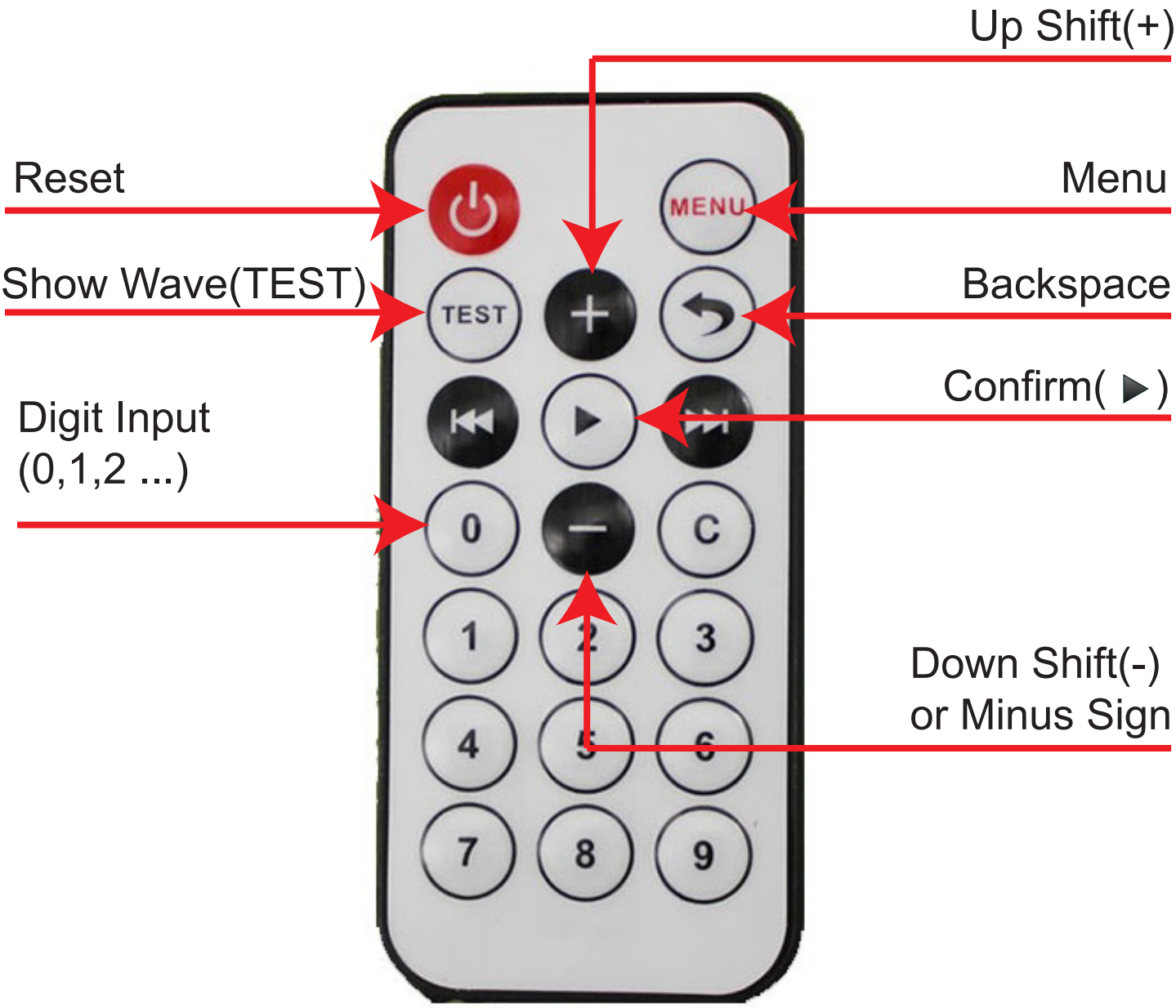
External Level Gauge Diagnosis Manual

V1.0.2

SK Electronic

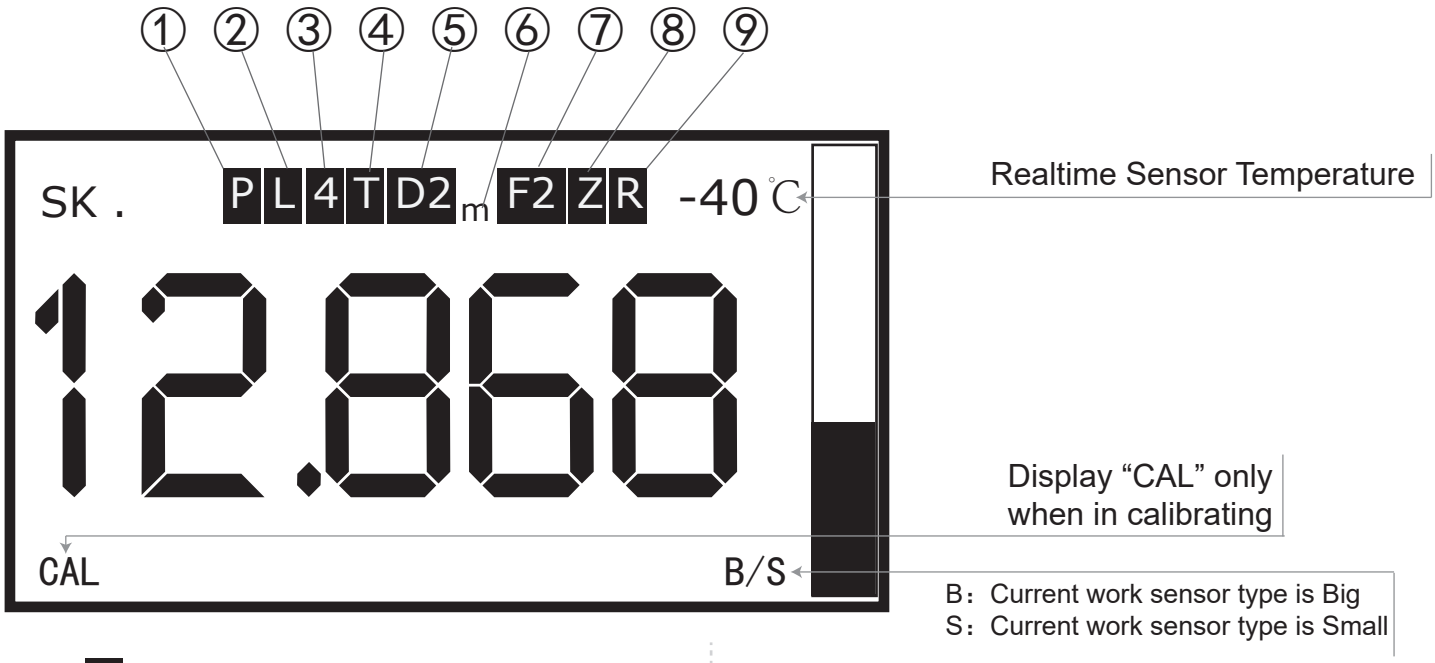
IR Controller Key Description



1：Reset：Press the button to reset the device
2：MENU: Open or Close the menu。
3：TEST：Display realtime echo wave。
4：All of the other button are used to edit the configs

Remarks：
Press “TEST” will enter into wave screen,
Press “TEST” again will enter into diagnosis screen.
Press “MENU” will enter into menu screen,,
Press “MENU” again will enter into diagnosis screen.

LCD Main Screen Description



