13. RS232 Transmission Specification

13.1 RS232 transmission format is 14 byte. Its transmission rate is 2400 bps. The format is as follow:

Sing	Data Byte				Space	Point	SB1	SB2	SB3	SB4	BAR	EOF	ENTER
1	2	3	4	5	6	7	8	9	10	11	12	13	14
+/-	X	X	X	X	020H	X	X	X	X	X	X	00DH	00AH

13.2 14 byte output code location:

a) Sing byte 1: 0f0H ;
b) Data byte 2: 0f1H ;
c) Data byte 3: 0f2H ;
d) Data byte 4: 0f3H ;
e) Data byte 5: 0f4H ;
f) Space byte: 0f5H ;
g) Point byte: 0f6H ;
h) SB1 byte: 0f7H ;
i) SB2 byte: 0f8H ;
j) SB3 byte: 0f9H ;
k) SB4 byte: 0faH ;
l) BAR byte: 0fbH ;
m) EOF byte: 0fcH ;
n) ENTER byte: 0fdH.

13.3 Sing byte stands for the positive or negative sign of DMM measuring signal, and its output code is ASCII code:

a) positive (+) : 02BH
b) negative (-) : 02DH.

13.4 Data byte is 4 byte that stands for DMM measured data, and its output code is ASCII code:

a) Date byte 2: stands for Lcd_1 ;
b) Date byte 3: stands for Lcd_2 ;
c)Date byte 4: stands for Lcd_3 ;
d)Date byte 5: stands for Lcd_4.

13.5 Point Byte stands for the decimal location, and its output code is Hex code:

a)Point 『0』: 030H stands for no decimal and LCDs 『0000』:

a)Point "0": 030H stands for no decimal and LCDs "0000";
b)Point "1": 031H stands for no decimal and LCDs "0.000";
c)Point "2": 032H stands for no decimal and LCDs "00.00";
d)Point "3": 033H stands for no decimal and LCDs "000.0".

13.6 SB1 Byte code is as follow (SB1), and its output code is Hex code:

Status	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0								
1	0	0	AUTO	DC	AC	REL	HOLD	BPN

13.7 SB2 Byte code is as follow (SB2), and its output code is Hex code:

Status	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0								
1	Z1	Z2	MAX	MIN	APO	Bat	n	Z3

13.8 SB3 Byte code is as follow (SB3), and its output code is Hex code:

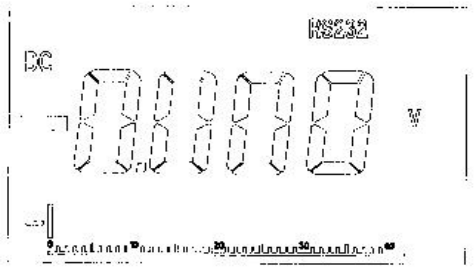
Status	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0								
1	μ	m	k	M	Beep	Diode	%	Z4

13.9 SB4 Byte code is as follow (SB4), and its output code is Hex code:

Status	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0								
1	V	A	Ω	hFE	Hz	F	℃	℉

13.10 Bar byte: Bit 7 stands for the positive or negative; Bit 0~6 stands for Bar graph number. Its output code is Hex code.

13.11 Example: measuring voltage mode 『MEAS: 11010』: input 0V. LCD is as follow:



13.12 RS232 Output Format:

2D-30-30-30-30-20-31-11-00-00-80-80-0D-0A

13.13 RS232 Output Wave Form

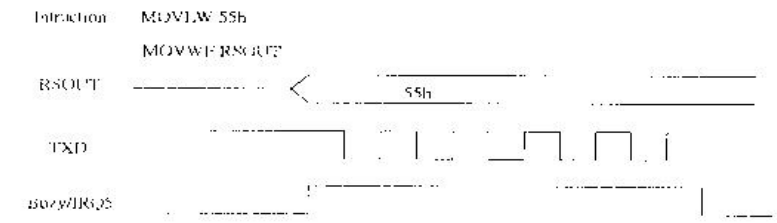


Diagram36 RS232 Output Wave Form

14. LCD

14.1 Plane Structure of LCD

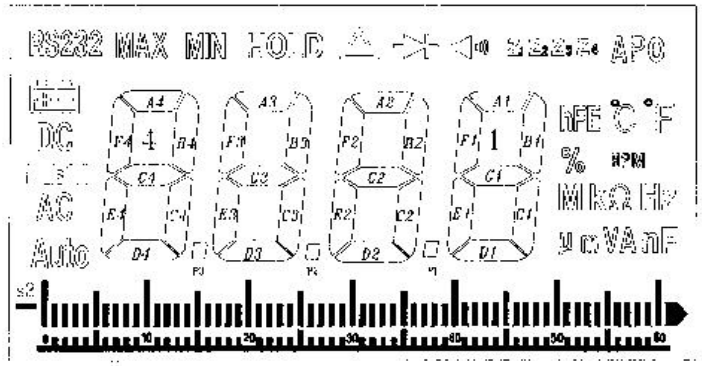


Diagram37 LCD Diagram

14.2 Table of True Valid Value of LCD

LCD PIN	1	2	3	4	5	6	7	8	9
IC PIN	COM1	COM2	COM3	COM4	SEG1	SEG2	SEG3	SEG4	SEG5
COM4				COM4	LB	RS232	Auto	MAX	F4
COM3			COM3		S1	S2	DC	AC	E4
COM2		COM2			BP0	BP1	BP3	BP5	BP7
COM1	COM1				BPN	BP2	BP4	BP6	BP8

LCD PIN	10	11	12	13	14	15	16	17	18
IC PIN	SEG6	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12	SEG13	SEG14
COM4	A4	B4	MIN	F3	A3	B3	HOLD	F2	A2
COM3	G4	C4	P3	E3	G3	C3	P2	E2	G2
COM2	D4	BP10	BP12	BP14	D3	BP17	BP19	BP21	D2
COM1	BP9	BP11	BP13	BP15	BP16	BP18	BP20	BP22	BP23

LCD PIN	19	20	21	22	23	24	25	26	27
IC PIN	SEG15	SEG16	SEG17	SEG18	SEG19	SEG20	SEG21	SEG22	SEG23
COM4	B2	△	F1	A1	B1	DIODE	CONT	Z1	Z2
COM3	C2	P1	E1	G1	C1	μ	m	V	A
COM2	BP24	BP26	BP28	D1	BP31	BP33	BP35	BP37	BP39
COM1	BP25	BP27	BP29	BP30	BP32	BP34	BP36	BP38	BP40

LCD PIN	28	29	30	31	32	33	34	35	36
IC PIN	SEG24	SEG25	SEG26	SEG27	SEG28	SEG29	SEG30	SEG31	SEG32
COM4	Z3	Z4	APO	hFE	℃	℉	%	Hi	BP60
COM3	n	F	M	k	Ω	Hz	RPM		BP59
COM2	BP41	BP43	BP45	BP47	BP49	BP51	BP53	BP56	BP58
COM1	BP42	BP44	BP46	BP48	BP50	BP52	BP54	BP55	BP57

Description:

1. BPN is the rule of Bar graph （0, 10, 20, 30, 40）
2. BP is the scale of Bar graph. The first left is BP0, then to right are BP1, BP2 , and so on, the most right including the arrow is BP40.