

Microprocessor Interface

The microprocessor interface is through the serial port, SPI port or one out of eight data bits on the eight bit parallel port and also control lines $\overline{\text{SDCLK}}$ and $\overline{\text{LOAD}}$.

Power Up Sequence

Upon power up display will come on at random. Thus the display should be reset at power-up. The reset will set the Address Register to Digit 0, User RAM is set to 0 (display blank) the Control Word is set to 0 (100% brightness with Lamp Test off) and the internal counters are reset.

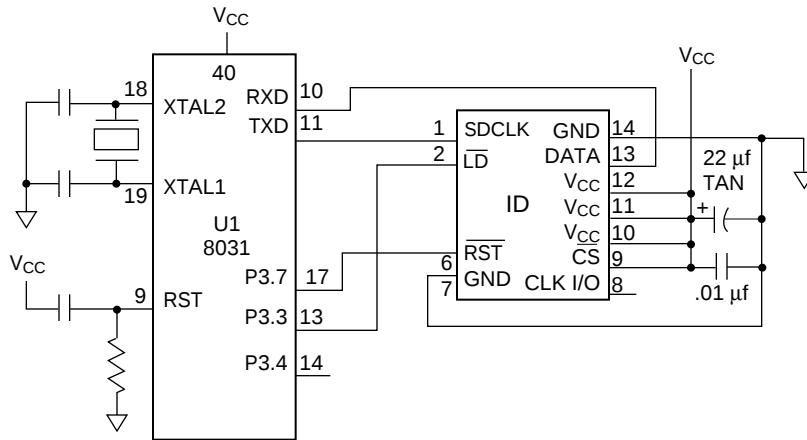


Figure 10. SCDV Interface to Siemens/Intel 8031 Microprocessor (using serial port in mode 0)

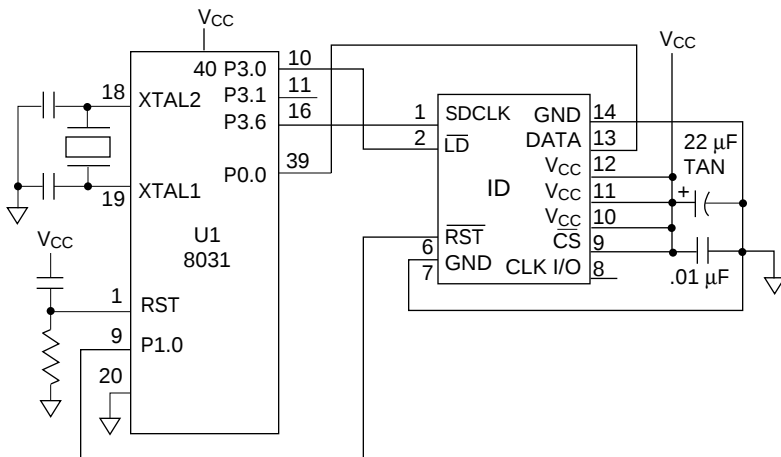


Figure 11. SCDV Interface to Siemens/Intel 8031 Microprocessor (using one bit of parallel port as serial input)

