SENSORS FOR FOOD AND LIFE SCIENCES.

HYGIENIC BY DESIGN
ANDERSON-NEGELE

30046 / 1.0 / 2022-09-27 / BJ / EN-EU

Operating Manual

Weighing controller SVS510

Note

Please read these installation and operating instructions carefully. All instructions in this manual must be followed exactly to ensure proper operation of the unit.

If you have any questions regarding the product, installation or commissioning, please contact Anderson-Negele Support:

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Specification		
Housing	Panel mounting Dust proof	175 mm x 95 mm x 139 mm 268 mm x 178 mm x 158 mm
Panel cut-out	W x H	160 mm x 70 mm, tolerance +0.5 mm
Protection class	Panel Mounting Dust Proof	IP65 IP68
Ambient	Operation temperature Storage temperature Humidity	-10...40 °C / 14...104 °F -40...60 °C / -40...140 °F 10...95 %, no condensation
Sensor input	One analog load cell I/F	Support up to ten 350 Ω load cells (350 Ω x 10)
Sensor excitation		5 V DC
OIML Ratings	Resolution Sensitivity Accuracy	6000 1uV Class III and IIII
Conversion rate		200/sec
I/O		8 TTL inputs -10...50 mA 12 SPST outputs solid state relays (total 2 A max.)
Display	128 x 64 dot matrix OLED	Up to 150,000 display division
Supply voltage	AC DC	85...264 V AC, 49...61 Hz, max. power consumption < 6 W 20...30 V DC, max. 7 W
Communication	COM1 / COM2 10/100M Ethernet PLC I/F	RS232 / RS232/485 Continuous output weight (TCP/UDP) Demand input and output (TCP/UDP) MODBUS-TCP Server (TCP) Rate calculation
Shipping weight	Panel Mounting Dust Proof	1.3...1.6 kg 3...3.5 kg

Order code

SVS510 Weighing controller

Housing
- **P** Panel Mounting (IP65)
- **D** Dust Proof (IP68)

Port
- **C** COM1 - RS232/422/485
- **E** COM2 - RS232/485/LAN

I/O
- **0** None
- **1** 8 in /12 open collector out
- **2** 8 in/12 relay out (only with PLC "0" or "A")

PLC (only for Port "C")
- **0** None
- **A** 4...20 mA
- **C** CC Link
- **E** Ethernet/IP
- **F** Profinet
- **P** Profibus
- **G** Ethernet/IP and 4...20 mA
- **H** Profinet and 4...20 mA

Applications
- **0** Basic applications

Language
- **0** English

Power supply
- **A** 110/220 V AC
- **D** 24 V DC

Converter box (for half bridge 3-wire sensors)
- **0** No converter box
- **C** With converter box

SVS510	**P**	**C**	**0**	**0**	**0**	**0**	**A**	**0**

Contents

Option:

Half Bridge to Full Bridge Sensor Converter

- Protection grade: IP65
- In the converter the input half bridge signal is reduced by 15.7 times and converted into full bridge signal output
- For up to 4 Half Bridge sensors or junction boxes.

Installation:

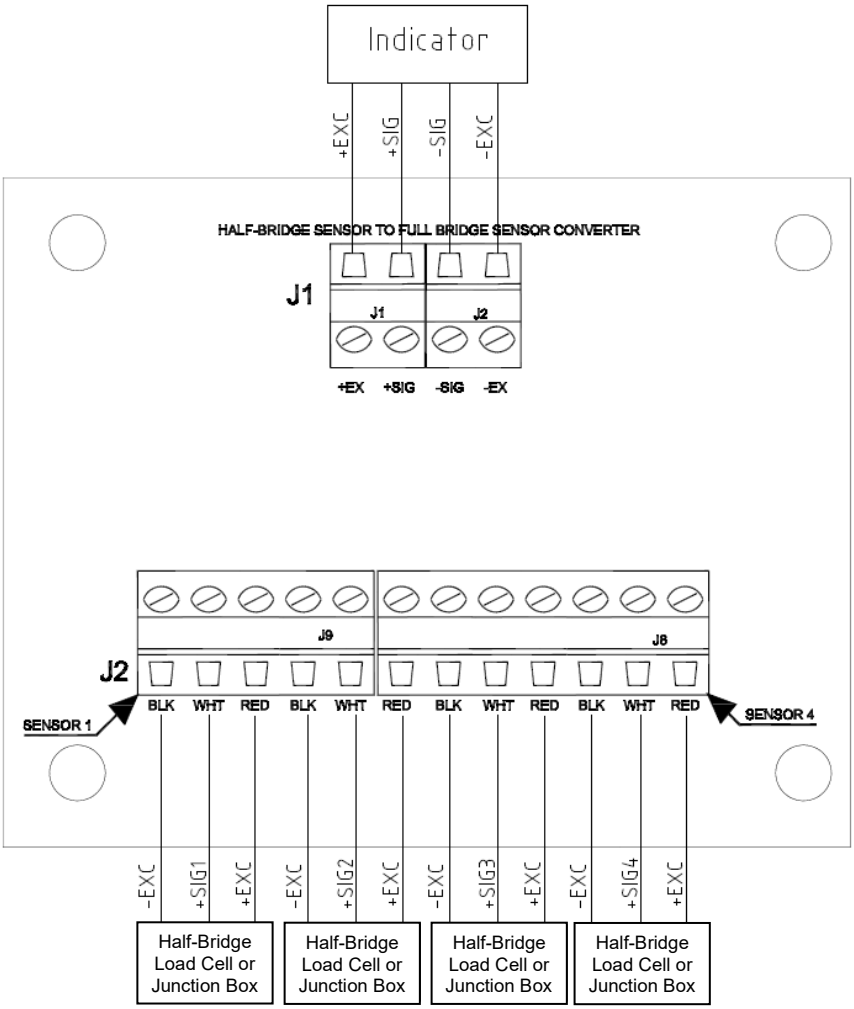
Fix the converter in the right position of the scale body. Open the upper cover, thread the sensor cable and the instrument signal cable from the corresponding interface of the converter through the cable glands, and connect all cables according to the wiring diagram. Connect the external shield of all cables to the grounding stud of the converter and ensure reliable grounding. Tighten all used cable glands.

Resistance of grounding wire to converter: < 1 ohm.
Grounding resistance of the grounding pile of the converter is < 4 ohm!

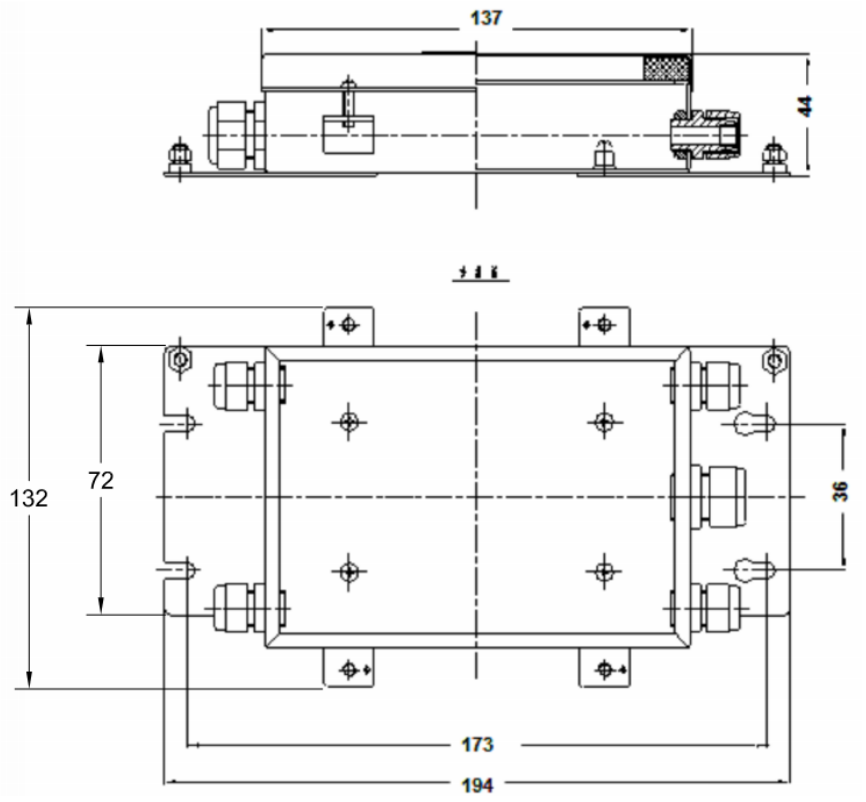
Replace the upper cover of the converter and tighten the screws. The unused cable glands should be blocked with sealing rubber gasket tightened, otherwise the sealing performance will be affected.

It is recommended to recheck and tighten all cover screws and cable glands at least every 6 months to ensure proper sealing is maintained.

Wiring



Dimensions



Chapter 1.0 Introduction

Overview

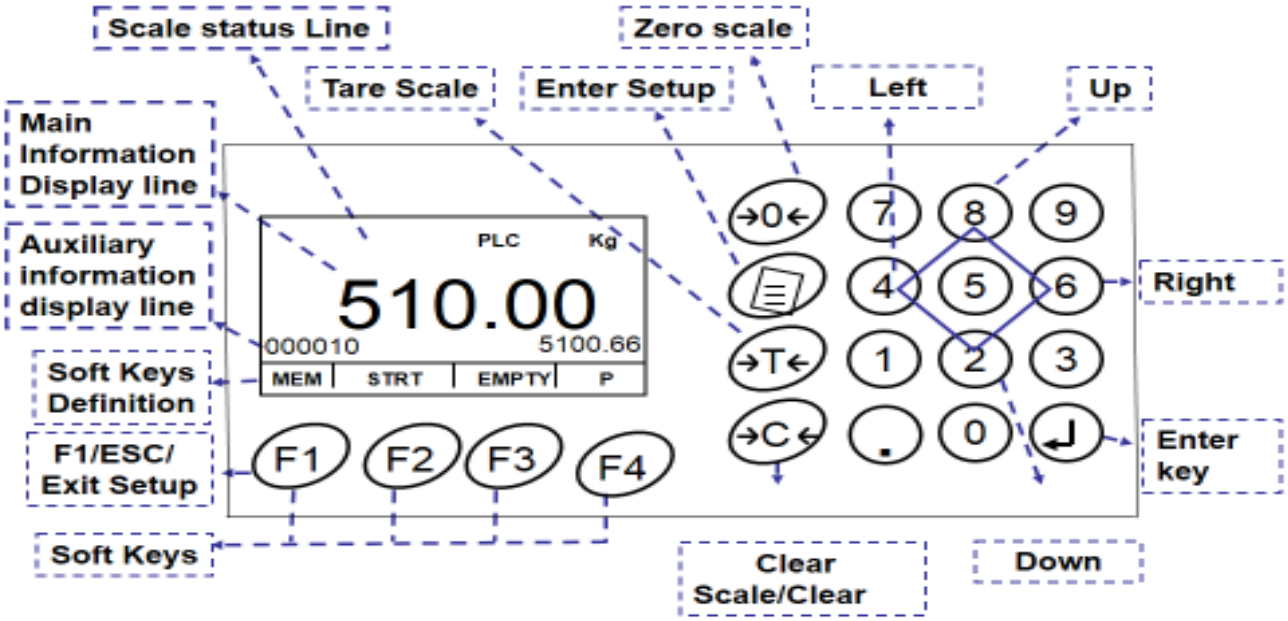
- One analog load cell I/F, support up to ten 350 Ohm (**350 Ohm x 10**) load cells
- Up to 150,000 display Division, 128X64 dot matrix OLED display
- RTC (Date & Time)
- Two serial ports
  - COM1 - RS232
  - COM2 - RS232/485
- 10/100M Ethernet port
  - Continuous Output Weight (TCP/UDP)
  - Demand Input and Output (TCP/UDP)
  - MODBUS-TCP Server (TCP)
- Variety of Calibration Methods
  - 2-Point Calibration
  - 3-point Calibration
  - Free Weight Calibration
- Target Controller
  - 1-speed or 2-speed control mode
  - Auto spill adjustment, Start limit checking, Start auto zero
  - Fill/None or Fill/Dump
  - Two auxiliary comparators : Under Auxiliary and Over Auxiliary
  - Zero tolerance checking
- Total
  - Scale print command weight total
  - Target control fill weight total
- Rate Calculation, display, and report via PLC I/F
- Remote configuration, calibration, and lock keypad via COM1,COM2 and PLC I/F
- MODEBUS-RTU supported via COM1 and COM2
- **200Hz** weight updating speed
- **200Hz** target comparison speed
- **100Hz** PLC I/F (PROFIBUS-DP) weight updating speed
- **50Hz** MODBUS-RTU updating speed
- **IP65** – Panel mount version, **IP68** – Dust proof version

Power In : 85-264VAC，49-61Hz, Maximum Power consumption < 6 W, 20...30 V DC, max. 7 W

- **Option Board**
  - 8-Input/12-Output OC type
  - PROFIBUS-DP
  - 4~20mA analog output option : x1 or x2
  - CC-Link option board
  - PROFINET option board
  - EtherNet/IP option board
- **Operating Environment Conditions**
  Operating Temperature: -10^0C~40^0C Humidity: 10％~95％ No Condensation
  Storage Temperature: -40^0C~60^0C Humidity: 10％~95％ No Condensation

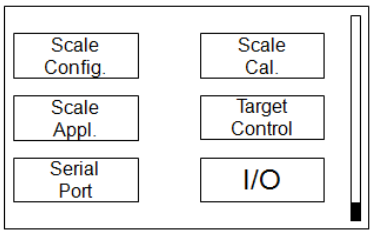
Chapter 2.0 Keypad and Setup Menu

2.1 Keypad Operation



2.2 Operator Menu

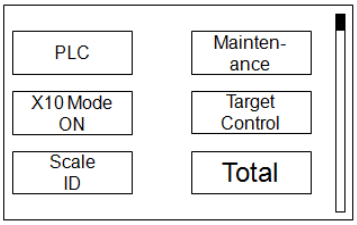
2.2.1 Top Menu



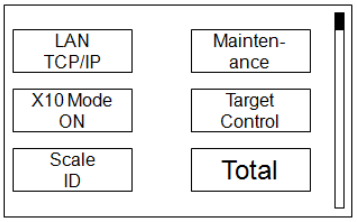
1) Page 1

- **Scale Configuration** :
  Enter Scale Calibration Configuration Page, See 2.2.2
- **Scale Cal.** :
  Enter Scale Calibration Page, See2.2.3
- **Scale Appl.** :
  Enter Scale Application Configuration Page. See 2.2.4
- **Target Control**:
  Enter Target Controller Configuration Page. See 2.2.5
- **Serial Port** :
  Enter Serial Port Configuration Page, See 2.2.6
- **I/O** :Enter I/O Application Configuration Page, See 2.2.7

2) Page 2



- **PLC Fieldbus** :
  Enter PLC Field Bus Configuration Page, See 2.2.8
- **LAN (Ethernet)** :
  Parameters set into LAN interface, See 2.2.9
- **Maintenance** :
  Enter Maintenance Page, See 2.2.9.10
- **X10 Mode OFF/ON** : X10 Mode Switch
- **i-Recall**:Enter Recall Information Page
- **Scale ID**: Enter Input Scale ID Page
- **Total**: Enter View Total page, see 2.2.11



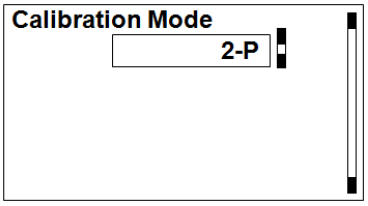
2.2.2 Scale Configuration. (Scale Calibration Config.)

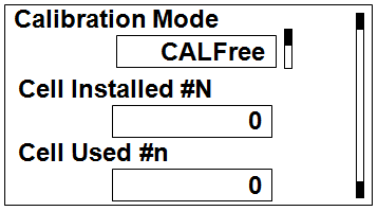
- **Capacity** : Input the capacity of the scale
- **Increment Size** :**0.001, 0.002, 0.005, 0.01, 0.02 0.05 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100**
- **Unit**:**None, g, kg, t**

Note: Throughout this manual refers to Increment Size

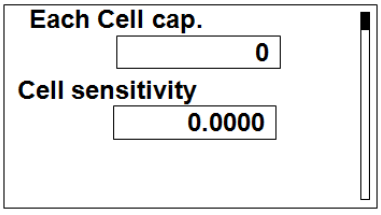
- **Calibration Mode** :

2-P: 2-point mode (**Zero-Point** and **End-Point**)
3-P: 3-point mode (**Zero-Point**, **Middle-Point** and **End-Point**)
CALFree: Free Weight Calibration





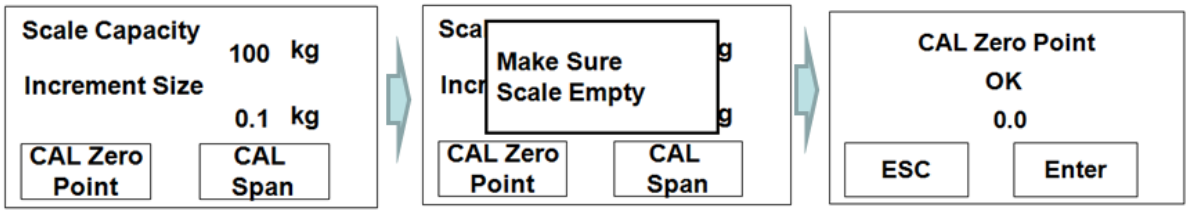
- **Cell Installed #N** :
  Input the number of load cells installed
- **Cell Used #n** :
  Input the number of load cells connected into indicator or junction box.
- **Each Cell Cap.** :
  Input the number of load cells installed
- **Cell sensitivity** :
  Input the sensitivity of load cell, in general is 2.000mV/V or 3.0000 mV/V



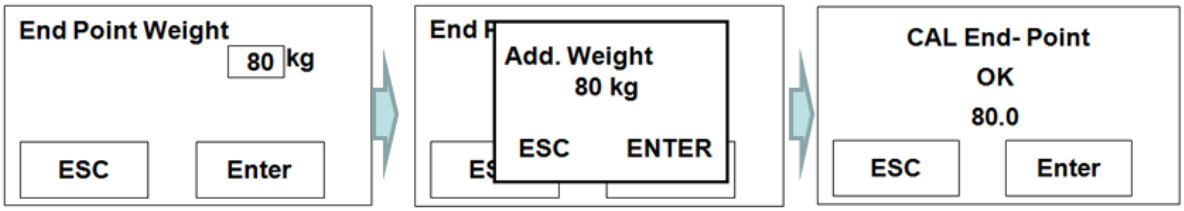
2.2.3 Scale Cal. (Scale Calibration)

1) 2-Point Calibration

➢ STEP1 : Zero Point Calibration

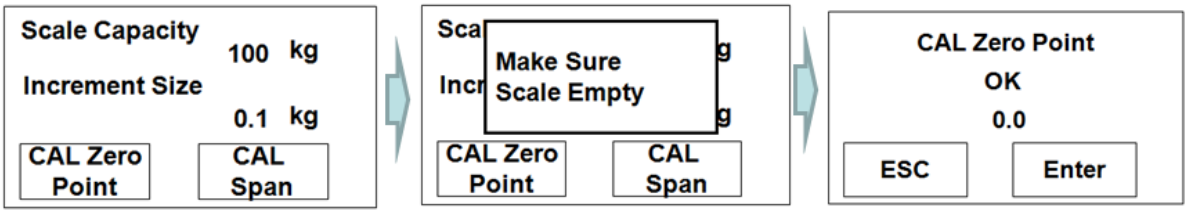


➢ STEP2 : End-Point Calibration

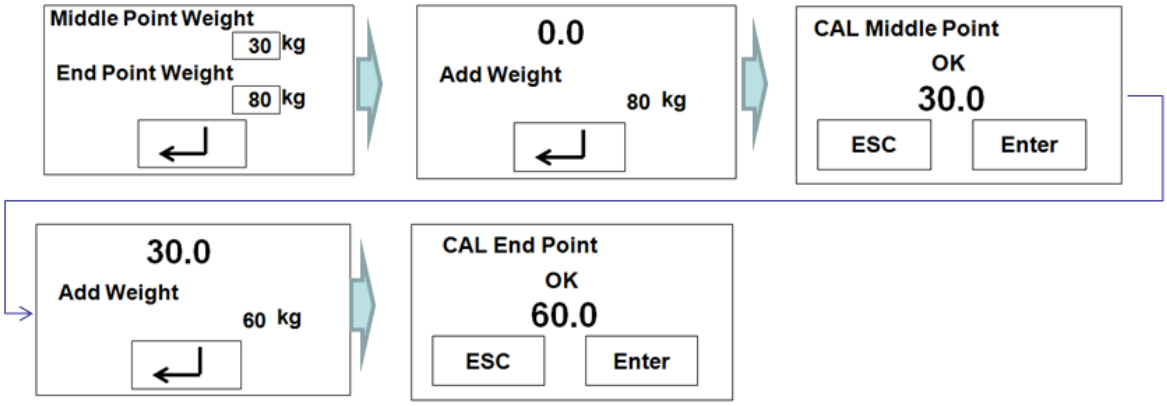


2) 3-Point Calibration

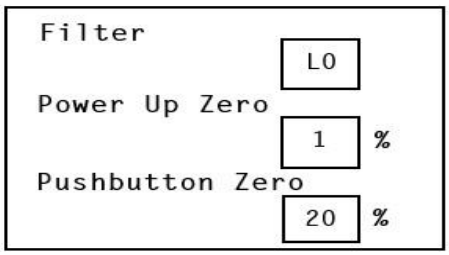
➢ STEP1 : Zero Point Calibration



➢ STEP2 : Middle-Point and End-Point Calibration



2.2.4 Scale App. (Scale Application Configuration)



1) Page 1

- **Filter** :
  L 0– Lightest filter L1,L2…..L9-Heaviest filter

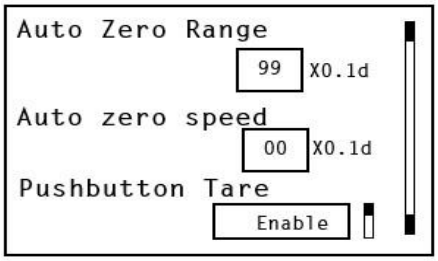
- **Power Up Zero**:
  0 – Disable power up zero, pre-zero point will be used after power on
  1~50% - The range of enable power up zero
  ※ Not more than ±10% automatically in W&M sealing mode

- **Pushbutton Zero** :
  0 – Disable Pushbutton Zero
  1~50% - Enable pushbutton zero range
  ※ Not more than ±2% automatically in W&M sealing mode

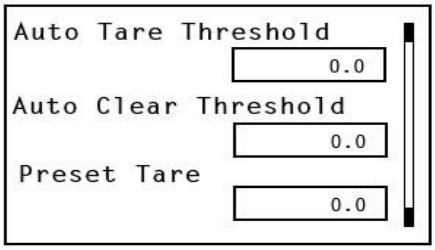
2) Page 2

- **Auto Zero Range** :
  0 – Disable Auto Zero
  (1~99)x0.1d – The range of enable auto zero
- **Auto Zero Speed** :
  0 – Disable Auto Zero
  (1~99)x0.1d/s– The range of enable auto zero, High value, fast Speed

- **Pushbutton Tare** :
  Disable – Disable Pushbutton Tare
  Enable – Enable Pushbutton Tare



3) Page 3

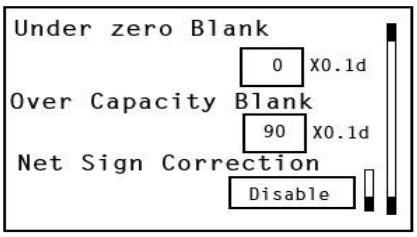


- **Auto Tare Threshold** :
  <0.5d – Disable Auto Tare
  >=0.5d – Enable Auto Tare

- **Auto Clear Threshold** :
  <0.5d – Disable Auto Clear
  >=0.5d –Enable Auto Clear

- **Preset Tare** :
  <0.5d – Disable Preset Tare
  >=0.5d – Enable Preset Tare

2) Page 4



- **Under Zero Blank**:
  0 – Disable Under Zero Blank Checking
  (1~99)x0.1d - Enable Under Zero Blank Checking

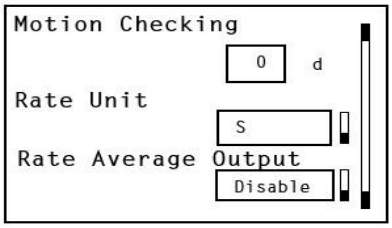
- **Over Capacity Blank** :

  0 – Disable Over Capacity Blank Checking
  (1~99)x0.1d- The range of enable Over Capacity Blank Checking

- **Net Sign Correction**:

Display & Print	Net Sign Correction	
	Disable	Enable
Gross Weight	100	250
Tare Weight	250	100
Net Weight	-150	150

5) Page 5

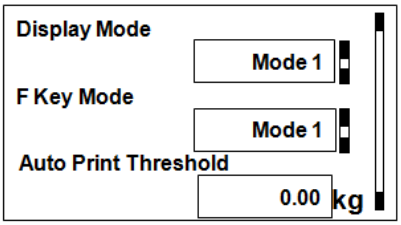


- **Motion Checking** :
  0 – Disable Motion Checking,
  1~9d – The range of enable motion checking

- **Rate Unit** :
  S – **S**econd, **M** – **M**inute, **H** – **H**our

- **Rate AverageOutput** :
  Disable – Disable Rate calculation
  0.1S,0.5S,1S,5S,10S,30S,60S – Enable rate calculation

6) Page 6



- **Display Mode** :

  Mode 1…….Mode 8

Display Mode	Function	
Mode 1	Large Font：Display weight	Small Font: Gross weight
Mode 2	Large Font：Display weight	Small Font： Flow rate
Mode 3	Large Font：Flow rate	Small Font：Display Weight
Mode 4	Large Font：Display weight	Small Font：Total Weight
Mode 5	Large Font：Display weight	Small Font：Bar Code or RFID Number
Mode 6	Large Font：Display weight	Small Font：Target Weight & Gross Weight
Mode 7	Large Font：Display weight	Middle Font：Target Weight
Mode 8	Large Font：Display weight	Middle Font：Target Weight & USER_ID

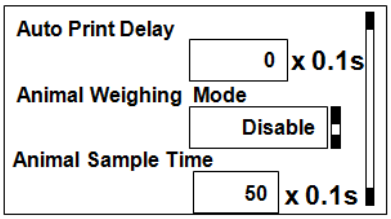
- **F Key Mode** :

Function Keys: Mode 1…….Mode 11

Function keys / Modes	F1	F2	F3	F3
Mode 1				P(Print)
Mode 2	MEM Set the target weight			P(Print)
Mode 3	MEM Set the target weight	PT(Preset Tare)		P(Print)
Mode 4	MEM Set the target weight	TOTAL (Cumulative Print)	CLR （Cancel current print）	P(Print)
Mode 5	MEM Set the target weight	START (Preset point)	EMPTY (Blow down)	
Mode 6	MEM Set the target weight		BCODE	P(Print)
Mode 7	MEM Set the target weight	START (Preset point)	EMPTY (Blow Down)	BCODE

- **Auto Print Threshold** :

0 or < 1d - Disable auto print
>1d –Enable Auto print, if display weight go to more than auto print threshold from empty, scale will trigger auto print automatically.



