EXCELL PRECISION CO.,LTD.

User Manual
320S

V24. 827

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Check Firmware Version

During power-on countdown, press 

key to display firmware version 04012XXX, where XXX is maintenance number.

Safety

This symbol is used where protect against personal injury or damage to the instrument.
This symbol is used to warn of a potential of shock hazard.

- When the instrument is installed, connect an earth bonding conductor from FG to the earth connection marked " ⏚ ".
- Fuse specifications for power socket: voltage 250Vac, current 0.5A, size 5x20mm.
- The authorized dealer must confirm the safety of the equipment after repairs.
- Disconnect the mains power supply before opening the instrument housing.
- To install the optional interface cards, it is necessary to disconnect the mains power supply and fit a yellow/green earth bonding cable to the rear panel.
- Before turning the power on ensure the supply voltage is within the acceptable range, AC 90V ~ 240V 50/60HZ.
- The operating ambient temperature range is 0 ^{o}C ~ 40 ^{o}C (32 °F ~ 104 °F).

Features

320S has a wide range of applications from batching to simple weighing.

Features:

- DIN size panel size 144x74 mm, convenient to store equipment or on the control panel. The front panel has water splash protection
- 0.2μV/d sensitivity, 360 times/s max sampling speed
- Application range of - 0.1 ~ 4.0 mV / V
- USB Logger (Up to 16GB): weight and time data can be stored in the USB PenDrive

Note: when both USB Logger and RS-485 are used at the same time, scan rate is recommended to be <1000ms

Note: USB Logger is used without sufficient system resources, the followings might occur:

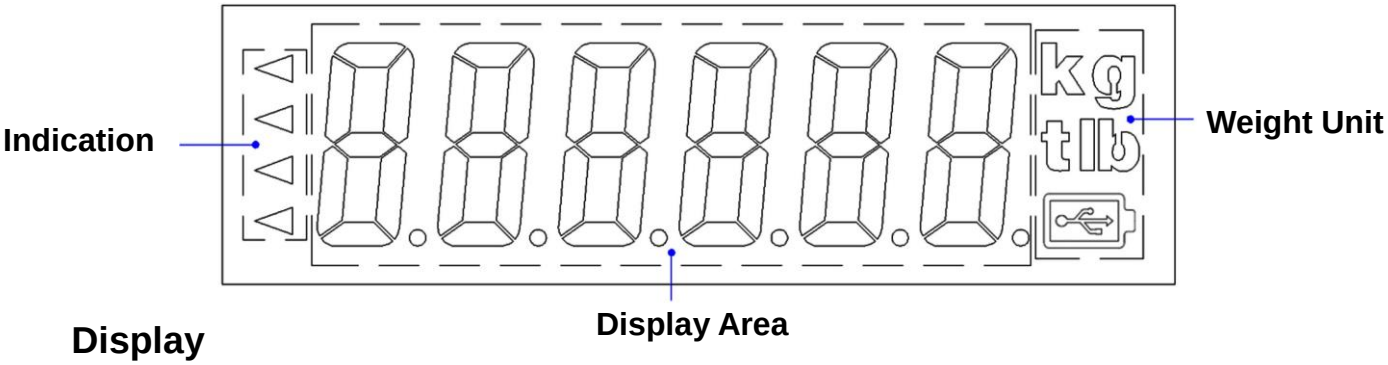
- Use webpage to configure settings for 320S (Default IP address: 192.168.1.210)
- Use webpage (I.E 10/11) to update firmware for 320S
- Flexible calibration method: standard 2-points calibration, 5-points linear calibration, manually enters signal voltage in mV / V without actually applying load.
- Read load cell output voltage in mV / V for future maintenance use.
- Adjustable digital filter: to effectively suppress the vibration generated by the environment.
- Six weight comparison modes that can cover most applications
- Stand alone batching mode or connect to PLC for external system control
  - Built in batching / dosing functions
  - Manual / automatic discharge operation
  - Set cycle times in a batch
  - Totalise weight and number of cycles
- Built-in RTC (Real Time Clock)
- Build in RS232C bi-directional and RS485 communication
- Built in MODBUS

Interface options:

- ♦ OP-01 RS-422 / RS-485 / RS-232 serial interface
- ♦ OP-02-1 BCD parallel output interface (Open collector output)
- ♦ OP-02-2 BCD parallel output interface (TTL output)
- ♦ OP-03 16 Bit Analogue current/voltage output interface (4 ~ 20 mA / 0 ~ 10 V)
- ♦ OP-04 Control I/O (4 In / 4 Out) + Setpoint In (BCD code)
- ♦ OP-05 Control I/O (8 In / 8 Out)

Chapter 1 Front and Rear Panel Specifications

1-1 Front panel



Display

- 6 digits, bright red or green, 7 segment LED display, character height 21mm (0.83”).
- Display can be switched between Gross Weight / Net Weight / Totalised Weight / Number of transactions in the total.

Indication icons “◄”

ZERO ◄ **:** Zero Indication
STABLE ◄ **:** Stable weight Indication
GROSS ◄ **:** Gross weight Indication
NET ◄ **:** Net weight Indication

♦ The indicator is supplied with suitable labels to customise the icon displays.

♦ Refer to FNC-06 ~ FNC-09 for the various options available.

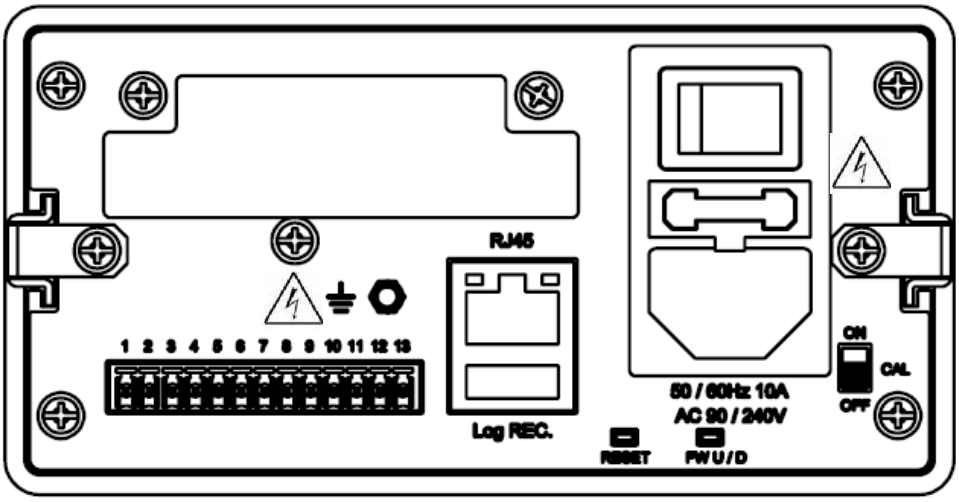
Weighing Units

- Weighing Units kg / g / t / lb.

USB Indicator

- USB icon is turned on when USB is connected; otherwise USB is not connected.

1-2 Rear panel



- 13 Way Terminal Block

1st	E+
2nd	E-
3rd	S+
4th	S-
5th	SEN-
6th	SEN+
7th	N/C
8th	N/C
9th	RS-232 RX
10th	RS-232 TX
11th	DGND
12th	RS-485 D+
13th	RS-485 D-

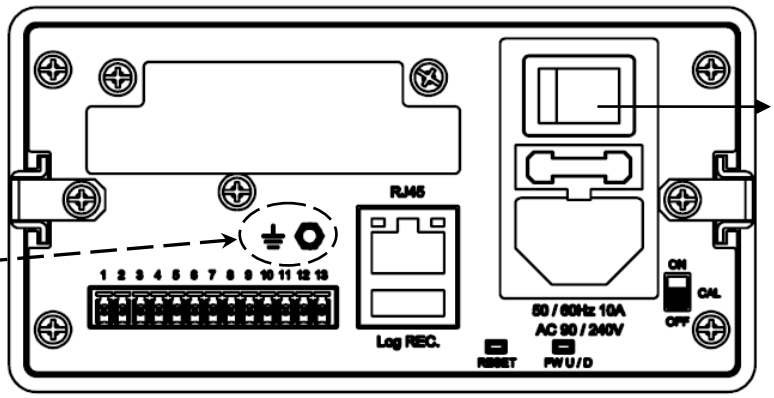
- Calibration Switch: set to the down is “OFF” and to the up is “ON”
- RESET: Press and release the "RESET" button to restart the system.
- Firmware update (FW U/D): Hold the "FW U/D" button while turning on 320S. After about 3 seconds, the LED panel will display "READY", and release the button to display "UPDATE". At this point, it has entered the firmware update mode. Please refer to Appendix 6 for more details of firmware update.
- ⚠ Fuse specifications for power socket: voltage 250Vac, current 0.5A, size 5x20mm.
- ⚠ Separate power cable specifications: H05VV-F. For your safety, please use the factory enclosed power cable or use power cable with the same specifications. For specifications, please refer to Appendix 7.

1-3 Suggestions to control and eliminate electrostatic interference

The industrial environment is prone to interference from the electrostatic field, the following suggestions to control and eliminate of electrostatic are provided in order to protect the normal operation of the equipment in this environment,

Use the screw next to the grounding symbol on the back panel of the chassis to wire connected to the weighing platform, and ensure chassis and platform are shorted. Please use a wire size ≧AWG18

Ground screw



If press ESC, 320S is not turned on. Please check if the switch at the back panel is at “|” position, which means “on”. If it is at “O”, that means “off”.

1-4 Keypad Description

 ESC	:	When entering data or reference setting, it means “ESC”. In the normal operation, it puts the indicator in standby mode or escape. **Entering standby mode:** All of the display (except ZERO “◂” symbol) and serial data output are disabled. **Escape from standby mode:** Re-power on mains for normal operation.
 Zero	:	When parameter setting, it moves the flashing digit left. In the normal mode, it performs a Zero operation.
 Tare	:	When parameter setting, it moves the flashing digit right. In the normal mode, it performs a semi-auto Tare operation.
 F1	:	When parameter setting, it increments the flashing digit or steps up the select item. In the normal mode, it accesses the FNC-05 setting. During power-on countdown, press this key to display firmware version.
 F	:	When parameter setting, it decrements the flashing digit or steps down the select item. In the normal mode, it accesses the FNC-04 setting.
 Enter	:	Confirm / enter key.

- Function FNC-03 can be used to selectively disable individual keys.
- Zero operation, will be limited by functions CSP-05 and CSP-10.
- Zero operation, will be limited by functions CSP-10 and CSP-11.

1-5 Specification

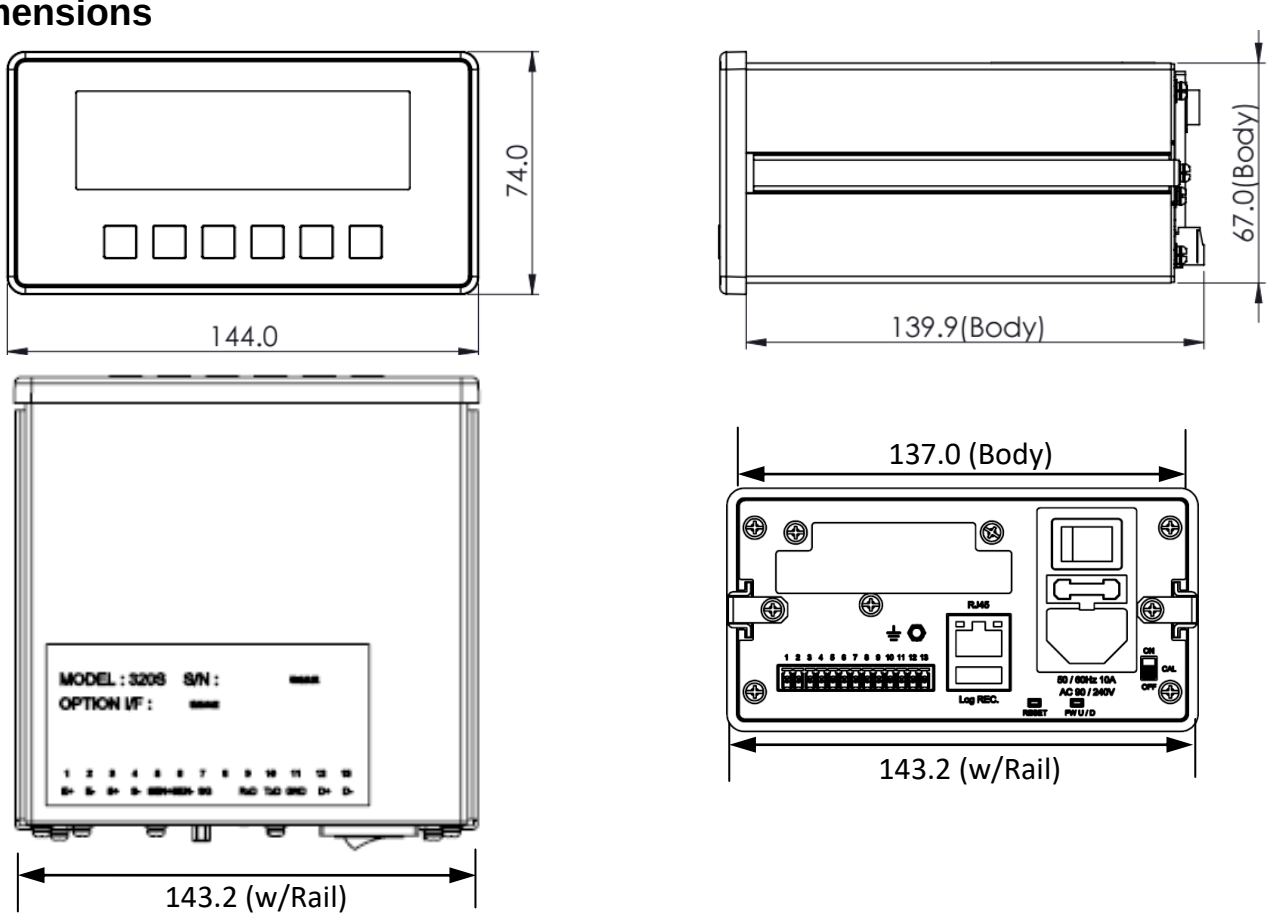
A/D Conversion

* Input Sensitivity : Over 0.2μV/d
* Max. Sampling Speed : 360 times/s
* Application Range : - 0.1 ~ 4.0 mV / V
* Load Cell Excitation Voltage : 5 V DC ±5%, 270 mA
  (Up to eight (8) 350 Ω load cells can be connected)

Power supply

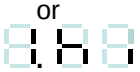
♦ AC 90V ~ 240V 50/60Hz and Power consumption is about 10 VA

Dimensions



Chapter 2 General Function Guide

2-1 Function Setup and Operation Procedures

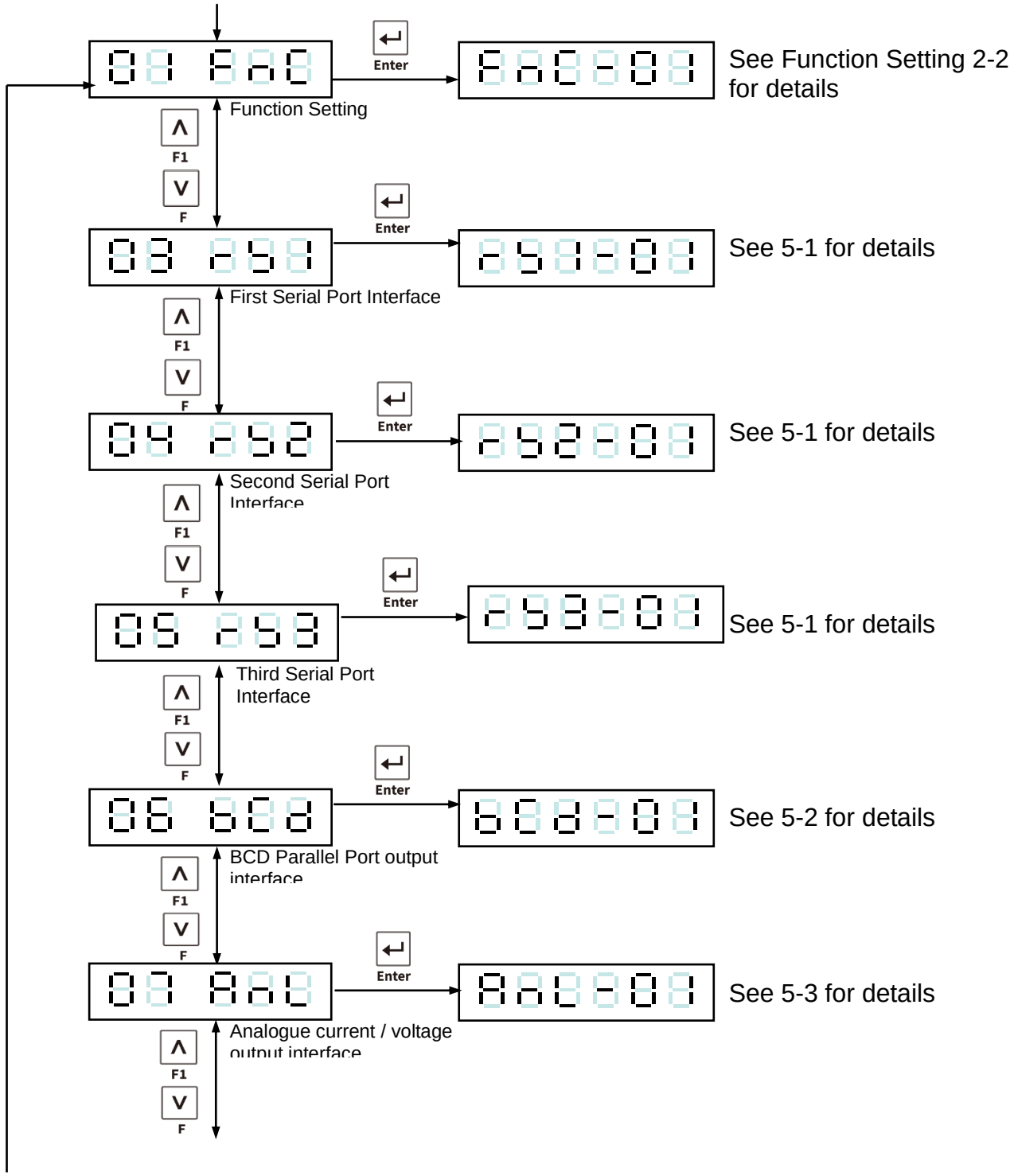
Function	Operation	Display	Description
Enter calibration mode	Turn the calibration switch to “ON”		See 3-2 for details
Enter function setting	Press Enter not release, then press F key after the power is turned on		See 2-2 for details
Reset all parameters back to default	Turn the power on then turn the calibration switch to “ON” then press and hold the F and Enter keys during the self-testing sequence		See 6-1 for details
Reset general function parameters back to default	Turn the power on and press F and Enter keys during self-testing sequence		See 6-2-1 for details
Clear zero point compensation and tare value	Turn the power on and press F and Enter keys during self-testing sequence, and then press F1 key		See 6-2-2 for details
Clear setpoint parameter setting	Turn the power on and press F and Enter keys during self-testing sequence, and then press F1 two times		See 6-2-3 for details
Value of zero point voltage(mV / V)	Turn the power on and Press F and Enter ,then press F1 key three times		See 6-2-4 for details
Value of Span voltage (mV / V)	Turn the power on and Press F and Enter , then Press F key		See 6-2-5 for details
Entering to test mode	Turn the power on and press ESC and Enter keys during self-testing sequence		See 6-3 for details
Check weighing setpoint parameter setting	Press the F key to set the parameter of FUNC.4 to 1 in the normal mode	 or 	See 4-2 for details

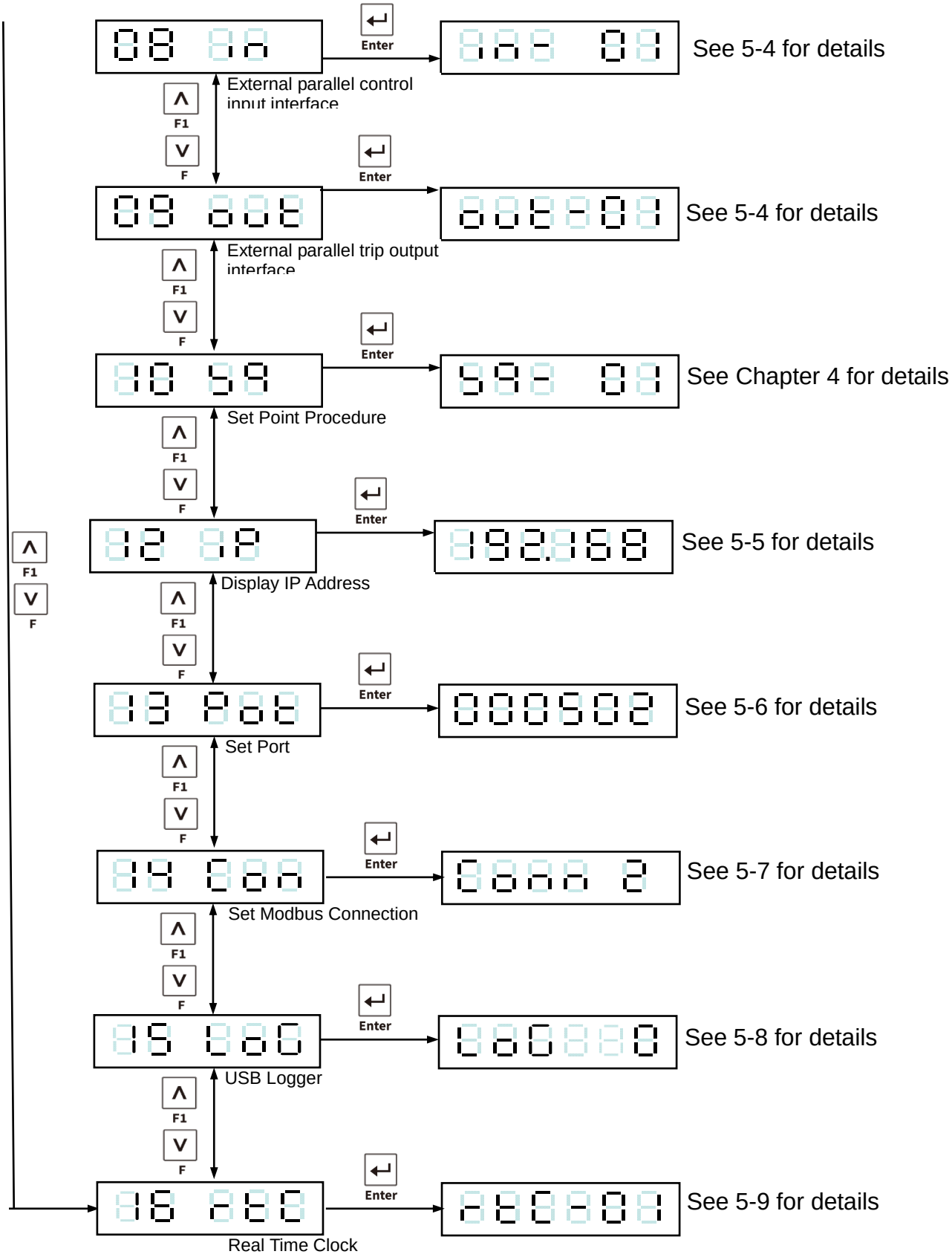
Key actions in function set up mode

∧ F1	⇒ Increment flashing digit	>	⇒ Move flashing point right
V F	⇒ Decrement flashing digit	↵ Enter	⇒ Store data in memory
< Zero	⇒ Move flashing point left	⏻ ESC	⇒ Exit / Escape

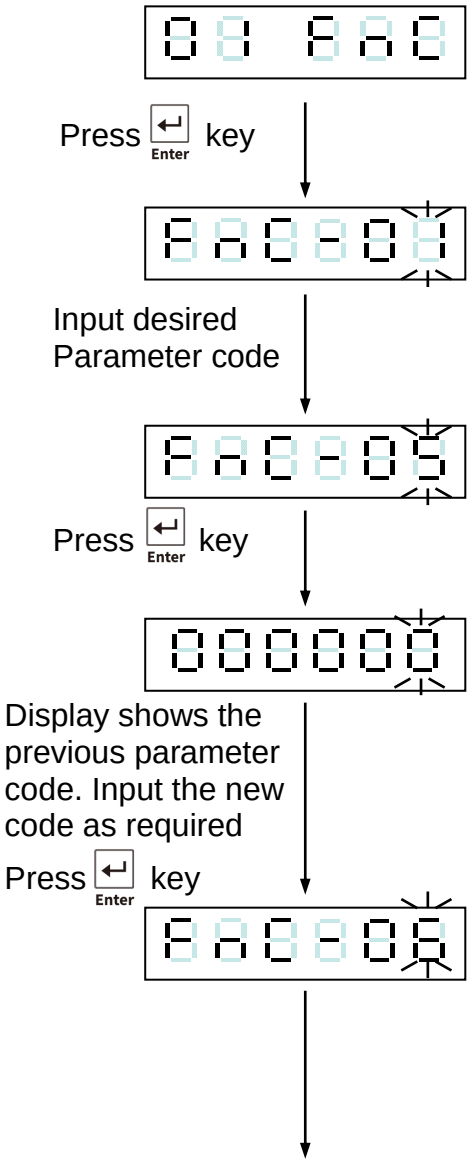
Function Setting Procedures

With weight displayed press and hold the ↵ Enter key. Then, press V F key




08 in
Enter
in- 01
See 5-4 for details
External parallel control input interface
F1
F
09 out
Enter
out-01
See 5-4 for details
External parallel trip output interface
10 sy
Enter
sy- 01
See Chapter 4 for details
Set Point Procedure
12 IP
Enter
192.168
See 5-5 for details
Display IP Address
13 Port
Enter
00502
See 5-6 for details
Set Port
14 Conn
Enter
Conn 2
See 5-7 for details
Set Modbus Connection
15 Usb
Enter
Usb 0
See 5-8 for details
USB Logger
16 rtc
Enter
rtc-01
See 5-9 for details
Real Time Clock

2-2 Function Setting 01 FnC



*Function Parameter code

- ⇒ Digital Filter I
- ⇒ Digital Filter II
- ⇒ Lock keypad function
- ⇒ “F” function setting
- ⇒ “F1” function setting
- ⇒ Front panel indication “◀” setting (first)
- ⇒ Front panel indication “◀” setting (second)
- ⇒ Front panel indication “◀” setting (third)
- ⇒ Front panel indication “◀” setting (fourth)
- ⇒ Terms of back to zero
- ⇒ Hold
- ⇒ Rate for display rewrite
- ⇒ Turn-on zero setting
- ⇒ Stand-by mode setting
- ⇒ Zero function record setting
- ⇒ Internal calibration password setting
- ⇒ Turn on/off watchdog
- ⇒ China Type Approval

∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

FNC Group function setting

<table>
<tr><th rowspan="2">Item</th><th rowspan="2">Function</th><th colspan="4">Setting value</th><th rowspan="2">Default</th></tr>
<tr><th>Parameter</th><th colspan="3">Description</th></tr>
<tr><td rowspan="10">FNC-01</td><td rowspan="10">Digital Filter I</td><td>0</td><td colspan="3" rowspan="10">Fast
↕
Slow</td><td rowspan="10">1</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td></tr>
<tr><td>9</td></tr>
<tr><td rowspan="6">FNC-02</td><td rowspan="6">Digital Filter II</td><td>0</td><td colspan="3">Disabled</td><td rowspan="6">3</td></tr>
<tr><td>1</td><td colspan="3" rowspan="5">Less filter
↕
Greater</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>FNC-03</td><td>Key – Locked</td><td>000000
↓
111111</td><td>0</td><td>Normal (lock disable)</td><td rowspan="2">The bits and front panel key positions are related to each other</td><td>000000</td></tr>
<tr><td></td><td></td><td>1</td><td>Close (lock enable)</td><td></td></tr>
<tr><td>FNC-04</td><td>“F” function setting</td><td colspan="4" rowspan="2">Parameter ⇒ Description
0 ⇒ Display Net / Gross weight
1 ⇒ Setpoint parameter setting
2 ⇒ Tare reset
3 ⇒ Manual serial, parallel print output
4 ⇒ Start load
5 ⇒ Stop load
6 ⇒ Start comparison
7 ⇒ Unload command
8 ⇒ Totalise weight and counts command
9 ⇒ Clear totalised weight and counts
10 ⇒ Hold mode
11 ⇒ Escape Hold mode(I / O DSP)
12 ⇒ Convert to Gross / Net / totalised weight / totalised Count
13 ⇒ Log (FNC-04 only)</td><td>1</td></tr>
<tr><td>FNC-05</td><td>“F1” function setting</td><td>0</td></tr>
</table>