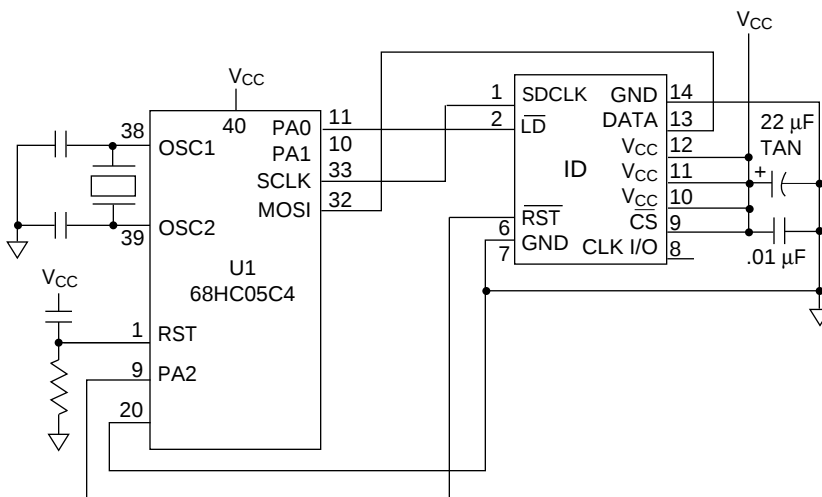


Figure 12. SCDV554X Interface with Motorola 68HC05C4 Microprocessor (using SPI Port)

Multiple displays can be cascaded using the $\overline{\text{CLK SEL}}$ and CLK I/O pins as shown below. The display designated as the Master Clock source should have its CLK SEL pin tied high and the slaves should have their CLK SEL pins tied low. All CLK I/O pins should be tied together. One display CLK I/O can drive 15 slave CLK I/Os. Use RST to synchronize all display counters.

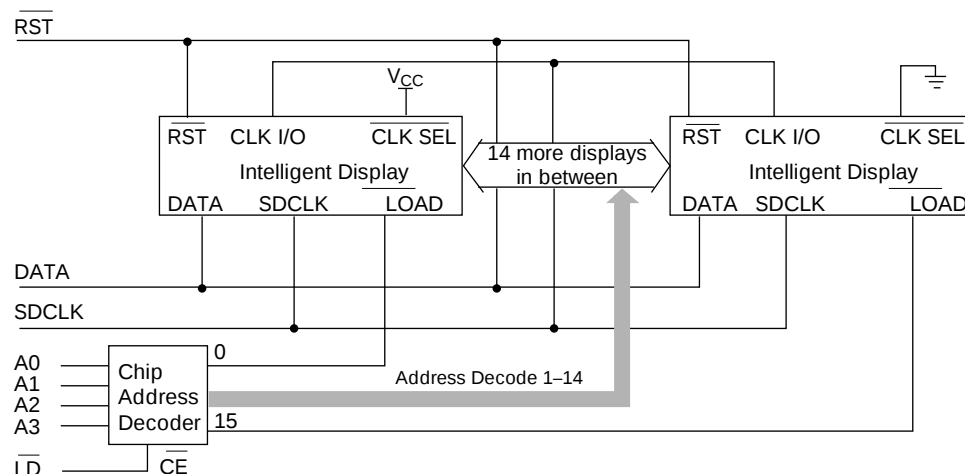


Figure 13. Cascading Multiple Displays

Loading Data into the Display

Use following procedure to load data into the display:

1. Power up the display.
2. Bring RST low (600 ns duration minimum) to clear the Multiplex Counter, Address Register, Control Word Register, User Ram and Data Register. The display will be blank. Display brightness is set to 100%.
3. If a different brightness is desired, load the proper brightness opcode into the Control Word Register.
4. Load the Digit Address into the display.
5. Load display row and column data for the selected digit.
6. Repeat steps 4 and 5 for all digits.

Data Contents for the Display in a Vertical Format “↑AB↓”

