

SYX
ADX SERIES
SYSTEM CONTROL PANEL
OPERATOR'S MANUAL



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INTRODUCTION

The SYX is a system master control panel capable of controlling all inputs and outputs in a 128x128 switching matrix as well as programming and executing up to four SALVOS. 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 level 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-ADX interface card located in the master ADF-64 frame. Connection is made to one of the BNCs 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 64 panels in total. These can be either system or single bus panels. Each panel in a system must have a unique address which is set by a dip switch located through an opening on the rear of the control panel. If the control 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 input levels on the front of the control panel. If any level is in a preset condition, the respective display window will flash. The output is indicated by the red numeric LED 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 or three digit output number whenever no preset condition exists.

The SYX is an intelligent panel in that it will automatically configure itself to the size of the system that the SCI-ADX is configured. The size of the system can be displayed whenever the panel is in normal display mode by pressing the TAKE switch. The maximum input is displayed in the **LEVEL 2** window and the **OUTPUT** window will display the maximum output. The LEVEL 1, LEVEL 3 and LEVEL 4 windows will be blank. After two seconds the display will return to normal. Systems up to 96 inputs require two digits of input, whereas systems with greater than 100 inputs will require 3 digits. For example, in a two digit system a leading 0 is required for any input less than 10 (01 thru 09). Similarly, in a three digit system leading zeros would be used as follows: 007 for input seven, 074 for input seventy-four, etc.

PANEL CONTROL

The SYX front panel is divided into 7 sections: SOURCE, STATUS, KEYBOARD, CLEAR, OUTPUT, TAKE and SALVO.

SOURCE: On the left side of the panel are four LEVEL switches. This allows selection of any one of the four control levels. When no LEVEL button has been selected, the panel is operating in the FOLLOW mode. Initiating a follow mode switch is done by first selecting a two or three digit input. When the first digit is entered, all unlocked level windows will clear and display the current entry in the 1's digit (flashing). A flashing display always indicates a preset condition. If an input is entered which exceeds the maximum input, the preset condition will clear and the display will revert to its former display status. If, after the second digit is entered, the output window displays the desired channel, press the **TAKE** switch. If not, the next press of a number button will cause the output display to clear and display this entry in the 1's digit. Now enter the second digit of the new output address, and press the **TAKE** key. If any entry is 00 or greater than the maximum output, the panel clears this number and reverts to its previous output status but the preset condition is not cleared on the inputs. At this point the correct output can be reentered, or the switch made to the output displayed in the output window by pressing the **TAKE**.

To streamline the operation of the panel somewhat, when entering the output number (during a preset condition) it is not necessary to enter two digits for numbers less than 10. If output 5 is required, just enter a 5 and press the TAKE. This also applies to systems with outputs greater than 100. For example, if output 5 was required in a system with 128 outputs, 005, 05, or just 5 could be entered into the output window and the TAKE switched pressed.

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. One or more **LEVEL** windows can be active at the same time and each can be set for a different input. Once a **LEVEL** is activated and an input selected, another LEVEL can be activated and 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 output and generation 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. The **LOCK** feature only prevents an input from being switched from the panel that is locked. It does not effect another panel or serial control of the switcher. To **LOCK** a level, press and hold the desired **LEVEL** button for 2 seconds on any non active panel (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 cannot 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 operator's discretion.

STATUS: To select the status of any OUTPUT, first press the STATUS key. All INPUT displays will change to show only the bottom segment of the display. The OUTPUT display will show either two or three decimal points, indicating whether two or three digits are required for the OUTPUT status. For two decimal points displayed, enter a two digit number corresponding to the desired output up to 99. For numbers less than 10, enter a leading zero. As the numbers are entered they will appear in the OUTPUT 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 the maximum OUTPUT of the system, the panel clears this number and reverts to its previous status. The CLEAR key can be used to exit the status mode. If the output entry is acceptable, the LEVEL displays will update to the current output status.

KEYBOARD: The keyboard provides numeric input to select the input and output channels. All input entries are either a two or three step process. First the 10's digit is entered (0 used for numbers less than 10), then the 1's digit. For example, to select six for an input, enter 0, then 6.

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

OUTPUT: Displays the current output.

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

The TAKE button when pressed without any other active functions on the panel will cause the maximum number of inputs to be displayed in the LEVEL 2 display window and the maximum number of outputs displayed in the OUTPUT window. This displaying of the maximum inputs and outputs will last approximately 2 seconds, then the display will return to normal.

