

**DT-1640**  
**DESKTOP CONTROL PANEL**  
**OPERATOR'S MANUAL**



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## INTRODUCTION

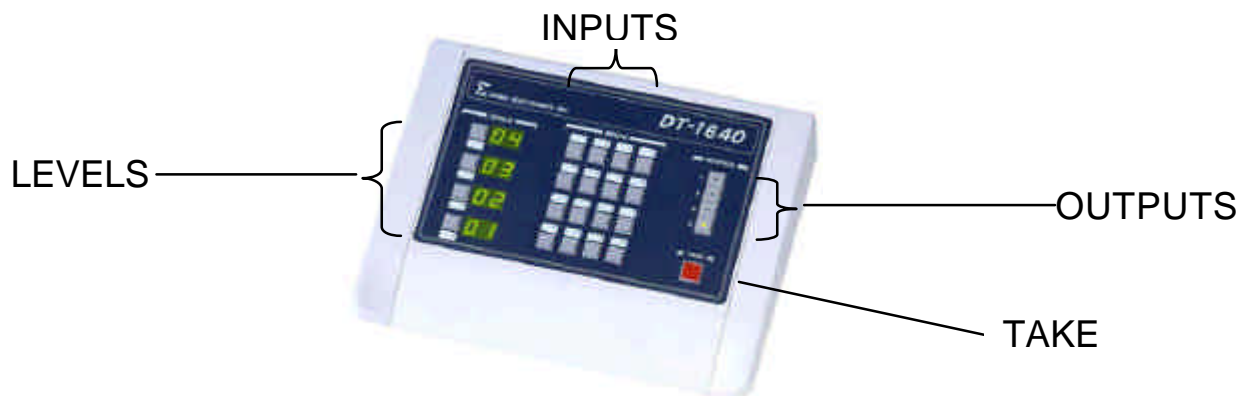
The DT-1640 is a system control panel capable of controlling 16 inputs and 4 outputs in a 16x4 switching matrix. The panel is capable of operating in several modes. It can operate in a FOLLOW mode, meaning that the input for all levels will change when a switch is made. It can also operate in a BREAKAWAY mode, where only the selected input levels will change, or a SPLIT mode where the level(s) can be individually set.

Each remote panel communicates with 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 the use of BNC "T" connectors. The system is capable of handling up to 16 panels in total. The panels can be either full X-Y system or single bus models. The DT-1640 panel's logical COMM address is fixed at 15. If the panel cannot establish communications with the SCI controller via the COMM line, the input and output windows will continue to flash after a TAKE is generated.

Numeric seven segment LEDs display the input status of the four control 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 each OUTPUT may be displayed by selection of the respective OUTPUT button. This status function must be done without a preset condition on the inputs to prevent an undesired switch from occurring.

## PANEL CONTROL

The DT-1640 front panel is divided into 4 sections: LEVELS, INPUTS, OUTPUTS, and TAKE.



**LEVEL:** Four LEVEL switches are on the left side of the control panel. 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, which switches all levels.

To activate a LEVEL, use a single momentary press of the desired 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. 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 the input is selected, another LEVEL can be activated, and for it, a different input selected. A second press of any active LEVEL button will clear the preset condition for that level.

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

**OUTPUTS:** This group of switches represents the four available outputs that the system can address. The incorporated status LED shows which output is currently active. If the current OUTPUT is not the desired output 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 are no preset conditions.

**TAKE:** The red button on the right side of the panel is the TAKE switch. When pressed, it completes the transaction request for the system SCI. The SCI polls each active panel for transaction requests. Upon execution, the new status of the router is sent to each control panel. When the panel receives the updated status, the display will stop flashing and reflect the current status of the selected output.

It should be noted that although the display does not immediately stop flashing upon the TAKE command, the actual switch is made immediately by the SCI. The panel update may be slightly delayed due to processing incoming transactions. All transactions held in the buffer will be executed before a status is transmitted. If the displays remain flashing for more than several seconds after a TAKE is generated, there may be a possible problem with the SCI or the COMM line coaxial cable.

## **DT-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 u1.

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.

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 brownout 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.