Item	Function	Setting value		Default
		Parameter	Description	
FNC-06	Front panel indication "◀" setting (top)	Parameter ⇒ Description 0 ⇒ Zero 1 ⇒ Stable 2 ⇒ Gross 3 ⇒ Net 4 ⇒ Totalised weight (Accu. V) 5 ⇒ Totalised transactions (Accu. C) 6 ⇒ SP1 7 ⇒ SP2 8 ⇒ SP3 9 ⇒ Hi 10 ⇒ OK 11 ⇒ Lo 12 ⇒ Under 13 ⇒ Over 14 ⇒ Discharge 15 ⇒ Running 16 ⇒ Hold 17 ⇒ MD		0
FNC-07	Front panel indication "◀" setting (next to top)			1
FNC-08	Front panel indication "◀" setting (next to bottom)			2
FNC-09	Front panel indication "◀" setting (bottom)			3
FNC-10	Return to zero band (d: refer to CSP-03)	0	5 d	0
		1	10 d	
		2	20 d	
		3	40 d	
		4	60 d	
		5	80 d	
		6	100 d	
		7	150 d	
		8	200 d	
		9	250 d	
FNC-11	Hold	0	Hold	0
		1	Peak hold (positive 1)	
		2	Peak hold (negative)	
		3	Peak hold (absolute value)	
		4	Peak hold (positive 2)	
FNC-12	Rate for display rewrite	0	No limitation	0
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 time/s	

Item	Function	Setting value		Default
		Parameter	Description	
FNC-13	Turn-on zero setting	0	Disable	0
		1	Enable	
FNC-14	Stand-by mode setting	0	Disable all the functions under stand-by mode	0
		1	Only turn off display but not disable other functions under stand-by mode	
FNC-15	Zero function record setting	0	Zero point record not saved into EEPROM	0
		1	Zero point record saved into EEPROM	
FNC-16	Internal calibration password setting	0000	No password	0000
		0001	Password is set	
FNC-17	Turn on/off watchdog	1	Turn on watchdog	1
		0	Turn off watchdog	
FNC-18	China Type Approval	0	Non-approval	0
		1	China Type Approval	

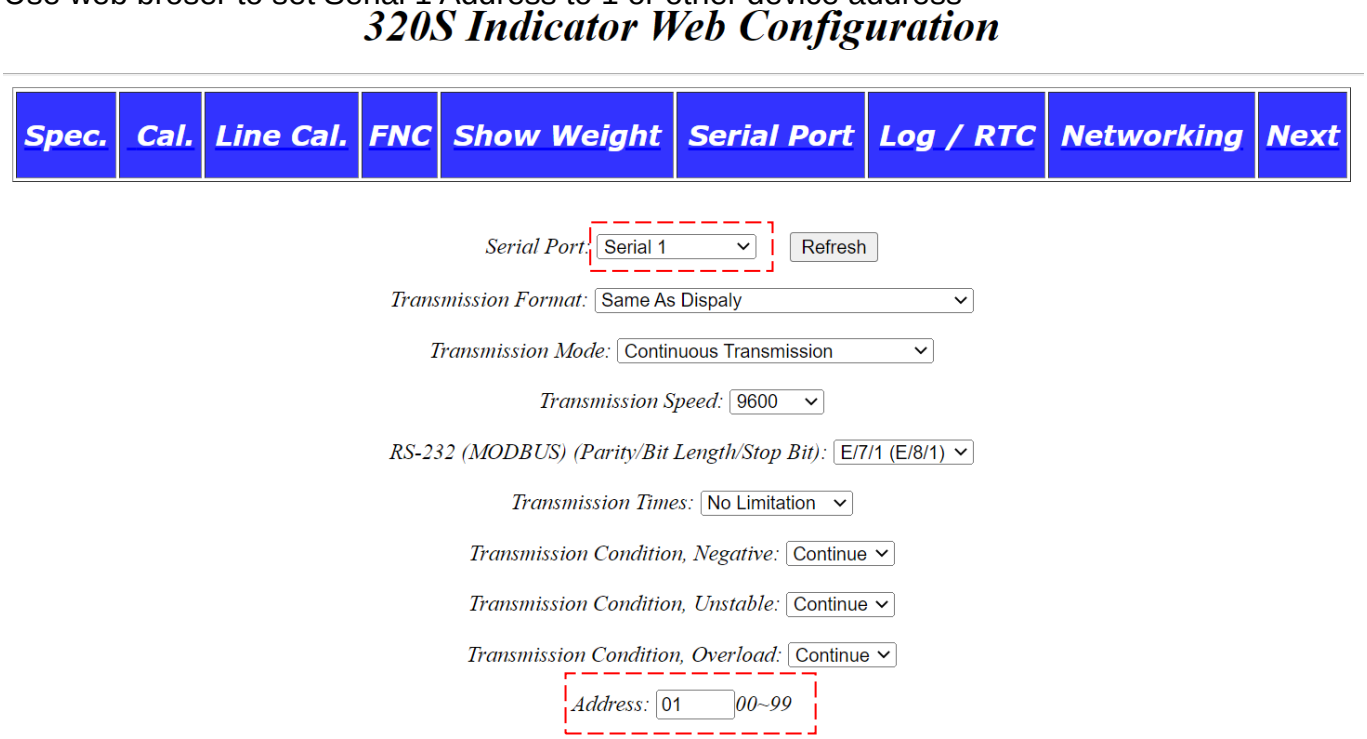
2-3 MODBUS Over TCP/IP Test Method

1. Connect 320S and PC/Notebook to the same HUB with RJ-45 cable.
2. Turn on 320S
3. Open terminal or PowerShell software on PC/Notebook side and execute “ping 192.168.1.210”

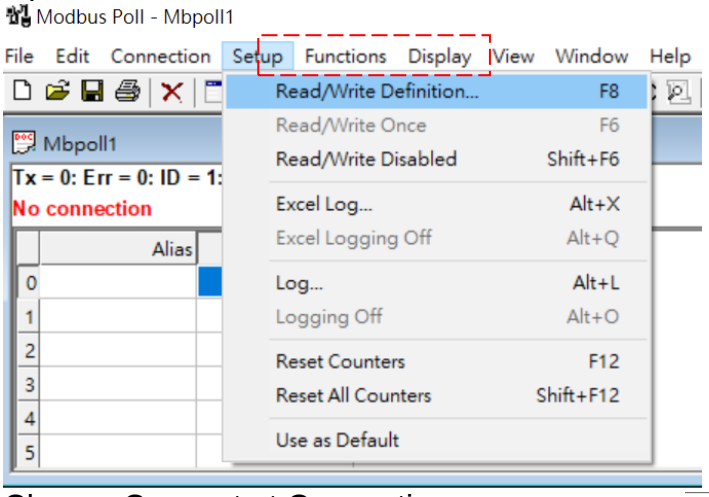
```
PS C:\Users\Jonathan Chang> ping 192.168.1.210

Pinging 192.168.1.210 with 32 bytes of data:
Reply from 192.168.1.210: bytes=32 time=719ms TTL=255
Reply from 192.168.1.210: bytes=32 time=1ms TTL=255
Reply from 192.168.1.210: bytes=32 time<1ms TTL=255
Reply from 192.168.1.210: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.210:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 719ms, Average = 180ms
```

If the 320S does not respond, please recheck the network connection or restart the 320S

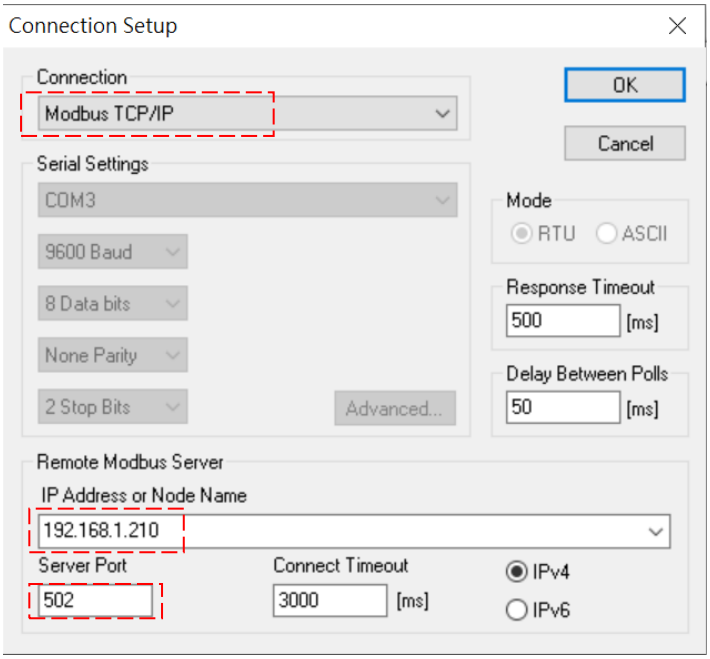
4. Use web broser to set Serial 1 Address to 1 or other device address



5. Open the MODBUS Poll software and select Read/Write Definition in the Setup menu

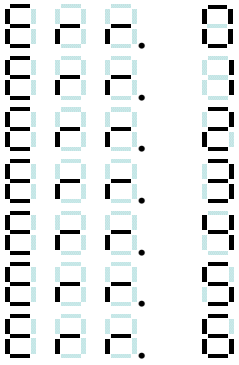


6. Choose Connect at Connection menu :
   6.1 Choose “Modbus TCP/IP” at Connection
   6.2 Choose “192.168.1.210” at IP Address or Node Name
   6.3 Choose “502” at Server Port



7. Follow RS485 MODBUS test method for Function 1, 3, 5, 6, 15 and 16

2-4 Error Messages (Display in General Function setting)



⇒ Load Cell output voltage < - 0.1m V / V or > 4mV / V

⇒ Weight value ≤ previous weight value

⇒ Actual measured weight value ≤ previous weight value

⇒ Setting value 0

⇒ mV / V value entered > measuring range

⇒ mV / V value entered is too small (SPAN – Zero < 0 mV / V)

⇒ Displayed resolution is less than 0.12 μV / division

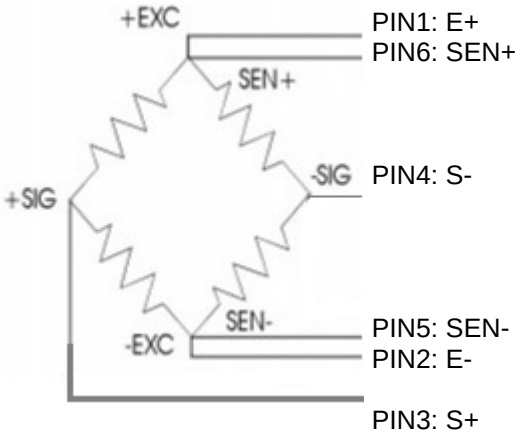
2-5 Set internal calibration password (FNC-16)

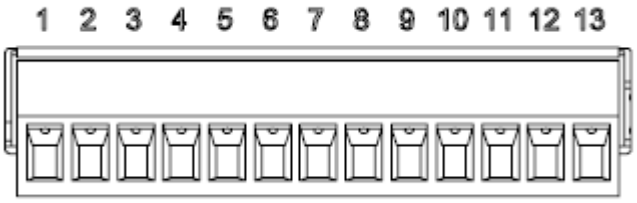
The default value of FNC-16 is 0000, which means internal calibration without password. To set a password, enter 4-digit numbers (other than 0001, 0000) and press confirm key to complete. If password is set to 0001, error message “UN.VALI” will appear.

If password has been set, FNC-16 will display 0001. To change password, it must enter the previously set password first. If entered password is wrong, it displays “PW ERR”. If entered password is correct, it displays “NEW PW” and then enters 4-digit numbers (other than 0001) for new password or enters 0000 to remove password. If password is forgotten, it must reset to factory setting.

Chapter 3 Calibration

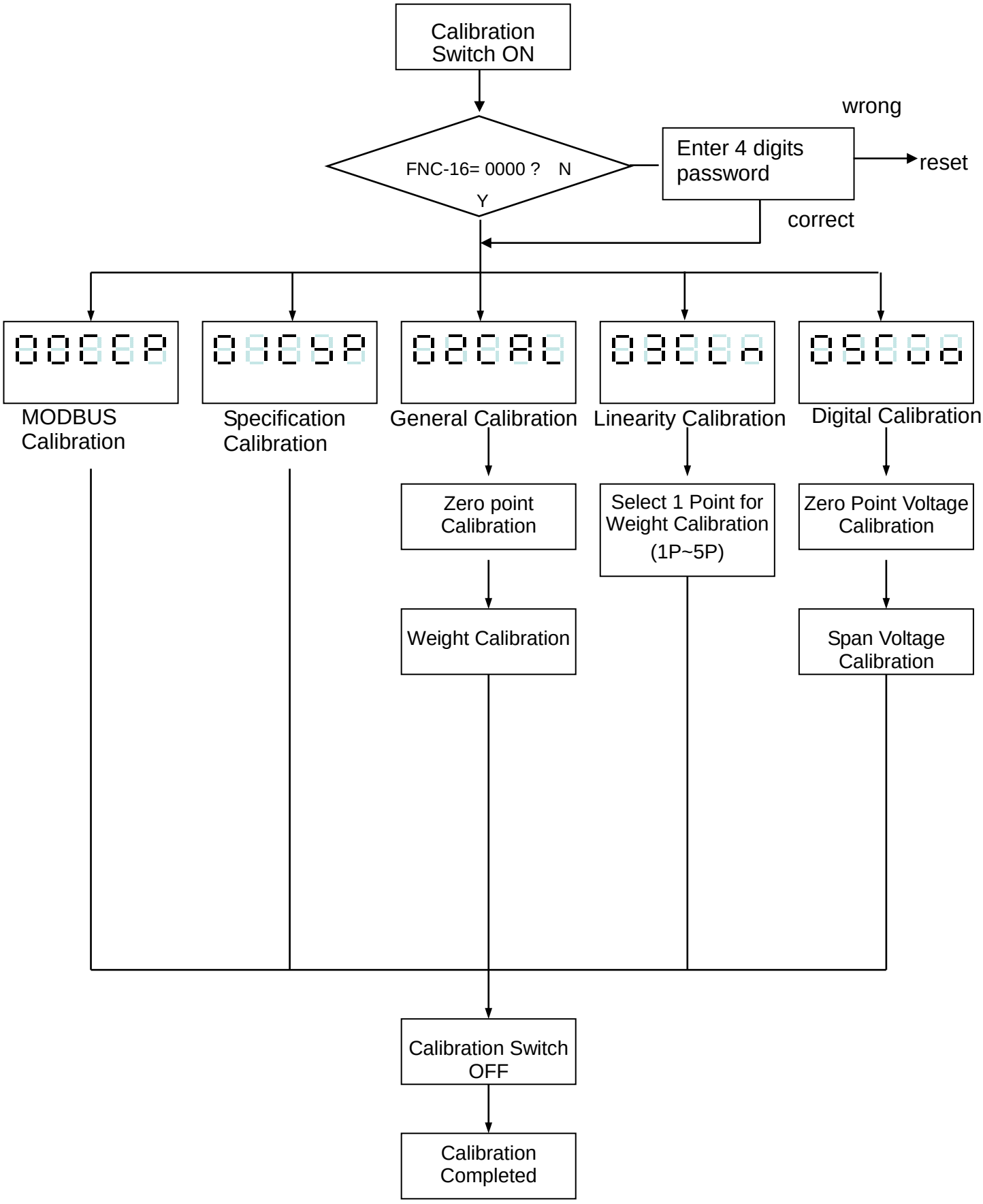
3-1 4 Wire Load Cell Connection



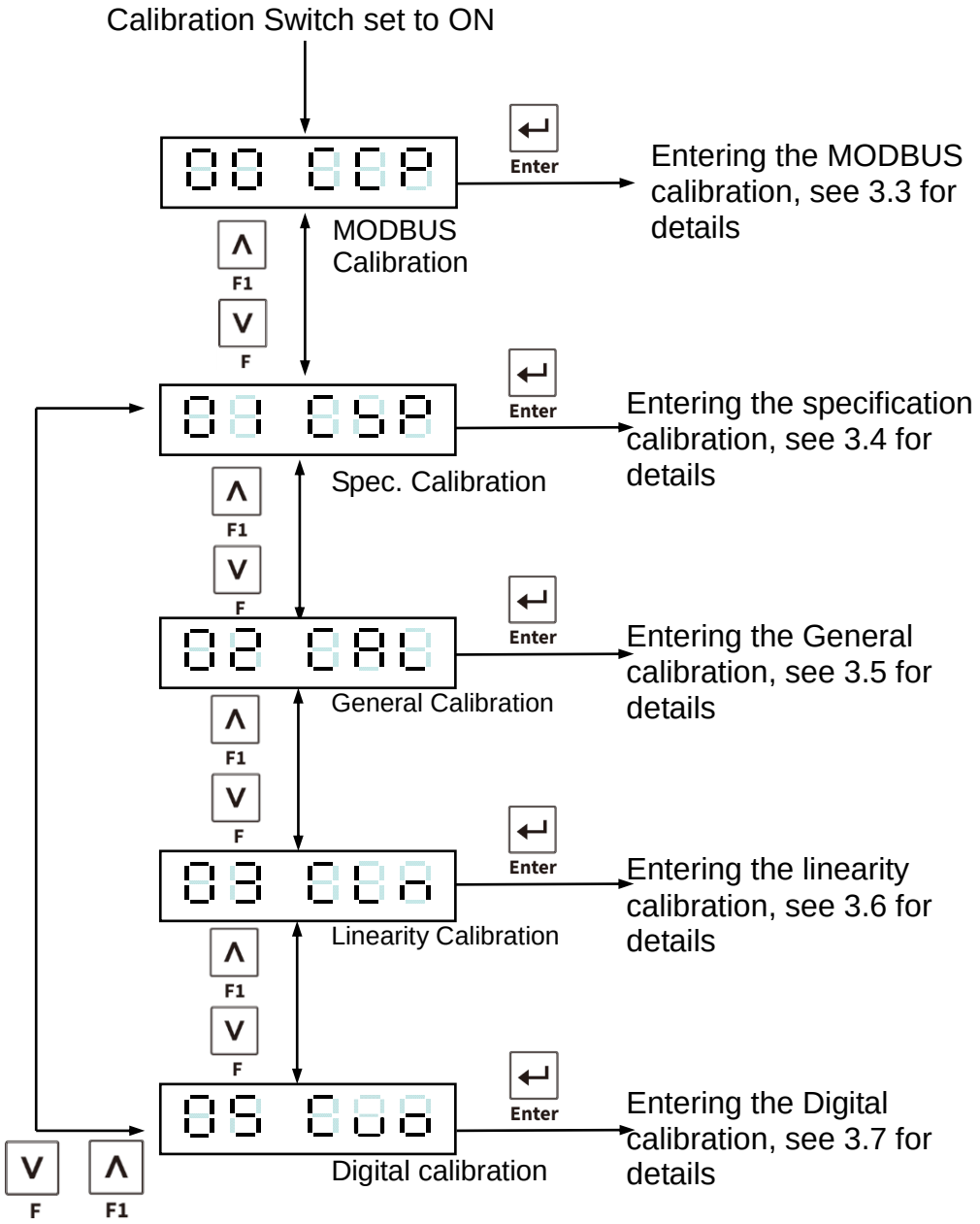


PIN	Name
1	E+
2	E-
3	S+
4	S-
5	SEN-
6	SEN+

3-2 Parameter Setting and Calibration Flow Chart



Calibration process



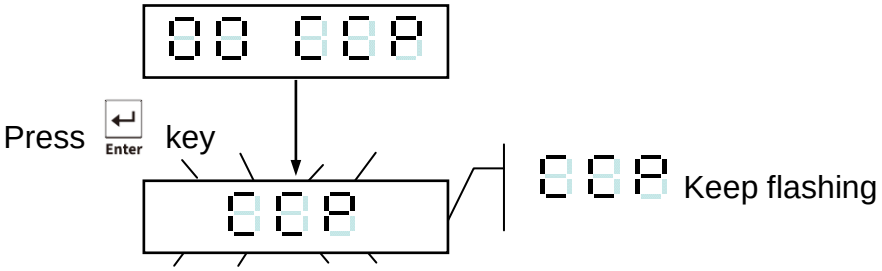
Before the Linearity Calibration, the General Calibration should be completed.

3-3 MODBUS Calibration

- RS1-02 set as “4” (MODBUS RTU mode)

  RS1-07 set as “01” (scale’s address)

  a. CAL Switch set to ON and set 00 CCP = CCP, or



  b. CAL Switch set to OFF

Eg:

Zero calibration

Input 01050423FF007CC0 ← zero calibration

Reading calibration status

1. Command: Input 010100410005AC1D
   First 01 is scale’s address. Second 01 is command. 00 41 (decimal number 65) is MODBUS address. 00 05 means continuously inquire 5 addresses, i.e. 65, 66, 67, 68, 69.
2. Scale’s reply: 01010105919B
   First 01 is scale’s address. Second 01 is command. Third 01 means reply with 1 byte, i.e. the subsequent 05 is binary 0000 0101 – if first bit is 1, that means Address 65 (decimal) is set to 1 ➔ performing zero calibration, and so on. If second bit is zero, then span calibration has no action. Please refer to “Appendix 3: MODBUS Data Address Table”. After zero calibration has finished without Err message, zero calibration is completed.

Span calibration

Input weight calibration value 3000

Input 0110044C0001020BB8EADE ← Input weight calibration value 3000

Put 3kg on the platter

Span calibration

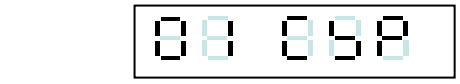
Input 01050424FF00CD01 ← Span calibration

Reading calibration status

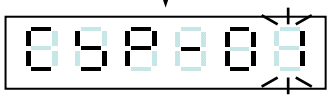
1. Command: Input 0101004200015DDE
2. Scale’s reply: 010101019048
   First 01 is scale’s address. Second 01 is command. Third 01 is scale’s reply byte count. Fourth 01 is binary 0000 0001, which means address – if first bit

is 1, that means Address 66 (decimal) is set to 1, i.e performing span calibration. Please refer to “Appendix 3: MODBUS Data Address Table”. After zero calibration has finished without Err message, zero calibration is completed. 9048 is CRC error detecting code.

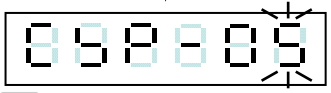
3-4 Specification calibration 01 CSP



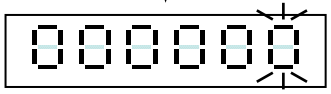
Press Enter key



Key in calibration code

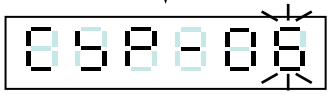


Press Enter key



Display shows the previous parameter code. Input the new code as required

Press Enter key



To continue the next function setting or press ESC key to escape

*Calibration parameter code

 ⇒Unit

 ⇒Decimal Point

 ⇒Min. Division

 ⇒Max. Capacity

 ⇒Zero Range

 ⇒Time of Zero tracking

 ⇒Range of Zero tracking

 ⇒Investigate period of unstable

 ⇒Investigate range of unstable

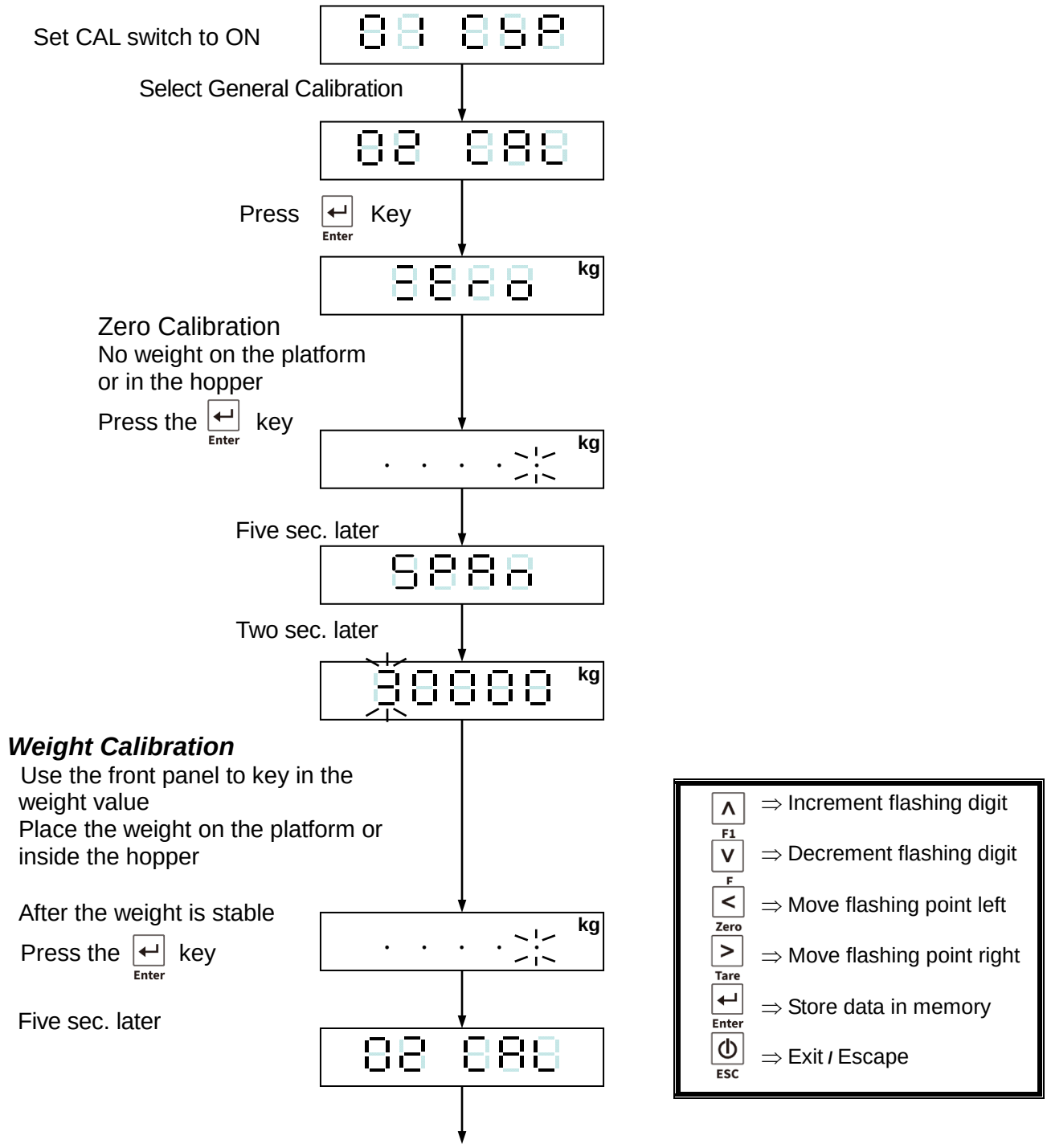
 ⇒Function Zero and Tare when the weight is unstable

