RC1640

REMOTE CONTROL PANEL

OPERATORS MANUAL

INTRODUCTION

The RC-1640 is a system control panel capable of controlling 16 inputs and 4 outputs in an 16x4 switching 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.

Each remote panel is controlled by the SCI-2144 interface card located in the 2100 series frame. Connection is made to the BNC labeled "COMM". This coaxial cable can be up to 1000' in length. Additional panels can be added by using BNC "T" connectors to tap off another line to the next panel. The system is capable of handling up to 16 panels in total. These can be either 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, the input and output windows will continue to flash after a TAKE is generated.

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 illuminated led incorporated into the OUTPUT switch. The status of any OUTPUT in the system can be displayed by selecting the respective OUTPUT switch whenever no preset condition exists.

PANEL CONTROL

The RC-1640 front panel is divided into 4 sections: LEVEL, INPUTS, OUTPUTS, 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.

To activate a LEVEL requires a single momentary press 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. This flashing display indicates a preset condition. 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.

INPUTS: Any one of sixteen inputs can be selected. If no LEVEL is active then the selected input is preset into all levels, otherwise it is only preset into the last active LEVEL windows. If the wrong input was selected, just select the correct one before pressing the TAKE. Any preset condition can be canceled by pressing the same key twice.

OUTPUTS: This group of switches represent the 4 available outputs that the system can address. The incorporated LED shows which output status is displayed. If the current OUTPUT is not what is required for the next panel switch, it may be changed before or after the panel has any active preset conditions. The STATUS of any output is available by selecting the appropriate output any time there is no preset condition.

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 OUTPUT 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 output. 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 remains flashing after a TAKE is generated, there is possibly a problem with the SCI or the COMM line.

RC-1640 PANEL ADDRESS

Whenever there are multiple control panels in a system, such as additional RC-1640 or SYC-2188A 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 S26,1-4 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	S26,1	S26,2	S26,3	S26,4
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

RC-1640 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 D3 (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 AND I/O
   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, C8 and C9 make up the 7.3728 mhz oscillator clock for ul.

Port 0 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 4-7.

Switch S26's status is input into the microprocessor by Port 2, lines 0-4.

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 R22 and R23 provide a bias for the COMM input signal comparator. The direction of the COMM line is controlled by P3.6, 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.

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