7) Page 7

- **Auto Print Delay** :

After auto print trigger, scale delay some time to keep weight is stable, and then print.

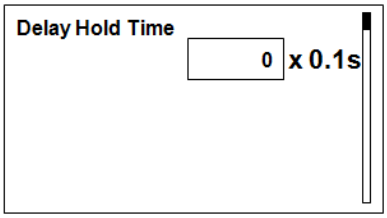
- **Animal Weighing Mode** :

Disable –Disable Animal Weighing
Enable - Enable Animal Weighing

- **Animal Sample Time** :

Because weighing is unstable, so keep sample some time and make sure weighing correct or very close to animal weight.

8) Page 8

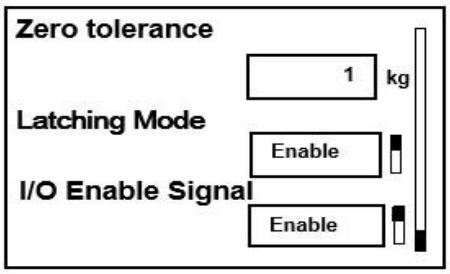


- **Display Hold Time** :

After Animal weighing complete,
Keep display weighing result some time.

2.2.5 Target Control. (Target Controller Configuration)

1) Page 1

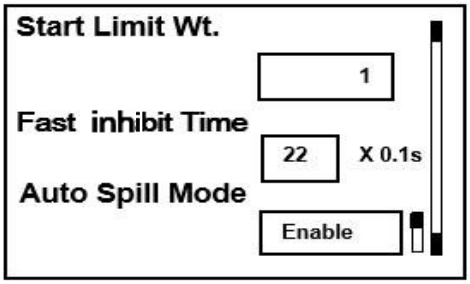


- **Zero Tolerance** :
  0-Prohibition zero tolerance and if set to>0,
  When the Gross Weight
  Less than set weight the zero tolerance output
  Effective

- **Latching Mode**:
  Disable – Non-Latching target mode,
  Enable – Latching Target mode

- **I/O Enable Signal**:
  Disable – No checking with Enable signal input when target running,
  Enable – Checking with Enable signal input when target running

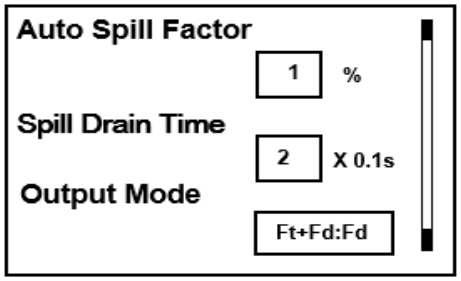
2) Page 2



- **Start Limit Wt.**:

- **Fast Inhibit Time**: 0~99 x0.1**S**econd

If big vibration is available after fast filling, Fast Inhibit Time can be configured and provide much help.



- **Auto Spill Mode**:
  Disable – Auto spill mode is off,
  Enable – Auto spill mode is on

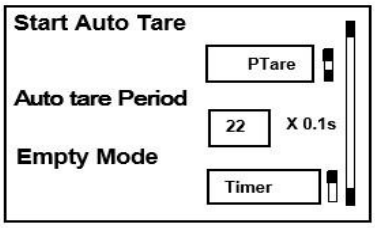
3) Page 3

- **Auto Spill Factor**:
  0 – if Auto Spill Mode is Enabled, spill weight will be adjusted with internal factor (fully auto learn mode)
  1~100 –If Auto Spill Mode is Enabled, spill weight will be adjusted with user setting factor

- **Spill Drain Time**: 0~99 x0.1**S**econd
  If Auto Spill Mode is enabled, this factor is very necessary, it should be long enough to wait until scale goes to be stability.

- **Output Mode**:
  Support 3 kinds of output mode, see section preset point in introduction

4) Page 4

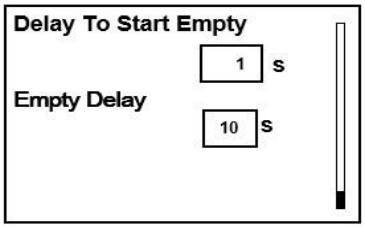


- **Start AutoTare** :
  - **Disable** – Disable Start Auto Tare,
  - **Key-Tare** – Pushbutton Tare is enabled automatically before start filling
  - **PTare** – Preset Tare is enabled automatically before start filling
  - **Key-Zero** is automatically cleared when you start

- **Auto Tare Period**:
  <1d: No start limit checking before filling
  >=1d Start checking enabled and with start limit checking before filling

- **Empty Mode** :
  Disable – No Empty,
  Manual – Manual empty,
  Timer – Timer delay to start empty automatically after filling completely

5) Page 5

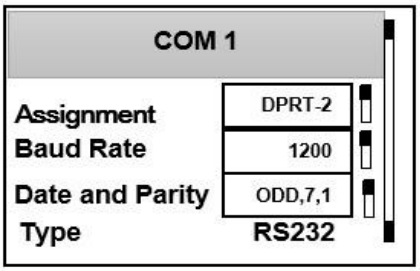


- **Delay to Start Empty**: **0~9999S**econd
  Delay time form filling completely to start empty

- **Empty Delay**: **0~99S**econd
  Delay time after empty (gross weight is below zero tolerance

2.2.6 Serial Port (Serial Port Configuration)

1) Page 1 (COM1)



- **Assignment**

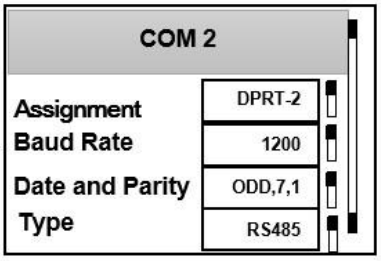
None:
CRPT: 17 bytes continuous output weight , Refer to 4.1
CPRT-C: 18 bytes continuous output weight, with CHK(Checksum),Refer to 4.1
CRPT-1: 17 bytes continuous output Rate, Refer to 4.1
CRPT-1-C: 18 bytes continuous output Rate, with CHK(Checksum)Refer to 4.1
DPRT-1: Demand Input and 1-line to print display weight，Refer to 4.2, 4.3
DPRT-1-C: Demand Input and 1-line to print display weight with CHK(Checksum), Refer to 4.2, 4.3
DPRT-2: Demand input and 1-line print gross weight, tare weight and net weight output,Refer to 4.2, 4.3
DPRT-2-C: Demand input and 1-line to print gross weight, tare weight and net weight output , with CHK(Checksum), Refer to 4.2, 4.3
DPRT-3: Demand input and 3-line to print gross weight, tare weight and net weight output, Refer to 4.2, 4.3
DPRT-3-C: Demand input and 3-line to print gross weight, tare weight and net weight output with CHK(Checksum)，Refer to 4.2, 4.3
Record-1: Record the print format 1,Refer to 4.3.4
Record-2: Record the print format 2**,** Refer to 4.3.4
Record-3: Record the print format 3, Refer to 4.3.4
Record-4: Record the print format 4, Refer to 4.3.4
Modbus1: Point prescription format MODBUS-RTU Communications, See the specific data definition 4.4 Modbus-RTU1
Modbus2: Floating point format MODBUS-RTU Communications, See the specific data definition 4.4 Modbus-RTU2
Modbus3: Floating point format MODBUS-RTU Communications, See the specific data definition 4.5 Modbus-RTU3
Bar-Scan: Connecting Bar code scanning
PQ20-1: Barcode Printer Print Format 1
PQ20-2: Barcode Printer Print Format 2
PQ20-3: Barcode Printer Print Format 3
PQ20-4: Barcode Printer Print Format 4
PQ20-5: Barcode Printer Print Format 5
PQ20-6: Barcode Printer Print Format 6
Record-5: Record the print format 5, Refer to 4.3.4

- **Baud Rate:1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200**

- **Data and Parity:**

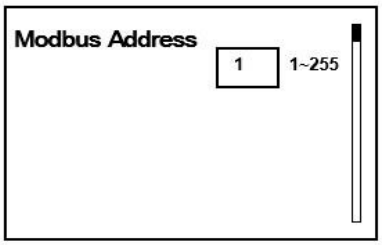
N,8,1 : No Parity,8 data bit, 1 stop bit
EVEN,7,1 : Even Parity,7 data bit, 1 stop bit
ODD,7,1 : Odd Parity,7 data bit, 1 stop bit

2) Page2 (COM2)



- **Assignment** : Same to COM1
- **Baud Rate** : Same to COM1
- **Data & Parity** : Same to COM1
- **Type** :**RS232** or **RS485**

3) Page 3 (MODBUS-RTU Node Address)

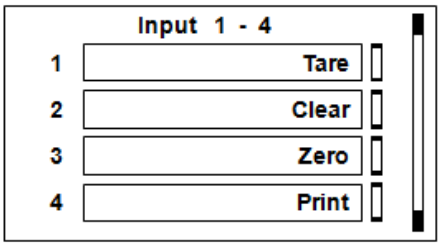


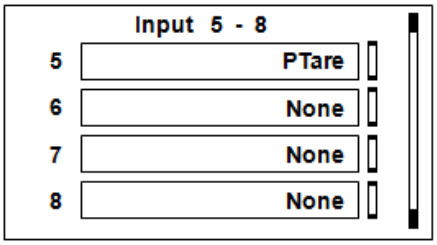
- **MODBUS Address** :**1~255**

If COM1 or COM2 assigned as MODBUS-RTU，MODBUS-RTU Address is necessary.

2.2.7 I/O (I/O Option Assignment)

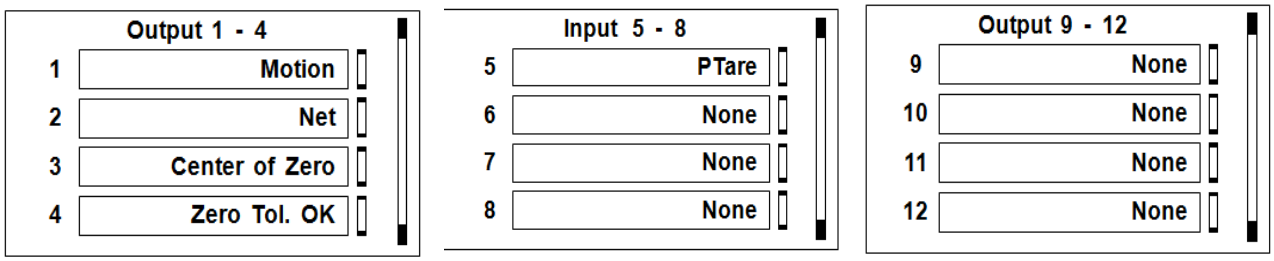
1) IN1~IN8: Support Assignments:





Input Assignment	Description	Available in Target Mode	
		Non-Latching	Latching
None	No Application	√	√
Tare	OFF->ON trigger Tare Scale	√	√
Clear	OFF->ON trigger Clear Scale	√	√
Zero	OFF->ON trigger Zero Scale	√	√
Print	OFF->ON trigger Print	√	√
PTare	OFF->ON trigger Preset Tare Scale	√	√
Key Lock	ON – Lock Keypad OFF – Unlock Keypad	√	√
Start Fill	OFF->ON Trigger Start Fill		√
Abort Fill	OFF->ON Trigger Abort Fill		√
I/O Enable Signa.	ON – I/O Enable Signal ON OFF - I/O Enable Signal OFF		√
Start Empty	OFF->ON trigger Start Empty		√
Adjust Ptare	ON: Adjust digital Ptare	√	√

2）OUT1~OUT12: Support Assignments:



Output Assignment	Description	Available in Target Mode	
		Non-Latching	Latching
None	No Application	√	√
Motion	Motion Flag of Scale Status	√	√
Net	Net Flag of Scale Status	√	√
Center of Zero	Center of Zero of Scale Status	√	√
Zero Tol. OK	Zero Tolerance OK	√	√
Fast Feed	Fast Feed Output of Target Controller	√	√
Feed	Feed Output of Target Controller	√	√
Running	Target Controller Running		√
Out of Tol.	Target Filling Out of Tolerance	√	√
Fill Complete	Target Fill Complete		√
Start Empty Del.	Start Empty Delay Output		√
Empty	Empty Output		√
Empty Complete	Empty Complete Output		√
Under Aux.	Under Auxiliary Output	√	√
Over Aux.	Over Auxiliary Output	√	√

2.2.8 PLC Fieldbus (PLC Field Bus Configuration)

◆ **PROFIBUS Option**

➢ **Node Address** **:1~126**

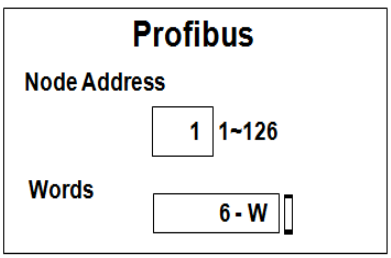
➢ **Words** **:**

2-W : 2-word Input, 2-word output, Integer data format

4-W : 4-word Input, 4-word output, Division data format

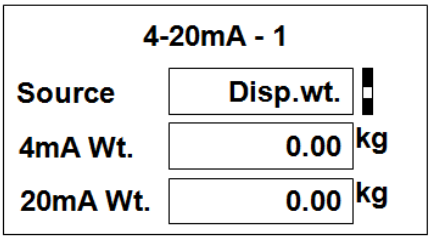
6-W : 6-word Input, 6-word output, Floating data format

Refer to 5.1



◆ 4~20 mA Analog Output Option

1) Page 1 (1# Parameters Configuration)



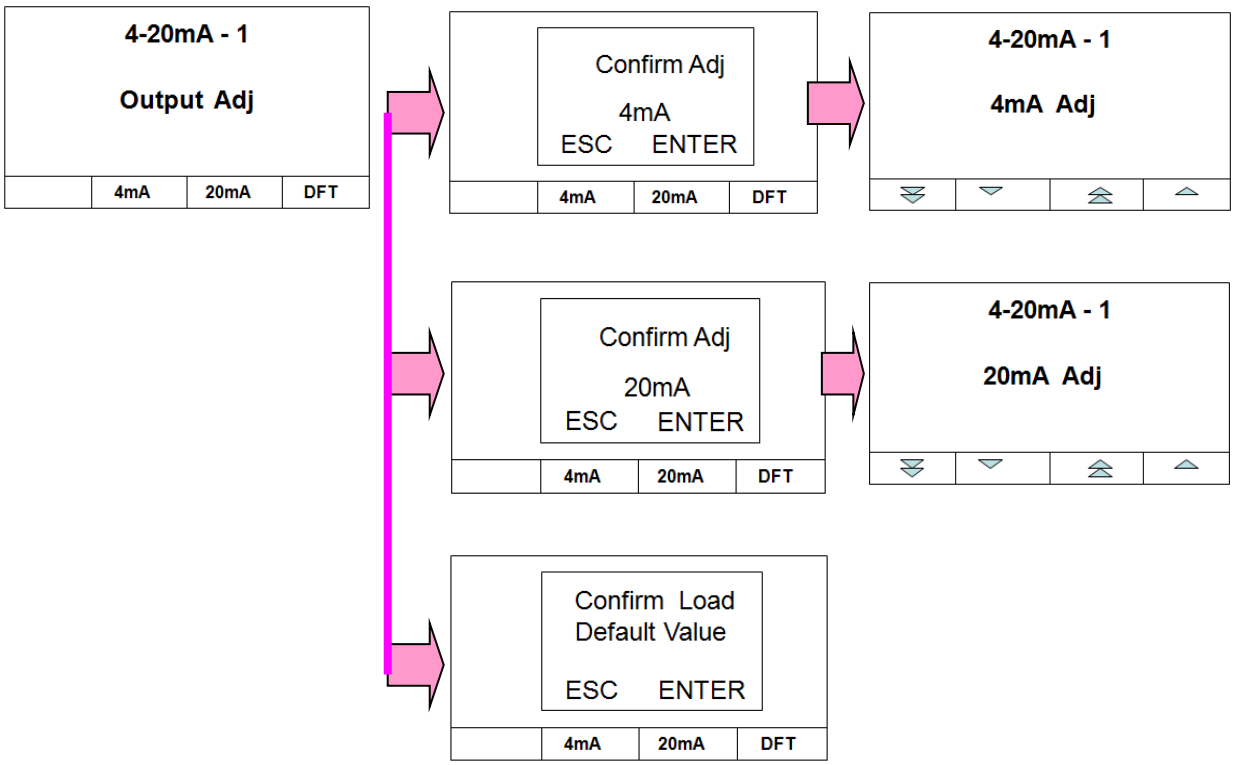
➢ **Source** :

None	**No output**
"Disp.Wt"	**Display weight output**
"ABS DisWt"	**Absolute display weight output**
"Gross"	**Gross weight output**
"ABS Gross"	**Absolute gross weight output**
"Net"	**Net weight output**
"ABS Net"	**Absolute net weight output**
"Rate"	**Rate output**
"ABS Rate"	**Absolute rate output**

➢ **4mA Wt.** :Input weight or rate value for 4mA output

➢ **20mA Wt.** :Input weight or rate value for 20mA output

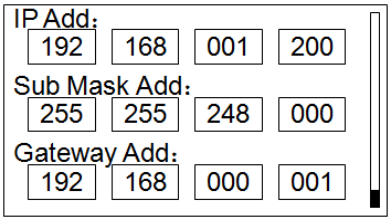
2) Page 1 (1# Output Adjustment)



3) Page 2 (2# Parameters Configuration)
Configurations for 2# channel

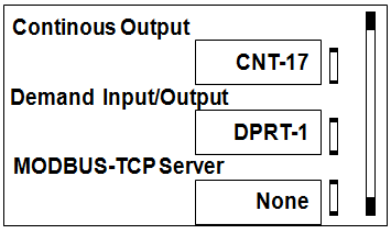
4) Page 2 (2# Output Adjustment)
Adjustment for 2# channel

2.2.9 LAN(TCP/IP)



1) Page 1 (IP Address Configuration)

- **IP Address**:Set the instrument IP address
- **Sub Mask Address**:Set the instrument subnet mask address
- **Gateway Address**: Set the gateway address



2) Page2(TCP/IP Application)

- **Continuous Output :**

Continuous output weight and receive demand through TCP connection of TCP1025port and 2025 port.

None: Disable Continuous output connection

TCP1： Continuous output port 1025, 17 bytes without checking

TCP2： Continuous output port 1025, 18 bytes

UDP1 ： 2025 Continuous output port, 17 bytes without parity

UDP2 ： Continuous output port 2025, 18 bytes

- **Demand Input/output :**

Connection via TCP 1024 port or UDP 2024 port, the instrument will receive Command input, and print the weight data in the appropriate format,

None: Disable Demand Input/Output connection

DPRT-1: Demand Input and 1-line print display weight output, Refer to 4.2, 4.3

DPRT-1-C: Demand Input and 1-line to print display weight output with CHK(Checksum) Refer to 4.2, 4.3

DPRT-2: Demand input and 1-line to print gross weight, tare weight and net weight output Refer to 4.2, 4.3

DPRT-2-C: Demand input and 1-line to print gross weight, tare weight and net weight output, with CHK(Checksum), Refer to 4.2, 4.3

DPRT-3: Demand input and 3-line to print gross weight, tare weight and net weight output，Refer to 4.2, 4.3

DPRT-3-C: Demand input and 3-line to print gross weight, tare weight and net weight output with CHK(Checksum)，Refer to 4.2, 4.3

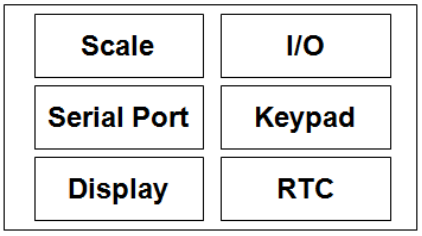
DPRT-5: Demand input and print display weight, date and time in lines Refer to 4.3.4

- **MODBUS-TCP Server:**

  MODBUS-TCP Server is supported through **TCP connection of port 502**.
  Refer to **4.5 MODEBUS-TCP**

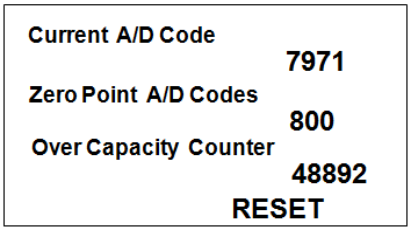
  None : MODBUS-TCP Server is disabled
  Division: MODBUS-TCP Server is enabled and in division data format
  Floating: MODBUS-TCP Server is enabled and in floating data format

2.2.10 Maintenance



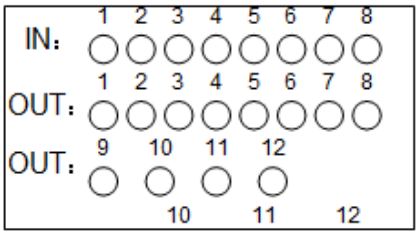
1) Scale:

- View Current A/D Code to check terminal Load Cell I/F and Load Cells
- View scale over capacity counter and clear counter
- PressKey F3 (RESET) to clear counter.



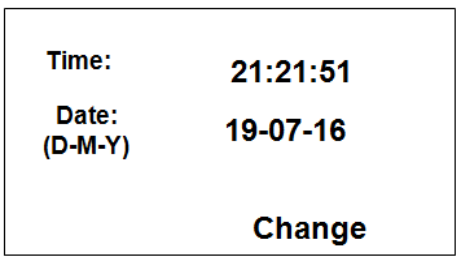
2) I/O:

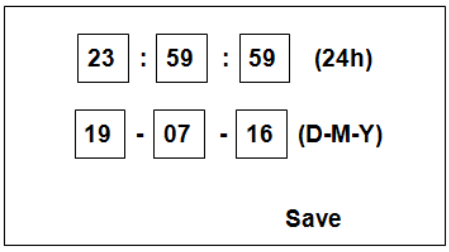
- View Inputs status, Light – ON, Dark – OFF
- Control Output, press key: 1 to 9 and F2(10), F3(11), F4(12) to control output ON/OFF



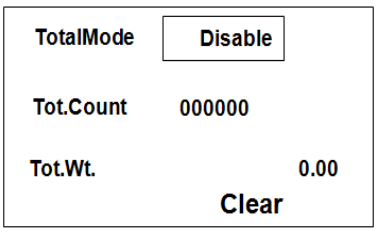
3) RTC: View and Change Date & Time

※ Time is in 24 Hour format one day





2.2.11 Total (Scale Print Total & Fill Total



- **Total Mode**:
  Disable: Total Functionality is disabled
  Print : Do subtotal when print weight out
  Fill : Do subtotal when target control complete filling

- **Tot. Count**:
  Show total counter, can only be cleared through **Clear** access

- **Tot. Wt.**:
  Show total weight, can only be cleared through **Clear** access

Below two ways to clear Total Count and Total Weight:

- Clear key access in setup
- Modbus-RTU, Modbus-TCP and PROFIBUS-DP communication command access

2.3 Function key operation instructions

- Function key MEM
  Enter / view preset point target value, zero tolerance and Auxiliary output threshold
- Function key START
  Start preset point control with latch. It exists only when the preset point latch function is allowed
- Function key EMPTY
  Start the preset point discharge control, which exists only when the preset point discharge function is manual discharge or automatic discharge
- Function key STOP
  Stop the preset point control with latch, and only latch when the preset point exists in operation
- Function key PT
  Digital peeling: When the preset tare weight is greater than 0.5d, digital peeling can be performed through Pt
- Function key P
  Keyboard print key. If the serial port or Ethernet port is configured for command output or output in other print formats, it can be printed through P key
- Function key TOTAL
  Cumulative printing. If the serial port or Ethernet port is configured as command output or output in other print formats, it can be printed by M key
- Function key BCODE
  Barcode ID can be edited through this function key
- Function key TABLE
  With this function key, you can edit label printing information: product number, product batch, shift, and operator

➢

Chapter 3.0 Target Controller

3.1 Latching-Enabled Target

➢ I/O Enable Signal Checking:

If **I/O Enable Signal** is configured as Enabled, Target can be started only when one of the input is configured as **"I/O Enable Signal"** and the input should be**ON** also.

➢ Start Limit Checking:

If **start Limit Wt.** is less than one division of the scale, Start Limit Checking is disabled, or it will be enabled, and target controller only can be started when the current gross weight is not less than the start limit value.

➢ Start Auto Tare:

If **Start Auto Tare** is enabled (configured as Key-Tare or PTare), Target controller will tare scale first and then start filling.

➢ Filling & Outputs

Two filling steps, Fast Filling and Fine Filling are available,
If**Fine Weight**is less than one division (1d), Fast Filling will not be available and only Fine Filling, three output modes are available, Refer below table

	Fast	Fast→Slow Switching	Low speed
Ft+Fd : Fd	Fast (Ft), slow (Fd) outputs valid	No	Slow (Fd) output valid
Ft : Fd	Fast (Ft) output valid	No	Slow (Fd) output valid
Ft : Ft+Fd	Fast (Ft) output valid	No	Fast (Ft), slow (Fd) outputs valid
Ft: nc	Fast (Ft), slow (Fd) outputs valid	Fast (Ft), slow (Fd) outputs are closed 0.5 seconds	Slow (Fd) output valid

➢ Auto Spill

If **Auto Spill Mode** is enabled, Spill weight will be adjusted automatically after filling completed, if user wants to get high precision filling result, Auto Spill is very useful and necessary.