Step	D 7	D 6	D 5	D 4	D 3	D 2	D 1	D 0	Function
A	1	1	0	0	0	0	0	0	CLEAR
B (optional)	1	1	1	1	0	B	B	B	BRIGHTNESS SELECT
1	1	0	1	0	0	0	0	0	DIGIT D0 SELECT
2	0	0	0	0	0	1	0	0	ROW 0 D0 (↑)
3	0	0	1	0	1	1	1	0	ROW 1 D0 (↑)
4	0	1	0	1	0	1	0	1	ROW 2 D0 (↑)
5	0	1	1	0	0	1	0	0	ROW 3 D0 (↑)
6	1	0	0	0	0	1	0	0	ROW 4 D0 (↑)
7	1	0	1	0	0	0	0	1	DIGIT D1 SELECT
8	0	0	0	0	0	1	0	0	ROW 0 D1 (A)
9	0	0	1	0	1	0	1	0	ROW 1 D1 (A)
10	0	1	0	1	1	1	1	1	ROW 2 D1 (A)
11	0	1	1	1	0	0	0	1	ROW 3 D1 (A)
12	1	0	0	1	0	0	0	1	ROW 4 D1 (A)
13	1	0	1	0	0	0	1	0	DIGIT D2 SELECT
14	0	0	0	1	1	1	1	0	ROW 0 D2 (B)
15	0	0	1	0	1	0	0	1	ROW 1 D2 (B)
16	0	1	0	0	1	1	1	0	ROW 2 D2 (B)
17	0	1	1	0	1	0	0	1	ROW 3 D2 (B)
18	1	0	0	1	1	1	1	0	ROW 4 D2 (B)
19	1	0	1	0	0	0	1	1	DIGIT D3 SELECT
20	0	0	0	0	0	1	0	0	ROW 0 D3 (↓)
21	0	0	1	0	0	1	0	0	ROW 1 D3 (↓)
22	0	1	0	1	0	1	0	1	ROW 2 D3 (↓)
23	0	1	1	0	1	1	1	0	ROW 3 D3 (↓)
24	1	0	0	0	0	1	0	0	ROW 4 D3 (↓)

Note: If the display is already reset at Power Up, there is no need for Software Clear.

USER DEFINABLE CHARACTER SET EXAMPLES*

Upper and Lower Case Alphabets

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
04 2A 5F 71 91		1E 29 4E 69 9E		0F 30 50 70 8F		1E 29 49 69 9E		1F 30 5E 70 9F		1F 30 5E 70 90		0F 30 53 71 8F		11 31 5F 71 91		0E 24 44 64 8E	
01 21 41 71 8E		13 34 58 74 93		10 30 50 70 9F		11 3B 55 71 91		11 39 55 73 91		0E 31 51 71 8E		1E 31 5E 70 90		0C 32 56 72 8D		1E 31 5E 74 92	
0F 30 4E 61 9E		1F 24 44 64 84		11 31 51 71 8E		11 31 51 6A 84		11 31 55 7B 91		11 2A 44 64 91		11 2A 44 64 84		1F 22 44 64 9F			
00 2E 52 72 8D		10 30 5E 71 9E		00 2F 50 70 8F		01 21 4F 71 8F		00 2E 5F 70 8E		04 2A 48 7C 88		00 2F 50 73 8F		10 30 56 79 91		04 20 4C 64 8E	
00 26 42 72 8C		10 30 56 78 96		0C 24 44 64 8E		00 2A 55 71 91		00 36 59 71 91		00 2E 51 71 8E		00 3E 51 7E 90		00 2F 51 6F 81		00 33 54 78 90	
00 23 44 62 8C		08 3C 48 6A 84		00 32 52 72 8D		00 31 51 6A 84		00 31 55 7B 91		00 32 4C 6C 92		00 31 4A 64 98		00 3E 44 68 9E			

DOT ON = 1
DOT OFF = 0

Numerals and Punctuation

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
0E 33 55 79 8E		04 2C 44 64 8E		1E 21 46 68 9F		1E 21 4E 61 9E		06 2A 5F 62 82		1F 30 5E 61 9E		06 28 5E 71 8E		1F 22 44 68 88		0E 31 4E 71 8E	
0E 31 4F 62 8C		0A 3F 4A 7F 8A		0F 34 4E 65 9E		06 29 5C 68 9F		19 3A 44 6B 93		08 34 4D 72 8D		0C 2C 44 68 80		02 24 44 64 82		08 24 44 64 88	
0C 2C 48 64 80		04 24 5F 64 84		00 2C 4C 64 88		00 20 5F 60 80		00 20 40 6C 8C		01 22 44 68 90		04 24 44 60 84		0A 2A 40 60 80		07 24 44 64 87	
10 28 44 62 81		1C 24 44 64 9C		0E 35 57 70 8E		00 20 40 60 9F		0C 2C 40 6C 8C		0C 20 4C 64 88		02 24 48 64 82		00 3F 40 7F 80		08 24 42 64 88	
0E 31 42 64 88		06 24 48 64 86		0C 24 42 64 8C		04 24 40 64 84		11 2A 44 6E 84		15 2E 5F 6E 95		04 2A 51 60 80		08 35 42 60 80			

DOT ON = 1
DOT OFF = 0

*CAUTION: No more than 128 LEDs "on" at one time at 100% brightness.