 ⇒Tare function availability when gross weight is negative

∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
CSP-01	Unit	0	None	2
		1	g	
		2	Kg	
		3	t	
		4	lb	
CSP-02	Decimal Point	0	None	0
		1	1 Decimal Point	
		2	2 Decimal Point	
		3	3 Decimal Point	
CSP-03	Division	1	Division size	1
		2		
		5		
		10		
		20		
		50		
CSP-04	Max. Capacity	999999 ↓ 000000	Max. capacity	999999
CSP-05	Zero range	0 =full range (±1%~30%)	Zero range = calibration zero point ± (Max. capacity×setting value %)	0
CSP-06	Time of zero tracking	0.0 ~ 5.0 (sec)	Time and range of zero tracking should be use at the same time. If the time is set to 0.0, the zero tracking function is disabled	1.0
CSP-07	Range of zero tracking	0 ~ 9	Range of zero tracking = (setting value×½)D , D=min. division Range and time of zero tracking should be use at the same time. If the range is set to 0, the zero tracking function is disabled	2
CSP-08	Investigate time in stable	0.0 ~ 5.0 (sec)	Investigate time and range should be use at the same time. If the time is set to 0.0, the investigate time is disabled	1.0
CSP-09	Investigate range in stable	0 ~ 9	Investigate time and range should be use at the same time. If the range is set to 0, the investigate range is disabled	2
CSP-10	Weight unstable, function ZERO and TARE	0	Action	0
		1	None	
CSP-11	Gross Weight is negative, function TARE	0	Action	0
		1	None	

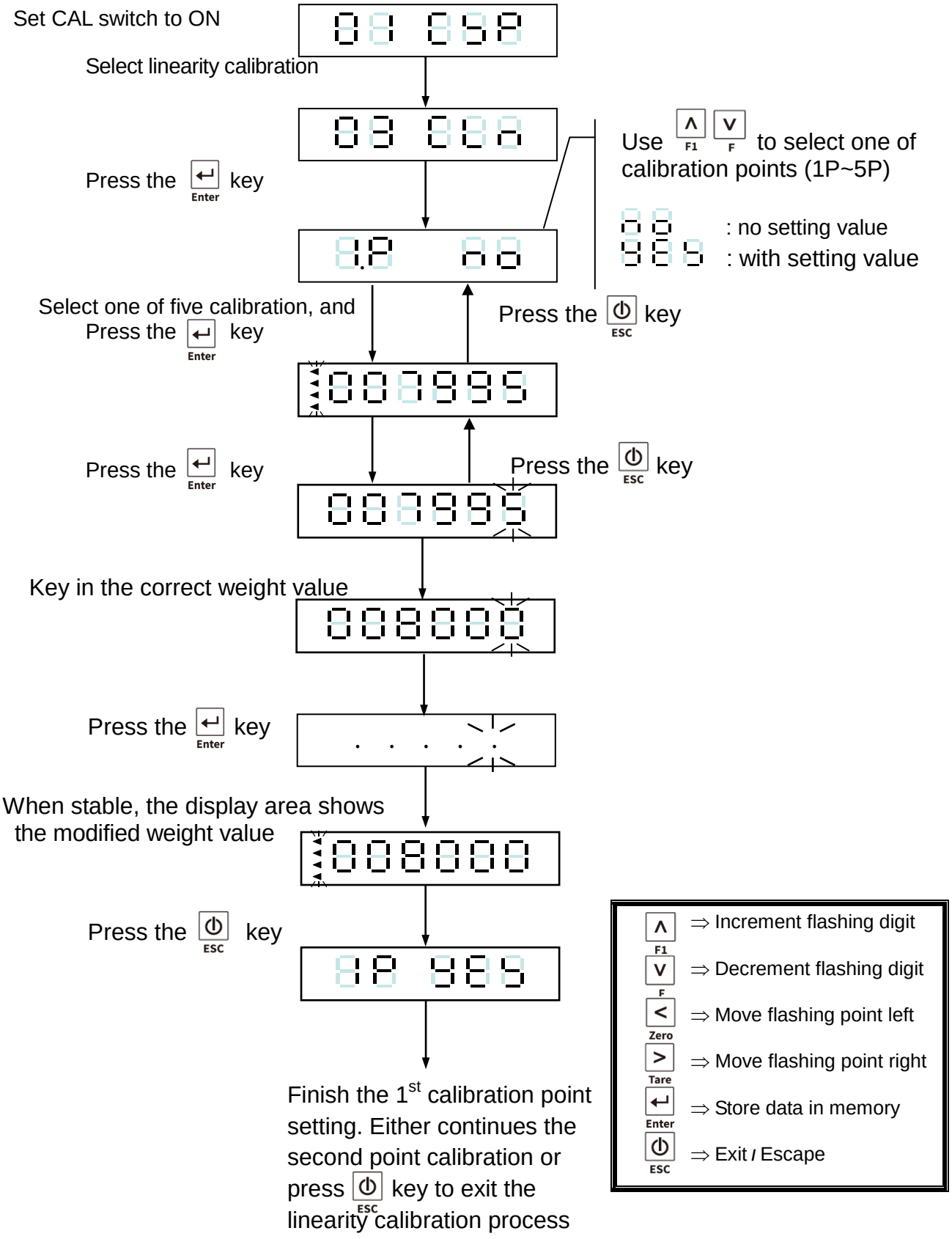
3-5 General Calibration 02 CAL



- Zero calibration only, press ESC key to escape after the display shows SPAn.
- Span calibration only, press ESC key entering directly to span calibration after the display shows Espa .
- Please refer to error message during calibration of the display show Err. **X** .

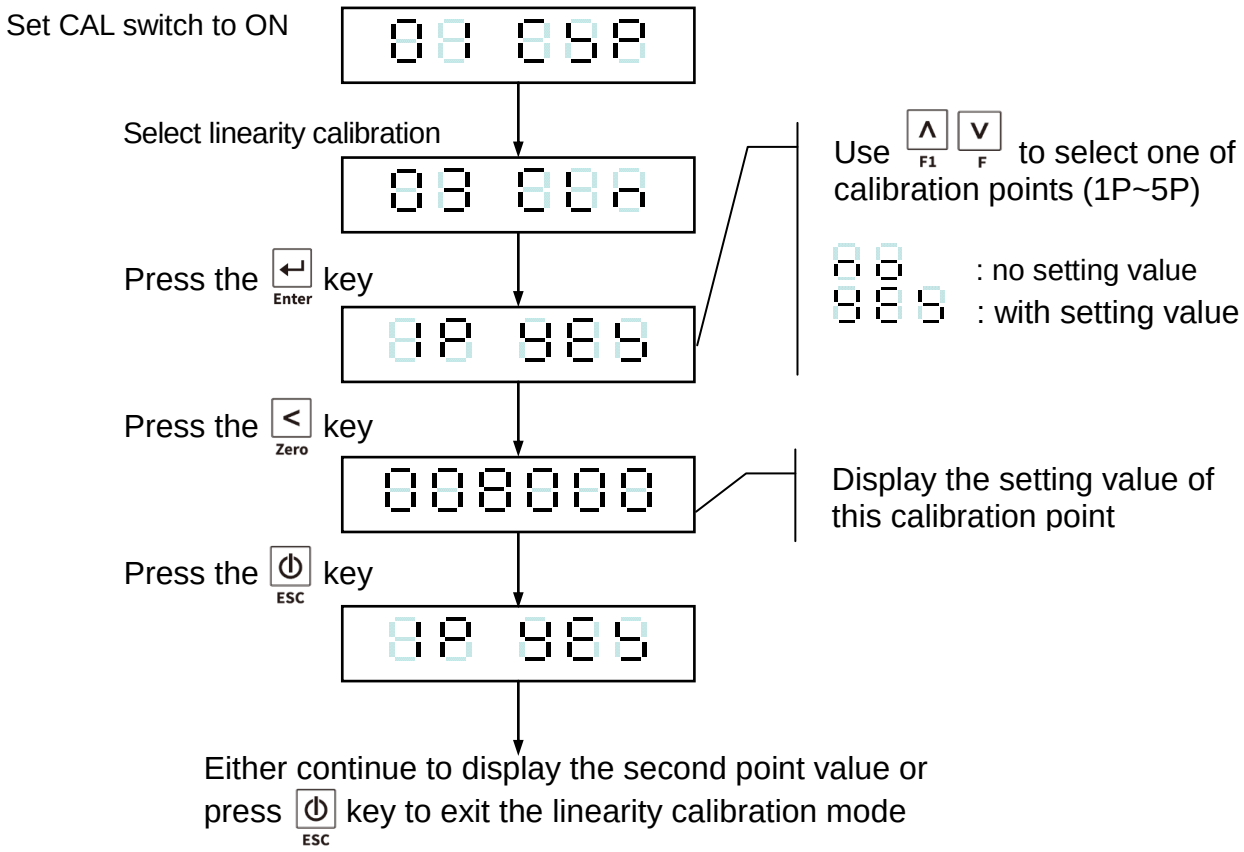
3-6 Linearity calibration 03 CLn

Before the Linearity calibration, the General calibration should be completed.

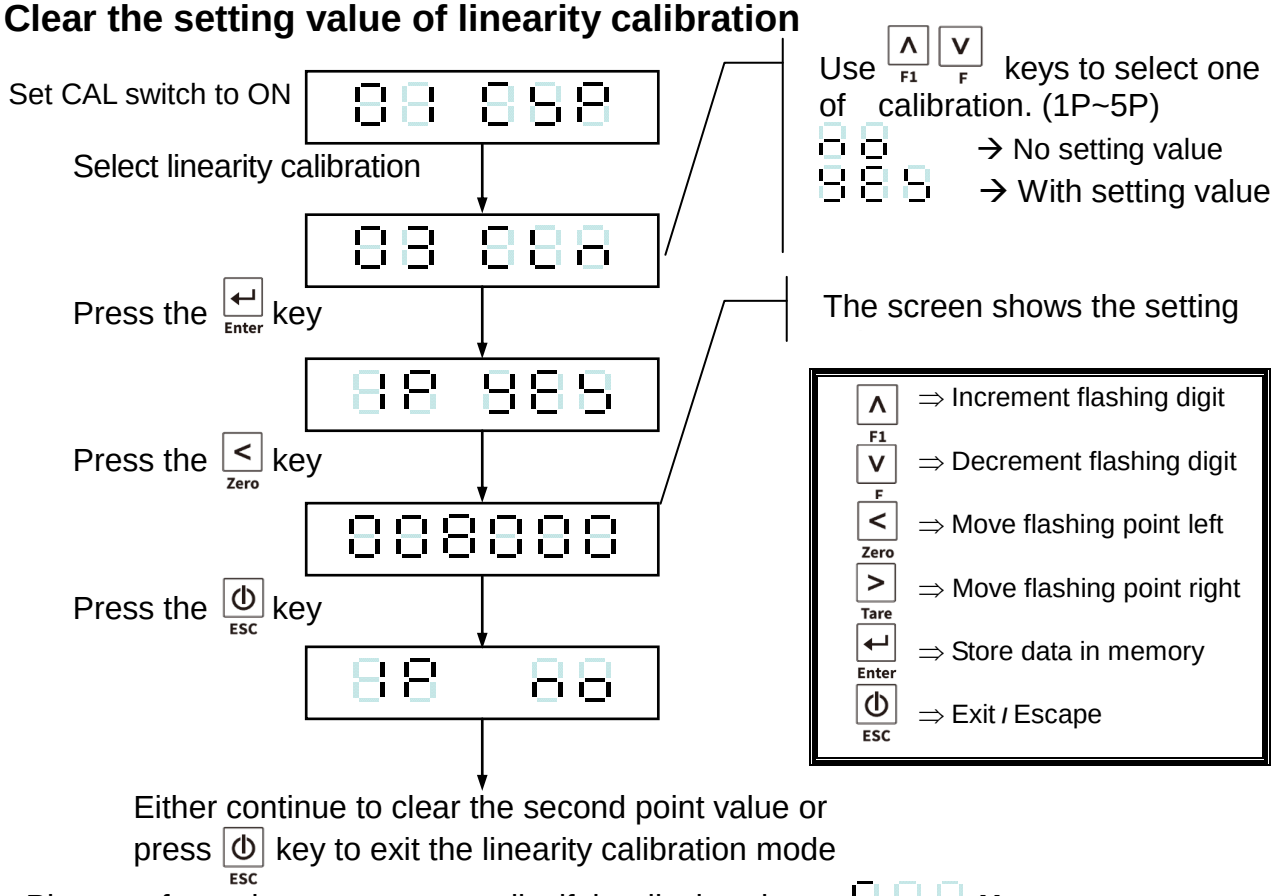


Please refer to the error message list if the display shows Err.X .

Display the setting value of linearity calibration



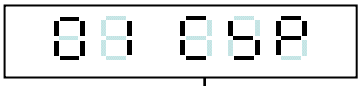
Clear the setting value of linearity calibration



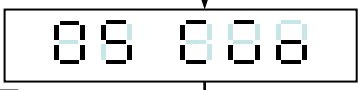
Please refer to the error message list if the display shows Err.X .

3-7 Digital calibration 05 Cvo

Set CAL switch to ON

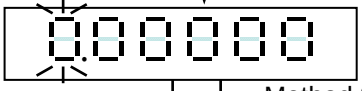


Select Digital calibration



Press the Enter Key

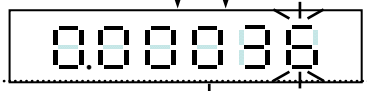
Two sec. later



Zero voltage calibration.

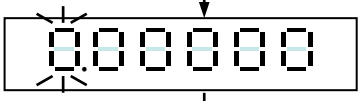
Method 1
Input zero voltage

Method 2
With no weight on the platform or in the hopper press the Enter key to set zero.



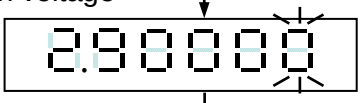
Press the Enter key

Two sec. later



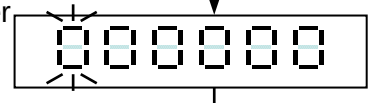
Span voltage calibration

Input the span voltage



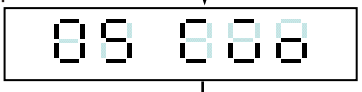
Press the Enter key

Two sec. later



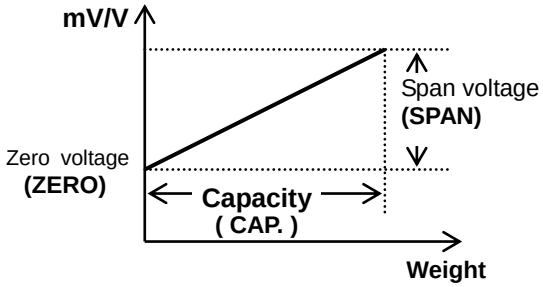
Enter the weighing capacity

Press the Enter key



Display shows nothing after calibration

Example:



Zero Voltage ⇒ 0.00036 mV/V(incl. dead load)
Span Voltage ⇒ 2.90000 mV/V
Capacity ⇒ 30 000 divisions

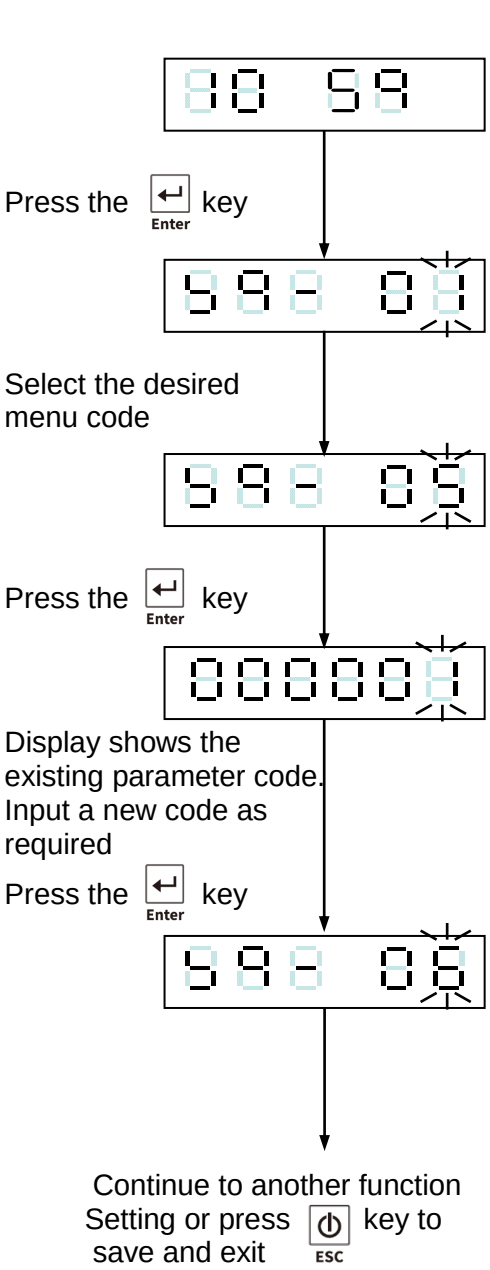
∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

Calibration completed set calibration switch to the OFF position

Please refer to the error message list if the display shows **Err. X** .

Chapter 4 Weight Comparison Procedures

4-1 Function Configuration Menu



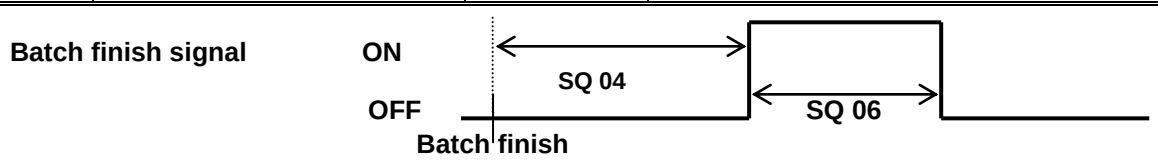
*Item code

- 59- 01 ⇒ Batching mode
- 59- 02 ⇒ Batching start delay time
- 59- 03 ⇒ Compare SP1 & SP" waiting time
- 59- 04 ⇒ Batch finishes output signal delay time
- 59- 05 ⇒ Batch finish condition
- 59- 06 ⇒ Batch finish output signal duration
- 59- 07 ⇒ Supplementary load times
- 59- 08 ⇒ Supplementary loading gate open time
- 59- 09 ⇒ Supplementary loading gate closed time
- 59- 10 ⇒ Discharge start delay time
- 59- 11 ⇒ Discharge stop delay time
- 59- 12 ⇒ Discharge time
- 59- 13 ⇒ Restart delay time
- 59- 14 ⇒ Batching times
- 59- 15 ⇒ Weight completed value in Zero band
- 59- 16 ⇒ Hi, OK, Lo action mode
- 59- 17 ⇒ Auto totalise weight / counts
- 59- 18 ⇒ The parameter source for weight comparison
- 59- 19 ⇒ Weight comparison delay time
- 59- 20 ⇒ Tare auto
- 59- 21 ⇒ Discharge auto

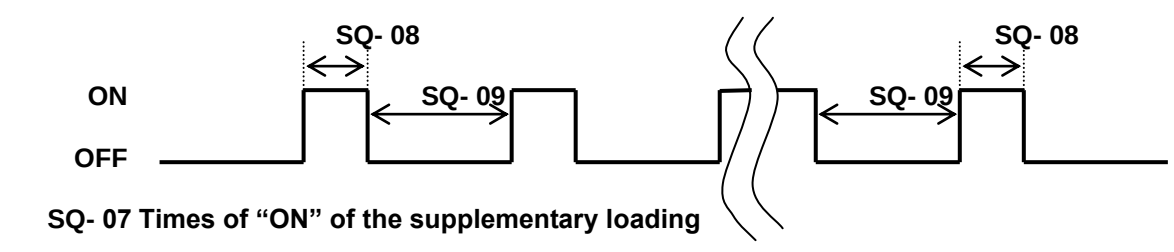
∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

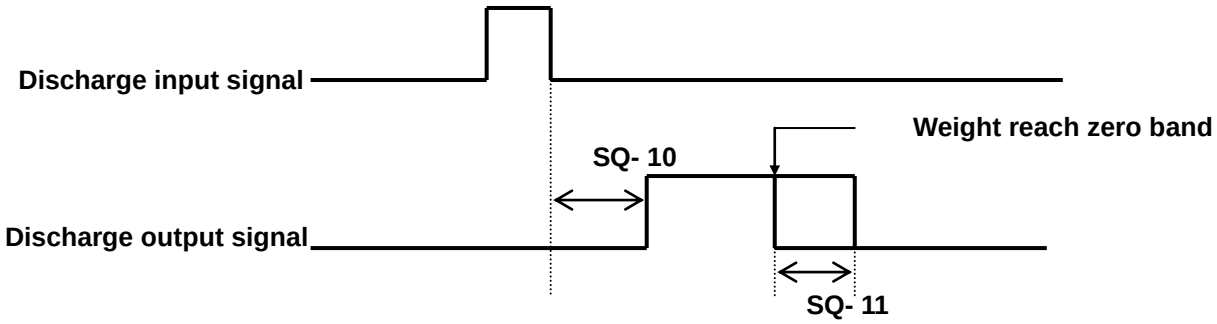
Functional Parameter Instruction

Item	Function	Setting value		Default
		Parameter	Description	
SQ- 01	Batching mode	1	Normal batch	1
		2	Loss-in weight	
		3	Comparison mode	
		4	Normal batch (Built-in program)	
		5	Loss-in weight (Built-in program)	
		6	Hold mode (Built-in program)	
		9	Close flow control	
SQ- 02	Batching start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program starts the batch comparison procedure after the input of the batch start signal	0.0
SQ- 03	SP1,SP2 Waiting time comparison	0.0 ~ 25.5 (sec)	No full flow comparison during this function's set time period. If the set value is 0, indicates this function is not in use	0.0
SQ- 04	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finished signal after this delay time	0.5
SQ- 05	Batch finish Condition	0	Wait until the weight is stabilized	0
		1	No need to wait until the weight has stabilized	
SQ- 06	Batch finish Output signal time	0.0 ~ 25.5 (sec)	Batch finished output signal time. If set to 0, the output signal will be off until the next batch start	1.0



SQ- 07	Number of Times the supplementary loading function operates	0 ~ 255	If the set value is 0, this function is not in use	0
SQ- 08	Supplementary loading gate open time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	0.1
SQ- 09	Supplementary loading gate close time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	1.0



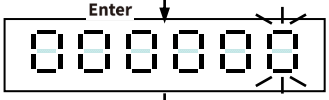
Item	Function	Setting value		Default
		Parameter	Description	
SQ- 10	Discharge start delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is ON	0.0
SQ- 11	Discharge stop delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is OFF	0.0
SQ- 12	Discharge time	0.0 ~ 25.5 (sec)	Won't activate internal discharge control function, if set to 0	0
				
SQ- 13	Restart delay time	0.0 ~ 25.5 (sec)	Delay time before Restart signal is ON	1.0
SQ- 14	Batching counts	0 ~ 255 (times)	Number of batch runs 0 ⇒ one batch only	0
SQ- 15	Set the zero band in to final weighing value	0	No setting	0
		1	Setting	
SQ- 16	Hi, OK, Lo	0	Comparison anytime	0
		1	To compare at batch finish	
		2	To compare at external input signal	
		3	To compare at batching finish and external input signal	
		4	Comparison auto	
SQ- 17	Auto totalise weight / counts	0	Disabled	0
		1	Enabled	
SQ- 18	The parameter source in weight comparison	0	Key in directly from front keypad	0
		1	Input directly from rear interface	
SQ- 19	Weight comparison delay time	0.0 ~ 25.5 (sec)	Comparison delay time for Hi, OK, Lo	0.5
SQ- 20	TARE auto.	0	Press keypad TARE to TARE	0
		1	TARE auto	
SQ- 21	Discharge auto	0	Input from external input or keypad	0
		1	Discharge auto + manual	

4-2 Check Weighing Configuration

1. FNC-04 = 1, SQ-01 = 1, 2, 4 or 5

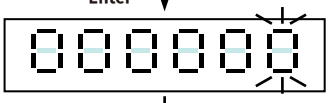
Press the V F key

Enter



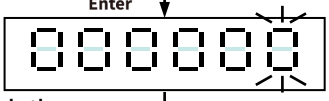
Display shows the existing **Final value** setting, Input new value as required.
Press the Enter key

Enter



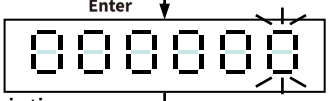
Display shows the existing **SP1 value** setting, Input new value as required.
Press the Enter key

Enter



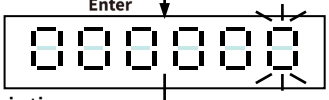
Display shows the existing **SP2 value** setting, Input new value as required.
Press the Enter key

Enter



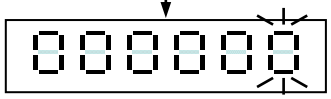
Display shows the existing **Free Fall value** setting, Input new value as required.
Press the Enter key

Enter



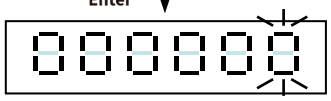
Display shows the existing **Over value** setting, Input new value as required.
Press the Enter key

Enter



Display shows the existing **Under value** setting. Input new value as required.
Press the Enter key

Enter

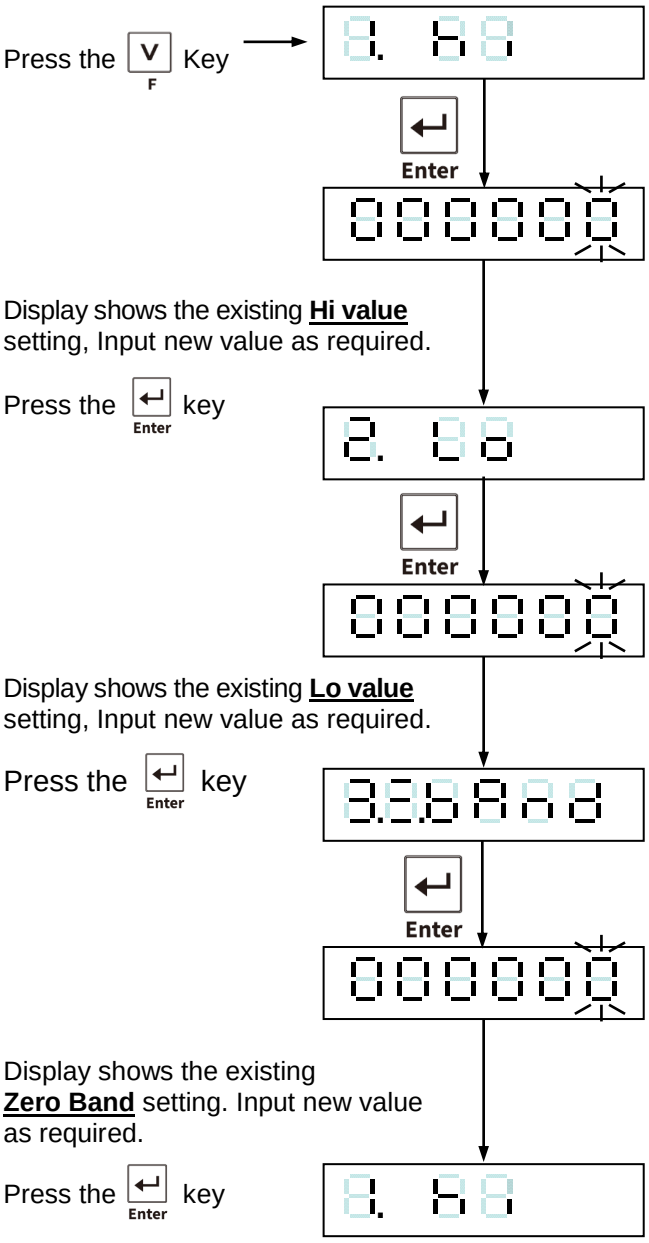


Display shows the existing **Zero Band**. setting. Input new value as required.
Press the Enter key