➢ Out of Tolerance Checking：

If tolerance checking is needed, **Low Tolerance Weight** and **Up Tolerance Weight** should be configured.

Out of Tolerance OFF:
Target Weight –Low Tolerance Weight≤Display Weight After Filling≤Target Weight + Up Tolerance Weight

Out of Tolerance ON:
Display Weight after filling<Target Weight –Low Tolerance Weight
or
Display Weight after filling >Target Weight +Up Tolerance Weight

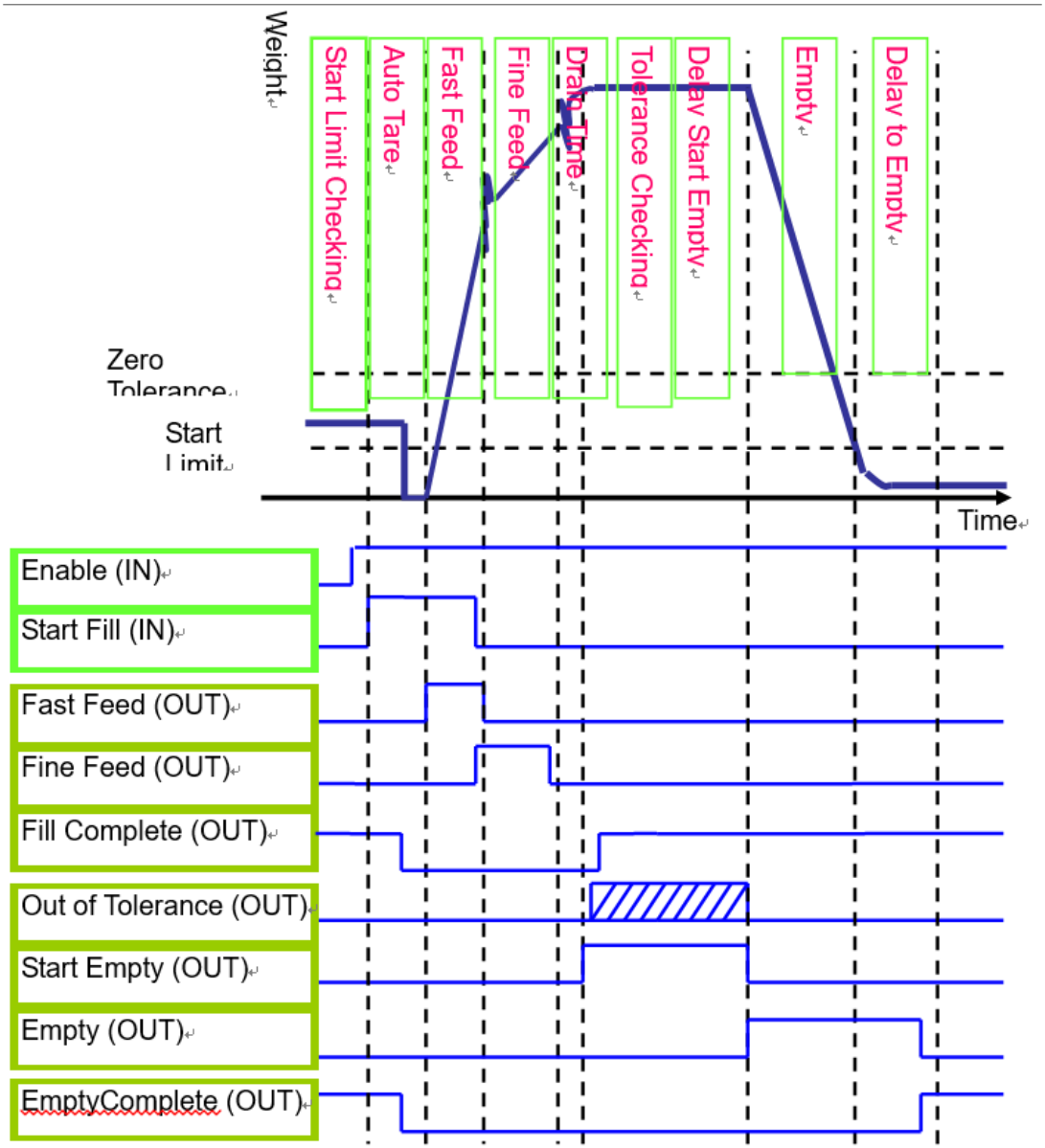
➢ Empty

Two empty modes, **Manual Empty** and **Timer Automatic Empty** are supported.

Delay Start Empty should be configured in Timer Automatic Empty
Empty output will not be OFF until gross weight goes to below zero tolerance and delay **Delay-to-Empty**

➢ Filling Complete and Empty Complete

- **Filling Complete**： It will be ON after Fine Filling complete and tolerance checking, it will not be reset until Target Controller start again in next time
- **Empty Complete**：It will be ON after delay **Delay-to-Empty**, it will not be reset until start target Controller or start empty again.


Weight
Start Limit Checking
Auto Tare
Fast Feed
Fine Feed
Drop Time
Tolerance Checking
Delay Start Empty
Empty
Delay to Empty
Zero
Tolerance
Start
Limit
Time
Enable (IN)
Start Fill (IN)
Fast Feed (OUT)
Fine Feed (OUT)
Fill Complete (OUT)
Out of Tolerance (OUT)
Start Empty (OUT)
Empty (OUT)
EmptyComplete (OUT)

3.2 Non-Latching Target

Preset can work without latch mode, when the preset point not start control signal, except in preset menu configuration mode. It has been running, and no longer has to start threshold comparison and start automatic tare.

※ Quick to when the material is always just fast (Ft) has an output

※ When the material is always slow to just fast (Fd) has an output

※Fast and Feed outputs are forced OFF in Setup Mode (Enter in Configuration Menu)

3.3 Auxiliary Comparator

It supports two independent comparators:

 Upper limit comparator, current gross than or equal to the set upper limit, output conduction

 Limit comparator, current gross less on the set limit, output conduction

Chapter 4.0 Serial Port Application

4.1 Continuous Output

COM1, COM2 and Ethernet support continuous output, COM1 and COM2 baud recommendations formulated to not less than 9600, otherwise it will affect the real-time data of the weighing instrument
Ethernet TCP continuous output port 1025, UDP port 2025 continuous output

17-Byte Continuous Output "CPRT"&"CPRT-1"																	
Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Data	STX	STA	STB	STC	W0	W1	W2	W3	W4	W5	TW0	TW1	TW2	TW3	TW4	TW5	CR
Des.	**A**	**B- Status**			**C- Display Wt.**						**D – Tare Wt.**						**E**

18-Byte Continuous Output "CPRT-C" & "CPRT-1-C"																		
Byte	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Data	STX	STA	STB	STC	W0	W1	W2	W3	W4	W5	TW0	TW1	TW2	TW3	TW4	TW5	CR	CHK
Des.	**A**	**B- Status**			**C- Display Wt.**						**D – Tare Wt.**						**E**	**F**

Description：
A – STX (ASCII 0x02) Start the test character.
STA, STB, STC – Status words, Refer to **Table B - Status** in next page.

C – Display Weight. Either gross or net weight for "CPRT" & "CPRT-C", Rate for "CPRT-1" & "CPRT-1-C", six digits, no decimal point or sign, Insignificant leading zeroes are replaced with spaces, Refer to Table B to get sign and decimal point position.

D – Tare weight, six digits of tare weight data, no decimal point in field, Refer to Table B to get decimal point position.

E – CR (ASCII 0x0D), ASCII Carriage Return character.

F – CHK(Checksum),Checksum is used to detect errors in the transmitted of data, Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the STX and CR characters.

Table B - Status									
STA	**Bit 0~2**			**Decimal Position**	**Bit 0,1,2**			**Decimal Position**
	2	**1**	**0**		**2**	**1**	**0**	
	0	0	0	XXXX00	1	0	0	XXXX. XX
	0	0	1	XXXXX0	1	0	1	XXX. XXX
	0	1	0	XXXXXX	1	1	0	XX. XXXX
	0	1	1	XXXXX. X	1	1	1	X. XXXXX
	Bit3,4							
	4		**3**	**Increment Size Factor**				
	0		1	X1				
	1		0	X2				
	1		1	X5				
	Bit-5			Always 1				
	Bit-6			Always 0				
	Bit-7			EVEN/ODD Parity bits				
STB	Bit-0			0 – Gross Mode, 1- Net Mode				
	Bit-1			0 – Positive Display Weight, 1 – Negative Display Weight				
	Bit-2			1 – Under Zero or Over Capacity				
	Bit-3			0 – Stability， 1 – Motion				
	Bit-4			0 – X10 OFF， 1- X10 ON				
	Bit-5			1- In Zero Tolerance				
	Bit-6			Always 1				
	Bit-7			EVEN/ODD Parity bits				
STC	Bit-0			0 – Fast OFF，1 – Fast ON				
	Bit-1			0 – Feed OFF 1 – Feed ON				
	Bit-2			0 – Out of Tolerance OFF，1 – Out of Tolerance ON				
	Bit-3			0 – Under Auxiliary OFF， 1 - Under Auxiliary ON				
	Bit-4			0 - Over Auxiliary OFF，1 - Over Auxiliary ON				
	Bit-5			0 – Empty OFF, 1- Empty ON				
	Bit-6			Always 1				
	Bit-7			EVEN/ODD Parity bits				

4.2 Demand Input

COM1, COM2 and Ethernet support even the command input / output, Ethernet command input / output TCP port 1024, UDP port 2024, Ethernet operates in continuous output mode also supports the following command input

Demand Input/Output		
Demand	**Description**	**Response**
C	Clear Scale	None
T	Pushbutton Tare Scale	None
D	Preset Tare Scale	None
P	Print	**Refer to Print Output 4.3**
Z	Zero Scale	None
S	Start Filling	None
A	Abort(Stop) Target Controller	None
E	Start Empty	None
M	Total Weight print	None
K	Display OK, clear print sign	None

4.3 Print Output

4.3.1 DPRT-1(1-Line to Print Display Weight Output)

DPRT-1-C (With Checksum)									
Char	1	2~9	10	11 ~ 12	13	14	15	16	17
Data	**STX**	**DWT**	**SP**	**kg**	**SP**	**G/N**	**CR**	**CHK**	**LF**

DPRT-1(Non-Checksum)							
Char	1~8	9	10 ~ 11	12	13	14	15
Data	**DWT**	**SP**	**kg**	**SP**	**G/N**	**CR**	**LF**

4.3.2 DPRT-2 (1-Line to Print Gross, Tare and Net weight Output)

DPRINT-2-C (With Checksum)									
Char	1	2~9	10	11~12	13	14	15	16~23	24
Data	**STX**	**GWT**	**SP**	**kg**	**SP**	**G**	**SP**	**TWT**	**SP**
Char	25~26	27	28	29	30~37	38	39~40	41	
Data	**kg**	**SP**	**T**	**SP**	**NWT**	**SP**	**kg**	**SP**	
Char	42~44	45	46	47					
Data	**NET**	**CR**	**CHK**	**LF**					

DPRINT-2(Non-Checksum)									
Char	1~8	9	10 ~ 11	12	13	14	15~22	23	24~25
Data	**GWT**	**SP**	**kg**	**SP**	**G**	**SP**	**TWT**	**SP**	**kg**
Char	26	27	28	29~36	37	38~39	40	41~43	
Data	**SP**	**T**	**SP**	**NWT**	**SP**	**kg**	**SP**	**NET**	
Char	44	45							
Data	**CR**	**LF**							

4.3.3 DPRT-3 (3-Line to Print Gross, Tare and Net weight Output)

DPRT-3-C (With Checksum)										
Char	1	2~9	10	11~ 12	13	14	15	16	17	18
Data	**STX**	**GWT**	**SP**	**kg**	**SP**	**G**	**SP**	**CR**	**CHK**	**LF**
Char	19~26	27	28~29	30	31	32	33	34		
Data	**TWT**	**SP**	**kg**	**SP**	**T**	**CR**	**CHK**	**LF**		
Char	35~42	43	44~45	46	47~49	50	51	52		
Data	**NWT**	**SP**	**kg**	**SP**	**NET**	**CR**	**CHK**	**LF**		

DPRT-3 (Non-Checksum)								
Char	1~8	9	10~ 11	12	13	14	15	16
Data	**GWT**	**SP**	**kg**	**SP**	**G**	**SP**	**CR**	**LF**
Char	17~24	25	26~27	28	29	30	31	
Data	**TWT**	**SP**	**kg**	**SP**	**T**	**CR**	**LF**	
Char	32~39	40	41~42	43	44~46	47	48	
Data	**NWT**	**SP**	**kg**	**SP**	**NET**	**CR**	**LF**	

※

STX– Start the text character (ASCII 0x02)
SP – Space（ASCII 0x20）
kg – Two bytes for unit: “kg”,’ g’,”lb”

G/N – ‘G’ – Gross Mode， ‘N’ – Net Mode
G – ‘G’: the gross weight flag.
N – ‘N’: the net weight flag
NET – “NET”: the net weight flag

CR – ASCII Carriage Return character（ASCII 0x0D）

CHK – CHK(Checksum),Checksum is used to detect errors in the transmitted of data, Checksum is defined as the 2’s complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the STX and CR characters

LF – Line Feeder（ASCII 0x0A）
DWT – Eight bytes of display weight， to Right and ，Insignificant leading zeroes are replaced with spaces（ASCII 0x20）

GWT – Eight bytes of gross weight， to Right and ，Insignificant leading zeroes are replaced with spaces（ASCII 0x20）

TWT – Eight bytes of tare weight， to Right and ，Insignificant leading zeroes are replaced with spaces（ASCII 0x20）

NWT – Eight bytes of net weight， to Right and ，Insignificant leading zeroes are replaced with spaces（ASCII 0x20）

4.3.4 DPRT-5

(Lines to Print Display Weight and Date, Time)

Record-1

```
POUND LIST
ID       001
Date   2014/01/01
Time NO.Net Wt --------
----------------------
08:10:05 000110.5 kg
08:15:16 0002 10.3 kg
08:16:18 0003 9.4 kg
------------------------------
TCNT          3
TWGT       30.2 kg
```

Record-2

```
POUND LIST
ID       001
Date   2014/01/01
Time       NO.Gross       Tare        Net       Unit
-------------------------------------------------------------------
08:10:05 0001   20.5         10.0         10.5 kg
08:15:16 0002   15.3          5.0         10.3 kg
08:16:18 0003   10.9          1.5         9.4 kg
-------------------------------------------------------------------
TCNT3
NWGT       30.2 kg
```

Record-3

```
POUND LIST
ID       001
Date   2014/01/01
Time   08:10:05
Num          0001
Gross       11.6 kg
Tare         1.1 kg
Net         10.5 kg
       POUND LIST
ID    001
Date   2014/01/01
Time   08:15:13
Num          0002
Gross        11.2 kg
Tare          1.1 kg
Net          10.1 kg
-------------------------
TCNT           2
NWGT         20.6kg
```

4.4 MODBUS (MODBUS-RTU, MODBUS-TCP)

4.4.1 Serial MODBUS-RTU

COM1 / COM2 support MODBUS-RTU protocol, via MODBUS-RTU, the host can achieve the following functions:

Support 03, 06, 16 command, does not support the bit operation, 16 command is only valid for 32 digits (ie only supports double word variable)

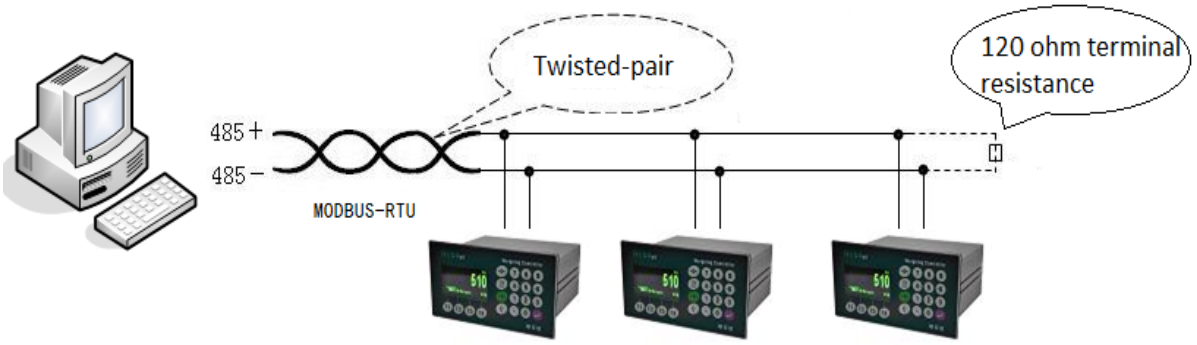
32-bit integer and 32-bit floating point decoding order as follows: 3412

Read instrument displays weight, tare and instrument status

Setting preset target value and preset mode parameter configuration

Remote school scale

MODBUS maximum sampling frequency of 50Hz, 50Hz run lower than is recommended during configuration, a minimum of 20ms latency communication baud rate must be above 9600, COM1 / COM2 support baud rate: 9600,19200,38400,57600,115200 (RS485 mode does not support). Support up to 255 nodes.



4.4.2 Ethernet MODBUS-TCP

Ethernet port supports MODBUS-TCP Server, the port is fixed at 502, the host can achieve the following functions:

Support 03, 06, 16 command, does not support the bit operation, 16 command is only valid for 32-bit

32-bit integer and 32-bit floating point decoding order as follows: 3412

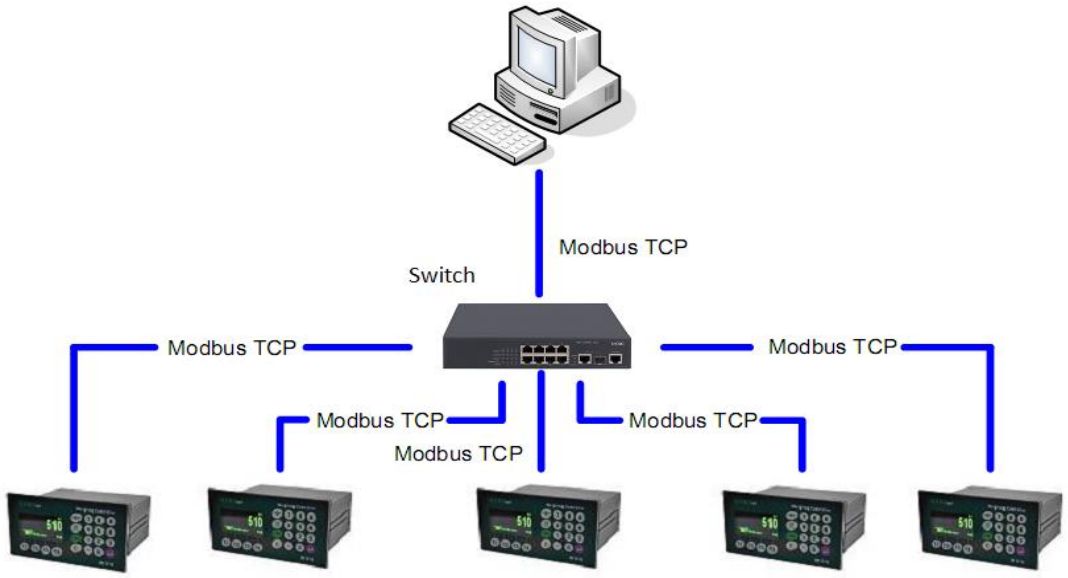
Support command 03, 06, 16, does not support the bit operation.

Read instrument displays weight, tare and instrument status

Setting preset target value and preset mode parameter configuration

Remote school scale

MODBUS-TCP Server sampling frequency of up to 50Hz, 50Hz run lower than is recommended during configuration, it is recommended to set the appropriate time-out from the station more than 10ms



MODBUS-RTU			
Register	**Description**		**Operation**
40001	Display Weight in Division(1)		R
40002	Tare Weight in Division(1)		R
40003	0	1 – In Center of Zero	R
	1	0 – Gross Mode 1 – Net Mode	
	2	0 – Stability， 1 – Motion	
	3	1- Over Capacity	
	4	1- Under Zero	
	5	1-Power Up Zero OK	
	6	1 – Weight Data OK(2)	
	7	0 – Not in Setup Mode, 1 – In Setup Mode	
	8~15	Calibration Status 255 – Calibration Fail 100 – Calibration Motion 9..1 – Calibration in Progress 0 – Calibration OK	
40004	0	In Zero Tolerance: 0 – OFF, 1- ON	R
	1	Fast : 0 – OFF， 1 – ON	
	2	Feed: 0 - OFF 1 – ON	
	3	Running: 0 - OFF， 1 – ON	
	4	Out of Tolerance: 0 - OFF， 1 – ON	
	5	Fill Complete: 0 - OFF， 1 – ON	
	6	Under Auxiliary: 0 – OFF, 1 – ON	
	7	Over Auxiliary: 0 - OFF，1 – ON	
	8	Empty: 0 - OFF， 1 – ON	
	9	Delay to Start : 0 - OFF， 1 – ON	
	10~14	Reserved	
	15	0 – Keypad Unlock， 1 – Keypad Lock	
40005	0~7	IN1 ~ IN8: 0 – OFF, 1 – ON	R
	8~15	OUT1 ~ OUT8: 0 – OFF, 1 - ON	
Next Page			

MODBUS-RTU			
Register	**Description**		**Operation**
40006	0	0→ 1 Trigger Scale Re-Init Scale Block	R/W
	1	0→ 1 Trigger Pushbutton Zero	
	2	0→ 1 Trigger Pushbutton Tare	
	3	0→ 1 Trigger Pushbutton Clear	
	4	0→ 1 Trigger Print	
	5	0→ 1 Trigger Preset Tare	
	6	1 – Lock Keypad， 0 – Unlock Keypad	
	7	1: Clear 40004.10, instrument display OK sign	
	8	0→ 1 Trigger Start Target Controller	
	9	0→ 1 Trigger Abort(Stop) Target Controller	
	10	0→ 1 Trigger Empty	
	11	1:clear 40008.10,instrument display ERR sign	
	12	0→ 1 Trigger Zero Point Calibration	
	13	0→ 1 Trigger Middle Point Calibration	
	14	0→ 1 Trigger End Point Calibration	
	15	0→ 1 Trigger Scale Re-Init All	
40007	Target Weight in Division(1)		R/W
40008	Fine Weight in Division(1)		R/W
40009	Spill Weight in Division(1)		R/W
40010	Low Tolerance Weight in Division(1)		R/W
40011	Up Tolerance Weight in Division(1)		R/W
40012	Start Limit in Division(1)		R/W
40013	Zero Tolerance in Division(1)		R/W
40014	Under Auxiliary Limit Weight in Division(1)		R/W
40015	Over Auxiliary Limit Weight in Division(1)		R/W
40016	Auto Spill Mode		R/W
40017	Auto Spill Factor		R/W
40018	Drain Time		R/W
40019	Start Auto Tare Mode		R/W
40020	Empty Mode		R/W
40021	Delay to Start Empty		R/W
40022	Delay to Empty		R/W
40023	Capacity		R/W
40024	Increment Size		R/W
40025	Calibration Mode		R/W
40026	Middle Point Calibration Weight		R/W
40027	End Point Calibration Weight		R/W
40028/29	Total counter (I32) **(3)**		R/W
40030/31	Total Weight in Division (I32) **(3)**		R/W
40032	Auto Tare Period for Preset point		R/W
40033	Filtering mode (0 ~ 9)		R/W

MODBUS-RTU1Description

(1)

Increment Size = 0.2			
MB-RTU Host	**Weight**	**Host Read Data**	**Host Write Data**
Read Display Weight	300.4	300.4/0.2=1502	
Read Target Weight	100.8	100.8/0.2=504	
Write Target Weight	100.8		100.8/0.2=504

Only 40001 (weight display sub-degree) is a 16-bit signed integer, the other is unsigned 16-bit integer

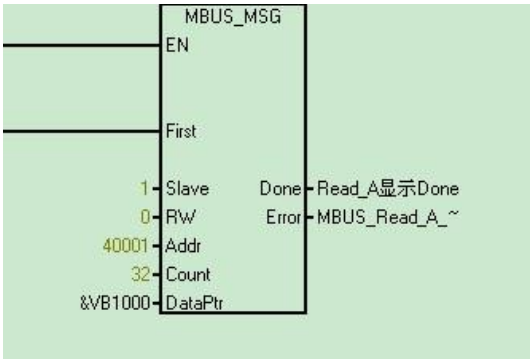
(2) - In the configuration menu when the boot is no catch to zero, the overload, under overload state, then weight data is invalid,
Where 40001 is 0, the host needs to detect this bit to ensure that the system is safe and reliable

※ After setting a new host division value through MODBUS, it must pass the 40006 Bit15 Bit0 or trigger re-initialized after the entry into force

(3) - 40028/29 (cumulative number) and 40031/32 (cumulative weight of sub-degree) are 32 unsigned integer,
Accumulated frequency and accumulated weight of divisions can be written 0 only by 0x10 command to clear the cumulative record through MODBUS

(4)-Read the whole packet data via MODBUS comman S7-200 PLC reads 32 words of data

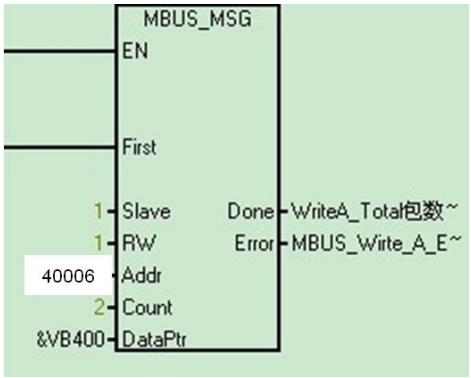
Byte	Data(Hex)	Description
1	01	Slave Address(Indicator Node Address)
2	03	MODBUS Read command
3	00	Read Start Address High byte
4	00	Read Start Address Low byte
5	00	Read bytes counter High byte
6	20	Read bytes counter Low byte
7		CRC check High Byte
8		CRC check Low Byte



(5)- MODBUS send command to ask scale tare

40006.2 value from zero to 1, rising along the trigger peeled. Via MODBUS 06 40006 write command, ensure 40006.2 change from 0 to 1.For example: the first to write 0, delay 50ms, then write 2-40006, then delay 50ms, write back to 0, if the front is zero, you can directly write 2.

