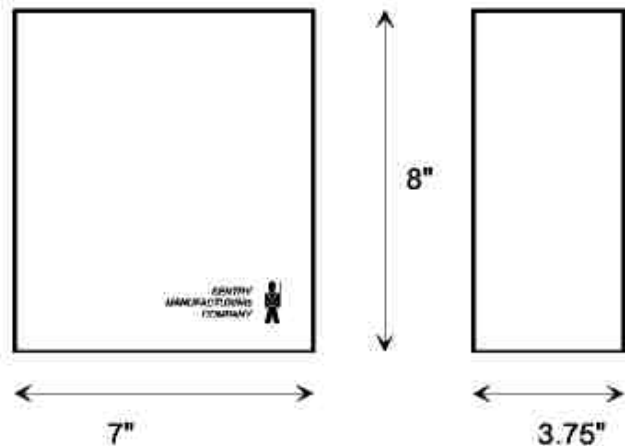
The HM-610 panel will send one trouble signal to the console if any one of the 12 inputs lose supervision. The red indicators will show which input has trouble.

The green LED flashes to indicate data communication. If data communication is lost, the panel's output will turn off within one minute.

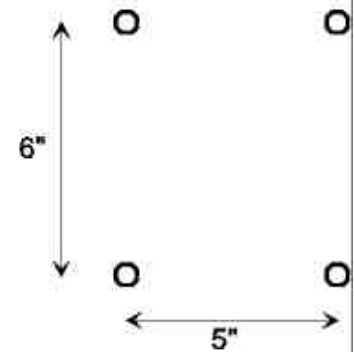


**11.0 SPECIFICATIONS**

|                       |  |
|-----------------------|--|
| Supply Voltage        | 10 to 16 Volts, DC   |
| Inputs                | 12 Individual Inputs,<br>for Isolated, dry contacts.         |
| Outputs               | 4 Individual, sourced.<br>Controlled by console.             |
| Output Voltage        | DC supply voltage minus 1.5 Volts                            |
| Output Current        | 120mA maximum per output                                     |
| Data Communication    | Standard Sentry protocol,<br>1200 baud, RS485                |
| Operating Temperature | 50 °C (122 °F) max.  |
| Wiring Size           | 16AWG through 22AWG  |
| Terminal Blocks       | 12 terminal, captive type,<br>un-pluggable                   |
| Indicators            | 30 long life LED's   |
| Dimensions            | 7"W x 8"H x 3.75"D   |
| Wiring Access         | Four 7/8" dia. knockouts<br>(for 1/2" EMT or equivalent).    |
| Mounting              | Wall mount, 4 holes provide on<br>back surface for hardware. |