Autotake offers switching without the use of the TAKE switch. This is accomplished by setting S1,7 ON, through the rear panel. When the panel is in the AUTOTAKE mode, the switch is made the instant the preset condition is setup. The switch is made to the current displayed OUTPUT. If the current OUTPUT is not correct, change it by using the STATUS function, then make the switch.

SALVO FUNCTION: The SYX is capable of creating, editing and executing four different salvos. The TAKE, SALVO and LEVEL buttons all have special functions in the SALVO mode and their operation will be explained.

SALVO BUTTON: The SALVO button is an on/off switch that lights or turns off its LED to let you know when the panel is operating in the salvo mode. The SELECT, SAVE and REVIEW buttons become functional in the salvo mode. Any time while in the salvo mode the CLEAR button is pressed and performs a clear-all, the display will revert to showing dashes in the input windows and the salvo number in the output window. It is when the salvo number is displayed that a salvo TAKE can occur.

When the SALVO mode is exited, the panel display is restored to the status of the output displayed upon entry into the salvo mode. The panel continues to receive updates of changes to the system. Therefore it is quite possible the input display may have changed during the time the salvo mode was invoked.

SELECT: Upon entering the salvo mode, the input windows will show dashes while the output window will show a number 1-4. It is distinguishable because it is the only instance in which the 10's digit is not lit. This number represents which salvo the panel is currently set to access. Pressing the SELECT button will cycle through the 4 available salvos. Stop when the number indicates which salvo you want to access.

REVIEW: To examine the contents of a particular salvo, use the SELECT button to choose the correct salvo. Pressing the REVIEW button will show the status of the salvo table beginning with output 1. Each subsequent press of the REVIEW button will show the next output's status in the salvo table. If any output has no input assignment for any of the levels, those input windows will show dashes where the digits would be.

SAVE: Creating and subsequent editing of a salvo is done by entering transaction information the same way as if it were a normal transaction. The difference is that the TAKE button is NOT used. Instead, press the SAVE button. This will store the transaction request in the appropriate salvo table.

It is possible in the salvo tables to erase an entry completely or set up a breakaway which will only change specific level(s). To do this from the panel select an input of 99 systems up to 96 inputs and 199 for systems greater than 99. Though normally invalid, in the salvo editing mode this will erase the current entry listed for the specified level(s). Use the LEVEL breakaway buttons to erase individual level entries or erase all entries for a specific output by entering 99 while in the follow mode. Using the SAVE button will send this edit information to the salvo table and erase the appropriate level data.

STATUS: In the salvo mode, you can directly access the status of any output in the salvo table by pressing the STATUS button and entering the digits for the output number. Remember that in the salvo mode you are seeing the

status of the salvo table, not the current status of the system. Pressing the **REVIEW** button will continue showing the status of the salvo resuming with the next output number.

TAKE: For a salvo **TAKE** to be valid, the panel must be displaying the salvo number. This occurs each time the salvo mode is entered, each time the **SELECT** button is pressed, or each time the **CLEAR (CE/C)** button clears the display. Whenever the salvo number is displayed, the input windows all have dashes and the output window shows only the 1's digit. Pressing the **TAKE** button while in the **SALVO** mode will execute the salvo. Bear in mind that salvo edits are done with the **SAVE** button. The **TAKE** will execute the current salvo (established via the **SELECT** button).

AUTOTAKE ENABLE

When the AUTOTAKE function is enabled, the take will automatically be generated whenever a valid input is selected. This requires the output selection to be correct before the input is selected.

AUTOTAKE	S1,7
OFF	OFF
ENABLED	ON

SYX PANEL ADDRESS

Whenever there are multiple control panels in a system, such as additional SYX or SBX control panels, the Logical ADDRESS for each panel must be different. There are 64 possible addresses that the COMM port can access, and these addresses are set using S1,1-6 which is accessed through an opening on the rear panel.