① P 485 used as Private Protocol

M 485 used as Modbus Protocol

② L Level Gauge

B Interface Gauge

③ 4 4~20mA Output is in malfunction

④ T Device is disturbed by environment, and reset

⑤ D1 Measure Delay above 10 seconds

D2 Measure Delay above 20 seconds

D3 Measure Delay above 30 seconds

D4 Measure Delay above 40 seconds

⑥ m dm cm mm LCD Display Height

% LCD Display Percentage

m^3 LCD Display Volume

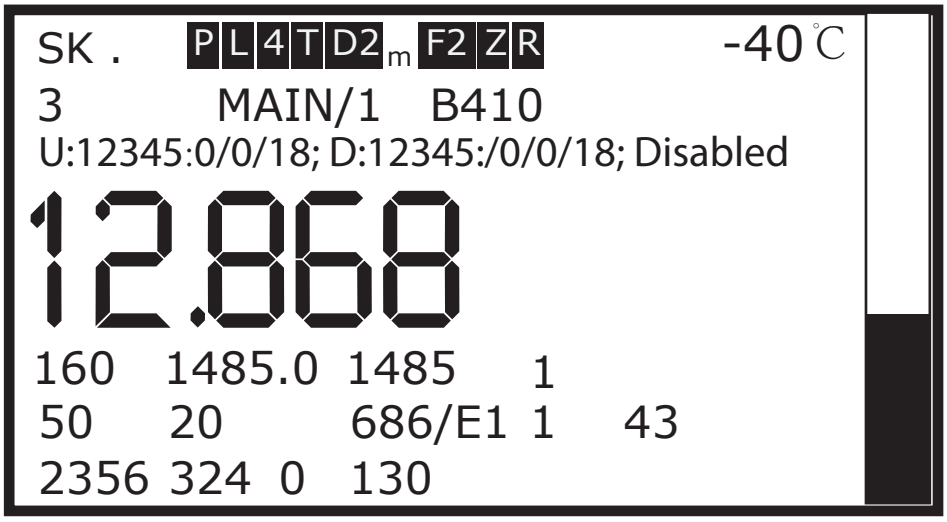
t LCD Display Weight

⑦ F2 Measure Fluctuation Index。[1, 10]
Measure is very stable is not showed。
Otherwise the bigger count,
the bigger fluctuation