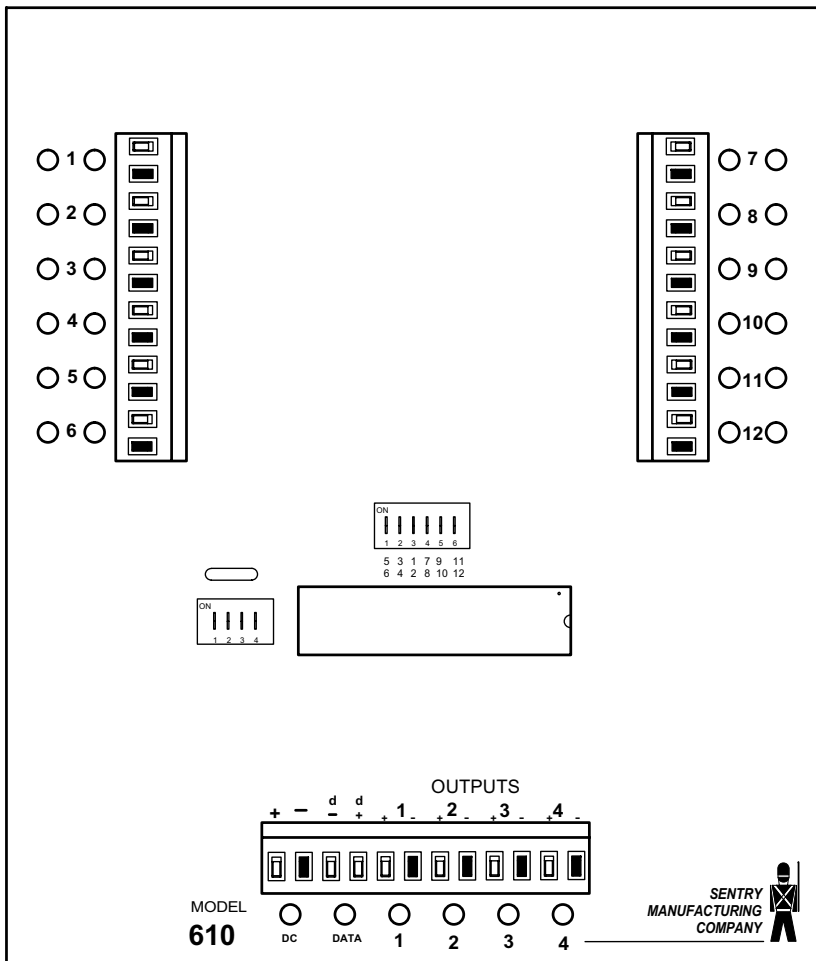


**Figure 3  
Enclosure Dimensions**



**Figure 4  
Mounting Holes**

110-3




TERMINALS DENOTED WITH SOLID MARKING ARE INTERNALLY CONNECTED TO D.C.COMMON, (- OF THE POWER SUPPLY PAIR). ALL INPUTS AND OUTPUTS INCLUDE A TERMINAL CONNECTED TO D.C. COMMON TO SIMPLIFY FIELD WIRING.

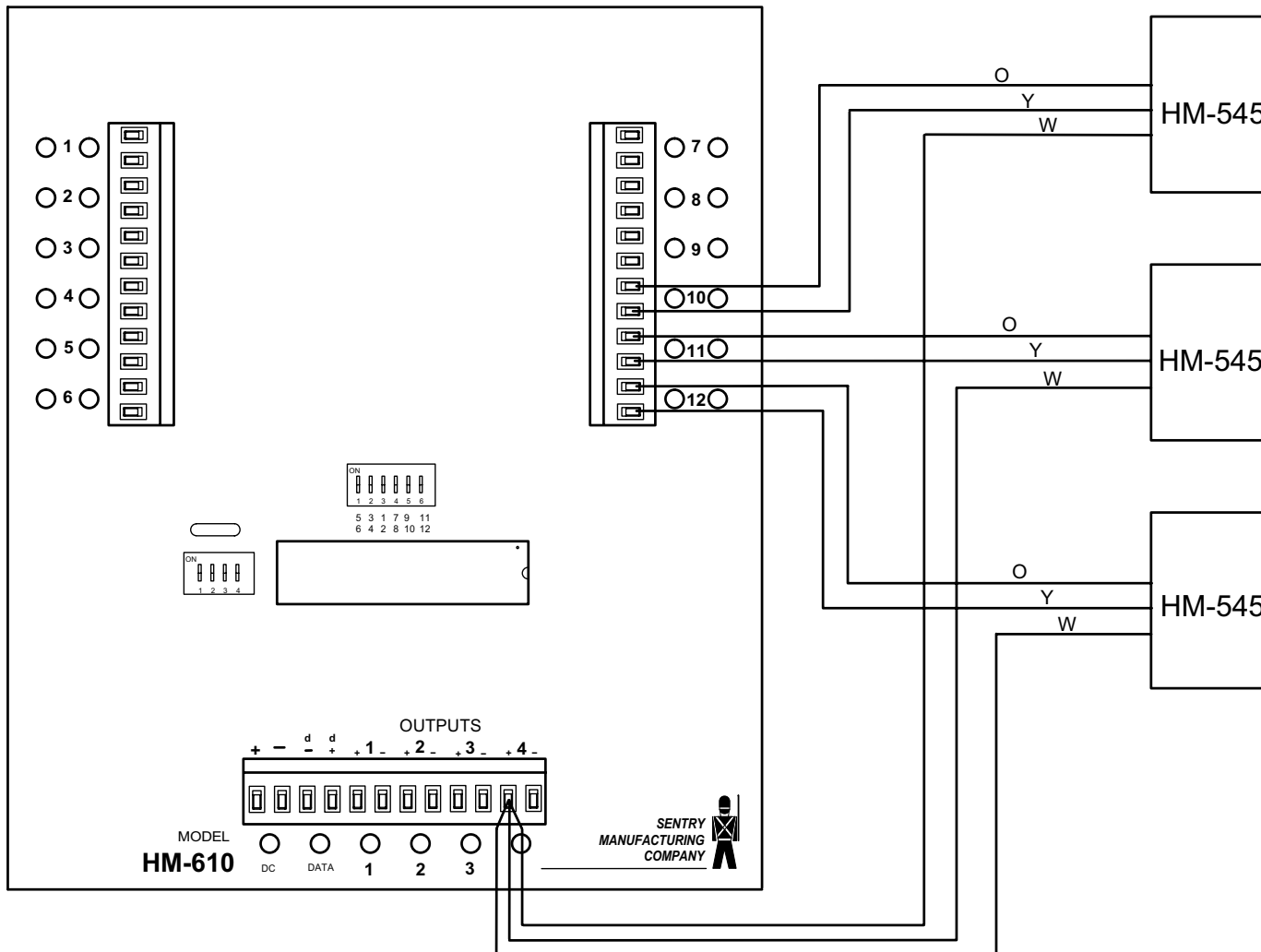
INPUTS ARE SELF POWERED AND CAN ONLY BE SWITCHED TO COMMON. MAXIMUM D.C. VOLTAGE OF THE INPUT WIRING TO A SWITCH IS 16 VOLTS, D.C.