USER DEFINABLE CHARACTER SET EXAMPLES* (continued)

Scientific Notations, etc.

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
06 2E 5E 6E 86		04 24 48 71 8E		1F 20 59 75 93		1F 20 56 79 91		0E 20 4A 64 8A		0D 32 52 72 8D		0C 32 56 71 96		0E 24 4E 71 8E		00 24 4A 71 9F	
10 3C 52 72 81		0E 31 5F 71 8E		10 28 44 6A 91		09 29 49 6E 90		01 2E 54 64 84		04 2E 55 6E 84		0E 31 51 6A 9B		01 2E 5A 6A 8A		0F 32 52 72 8C	
1F 28 44 68 9F		18 24 48 7C 80		1C 28 44 78 80		12 36 5A 67 80		06 21 5A 67 80		07 22 59 66 80		1C 34 5C 60 80		0F 28 48 78 88		04 2E 5F 6E 80	
00 24 4E 7F 8E		00 2E 5F 6E 84		0E 3F 4E 64 80		04 3E 5F 7E 84		04 2F 5F 6F 84		0E 2E 4E 6E 8E		00 3F 5F 7F 80		04 2E 55 64 84		04 24 55 6E 84	
04 22 5F 62 84		04 28 5F 68 84		1F 31 51 71 9F		08 2C 4A 78 98		0A 35 4A 75 8A		15 2A 55 6A 95		1F 35 5F 75 9F		00 3F 5F 7C 80		0E 3F 5B 7F 8E	
00 27 4F 78 9C		00 3C 5F 63 87		00 20 40 60 83		00 20 40 67 9F		00 23 5F 7F 9F		0C 3C 5C 7C 9C		15 2E 44 64 84					

DOT ON = 1
DOT OFF = 0

Foreign Characters

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
1F 21 51 62 84		1F 21 46 64 88		01 22 46 6A 82		04 3F 51 61 86		00 3F 44 64 9F		02 3F 46 6A 92		08 3F 49 6A 88		1F 21 45 67 8C		02 3F 51 62 8C	
08 3F 49 69 92		04 3F 44 7F 84		0F 29 51 62 8C		08 2F 52 62 82		0F 21 41 61 9F		0A 3F 4A 62 8C		19 21 59 62 9C		0F 29 55 63 8C		01 3E 42 7F 86	
15 35 55 62 8C		0E 20 5F 64 98		08 28 4C 6A 88		04 3F 44 64 98		0E 20 40 60 9F		1F 21 4A 64 9A		04 3E 44 6E 95		04 24 44 68 90		04 22 51 71 91	
10 3F 50 70 8F		1F 21 41 62 8C		0E 20 4E 60 8F		04 28 51 7F 81		01 21 4A 64 8A		1F 28 5F 68 87		1E 22 42 62 9F		1F 21 5F 61 9F		0E 20 5F 61 8E	
12 32 52 64 88		04 34 54 75 96		1E 25 4F 74 8F		0F 34 5F 74 97		0F 30 4F 64 98		0F 33 55 79 9E		0F 34 57 74 8F		00 2A 5F 74 8B		08 24 4E 72 8F	
0A 2E 51 7F 91		02 24 4C 64 8E		04 2A 4E 71 8E		0A 34 52 7A 96		08 24 51 71 8E		02 24 51 71 8E		04 2A 51 71 8E					

DOT ON = 1
DOT OFF = 0