Enter

∧ F1	⇒ Increment flashing digit
V F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

2. FNC-04 = 1, SQ-01 = 3

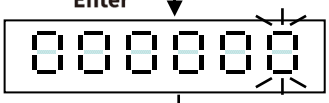


∧ F1	⇒ Increment flashing digit
V F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

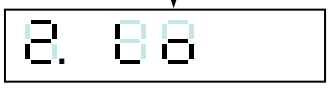
3. FNC-04 = 1, SQ-01 = 6

Press the V F key →

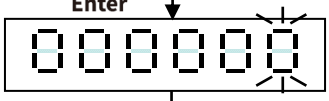
Enter



Display shows the existing **Hi value** setting,
Input new value as required.
Press the Enter key

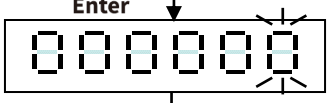


Enter

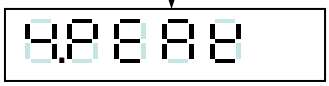


Display shows the existing **Lo value** setting,
Input new value as required.
Press the Enter key

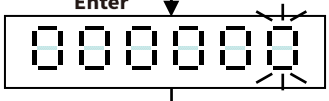
Enter



Display shows the existing **Zero Band** setting, Input new value as required.
Press the Enter key



Enter



Display show the existing **Peak Ready value** setting. Input new value as required.
Press the Enter key

∧ F1	⇒ Increment flashing digit
V F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

4-3 Batching Signal Outputs

Normal batching signal outputs

Signal	Output condition
SP1	Net ≥ Final(value) - SP1(value)
SP2	Net ≥ Final(value) - SP2(value)
SP3	Net ≥ Final(value) – Free Fall (in-flight) (value)
Under	Net < Final(value) – Under(value)
Over	Net ≥ Final(value) + Over(value)
Zero Band	Gross ≤ Zero Band(value)

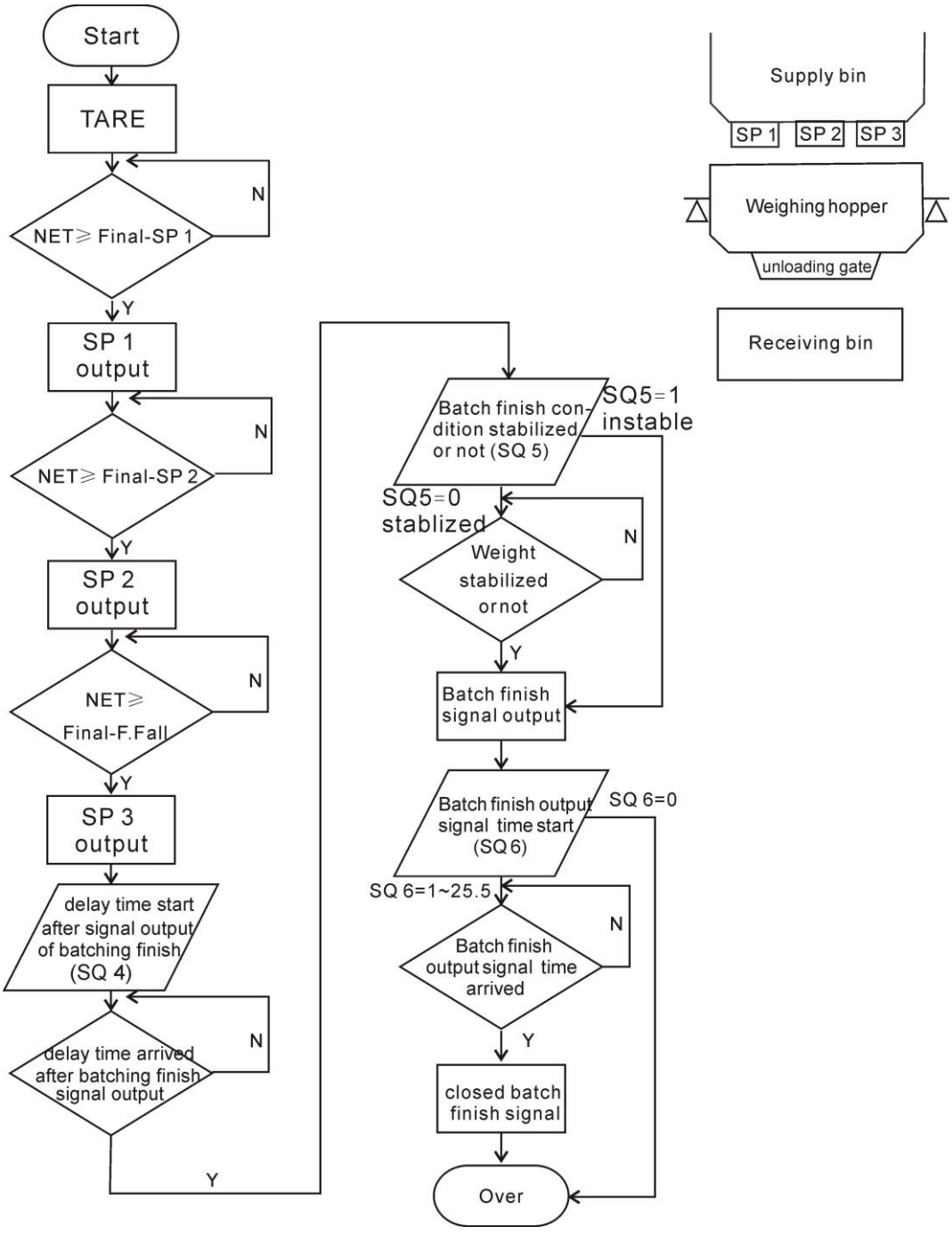
Loss-in-weight signal outputs

Signal	Output condition
SP1	Gross ≥ SP1(value)
SP2	- Net ≥ Final(value) – SP2(value)
SP3	- Net ≥ Final(value) – Free Fall (in-flight) (value)
Under	- Net < Final(value) – Under(value)
Over	- Net ≥ Final(value) + Over(value)
Zero Band	Gross ≤ Zero Band(value)

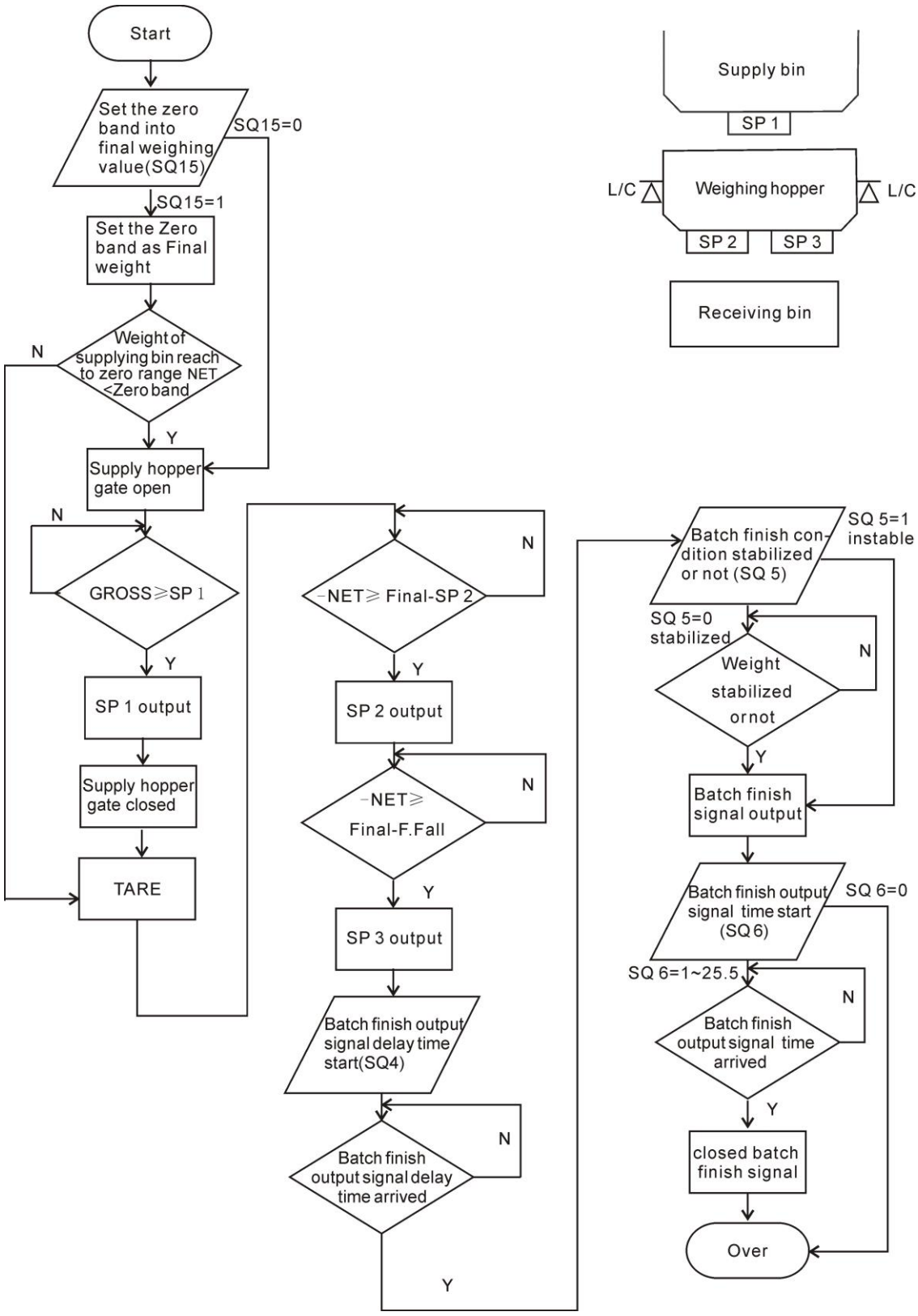
Hi, OK, Lo signal outputs

Setting		Signal	Output condition
SQ01	SQ16		
1,2,4,5	1,3	Under	Net < Final(value) – Under(value)
3	0,2,4		Net <Lo(value)
1,2,4,5	1,3	Over	Net ≥ Final(value) + Over(value)
3	0,2,4		Net ≥ HI(value)
1,2,4,5	1,3	OK	Final(value) – Under(value)≤Net < Final(value) + Over(value)
3	0,2,4		Lo(value)≤Net<Hi(value)
1,2,4,5	1,3	LO	Net < Final(value) – Under(value)
3	0,2,4		Net < Lo(value)
1,2,4,5	1,3	HI	Net ≥ Final(value) + Over(value)
3	0,2,4		Net ≥HI(value)

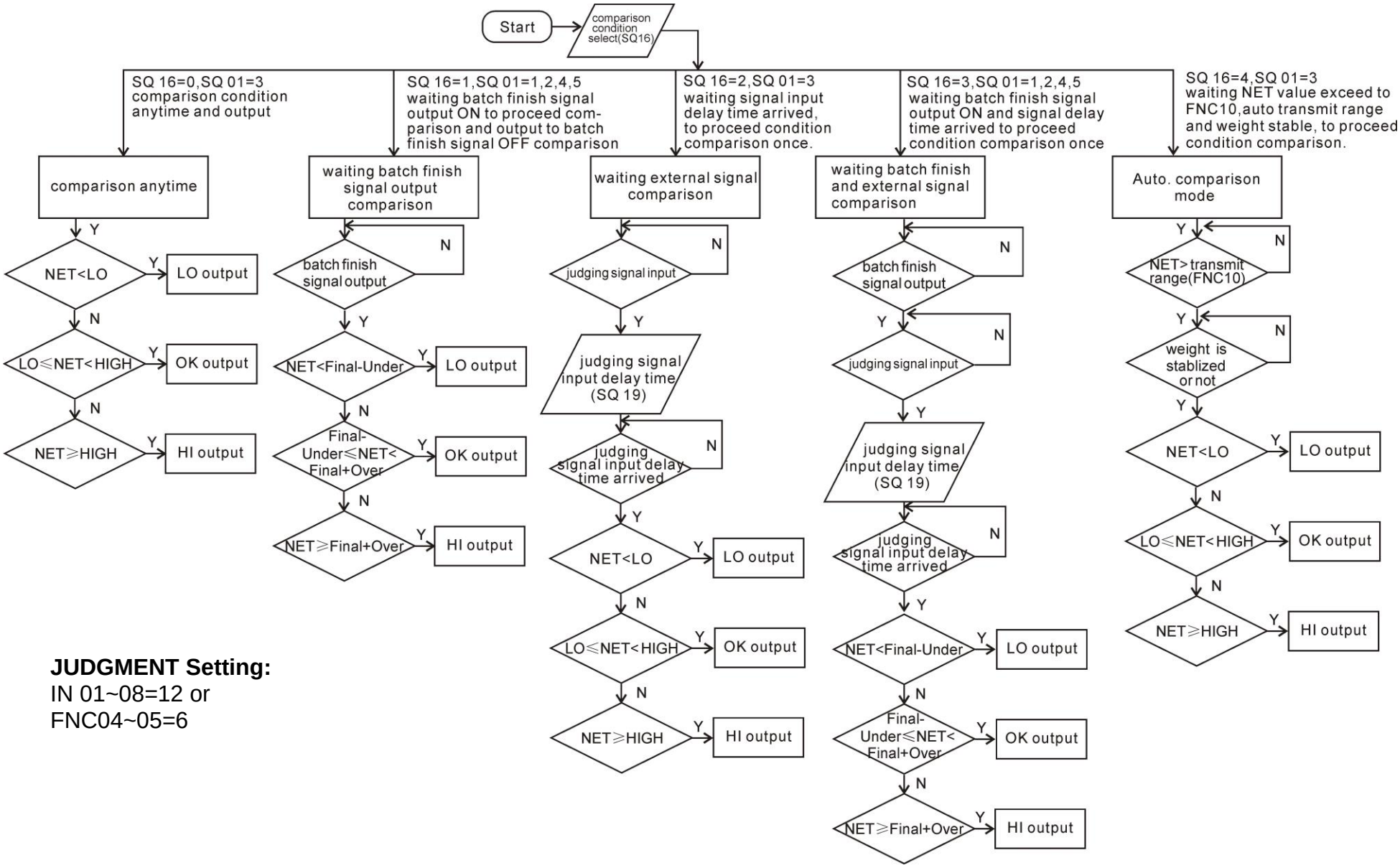
4-4 Normal batching flow chart (SQ-01=1)



4-5 Loss-in Weight flow chart (SQ1=2)

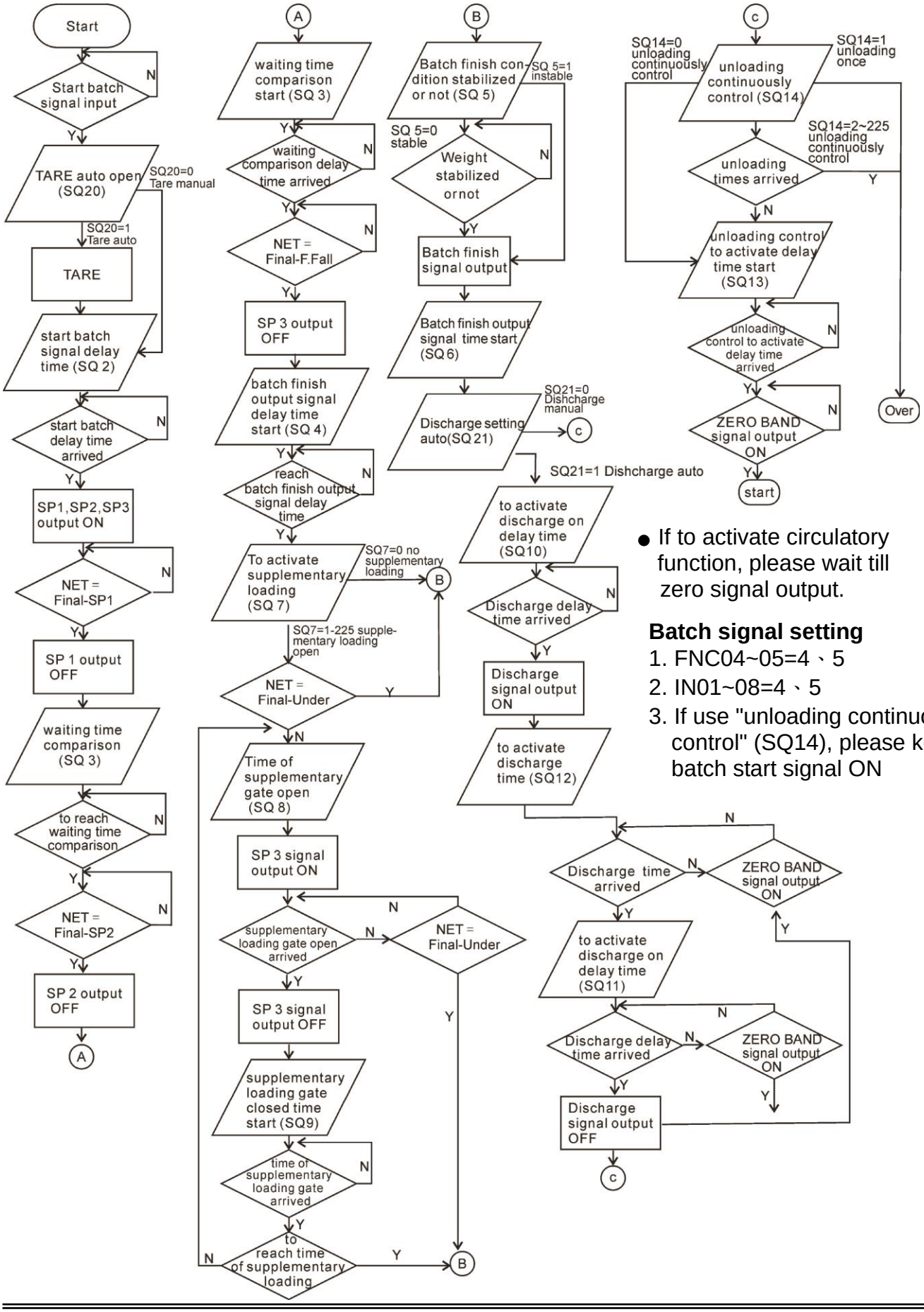


4-6 Hi, OK, Lo output flowchart



JUDGMENT Setting:
IN 01~08=12 or
FNC04~05=6

4-7 Normal batching (built-in program) flowchart (SQ-01=4)

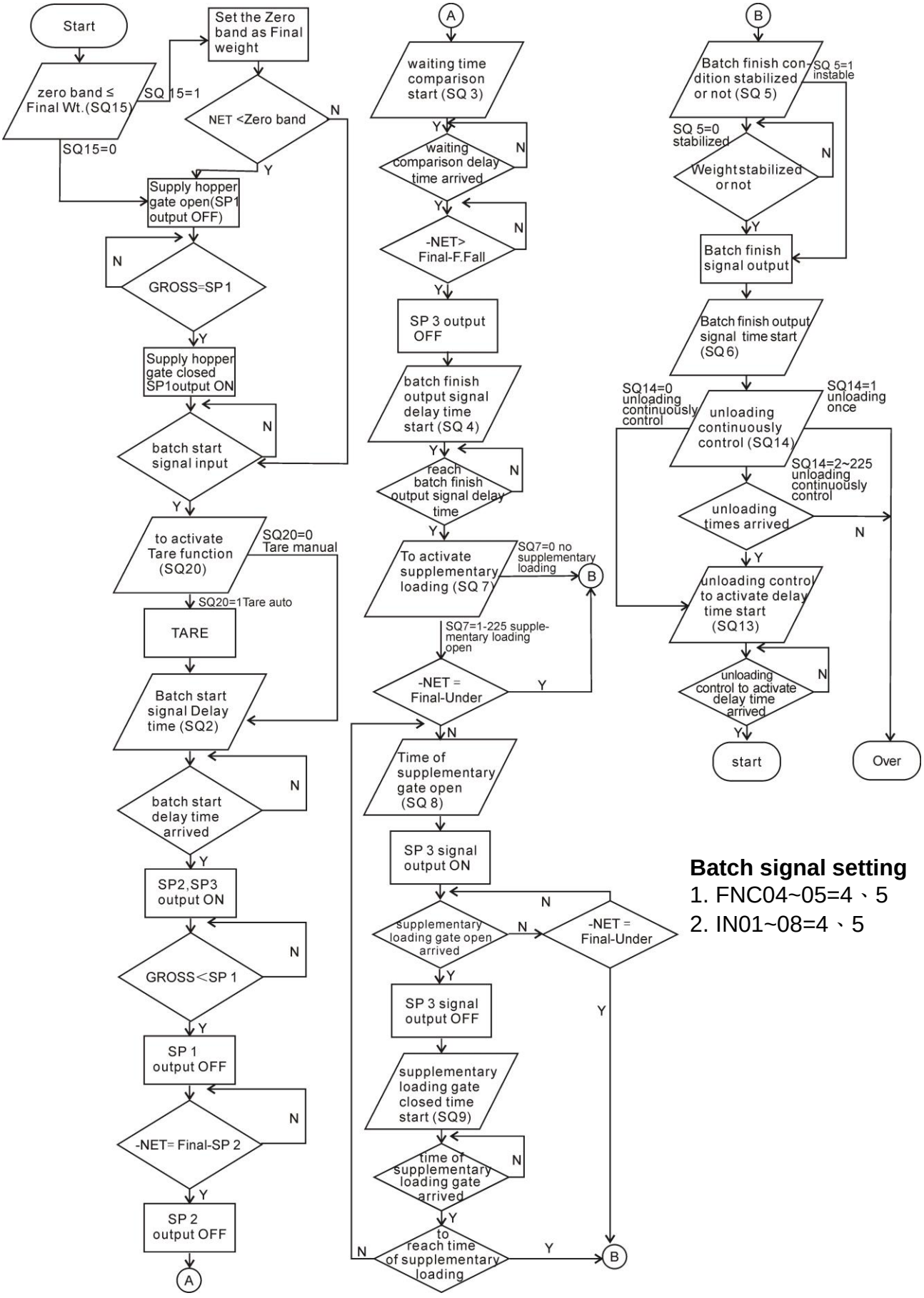


- If to activate circulatory function, please wait till zero signal output.

Batch signal setting

1. FNC04~05=4、5
2. IN01~08=4、5
3. If use "unloading continuously control" (SQ14), please keep batch start signal ON

4-8 Loss-in Weight (built in program) (SQ-01=5)

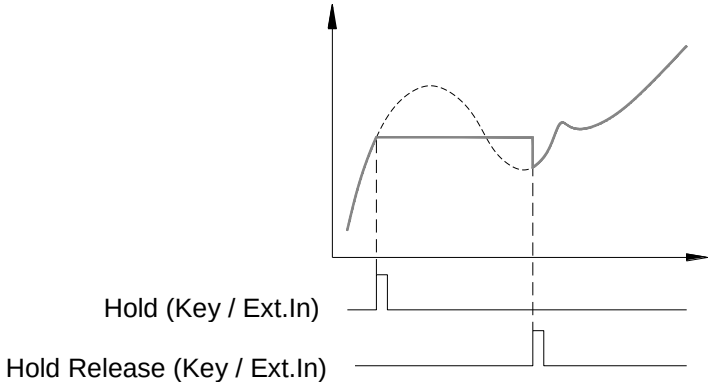


Batch signal setting

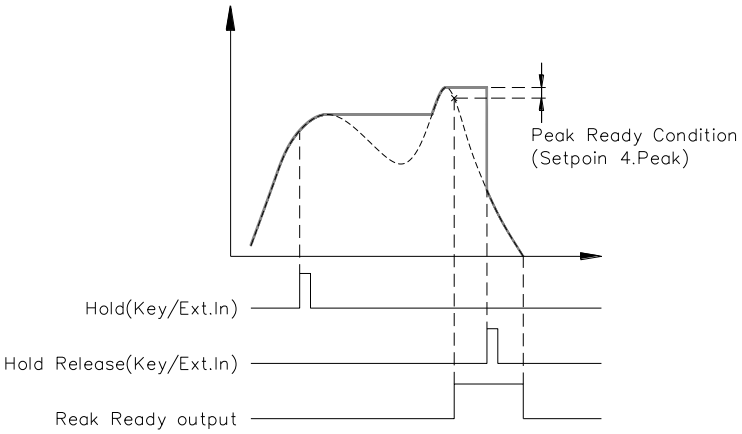
1. FNC04~05=4、5
2. IN01~08=4、5

4-9 Hold mode (SQ-01 = 6)

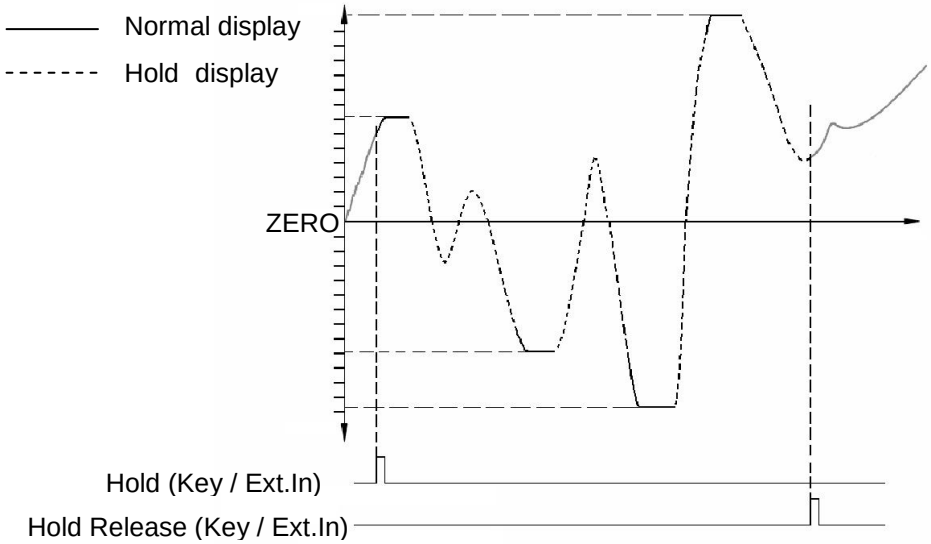
1. General hold mode (FNC-11 = 0)



2. Peak hold mode (FNC-11 = 1、2)



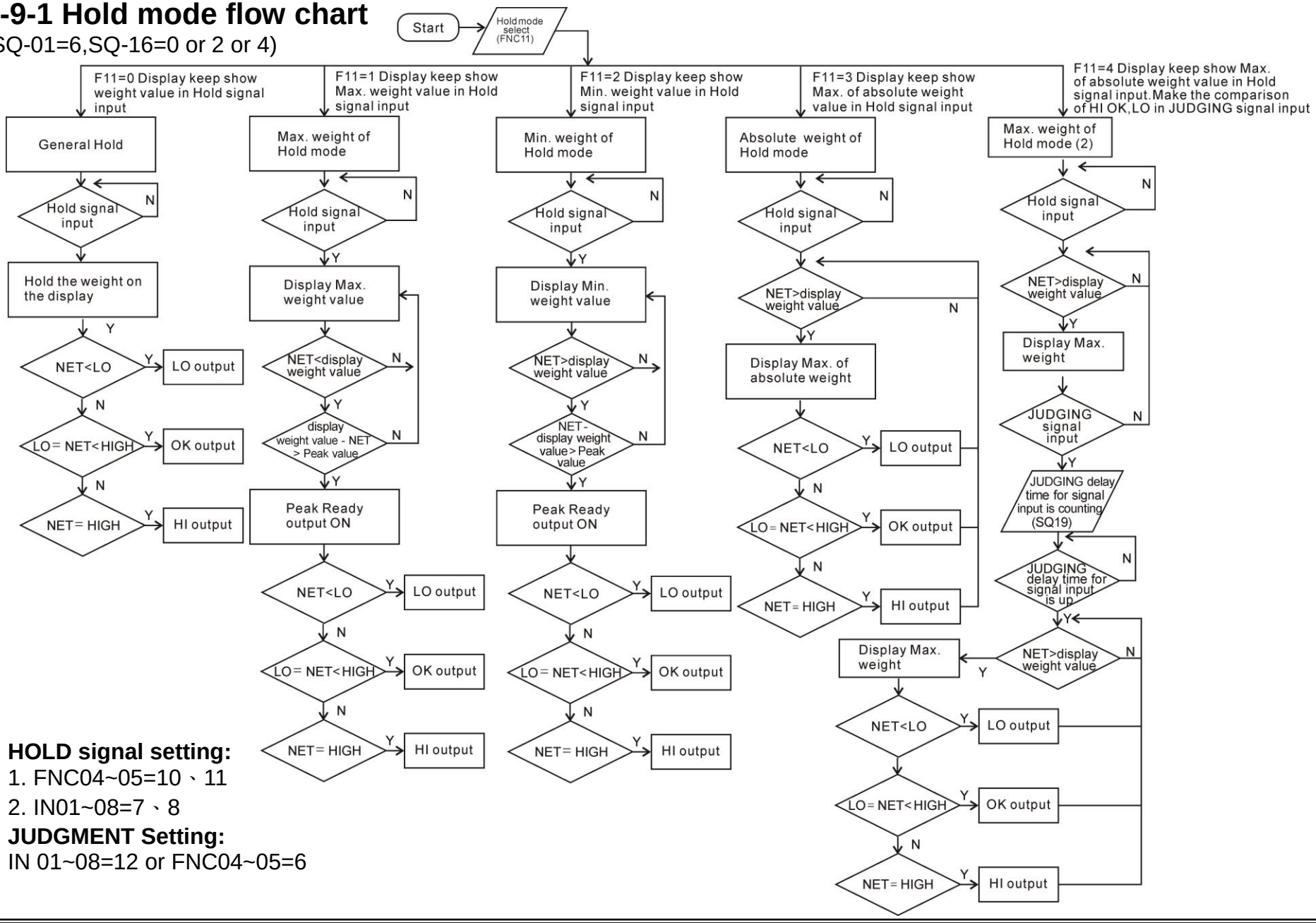
3. Peak hold mode (FNC-11 = 3、4)



Peak hold mode with four different states (FNC-11 = 1,2,3,4), positive peak weight(1), negative peak weight, absolute value of peak weight and positive peak weight(2) . The peak holds of absolute value and positive peak weight (2) both have no peak ready signal output.

