

HSY-1616
MASTER CONTROL PANEL



SIGMA ELECTRONICS, INC.
P.O. BOX 448
1027 COMMERCIAL AVENUE
EAST PETERSBURG PA 17520
(717) 569-2681

HSY-1616

INTRODUCTION

The HSY-1616 is a system control panel capable of controlling all inputs and outputs in a Sigma Electronics 16x16 or smaller matrix. The panel is capable of operating in several modes. It can operate in a FOLLOW mode, meaning that the same input for all levels will change when a switch is made. It can also operate in a BREAKAWAY mode, where only the selected input levels will change, or a SPLIT mode where the level(s) can be individually set. Additionally, any input level can be LOCKED, preventing it from switching in any mode.

Each remote panel is controlled by the SCI-2144 interface card located in an HPX or 2100 series frame. Control panel connection is made to the BNC labeled "COMM". Additional panels can be added by using BNC "T" connectors to tap off another line to the next panel. ". The total coaxial cable can be up to 1000' in length. The system is capable of handling a total of 16 panels. Panels can be either full X-Y system or single bus panels. Each panel in a system must have a unique address, and this is accomplished by a dip switch located through the rear panel. If the panel cannot establish initial communications with the SCI controller via the COMM line, 00 will be displayed in the level windows and the keyboard will not function.

Green numeric LEDs display the current input levels. If any level is in a preset condition, the respective display window will flash. The current output is indicated by the red numeric LEDs display located on the right side of the panel. The status of any OUTPUT in the system can be displayed by selecting the STATUS button and entering a two digit output number whenever no preset condition exists.

PANEL CONTROL

The HSY-1616 front panel is divided into 6 sections: LEVEL, STATUS, KEYPAD, CLEAR, DESTINATION, and TAKE.

LEVEL: On the left side of the panel are four LEVEL switches. This allows selection of any one of the four levels. When no LEVEL button has been selected, the panel is operating in the FOLLOW mode. Initiating a follow is done by first selecting a two digit input on the keypad. When the first digit is entered, all unlocked level windows will clear and display (flashing) the current entry in the 10's digit. A flashing display always indicates a preset condition. If after the second digit is entered and the destination window displays the desired channel, press the TAKE switch. If not, the next press of a number button will cause the destination display to clear and display this entry in the 10's digit. Now enter the second digit of the new destination address, and press the TAKE key. If any entry is 00 or greater than 16, the panel clears this number and reverts to its previous status.

Activation of a LEVEL requires a single momentary press of the appropriate LEVEL button at which time the respective display will go blank. An input can now be selected, and if so, will be displayed (flashing) in the active LEVEL window. One or more LEVEL windows can be active at the same time and each can be set for a different input. If a LEVEL is activated and an input is selected, another LEVEL can be activated, and for it, a different input selected. A second press of any active LEVEL will clear the preset mode. Once the input levels are preset, the selection of the destination and activation of the TAKE are the same as the follow mode above.

Another feature of the LEVEL switch is to individually LOCK the levels from being changed. To LOCK a LEVEL, press and hold the respective LEVEL button for 2 seconds from any non active level (no preset condition). The display will initially blank until the 2 seconds have elapsed, then the display will return on and the LED incorporated into the LEVEL switch will be illuminated. This level is now LOCKED. It can not be selected or changed from this panel without canceling the LOCK mode. To cancel the LOCK mode, press and hold the respective LEVEL button for 2 seconds. When unlocked, the LED will go off. One or more LEVELS can be LOCKED at the operators discretion.

STATUS: To select the status of any destination, first press the STATUS key. All displays will change to show only decimal points. This indicates the status request. Now enter a two digit number corresponding to the desired destination (output). For numbers less than 10, enter a leading zero. As the numbers are entered they will appear in the destination window, beginning with the 10's digit first, then the 1's. As soon as the 1's digit is selected, the panel evaluates the entry. If the entry is 00 or greater than 16, the panel clears this number and reverts to its previous status. The CLEAR key can be used to exit the status mode. If the destination entry is acceptable, the level displays will update to the current destination status.