Byte	Data(Hex)	Description
1	01	Slave Address(Indicator Node Address)
2	06	MODBUS write command
3	00	Write register address high byte
4	06	Write register address low byte
5	00	Write value high byte
6	02	Write value low byte
7		CRC check High Byte
8		CRC check Low Byte



(6)- MODBUS command do 2-Point calibration

1) Write ：40023（Capacity），40024（Increment Size），40025(Calibration Mode: 0），40027(End Point Calibration Weight)

2） Zero Point Calibration：

- Make sure scale empty
- Write 40006.12: write 0，delay 50ms，write 1：this bit rising edge trigger zero point calibration

3） End-Point Calibration：

- Add Test Weight，should be same as 40027
- Write 40006.14， Write 0，Delay 50ms，write1：this bit rising edge trigger end-point calibration

4.4.3 MODBUS-RTU2/MB-TCP2

MODBUS-RTU2 / MB-TCP2 – Float			
Register	**Description**		**Operation**
40001/2	Display Weight in Float Decode Order: 3412		R
40003/4	Gross Weight in Float Decode Order: 3412		R
40005/6	Flow Weight in Float Decode Order: 3412		R
40007	0	1 – In Center of Zero	R
	1	0 – Gross Mode 1 – Net Mode	
	2	0 – Stability， 1 – Motion	
	3	1- Over Capacity	
	4	1- Under Zero	
	5	1-Power Up Zero OK	
	6	1 – Weight Data OK(1)	
	7	0 – Not in Setup Mode, 1 – In Setup Mode	
	8~15	Calibration Status 255 – Calibration Fail 100 – Calibration Motion 9..1 – Calibration in Progress 0 – Calibration OK	
40008	0	In Zero Tolerance: 0 – OFF, 1- ON	R
	1	Fast : 0 – OFF， 1 – ON	
	2	Feed: 0 - OFF 1 – ON	
	3	Running: 0 - OFF， 1 – ON	
	4	Out of Tolerance: 0 - OFF， 1 – ON	
	5	Fill Complete: 0 - OFF， 1 – ON	
	6	Under Auxiliary: 0 – OFF, 1 – ON	
	7	Over Auxiliary: 0 - OFF，1 – ON	
	8	Empty: 0 - OFF， 1 – ON	
	9	Delay to Start : 0 - OFF， 1 – ON	
	10	1- Print	
	11~14	Reserved	
	15	0 – Keypad Unlock， 1 – Keypad Lock	
40009	0~7	IN1 ~ IN8: 0 – OFF, 1 – ON	R/W
	8~15	OUT1 ~ OUT8: 0 – OFF, 1 - ON	
Next Page			

MODBUS-RTU2– Float			
Register	**Description**		**Operation**
40010	0	0→ 1 Trigger Scale Re-Init Scale Block	R/W
	1	0→ 1 Trigger Pushbutton Zero	
	2	0→ 1 Trigger Pushbutton Tare	
	3	0→ 1 Trigger Pushbutton Clear	
	4	0→ 1 Trigger Print	
	5	0→ 1 Trigger Preset Tare	
	6	1 – Lock Keypad， 0 – Unlock Keypad	
	7	1:clear 40008.10,instrument display OK sign	
	8	0→ 1 Trigger Start Target Controller	
	9	0→ 1 Trigger Abort(Stop) Target Controller	
	10	0→ 1 Trigger Empty	
	11	1:clear 40008.10,instrument display ERR sign	
	12	0→ 1 Trigger Zero Point Calibration	
	13	0→ 1 Trigger Middle Point Calibration	
	14	0→ 1 Trigger End Point Calibration	
	15	0→ 1 Trigger Scale Re-Init All	
40011/12	Target Weight in FloatDecode Order: 3412		R/W
40013/14	Fine Weight in FloatDecode Order: 3412		R/W
40015/16	Spill Weight in FloatDecode Order: 3412		R/W
40017/18	Low Tolerance Weight in FloatDecode Order: 3412		R/W
40019/20	Up Tolerance Weight in FloatDecode Order: 3412		R/W
40021/22	Start Limit in FloatDecode Order: 3412		R/W
40023/24	Zero Tolerance in FloatDecode Order: 3412		R/W
40025/26	Under Auxiliary Limit Weight in FloatDecode Order: 3412		R/W
40027/28	Over Auxiliary Limit Weight in FloatDecode Order: 3412		R/W
40029/30	Total counter (I32) (2) Decode Order: 3412		R/W
40031/32	Total Weight in Float (2) Decode Order: 3412		R/W
40033	UserdefinedID		R/W

MODBUS RTU2 Description

(1)–In the configuration menu when the boot is no catch to zero, the overload, under overload state, then weight data is invalid,
Where 40001 is 0, the host needs to detect this bit to ensure that the system is safe and reliable

(2)– **40029/30** (cumulative number) and**40031/32**(cumulative weight) can be written 0 only by 0x10 command to clear the cumulative record through MODBUS

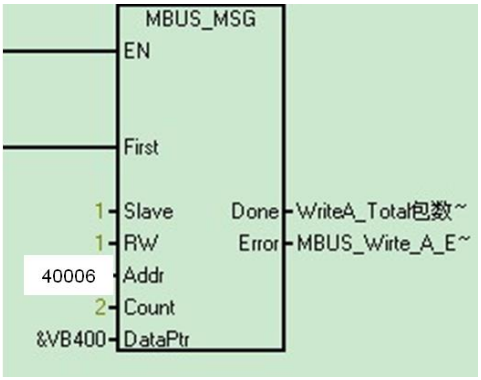
MODBUS-RTU3 / MB-TCP3 – Float			
Register	**Description**		**Operation**
40001/2	Display Weight in Float Decode Order: 3412		R
40003/4	Gross Weight in Float Decode Order: 3412		R
40005/6	Flow Weight in Float Decode Order: 3412		R
40007	0	1 – In Center of Zero	R
	1	0 – Gross Mode 1 – Net Mode	
	2	0 – Stability， 1 – Motion	
	3	1- Over Capacity	
	4	1- Under Zero	
	5	1-Power Up Zero OK	
	6	1 – Weight Data OK(1)	
	7	0 – Not in Setup Mode, 1 – In Setup Mode	
	8~15	Calibration Status 255 – Calibration Fail 100 – Calibration Motion 9..1 – Calibration in Progress 0 – Calibration OK	
40008	0	In Zero Tolerance: 0 – OFF, 1- ON	R
	1	Fast : 0 – OFF， 1 – ON	
	2	Feed: 0 - OFF 1 – ON	
	3	Running: 0 - OFF， 1 – ON	
	4	Out of Tolerance: 0 - OFF， 1 – ON	
	5	Fill Complete: 0 - OFF， 1 – ON	
	6	Under Auxiliary: 0 – OFF, 1 – ON	
	7	Over Auxiliary: 0 - OFF，1 – ON	
	8	Empty: 0 - OFF， 1 – ON	
	9	Delay to Start : 0 - OFF， 1 – ON	
	10	Print Flag: 0 - OFF， 1 – ON	
	11~14	Reserved	
	15	0 – Keypad Unlock， 1 – Keypad Lock	
40009	0~7	IN1 ~ IN8: 0 – OFF, 1 – ON	R/W
	8~15	OUT1 ~ OUT8: 0 – OFF, 1 - ON	
40010	0	0→ 1 Trigger Scale Re-Init Scale Block	R/W
	1	0→ 1 Trigger Pushbutton Zero	
	2	0→ 1 Trigger Pushbutton Tare	
	3	0→ 1 Trigger Pushbutton Clear	
	4	0→ 1 Trigger Print	
	5	0→ 1 Trigger Preset Tare	
	6	1 – Lock Keypad， 0 – Unlock Keypad	
	7	1:clear 40008.10,instrument display OK sign	
	8	0→ 1 Trigger Start Target Controller	
	9	0→ 1 Trigger Abort(Stop) Target Controller	
	10	0→ 1 Trigger Empty	
	11	1:clear 40008.10,instrument display ERR sign	
	12	0→ 1 Trigger Zero Point Calibration	
	13	0→ 1 Trigger Middle Point Calibration	
	14	0→ 1 Trigger End Point Calibration	
	15	0→ 1 Trigger Scale Re-Init All	
Next Page			

MODBUS-RTU3– Float			
Register	**Description**		**Operation**
40011	BarCode: Second Byte	BarCode: first Byte	R/W
40012	BarCode: Fourth Byte	BarCode: Third Byte	R/W
40013	BarCode: Sixth Byte	BarCode: Fifth Byte	R/W
40014	BarCode: Eighth Byte	BarCode: Seventh Byte	R/W
40015	BarCode: Tenth Byte	BarCode: Ninth Byte	R/W
40016/17	Target Weight in Float (1) Decode Order: 3412		R/W
40018/19	Fine Weight in FloatDecode Order: 3412		R/W
40020/21	Spill Weight in FloatDecode Order: 3412		R/W
40022/23	Low Tolerance Weight in FloatDecode Order: 3412		R/W
40024/25	Up Tolerance Weight in FloatDecode Order: 3412		R/W
40026/27	Start Limit in FloatDecode Order: 3412		R/W
40028/29	Zero Tolerance in FloatDecode Order: 3412		R/W
40030/31	Under Auxiliary Limit Weight in FloatDecode Order: 3412		R/W
40032/33	Over Auxiliary Limit Weight inFloatDecode Order: 3412		R/W
40034/35	Total counter (I32) Decode Order: 3412		R/W
40036/37	Total Weight in Float Decode Order: 3412		R/W
40038/39	Feed Result in Float Decode Order: 3412		R
40040	Filtering mode (0 ~ 9)		R/W

(1)-Write the target weight in float via MODBUS command

40016/17 is the target weight in 32 bits float, the bytes order is 3412. Can be written 2 words via MODBUS command 0x10。

Byte	Data(Hex)	Description
1	01	Slave Address(Indicator Node Address)
2	10	MODBUS Write command
3	00	Write Start Address High byte
4	0F	Write Start Address Low byte
5	00	Write bytes counter High byte
6	02	Write bytes counter Low byte
7	04	Write Data Byte Counter
8		High Byte in Low Word of Float
9		Low Byte in Low Word of Float
10		High Byte in High Word of Float
11		Low Byte in High Word of Float
12		CRC check High Byte
13		CRC check Low Byte



Chapter 5.0 PLC Fieldbus Application

5.1 PROFIBUS Parameters Configuration

Three types of GSD file are supported:
Integer Data Format：PLC can use 2-Word Input and 2-Word Output, and all weights are converted into integer data format, Refer to below example：

Increment Size = 0.1			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.5	3005	
Read Target Weight	100.7	1007	
Write Target Weight	100.7		1007

Division Data Format：PLC can use 4-Word Input and 4-Word Output for ID511 GSD, 2-Word Input and 2-Word Output for PTPN or 331 GSD, and all weights are converted into division data format, Refer below example：

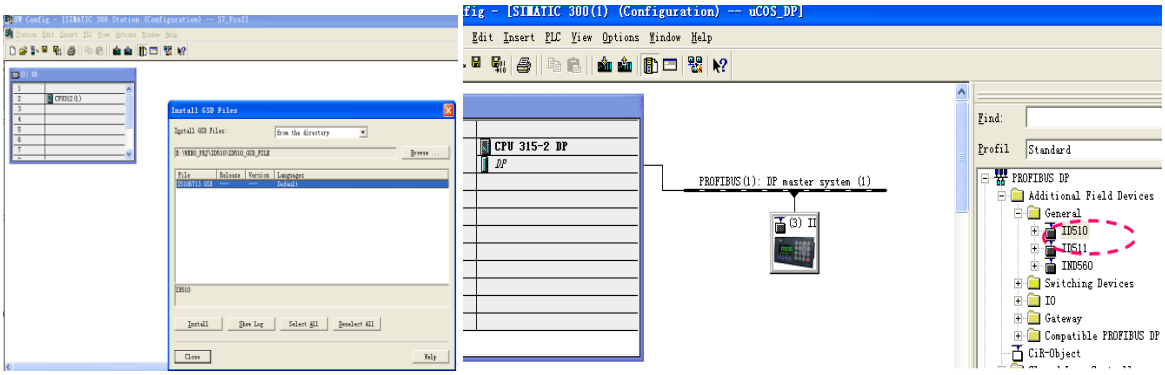
Increment Size = 0.2			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.4	300.4/0.2=1502	
Read Target Weight	100.8	100.8/0.2=504	
Write Target Weight	100.8		100.8/0.2=504

Floating Point Data Format：PLC can use 6-Word Input and 6-Word Output, all weights are the actual weight value

5.2 STEP7PLC Programming

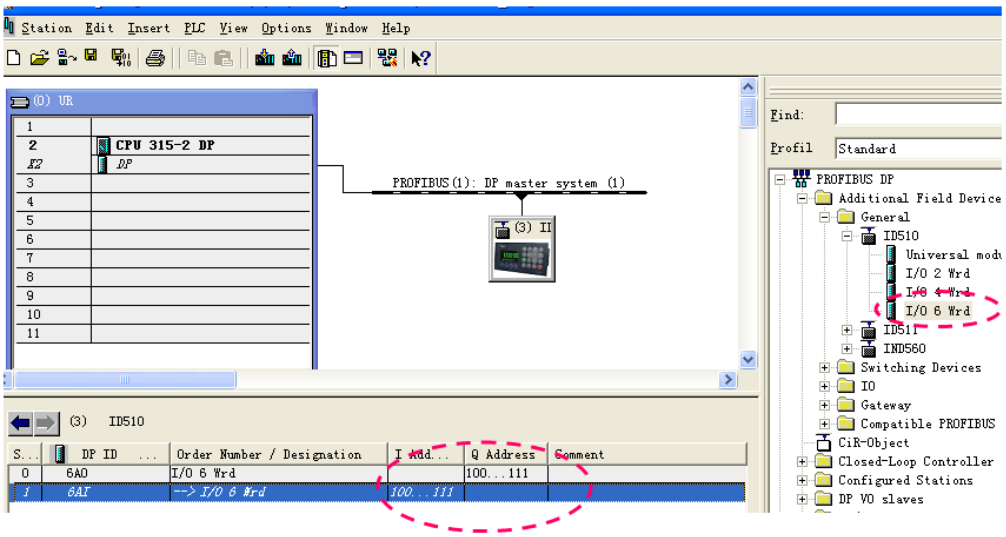
5.2.1 Install SVS510 GSD file to STEP7

Install SVS510 GSD file　　SVS510 will be found in Additional Field Device\General

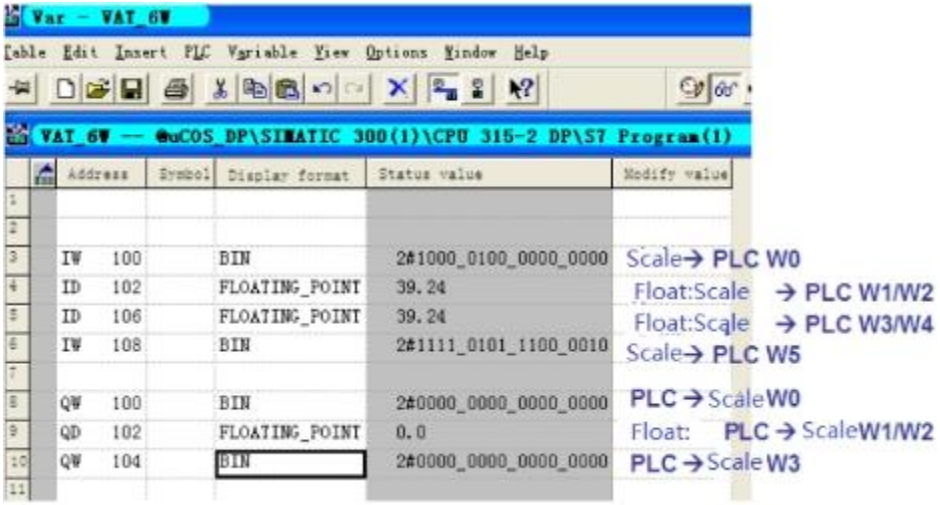


5.2.2 Configure Data Size

Select Floating Data Format with 6-Word Input and Output



5.2.3 Create a Variable table for monitor



5.3 Data Format

5.3.1 SVS510 Integer Data Format

Request: PLC → SVS510 – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Sign, Integer Weight, without decimal point (-32768~32767)															
W1	Load Target	Abort Target	O 2	O 1	Load Tolerance	Load Fine	Load Spill	Target Control	Zero	Print	Tare	Clear	Load Preset Tare	SEL 3	SEL 2	SEL 1

SEL3	SEL2	SEL1	Response Weight
0	0	0	Gross Weight
0	0	1	Net Weight
0	1	0	Display Weight
0	1	1	Tare Weight
1	0	0	Target Weight
1	0	1	Rate
1	1	0	Fine Weight
1	1	1	Spill Weight

W1_8: Target Control：
F5.1=2 Sequence Control: 0->1 trigger to start target control，same to Discrete Input trigger.
F5.1=1 Simple Target Control: 0->1 trigger simple target control update target values and parameters
W1_14: Abort Target: 0->1 trigger to stop sequence control target when it is running

Response: SVS510→ PLC – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	SVS511 response weight in integer(-32768~32767)															
W1	Data OK	ACTIVE	Net	Motion	Reserved	IN 3	IN 2	IN 1	Over Auxiliary	Under Auxiliary	Zero Tolerance	OK Auxiliary	Empty	Out of Tolerance	Feed	Fast Feed

W1_0: Fast Feed: Target Control Fast Feed
W1_1: Feed： Target Control Feed
W1_2: Out of Tolerance
W1_3: Running
W1_4: Empty Mode

5.3.2 SVS510 Division Data Format

Request: PLC → SVS510 – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	S7	S6	S5	S4	S3	S2	S1	S0	R/W
W1	PLC Write to SVS510 Value															
W2	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	Clear	Load Preset Tare	Tare	Zero
W3	Reserved															

Notes of Request: PLC → SVS510 – Division:

W0_0 : 0 – Read ; 1 －Write
W0_1~W0_8: S0-S7 Read or Write Variable Idex

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
1. W0_0 is written from 0 to 1
2. W0_0 is 1 and W0_1 to W0_8 with any change

W0_11 : 0 → 1 trigger **Empty**command
W0_12 : 1 – SVS510 keypad locked, 0 –SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command
W1: Write Variable in Word form
W2_0: 0 → 1 trigger **Zero** command
W2_1: 0 → 1 trigger **Tare** command
W2_2: 0 → 1 load W1(PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W2_3: 0 → 1 trigger **Clear** command
W2_4~W2_15 : PLC can control SVS510 discrete output when which bit is configured as none(see F4.2.1 ~ F4.2.12)

Response: SVS510→ PLC – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK1	Over Capacity	Under Zero	Power Up Zero	Net	Motion	W_FAIL	S7	S6	S5	S4	S3	S2	S1	S0	R / W
W1	Read variable's value refer table															
W2	Data OK2	IN6	IN5	IN4	IN3	IN2	IN1	Key Locked	Over Auxiliary	Under Auxiliary	Zero Tolerance OK	Empty	Running	Out of Tolerance	Feed	Fast Feed
W3	Display Weight in Division															

W0_0 : 0 – Read ； 1 －Write
W0_1~W0_8: S0-S7 Read or Write Variable Idex

W0_9: Writing operation result:
0 – write OK,
1- write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved
W0_10: 0 – Stability， 1- Motion
W0_11: 0 –Gross， 1- Net
W0_12: 1 – Power Up Zero OK
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK

W2_0: Fast Feed : Target Control Fast Feed
W2_1: Feed：Target Control Feed
W2_2: Out of Tolerance
W2_3: Running：Target Control is running.
W2_4: Empty：Target Control is Empty.
W2_5: 1 – In Zero Tolerance
W2_6: Under Auxiliary
W2_7: Over Auxiliary
W2_8: 1 – keypad locked, 0 –keypad unlock
W2_9~W2_14: IN1~IN6 0 – OFF, 1-ON
W3 : Display weight in division format, Gross weight for gross mode, net weight for net mode

5.3.3 SVS510 Floating Point Data Format

Request: PLC → SVS510 – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	**S7**	**S6**	**S5**	**S4**	**S3**	**S2**	**S1**	**S0**	**R/W**
W1	**Value_0**															
W2	**Value_1**															
W3	**O12**	**O11**	**O10**	**O9**	**O8**	**O7**	**O6**	**O5**	**O4**	**O3**	**O2**	**O1**	Clear	Load Preset Tare	Tare	Zero
W4																
W5																

W0_0 : 0 – Read ;1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Idex

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
3. W0_0 is written from 0 to 1
4. W0_0 is 1 and W0_1 to W0_8 with any change

W0_11: 0->1 trigger Empty command
W0_12 : 1 - SVS510 keypad locked, 0 – SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command

W1&W2: provide 32 bits floating point data for PLC write variable's value to SVS510 or load digital tare weight value to SVS510

W3_0: 0 → 1 trigger **Zero** command
W3_1: 0 → 1 trigger **Tare** command
W3_2: 0 → 1 load W1 & W2 (PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W3_3: 0 → 1 trigger **Clear** command
W3_4~W2_15 : PLC can control SVS510 discrete output when which bit is configured as none(see F4.2.1 ~ F4.2.12)

Response: SVS510→ PLC – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK	Over Capacity	Under Zero	Data Bit 1	Net	Motion	W_FAIL	S7	S6	S5	S4	S3	S2	S1	S0	R / W
W1	Read variable's value in floating point data , word1															
W2	Read variable's value in floating point data , word2															
W3	Display Weight in Floating Point Word 1															
W4	Display Weight in Floating Point Word 2															
W5	Data Bit2	IN6	IN5	IN4	IN3	IN2	IN1	Key Locked	Over Auxiliary	UnderAuxiliary	Zero Tolerance OK	Empty	Running	Out of Tolerance	Feed	Fast Feed

W0_0 : 0 – Read ; 1 –Write
W0_1~W0_8: S0-S7 Read or Write Variable Index
W0_9: Writing operation result:
0 – write OK,
1- write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved
W0_10: 0 – Stability， 1- Motion
W0_11: **0 – Gross, 1 – Net**
W0_12: Data Bit1
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK
W1/W2: Read variable's value in floating point data
W3/W4: **Display weight in floating format, Gross weight for gross mode, net weight for net mode**
W5_0: Fast Feed : Target Control Fast Feed
W5_1: Feed：Target Control Feed
W5_2: Out of Tolerance
W5_3: Running
W5_4: Empty
W5_5: 1 – In Zero Tolerance
W5_6: Under Auxiliary
W5_7: Over Auxiliary
W5_8: 1 – keypad locked, 0 –keypad unlock
W5_9~W5_14: IN1~IN6 0 – OFF, 1-ON
W5_15: Data Bit2

Notes:
When scale in setup mode, or Power Up Zero Failure, or Under Zero,or Over Capacity, W0_15(Data OK) will be 0, now display weight(See W3&W4) will be 0, user should always check W0_15 and make sure it is '1' and then read display weight.

5.3.4 SVS510 Access Variables in Division and Floating

Index (Dec.)	Description	Operation （R/W）	Value
00	Net Weight	R	
01	Gross Weight	R	
02	Tare Weight	R	
03	Rate	R	
04	Preset Tare	R	
05	Calibration Result	R	255 – Fail 100 – Motion 9..1 – In Progress 0 – OK
06	Demand to trigger Calibration	R/W	0->1 Zero-Point Calibration 0->2 Middle-Point Calibration 0->3 End-Point Calibration
20	Unit	R/W	0 – None 1 – kg 2 – g3 - t
21	Capacity	R/W	
22	Increment Size	R/W	0 – 0.001 1 – 0.002 2 – 0.005 3 – 0.01 4 – 0.02 5 – 0.05 6 – 0.1 7 – 0.2 8 – 0.5 9 – 1 10 – 2 11 – 5 12 – 10 13 – 20 14 – 50 15 - 100
23	Calibration Mode	R/W	0 – 2-Point Mode, 1 – 3-Point Mode
24	Middle Point Calibration Weight	R/W	
25	End Point Calibration Weight	R/W	
26	Filter Mode	R/W	0（**L**ow），1(**M**iddle)，2（**H**igh）
27	Power Up Zero Range	R/W	0~50
28	Pushbutton Zero Range	R/W	0~50
29	Auto Zero Range	R/W	0~99
30	Pushbutton Tare	R/W	0 – Disable 1 – Enable
31	Auto Tare Threshold	R/W	
32	Auto Clear Threshold	R/W	
33	Motion Checking	R/W	0~9
34	Rate Unit	R/W	0 – **S**econd, 1 – **M**inute, 2- **H**our
35	Rate Average	R/W	0- Disable, 1 – 0.1s, 2 – 0.5s 3 – 1s, 4 – 5s, 5-10s 6 – 30s, 7- 60s
50	Target Controller Latching Mode	R/W	0- No latching 1- Latch Enable
51	Target Controller Start I/O Enable Signal	R/W	0- Disable 1- Enable
52	Target Controller Start Auto Tare	R/W	0 – Disable 1 – Pushbutton Tare 2 – Preset Tare
53	Zero Tolerance	R/W	
54	Target Controller Start Limit weight	R/W	
55	Target Controller Output Mode	R/W	0 - Ft+Fd : Fd 1 - Ft : Fd 2 - Ft-Ft : Fd
56	Fast Inhabit Time	R/W	0~99 x0.1s
57	Spill Drain Time	R/W	0~99 x0.1s
58	Auto Spill Mode	R/W	0 – Disable , 1 – Enable
59	Auto Spill Factor	R/W	0~100
60	Empty Mode	R/W	0 – Disable1 – Manual empty 2 – Timer

61	Delay to start Empty	R/W	0~9999x0.1s
62	Empty Delay	R/W	0~99x0.1s
63	Target Weight	R/W	
64	Fine Weight	R/W	
65	Spill Weight	R/W	
66	Low Tolerance Weight	R/W	
67	Up Tolerance Weight	R/W	
68	Under Auxiliary Weight	R/W	
69	Over Auxiliary Weight	R/W	
70	Total	R/W	
71	Total Weight	R/W	
72	Start Auto Tare	R/W	0~99

PROFIBUS-DP notes:

When in the configuration menu, startup fails to capture zero point, upper overload and lower overload, the weight data is invalid. For example, the displayed weight, gross weight and net weight will be 0. The host needs to detect this bit to ensure the safety and reliability of the system

(1) Cumulative times and cumulative weight are only supported in floating-point format. Write 0 to clear the cumulative record

5.4 Same to PANTHER/IND331 Integer & Division Application

GSD ID configured as ： ptpn or 331
Data format configured as ： Integer or Division

Response: SVS510>> PLC		
Bit	Word0 (IW0)	Word1 (IW1)
0	Word 0 is a 16 bit, signed integer that may represent the terminal's gross weight, net weight, displayed weight, tare weight, or rate. The **bits 0** to **2** in the PLC 2nd output word designate what data is being sent by the terminal.	Fast Feed
1		Feed
2		Zero Tolerance OK
3		Tolerance OK
4		Reserved
5		Auxiliary UNDER
6		Auxiliary OK
7		Auxiliary OVER
8		Reserved
9		IN1 status, 0-OFF, 1-ON
10		IN2 status, 0-OFF, 1-ON
11		IN3 status, 0-OFF, 1-ON
12		Motion, 1-motion, 0- stability
13		1 – net mode, 0 – gross mode
14		Update in Process
15		Data OK

Request: PLC>> SVS510		
位	Word0 (QW0)	Word1 (QW1)
0	Target values or preset-tare weight value	0 0 0 ： Request Read Gross weight 0 0 1 ： Request Read Net Weight 0 1 0 ： Request Read Display Weight 0 1 1 ： Request Read Tare Weight 1 0 0 ： Request Read Target Value 1 0 1 : Request Read Rate
1		
2		

		1 1 0 : Request Read Display Weight 1 1 1： Request Read Display Weight
3		0->1: load preset tare value as tare weight and trigger digital tare
4		0→1: trigger Clear command
5		0→1: trigger Tare command
6		0→1: trigger Print command
7		0→1: trigger Zero command
8		Start / Abort Target Control
9		0→1: load fine value
10		0→1: load Spill Value
11		0→1: load upper & lower tolerance Value
12		1：O1=ON； 0：O1=OFF
13		1：O2=ON； 0：O2=OFF
14		1：O3=ON； 0：O3=OFF
15		0→1: load target value

5.5 Same to IND331 Floating Point Application

Discrete Read Floating Point – IND131/IND331 >> PLC Input

Table 4.3.6-1

Bit	Word0 Command Response	Word1 Floating Value	Word2 Floating Value	Word3 Scale Status
0	Reserved	Floating Point Value high 16 bit (See Note 4)	Floating Point Value low 16 bit (See Note 4)	Feed
1				Reserved
2				Fast Feed
3				Reserved
4				Tolerance OK
5				Reserved
6				Reserved
7				Reserved
8	FP Input Indicator 1(1)			Reserved
9	FP Input Indicator 2(1)			Input 1 (7)
10	FP Input Indicator 3(1)			Input 2 (7)
11	FP Input Indicator 4(1)			Input 3 (7)
12	FP Input Indicator 5(1)			Motion (8)
13	Data Integrity 1(2)			Net Mode (9)
14	Cmnd Ack 1(3)			Data Integrity 2(2)
15	Cmnd Ack 2(3)			Data OK(5)

Notes:

1. The Floating Point Indicator bits (Word 0 bits 8-12) are used to determine what type of floating or other data is being sent in Words 1 and 2. See the Floating Point Indicator Table A-12 for the information from these bits in decimal format.