4-9-1 Hold mode flow chart

(SQ-01=6,SQ-16=0 or 2 or 4)



HOLD signal setting:

1. FNC04~05=10、11
2. IN01~08=7、8

JUDGMENT Setting:

IN 01~08=12 or FNC04~05=6

4-9-2 Hi, OK, Lo comparison

1. Normal HOLD (FNC-11 = 0)
Entering the Hold mode, Hi, OK, Lo comparison output. Escape Hold mode will switch off the outputs.

2. Peak HOLD (FNC-11 = 1, 2)
If Peak Ready is ON, Hi, OK, Lo comparison output. Escape Hold mode will switch off the outputs.

3. The absolute value of peak HOLD (FNC-11 = 3)
Entering the Hold mode, Hi, OK, Lo comparison output.

4. FNC-11 = 4
When the external input single Judgement is ON, Hi, OK, Lo comparison output.

5. If to release HOLD (display value and Hi, OK, Lo signal), please make HOLD release signal on.

4-10 Totalizing (ACCU.) Auto / Transmit

With automatic totalising active (SQ-17) or RS232 / RS485 or BCD output set to auto transmit.

1. SQ-01 = 1, 2, 4 or 5 batch / loss-in weight

a) When the weight reaches the Final weight and the batch finish signal is ON the net weight will be added to the totaliser and number of additions is incremented. The RS-232 / RS-485 and BCD outputs transmit data. (RS-01/ RS-02=10 accumulated weight and counts)
b) When the net weight returns to the zero range (FNC-10), then the sequence in a) above can be repeated.
c) When SQ-01=1 or 4, Net ＞Final and Batch finish=1, it accumulate once.
d) When SQ-01=2 or 5, -Net ＞Final and Batch finish=1, it accumulate once.

2. SQ-01 = 3 Comparison mode

a) When the net weight exceeds the zero range and the weight has stabilized it will be added to the totaliser and number of additions is incremented. The RS-232 – RS-485 and BCD outputs transmit data.

3. SQ-01=6 HOLD mode

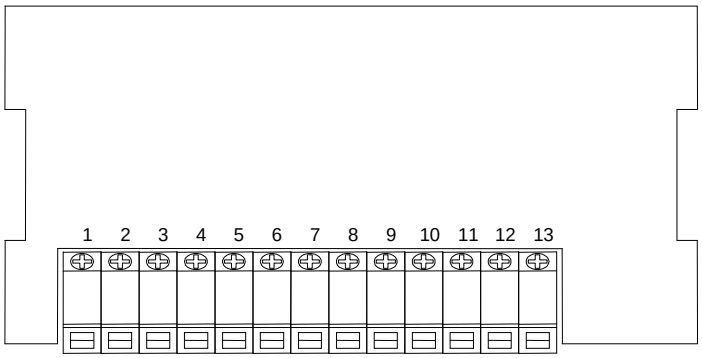
a).Lo. Wt. ＜weight＜Hi. Wt. weight will be added to the totaliser and number of additions is incremented.RS-232 / RS-485 and BCD outputs transmit data. (RS-01/ RS-02=10 accumulated weight and counts)
b). Until the net weight returns to the zero range (FNC-10), then the sequence in a) above can be repeated.

Chapter 5 Interface

5-1 Serial Input / Output Interface (default OP-01)

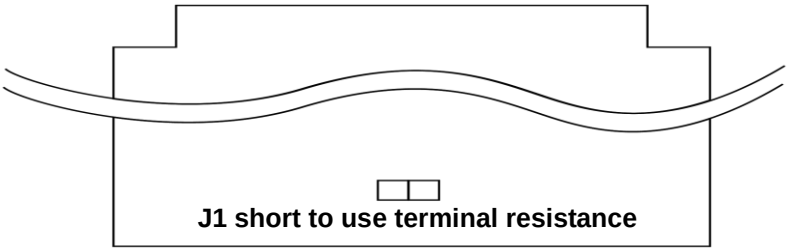
Pin location and setting

1. Built-in 1 set of RS-232 and 1 set of RS-485



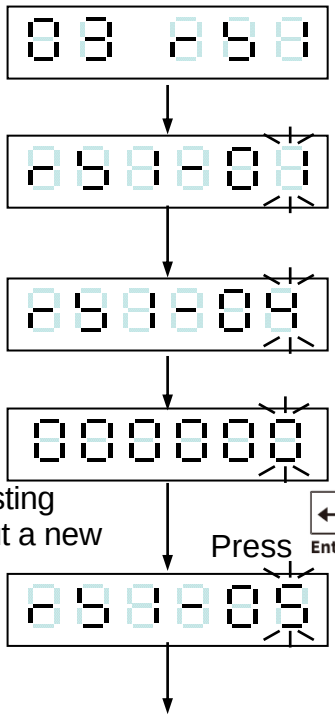
PIN	Function
9	RS-232 RX
10	RS-232 TX
11	SG
12	RS-485 D+
13	RS-485 D-

Use of Terminal Resistance



When the distance is long, add terminal resistance at the end of the transmission line (first unit and last unit) to reduce signal distortion

Set first serial port interface 03 rS1
built-in RS485



Press Enter key

Input desired parameter code

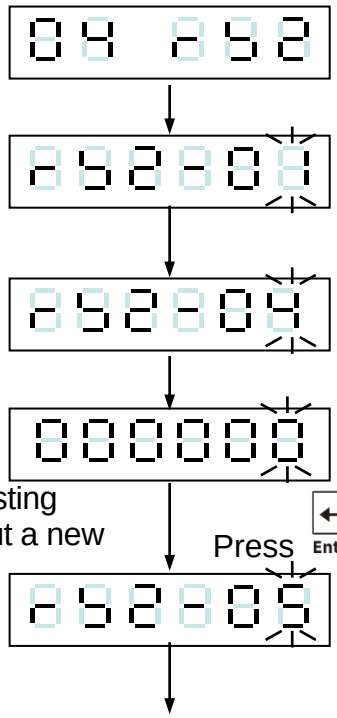
Press Enter key

Display show the existing parameter code. Input a new code as required

Press Enter key

Continue to the next function setting or press ESC key to escape

Set second serial port interface 04 rS2
built-in RS232



Press Enter key

Input desired parameter code

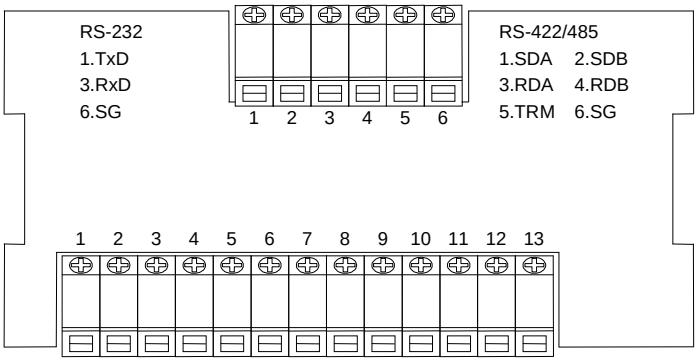
Press Enter key

Display show the existing parameter code. Input a new code as required

Press Enter key

Continue to the next function setting or press ESC key to escape

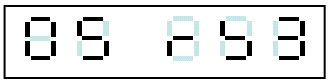
2. OP-01 RS-422 / RS-485 / RS-232



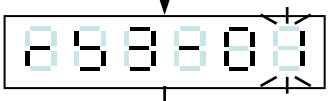
PIN	Function	
	RS422/RS485	RS232
1	SDA	TXD
2	SDB	
3	RDA	RXD
4	RDB	
5	TRM	
6	SG	SG

Set first serial port interface 05 rS3

OP-01

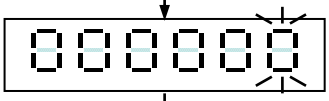


Press Enter key



Input desired parameter code

Press Enter key

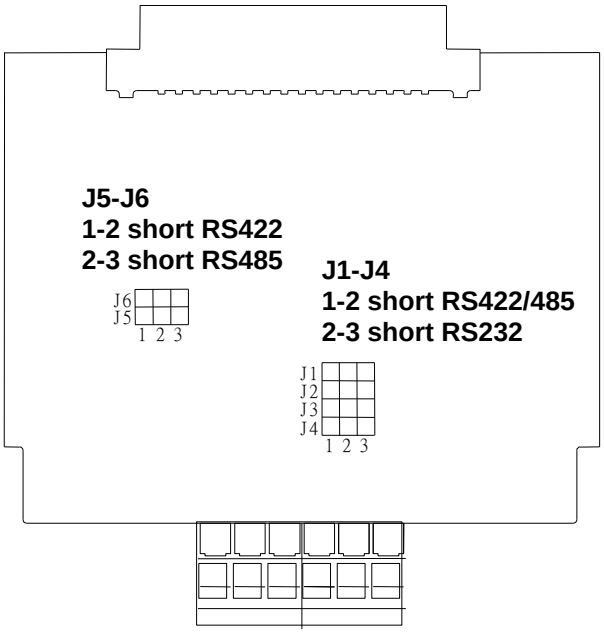


Display show the existing parameter code. Input a new code as required

Press Enter key

Continue to the next function setting or press ESC key to escape

Jumper configuration



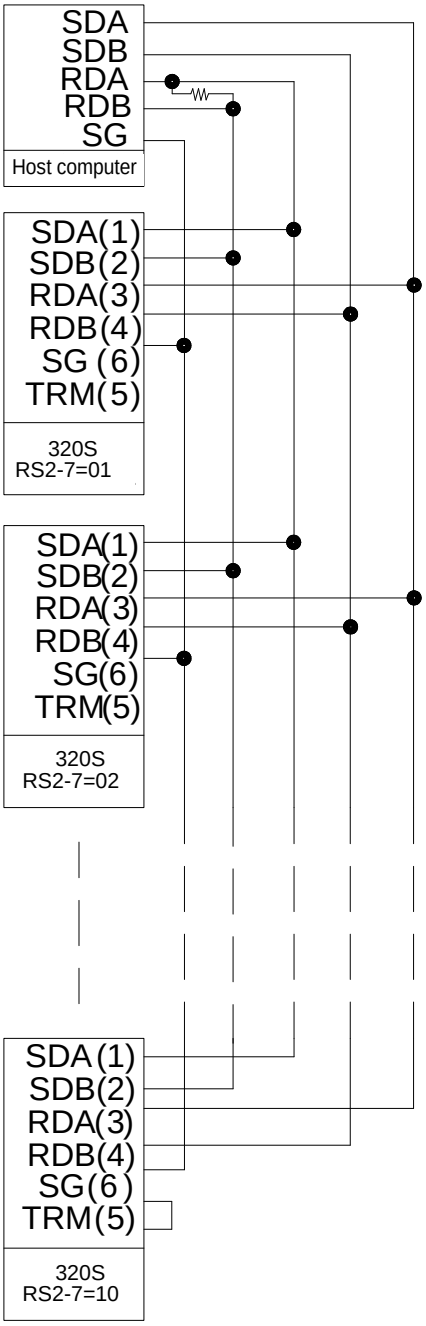
∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

RS1 is the setting for built-in RS485, RS2 for built-in RS232, RS3 for OP-01

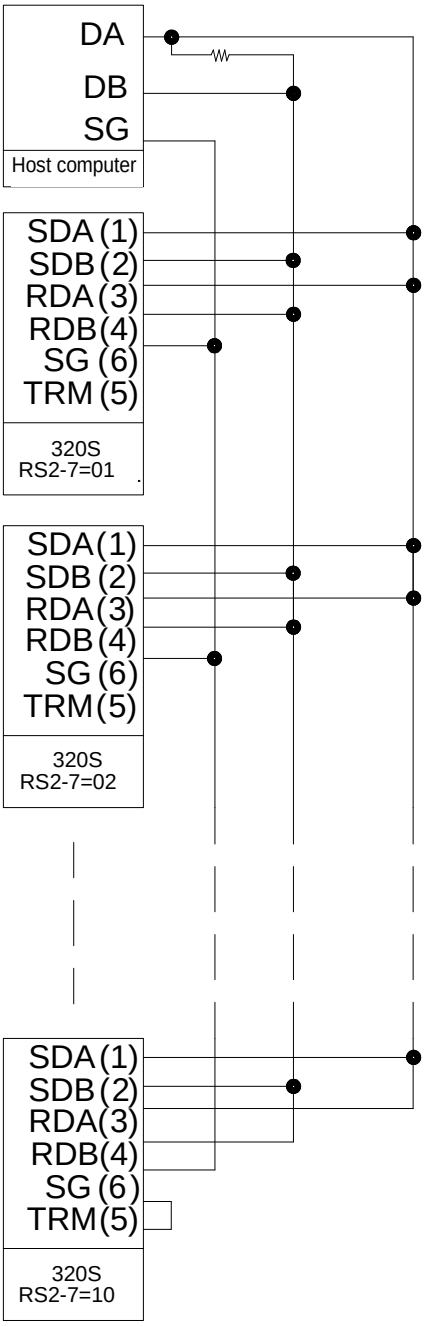
	Function	Setting value			Default
		Para-meter	Description		
RS1- 01 RS2- 01 RS3- 01	Transmit format	0	As display		0
		1	Gross only		
		2	Net only		
		3	As display (simple)		
		4	Gross (simple)		
		5	Net (simple)		
		6	Comparison + As display (simple)		
		7	Comparison +Gross (simple)		
		8	Comparison +Net (simple)		
		9	Tare		
		10	Totalised (Accu.) Weight and number of transactions		
RS1- 02 RS2- 02 RS3- 02	Transmit mode	0	Transmit continuous + command mode (RS3-02 only support Transmit continuous)		0
		1	Auto transmit + command mode		
		2	Manual transmit + command mode		
		3	Command mode		
		4	MODBUS RTU mode		
RS1- 03 RS2- 03 RS3- 03	Transmit speed	0	2400		2
		1	4800		
		2	9600		
		3	19200		
		4	38400		
		5	57600		
		6	115200		
RS1- 04 RS2- 04 RS3- 04	Parity Bit length Stop Bit	0	N, 8, 1	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
	MODBUS Mode: Parity Bit length Stop Bit	0	N, 8, 2	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
RS1- 05 RS2- 05 RS3- 05	Transmit times	0	Open		0
		1	1 time/sec.		
		2	2 time/sec.		
		3	5 time/sec.		
		4	10 time/sec.		

RS1- 06 RS2- 06 RS3- 06	Transmission conditions	0 0 0 0 0 0 Negative (Net Wt.) Weight unstable Overload (OL) 0 ⇒ transmit cont. 1 ⇒ Stop transmit		000000
RS1- 07 RS2- 07 RS3- 07	Indicator poling address	00 ↓ 99	When set to 0, Indicator addressing is not used	0

RS-422



RS-485



Notice:

- The maximum connection is 10 sets of indicator.
- When the Host computer has the built-in terminal resist, it is not necessary to have the external one.
- On the last set of indicator, the TRM & RDB can be connected depends on the situation.
- When the host computer has no single (SG), it is acceptable to disconnect that part.

Data format

1. General Format

NET	S	T	,	G	S	,	+	0	1	2	3	4	5	6	k	g	CR	LF
GROSS	S	T	,	N	T	,	+	1	2	3	4	.	5	6		g		
TARE	S	T	,	T	R	,	+	0	1	2	3	4	5	6		t		
+ OL	O	L	,	G	S	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP		
- OL	O	L	,	G	S	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP		
UNSTABLE	U	S	,	G	S	,	+	1	2	3	4	.	5	6	k	g		

2. Totalised (Accu.) Format (RS1-01 / RS2-01=10)

Accu. Weight	T	W	,	+	1	2	3	4	5	6	.	7	8	9	k	g	CR	LF
Accu. Wt. Over+	T	W	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Accu. Wt. Over -	T	W	,	-	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP		
Accu. Count	T	N	,	+	0	1	2	3	4	5	6	7	8	9				
Accu. Count over	T	N	,	+	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP				

3. Sample Format

Gross/Net or as display	+	1	2	3	4	5	6	CR	LF
Over load positive	+	SP	SP	SP	SP	SP	SP		
Over load negative	-	SP	SP	SP	SP	SP	SP		

4. Setpoint (1) + Simple Format (Gross/Net or as display)

	+	1	2	3	4	5	6	CR	LF

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0

bit 0 : Zero Band
bit 1 : Over
bit 2 : Under / Hi
bit 3 : SP1 / OK
bit 4 : SP2 / Lo
bit 5 : SP3
bit 6 : Discharge
bit 7 : Batch finished

5. Comparison condition (2)

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7

Byte 0 : Zero Band
Byte 1 : Over
Byte 2 : Under / Hi
Byte 3 : SP1 / OK
Byte 4 : SP2 / Lo
Byte 5 : SP3
Byte 6 : Discharge
Byte 7 : Batch finished

ON : 0 (ASC II Code 30 H)
OFF : 1 (ASC II Code 31 H)

Description

	Output	ASCII	Description
Status 1	OL	4FH, 4CH	Over load
	ST	53H, 54H	Weight stable
	US	55H, 53H	Weight unstable
Status 2	GS	47H, 53H	Gross Weight
	NT	45H, 54H	Net Weight
	TR	54H, 52H	TARE
	TW	54H, 57H	Totalised Weight
	TN	54H, 4EH	Number of transactions in total
Data of Weight	0 ~ 9	30H ~ 39H	Figure of weight
	+, -	2BH, 2DH	Symbol (+ or -) of weight
	Space	20H	Over load
	.	2EH	Decimal
Units	Space, Space	20H, 20H	None
	kg	6BH, 67H	kg
	Space t	20H, 74H	tonne
	lb	6CH, 62H	lb
Ending code	CR, LF	0DH, 0AH	Ending code
Separating code	,	2CH	Comma

Command mode

1. Command Format A

Host	Command	<CR>< LF>
Slave	Command	<CR>< LF>

MZ	Zero	CZ	Zero compensation On/OFF
MT	Tare	CT	Clear TARE value
MG	Gross Weight	MN	Net weight
AT	Accu. Current net weight and times plus 1		
ST	Deduct times of last accu. Value minus 1		
DT	Clear accu. Value and times		
BB	Start batching (one time)	HB	Load stop
BC	Start batching (continuous)		
BD	Start unload		
SC	Transmit continuous	SA	Auto transmit
SM	Manual transmit	SO	Command mode
%	Stop continuous transmission and enter the command mode		

Note : Since BC continuous weighing is completed, it must zero re-set the continuous weighing frequency by BB command.

2. Command Format B

Host	Command	<CR>< LF>
Slave	Data	<CR>< LF>

RW	Read current weight	RT	Read TARE
RG	Read Gross Weight	RN	Read Net weight
RB	Read current display of wt (simple)	RH	Read Gross (simple)
RI	Read Net (simple)		
RJ	Read comparison situation + current display of weight (simple)		
RK	Read comparison situation + Gross (simple)		
RL	Read comparison situation + Net (simple)		
RO	Read comparison situation (2)		
RF	Read prior completed weight	RA	Read accu. Value (incl. times)

Note : Prior command plus %

Read Weight Compared value: RS□□

FW	Read unload target weight	S1	Read SP1
S2	Read SP2	S3	Read SP3
UD	Read Under	LO	Read LO
ZB	Read Zero Band	HI	Read HI
PR	Reading Peak value	OV	Read Over

Ex:

Command : RSFW < CR > < LF > Indicator reply : RSFW□□□□□□

Read unload target weight (FW = final weight) 6 bytes

3. COMMAND FORMAT C

Host	Command + Data	<CR>< LF>
Slave		Command + Data <CR>< LF>

Write weight compared value WS□□XXXXXX

□□ : setting items XXXXXX : value (6 bytes)

FW	Write unload target weight	S1	Write SP1
S2	Write SP2	S3	Write SP3
UD	Write Under	LO	Write LO
ZB	Write Zero Band	HI	Write HI
PR	Write Peak value	OV	Write Over
BC	Write SQ14	PT	Set OUT

Note : WSPTxxxxxx (input 0~255 decimal system) converts to BIT value which indicates OUT (1-8) is ON, and the rest of numbers are OFF.

Ex:

Inputting WSPT000010 means the BIT value is 00001010 (OUT 2, 4 = ON) (OUT 1, 3, 5, 6, 7, 8 are OFF).

Error messages

E1: Format command fault

E2: Setting parameters over range

E3: Command not recognised

Indicator poling address

If address of RS1(2) – 07 is set to 0, after receiving the command, it executes the command directly.

If address of RS1(2) – 07 is set to 1 ~ 99, after receiving the command, it compares the address before the command. If it is correct, it then executes the command.

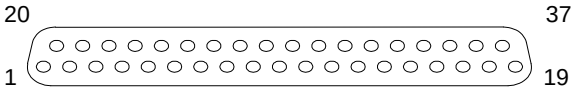
For example: The indicator poling address is set to 02; it would send the weight value only if it received the command:

@02RW < CR > < LF >

5-2 BCD parallel output interface (OP-02)

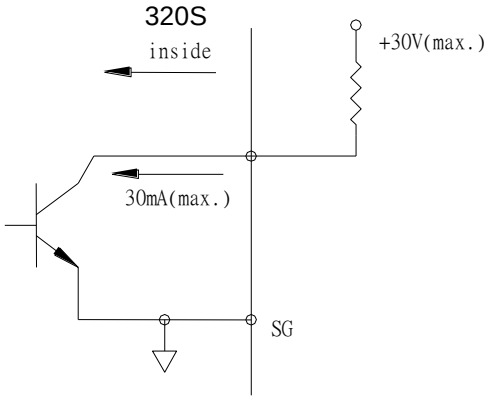
PIN Location

D-Sub 37PIN

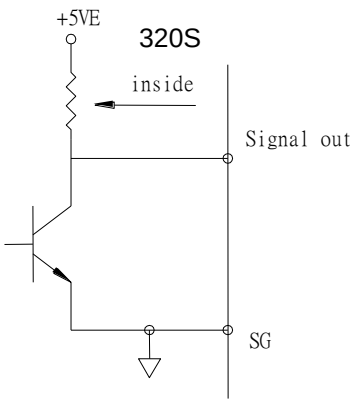


PIN	Function	PIN	Function
1	**SG**	**20**	SG
2	1×10^0	**21**	2×10^0
3	4×10^0	**22**	8×10^0
4	1×10^1	**23**	2×10^1
5	4×10^1	**24**	8×10^1
6	1×10^2	**25**	2×10^2
7	4×10^2	**26**	8×10^2
8	1×10^3	**27**	2×10^3
9	4×10^3	**28**	8×10^3
10	1×10^4	**29**	2×10^4
11	4×10^4	**30**	8×10^4
12	1×10^5	**31**	2×10^5
13	4×10^5	**32**	8×10^5
14	Gross / - Net	**33**	Stable / - MD
15	Plus / - Minus	**34**	DP1
16	DP2	**35**	DP3
17	DP4	**36**	Over / - Normal
18	Data ready	**37**	Hold input
19			

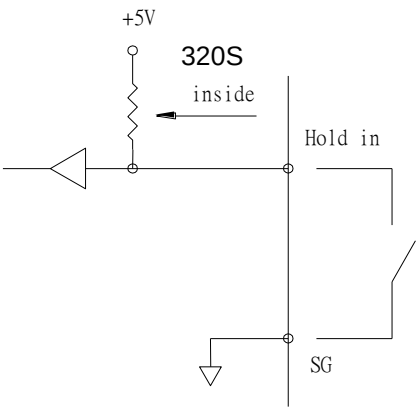
Equivalent Circuit



Open Collector Output (OP-02-1)

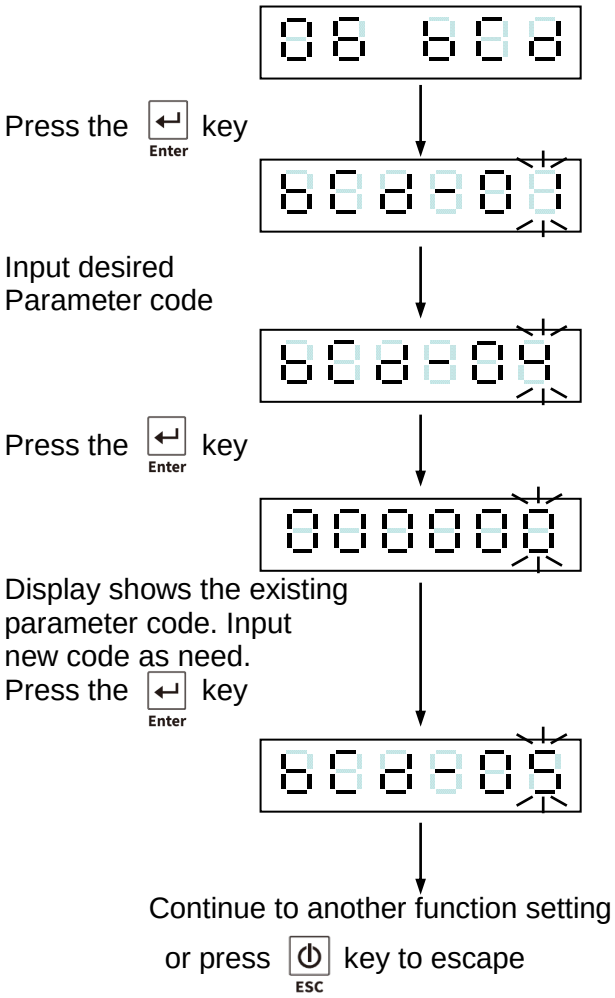


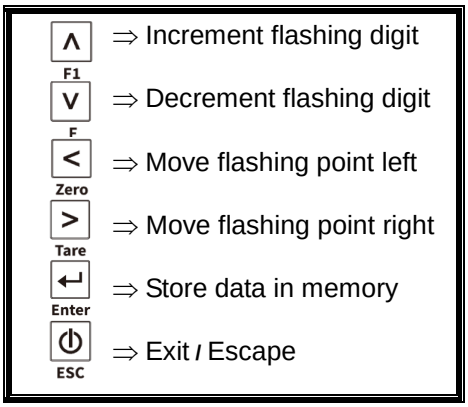
TTL Output (OP-02-2)



Hold Input

Function setting

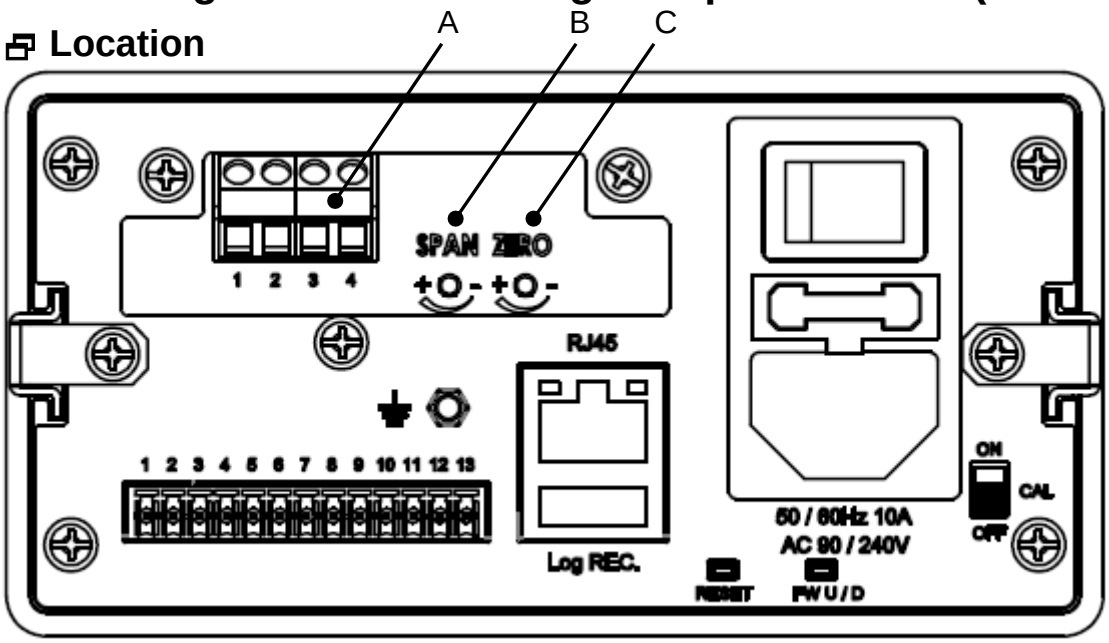




Item	Function	Setting value		Default
		Parameter	Description	
bCd- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
bCd- 02	Transmit mode	0	Transmit continuous	0
		1	Auto transmit	
		2	Manual transmit	
bCd- 03	Output Logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 04	Data ready Signal logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 05	OL output code	0	FFFFFF	0
		1	999999	
bCd- 06	Data code	0	BCD Code	0
		1	Hex. Code	

5-3 Analogue Current / Voltage Output Interface (OP-03)

Location



A. Terminal (4 way)

1 : 4 ~ 20mA current output, A(+)
2 : 0 ~ 10V voltage output, V(+)
3 : Current / voltage signal, Com. (-)
4 : Ground / 0V, FG

B. SPAN adjustment

Current / voltage Span adjustment to increase value turn clockwise, decrease value turn anticlockwise.