KEYPAD: The keypad provides numeric input to select the input and destination channels. All entries are a two step process. First the 10's digit is entered (0 used for numbers less than 10), then the 1's digit.

CLEAR: The CLEAR key generally clears the last key entered. However, when both the input and destination are in a preset condition, the first press will only reset the destination window. At this point the TAKE key can be pressed or a new destination can be entered. A second press will clear the panel to its previous status. The CLEAR key will also cancel the STATUS mode.

DESTINATION: Displays the current destination or output. The status information displayed pertains to this destination.

TAKE: The red switch on the right side of the panel is the TAKE. When pressed, it sends to the SCI a request to change the current DESTINATION to the preset condition. The status of the switch request will be transmitted back to the panel by the SCI. When the panel receives the updated status, the display will stop flashing and reflect the current status of that destination. It should be noted that although the display does not always stop flashing upon the TAKE, the actual switch is made immediately by the SCI; only the panel update is slightly delayed. If the displays remain flashing after a TAKE is activated, there is possibly a problem with the SCI or the COMM line.

The panel is also capable of switching without the use of the TAKE switch. This is accomplished by setting a switch through the rear panel. When the panel is in the AUTOTAKE mode, the switch is made the instant the preset condition is setup. Always reset power to the control panel when changing switch configurations.

HSY-1616 PANEL ADDRESS

Whenever there are multiple control panels in a system, such as additional HSY-1616 or HSB-16 control panels, the LOGICAL ADDRESS for each panel must be different. There are 16 possible addresses that the COMM port can access, and these addresses are set using S1,1-4 which is accessed through the rear panel. If the address for each panel is not unique, than more that one panel may try to communicate with the SCI at the same time, and the result will be panels which do not function properly. It is essential for proper system operation that each panel have its own unique address. The COMM panel address table is as follows.

ADDRESS	S1,1	S1,2	S1,3	S1,4
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON
16	OFF	OFF	OFF	OFF

AUTOTAKE ENABLE

When the AUTOTAKE function is enabled, the take will automatically be generated whenever a valid input is selected.

AUTOTAKE	S1,5
DISABLED	OFF
ENABLED	ON

HSY-1616 THEORY OF OPERATION

1. POWER SUPPLY

Power to the remote panel is supplied by a 9-12 VDC wall pack power supply through J1. Polyswitch RT1 provides fault current protection to the wall pack supply and the remote panel. Diode D2 (in combination with RT1) also provides reverse voltage protection should a wrong polarity power supply accidentally be connected to the remote panel. The 9-12 VDC input is regulated to 5 VDC by U4.

2. MICROPROCESSOR, RESET, I/O and DISPLAY

All functions of the remote panel are controlled by U1, an 8051 type microprocessor. The microprocessor is complete with a serial port, ram, counters, i/o lines and program storage EEPROM. Y1, C6 and C7 make up the 7.3728 MHz oscillator clock for u1.

Port 0 (lines 0-3 through U5)) and Port 1 control the LED display drivers through buffer transistors Q1-Q16. Port 0 also performs the front panel keyboard scan with any active key returned to the microprocessor via Port 2, lines 3-6. Long term variable data is stored by U6. It is interfaced to the microprocessor via Port 0,4-6.

Switch S1's status is input into the microprocessor by Port 2, lines 0-4. P2,6 and 7 control the level lock and output LEDs buffer transistors, Q17 and Q18.

U3 combines the individual microprocessor TXD and RXD lines into a single COMM line. It also provides the necessary drive and level conversion between the microprocessor serial i/o lines and the COMM line interface. Resistors R2 and R3 provide a bias for the COMM input signal comparator. The direction of the COMM line is controlled by P0.7, and is normally in the receive mode except when a panel transaction is made.

U2 provides the reset function to the microprocessor upon three different conditions. The first is a power on reset. The second is at any time the 5 VDC power supply goes below ~4.5 VDC (a brown-out condition). Third is when the microprocessor fails to toggle P3.7 in a timely fashion (watchdog). Under normal operation the microprocessor should toggle P3.7 many times per second.