

Connecting SIEMENS SL45 LCD to microcontroller

Don't Connect "VC " (pin11) to external power sources!
LCD pins 31, 32 are on sides!

CS (pin 30), RESET (pin 29), RS (pin 28), CLK (pin 27), DATA (pin 26) are from 0V to 2.8V
 "LED+" = max 3.7V, "LED-" =GND

LCD format: 101 x 80 pix
 10 rows (every row is 8 pix high = 1byte), 101 column (1 pix long)

$F_{clk} = 3.3 \text{ MHz}$ ($t_{low}=t_{high}=160 \text{ nS}$)
 CLK=1 (idle)
 RS=0 (command), RS=1 (data) [you can change it when CS=1]
 CS=0 (active), CS=1 (idle)
 RESET =0 (reset), RESET =1 (normal)
 Data loaded into LCD on rising edge of CLK signal, MSB first (Atmel AVR SPI mode=2)

Startup:
 RESET=0 for 760 mS, while (CS=0)
 RESET=1, wait 660 mS, then CS=1, wait 100 mS

LCDinit:

- RS=0,CS=0, wait 18.5uS, Command (2 bytes): 0x81,0x45, wait 5.5uS,CS=1
- Wait 16uS
- RS=0,CS=0, wait, Command (18 bytes): 0xA1, 0xC0, 0xA6, 0x74, 0x00, 0x81, 0x45, 0x40, 0x55,0xAB, 0x27, 0x8A, 0x00, 0xB0, 0x10, 0x00, 0xA4, 0xAF , wait 5.5uS,CS=1

LCDwrite:

RS=0, CS=0, wait, Command (3 bytes): 0xB0, 0x10, 0x00, wait 5.5 uS, CS=1 **[0xB0,0xB1,... 0xB9 –row numbers]**

RS=1, CS=0, wait, Data0,Data1,...Data101, wait 5.5uS,CS=1

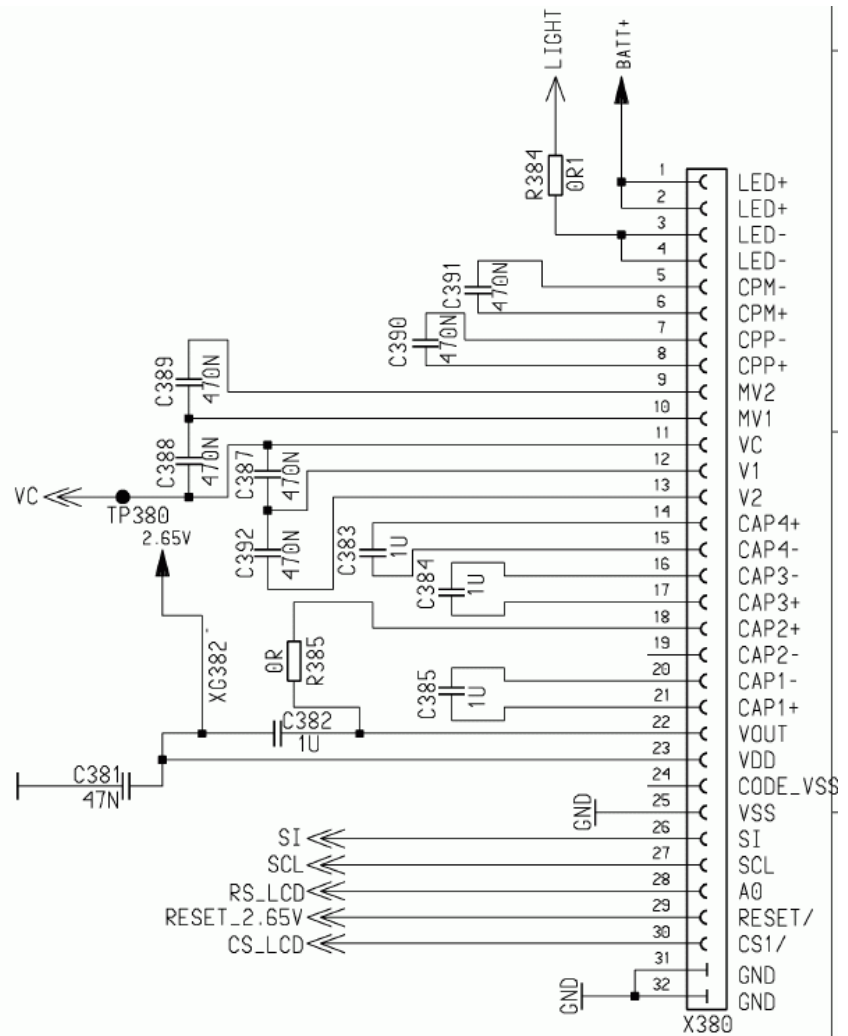
RS=0, CS=0, wait, Command (3 bytes): 0xB1, 0x10, 0x00, wait 5.5 uS, CS=1 **[0xB0,0xB1,... 0xB9 –row numbers]**

RS=1, CS=0, wait, Data0,Data1,...Data101, wait 5.5uS,CS=1

.... To 0xB9

LCD turn off:

- CS=0,RS=0,wait 18.5uS, Command (1 byte): 0xAE, wait 5.5uS,CS=1
- Turn power OFF





Real Time Data transfer:

81 45
 A1 C0 A6 74 00 81 45 40 55 AB 27 8A 00 **B0 10 00** A4 AF



B0 10 00 00
B1 10 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00

00	00	00	00	00	F0	F8	F8
FC	FC	FE	7E	00	00	00	00
00	00	00	03	83	82	83	01
00	81	03	82	81	03	80	80
01	03	82	00	80	81	03	02
80	C1	E3	82	03	81	80	03
83	80	00	00	F4	F4	07	03
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B4	10	00	00
00	00	00	00	00	03	FF	FF
FF	FF	3F	00	00	00	00	00
00	00	00	1F	3F	24	37	13
00	3F	3F	00	3F	3F	00	3F
3F	00	7F	7F	10	1F	0F	00
00	1F	3F	20	00	47	4F	78
3F	0F	00	00	2F	2F	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B5	10	00	00
00	00	00	00	00	00	01	7F
7F	1F	00	00	00	00	00	00
00	00	00	FF	FF	21	3F	1E
00	FF	FF	00	F0	F8	48	78
30	00	90	D8	48	F8	F0	00
30	78	48	D8	90	00	F0	F8
48	78	30	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B6	10	00	00
00	00	00	00	00	00	78	7C
7C	7C	3C	00	00	00	00	00
00	00	00	F3	F3	10	F0	E0
00	03	83	80	81	03	02	03
81	80	81	03	02	F1	F3	80
81	03	02	03	81	80	81	03
02	83	01	80	80	00	00	80
80	00	80	00	00	80	80	80
00	00	00	F0	F0	00	00	00

00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B7	10	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	3F	3F	02	3F	3D
00	1F	3F	24	37	13	00	1F
3F	20	39	19	00	3F	3F	00
3F	3F	00	19	3D	24	1F	3F
00	3F	3F	01	01	00	4F	5F
50	7F	3F	00	1F	3F	24	37
13	00	00	2F	2F	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B8	10	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	B9	10	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	57