C. ZERO adjustment

Current / voltage Zero adjustment to increase value turn clockwise, decrease value turn anticlockwise.

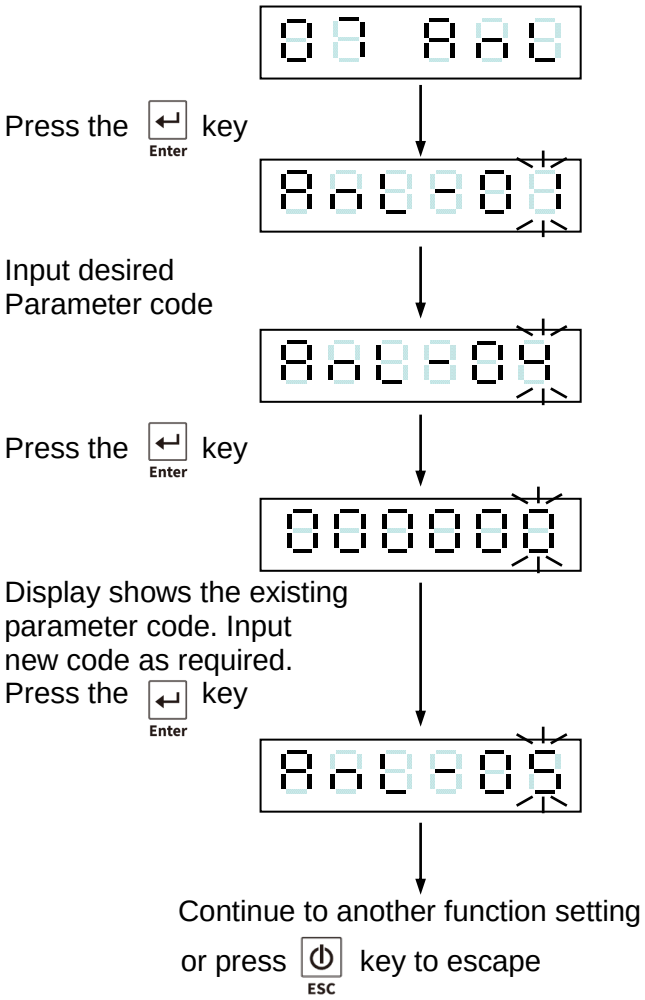
Analogue output interface specification

Resolution : 16 bits

Current output : 4 ~ 20mA (0 ~ 550 Ω load)

Voltage output : 0 ~ 10V

Function setting



∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
AnL- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
AnL- 02	Signal output	0	Current output	0
		1	Voltage output	
AnL- 03	Weight in Lo	000000 ~ 999999	When the weight reaches the value of that in AnL-03(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-04	0
AnL- 04	Current / Voltage in Lo	4.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		4.0
AnL- 05	Weight in Hi	000000 ~ 999999	When the weight reaches the value of that in AnL-05(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-06	30000
AnL- 06	Current / Voltage in Hi	4.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		20.0

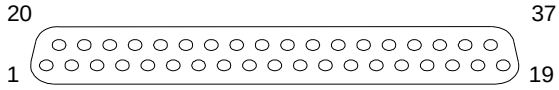
Analogue output notes

1. The current output, load resistor should not exceed 550 Ω. It is recommended that a resistor with a low temperature coefficient and a power rating above 0.2 W be used.
2. Avoid short circuits between the positive and negative analogue output terminals as the interface this may cause damage.
3. It is recommended that a screened cable is used to connect the analogue output to its load and that the screen is earthed to avoid noise interference.

5-4 External Parallel Input / Output Interface

PIN location

D-Sub 37PIN



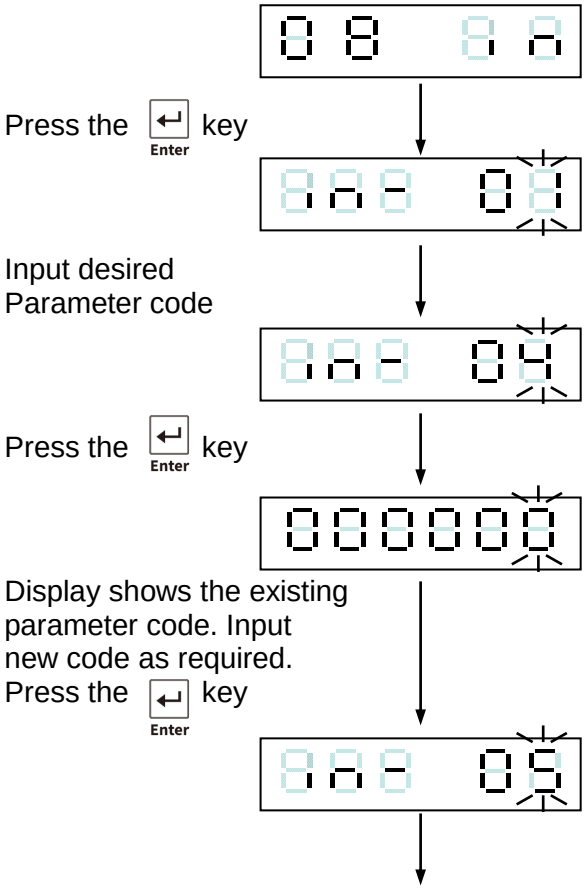
OP-04 Control I/O (4 in / 4 out) + Setpoint Input (BCD code)

PIN	I/O	**Signal**	PIN	I/O	**Signal**
1	IN	Code 100	20	IN	Code 101
2	IN	Code 102	21	IN	Code 103
3	IN	Code 104	22	IN	Code 105
4	IN	Code 106	23	IN	Code 107
5	IN	Code 108	24	IN	Code 109
6	IN	Code 1010	25	IN	Code 1011
7			26		
8			27	OUT	OUT 1
9	**OUT**	**OUT 2**	**28**	**OUT**	**OUT 3**
10	**OUT**	**OUT 4**	**29**	**IN**	**Vex**
11		**COM 2**	**30**		**COM 2**
12			**31**		
13		**COM 1**	**32**		**COM1**
14	**IN**	**IN 1**	**33**	**IN**	**IN 2**
15	**IN**	**IN 3**	**34**	**IN**	**IN 4**
16			**35**		
17			**36**	**IN**	**Code 1**
18	**IN**	**Code 2**	**37**	**IN**	**Code 4**
19	**IN**	**Code 8**			

OP-05 Control I/O (8 in / 8 out)

PIN	**I/O**	**Signal**	**PIN**	**I/O**	**Signal**
1	**IN**	**IN 1**	**20**		**COM 1**
2	**IN**	**IN 2**	**21**		**COM 1**
3	**IN**	**IN 3**	**22**		**COM 1**
4	**IN**	**IN 4**	**23**		**COM 1**
5	**IN**	**IN 5**	**24**		**COM 1**
6	**IN**	**IN 6**	**25**		**COM 1**
7	**IN**	**IN 7**	**26**		**COM 1**
8	**IN**	**IN 8**	**27**		**COM 1**
9		**COM 1**	**28**		**COM 1**
10		**COM 2**	**29**		**COM 2**
11	**OUT**	**OUT 1**	**30**		**COM 2**
12	**OUT**	**OUT 2**	**31**		**COM 2**
13	**OUT**	**OUT 3**	**32**		**COM 2**
14	**OUT**	**OUT 4**	**33**		**COM 2**
15	**OUT**	**OUT 5**	**34**		**COM 2**
16	**OUT**	**OUT 6**	**35**		**COM 2**
17	**OUT**	**OUT 7**	**36**		**COM 2**
18	**OUT**	**OUT 8**	**37**		**COM 2**
19	**IN**	**Vex**			

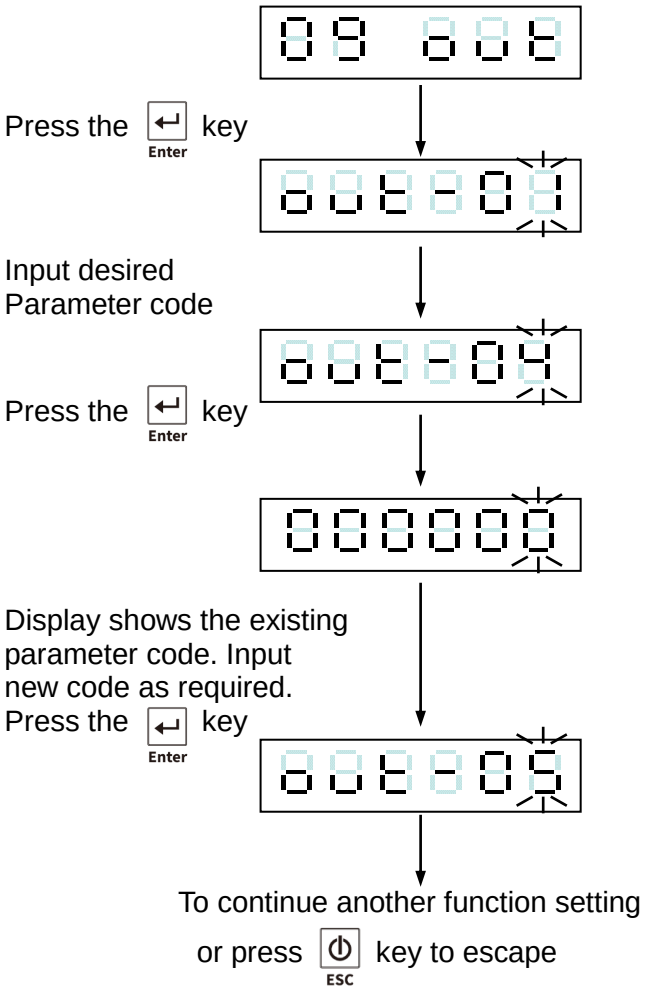
Input signal configuration

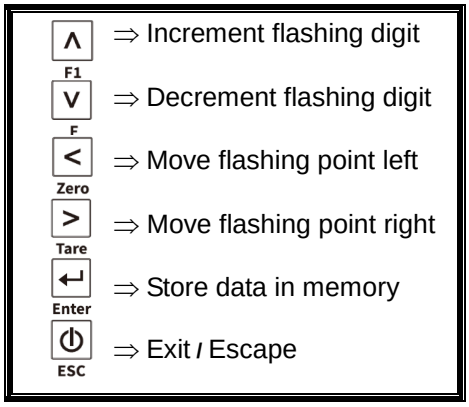


∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

Item	Function	Setting value Parameter ⇒ Description	Default
IN - 01	Input 1	0 ⇒ None 1 ⇒ Zero 2 ⇒ Tare 3 ⇒ Tare reset 4 ⇒ Start batching 5 ⇒ Stop batching 6 ⇒ Discharge Command 7 ⇒ Hold 8 ⇒ Hold display & I/O reset 9 ⇒ Totalise (Accu) Command 10 ⇒ Clear totaliser (Accu) 11 ⇒ Clear previous total (Accu) Value 12 ⇒ Start to compare 13 ⇒ Serial and parallel printer manual output 14 ⇒ Net / Gross	1
IN - 02	Input 2		2
IN - 03	Input 3		3
IN - 04	Input 4		4
IN - 05	Input 5		5
IN - 06	Input 6		6
IN - 07	Input 7		7
IN - 08	Input 8		8

Output signal setting

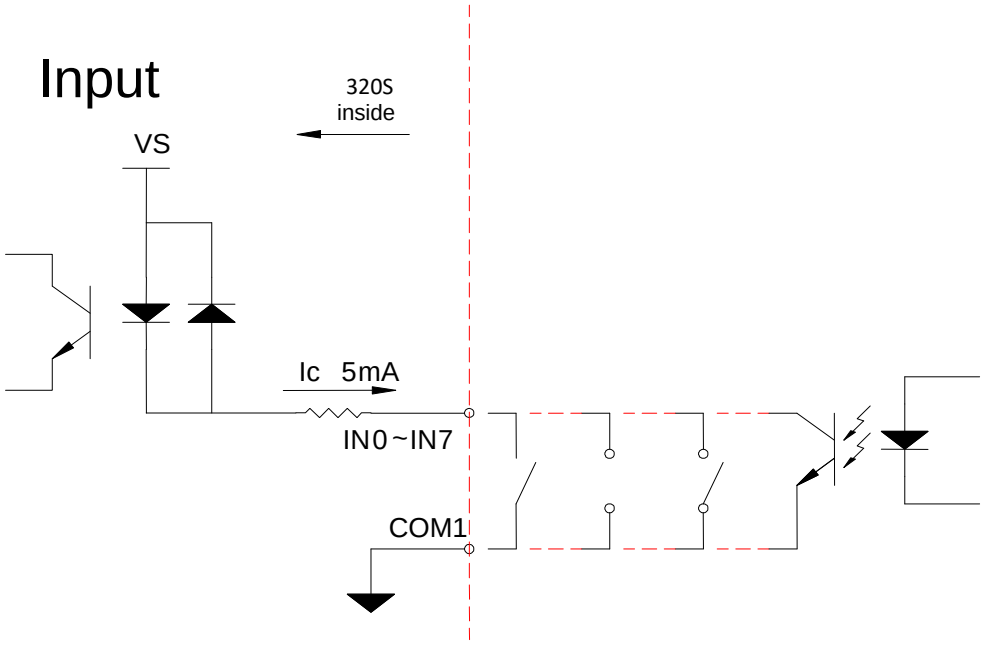




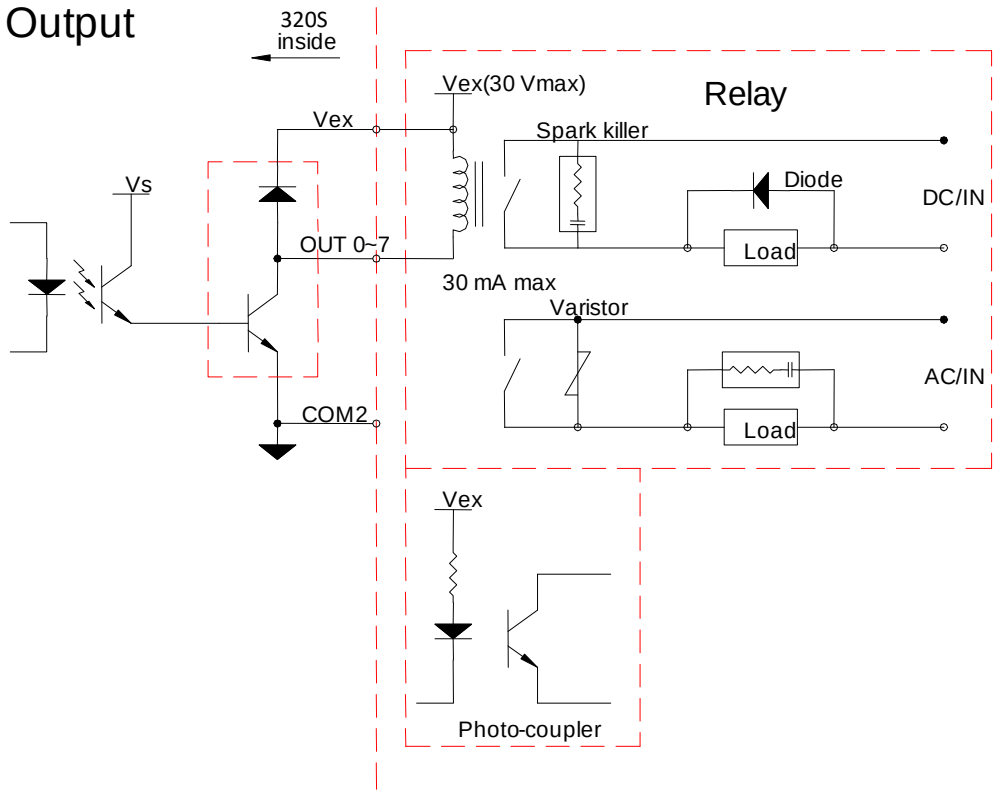
Item	Function	Setting value		Default
		Parameter	Description	
OUT- 01	Output 1	0 ⇒ None 1 ⇒ Zero band 2 ⇒ SP1 3 ⇒ SP2 4 ⇒ SP3 5 ⇒ Batching completed 6 ⇒ Discharge 7 ⇒ Peak ready 8 ⇒ Stable 9 ⇒ Internal batching process running 10 ⇒ Under 11 ⇒ Over 12 ⇒ Hi 13 ⇒ OK 14 ⇒ Lo 15 ⇒ DM_ACCUV 16 ⇒ DM_ACCUC 17 ⇒ Hold 18 ⇒ Hi_Hi 19 ⇒ Lo_Lo 32 ⇒ Controlled through RS232 (WSPT) commands	1
OUT- 02	Output 2			2
OUT- 03	Output 3			3
OUT- 04	Output 4			4
OUT- 05	Output 5			5
OUT- 06	Output 6			6
OUT- 07	Output 7			7
OUT- 08	Output 8			8

OUT-09	The output logic of OUT-04~OUT-01	0000 → positive logic 1111 → negative logic	0000
OUT-10	The output logic of OUT-08~OUT-05	0000 → positive logic 1111 → negative logic	0000

Equivalent Circuits



- IN 1 ~ IN 8 and COM 1. Input signal - Open ↔ OFF, Short ↔ ON.
- Warning: Don't use external power (AC or DC) to connect to the input terminals.



Thumbwheel Switches (for OP-04)

The interface can connect to external thumbwheel switches or a PLC to input various parameters depending on the configuration of SQ-01.

The input variables are:

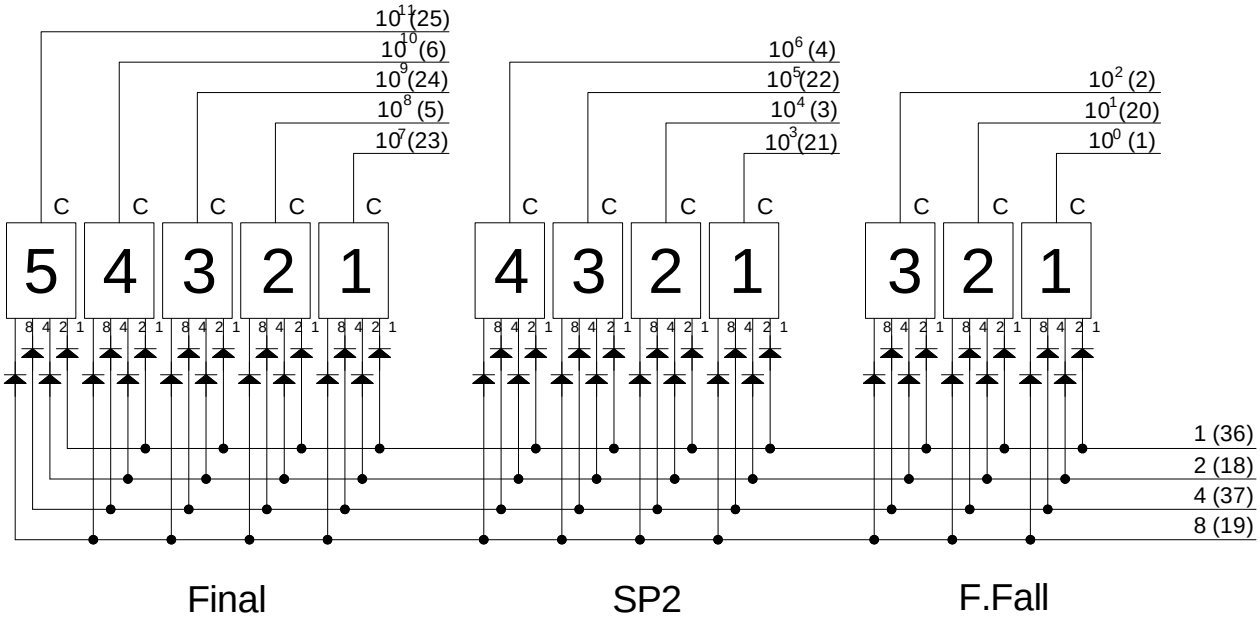
① Final (5 digits), SP2 (4 digits) & Free Fall (3 digits).

or ② Hi (6 digits), Lo (6 digits).

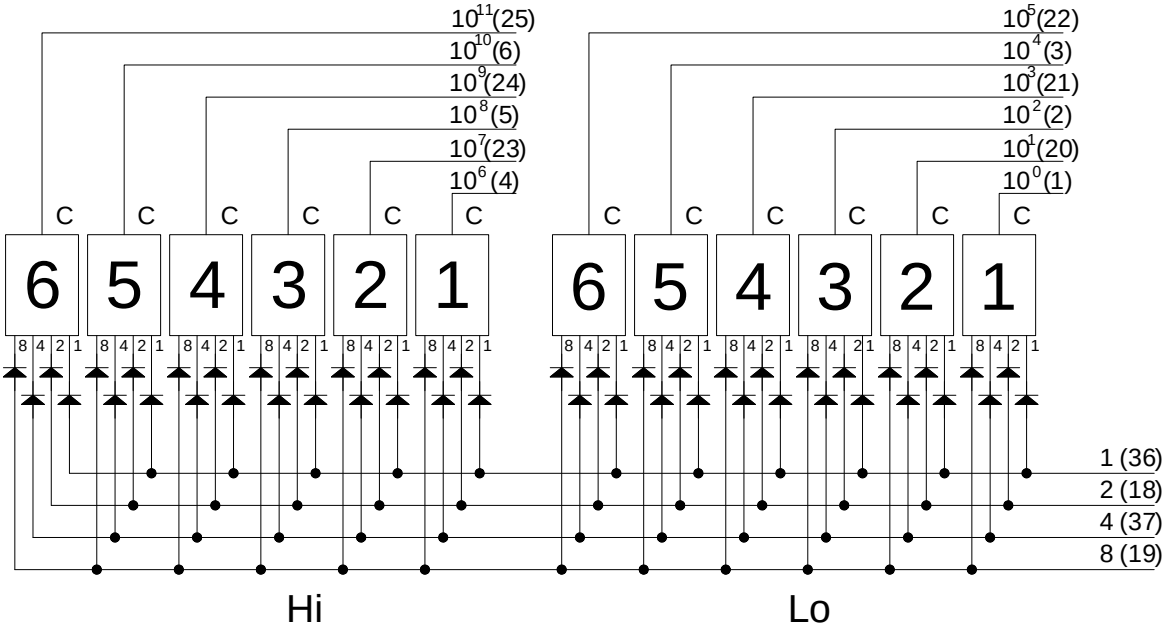
When using external thumbwheel Switches, SQ-18 should be set to 1.