OUTPUTS ARE SOURCED. THEY ARE TRANSISTOR SWITCHED TO THE + DC SUPPLY (+12 VOLTS) WHEN ACTIVE.

OUTPUT 1 FOLLOWS INPUTS 1,2 & 3.  
 OUTPUT 2 FOLLOWS INPUTS 4,5 & 6.  
 OUTPUT 3 FOLLOWS INPUTS 7, 8 & 9.  
 OUTPUT 4 FOLLOWS INPUTS 10, 11, & 12.

*THE OUTPUTS ARE CONTROLLED BY THE MAIN CONTROLLER. SOME INSTALLATIONS USE THE OUTPUTS FOR SPECIAL CONTROL FUNCTIONS AND WILL NOT FOLLOW THE TABLE SHOWN ABOVE.*

|   |       |     |  |                      |  |
|---|-------|-----|--|----------------------|--|
|  <b>SENTRY EMERGENCY CALL SYSTEM</b> |       |     | <b>HERITAGE MEDCALL TAMPA, FLORIDA</b> |                      |  |
| DATE  | SCALE | REV | CHECKED                                | DRAWN BY             |  |
| 12-3-94   | N/A   | A   |  | KJL                  |  |
| TITLE   |       |     |  |                      |  |
| DC COMMON TERMINAL CONNECTIONS  |       |     |  |                      |  |
| 610 UTILITY INPUT PANEL   |       |     |  | DWG NO<br>431-610-06 |  |