⑧ Z System is in recovery

⑨ R The IR function is disturbed by environment and disabled by system

LCD Debug Screen Description



① 3：Current gain
Gain Tpe：
MAIN/1: Auto Gain(Enhanced)
MAIN/2: Fixed Gain
MAIN: Auto Gain，Time Gain，Others
B410: Current dead zone is 410 mm
B/S: B：Current work sensor type is big
S：Current work sensor type is small

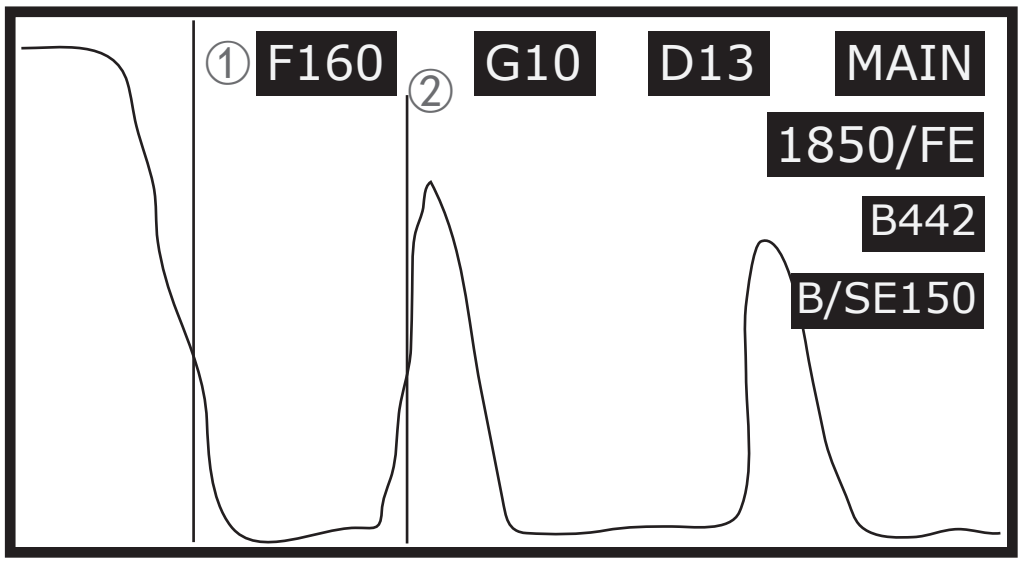
② 160： Work Frequency，Unit: kHz
1485.0 Current work sound speed, with precision 0.1m/s
1485 Default Sound Speed
1： Work Type

1：Single Sensor Mode
2：Double Sensor Mdoe
3：Temp Calibrate Mode
4：Pipe Calibrate Mode
5：Pipe+Double Sensor Mode
6：Temp + Temp Mode
9：Debug Mode
0：Unknown

③ 50：Measure Range Unit: 100mm
20：Calibrate Distance Unit: 100mm
686/E1：In normal state, it represents the current result，
Othereise it is error code，usually start with ‘E’or’F’
1： System feature，Value 1 is normal，
otherwise indicates system is in dead zone
43：Auto calculated blind，Unit: 10mm

④ 2356：Signal Strength
324： Noise Strength
0： Filter Error Count
130： Filter Total Count

LCD Wave Screen Description



F160	Current Work Frequency
G10	Current Work Gain。Min:0,Max:128
D13	When Displayed,it means there 13 cycles delay, Otherwise there is no delay
MAIN	Flash one time when a measure occurs MAIN indicates the main sensor is in work, CAL indicates the calibrate sensor is in work
1850/FE	In normal state, it represents the current result, Othereise it is error code， usually start with ‘E’or’F’
B442	Real time blind,Unit: mm
B/SE150	B：Current work sensor type is Big； S：Current work sensor type is Small E：Envelope Width
①	Auto detected blind
②	Echo position