Connection data

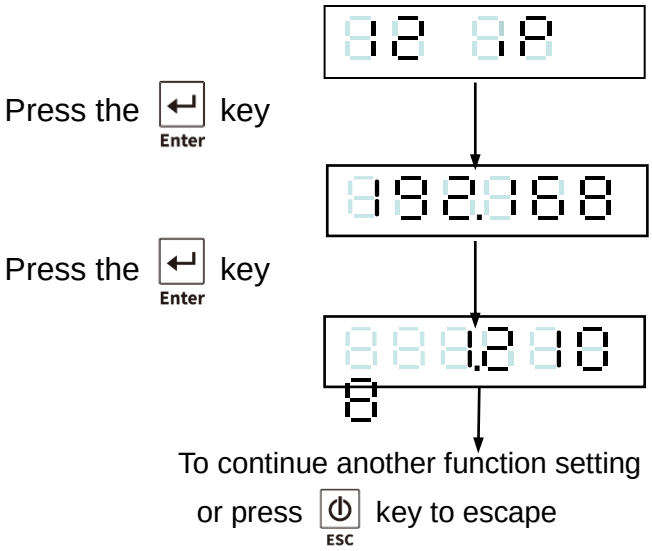
SQ-01 = 1, 2, 4 or 5



SQ-01 = 3 or 6

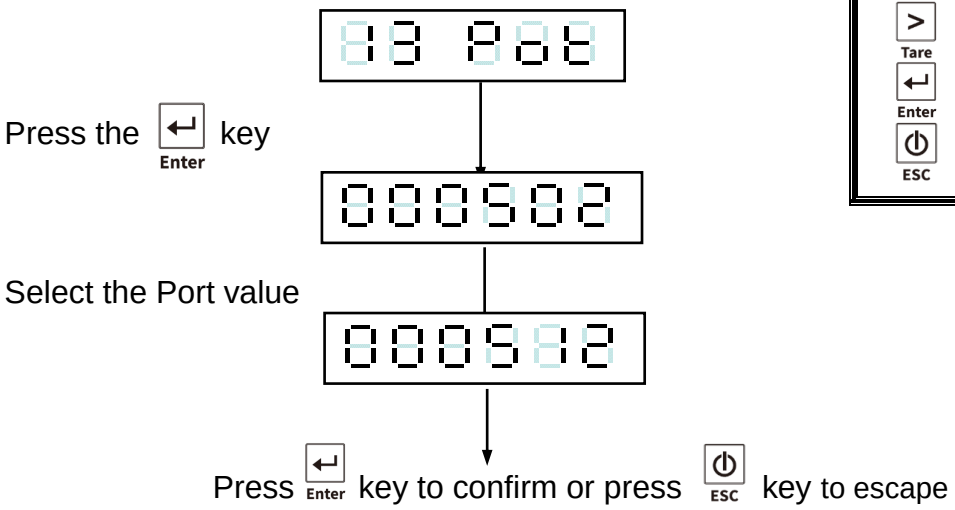


5-5 Display IP Address

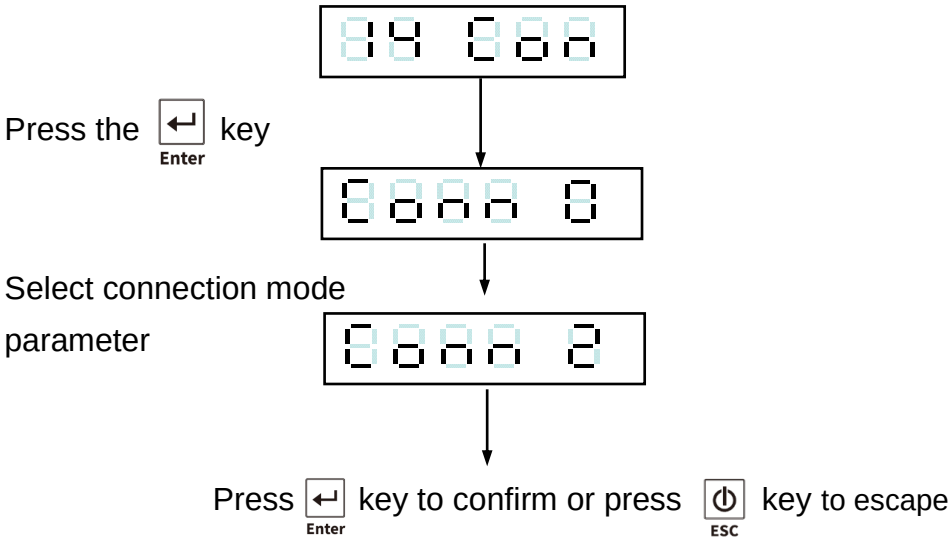


∧ F1	⇒ Increment flashing digit
∨ F	⇒ Decrement flashing digit
< Zero	⇒ Move flashing point left
> Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

5-6 Set Port

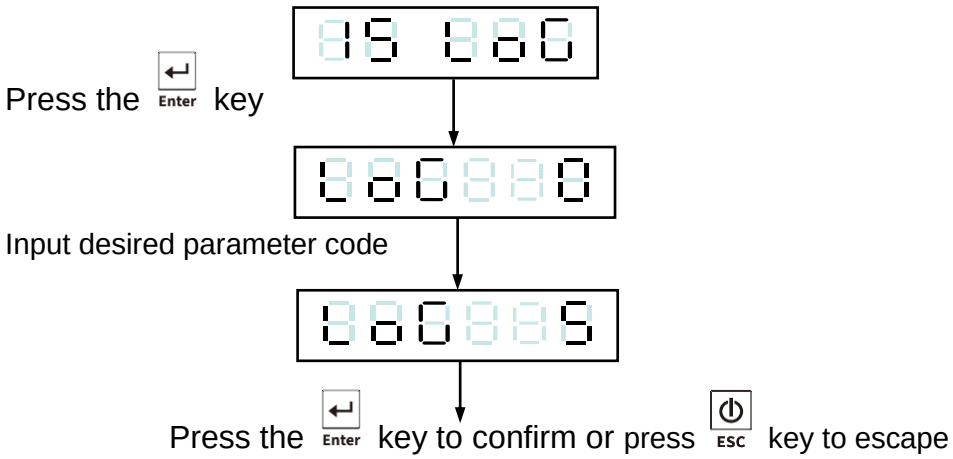


5-7 Set Modbus Connection



Item	Function	Setting value		Default
		Parameter	Description	
Con	Modbus connection mode	0	Disable	0
		1	Modbus over TCP/IP	
		2	Modbus RTU over TCP/IP	

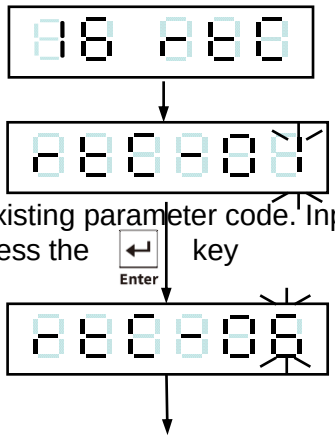
5-8 USB Logger



Item	Function	Setting value		Default
		Parameter	Description	
LOG	USB Logger	0	Disable	0
		1	Record weight data every 1 sec	
		2	Record weight data every 2 sec	
		3	Record weight data every 3 sec	
		4	Record weight data every 5 sec	
		5	Record weight data every 10 sec	
		6	Record weight data every 1 min	
		7	Record weight data every 2 min	
		8	Record weight data every 3 min	
		9	Record weight data every 5 min	
		10	Record weight data every 10 min	
		11	Log when batch is OK.	
		12	Log when press F key	
		13	Log after Hi, OK, Lo comparison	

5-9 Real Time Clock

Press the Enter key



Display shows the existing parameter code. Input new code as required. Then press the Enter key

To continue another function setting or press ESC key to escape

F1	⇒ Increment flashing digit
F	⇒ Decrement flashing digit
Zero	⇒ Move flashing point left
Tare	⇒ Move flashing point right
Enter	⇒ Store data in memory
ESC	⇒ Exit / Escape

Item	Function	Setting value		Default
		Parameter	Description	
RTC- 01	Year	xx	Year 20xx	21
RTC- 02	Month	1~12	January ~ December	1
RTC- 03	Date	1~31	Day 1~31	1
RTC- 04	Hour	0~23	0~23 hour	0
RTC- 05	Minute	0~59	0~59 min	0
RTC- 06	Second	0~59	0~59 sec	0

Chapter 6 Maintenance

6-1 Restore All Parameters to Their Default Factory Values.

(1) While the indicator is counting back to zero, adjust SW to ON and press V F Enter keys.

(2) Display shows the flashing digits  .

(3) Confirm / abort.

(3-1) To confirm press the Enter key & don't release it until the display shows  , then release the key and return the calibration SW to OFF.

(3-2) To abort, set the calibration SW to OFF directly.

6-2 Maintenance Function Parameters

Power on and press V F Enter keys during countdown. Display show 1 FnC, and use ∧ F1 V F keys to browse menu and press Enter key to get in setting.

Menu display	功能	See section
	Restore all parameters to their default factory values	6-2-1
	Clear zero compensation and tare value	6-2-2

3 SPo	Clear batch setting value	6-2-3
4 3UnU	Display zero voltage (mV/V)	6-2-4
5 bUnU	Display span voltage (mV/V)	6-2-5

6-2-1 Restore the function parameter back to its default value

(1) During the indicator count back to zero, press V (F) ↵ (Enter) keys.
(2) The display shows 1 Fn C.
(3) Press the ↵ (Enter) key and the display shows 1.Fn C flashing.
(4) Confirm / abort.
(4-1) To confirm, press the ↵ (Enter) key & don't release it. The display will then show 1 Fn C.
(4-2) To abort press the ⏻ (ESC) key or switch the power off.

6-2-2 Clear zero compensation and TARE values

(1) During the indicator count back to zero, press V (F) ↵ (Enter) keys.
(2) The display shows 1 Fn C press the F1 key to display 2 ZEro.
(3) Press the ↵ (Enter) key, the display shows 2.ZEro flashing.
(4) Confirm / abort.
(4-1) To confirm press the ↵ (Enter) key & don't release it. The display will then show 2 ZEro
(4-2) To abort press the ⏻ (ESC) key or switch the power off.

6-2-3 Clear batch setting

(1) During the indicator count back to zero, press V (F) ↵ (Enter) keys
(2) The display shows 1 Fn C press the F1 key to display 3 SPo.
(3) Press the ↵ (Enter) key, the display shows 3.SPo flashing.
(4) Confirm / abort.
(4-1) To confirm press the ↵ (Enter) key & don't release it. The display will then show 3 SPo
(4-2) To abort press the ⏻ (ESC) key or switch the power off.

6-2-4 Display zero voltage (mV/V)

(1) During the indicator count back to zero, press V (F) ↵ (Enter) keys.
(2) The display shows 1 Fn C press the F1 key to display 4 3UnU.
(3) Press the ↵ (Enter) key the display shows the zero voltage (mV/V). e.g 0.00000.
(4) Press the ⏻ (ESC) key or switch the power off.

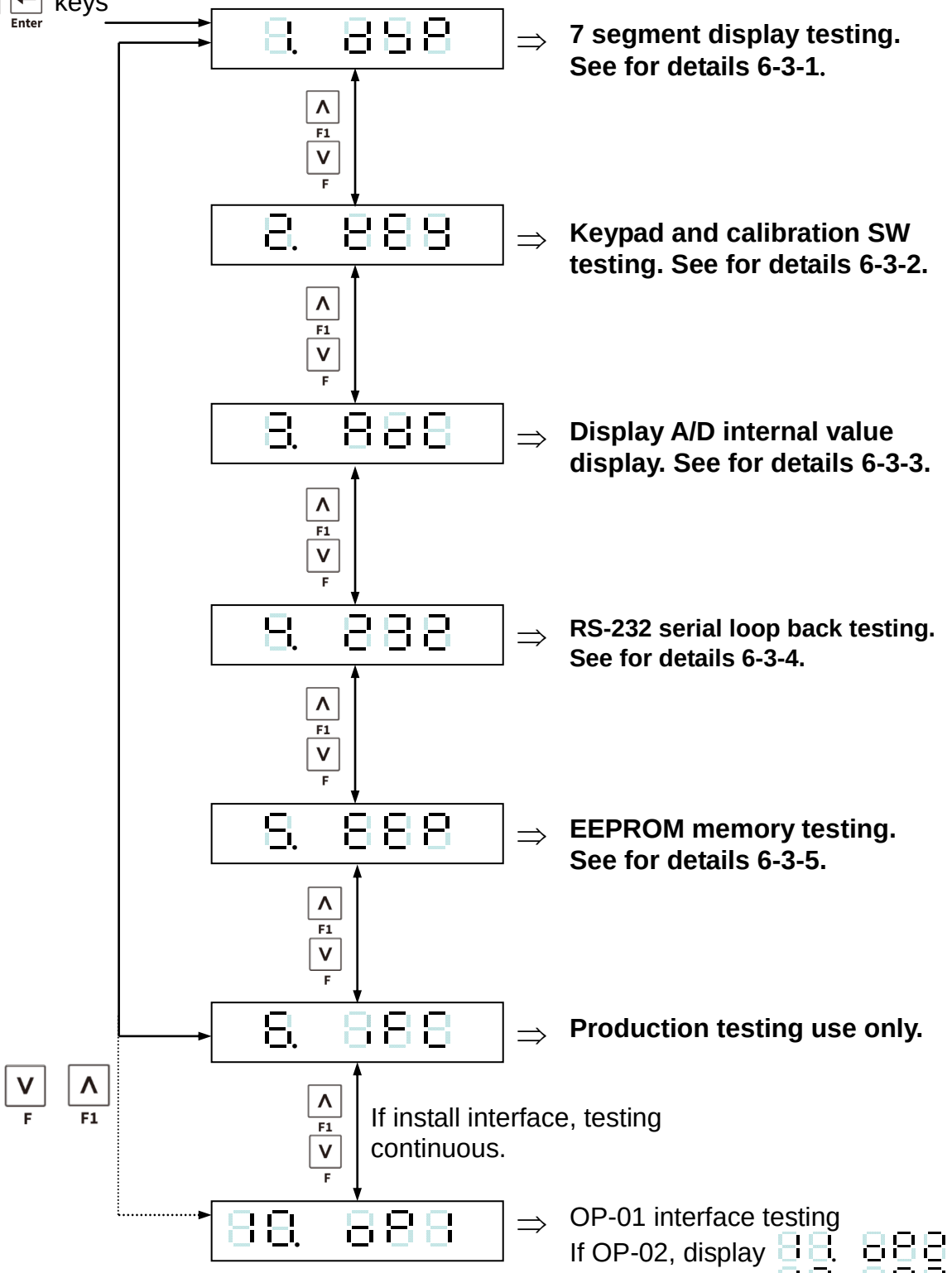
6-2-5 Clear batch setting

(1) During the indicator count back to zero, press V (F) ↵ (Enter) keys.
(2) The display shows 1 Fn C press the F1 key to display 5 bUnU.
(3) Press the ↵ (Enter) key, the display shows the span voltage (mV/V). e.g.4.0000
(4) Press the ⏻ (ESC) key or switch the power off.

6-3 Test mode

During the indicator count back to zero

Press ESC Enter keys



6-3-1 7-Segment display testing

The display will show 8 ~ 9, then display "." and all of the icons.
To exit press the ESC key

6-3-2 Keypad and calibration SW testing

Setting the calibration SW to "ON", or pressing any key will cause the related display segment to change from ' → '. To exit press the ESC key

6-3-3 Display A/D internal value display

Display range is 2,449,950 ~ 4,101,400d (-0.1mV/V ~ 4.0mV/V). To exit press the ESC key

6-3-4 RS-232 serial loop back testing

Terminal pin 5 and pin 6 must be connected together at the rear of the indicator.
If display shows PASS, the interface is working normally. If display shows FAIL,
the interface is not working correctly.

6-3-5 EEPROM memory testing

If the display shows PASS, it means normal. If the display shows FAIL, the memory is not working correctly.

6-3-6 Option interface card testing

OP-01 RS232/RS422/RS485 testing

1) RS232 testing

J1~J4 ⇒ 1, 2 short (Adjust J1~J4 mini jumper to 2, 3)
Terminal pin 1 and pin 3 must be connected together at the rear of the indicator.
If display shows PASS, the interface is working normally. If display shows FAIL,
the interface is not working correctly.

2) RS422 testing

J1~J4 ⇒ 1, 2 short (Adjust J1~J4 mini jumper to 1, 2)

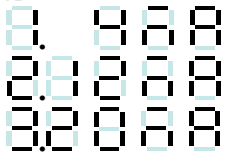
J5~J6 ⇒ 1, 2 short (Adjust J5~J6 mini jumper to 1, 2)
Terminal pin1 and pin 3, pin 2 and pin 4 must be separately connected together at the rear of the indicator.
If display shows PASS, the interface is working normally. If display shows FAIL the interface is not working correctly.

OP-02 BCD parallel output interface testing

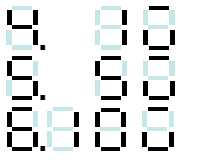
1) A flashing decimal point indicates the test procedure is active.
2) Program will transmit OFF → ON → OFF signal for each output bit of the BCD interface in sequence.

OP-03 Analogue current output interface testing

1) 0 ~ 20 mA current output testing
   Use an ammeter to measure the output current between pin1 & pin 3 of the interface.
   Use the [∧ F1] [∨ F] keys to select the output current level desired.

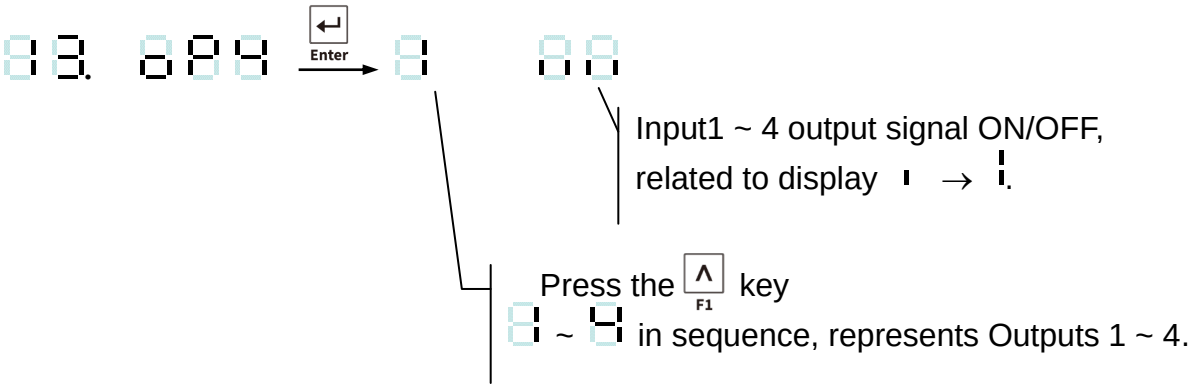


2) 0 ~ 10V voltage output testing
   Use a voltmeter to measure the voltage between pin 2 & pin 3 of the interface.
   Use the [∧ F1] [∨ F] keys to select the output voltage level desired.



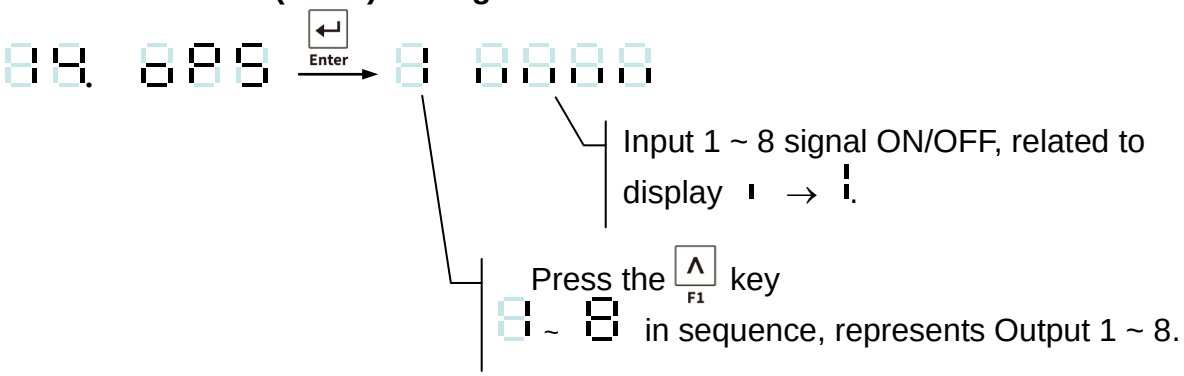
Warning: To avoid damage to components use only a voltmeter.

OP-04 Control I/O (4I/4O) testing

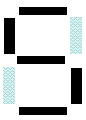
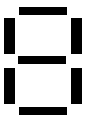
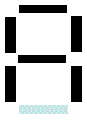
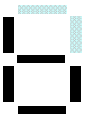
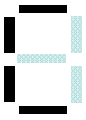
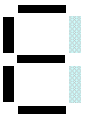
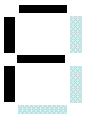
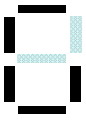
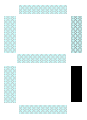
1) 

2) Press the [↵ Enter] key to switch to the control input value.

OP-05 Control I/O (8I/8O) testing



Appendix 1 Description of 7-Segment Characters

0	1	2	3	4	5	6	7	8	9
									
A	B	C	D	E	F	G	H	I	J
									
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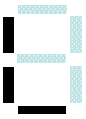
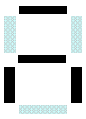
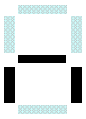
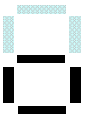
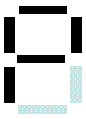
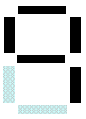
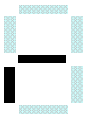
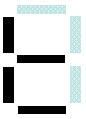
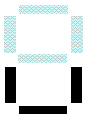
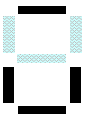
									
U	V	W	X	Y	Z				
									

Appendix 2 Function Table

Specification Calibration

Item	Function	Setting value		Default
		Parameter	Description	
CSP-01	Unit	0	None	2
		1	g	
		2	Kg	
		3	t	
		4	lb	
CSP-02	Decimal Point	0	None	0
		1	1 Decimal Point	
		2	2 Decimal Point	
		3	3 Decimal Point	
CSP-03	Division	1	Division size	1
		2		
		5		
		10		
		20		
		50		
CSP-04	Max. Capacity	999999 ↓ 000000	Max. capacity	999999
CSP-05	Zero range	0 =full range (±1%~30%)	Zero range = calibration zero point ± (Max. capacity×setting value %)	0

CSP-06	Time of zero tracking	0.0 ~ 5.0 (sec)	Time and range of zero tracking should be use at the same time. If the time is set to 0.0, the zero tracking function is disabled	1.0
CSP-07	Range of zero tracking	0 ~ 9	Range of zero tracking = (setting value×½)D , D=min. division Range and time of zero tracking should be use at the same time. If the range is set to 0, the zero tracking function is disabled	2
CSP-08	Investigate time in stable	0.0 ~ 5.0 (sec)	Investigate time and range should be use at the same time. If the time is set to 0.0, the investigate time is disabled	1.0
CSP-09	Investigate range in stable	0 ~ 9	Investigate time and range should be use at the same time. If the range is set to 0, the investigate range is disabled	2
CSP-10	Weight unstable, function ZERO and TARE	0	Action	0
		1	None	
CSP-11	Gross Weight is negative, function TARE	0	Action	0
		1	None	

FNC Group Function Setting

Item	Function	Setting value				Default
		Parameter	Description			
FNC-01	Digital Filter I	0	Fast ↕ Slow			1
		1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
FNC-02	Digital Filter II	0	Disabled			3
		1	Less filter ↕ Greater			
		2				
		3				
		4				
		5				
FNC-03	Key – Locked	000000 ↓ 111111	0	Normal **(lock disable)**	The bits and front panel key positions are related to each other	000000
			1	Close **(lock enable)**		

FNC-04	“F” function setting	Parameter ⇒ Description 0 ⇒ Display Net / Gross weight 1 ⇒ Setpoint parameter setting 2 ⇒ Tare reset 3 ⇒ Manual serial, parallel print output 4 ⇒ Start load 5 ⇒ Stop load 6 ⇒ Start comparison 7 ⇒ Unload command 8 ⇒ Totalise weight and counts command 9 ⇒ Clear totalised weight and counts 10 ⇒ Hold mode 11 ⇒ Escape Hold mode(I / O DSP) 12 ⇒ Convert to Gross / Net / totalised weight / totalised Count	1
FNC-05	“F1” function setting		0

Item	Function	Setting value		Default
		Parameter	Description	
FNC-06	Front panel indication “◀” setting (top)	Parameter ⇒ Description 0 ⇒ Zero 1 ⇒ Stable 2 ⇒ Gross 3 ⇒ Net 4 ⇒ Totalised weight (Accu. V) 5 ⇒ Totalised transactions (Accu. C) 6 ⇒ SP1 7 ⇒ SP2 8 ⇒ SP3 9 ⇒ Hi 10 ⇒ OK 11 ⇒ Lo 12 ⇒ Under 13 ⇒ Over 14 ⇒ Discharge 15 ⇒ Running 16 ⇒ Hold 17 ⇒ MD		0
FNC-07	Front panel indication “◀” setting (next to top)			1
FNC-08	Front panel indication “◀” setting (next to bottom)			2
FNC-09	Front panel indication “◀” setting (bottom)			3
FNC-10	Return to zero band (d: refer to CSP-03)	0	5 d	0
		1	10 d	
		2	20 d	
		3	40 d	
		4	60 d	
		5	80 d	
		6	100 d	

FNC-10	Return to zero band (d: refer to CSP-03)	7	150 d	0
		8	200 d	
		9	250 d	
FNC-11	Hold	0	Hold	0
		1	Peak hold (positive 1)	
		2	Peak hold (negative)	
		3	Peak hold (absolute value)	
		4	Peak hold (positive 2)	
FNC-12	Rate for display rewrite	0	No limitation	0
		1	20 times/s	
		2	10 times/s	
		3	5 times/s	
		4	1 time/s	

Item	Function	Setting value		Default
		Parameter	Description	
FNC-13	Turn-on zero setting	0	Disable	0
		1	Enable	
FNC-14	Stand-by mode setting	0	Disable all the functions under stand-by mode	0
		1	Only turn off display but not disable other functions under stand-by mode	
FNC-15	Zero function record setting	0	Zero point record not saved into EEPROM	0
		1	Zero point record saved into EEPROM	
FNC-16	Internal calibration password setting	0000	No password	0000
		0001	Password is set	
FNC-17	Turn on/off watchdog	1	Turn on watchdog	1
		0	Turn off watchdog	

Serial Input/Output Interface

(RS1 is the setting for built-in RS485, RS2 for built-in RS232, RS3 for OP-01)

	Function	Setting value			Default
		Para-meter	Description		
RS1- 01 RS2- 01 RS3- 01	Transmit format	0	As display		0
		1	Gross only		
		2	Net only		
		3	As display (simple)		
		4	Gross (simple)		
		5	Net (simple)		
		6	Comparison + As display (simple)		
		7	Comparison +Gross (simple)		
		8	Comparison +Net (simple)		
		9	Tare		
		10	Totalised (Accu.) Weight and number of transactions		
RS1- 02 RS2- 02 RS3- 02	Transmit mode	0	Transmit continuous + command mode (RS3-02 only support Transmit continuous)		0
		1	Auto transmit + command mode		
		2	Manual transmit + command mode		
		3	Command mode		
		4	MODBUS RTU mode		
RS1- 03 RS2- 03 RS3- 03	Transmit speed	0	2400		2
		1	4800		
		2	9600		
		3	19200		
		4	38400		
		5	57600		
		6	115200		
RS1- 04 RS2- 04 RS3- 04	Parity Bit length Stop Bit	0	N, 8, 1	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
	MODBUS Mode: Parity Bit length Stop Bit	0	N, 8, 2	No parity, 8 data bits, 1 Stop bit	2
		1	O, 7, 1	Odd parity, 7 data bits, 1 Stop bit	
		2	E, 7, 1	Even parity, 7 data bits, 1 Stop bit	
RS1- 05 RS2- 05 RS3- 05	Transmit times	0	Open		0
		1	1 time/sec.		
		2	2 time/sec.		
		3	5 time/sec.		
		4	10 time/sec.		