NOTE: MODEL HM-545 LATCHING CALL STATIONS HAVE A BUILT-IN E.O.L. RESISTOR

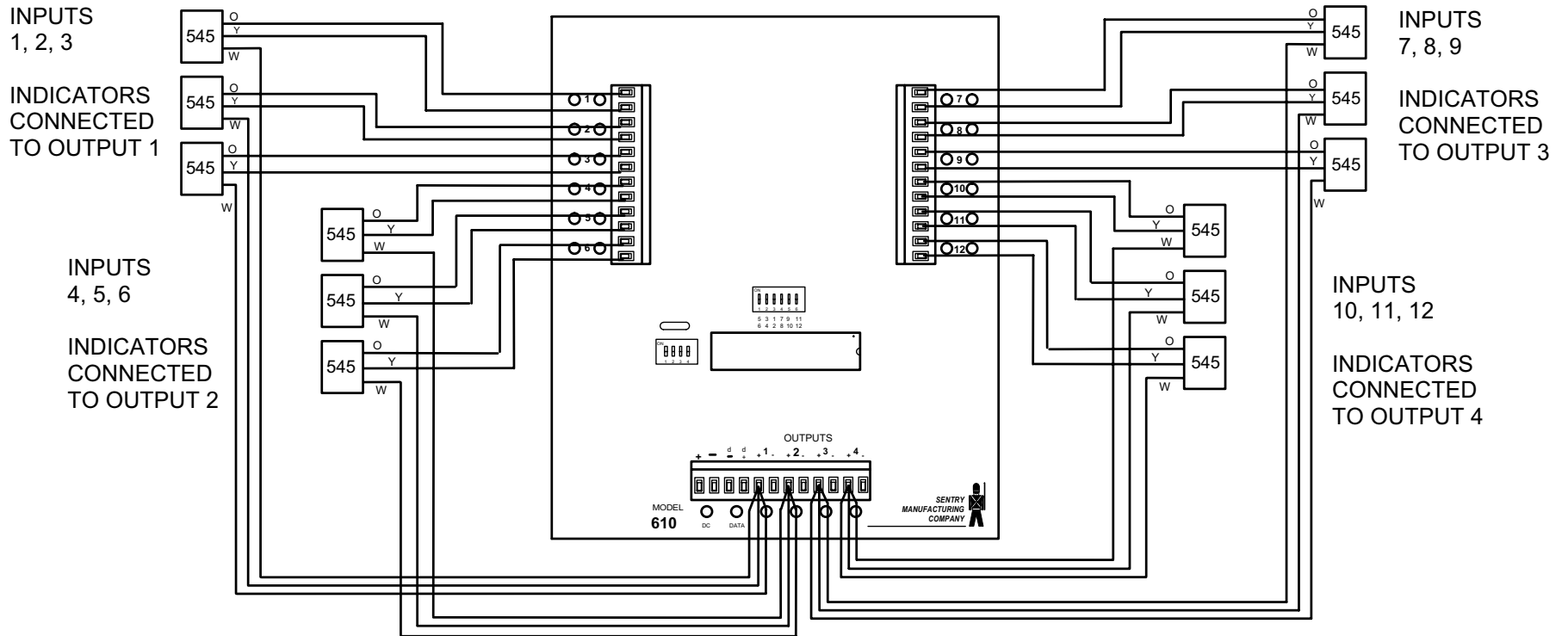
TYPICAL HOOK-UP WITH THREE INPUTS SHARE ONE OUTPUT FOR THE ACKNOWLEDGE INDICATOR.

HM-610 UTILITY PANEL OUTPUTS FOLLOW INPUTS BY GROUP. OUTPUTS ARE NORMALLY USED TO POWER THE ACKNOWLEDGE INDICATORS ON THE CALL PANELS.

- OUTPUT 1 ACKNOWLEDGES INPUTS 1, 2, & 3
- OUTPUT 2 ACKNOWLEDGES INPUTS 4, 5, & 6
- OUTPUT 3 ACKNOWLEDGES INPUTS 7, 8, & 9
- OUTPUT 4 ACKNOWLEDGES INPUTS 10, 11, & 12

|   |       |     |  |                             |  |
|---|-------|-----|--|-----------------------------|--|
|  <b>SENTRY EMERGENCY CALL SYSTEM</b> |       |     | <b>HERITAGE MEDCALL TAMPA, FLORIDA</b> |                             |  |
| DATE  | SCALE | REV | CHECKED                                | DRAWN BY                    |  |
| 9-16-94   | N/A   | A   |  | KJL                         |  |
| TITLE   |       |     |  |                             |  |
| <b>LATCHING STATION WIRING</b>  |       |     |  |                             |  |
| HM-610 UTILITY INPUT PANEL  |       |     |  | DWG NO<br><b>431-610-03</b> |  |


HM-610 UTILITY PANEL



THE + TERMINAL OF THE OUTPUT PAIR SWITCHES TO +12V WHEN THE OUTPUT GOES ACTIVE.

THE - TERMINAL IS COMMON TO SYSTEM COMMON (GND), AND IS NOT USED WITH MODEL HM-545 CALL STATIONS.

- OUTPUT 1 ACKNOWLEDGES INPUTS 1, 2, & 3
- OUTPUT 2 ACKNOWLEDGES INPUTS 4, 5, & 6
- OUTPUT 3 ACKNOWLEDGES INPUTS 7, 8, & 9
- OUTPUT 4 ACKNOWLEDGES INPUTS 10, 11, & 12

|   |       |  |         |                             |  |
|---|-------|--|---------|-----------------------------|--|
|  <b>SENTRY EMERGENCY CALL SYSTEM</b> |       | <b>HERITAGE MEDCALL TAMPA, FLORIDA</b> |         |                             |  |
| DATE  | SCALE | REV                                    | CHECKED | DRAWN BY                    |  |
| 12-16-94  | N/A   | A                                      |         | KJL                         |  |
| TITLE   |       |  |         |                             |  |
| HM-610 UTILITY INPUT PANEL  |       |  |         | DWG NO<br><b>431-610-07</b> |  |