Menu Description

1. MAIN SENSOR BSC	1.1 SENDING TIME	1.3 BLIND START		
	1.2 FREQUENCY	1.4 BLIND WINDOW		
2. MAIN SENSOR ADV	2.1 GAIN TYPE	2.5 HEIGHT UP	2.9 FORWARD LEN	2.13 ECHO AREA CTRL
	2.2 TGC TYPE	2.6 HEIGHT DOWN	2.10 FORWARD WINDOW	2.14 ECHO AREA START
	2.3 GAIN 1	2.7 WIDTH UP	2.11 FORWARD THRE	2.15 ECHO AREA STOP
	2.4 GAIN 2	2.8 WIDTH DOWN	2.12 ENVELOPE	2.16 POWER LEVEL
				2.17 TANK THICKNESS
				2.18 TANK SPEED
3. CAL SENSOR BSC	3.1 SENDING TIME	3.3 BLIND START		
	3.2 FREQUENCY	3.4 BLIND WINDOW		
4. CAL SENSOR ADV	4.1 GAIN TYPE	4.5 HEIGHT UP	4.9 FORWARD LEN	4.13 ECHO AREA CTRL
	4.2 TGC TYPE	4.6 HEIGHT DOWN	4.10 FORWARD WINDOW	4.14 ECHO AREA START
	4.3 GAIN 1	4.7 WIDTH UP	4.11 FORWARD THRE	4.15 ECHO AREA STOP
	4.4 GAIN 2	4.8 WIDTH DOWN	4.12 ENVELOPE	4.16 POWER LEVEL
				4.17 TANK THICKNESS
				4.18 TANK SPEED
5. SYSTEM BASIC	5.1 DEFAULT SPEED	5.3 OFFSET	5.5 FILTER LEN	5.7 REF SPEED
	5.2 MEASURE RANGE	5.4 DEAD ZONE	5.6 FILTER FACTOR	
6. SYSTEM CAL	6.1 DISTANCE	6.3 HEIGHT	6.5 LAST CAL SPEED	6.7 DOWN OFFSET
	6.2 PERIOD	6.4 PIPE CALIB DIST	6.6 UP OFFSET	6.8 FACTOR
7. SYSTEM ADV	7.1 DEVICE NO	7.5 CIRCLE DETECT	7.9 SHOW WAVE/PARA	7.18 Level Jump Dist
	7.2 LCD DISP TYPE	7.6 DEBUG	7.10 NO HIGHER THAN	7.19 Level Change Spd
	7.3 LEVEL PRECESION	7.7 RELAY 1 THRE	7.11 NO LOWER THAN	7.20 Crossing Count
	7.4 LEVEL STRAGEDY	7.8 RELAY 2 THRE	7.12 VALIDATE ECHO	7.21 Max Dead Zone
			7.13 SECOND ECHO REC	7.22 LCD Disp Content
			7.14 Serial Mode	7.23 Measure Precision
			7.15 Relay Mode	7.24 Tail False Echo Sup
			7.16 Level Mode	7.25 Primary Work Sensor
			7.17 Level Zero Jump	7.26 Small Blind Mea Thr
				7.27 Gain Limit Lower
				7.28 Gain Limit Upper
8. MODE	8.1 SINGLE	8.3 PIPE		
	8.2 DOUBLE	8.4 PIPE+DOUBLE		
9. DEVICE INFO	9.1 TYPE	9.4 CONTACT		
	9.2 SERIAL NO	9.5 CHECK PWD		
	9.3 VERSION			
10. TOOL	10.1 RESET	10.4 Calibrate Now	10.7 Backup Configs	
	10.2 Set Debug Mode	10.5 TO FACTORY SETS	10.8 Restore Configs	
	10.3 Set Work Mode	10.6 COPY PARAS		
11. Diagnosis	11.1 Signal Smooth			
	11.2 System Damp Coef			
	11.3 View Last Error			

Remarks：Red means menu is not locked。
Black means menu only visible after system unlocked

External Level Gauge Error Code

Index	Code	Description		Cause	Solution	Remark
1	FF	Unknown error		Device is breakdown		
2	FE	System enter into blind area		Level is too low		
3	FD	Echo width is too wide		User paras wrong	Contact technical support	
4	FC	Echo width is too narrow		User paras wrong	Contact technical support	
5	FB	System paras wrong		Device is breakdown		
6	FA	Memory error		Device is breakdown		
7	F9	No echo		Tank is empty		
8	F8	Echo height is too high		User paras wrong	Contact technical support	
9	F7	Circular echo is detected		Tank is empty		
10	E0	Echo strength is too week		Wrong sensor installation	Contact technical support	
11	E1	System blind is too big		Usually occurred when tank is empty or level is high	Adjust “Max Dead Zone” user para	
12	E2	System enter into blind area		There is a lot of silt in the bottom of tank or more than 2 kinds of liquid is detected	Adjust “Signal Smooth” user para	
13	E3	System detects false echo		There is a lot of silt in the bottom of tank or more than 2 kinds of liquid is detected	Adjust “Signal Smooth” user para	

Remark： Error code 0 is a temporary code.