ADDRESS	S1,1	S1,2	S1,3	S1,4	S1,5	S1,6	ADDRESS	S1,1	S1,2	S1,3	S1,4	S1,5	S1,6
1	OFF	OFF	OFF	OFF	OFF	ON	33	ON	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	ON	OFF	34	ON	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	ON	ON	35	ON	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	ON	OFF	OFF	36	ON	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	OFF	ON	OFF	ON	37	ON	OFF	OFF	ON	OFF	ON
6	OFF	OFF	OFF	ON	ON	OFF	38	ON	OFF	OFF	ON	ON	OFF
7	OFF	OFF	OFF	ON	ON	ON	39	ON	OFF	OFF	ON	ON	ON
8	OFF	OFF	ON	OFF	OFF	OFF	40	ON	OFF	ON	OFF	OFF	OFF
9	OFF	OFF	ON	OFF	OFF	ON	41	ON	OFF	ON	OFF	OFF	ON
10	OFF	OFF	ON	OFF	ON	OFF	42	ON	OFF	ON	OFF	ON	OFF
11	OFF	OFF	ON	OFF	ON	ON	43	ON	OFF	ON	OFF	ON	ON
12	OFF	OFF	ON	ON	OFF	OFF	44	ON	OFF	ON	ON	OFF	OFF
13	OFF	OFF	ON	ON	OFF	ON	45	ON	OFF	ON	ON	OFF	ON
14	OFF	OFF	ON	ON	ON	OFF	46	ON	OFF	ON	ON	ON	OFF
15	OFF	OFF	ON	ON	ON	ON	47	ON	OFF	ON	ON	ON	ON
16	OFF	ON	OFF	OFF	OFF	OFF	48	ON	ON	OFF	OFF	OFF	OFF
17	OFF	ON	OFF	OFF	OFF	ON	49	ON	ON	OFF	OFF	OFF	ON
18	OFF	ON	OFF	OFF	ON	OFF	50	ON	ON	OFF	OFF	ON	OFF
19	OFF	ON	OFF	OFF	ON	ON	51	ON	ON	OFF	OFF	ON	ON
20	OFF	ON	OFF	ON	OFF	OFF	52	ON	ON	OFF	ON	OFF	OFF
21	OFF	ON	OFF	ON	OFF	ON	53	ON	ON	OFF	ON	OFF	ON
22	OFF	ON	OFF	ON	ON	OFF	54	ON	ON	OFF	ON	ON	OFF
23	OFF	ON	OFF	ON	ON	ON	55	ON	ON	OFF	ON	ON	ON
24	OFF	ON	ON	OFF	OFF	OFF	56	ON	ON	ON	OFF	OFF	OFF
25	OFF	ON	ON	OFF	OFF	ON	57	ON	ON	ON	OFF	OFF	ON
26	OFF	ON	ON	OFF	ON	OFF	58	ON	ON	ON	OFF	ON	OFF
27	OFF	ON	ON	OFF	ON	ON	59	ON	ON	ON	OFF	ON	ON
28	OFF	ON	ON	ON	OFF	OFF	60	ON	ON	ON	ON	OFF	OFF
29	OFF	ON	ON	ON	OFF	ON	61	ON	ON	ON	ON	OFF	ON
30	OFF	ON	ON	ON	ON	OFF	62	ON	ON	ON	ON	ON	OFF
31	OFF	ON	ON	ON	ON	ON	63	ON	ON	ON	ON	ON	ON
32	ON	OFF	OFF	OFF	OFF	OFF	64	OFF	OFF	OFF	OFF	OFF	OFF

SYX THEORY OF OPERATION

SBB-9600 MICROPROCESSOR PCB

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 D1 (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

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 11.05 MHz oscillator clock for u1.

Port 0 (P0.0-P0.7) and Port 1 (P1.0-P1.7) control the front panel display board.

Long term variable data is stored in the serial EEPROM U5. It is interfaced to the microprocessor via P3.3-p3.5.

Switch S1's status is input to the microprocessor by P2.0-P2.5.

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 P3.7, 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 P3.6 in a timely fashion (watchdog). Under normal operation the microprocessor should toggle P3.6 many times per second.

SYA-9600 DISPLAY PCB

The microprocessor via P1.0-P1.7 controls the front panel through IC U1. U1 is a high density PLD. It is programmed with an address decoder for three 4-bit addressable latches, encoder logic to drive the 7-segment LED displays and decoder logic for the row and digit drive signals.

The segment and row data are buffered by row driver transistors Q1-Q9. The digit data is buffered by column driver transistors Q14-Q29. The display functions by the microprocessor setting up the segment drivers (row) with the data for a digit, and then enabling the appropriate digit (column) driver. Each digit is enabled for 1mS out of 16mS.

The keyboard is scanned by turning off the row drivers and testing the KEYROW lines while the column transistors are turned on one at a time.