2. The Data Integrity bits (Word 0 bit 13 and Word 3 bit 14) should be used to assure that communication is still valid, and that data are valid. Both bits are set to ‘1’ for one update from the terminal, then are set to ‘0’ for the next update from the terminal and this change of state is on every update and is constant as long as the communications link is not disrupted.

3. Word 0 Command Response bits (bits 14 and 15) are used by the terminal to inform the PLC that a new command was received. The decimal values of these bits will rotate sequentially from 1 to 3 as long as a command other than ‘0’ is being sent (output Word 2). The decimal value of these bits will be ‘0’ when output Word 2 (PLC output command word) is decimal ‘0’.

4. Words 1 and 2 are 32 bit, single precision floating point data. The data may represent the various scale weight data or setup configuration data. The PLC output command word determines what data will be sent.

5. Word 3 bit 15; The data ok bit is set to ‘1’ when the terminal operating conditions are normal. The bit is set to ‘0’ during power-up, during terminal setup, when the scale is over capacity or under zero, and when in the x10 display mode. The PLC should continuously monitor the data ok bit and the PLC data connection fault bit (see PLC documentation) to determine the validity of the data in the PLC.

6. Word 3 Comparator bits indicate the state of the associated comparator logic; when the bit is set to ‘1’ the comparator state is ‘ON’; when it is set to ‘0’ the comparator state is ‘OFF’. The setup on each comparator will determine when the state is ‘ON’ or ‘OFF’.

7. Word 3 bits 9 and 10, indicate the state of the associated hardware input internal to the terminal; these are Input 1 and Input 2. When the input is ‘ON’ the associated bit is set to ‘1’.

8. Word 3 bit 12; The motion bit is set to ‘1’ when the scale is in motion (unstable).

9. Word 3 bit 13; The net mode bit is set to ‘1’ when scale is in the net mode (a tare has been taken). If no tare has been taken (gross mode), the bit it set to ‘0’.

Floating Point Input Indication

Table 4.3.6-2

Dec	Hex	Data	Dec	Hex	Data
0	0	Gross Weight	16	10	-Tolerance Value(TOL2)
1	1	Net Weight	17	11	Reserved
2	2	Tare Weight	18	12	Reserved
3	3	Fine Gross Weight	19	13	Spill Value(SP3)
4	4	Fine Net Weight	20	14	Reserved
5	5	Fine Tare Weight	21	15	Reserved
6	6	Rate	22	16	Reserved
7	7	Reserved	23	17	Reserved
8	8	Reserved	24	18	Reserved
9	9	Reserved	25	19	Reserved
10	A	Reserved	26	1A	Reserved
11	B	Reserved	27	1B	Reserved
12	C	Reserved	28	1C	Reserved
13	D	Target Value(SP1)	29	1D	Reserved
14	E	+Tolerance Value(TOL1)	30	1E	Valid Command
15	F	Fine Feed Value(SP2)	31	1F	Invalid Command

Discrete Write Floating Point – PLC >> IND131/IND331

Table 4.3.6-3

Bit	Word0 Command Response	Word1 PLC Output Scale Command	Word2 Floating Value	Word3 Floating Value
0	Reserved	**4.3.6– 4 (Table 4.3.6--4)**	Floating Point Data High 16 bits See Note 4	Floating Point Data Low 16 Bit See Note 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

(1) PLC Output Command Table (Floating Point Only)

Table 4.3.6-4

De	Command	De	Command	De	Command
0	Report next rotation[1]	42	Add tare weight in rotation [7]	124	Set Spill Value (SP3) [6]
1	Report next rotation field [2,3]	43	Add fine gross weight in rotation [7]	131	Set +Tolerance (TOL2) [6]
2	Report next rotation field [2,3]	44	Add fine net weight in rotation [7]	132	Reserved
3	Reset (Cancel) rotation [2]	45	Add fine tare weight in rotation [7]	133	Reserved
10	Report Gross Weight [2]	46	Add rate in rotation [7]	134	Reserved
11	Report Net Weight [2]	60	Report Programmable Tare [5]	135	Reserved
12	Report Tare Weight [2]	61	Tare Scale command [7]	136	Reserved
13	Report Fine Gross Weight [2]	62	Clear Scale command [7]	137	Reserved
14	Report Fine Net Weight [2]	63	Print command [7]	160	Reserved
15	Report Fine Tare Weight [2]	64	Zero Scale command [7]	164	Reserved
16	Report Rate [2]	73	Reserved	165	Reserved
19	Reserved	74	Reserved	200	Reserved
20	Reserved	90	OUT1 ON [7]	201	Reserved
21	Report Target Value (SP1) [5]	91	OUT2 ON [7]	202	Reserved
22	Report +Tolerance (TOL2) [5]	92	OUT3 ON [7]	203	Reserved
23	Report Fine Feed Value (SP2) [5]	93	OUT4 ON [7]	204	Reserved
24	Report –Tolerance(TOL1) [5]	100	OUT1 OFF [7]	205	Reserved
26	Report Spill Value(SP3) [5]	101	OUT2 OFF [7]	206	Reserved
27	Reserved	102	OUT3 OFF [7]	207	Reserved
28	Reserved	103	OUT4 OFF [7]	210	Reserved
29	Reserved	110	Set Target Value (SP1) [6]	211	Reserved
30	Reserved	111	Set Fine Feed Value(SP2) [6]	212	Reserved
31	Reserved	112	Set –Tolerance(TOL1) [6]	213	Reserved
32	Reserved	114	Start Target Logic[7]	214	Reserved
33	Reserved	115	Abort Target Logic[7]	215	Reserved
40	Add gross weight in rotation [7]	121	Reserved	220	Reserved
41	Add net weight in rotation [7]	122	Reserved	221	Reserved

Notes for Table 4.3.6-4:

1. Rotation is setup by commands 40 to 48. On each terminal the rotation setup is reported in Words 1 and 2 of the floating point terminal. The floating point indication date reports what the field d

2. Keep up with the rotation changes, the PLC program scan time should be 30 milliseconds or less. A command of ‘0’ without rotation setup will report the scale gross weight. The commands acknowledge bits are set to the value of ‘0’. 2 A command that requests data that is refreshed on

3. Toggling between commands 1 and 2 will allow the PLC to control the rotationchange.

5. A command that request a specific value; as long as the request is in the commandword to the terminal no other data will be reported by the terminal.

6. A command that requires a floating point value be in Words 1 and 2 when the command is sent to the terminal. If the command is succeed

7. A command that will not report back a value; the floating point will be zero.

Chapter 6 4~20mA Analog Output Option Board

One channel 4~20mA analog output is supported, 16 bit ADC embedded inside and support 0mA ~ 25mA output.
Kinds of output source can be configured.

"Disp.Wt" – Display Weigth; "ABS DisWt" –Absolute Display Weight
"Gross" –Gross Weight; "ABS Gross" –Absolute Gross Weight
"Net" - Net Weight; "ABS Net" –Absolute Net Weight
"Rate" –Rate; "ABS Rate" –Absolute Rate

Output Reference Table		
Output Source: Weight or Rate		**Output**
	4mA Output Value: **0** **20mA** Output Value: **1000**	
Scale Under Zero Blank		**0mA**
Less than **4mA** output value and below **10%** of analog output capacity	**<-100**	**0mA**
Less than **4mA** output value, but not below **10%** of analog output capacity	**-100 ~ 0**	**2.4mA~4mA**
= **4mA** analog output value	**0**	**4mA**
Not less than **4mA** output value, not more than **20mA** output value	**0~1000**	**4mA~20mA**
= **20mA** output value	**1000**	**20mA**
More than **20mA** output value, but not more than **10%** of analog output capacity	**1000~1100**	**20mA~21.6mA**
More than **20mA output value and more than 10%** of analog output capacity	**>1100**	**25mA**
Scale Over Capacity Blank		**25mA**
Cases: Analog Output Source is None or **4mA** output value **>= 20mA** output value or Scale is setup mode or Scale power up zero not captured		**25mA**

Chapter 7.0 EtherNet/IP

7.1 EtherNet/IP Parameters Configuration

1) **PLC Configuration Type**
2) **Data Format**, three data formats**, Integer, Division and Floating are supported.**
   Different data format with different data size (for details refer to table below).

Configuration Type	Integer	Division	Floating
0 – 511	2 Words	4 Words	6 Words
1 – 331	2 Words	2 Words	4 Words

Configure EtherNet/IP LAN port IP Address

Integer Data Format：PLC can use 2-Word Input and 2-Word Output, and all weights are converted into integer data format, Refer to below example：

Increment Size = 0.1			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.5	3005	
Read Target Weight	100.7	1007	
Write Target Weight	100.7		1007

Division Data Format：PLC can use 4-Word Input and 4-Word Output for SVS510 GSD, 2-Word Input and 2-Word Output for PTPN or 331 GSD, and all weights are converted into division data format, Refer below example：

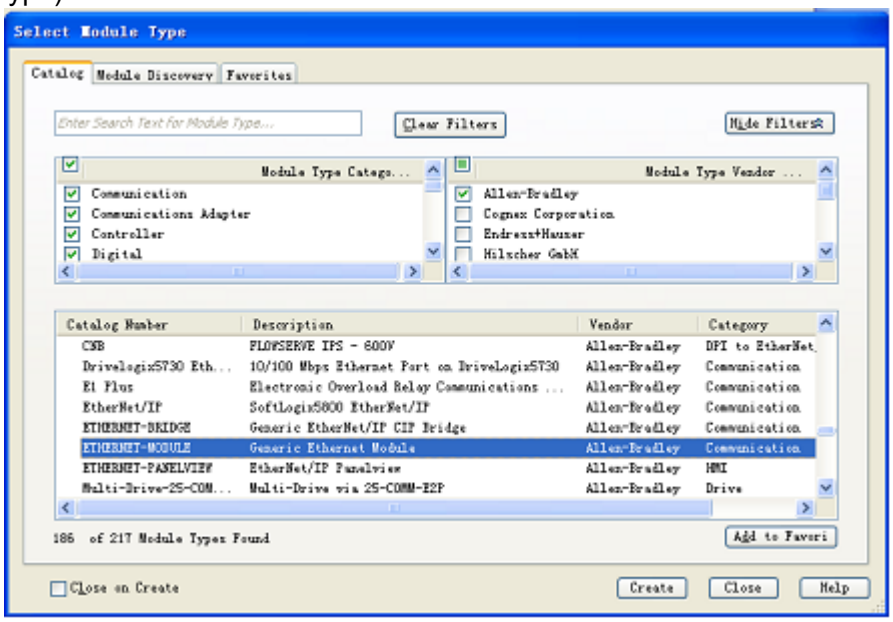
Increment Size = 0.2			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.4	300.4/0.2=1502	
Read Target Weight	100.8	100.8/0.2=504	
Write Target Weight	100.8		100.8/0.2=504

Floating Point Data Format：PLC can use 6-Word Input and 6-Word Output, all weights are the actual weight value

7.2 EtherNet/IP PLC Configuration Guide

7.2.1 SVS510 Floating(6W) Configuration Guide

Run RSLogix5000，Select ETHERNET-MODULE(this is SVS510 indicator EtherNet/IP module type)

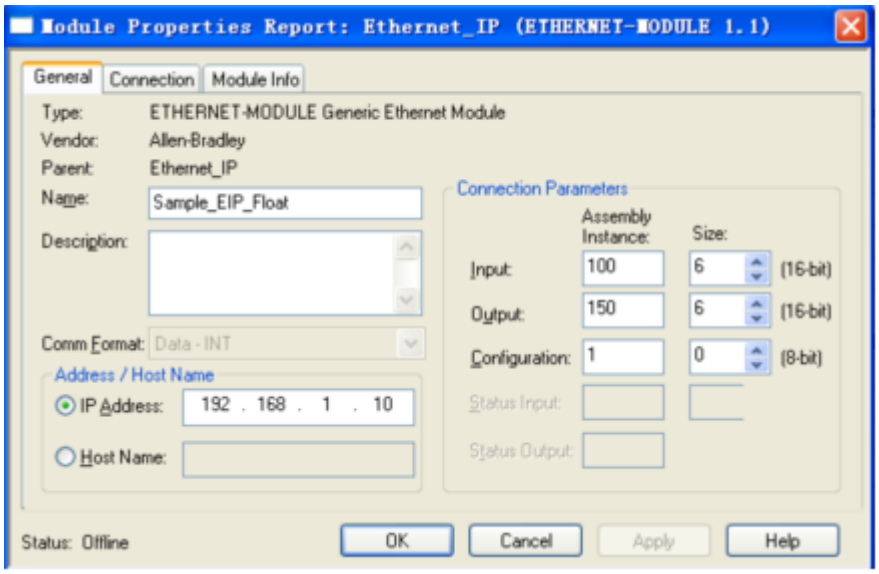


7.2.2 Start Configuration

Configure Input Assembly Instance as 100, Output Assembly Instance as 150

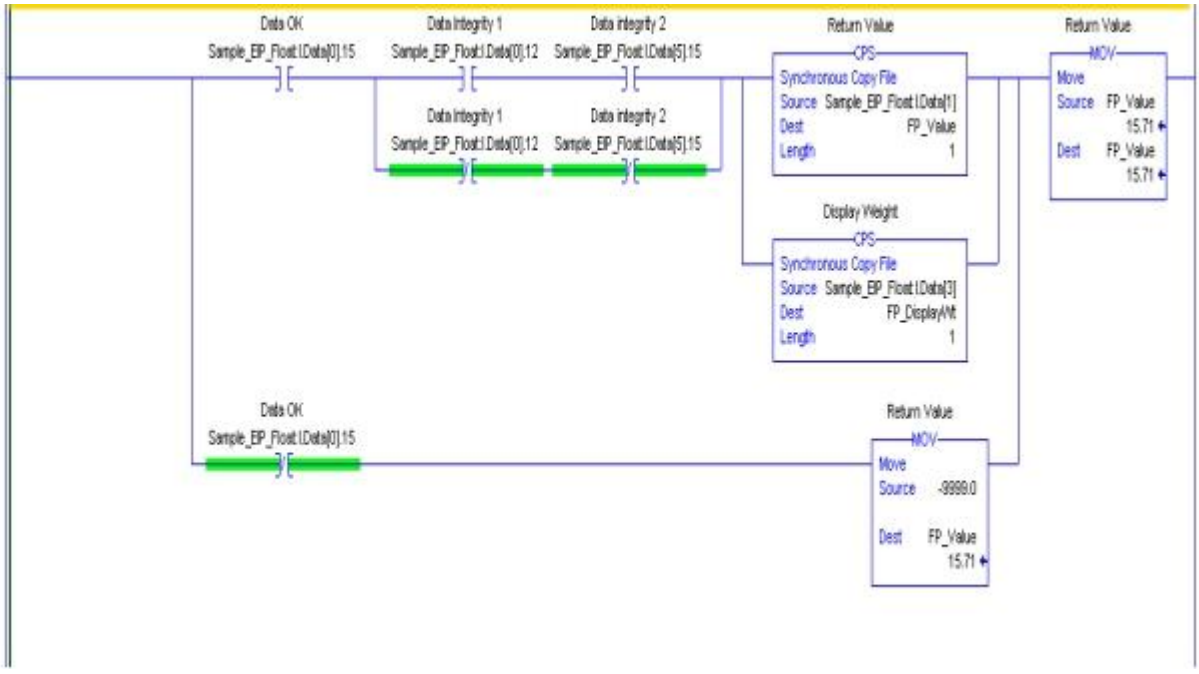
Data Format	Input Assembly Instance	Input Size	Output Assembly Instance	Output Size
Integer	100	2	150	2
Division	100	4	150	4
Floating	100	6	150	6

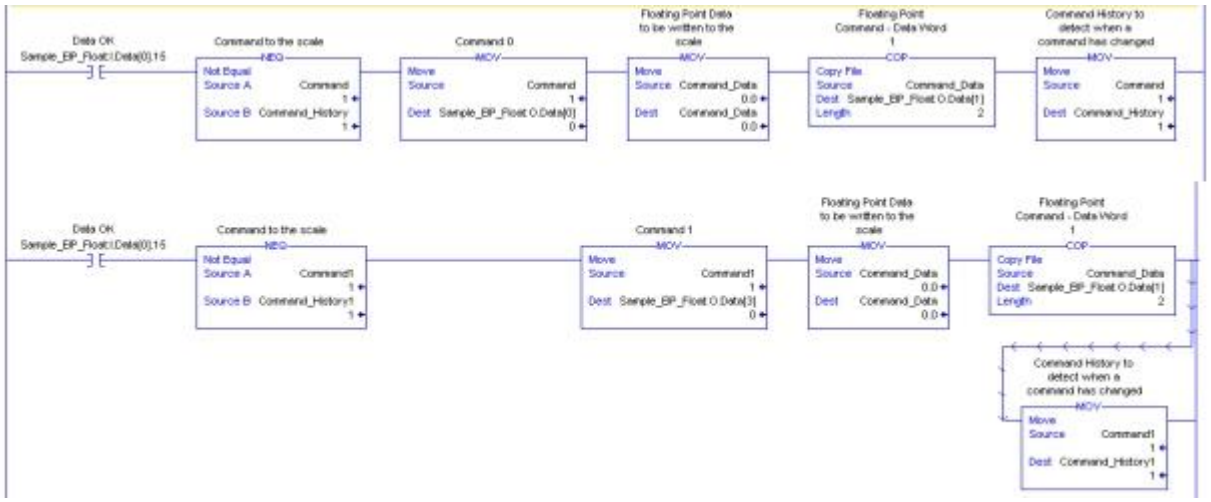
Configuration Assembly Instance always is 1 and 0 size.
Refer to picture below for floating (6W) configuration.

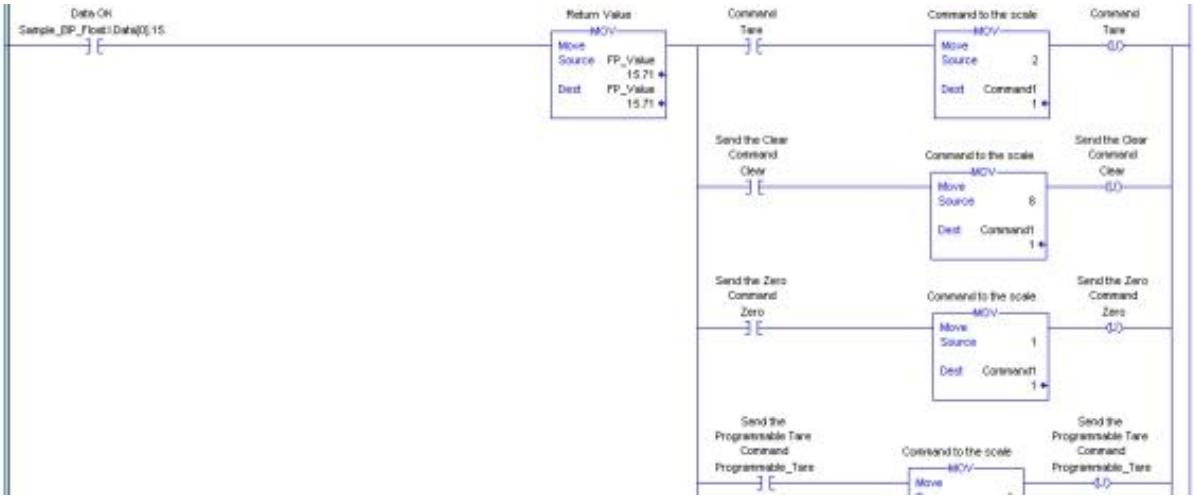


7.2.3 Monitor and Read Display Weight

Below shows floating data format program in RSLogix5000, only when Data Ok(IW0.15) and when Data bit 1(IW0.12) and data bit 2(IW5.15) with the same value, copy two words weight value into one 32-bit weight value, then built one 32-bit floating point weight value. Refer below picture to program.




Data OK
Sample_EP_Float:I.Data[0].15
Command to the scale
NEQ
Not Equal
Source A Command 1
Source B Command_History 1
Command 0
MOV
Move
Source Command 1
Dest Sample_EP_Float:O.Data[0] 0
Floating Point Data to be written to the scale
MOV
Move
Source Command_Data 0.0
Dest Command_Data 0.0
Floating Point Command - Data Word 1
COP
Copy File
Source Command_Data
Dest Sample_EP_Float:O.Data[1]
Length 2
Command History to detect when a command has changed
MOV
Move
Source Command 1
Dest Command_History 1
Data OK
Sample_EP_Float:I.Data[0].15
Command to the scale
NEQ
Not Equal
Source A Command1 1
Source B Command_History1 1
Command 1
MOV
Move
Source Command1 1
Dest Sample_EP_Float:O.Data[3] 0
Floating Point Data to be written to the scale
MOV
Move
Source Command_Data 0.0
Dest Command_Data 0.0
Floating Point Command - Data Word 1
COP
Copy File
Source Command_Data
Dest Sample_EP_Float:O.Data[1]
Length 2
Command History to detect when a command has changed
MOV
Move
Source Command1 1
Dest Command_History1 1


Data OK
Sample_EP_Float:I.Data[0].15
Return Value
MOV
Move
Source FP_Value 15.71
Dest FP_Value 15.71
Command Tare
Command to the scale
MOV
Move
Source 2
Dest Command1 1
Command Tare
Send the Clear Command
Clear
Command to the scale
MOV
Move
Source 8
Dest Command1 1
Send the Clear Command
Clear
Send the Zero Command
Zero
Command to the scale
MOV
Move
Source 1
Dest Command1 1
Send the Zero Command
Zero
Send the Programmable Tare Command
Programmable_Tare
Command to the scale
MOV
Move
Send the Programmable Tare Command
Programmable_Tare

7.3 Data Format

7.3.1 SVS510 Integer Data Format

Request: PLC → SVS510 – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Sign, Integer Weight, without decimal point (-32768~32767)															
W1	Load Target	Abort Target	O 2	O 1	Load Tolerance	Load Fine	Load Spill	Target Control	Zero	Print	Tare	Clear	Load Preset Tare	SEL 3	SEL 2	SEL 1

SEL3	SEL2	SEL1	Response Weight
0	0	0	Gross Weight
0	0	1	Net Weight
0	1	0	Display Weight
0	1	1	Tare Weight
1	0	0	Target Weight
1	0	1	Rate
1	1	0	Fine Weight
1	1	1	Spill Weight

W1_8: Target Control：
F5.1=2 Sequence Control: 0->1 trigger to start target control，same to Discrete Input trigger.
F5.1=1 Simple Target Control: 0->1 trigger simple target control update target values and parameters
W1_14: Abort Target: 0->1 trigger to stop sequence control target when it is running

Response: SVS510→ PLC – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	ID511 response weight in integer(-32768~32767)															
W1	Data OK	ACTIVE	Net	Motion	Reserved	IN 3	IN 2	IN 1	Over Auxiliary	Under Auxiliary	Zero Tolerance	OK Auxiliary	Fill Complete	Tolerance OK	Feed	Fast Feed

W1_0: Fast Feed: Target Control Fast Feed
W1_1: Feed： Target Control Feed
W1_2: Tolerance OK： Target Control Tolerance Check OK
W1_3: Fill Complete： Target Control Fill Complete

W1_4: OK Auxiliary: Auxiliary Comparator OK
W1_6: Under Auxiliary: Auxiliary Comparator Under
W1_7: Over Auxiliary: Auxiliary Comparator Over

7.3.2 SVS510 Division Data Format

Request: PLC → SVS510 – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	S 7	S 6	S 5	S 4	S 3	S 2	S 1	S 0	R/ W
W1	PLC Write to SVS510 Value															
W2	O 12	O 11	O 10	O 9	O 8	O 7	O 6	O 5	O 4	O 3	O 2	O 1	Clear	Load Tare Preset	Tare	Zero
W3	Reserved															

Notes of Request: PLC → SVS510 – Division:

W0_0 : 0 – Read ; 1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Index

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
5. W0_0 is written from 0 to 1
6. W0_0 is 1 and W0_1 to W0_8 with any change

W0_9~W0_10 Reserved
W0_11: 0->1 trigger Empty Mode
W0_12 : 1 – SVS510 keypad locked, 0 –SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command

W2_0: 0 → 1 trigger **Zero** command
W2_1: 0 → 1 trigger **Tare** command
W2_2: 0 → 1 load W1(PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W2_3: 0 → 1 trigger **Clear** command
W2_4~W2_15 : PLC can control SVS510 discrete output when which bit is configured as none(see F4.2.1 ~ F4.2.12)

Response: SVS510→ PLC – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK1	Over Capacity	Under Zero	Power Up Zero	Net	Motion	W_FAIL	S7	S6	S5	S4	S3	S2	S1	S0	R/W
W1	Read variable's value refer table															
W2	Data OK2	IN6	IN5	IN4	IN3	IN2	IN1	Key Locked	IN7	Over Auxiliary	Zero Tolerance OK	Under Auxiliary	Fill Complete	Tolerance OK	Feed	Fast Feed
W3	Display Weight in Division															

W0_0 : 0 – Read ; 1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Idex

W0_9: Writing operation result:
0 – write OK,
1- write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved
W0_10: 0 – Stability， 1- Motion
W0_11: 0 – Gross Mode，1 – Net Mode
W0_12: 1 – Power Up Zero OK
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK

W2_0: Fast Feed : Target Control Fast Feed
W2_1: Feed：Target Control Feed
W2_2: Tolerance OK：Target Control Tolerance Check OK

W2_3: Fill Complete：Target Control Fill Complete
W2_4: Under Auxiliary: Auxiliary Comparator Under
W2_5: 1 – In Zero Tolerance
W2_6:Over Auxiliary
W2_7: 0 – IN8 OFF, 1 – IN8 ON
W2_8: 1 – keypad locked, 0 –keypad unlock
W2_9~W2_14: IN1~IN6 0 – OFF, 1-ON
W3 : Display weight in division format, Gross weight for gross mode, net weight for net mode

7.3.3 SVS510 Floating Point Data Format

Request: PLC → SVS510 – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	**S 7**	**S 6**	**S 5**	**S 4**	**S 3**	**S 2**	**S 1**	**S 0**	**R/ W**
W1	**Value_0**															
W2	**Value_1**															
W3	**O 12**	**O 11**	**O 10**	**O 9**	**O 8**	**O 7**	**O 6**	**O 5**	**O 4**	**O 3**	**O 2**	**O 1**	Clear	Load Preset Tare	Tare	Zero
W4	Reserved															
W5	Reserved															

W0_0 : 0 – Read ; 1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Idex

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
7. W0_0 is written from 0 to 1
8. W0_0 is 1 and W0_1 to W0_8 with any change

W0_11: 0->1 trigger **Empty** command
W0_12 : 1 – SVS510 keypad locked, 0 –SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command

W1&W2: provide 32 bits floating point data for PLC write variable's value to SVS510 or load digital tare weight value to SVS510

W3_0: 0 → 1 trigger **Zero** command
W3_1: 0 → 1 trigger **Tare** command
W3_2: 0 → 1 load W1 & W2 (PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W3_3: 0 → 1 trigger **Clear** command
W3_4~W2_15 : PLC can control SVS510 discrete output when which bit is configured as none(see F4.2.1 ~ F4.2.12)

Response: SVS510 → PLC – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK	Over Capacity	Under Zero	Data Bit 1	Net	Motion	W_FAIL	S 7	S 6	S 5	S 4	S 3	S 2	S 1	S 0	R / W
W1	Read variable's value in floating point data , word1															
W2	Read variable's value in floating point data , word2															
W3	Display Weight in Floating Point Word 1															
W4	Display Weight in Floating Point Word 2															
W5	Data Bit2	I N 6	I N 5	I N 4	I N 3	I N 2	I N 1	Key Locked	I N 8	I N 7	Zero Tolerance OK	Reserved	Fill Complete	Tolerance OK	Feed	Fast Feed

W0_0 : 0 – Read ; 1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Index
W0_9: Writing operation result:
0 – write OK,
1-write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved
W0_10: 0 – Stability， 1- Motion
W0_11: 0 – Gross, 1 – Net
W0_12: Data Bit1
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK
W1/W2: Read variable's value in floating point data
W3/W4: Display weight in floating format, Gross weight for gross mode, net weight for net mode
W5_0: Fast Feed : Target Control Fast Feed
W5_1: Feed： Target Control Feed
W5_2: Tolerance OK： Target Control Tolerance Check OK
W5_3: Fill Complete： Target Control Fill Complete
W5_5: 1 – In Zero Tolerance
W5_6: IN7: 0 – OFF， 1 – ON
W5_7: 0 – IN8 OFF, 1 – IN8 ON
W5_8: 1 – keypad locked, 0 –keypad unlock
W5_9~W5_14: IN1~IN6 0 – OFF, 1-ON
W5_15: Data Bit2

Notes:

When scale in setup mode, or Power Up Zero Failure, or Under Zero, or Over Capacity, W0_15(Data OK) will be 0, now display weight(See W3&W4) will be 0, user should always check W0_15 and make sure it is '1' and then read display weight.

7.3.4 SVS510 Access Variables in Division and Floating

Index (Dec.)	Description	Operation （R/W）	Value
00	Net Weight	R	
01	Gross Weight	R	
02	Tare Weight	R	
03	Rate	R	
04	Preset Tare	R	
05	Calibration Result	R	255 – Fail 100 – Motion 9..1 – In Progress 0 – OK
06	Demand to trigger Calibration	R/W	0->1 Zero-Point Calibration 0->2 Middle-Point Calibration 0->3 End-Point Calibration
20	Unit	R/W	0 – None 1 – kg 2 – g3 - t
21	Capacity	R/W	
22	Increment Size	R/W	0 – 0.001 1 – 0.002 2 – 0.005 3 – 0.01 4 – 0.02 5 – 0.05 6 – 0.1 7 – 0.2 8 – 0.5 9 – 1 10 – 2 11 – 5 12 – 10 13 – 20 14 – 50 15 - 100
23	Calibration Mode	R/W	0 – 2-Point Mode, 1 – 3-Point Mode
24	Middle Point Calibration Weight	R/W	
25	End Point Calibration Weight	R/W	
26	Filter Mode	R/W	0（**L**ow），1(**M**iddle)，2（**H**igh）
27	Power Up Zero Range	R/W	0~50
28	Pushbutton Zero Range	R/W	0~50
29	Auto Zero Range	R/W	0~99
30	Pushbutton Tare	R/W	0 – Disable 1 – Enable
31	Auto Tare Threshold	R/W	
32	Auto Clear Threshold	R/W	
33	Motion Checking	R/W	0~9
34	Rate Unit		0 – **S**econd, 1 – **M**inute, 2- **H**our
35	Rate Average		1- Disable, 1 – 0.1s, 2 – 0.5s 3 – 1s, 4 – 5s, 5-10s 6 – 30s, 7- 60s
50	Target Controller Latching Mode	R/W	2- No latching 3- Latch Enable
52	Target Controller Start Auto Tare	R/W	0 – Disable 1 – Pushbutton Tare 2 – Preset Tare
53	Zero Tolerance	R/W	
55	Target Controller Output Mode	R/W	0 - Ft+Fd : Fd 1 - Ft : Fd 2 - Ft-Ft : Fd
58	Auto Spill Mode	R/W	0 – Disable , 1 – Enable
59	Auto Spill Factor	R/W	0~100
63	Target Weight	R/W	
64	Fine Weight	R/W	
65	Spill Weight	R/W	
66	Low Tolerance Weight	R/W	
67	Up Tolerance Weight	R/W	
68	Under Auxiliary Weight	R/W	
69	Over Auxiliary Weight	R/W	

7.3.5 Same to IND331 Integer & Division Application

PLC Configuration Type configured as ： 1 - 331
Data format configured as ： Integer or Division

Response: SVS510>> PLC		
Bit	Word0 (IW0)	Word1 (IW1)
0	Word 0 is a 16 bit, signed integer that may represent the terminal's gross weight, net weight, displayed weight, tare weight, or rate. The **bits 0** to **2** in the PLC 2nd output word designate what data is being sent by the terminal.	Fast Feed
1		Feed
2		Zero Tolerance OK
3		Tolerance OK
4		Reserved
5		Auxiliary UNDER
6		Auxiliary OK
7		Auxiliary OVER
8		Reserved
9		IN1 status, 0-OFF, 1-ON
10		IN2 status, 0-OFF, 1-ON
11		IN3 status, 0-OFF, 1-ON
12		Motion, 1-motion, 0- stability
13		1 – net mode, 0 – gross mode
14		Update in Process
15		Data OK

Request: PLC>> SVS510		
位	Word0 (QW0)	Word1 (QW1)
0	Target values or preset-tare weight value	0 0 0 ： Request Read Gross weight 0 0 1 ： Request Read Net Weight 0 1 0 ： Request Read Display Weight 0 1 1 ： Request Read Tare Weight 1 0 0 ： Request Read Target Value 1 0 1 : Request Read Rate 1 1 0 : Request Read Display Weight 1 1 1： Request Read Display Weight
1		
2		
3		0->1: load preset tare value as tare weight and trigger digital tare
4		0→1: trigger Clear command
5		0→1: trigger Tare command
6		0→1: trigger Print command
7		0→1: trigger Zero command
8		Start / Abort Target Control
9		0→1: load fine value
10		0→1: load Spill Value
11		0→1: load upper & lower tolerance Value
12		1：O1=ON； 0：O1=OFF
13		1：O2=ON； 0：O2=OFF
14		1：O3=ON； 0：O3=OFF
15		0→1: load target value

7.3.6 Same to IND331 Floating Point Application

Discrete Read Floating Point – IND131/IND331 >> PLC Input

Bit	Word0 Command Response	Word1 Floating Value	Word2 Floating Value	Word3 Scale Status
0	Reserved	Floating Point Value high 16 bit (See Note 4)	Floating Point Value low 16 bit (See Note 4)	Feed
1				Reserved
2				Fast Feed
3				Reserved
4				Tolerance OK
5				Reserved
6				Reserved
7				Reserved
8	FP Input Indicator 1(1)			Reserved
9	FP Input Indicator 2(1)			Input 1 (7)
10	FP Input Indicator 3(1)			Input 2 (7)
11	FP Input Indicator 4(1)			Input 3 (7)
12	FP Input Indicator 5(1)			Motion (8)
13	Data Integrity 1(2)			Net Mode (9)
14	Cmnd Ack 1(3)			Data Integrity 2(2)
15	Cmnd Ack 2(3)			Data OK(5)

Notes:
1. The Floating Point Indicator bits (Word 0 **bits 8-12**) are used to determine what type of floating or other data is being sent in Words 1 and 2. See the Floating Point Indicator Table A-12 for the information from these bits in decimal format.
2. The Data Integrity bits (Word 0 **bit 13** and Word 3 **bit 14**) should be used to assure that communication is still valid, and that data are valid. Both bits are set to '1' for one update from the terminal, then are set to '0' for the next update from the terminal and this change of state is on every update and is constant as long as the communications link is not disrupted.
3. Word 0 Command Response bits (**bits 14** and **15**) are used by the terminal to inform the PLC that a new command was received. The decimal values of these bits will rotate sequentially from 1 to 3 as long as a command other than '0' is being sent (output Word 2). The decimal value of these bits will be '0' when output Word 2 (PLC output command word) is decimal '0'.
4. Words 1 and 2 are 32 bit, single precision floating point data. The data may represent the various scale weight data or setup configuration data. The PLC output command word determines what data will be sent.
5. Word 3 **bit 15**; The data ok bit is set to '1' when the terminal operating conditions are normal. The bit is set to '0' during power-up, during terminal setup, when the scale is over capacity or under zero, and when in the x10 display mode. The PLC should continuously monitor the data ok bit and the PLC data connection fault bit (see PLC documentation) to determine the validity of the data in the PLC.
6. Word 3 Comparator bits indicate the state of the associated comparator logic; when the bit is set to '1' the comparator state is 'ON'; when it is set to '0' the comparator state is 'OFF'. The setup on each comparator will determine when the state is 'ON' or 'OFF'.
7. Word 3 **bits 9** and **10**, indicate the state of the associated hardware input internal to the terminal; these are Input 1 and Input 2. When the input is 'ON' the associated bit is set to '1'.
8. Word 3 **bit 12**; The motion bit is set to '1' when the scale is in motion (unstable).
9. Word 3 **bit 13**; The net mode bit is set to '1' when scale is in the net mode (a tare has been taken). If no tare has been taken (gross mode), the bit it set to '0'.

Floating Point Input Indication

Table 7.3.6-2

Dec	Hex	Data	Dec	Hex	Data
0	0	Gross Weight	16	10	-Tolerance Value(TOL2)
1	1	Net Weight	17	11	Reserved
2	2	Tare Weight	18	12	Reserved
3	3	Fine Gross Weight	19	13	Spill Value(SP3)
4	4	Fine Net Weight	20	14	Reserved
5	5	Fine Tare Weight	21	15	Reserved
6	6	Rate	22	16	Reserved
7	7	Reserved	23	17	Reserved
8	8	Reserved	24	18	Reserved
9	9	Reserved	25	19	Reserved
10	A	Reserved	26	1A	Reserved
11	B	Reserved	27	1B	Reserved
12	C	Reserved	28	1C	Reserved
13	D	Target Value(SP1)	29	1D	Reserved
14	E	+Tolerance Value(TOL1)	30	1E	Valid Command
15	F	Fine Feed Value(SP2)	31	1F	Invalid Command

Discrete Write Floating Point – PLC >> IND131/IND331

Table 7.3.6-3

Bit	Word0 Command Response	Word1 PLC Output Scale Command	Word2 Floating Value	Word3 Floating Value
0	Reserved	**7.3.6 – 4 (Table 7.3.6--4)**	Floating Point Data High 16 bits See Note 4	Floating Point Data Low 16 Bit See Note 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

(2) PLC Output Command Table (Floating Point Only)

Table 7.3.6-4

Dec	Command	Dec	Command	Dec	Command
0	Report next rotation [1]	42	Add tare weight in rotation [7]	124	Set Spill Value (SP3) [6]
1	Report next rotation field [2,3]	43	Add fine gross weight in rotation [7]	131	Set +Tolerance (TOL2) [6]
2	Report next rotation field [2,3]	44	Add fine net weight in rotation [7]	132	Reserved

3	Reset (Cancel) rotation [2]	45	Add fine tare weight in rotation [7]	133	Reserved
10	Report Gross Weight [2]	46	Add rate in rotation [7]	134	Reserved
11	Report Net Weight [2]	60	Report Programmable Tare [5]	135	Reserved
12	Report Tare Weight [2]	61	Tare Scale command [7]	136	Reserved
13	Report Fine Gross Weight [2]	62	Clear Scale command [7]	137	Reserved
14	Report Fine Net Weight [2]	63	Print command [7]	160	Reserved
15	Report Fine Tare Weight [2]	64	Zero Scale command [7]	164	Disable Pushbutton Tare
16	Report Rate [2]	73	Reserved	165	Pushbutton Tare
19	Reserved	74	Reserved	200	Zero-Point Calibration
20	Reserved	90	OUT1 ON [7]	201	Middle-Point Calibration
21	Report Target Value (SP1) [5]	91	OUT2 ON [7]	202	End-Point Calibration
22	Report +Tolerance (TOL2) [5]	92	OUT3 ON [7]	203	Read calibrate state
23	Report Fine Feed Value (SP2) 5	93	OUT4 ON [7]	204	Write Middle-Point Weight
24	Report –Tolerance(TOL1) [5]	100	OUT1 OFF [7]	205	Write End-Point Weight
26	Report Spill Value(SP3) [5]	101	OUT2 OFF [7]	206	Read Middle-Point Weight
27	Reserved	102	OUT3 OFF [7]	207	Read End-Point Weight
28	Reserved	103	OUT4 OFF [7]	210	Reserved
29	Reserved	110	Set Target Value (SP1) [6]	211	Reserved
30	Reserved	111	Set Fine Feed Value(SP2) [6]	212	Reserved
31	Reserved	112	Set –Tolerance(TOL1) [6]	213	Reserved
32	Reserved	114	Start Target Logic[7]	214	Reserved
33	Reserved	115	Abort Target Logic[7]	215	Reserved
40	Add gross weight in rotation [7]	121	Target Controller	220	Reserved
41	Add net weight in rotation [7]	122	Target Compare	221	Reserved

Notes for Table **7.3.6**-4:

1. Rotation is setup by commands 40 to 48. On each terminal the rotation setup is reported in Words 1 and 2 of the floating point terminal. The floating point indication date reports what the field d

2. To keep up with the rotation changes, the PLC program scan time should be 30 milliseconds or less. A command of ‘0’ without rotation setup will report the scale gross weight. The commands acknowledge bits are set to the value of ‘0’. 2 A command that requests data that is refreshed on

3. Toggling between commands 1 and 2 will allow the PLC to control the rotationchange.

5. A command that request a specific value; as long as the request is in the commandword to the terminal no other data will be reported by the terminal.

6. A command that requires a floating point value be in Words 1 and 2 when the command is sent to the terminal. If the command is succeed

7. A command that will not report back a value; the floating point will be zero.

Chapter 8.0 PROFINET

8.1 PROFINET Parameters Configuration

1) **PLC Configuration Type**
2) **Data Format**, three data formats**, Integer, Division and Floating are supported. Different data format with different data size**，refer to the table below for details.

GSD ID	Integer	Division	Floating
0 – 511	2 Words	4 Words	6 Words
1– 331	2 Words	2 Words	4 Words

[8.3.3] Configure EtherNet/IP LAN port IP Address
[F 8.3.3] IP Address, [F 8.3.4] Su-Net Mask Address,
[F 8.3.5] Net IP Address
Make sure IP address are same to PLC side configuration for each indicator.

Integer Data Format：PLC can use 2-Word Input and 2-Word Output, and all weights are converted into integer data format, Refer to table example below：

Increment Size = 0.1			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.5	3005	
Read Target Weight	100.7	1007	
Write Target Weight	100.7		1007

Division Data Format：PLC can use 4-Word Input and 4-Word Output for ID511， 2-Word Input and 2-Word Output for IND331 , and all weights are converted into division data format,
Refer to example below：

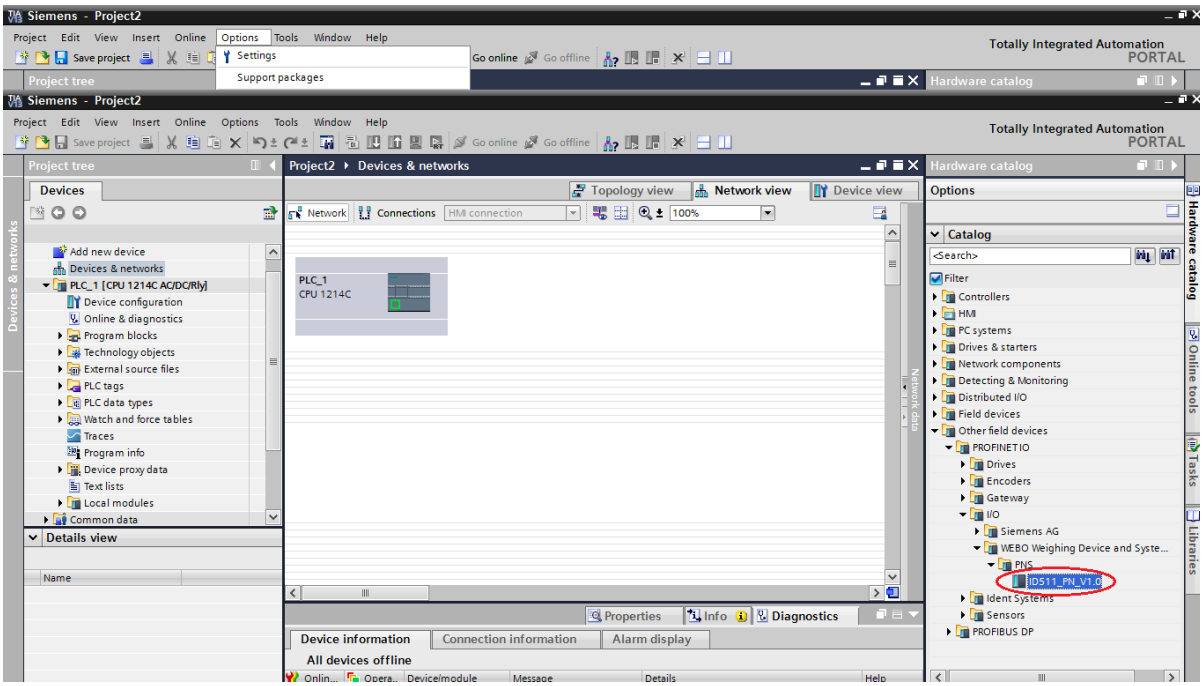
Increment Size = 0.2			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.4	300.4/0.2=1502	
Read Target Weight	100.8	100.8/0.2=504	
Write Target Weight	100.8		100.8/0.2=504

Floating Point Data Format：PLC can use 6-Word Input and 6-Word Output, all weights are the actual weight value

8.2 PROFINET PLC Configuration Guide

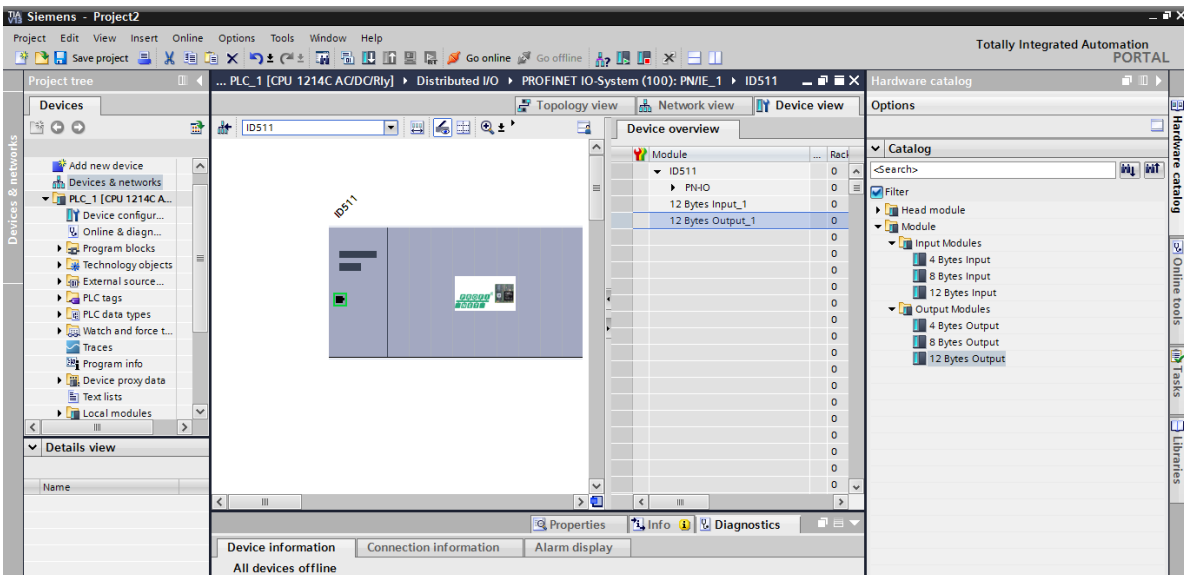
8.2.1 SVS510 Floating(6W) Configuration Guide

Run TIA PORTAL software , install SVS510 GSDML file into TIA PORTAL, and then find SVS510_PN_V1.0 in Other Field Device\ Profinet IO\I/O\. Refer to picture below.



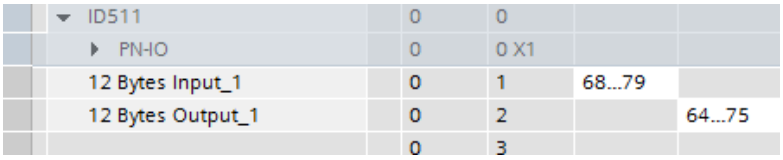
8.2.2 Start Configuration

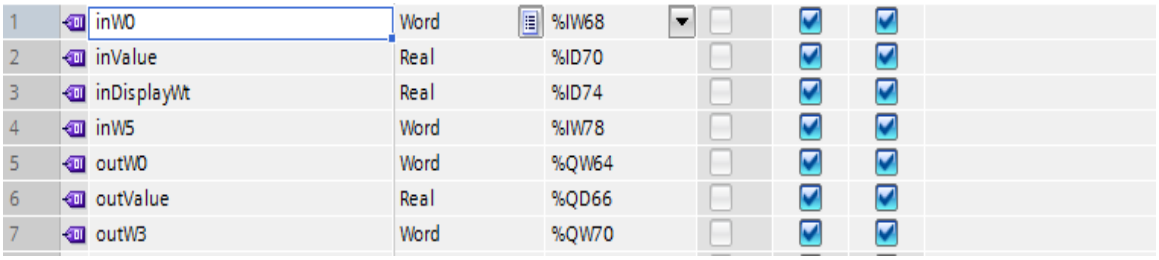
Different data format with different configuration Input and output size,Floating point with 6 words(12 Bytes) Input and 6 words(12 Bytes) output. Refer to picture below.



8.2.3 Monitor and Read Display Weight

PLC1214C integrated with SVS510 indicator，12 Bytes Input configured 68 to 69, 12 Bytes Outputconfigured 64 to 75





8.3 Data Format

8.3.1 SVS510 Integer Data Format

Request: PLC → SVS510 – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Sign, Integer Weight, without decimal point (-32768~32767)															
W1	Load Target	Abort Target	O 2	O 1	Load Tolerance	Load Fine	Load Spill	Target Control	Zero	Print	Tare	Clear	Load Preset Tare	SEL 3	SEL 2	SEL 1

SEL3	SEL2	SEL1	Response Weight
0	0	0	Gross Weight
0	0	1	Net Weight
0	1	0	Display Weight
0	1	1	Tare Weight
1	0	0	Target Weight
1	0	1	Rate
1	1	0	Fine Weight
1	1	1	Spill Weight

W1_8: Target Control：
F5.1=2 Sequence Control: 0->1 trigger to start target control，same to Discrete Input trigger.
F5.1=1 Simple Target Control: 0->1 trigger simple target control update target values and parameters
W1_14: Abort Target: 0->1 trigger to stop sequence control target when it is running

Response: SVS510→ PLC – Integer																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	ID511 response weight in integer(-32768~32767)															
W1	Data OK	ACTIVE	Net	Motion	Reserved	IN3	IN2	IN1	Over Auxiliary	Under Auxiliary	Zero Tolerance	OK Auxiliary	Fill Complete	Tolerance OK	Feed	Fast Feed

W1_0: Fast Feed : Target Control Fast Feed
W1_1: Feed：Target Control Feed
W1_2: Tolerance OK：Target Control Tolerance Check OK
W1_3: Fill Complete：Target Control Fill Complete

W1_4: OK Auxiliary: Auxiliary Comparator OK
W1_6: Under Auxiliary: Auxiliary Comparator Under
W1_7: Over Auxiliary: Auxiliary Comparator Over

8.3.2 SVS510 Division Data Format

Request: PLC → SVS510 – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	S7	S6	S5	S4	S3	S2	S1	S0	R/W
W1	PLC Write to SVS510 Value															
W2	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	Clear	Load Tare Preset	Tare	Zero
W3	Reserved															

Notes of Request: PLC → SVS510 – Division:

W0_0 : 0 – Read ;1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Index

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
9. W0_0 is written from 0 to 1
10. W0_0 is 1 and W0_1 to W0_8 with any change

W0_11: 0->1trigger **Empty** command

W0_12 : 1 – SVS510 keypad locked, 0 –SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command

W2_0: 0 → 1 trigger **Zero** command
W2_1: 0 → 1 trigger **Tare** command
W2_2: 0 → 1 load W1(PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W2_3: 0 → 1 trigger **Clear** command
W2_4~W2_15 : PLC can control SVS510 discrete output when which bit is configured as none(see F4.2.1 ~ F4.2.12)

Response: SVS510→ PLC – Division																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK1	Over Capacity	Under Zero	Power Up Zero	Net	Motion	W_FAIL	S7	S6	S5	S4	S3	S2	S1	S0	R / W
W1	Read variable's value refer table															
W2	Data OK2	IN6	IN5	IN4	IN3	IN2	IN1	Key Locked	IN7	Over Auxiliary	Zero Tolerance OK	Under Auxiliary	Fill Complete	Tolerance OK	Feed	Fast Feed
W3	Display Weight in Division															

W0_0 : 0 – Read ;1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Index
W0_9: Writing operation result:
0 – write OK,
1- write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved
W0_10: 0 – Stability， 1- Motion
W0_11: 0 – Gross Mode，1 – Net Mode
W0_12: 1 – Power Up Zero OK
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK

W2_0: Fast Feed : Target Control Fast Feed
W2_1: Feed：Target Control Feed
W2_2: Tolerance OK：Target Control Tolerance Check OK
W2_3: Fill Complete：Target Control Fill Complete
W2_4: Under Auxiliary: Auxiliary Comparator Under
W2_5: 1 – In Zero Tolerance
W2_6: Over Auxiliary: Auxiliary Comparator Over
W2_7: 0 – IN8 OFF, 1 – IN8 ON
W2_8: 1 – keypad locked, 0 –keypad unlock
W2_9~W2_15: IN1~IN7 0 – OFF, 1-ON
W3: Display weight in division format, Gross weight for gross mode, net weight for net mode

8.3.3 SVS510 Floating Point Data Format

Request: PLC → SVS510 – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Abort Target	Start Target	Print	Lock Key	Empty	Reserved	Reserved	**S 7**	**S 6**	**S 5**	**S 4**	**S 3**	**S 2**	**S 1**	**S 0**	**R/ W**
W1	**Value_0**															
W2	**Value_1**															
W3	**O 12**	**O 11**	**O 10**	**O 9**	**O 8**	**O 7**	**O 6**	**O 5**	**O 4**	**O 3**	**O 2**	**O 1**	Clear	Load Tare Preset	Tare	Zero
W4																
W5																

W0_0 : 0 – Read ; 1－Write
W0_1~W0_8: S0-S7 Read or Write Variable Index

W0_0 ~W0_8: These nine bits as read or write command,
Two ways can trigger to write operation:
11. W0_0 is written from 0 to 1
12. W0_0 is 1 and W0_1 to W0_8 with any change

W0_11: 0->1trigger **Empty** command
W0_12 : 1 – SVS510 keypad locked, 0 –SVS510 keypad unlocked
W0_13 : 0 → 1 trigger **Print** command
W0_14 : 0 → 1 trigger **Start Target Control** command
W0_15 : 0 → 1 trigger **Abort Target Control** command

W1&W2: provide 32 bits floating point data for PLC write variable's value to SVS510 or load digital tare weight value to SVS510

W3_0: 0 → 1 trigger **Zero** command
W3_1: 0 → 1 trigger **Tare** command
W3_2: 0 → 1 load W1 & W2 (PLC Write to SVS510 Value) as preset digital tare to SVS510 and trigger **Digital Tare** command
W3_3: 0 → 1 trigger **Clear** command
W3_4~W3_15: PLC can control SVS510 discrete output when which bit is configured as none(see menu F4.2.1 ~ F4.2.12)

Response: SVS510→ PLC – Floating Point																
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
W0	Data OK	Over Capacity	Under Zero	Data Bit 1	Net	Motion	W_FAIL	S 7	S 6	S 5	S 4	S 3	S 2	S 1	S 0	R / W
W1	Read variable's value in floating point data , word1															
W2	Read variable's value in floating point data , word2															
W3	Display Weight in Floating Point Word 1															
W4	Display Weight in Floating Point Word 2															
W5	Data Bit2	I N 6	I N 5	I N 4	I N 3	I N 2	I N 1	Key Locked	I N 8	I N 7	Zero Tolerance OK	Under Auxiliary:	Fill Complete	Tolerance OK	Feed	Fast Feed

W0_0 : 0 – Read ; 1—Write
W0_1~W0_8: S0-S7 Read or Write Variable Index

W0_9: Writing operation result:
0 – write OK,
1-write fail, check W1 for error code:
1 – not allowed to be written
2 – illegal value
3 – Reserved

W0_10: 0 – Stability， 1- Motion
W0_11: **0 – Gross, 1 – Net**
W0_12: Data Bit1
W0_13: 1 – Under Zero
W0_14: 1 – Over Capacity
W0_15: 1 – Data OK

W1/W2: Read variable's value in floating point data
W3/W4: **Display weight in floating format, Gross weight for gross mode, net weight for net mode**
W5_0: Fast Feed : Target Control Fast Feed
W5_1: Feed：Target Control Feed
W5_2: Tolerance OK：Target Control Tolerance Check OK
W5_3: Fill Complete：Target Control Fill Complete
W5_4: Under Auxiliary: Auxiliary Comparator Under
W5_5: 1 – In Zero Tolerance
W5_6: IN7: 0 – OFF， 1 – ON
W5_7: 0 – IN8 OFF, 1 – IN8 ON
W5_8: 1 – keypad locked, 0 –keypad unlock
W5_9~W5_14: IN1~IN6 0 – OFF, 1-ON
W5_15: Data Bit2

Notes:
When scale in setup mode, or Power Up Zero Failure, or Under Zero, or Over Capacity, W0_15(Data OK) will be 0, now display weight(See W3&W4) will be 0, user should always check W0_15 and make sure it is '1' and then read display weight.

8.3.4 SVS510 Access Variables in Division and Floating

Index (Dec.)	Description	Operation （R/W）	Value
00	Net Weight	R	
01	Gross Weight	R	
02	Tare Weight	R	
03	Rate	R	
04	Preset Tare	R	
05	Calibration Result	R	255 – Fail 100 – Motion 9..1 – In Progress 0 – OK
06	Demand to trigger Calibration	R/W	0->1 Zero-Point Calibration 0->2 Middle-Point Calibration 0->3 End-Point Calibration
20	Unit	R/W	0 – None 1 – kg 2 – g3 - t
21	Capacity	R/W	
22	Increment Size	R/W	0 – 0.001 1 – 0.002 2 – 0.005 3 – 0.01 4 – 0.02 5 – 0.05 6 – 0.1 7 – 0.2 8 – 0.5 9 – 1 10 – 2 11 – 5 12 – 10 13 – 20 14 – 50 15 - 100
23	Calibration Mode	R/W	0 – 2-Point Mode, 1 – 3-Point Mode
24	Middle Point Calibration Weight	R/W	
25	End Point Calibration Weight	R/W	
26	Filter Mode	R/W	0（**L**ow），1(**M**iddle)，2（**H**igh）
27	Power Up Zero Range	R/W	0~50
28	Pushbutton Zero Range	R/W	0~50
29	Auto Zero Range	R/W	0~99
30	Pushbutton Tare	R/W	0 – Disable 1 – Enable
31	Auto Tare Threshold	R/W	
32	Auto Clear Threshold	R/W	
33	Motion Checking	R/W	0~9
34	Rate Unit		0 – **S**econd, 1 – **M**inute, 2- **H**our
35	Rate Average		2- Disable, 1 – 0.1s, 2 – 0.5s 3 – 1s, 4 – 5s, 5-10s 6 – 30s, 7- 60s
50	Target Controller Latching Mode	R/W	4- No latching 5- Latch Enable
52	Target Controller Start Auto Tare	R/W	0 – Disable 1 – Pushbutton Tare 2 – Preset Tare
53	Zero Tolerance	R/W	
55	Target Controller Output Mode	R/W	0 - Ft+Fd : Fd 1 - Ft : Fd 2 - Ft-Ft : Fd
58	Auto Spill Mode	R/W	0 – Disable , 1 – Enable
59	Auto Spill Factor	R/W	0~100
63	Target Weight	R/W	
64	Fine Weight	R/W	
65	Spill Weight	R/W	
66	Low Tolerance Weight	R/W	
67	Up Tolerance Weight	R/W	
68	Under Auxiliary Weight	R/W	
69	Over Auxiliary Weight	R/W	

8.3.5 Same to IND331 Integer & Division Application

PLC Configuration Type configured as ： 1 - 331
Data format configured as ： Integer or Division

Response: SVS510> PLC		
Bit	Word0 (IW0)	Word1 (IW1)
0	Word 0 is a 16 bit, signed integer that may represent the terminal's gross weight, net weight, displayed weight, tare weight, or rate. The **bits 0** to **2** in the PLC 2nd output word designate what data is being sent by the terminal.	Fast Feed
1		Feed
2		Zero Tolerance OK
3		Tolerance OK
4		Reserved
5		Auxiliary UNDER
6		Auxiliary OK
7		Auxiliary OVER
8		Reserved
9		IN1 status, 0-OFF, 1-ON
10		IN2 status, 0-OFF, 1-ON
11		IN3 status, 0-OFF, 1-ON
12		Motion, 1-motion, 0- stability
13		1 – net mode, 0 – gross mode
14		Update in Process
15		Data OK

Request: PLC>> SVS510		
位	Word0 (QW0)	Word1 (QW1)
0	Target values or preset-tare weight value	0 0 0 ： Request Read Gross weight 0 0 1 ： Request Read Net Weight 0 1 0 ： Request Read Display Weight 0 1 1 ： Request Read Tare Weight 1 0 0 ： Request Read Target Value 1 0 1 : Request Read Rate 1 1 0 : Request Read Display Weight 1 1 1： Request Read Display Weight
1		
2		
3		0->1: load preset tare value as tare weight and trigger digital tare
4		0→1: trigger Clear command
5		0→1: trigger Tare command
6		0→1: trigger Print command
7		0→1: trigger Zero command
8		Start / Abort Target Control
9		0→1: load fine value
10		0→1: load Spill Value
11		0→1: load upper & lower tolerance Value
12		1：O1=ON； 0：O1=OFF
13		1：O2=ON； 0：O2=OFF
14		1：O3=ON； 0：O3=OFF
15		0→1: load target value

8.3.6 Same to IND331 Floating Point Application

Discrete Read Floating Point – IND131/IND331 >> PLC Input

Table 8.3.6-1

Bit	Word0 Command Response	Word1 Floating Value	Word2 Floating Value	Word3 Scale Status
0	Reserved	Floating Point Value high 16 bit (See Note 4)	Floating Point Value low 16 bit (See Note 4)	Feed
1				Reserved
2				Fast Feed
3				Reserved
4				Tolerance OK
5				Reserved
6				Reserved
7				Reserved
8	FP Input Indicator 1(1)			Reserved
9	FP Input Indicator 2(1)			Input 1 (7)
10	FP Input Indicator 3(1)			Input 2 (7)
11	FP Input Indicator 4(1)			Input 3 (7)
12	FP Input Indicator 5(1)			Motion (8)
13	Data Integrity 1(2)			Net Mode (9)
14	Cmnd Ack 1(3)			Data Integrity 2(2)
15	Cmnd Ack 2(3)			Data OK(5)

Notes:
1. The Floating Point Indicator bits (Word 0 **bits 8-12**) are used to determine what type of floating or other data is being sent in Words 1 and 2. See the Floating Point Indicator Table A-12 for the information from these bits in decimal format.
2. The Data Integrity bits (Word 0 **bit 13** and Word 3 **bit 14**) should be used to assure that communication is still valid, and that data are valid. Both bits are set to '1' for one update from the terminal, then are set to '0' for the next update from the terminal and this change of state is on every update and is constant as long as the communications link is not disrupted.
3. Word 0 Command Response bits (**bits 14** and **15**) are used by the terminal to inform the PLC that a new command was received. The decimal values of these bits will rotate sequentially from 1 to 3 as long as a command other than '0' is being sent (output Word 2). The decimal value of these bits will be '0' when output Word 2 (PLC output command word) is decimal '0'.
4. Words 1 and 2 are 32 bit, single precision floating point data. The data may represent the various scale weight data or setup configuration data. The PLC output command word determines what data will be sent.
5. Word 3 **bit 15**; The data ok bit is set to '1' when the terminal operating conditions are normal. The bit is set to '0' during power-up, during terminal setup, when the scale is over capacity or under zero, and when in the x10 display mode. The PLC should continuously monitor the data ok bit and the PLC data connection fault bit (see PLC documentation) to determine the validity of the data in the PLC.
6. Word 3 Comparator bits indicate the state of the associated comparator logic; when the bit is set to '1' the comparator state is 'ON'; when it is set to '0' the comparator state is 'OFF'. The setup on each comparator will determine when the state is 'ON' or 'OFF'.
7. Word 3 **bits 9** and **10**, indicate the state of the associated hardware input internal to the terminal; these are Input 1 and Input 2. When the input is 'ON' the associated bit is set to '1'.
8. Word 3 **bit 12**; The motion bit is set to '1' when the scale is in motion (unstable).
9. Word 3 **bit 13**; The net mode bit is set to '1' when scale is in the net mode (a tare has been taken). If no tare has been taken (gross mode), the bit it set to '0'.

Floating Point Input Indication

Table 8.3.6-2

Dec	Hex	Data	Dec	Hex	Data
0	0	Gross Weight	16	10	-Tolerance Value(TOL2)
1	1	Net Weight	17	11	Reserved
2	2	Tare Weight	18	12	Reserved
3	3	Fine Gross Weight	19	13	Spill Value(SP3)
4	4	Fine Net Weight	20	14	Reserved
5	5	Fine Tare Weight	21	15	Reserved
6	6	Rate	22	16	Reserved
7	7	Reserved	23	17	Reserved
8	8	Reserved	24	18	Reserved
9	9	Reserved	25	19	Reserved
10	A	Reserved	26	1A	Reserved
11	B	Reserved	27	1B	Reserved
12	C	Reserved	28	1C	Reserved
13	D	Target Value(SP1)	29	1D	Reserved
14	E	+Tolerance Value(TOL1)	30	1E	Valid Command
15	F	Fine Feed Value(SP2)	31	1F	Invalid Command

Discrete Write Floating Point – PLC >> IND131/IND331

Table 8.3.6-3

Bit	Word0 Command Response	Word1 PLC Output Scale Command	Word2 Floating Value	Word3 Floating Value
0	Reserved	**8.3.6 – 4 (Table 8.3.6--4)**	Floating Point Data High 16 bits See Note 4	Floating Point Data Low 16 Bit See Note 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

(3) PLC Output Command Table (Floating Point Only)

Table 8.3.6-4

Dec	Command	Dec	Command	Dec	Command
0	Report next rotation[1]	42	Add tare weight in rotation [7]	124	Set Spill Value (SP3) [6]
1	Report next rotation field [2,3]	43	Add fine gross weight in rotation [7]	131	Set +Tolerance (TOL2) [6]
2	Report next rotation field [2,3]	44	Add fine net weight in rotation [7]	132	Reserved
3	Reset (Cancel) rotation [2]	45	Add fine tare weight in rotation [7]	133	Reserved
10	Report Gross Weight [2]	46	Add rate in rotation [7]	134	Reserved
11	Report Net Weight [2]	60	Report Programmable Tare [5]	135	Reserved
12	Report Tare Weight [2]	61	Tare Scale command [7]	136	Reserved
13	Report Fine Gross Weight [2]	62	Clear Scale command [7]	137	Reserved
14	Report Fine Net Weight [2]	63	Print command [7]	160	Reserved
15	Report Fine Tare Weight [2]	64	Zero Scale command [7]	164	Disable Pushbutton Tare
16	Report Rate [2]	73	Reserved	165	Pushbutton Tare
19	Reserved	74	Reserved	200	Zero-Point Calibration
20	Reserved	90	OUT1 ON [7]	201	Middle-Point Calibration
21	Report Target Value (SP1) [5]	91	OUT2 ON [7]	202	End-Point Calibration
22	Report +Tolerance (TOL2) [5]	92	OUT3 ON [7]	203	Read calibrate state
23	Report Fine Feed Value (SP2) [5]	93	OUT4 ON [7]	204	Write Middle-Point Weight
24	Report –Tolerance(TOL1) [5]	100	OUT1 OFF [7]	205	Write End-Point Weight
26	Report Spill Value(SP3) [5]	101	OUT2 OFF [7]	206	Read Middle-Point Weight
27	Reserved	102	OUT3 OFF [7]	207	Read End-Point Weight
28	Reserved	103	OUT4 OFF [7]	210	Reserved
29	Reserved	110	Set Target Value (SP1) [6]	211	Reserved
30	Reserved	111	Set Fine Feed Value(SP2) [6]	212	Reserved
31	Reserved	112	Set –Tolerance(TOL1) [6]	213	Reserved
32	Reserved	114	Start Target Logic[7]	214	Reserved
33	Reserved	115	Abort Target Logic[7]	215	Reserved
40	Add gross weight in rotation [7]	121	Target Controller	220	Reserved
41	Add net weight in rotation [7]	122	Target Compare	221	Reserved

Notes for Table **8.3.6**-4:

1. Rotation is setup by commands 40 to 48. On each terminal the rotation setup is reported in Words 1 and 2 of the floating point terminal. The floating point indication date reports what the field d

2. keep up with the rotation changes, the PLC program scan time should be 30 milliseconds or less. A command of ‘0’ without rotation setup will report the scale gross weight. The commands acknowledge bits are set to the value of ‘0’. 2 A command that requests data that is refreshed on

3. Toggling between commands 1 and 2 will allow the PLC to control the rotation change.

5. A command that request a specific value; as long as the request is in the command word to the terminal no other data will be reported by the terminal.

6. A command that requires a floating point value be in Words 1 and 2 when the command is sent to the terminal. If the command is succeed

7. A command that will not report back a value; the floating point will be zero.

Chapter 9.0 CC-Link

CC-Link option board as a remote device station, conform to CC-Link V1.10,and also fully compatible with IND131/331。

9.1 CC-Link Parameters Configuration

1) Remote device station address.
See Menu [F8.5.1]
2) Chose Data Format, see menu [F8.5.2] Data Format，two data formats, Integer and Division are supported., refer to table.below for details. The remote registers used by the indicator are the first two words in every station, the remote IO is 32 point fixed, not be used.

Description	Integer	Division
word length	2 words（2W）	2 words（2W）
Station number	1	1

3) Baud Rate, see menu[F8.5.3].

Integer Data Format：PLC can use 2-Word Input and 2-Word Output, and all weights are converted into integer data format, Refer to table examplebelow：

Increment Size = 0.1			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.5	3005	
Read Target Weight	100.7	1007	
Write Target Weight	100.7		1007

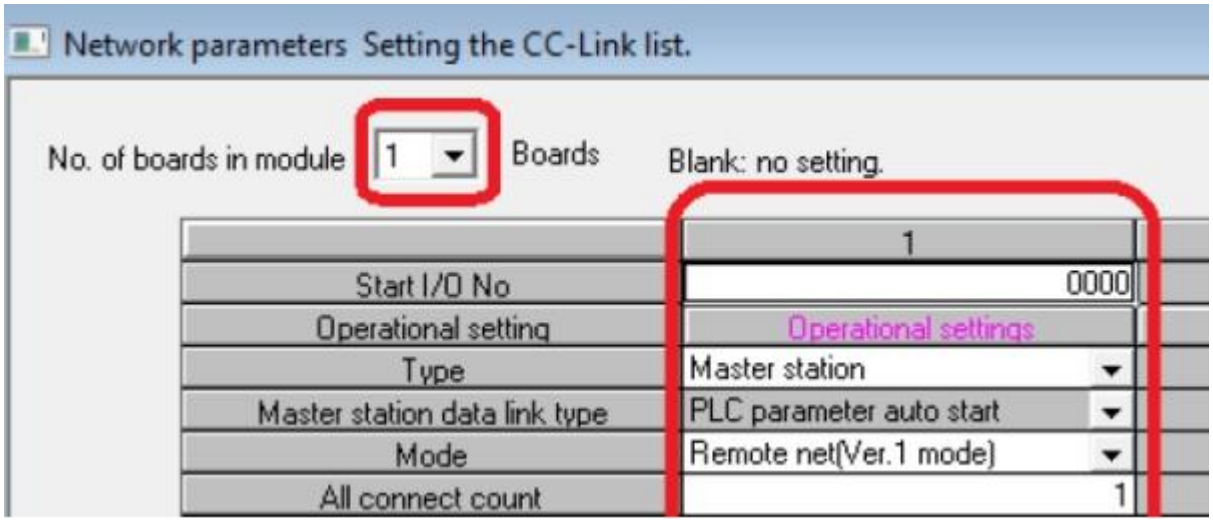
Division Data Format: PLC can use 2-Word Input and 2-Word Output, and all weights are converted into division data format, Refer to table examplebelow：

Increment Size = 0.2			
PLC Operation	**Weight**	**PLC Read Data**	**PLC Write Data**
Read Display Weight	300.4	300.4/0.2=1502	
Read Target Weight	100.8	100.8/0.2=504	
Write Target Weight	100.8		100.8/0.2=504

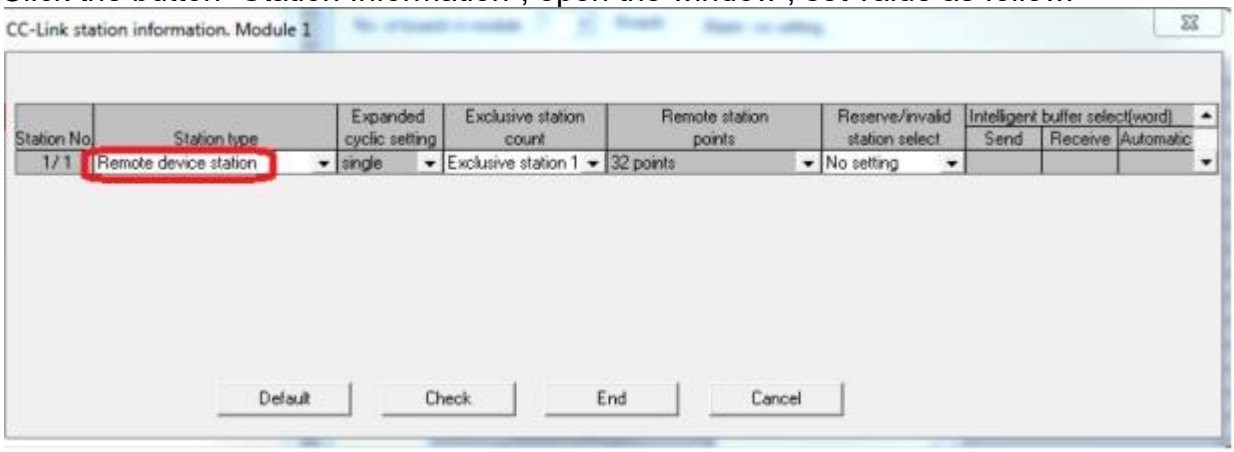
9.2 CC-Link PLC Configuration Guide

9.2.1 Integer/Division Data Format

Run GX Works2 software, here, in series of FX CPU FX3G-14M and CC-Link host station module for example, open the menu “network parameter”->”CC-Link”, and set value as follow.

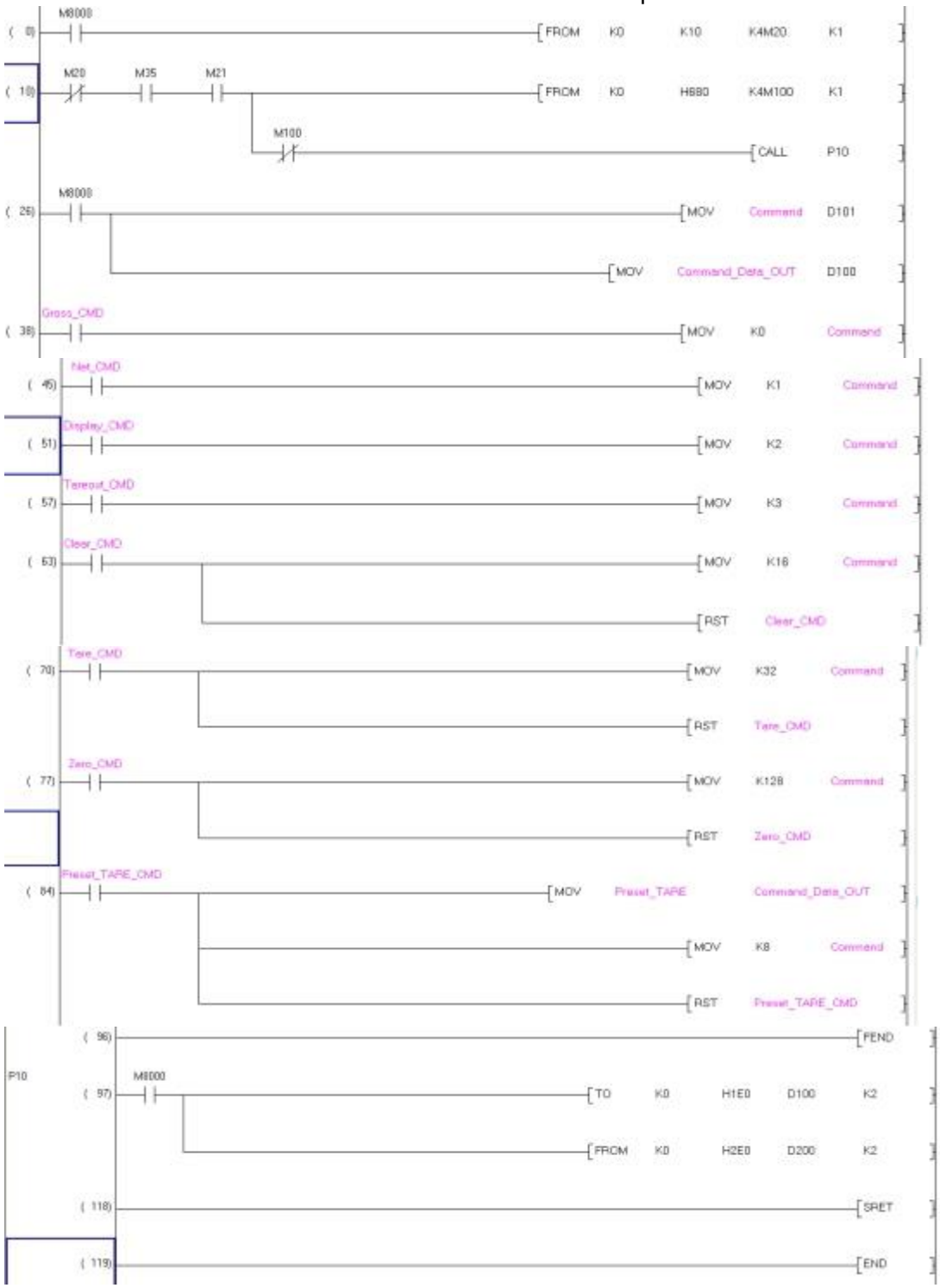


Click the button “Station Information”, open the window , set value as follow.



9.2.2 Monitor and Read Display Weight

Here, we connect only one remote device station to PLC, and it takes up one slave station, in the CCLink Ver.1 mode, the RWw and RWr start address in the PLC take up by the CC-Link host station module are 0x01E0 and 0x02E0 respectively, after connecting, can use FROM and TO instructions to read and write data. Please refer to example as follows.



9.3 Data Format

Same to IND331 Integer and Division data format

Response: SVS510>> PLC		
Bit	Word0 (IW0)	Word1 (IW1)
0	Word 0 is a 16 bit, signed integer that may represent the terminal's gross weight, net weight, displayed weight, tare weight, or rate. The **bits 0**to **2**in the PLC 2ndoutput word designate what data is being sent by the terminal.	Fast Feed
1		Feed
2		Zero Tolerance OK
3		Tolerance OK
4		Reserved
5		Auxiliary UNDER
6		Auxiliary OK
7		Auxiliary OVER
8		Reserved
9		IN1 status, 0-OFF, 1-ON
10		IN2 status, 0-OFF, 1-ON
11		IN3 status, 0-OFF, 1-ON
12		Motion, 1-motion, 0- stability
13		1 – net mode, 0 – gross mode
14		Update in Process
15		Data OK

Request: PLC>> SVS510		
位	Word0 (QW0)	Word1 (QW1)
0	Target values or preset-tare weight value	0 0 0 ： Request Read Gross weight 0 0 1 ： Request Read Net Weight 0 1 0 ： Request Read Display Weight 0 1 1 ： Request Read Tare Weight 1 0 0 ： Request Read Target Value 1 0 1 : Request Read Rate 1 1 0 : Request Read Display Weight 1 1 1： Request Read Display Weight
1		
2		
3		0->1: load preset tare value as tare weight and trigger digital tare
4		0→1: trigger Clear command
5		0→1: trigger Tare command
6		0→1: trigger Print command
7		0→1: trigger Zero command
8		Start / Abort Target Control
9		0→1: load fine value
10		0→1: load Spill Value
11		0→1: load upper & lower tolerance Value
12		1：O1=ON； 0：O1=OFF
13		1：O2=ON； 0：O2=OFF
14		1：O3=ON； 0：O3=OFF
15		0→1: load target value

Chapter 10.0 CalFree Calibration

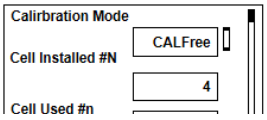
10.1 Principle of CalFree Calibration

SVS510 supports calibration by input sensor sensitivity,In this way, we can avoid the difficulty of calibration without weights, or the need for large tonnage weights. Asfollows

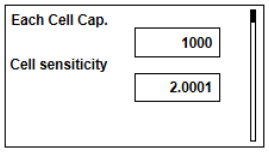
- Calibration Mode set to CalFree
- Input the sensitivity of load cell
- Zero-Point Calibration
- Zero-Point calibrate completely, put objects with known weights on the scale to test weight.If necessary, change the sensitivity of load cell according to the test weight.

10.2 Process of CalFree Calibration

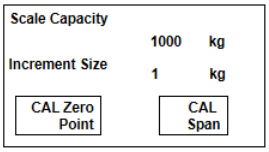
- Calibration Mode: CalFree



- Set parameters of CalFree Calibration

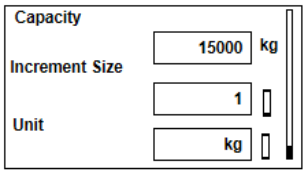


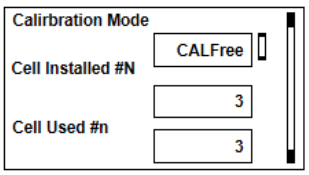
- Zero-Point calibration

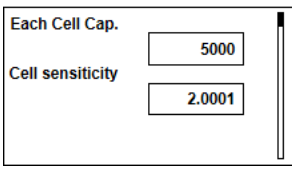


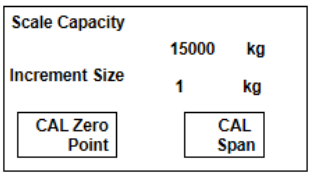
10.3 Examples of CalFree Calibration

If the scale is made up of three 5T sensors.



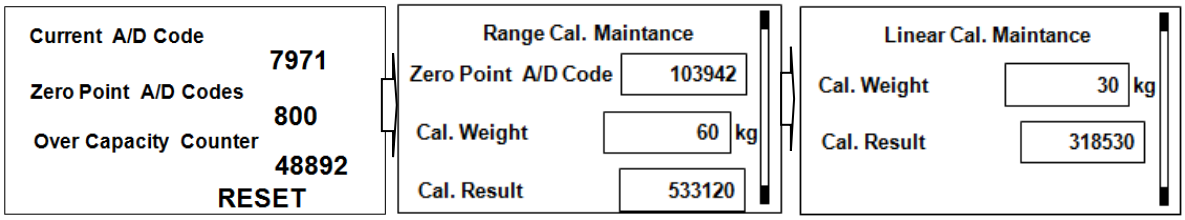






Chapter 11 Emergency Recovery and Correction of Result

When the system fails, or when the meter needs to be replaced, and you do not have the time to calibrate, calibration results can be processed through the emergency recovery.



In the scale interface maintenance interface, through the down navigation key to correcting the results page maintenance interface, if the calibration mode is "2-P", you can only see the span calibration and maintenance; if it is "3-P" you can see the span calibration maintenance and linearity correction maintenance; internal code by entering the zero and span calibration weight, span calibration results, linearity correction weight and linear calibration results, enabling emergency recovery calibration results.

Note: Emergency Recovery results are used only in case where is no way to calibrate, the scale does not guarantee the absolute accuracy, once the conditions are appropriate re-calibrate.

Chapter 12.0 Hardware

12.1 DIP Switch

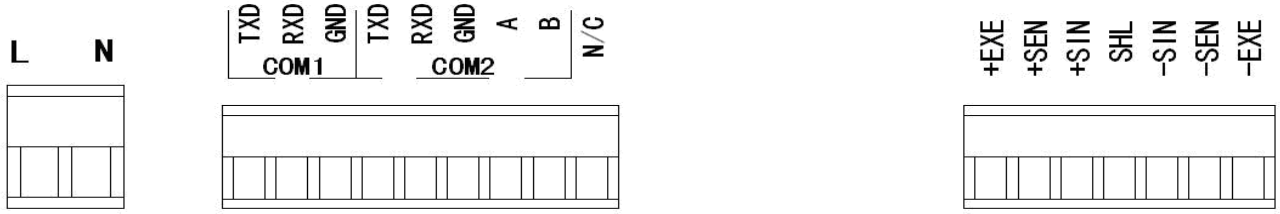
Four switches are available on main board.

1	2	3	4
ON-Prohibit correction (seals) **OFF-**Allows correction	**ON -** Allows lock the keypad **OFF-**Prohibition lock the keypad	**ON-** The factory default values loaded	**ON-** Update mode must be **OFF** during normal use

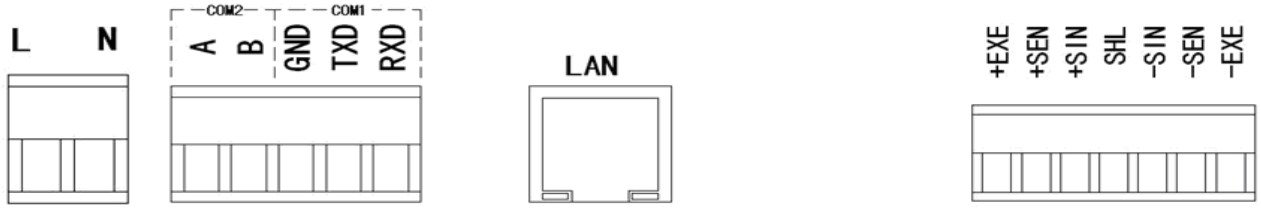
12.2 Harness Wiring Guide

12.2.1 Main Board

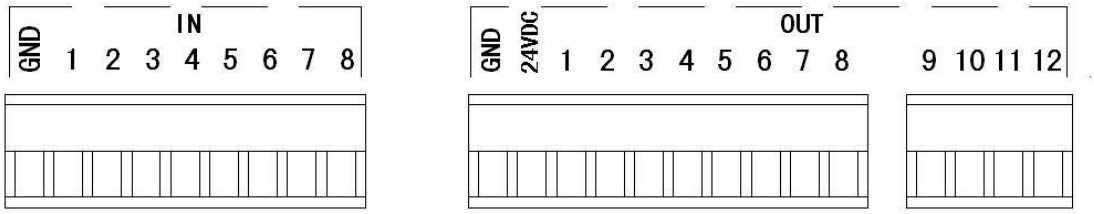
12.2.1.1 Non-LAN Version



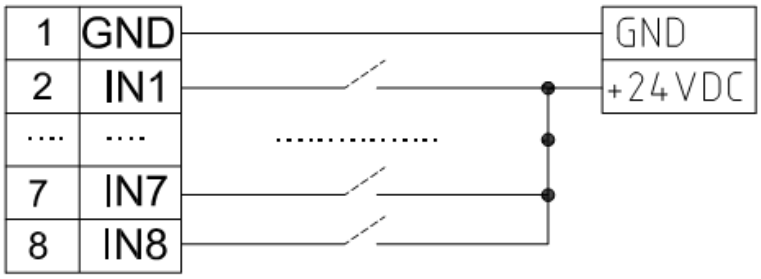
12.2.1.2 with-LAN Version



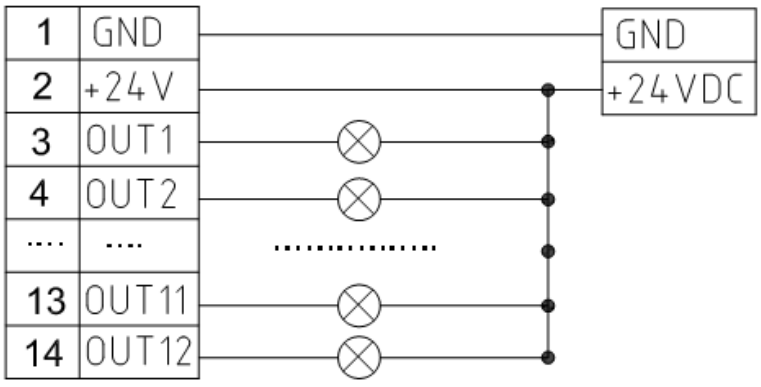
12.2.2 I / O Option Board - Transistor Output



Input



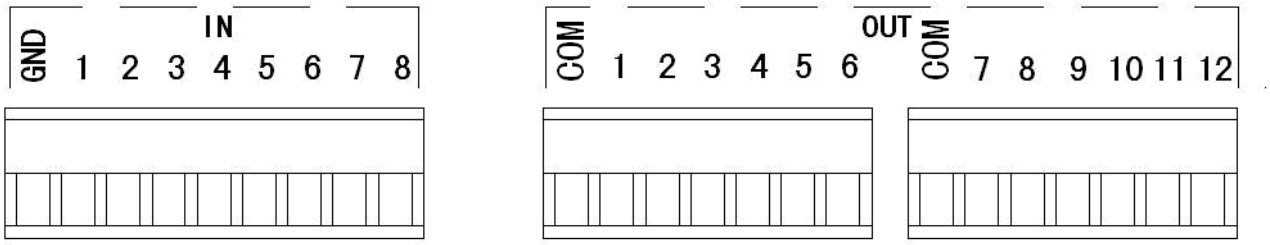
Transistor Output

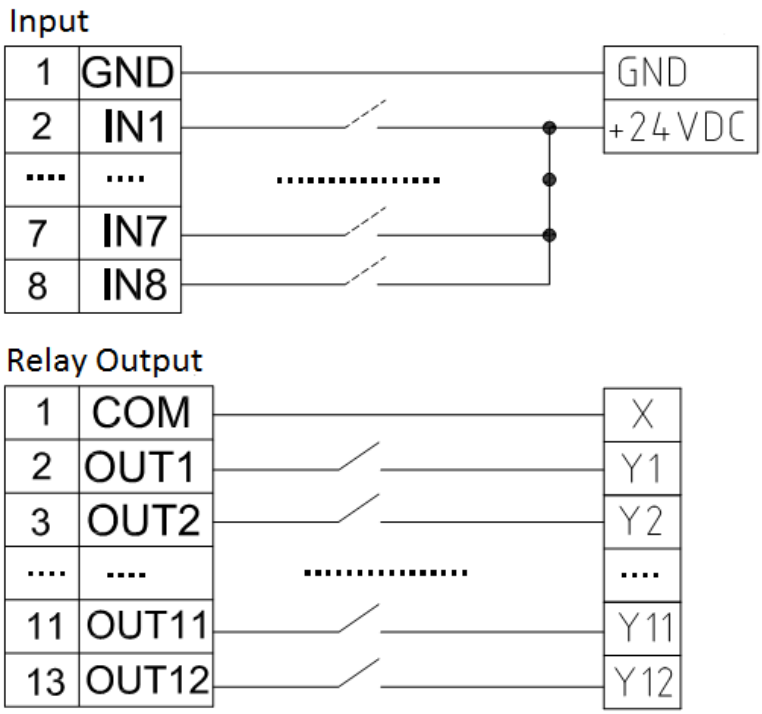


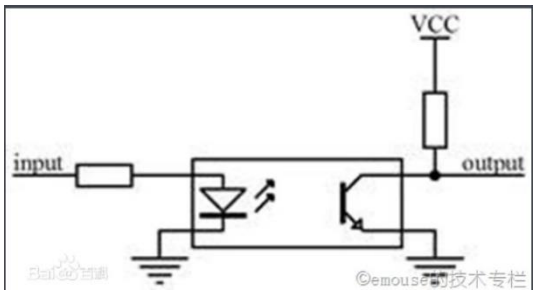
※※

Each OUT can pass through not more than 300mA current!
24VDC can be 12~30VDC, typical power supplier is 24VDC

12.2.3 I / O Option Board - Relay Output Version







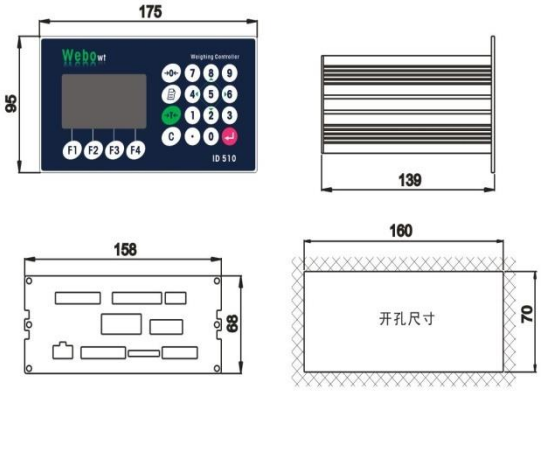
Note for relays: Rated 5A for 30VDC or 220VAC. Sum of all relay currents is 2A max.

※※

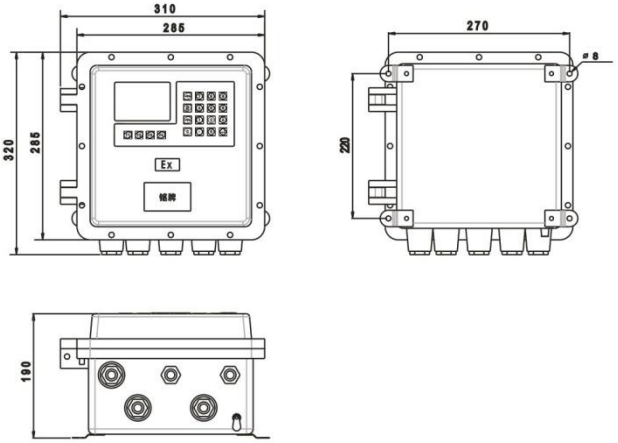
Note that the relay output for an external common 220VAC or DC24V. Recommend connecting L line, the load does not exceed 1A when the external 220VAC while.

Chapter 13.0 Physical Dimensions

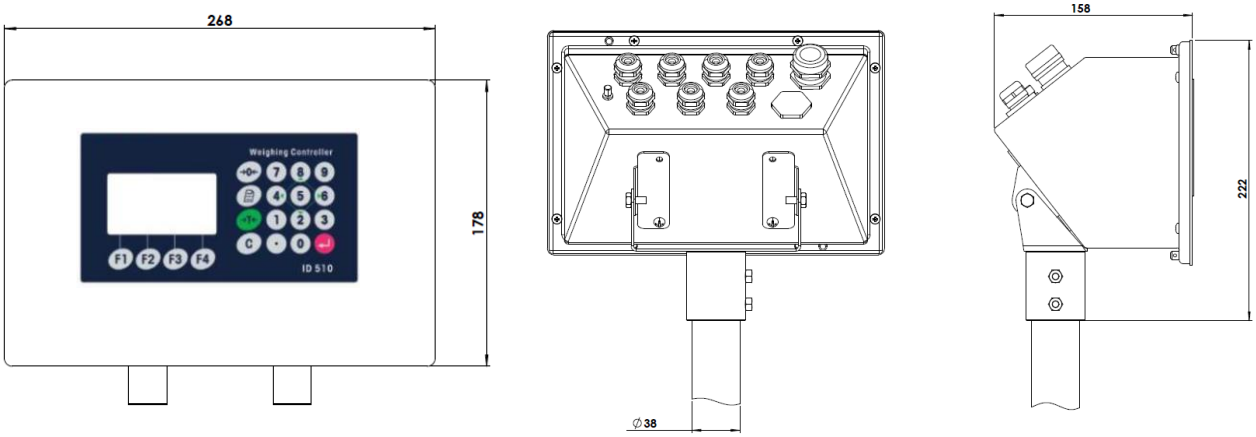
Panel mounting (Panel)

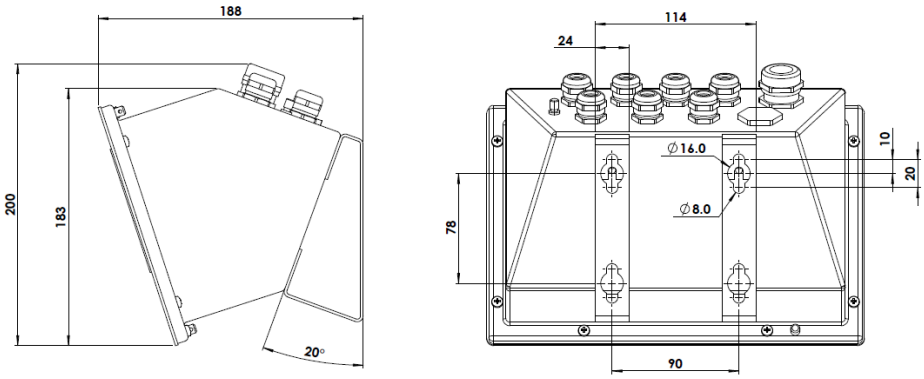


Explosive proof (Exd)



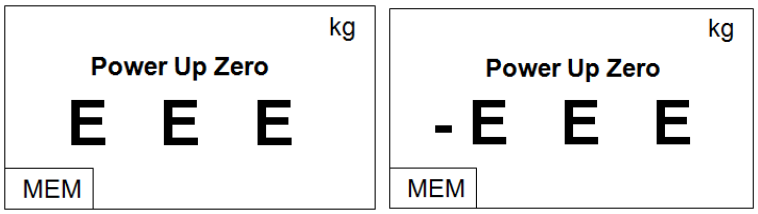
Dust proof version (Harsh)



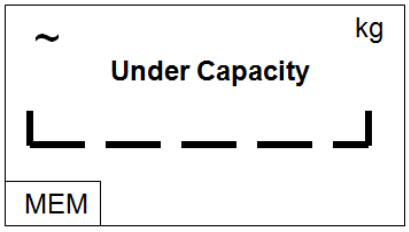


Appendix 1: Errors & Alarms

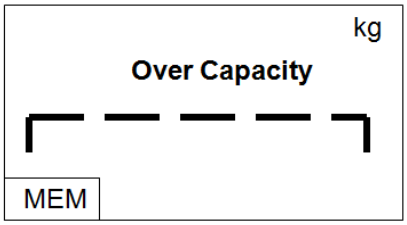
Power up Zero Fail



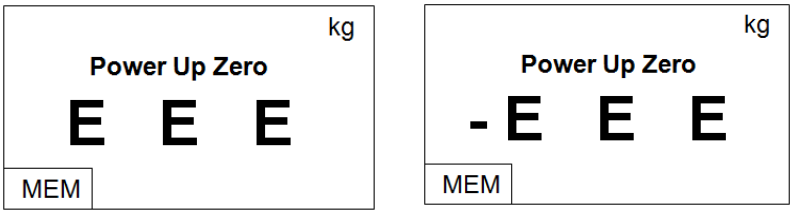
Under Zero Blank



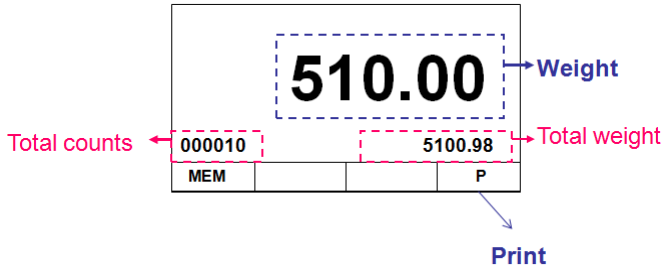
Over Capacity Blank



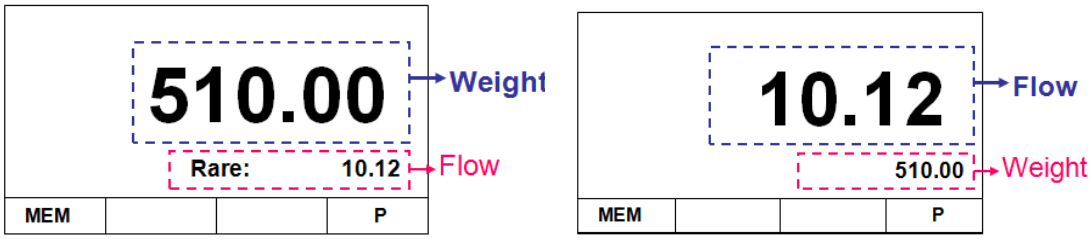
Over Loading Power zero error under Load condition Power zero error



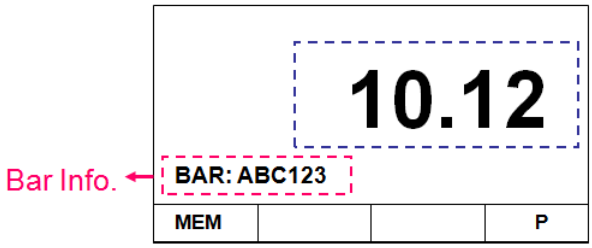
Allows Cumulative function



High weight, low flow displayHigh flow, low weight display



Weight and barcode information display



Appendix 2: Fast Digital Inputs and Digital Tare

In the main section and press the number keys to enter the digital tare input screen, then press the Tare key to quickly peeled