RS1- 06 RS2- 06 RS3- 06	Transmission conditions	0 0 0 0 0 0 Negative (Net Wt.) Weight unstable Overload (OL) 0 ⇒ transmit cont. 1 ⇒ Stop transmit		000000
RS1- 07 RS2- 07 RS3- 07	Indicator poling address	00 ↓ 99	When set to 0, Indicator addressing is not used	0

BCD Parallel Output Interface (OP – 02)

Item	Function	Setting value		Default
		Parameter	Description	
bCd- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
bCd- 02	Transmit mode	0	Transmit continuous	0
		1	Auto transmit	
		2	Manual transmit	
bCd- 03	Output Logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 04	Data ready Signal logic	0	Positive logic action	0
		1	Negative logic action	
bCd- 05	OL output code	0	FFFFFF	0
		1	999999	
bCd- 06	Data code	0	BCD Code	0
		1	Hex. Code	

Analogue Current/Voltage Output Interface (Op - 03)

Item	Function	Setting value		Default
		Parameter	Description	
AnL- 01	Data type	0	As display	0
		1	Gross	
		2	Net	
AnL- 02	Signal output	0	Current output	0
		1	Voltage output	
AnL- 03	Weight in Lo	000000 ~ 999999	When the weight reaches the value of that in AnL-03(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-04	0
AnL- 04	Current / Voltage in Lo	4.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		4.0
AnL- 05	Weight in Hi	000000 ~ 999999	When the weight reaches the value of that in AnL-05(the Max. weight is the max setting value (refer to CSP-04), the current / voltage(refer to AnL-02) output is changed to that configured in AnL-06	30000
AnL- 06	Current / Voltage in Hi	4.0 mA ~ 20.0 mA or 0.0 V ~ 10.0 V		20.0

External Parallel Input/Output Interface (Op-04 & Op-05)

OP-04 Control I/O (4 in / 4 out) + Setpoint Input (BCD code)

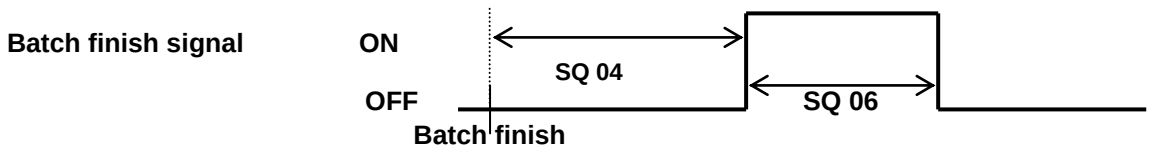
PIN	I/O	Signal	PIN	I/O	Signal
1	IN	Code 100	20	IN	Code 101
2	IN	Code 102	21	IN	Code 103
3	IN	Code 104	22	IN	Code 105
4	IN	Code 106	23	IN	Code 107
5	IN	Code 108	24	IN	Code 109
6	IN	Code 1010	25	IN	Code 1011
7			26		
8			27	OUT	OUT 1
9	**OUT**	**OUT 2**	**28**	**OUT**	**OUT 3**
10	**OUT**	**OUT 4**	**29**	**IN**	**Vex**
11		**COM 2**	**30**		**COM 2**
12			**31**		
13		**COM 1**	**32**		**COM1**
14	**IN**	**IN 1**	**33**	**IN**	**IN 2**
15	**IN**	**IN 3**	**34**	**IN**	**IN 4**
16			**35**		
17			**36**	**IN**	**Code 1**
18	**IN**	**Code 2**	**37**	**IN**	**Code 4**
19	**IN**	**Code 8**			

OP-05 Control I/O (8 in / 8 out)

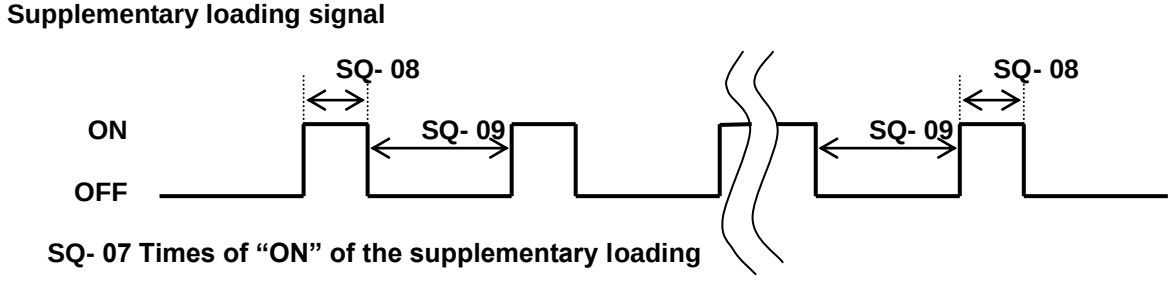
PIN	I/O	Signal	PIN	I/O	Signal
1	**IN**	**IN 1**	**20**		**COM 1**
2	**IN**	**IN 2**	**21**		**COM 1**
3	**IN**	**IN 3**	**22**		**COM 1**
4	**IN**	**IN 4**	**23**		**COM 1**
5	**IN**	**IN 5**	**24**		**COM 1**
6	**IN**	**IN 6**	**25**		**COM 1**
7	**IN**	**IN 7**	**26**		**COM 1**
8	**IN**	**IN 8**	**27**		**COM 1**
9		**COM 1**	**28**		**COM 1**
10		**COM 2**	**29**		**COM 2**
11	**OUT**	**OUT 1**	**30**		**COM 2**
12	**OUT**	**OUT 2**	**31**		**COM 2**
13	**OUT**	**OUT 3**	**32**		**COM 2**
14	**OUT**	**OUT 4**	**33**		**COM 2**
15	**OUT**	**OUT 5**	**34**		**COM 2**
16	**OUT**	**OUT 6**	**35**		**COM 2**
17	**OUT**	**OUT 7**	**36**		**COM 2**
18	**OUT**	**OUT 8**	**37**		**COM 2**
19	**IN**	**Vex**			

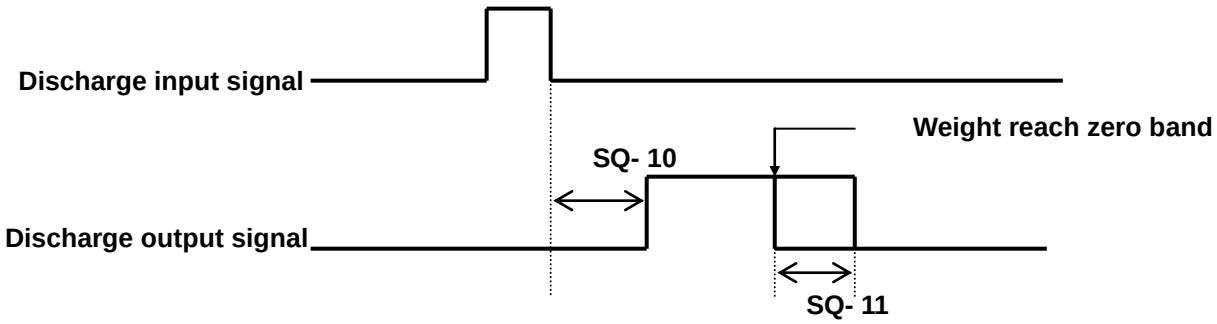
Function Configuration Menu

Item	Function	Setting value		Default
		Parameter	Description	
SQ- 01	Batching mode	1	Normal batch	1
		2	Loss-in weight	
		3	Comparison mode	
		4	Normal batch (Built-in program)	
		5	Loss-in weight (Built-in program)	
		6	Hold mode (Built-in program)	
		9	Close flow control	
SQ- 02	Batching start delay time	0.0 ~ 25.5 (sec)	The built-in auto-program starts the batch comparison procedure after the input of the batch start signal	0.0
SQ- 03	SP1,SP2 Waiting time comparison	0.0 ~ 25.5 (sec)	No full flow comparison during this function's set time period. If the set value is 0, indicates this function is not in use	0.0
SQ- 04	Batch finish output signal delay time	0.0 ~ 25.5 (sec)	Output the batch finished signal after this delay time	0.5
SQ- 05	Batch finish Condition	0	Wait until the weight is stabilized	0
		1	No need to wait until the weight has stabilized	
SQ- 06	Batch finish Output signal time	0.0 ~ 25.5 (sec)	Batch finished output signal time. If set to 0, the output signal will be off until the next batch start	1.0



SQ- 07	Number of Times the supplementary loading function operates	0 ~ 255	If the set value is 0, this function is not in use	0
SQ- 08	Supplementary loading gate open time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	0.1
SQ- 09	Supplementary loading gate close time	0.0 ~ 25.5 (sec)	Must be coordinate with times of supplementary loading, (SQ- 07)	1.0



Item	Function	Setting value		Default
		Parameter	Description	
SQ- 10	Discharge start delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is ON	0.0
SQ- 11	Discharge stop delay time	0.0 ~ 25.5 (sec)	Delay time before Discharge signal is OFF	0.0
SQ- 12	Discharge time	0.0 ~ 25.5 (sec)	Won't activate internal discharge control function, if set to 0	0.0
				
SQ- 13	Restart delay time	0.0 ~ 25.5 (sec)	Delay time before Restart signal is ON	1.0
SQ- 14	Batching counts	0 ~ 255 (times)	Number of batch runs 0 ⇒ one batch only	0
SQ- 15	Set the zero band in to final weighing value	0	No setting	0
		1	Setting	
SQ- 16	Hi, OK, Lo	0	Comparison anytime	0
		1	To compare at batch finish	
		2	To compare at external input signal	
		3	To compare at batching finish and external input signal	
		4	Comparison auto	
		5	Hi_Hi & Lo_Lo	
SQ- 17	Auto totalise weight / counts	0	Disabled	0
		1	Enabled	
SQ- 18	The parameter source in weight comparison	0	Key in directly from front keypad	0
		1	Input directly from rear interface	
SQ- 19	Weight comparison delay time	0.0 ~ 25.5 (sec)	Comparison delay time for Hi, OK, Lo	0.5
SQ- 20	TARE auto.	0	Press keypad TARE to TARE	0
		1	TARE auto	
SQ- 21	Discharge auto	0	Input from external input or keypad	0
		1	Discharge auto + manual	

Appendix 3 MODBUS Data Address Table I

Data Register		Bit I/O		Bit I/O	
Function Code 03 (Read)		Function Code 01 (Read)		Function Code 05 and 15 (Write)	
Modbus	SCALE	Modbus	SCALE Output	Modbus	SCALE Input
40000 ~ 40001	As display value	00000	Stable status	01000	Zero
40002 ~ 40003	Gross weight	00001	Zero status	01001	Clear zero compensation
40004 ~ 40005	Net weight	00002	Gross	01002	Tare
40006 ~ 40007	Tare weight	00003	Net	01003	Clear Tare
40008 ~ 40009	Gross weight hold value			01004	Clear Pre-tare
40010 ~ 40011	Net weight hold value	00050	Zero Band	01005	Display the gross weight on main display
40012 ~ 40013	Weight final value	00051	Sp1	01006	Display the net weight on main display
40014 ~ 40015	Unit weight	00052	Sp2	01007	Enter/Exit the function mode
40016 ~ 40017	Percentage value	00053	Sp3	01008 ~ 01027	Switch unit from the 1st to 20th
40018 ~ 40019	Totalised value	00054	Batch Finish		
40020 ~ 40021	Totalised times	00055	Under	01049	Switch the operation modes
40022 ~ 40023	Totalised times of HI value	00056	Over	01050	Totalised the current net weight and add 1 to the totalised times
40024 ~ 40025	Totalised times of Lo value	00057	Unloading	01051	Deduct the last totalised value and deduct 1 to the totalised times
40026 ~ 40027	Totalised times of OK value	00058	Hi-Hi	01052	Clear the totalised value and times
		00059	Hi	01053	Running
Function Code 06 and 16 (Write)		00060	Go	01054	Stop
41000 ~ 41001	Pre-tare value	00061	Lo	01055	Discharge starts
41002 ~ 41003	Zero Band value	00062	Lo-Lo	01056	Hold mode ON/OFF
41004 ~ 41005	Target value	00063	Peak ready	01057	Release "Hold value"
41006 ~ 41007	SP1 value	00064	Running	01058	Output judgement
41008 ~ 41009	SP2 value	00065	ZERO calibration	01059	ZERO calibration
41010 ~ 41011	SP3 value	00066	SPAN calibration	01060	SPAN calibration
41012 ~ 41013	LO_LO value	00067	Calibrate ERR0		
41014 ~ 41015	LO value	00068	Calibrate ERR2		
41016 ~ 41017	HI_HI value	00069	Calibrate ERR6		
41018 ~ 41019	HI value				
41020 ~ 41021	Under value				
41022 ~ 41023	Over value				
41024 ~ 41025	Peak value setting				
41026 ~ 41027	Batch Finish delay time				
41100 ~ 41101	SPAN calibration value				

The settings marked in grey are not available.

Appendix 4 MODBUS Data Address Table II

(For Hitech and Pro-face Human Machine Interface)

Data Register		Bit I/O		Bit I/O	
Function Code 03 (Read)		Function Code 01 (Read)		Function Code 05 and 15 (Write)	
Modbus	SCALE	Modbus	SCALE Output	Modbus	SCALE Input
40001 ~ 40002	As display value	00001	Stable status	01001	Zero
40003 ~ 40004	Gross weight	00002	Zero status	01002	Clear zero compensation
40005 ~ 40006	Net weight	00003	Gross	01003	Tare
40007 ~ 40008	Tare weight	00004	Net	01004	Clear Tare
40009 ~ 40010	Gross weight hold value			01005	Clear Pre-tare
40011 ~ 40012	Net weight hold value	00051	Zero Band	01006	Display the gross weight on main display
40013 ~ 40014	Weight final value	00052	Sp1	01007	Display the net weight on main display
40015 ~ 40016	Unit weight	00053	Sp2	01008	Enter/Exit the function mode
40017 ~ 40018	Percentage value	00054	Sp3	01009 ~ 01028	Switch unit from the 1st to 20th
40019 ~ 40020	Totalised value	00055	Batch Finish		
40021 ~ 40022	Totalised times	00056	Under	01050	Switch the operation modes
40023 ~ 40024	Totalised times of HI value	00057	Over	01051	Totalised the current net weight and add 1 to the totalised times
40025 ~ 40026	Totalised times of Lo value	00058	Unloading	01052	Deduct the last totalised value and deduct 1 to the totalised times
40027 ~ 40028	Totalised times of OK value	00059	Hi-Hi	01053	Clear the totalised value and times
		00060	Hi	01054	Running
Function Code 06 and 16 (Write)		00061	Go	01055	Stop
41001 ~ 41002	Pre-tare value	00062	Lo	01056	Discharge starts
41003 ~ 41004	Zero Band value	00063	Lo-Lo	01057	Hold mode ON/OFF
41005 ~ 41006	Target value	00064	Peak ready	01058	Release "Hold value"
41007 ~ 41008	SP1 value	00065	Running	01059	Output judgement
41009 ~ 41010	SP2 value	00066	ZERO calibration	01060	ZERO calibration
41011 ~ 41012	SP3 value	00067	SPAN calibration	01061	SPAN calibration
41013 ~ 41014	LO_LO value	00068	Calibrate ERR0		
41015 ~ 41016	LO value	00069	Calibrate ERR2		
41017 ~ 41018	HI_HI value	00070	Calibrate ERR6		
41019 ~ 41020	HI value				
41021 ~ 41022	Under value				
41023 ~ 41024	Over value				
41025 ~ 41026	Peak value setting				
41101 ~ 41102	SPAN calibration value				

The settings marked in grey are not available.

Appendix 5 Examples for Input and Output of Modbus

- Examples here use Appendix 3 and can also be applied to appendix 4, with different Modbus Data Address.
- CRC : Error check code

Function code 03: Modbus (40000~40001) Weight Display

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	03		Function code	03	
Starting Address Hi	00	Register's starting address is 0 = 00 00 (HEX)	Byte Count	04	1 register per 2 bytes, and total of 4 bytes
Starting Address Lo	00		Data Hi (40000)	01	Data in 40000 500 (10) = 01 F4 (HEX)
No. of Points Hi	00	40000~40001, 2 registers are used	Data Lo (40000)	F4	
No. of Points Lo	02		Data Hi (40001)	00	Data in 40001
			Data Lo (40001)	00	
CRC	04		CRC	BA	
	0B			3D	

Function code 05: Modbus (01000) write zero command

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	05		Function code	05	
Register's address	03	$1000_{(10)}$ = 03 $E8_{(HEX)}$ this address for "zero on/off"	Register's address	03	$1000_{(10)}$ = 03 $E8_{(HEX)}$ this address for "zero on/off"
	E8			E8	
ON/OFF	FF	FF 00 :zero on 00 00 : zero off	ON/OFF	FF	FF 00 :zero on 00 00 : zero off
	00			00	
CRC	0C		CRC	0C	
	4A			4A	

Function code 06: Modbus (41004) write zero band value

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	06		Function code	06	
Register's address	03	address for zero band value 1004 (10) = 03 EC (HEX)	Register's address	03	address for zero band value 1004 (10) = 03 EC (HEX)
	EC			E8	
Setting value	01	500 (10) = 01 F4 (HEX)	Setting value	01	500 (10) = 01 F4 (HEX)
	F4			F4	
CRC	48		CRC	48	
	6C			6C	

Function code 06: Modbus (41026): write batch finish delay time write

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	06		Function code	06	
Register's address	04	Batch Finish delay time address $1026_{(10)} = 04\ 02_{(HEX)}$	Register's address	04	Batch Finish delay time address $1026_{(10)} = 04\ 02_{(HEX)}$
	02			02	
Setting value	00	Input value 7s is $0007_{(HEX)}$	Setting value	00	Input value 7s is $0007_{(HEX)}$
	07			07	
CRC	xx		CRC	xx	
	xx			xx	

Function code 01: Modbus (00000~00001): read current scale status

Name	Input	Description	Name	Output	Description
ID Address	01	Machine ID	ID Address	01	Machine ID
Function code	01		Function code	01	
Register's address	00	Starting Address	Bit	02	Read 2 Bit data: $2=10_{(2)}$, 00001 = 1 (return to zero) or 0 (non return to zero), 00000 = 0 (stable) or 1 (unstable)
	00				
Setting value	00	Read 2 status (2 Bit) 00000~00001			
	02				
CRC	BD		CRC	D0	
	CB			49	

Appendix 6 Setup/Update 320S with Ethernet

A) Set up a network to configure 320S indicator

1. Connect 320S to a HUB via a RJ45 cable (CAT-5 / CAT-6).
2. Connect your PC/NB to the same HUB.
3. Default IP address of 320S is **192.168.1.210**.

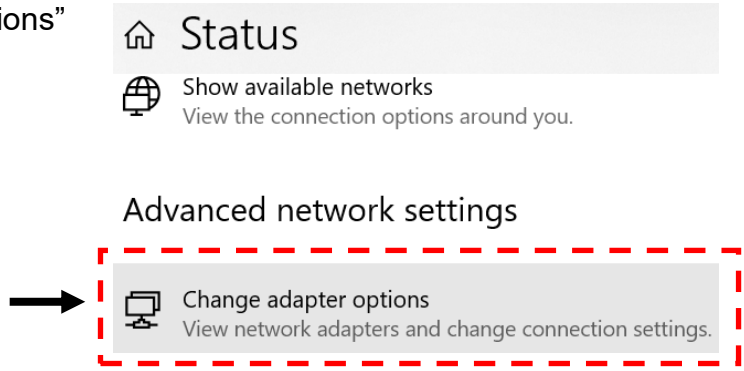
Follow below steps to setup PC/NB's IP address :

a. On Windows 10, right click on Start icon 

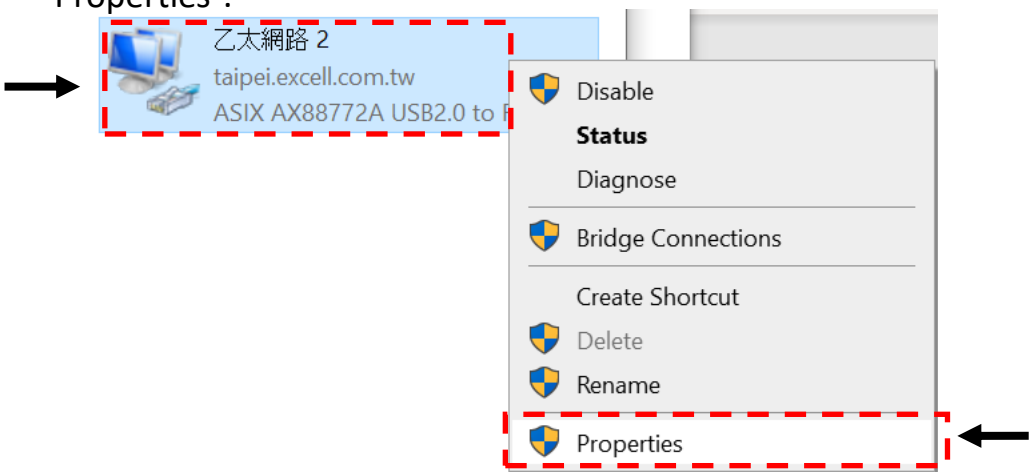
to go to setting

b. Click on "Network Connections"

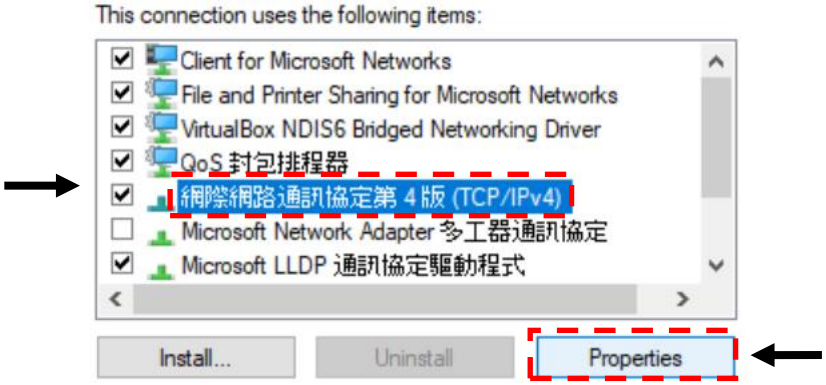
c. Click on "Change adapter options"



d. Right click on the Ethernet Adapter that you connected to the HUB, then click on "Properties".

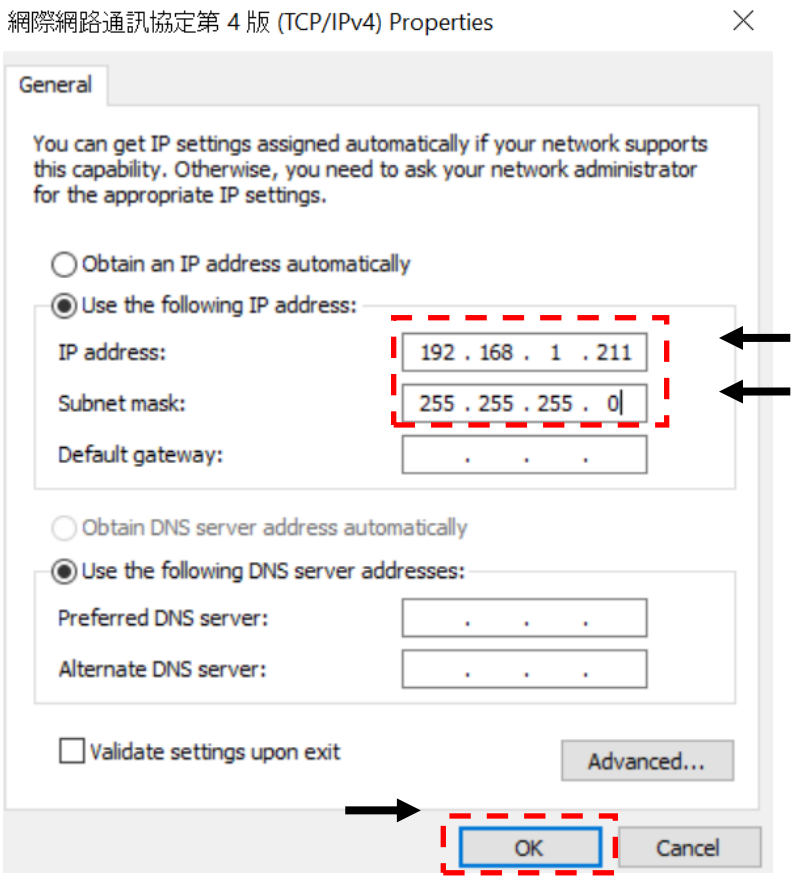


e. Choose "TCP/IPv4" then click on "Properties".



f. Choose a fixed IP address (in this case: 192.168.1.211) and fill in 255.255.255.0 as subnet mask, then press “OK” button.

(Also can choose “Obtain an IP address automatically” to retrieve an IP address from a DHCP server, then check what IP address has obtained by the instructions in user manual.)



Note : please ping the IP address (192.168.1.211) first, in case the IP address already used by the others.

```
PS C:\Users\Jonathan Chang> ping 192.168.1.211

Pinging 192.168.1.211 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.211:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

g. Then click “Close” to close Ethernet properties window.

h. Now, ping 192.168.1.211 again. We should get replies from 320S.

```
PS C:\Users\Jonathan Chang>
PS C:\Users\Jonathan Chang> ping 192.168.1.211

Pinging 192.168.1.211 with 32 bytes of data:
Reply from 192.168.1.211: bytes=32 time<1ms TTL=128
Reply from 192.168.1.211: bytes=32 time<1ms TTL=128
Reply from 192.168.1.211: bytes=32 time<1ms TTL=128
Reply from 192.168.1.211: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.211:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PS C:\Users\Jonathan Chang> ping 192.168.1.210

Pinging 192.168.1.210 with 32 bytes of data:
Reply from 192.168.1.210: bytes=32 time<1ms TTL=255
Reply from 192.168.1.210: bytes=32 time<1ms TTL=255
Reply from 192.168.1.210: bytes=32 time<1ms TTL=255
Reply from 192.168.1.210: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.210:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PS C:\Users\Jonathan Chang>
```

B) Use web browser to config 320S

1. Disable USB logger or remove USB disk before using browser to configure 320S.
2. Open a web browser and type in 192.168.1.210 as URL.

3. Then key in “admin” and “password” as User ID and Password respectively.
4. Follow the on screen instructions to finish the configurations.

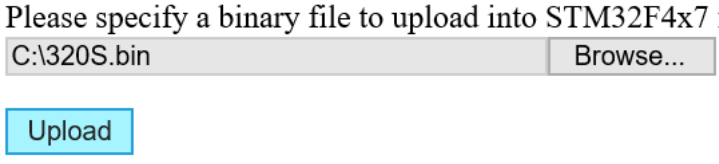
C) Use web browser to update firmware

Note : firmware update function supports Microsoft Internet Explorer 10 and 11 only.

1. Turn off 320S.
2. Hold FW U/D button at the back of 320S, and turn on 320S till the front panel shows “READY”. When release the button, panel will show “UPDATE”.
3. Open a web browser and type in 192.168.1.210 as URL.
4. Then key in “admin” and “password” as User ID and Password respectively.

5. Click “Browse…”” button to select the firmware binary file.

6. click “Open” button.
7. The filename will be displayed on screen then click “Upload” button to start updating firmware.



8. When firmware update completed, click “Reset MCU” to restart 320S.

Appendix 7 Power Cable Specification

Specification: H05VV-F 3X0.75mm^2

Item		Unit	Specification
Product		\	H05VV-F
Conductor	Size	mm2	0.75
	Number	C	3
	Material	\	Bare Copper
	Construction	pcs / mm	42/ 0.15±0.005
Insulation	Material	\	PVC 45P
	Min.thickness	mm	0.44
	Avg.thickness	mm	0.60
	Diameter	mm	2.4±0.10
	Color	\	Brown, Blue, Yellow/Green
Outer Conductor	Type	\	\
	Material	\	\
	Construction	pcs / mm	\
	Coverage	\	\
	Overlap	\	\
Jacket	Material	\	PVC 60P
	Min.thickness	mm	0.58
	Avg.thickness	mm	0.80
	Color	\	black
	Overall Diameter	mm	6.90±0.15
Marking	AWIN.⊲VDE⊳⊲OVE⊳ KEMA-KEUR FI D N S CEBEC 1409 IEMMEQU NSW23371 NF-USE-1369 H05VV-F 3G0.75mm^2 60227IEC53(RVV) 300/500V CCC A063970 TÜV RHEINLAND		

Characteristics:

Item	Unit	Specification	Standard
Conductor Resistance	Ω / KM	AT 20℃	Max.26
Insulation Resistance	MΩ / KFT	AT 15.6℃	Min. 2.5
Dielectric Withstand	VAC / 1min	1500	NO Breakdown
Flame Test	Sec	VW-1	Max.60

Cross - Section View: