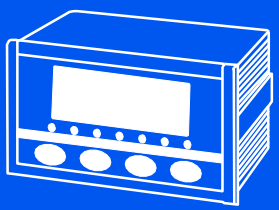
INDUSTRIAL WEIGHING SOLUTION™

CI-1580A

Weighing Indicator



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OWNER'S MANUAL

CAS

Contents

1. Introduction

■ Introduction

This product as an indicator for weighing instruction and control is designed for the most suitable use of any meters (packer, weigh separator, platform scale, various tensile and compression test equipment) that can be applied in the widest way throughout industries.
This product ensures communications with external devices such as computers as it basically installs an RS-232C port.
In addition, this product can be conveniently used for the weighing control as it basically has three relay outputs necessary for control (applicable only if there is relay out).
Please utilize all the functions in this product sufficiently as you can use the device properly with good knowledge of this manual before you use this product.

■ Features

- Measures to screen off external noises
- Built-in self-diagnosis and self-recovery functions from failure
- External resolution : 1/20,000
- Electrostatic data memory
- 2 built-in external relay input terminals (zero, tare/tare removal)
- Data memory
- 24V of input power supply can be used with the use of DC power supply regardless of polarity (500mA < Trans Type > or more is recommended)
- FAC (Full Auto Calibration) method for calibration
- Equivalent input method for Calibration
- Basic installation of RS-232C
- Option : RS-422/485
- Option : I/V-OUT

■ Cautions

- Do not drop or apply severe shocks to the product.
- Do not install the product with high voltage or severe electric noises.
- Do not install the produce with direct sunlight or severe vibrations.
- Connect the product with external peripheral devices after turning off the power switch.
- Keep the product from water or rain.

■ Accessories

- Product manual
- Option (separate option for any addition): 1 EA of adaptor (DC 24V / 500mA)

2. Specifications

■ Analog Part & A/D Conversion

Input sensitivity	0.3㎶ / D
Adjustment range of Zero	- 0.6mV ~ + 1.5mV
Load Cell Excitation Voltage	DC 10V (±5V)
Temperature Coefficient	Zero : ±10 PPM / ℃ SPAN : ±10 PPM / ℃
Input Noise	±0.6㎶ P.P
Input Impedance	Over 10㏁
A/D conversion method	Δ∑
A/D Internal Resolution	520,000 Count(19bit)
A/D Conversion Rate	200 times / Sec
Non-linearity	0.01% FS

■ Digital Part

Display	7-Segment, 5 digit RED FND Character size : 12.7(H) ×7.3(W)mm
Division	×1, ×2, ×5, ×10, ×20, ×50
Below Zero Indication	"-" Minus Sign
Decimal Point	0, 0.0, 0.00, 0.000
Status Lamp	Stable, Zero, High, Low, OK, Hold, Comm
Function Key	ZERO, TARE, SET, ENTER

■ General Specification

Power	DC 24V / About 500mA (Trans Type)
Operating Temperature Range	-5℃ ~ +40℃
Operating Humidity Range	Under 85% Rh (Non-condensing)
Product Size	(W) 100 X (H) 52 X (D) 125 (mm)
Product Weight	About 450g

■ Options

Option - 1	RS-422/485
Option – 2	I-OUT (4~20mA)
Option - 3	V-OUT (0~10V)

3. Front Panel Descriptions

■ DISPLAY (CI-1580A)

■ Display

- Weight: The current weight at the indicator is displayed.

– Whenever the set key is pressed, the value for high limit, low limit or differences is displayed.

■ Display of Status

- STABLE: It is displayed when the weight is stable.
- ZERO: It is displayed when the weight is "0".
- LOW: It is displayed when the weight is the low limit or less.
- HIGH: It is displayed when the weight is the high limit or more.
- OK: It is displayed when the weighing is completed.
- HOLD: It is displayed while the weight is being held.
- COMM(RTxD): It is displayed while the product is communicating with other devices.

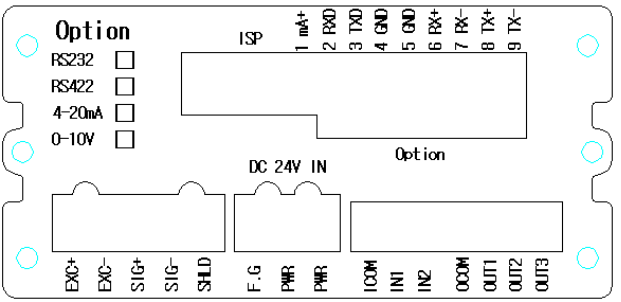
■ Key Operations

Key	Descriptions
	It is used to set the weight display to '0' within a range of maximum weight (CAPA) defined by the user. (However, it is operated within the input range by the user to 'Equipment Set' '08' (Set for Zero Range).
	It is used to set the tare to '0' after a container is put on the weighing tray. (However, it is operated within the input range by the user to 'Equipment Set' '09' (Set for Tare Range)
	It is used for the input of low limit (SP1) and high limit (SP2).
	It is used to enter the set value.

■ Special Key Operations

Key	Descriptions
	① It is used to increase the numeric value. ② It is used to finish the setting under the SET, CAL status.
	① It is used to move the position of a numeric value. ② It is used to move to TEST MODE under the SET, CAL status.
	① It is used to increase the unique number (F XX) in 'Equipment Set'. ② When it is pressed under the 'SET, CAL' status, it moves to 'Equipment Set' (SET UP).
	① It is used to enter (save) the set value by the user in the 'Weight Calibration' function. ② When it is pressed under the 'SET, CAL' status, it moves to 'Weight Calibration' (Calibration).

4. Rear Panel Descriptions

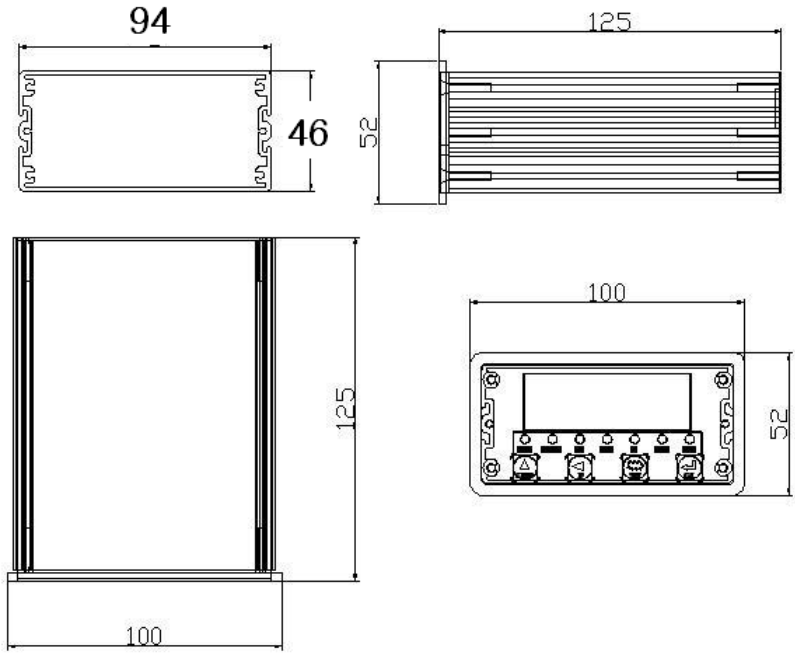


① POWER	- DC IN : As this product uses DC power supply, DC 24V (500mA Trans Type) can be used for this product.
② OPTION	- RS-232C (3P Connecter I/F Communications) (Basic Specifications) - RS-422/485 (4P Connecter I/F Communications) (Separate Option) - 4~20mA (0~10V) (2P Connecter I/F) (Separate Option)
③ EXTERNAL INPUT	1 +EXC - Load cell connection terminal 2 -EXC - Load cell connection terminal 3 +SIG - Load cell connection terminal 4 – SIG - Load cell connection terminal 5 SHIELD - Load cell connection terminal 6 F.G - Grounding 7 PWR - DC IN 24V (input regardless of polarity) 8 PWR - 9,10,11 ICOM, IN1~2(INPUT) – Refer to F11 set for F-Function Mode 12,13,14,15 0COM, OUT1~3(OUTPUT) – Refer to F21 set for F-Function Mode

5. Installation

■ External Dimension & Panel Cutting Size

(External Dimension X mm)



6. Calibration

■ What is calibration?

Calibration refers to the adjustment to make the displayed value consistent with the actual weight on the display of weight.

■ Definition of each mode

☞ If the power is applied while any key is being pressed on the front, you may enter the test screen mode. - Press ZERO Key to return to TEST1 after the sequential increase in TEST1~9. - Press ENTER Key to enter the Test Mode as desired. Please refer to the following descriptions for each mode. - Press ENTER Key again after setting or confirming each mode to return to TEST1. (TEST3 is exceptional). - Press SET Key to enter ST.CAL.	
TEST 1	Zero weight value (A/D) can be confirmed.
TEST 2	Operations of each key can be confirmed.
TEST 3	Mode for the span calibration and equipment set under the SET, CAL mode. ☞ Press TARE Key to return to each mode selection from this status.
TEST 4	It is Display Test Mode. Press ZERO Key to return to TEST.
TEST 5	It is Relay Output Test Mode. Press ZERO Key to return to TEST.
TEST 6	It is Input Test Mode. Press ZERO Key to return to TEST.
TEST 7	It is to select the analog amplification ratio. Press ZERO Key to return to TEST.

■ Span Calibration

The span calibration refers to the adjustment of linearity to set the actual weight consistent with the displayed value from "0" to the maximum weight as the standards in displaying the weight on the indicator.

▶ Enter Span Calibration

- Apply the power supply while ENTER is being pressed on the front
- TEST appears on the display.
- Press SET to display ST.CAL
- Press ENTER to display CAL._1 and then enters the general weight mode.

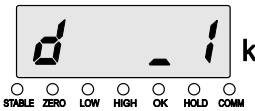
▶ Span Calibration Method

➔ Use ENTER Key for the progressive move

➔ Use SET Key for the reverse move

▶ General Weight Calibration Mode (CAL 1 Mode)

I. Step 1



It is a step to set the value of a division (minimum division of a scale to be displayed).

In this, it is an abbreviation of division meaning "the value for a division of a scale (minimum division of a scale to be displayed)".

Whenever ZERO Key is pressed, the value increases in the order of "01 -> 02 -> 05 -> 10 -> 20 -> 50".

Whenever TARE Key is pressed, the value decreases in the reverse order of the above values.

Press SET Key to escape from ST.CAL.

Press ENTER Key to remember "the value for a division" and then move to the next step.

II. Step 2

It is a step to set the maximum display weight

In this, "CAPA" is an abbreviation, which means the maximum display weight that can be weighted in the indicator.

Enter the maximum display weight as the user desire instead of a random value that is currently displayed.

Whenever ZERO Key is pressed, the number increases in 0 -> 9

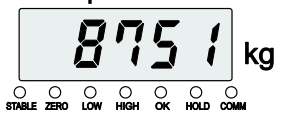
Whenever TARE Key is pressed, it moves to the left

Press SET Key to move the setting of a division value

Press ENTER Key to store the currently designated value to the maximum display weight. Move on the next step.

※ Do not set (a value for a division of a scale/maximum display weight) to more than (1/30,000). More than (1/30,000) cannot be set. The product can be applied to at maximum 1/30,000.

III. Step 3



It is a step to check zero status in the current indicator.
A random value A/D is shown on the display, which means zero for calibration.

ZERO Key is not used.

TARE Key is not used.

Press SET Key to move to the setting for the maximum display weight

Press ENTER Key to store the currently displayed zeroing value. Move on to the next step.

IV. Step 4

It is a step to load the prepared standard counterweights on the indicator.
In this, prepare standard counterweights for 10% or more of the maximum weight (CAPA)

Whenever ZERO Key is pressed, the number increases in 0 -> 9

Whenever TARE Key is pressed, it moves to the left

Press SET Key to check zero status and move

Press ENTER Key to store the currently displayed value for counterweights Move on to the next step.
Proceed to Step 5 as it moves onto Step 3 of gage bar.

V. Step 5

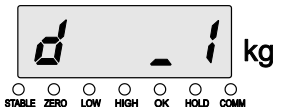
A span constant is shown on the display
It enters the weight mode as C.EnD. is blinking and then reset.

▶ Equivalent Input Mode (CAL 2 Mode)

▶ Enter Span Calibration

- Apply the power supply while ENTER is being pressed on the front
- TEST appears on the display.
- Press SET to display ST.CAL
- Press TARE to display CAL._2 and then enters the general weight mode.

I. Step 1



It is a step to set the value of a division (minimum division of a scale to be displayed).
In this, it is an abbreviation of division meaning "the value for a division of a scale (minimum division of a scale to be displayed)".

Whenever ZERO Key is pressed, the value increases in the order of "01 -> 02 -> 05 -> 10 -> 20 -> 50".

Whenever TARE Key is pressed, the value decreases in the reverse order of the above values.

Press SET Key to escape from ST.CAL.

Press ENTER Key to remember "the value for a division" and then move to the next step.

II. Step 2

It is a step to set the maximum display weight written in the load cell
In this, "CAPA" is an abbreviation, which means the maximum display weight that can be weighted in the indicator.
Just enter the maximum weight displayed on the load cell instead of the currently displayed random value.

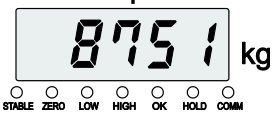
Whenever ZERO Key is pressed, the number increases in 0 -> 9

Whenever TARE Key is pressed, it moves to the left

Press SET Key to move the setting of a division value

Press ENTER Key to store the currently designated value to the maximum display weight.
Move on the next step.

Ⅲ. Step 3



It is a step to check zero status in the current indicator.
A random value A/D is shown on the display, which means zero for calibration.

ZERO Key is not used.
TARE Key is not used.
Press SET Key to move to the setting for the maximum display weight
Press ENTER Key to store the currently displayed zeroing value.
Move on to the next step.

Ⅳ. Step 4

It is a step to enter mV/V displayed on the loadcell.
Ex) Enter 2.0000 if 2mV/V is displayed on the load cell.
Whenever ZERO Key is pressed, the number increases in 0 -> 9
Whenever TARE Key is pressed, it moves to the left
Press SET Key to check zero status and move
Press ENTER Key to store the currently displayed value for counterweights Move on to the next step.
Proceed to Step 5 as it moves onto Step 3 of gage bar.

Ⅴ. Step 5

A span constant is shown on the display
It enters the weight mode as C.EnD. is blinking and then reset.

※ While setting the weight of counterweights;
The span can be more accurately adjusted; if (a value for a division) is 1/5,000 or less, prepare counterweights in 10% or more of the maximum display division and set the value; if it is 1/5,000 or more, prepare counterweights in 20% or more of the maximum display division and set the value.
- If the weight of counterweights for not less than the maximum display division is set, Error 04 Message is displayed.
- If the weight of counterweights for 10% or less of the maximum display division is set, Error 05 Message is displayed.

■ Error Display Status and Measures in Detail

Seq	Division	Causes	Measures in Detail
1	Err 01	The maximum display division / the value of a division is 20,000 or more.	Enter again the maximum display division / the value of a division to become 20,000 or less
3	Err 04	The setting of standard counterweights is set to more than the maximum display division.	Enter again the setting of standard counterweights to become less than the maximum display division.
4	Err 05	The setting of standard counterweights is set to 10% or less of the maximum display division.	Enter again the setting of standard counterweights to become 10% or more of the division.
5	Err 06	The output value for the load cell is too large.	Check if the weight is loaded as much as it is set with the standard counterweights. If the standard counterweights greater than the setting value are loaded, set them to the setting value.
6	Err 07	The output value for the load cell is too small.	Check if the weight is loaded as much as it is set with the standard counterweights. If the standard counterweights smaller than the setting value are loaded, set them to the setting value.
7	Err A	Calibration judgment cannot be done due to the continuous shaking on the weight.	Check out the surrounding environment and separate any vibrating source for the stable weighing while preventing the indicator from any great vibration. - Check out any defect in the load cell - Check out any electric leak in the connecting wire to the load cell. - Check out the insulation resistance in the load cell.
8	Err _8	A value that should not be entered to F-Function is entered.	Check out the value and enter the proper value again.
9	Err _9	When a constant Y.YXXXX YY is a value between 3.9~9.9 > the resolving power is 1/20000 and small counterweights are placed.	Lower the resolving power. (Ex: value for a division 1 -> 5)

7. Set-up

■ Set-up

− Overview

It means the setting works to ensure the indicator to be operated under the optimal conditions by setting F-FUNCTION properly to the operating devices and surrounding environment.

− How to enter Set-up

"TEST" is displayed when the power is turned on while any key is being pressed.

At this time, press SET Key to display ST.CAL on the main display.

At this state, press SET Key to display 01-XX.

EX) While the power is turned off;
① Press "3" Key and turn on the power for "TEST___"
② Press "3" Key for "SET. CAL"
③ Press "CLEAR" Key for "F01-XX"
"X" is a random number.

− How to change the unique number for F-FUNCTION

To change the unique number for F-Function, the unique number increases whenever ZERO Key is pressed once.
It increases to 01-53 and then returns to 01.

Whenever ZERO Key is pressed, the number increases in 0 -> 9.

Whenever TARE key is pressed, it moves to the left.

Press SET Key to call the function after the number is assigned to the function.
Sequential increase in 01-53 if no number is assigned

Press ENTER Key to store the currently displayed value and press once again to move to ST. CAL.

− How to enter after assigning F-Function

After assigning F-Function using ZERO & TARE Key, you may enter the appropriate F-Function using SET Key.

1. Whenever ZERO Key is pressed, the number increases in 0~9 on the position.
2. Press TARE Key to change the number in 0~9.
3. Press ZERO Key again to increase the number in 0~9.
4. Press SET Key to enter the assigned F-Function.

EX) Assign F53 and then enter it:

1. On the screen for F01-01
2. When the number 1 is blinking, press ZERO Key to make the number 3.
3. Press TARE Key to move the number on the position and then the number 0 is blinking.
4. Press ZERO Key again to make the number 5.
5. Press SET Key again to enter the Function immediately.

※ Caution: Be aware that the value for the Function is stored when ENTER Key is pressed.

− How to change the setting of F-Function

After entering a value to change the setting of F-Function, press ENTER Key to store it in the internal memory and finish the change.

If ENTER Key is not pressed only after the desired value is entered, the value is not stored.

※ **The value can be stored in the internal memory when** you press ENTER Key after the value is changed to your desired set value.

■ F-FUNCTION LIST

Function	default	Details	Division
01	2	DECIMAL POINT SETTING	0, 0.0, 0.00 ,0.000
02	0	ZERO MEMORY MODE	Normal(0), Back-UP(1)
03	5	MOTION BAND RANGE	0~9
04	5	ZERO TRACKING RANGE	0~9
05	0	AUTO ZERO RANGE SETTING	00~99
06	15	DIGITAL FILTER RANGE	01~49
07	0	ZERO,TARE KEY OPERATION MODE	0) during the stable period , 1) during the instable period
08	3	ZERO KEY OPERATION RANGE SETTING MODE	2%(0),5%(1),10%(2),20%(3),100%(4)
09	3	TARE KEY OPERATION RANGE SETTING MODE	10%(0),20%(1),50%(2),100%(3)
10	0	HOLD FUNCTION SETTING	Peak-hold(0),Sample hold(1) 5 second average hold (2)
11	3	EXTERNAL RELAY INPUT SETTING	0,1,2,3,4
12	0	FRONT KEY OPERATION SETTING	0,1,2,3,4
13	0	CODE NUMBER ASSIGNING	0,1,2
14	0	HOLD OFF TIME	0.0 ~ 9.9 seconds
21	1	WEIGHING MODE SELECTION	1,2,3,4
22	10	COMMUNICATION OUTPUT" DELAY TIME(T1) SETTING	0.0 ~ 9.9 seconds
24	10	DELAY TIME OF RELAY OUTPUT FOR THE WEIGHING JUDGMENT	0.0 ~ 9.9 seconds
25	10	ON TIME OF RELAY OUTPUT FOR THE WEIGHING JUDGMENT	0.0 ~ 9.9 seconds
30	0	SERIAL PARITY BIT SETTING MODE	NO(0), ODD(1), EVEN(2)
31	7	BAUD RATE FOR SERIAL COMMUNICATIONS	0~9 , 115200 bps ~ 2400 bps
32	0	SERIAL COMMUNICATION MODE	0 : Stream Mode, 1: Stable Mode,
33	1	SERIAL COMMUNICATION MODE	0: Unilateral Transmission Mode 1: COMMAND Mode, 2: LCD Mode 4: External Display Mode
34	1	EQUIPMENT ID NUMBER SETTING	1~99
35	0	TRANSMISSION DATE FORMAT	0: BASIC FORMAT, 1: CAS FORMAT
36	0	BCC SELECTION MODE	0: BCC not used 1: BCC used
37	3	DATA TRANSFERENCE COUNT SETTING	0~6
40	0	Weight Unit selection (Communication)	0: kg, 1: g, 2: ton

53	0	AVERAGE DISPLAY SETTING MODE	00~99 0: No operation. 1~99: Under operations
54	0	Steady LED Status Lamp Delay time setting	0: No operation, 1: Operation.
55	0	Tension and Compression setting	0: No operation. (JP 1 OFF) 1: Operation. (JP 1 ON)

※ F80~F89 can be entered after FUNCTION is designated.

(Refer to Page 22 How to enter after assigning F-Function

80	10	NEAR ZERO(EMPTY) RANGE SETTING	xxxxxx
81	0	ZERO DISPLAY RANGE SETTING	xxxxxx
82	xxxxxx	ZERO MINUS VALUE SETTING	xxxxxx
83	0	MAXIMUM ANALOG OUTPUT VALUE SETTING	xxxxxx
85	xxxxxx	INPUT OF EQUIVALENT CIRCUIT VALUE	xxxxxx
89	-	CHECK FOR CALIBRATION SPAN CONSTANT	x.xxxxx

Input	**IN1**	**IN2**	
Use	Zero	Tare / Tare Removal	
Output	**OUT1**	**OUT2**	**OUT3**
Use	SP3(Zero)	SP2(High Limit)	SP1(Low Limit)

■ F-FUNCTION DESCRIPTIONS IN DETAIL

(● : Factory Default)

Decimal Point Setting				
F01		0	No decimal point	0
		1	A place of decimals	0.0
	●	2	2 places of decimals	0.00
		3	3 places of decimals	0.000

Zero Memory Mode			
F02	●	0	Normal Mode
		1	Back-up Mode

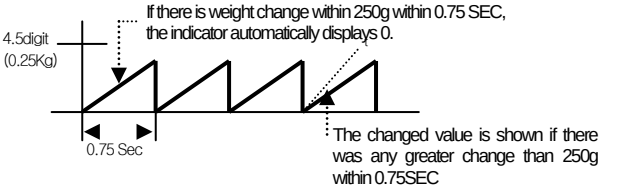
* The weight on the indicator is not stored in the Normal Mode during any blackout or power-off. Accordingly, the power should be turned on after the weighing object is removed from the indicator.
* "0" is immediately shown on the display in the Back-up Mode by reading the stored zero point when the power is turned on. Therefore, the weight is shown during any blackout or power-off if there is any weighing object on the indicator if the power is turned on.

Motion Band Range Setting			
F03	5	0 ∫ 9	A function to set how much the range of variations for weight per hour is set for the stable status. 0 : With less vibration (weak) ~ 3: With more vibration (strong)

* It is a function to stabilize the state when the range of variations for weight in the set time does not go over the A/D Count set range.
※ There are subtle vibrations in general when a weighing object is placed on the indicator.
Hence, the state indicator "Stable" is turned on the display once the vibration is stabilized. "Motion Band" sets the time range to stabilize the vibration in this way.

Zero Tracking Adjustment Range Setting			
F04	5	0 ∫ 9	The automatic zero calibration if it does not exceed a certain range of divisions within a certain time if there is any subtle change in the weight for some reason (environment, temperature, wind, dust, etc.)

Ex) F04 is set to "3" when the maximum display division is set to 120.00Kg and a division to 0.05Kg;



※ This function prevents the indicator from any impact from the accumulated dusts or dirt where you might have a lot of dusts or dirt in the environment during the use.

Auto – Zero Range Setting			
F05	00	00 ∫ 99	A function to return the display value to "0" immediately once the weight is displayed and stabilized under the set value.

* The automatic zeroing can be done (before the weighing is done again) if there is any remaining under the set value with no use of 'ZERO' Key once this function is set.
* Ex) If the maximum display weight is set to 120.00Kg, a division to 0.02Kg and F05 to 30 in the indicator, the display value becomes "0.00Kg" as the zeroing is immediately operated once (STEADY LAMP ON) is carried while the remaining amount exists up to ±(0.02~0.30Kg).

Digital Filter Range					
F06	15	00 ∫ 49	Weak ↕ Strong	More vibration ↑ Less vibration	More Sensitive Less Sensitive

* This function should be used after the adjustment for the set value depending on the environment (surrounding vibration).
* Decrease the set value for the quicker response speed in the indicator

ZERO, TARE Key Operation Mode			
F07	●	0	"ZERO" Key can be operated only if the weight is stabilized.
		1	"ZERO" Key can be operated even if there is any change in the weight.

ZERO Key Range Setting Mode			
F08		0	Operations within 2% of maximum CAPA
		1	Operations within 5% of maximum CAPA
		2	Operations within 10% of maximum CAPA
	●	3	Operations within 20% of maximum CAPA
		4	Operations within 100% of maximum CAPA

* As the indicator set 10% more for its allowable range, the maximum weight in reality becomes 110kg on the indicator if the maximum weight is set to 100kg.
Ex) If the maximum weight (CAPA) is set to 100kg and F08 to "T", then "ZERO" Key can be operated within 1kg (10%).

Setting Mode for TARE Key Operating Range			
F09		0	Operations within 10% of maximum CAPA
		1	Operations within 20% of maximum CAPA
		2	Operations within 50% of maximum CAPA
	●	3	Operations within 100% of maximum CAPA

Ex) "Tare" Key can be operated within 50kg when the maximum weight (CAPA) is set to 100kg and F09 to "2".

Hold Function Setting			
F10	●	0	Hold (once) to detect the maximum weight (Peak-Hold)
		1	Hold for the currently displayed weight for Hold Key or during the input (Sample – Hold)
		2	5 second average hold for Hold Key or during the input (Average– Hold)

External Relay Input Mode				
F11	Division		IN1	IN2
		0	Start	Stop
		1	Start/Stop	Tare / Tare Removal
		2	Zero	Tare / Tare Removal
	●	3	Hold	Hold Removal
		4	Tare	Tare Removal

Front Key Operation Setting						
F12	Division		ZERO	TARE	SET	ENTER
		0	Zero	Tare/Tare Removal	Set	Hold/Hold Removal
		1	Zero	Hold	Set	Hold Removal
		2	Zero	Tare	Set	Tare Removal
	●	3	Zero	Start	Set	Stop
		4	Zero	Start/Stop	Set	Hold/Hold Removal

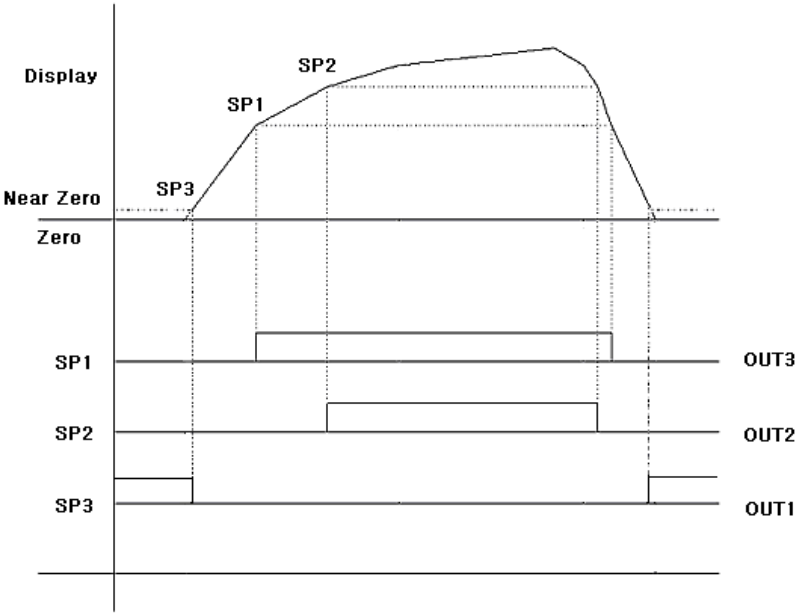
Code Number Assigning Mode			
F13	●	0	Fix
		1	Increase by 1 after 11 rounds of weighing
		2	Decrease by 1 after a round of weight

Hold Off Time Setting			
F14	00	00~99	0 ~ 9.9 seconds
	※ Applicable only for 1, 2 at the setting of F10 (Sample hold, Average hold)		

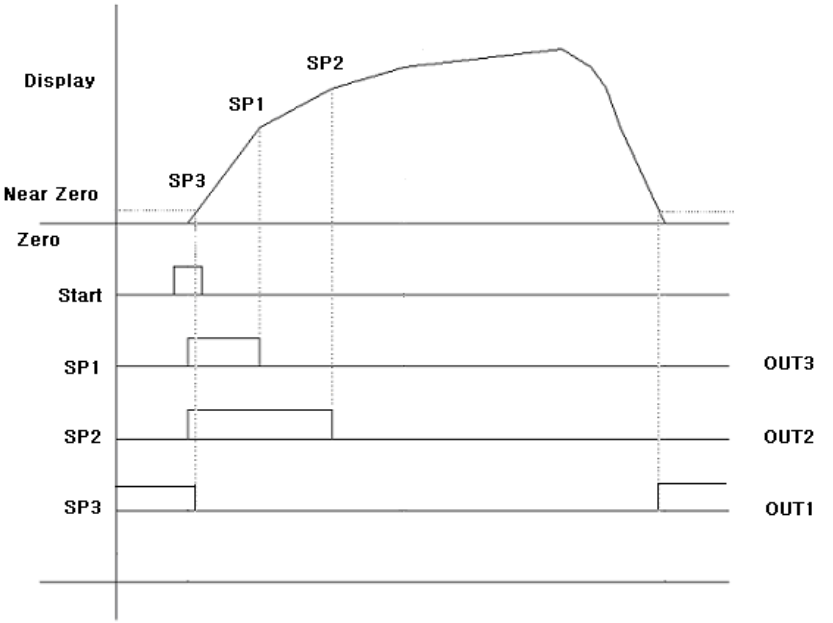
Weighing Mode Selection			
F21	●	1	Relay out mode 1 Normal Batching(Limit)
		2	Relay out mode 2 Programing Batching(Packer)
		3	Relay out mode 3 Comparison mode(Checker 1)
		4	Relay out mode 4 Comparison mode (Checker 2)

External Relay Output (for Control)				
Relay Output		OUT3	OUT2	OUT1
1	Limit	SP1 (Low)	SP2 (High)	SP3 (Zero)
2	Packer	SP1 (Low)	SP2 (High)	SP3 (Zero)
3	Checker 1 (Weight selection)	SP1 (Low)	SP2 (High)	SP3 (Complete)
4	Checker 2 (Judgment Mode)	SP1 (Low)	SP2 (High)	SP3 (Complete)

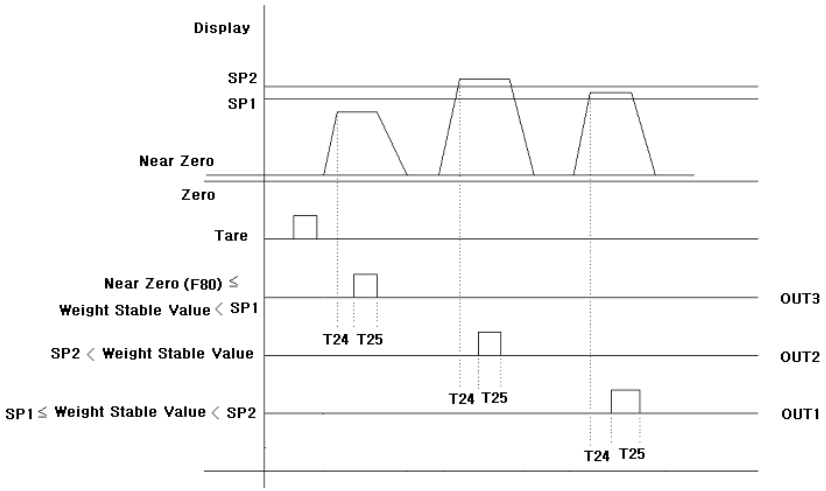
1. Weighing Mode 1 : Normal Batching (Limit Mode)



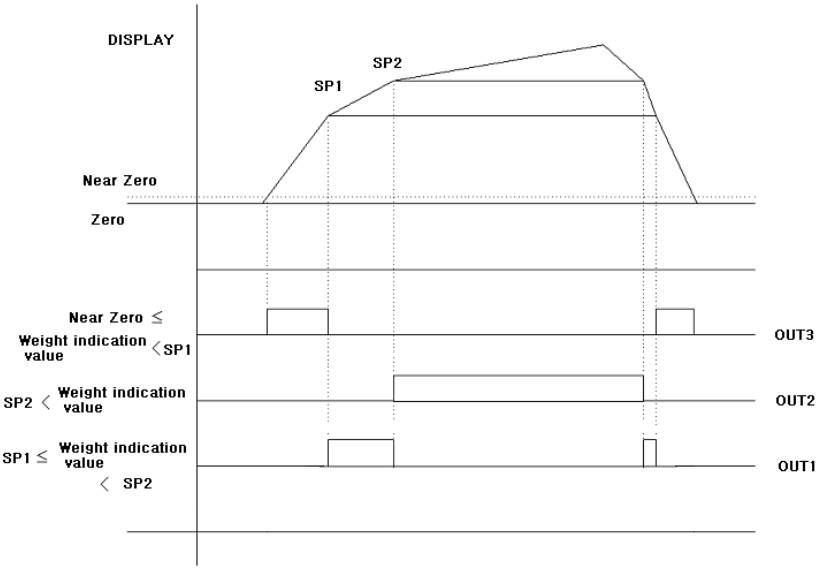
2. Weighing Mode 2 : Programing Batching (Packer Mode 1)

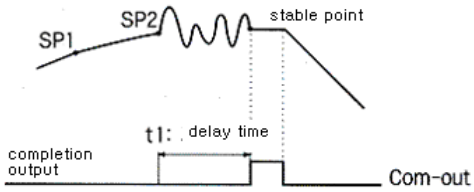


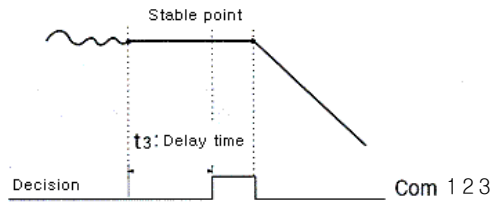
3. Weighing Mode 3 : Comparison Mode 1(Checker Mode1)

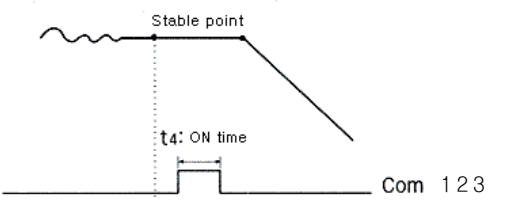


4. Weighing Mode 4 : Comparison Mode 2(Checker Mode 2)



"Communication Output" delay time(t1) setting (upon the setting of F21-1, 2 Weighing Mode)			
F22	10	00 ∫ 99	 Delay time to the relay operation after SP2 relay operations can be set. * Reference 00 : Relay output during the stable weight 01 : Relay output after 0.1 second 99 : Relay output after 9.9 seconds

Delay Time of Relay Output for the Weighing Judgment (F21-3 Checker Mode)			
F24	10	01 ∫ 99	 The delay time to the operation of relay for judgment after the completion of weighing can be set. * Reference 01 : Relay output after 0.1 second. 99 : Relay output after 9.9 seconds

On Time of Relay Output for the Weighing Judgment (F21-3 Checker Mode)			
F25	10	00 ∫ 99	 ON time for relay output for the completion of weighing can be set. * Reference 01 : Relay ON for 0.1 second 99 : Relay ON for 9.9 seconds

※ Communication Setting

Serial Communication Parity Bit Setting mode			
F30	●	0	No Parity
		1	Odd Parity
		2	Even Parity

Serial Communication : Baud Rate Setting			
F31		0	115,200 bps
		1	76,800 bps
		2	57,600 bps
		3	38,400 bps
		4	28,800 bps
		5	19,200 bps
		6	14,400 bps
	●	7	9,600 bps
		8	4,800 bps
		9	2,400 bps

Serial Communication Mode (When F33 is set to "0")			
F32	●	0	Stream Mode: Continuous output of weights all the time
		1	Mode during the stable time: Data output at the time of stable weighing

Serial Communication Mode			
F33		0	Unilateral Transmission Mode
	●	1	Command Mode
		2	LCD Mode
		4	External Display Mode

Equipment Number (ID NUMBER) Setting			
F34	1	1~99	Number to be set for classification

Transmission Data Format			
F35	●	0	BASIC FORMAT
		1	CAS FORMAT

BCC Selection Mode			
F36	●	0	BCC not used
		1	BCC used

Data Transference count setting			
F37		0	About 40 times/sec
		1	About 30 times/sec
		2	About 20 times/sec
	●	3	About 15 times/sec
		4	About 10 times/sec
		5	About 5 times/sec
		6	About 3 times/sec

Weight Unit selection (Communication)			
F40	●	0	kg
		1	g
		2	ton

Average Display Setting Mode			
F53	●	0	No operation.
		1~99	Operating. (The higher the value, the slower the response time in the weight shown on the display)

Steady LED Status Lamp Delay time setting			
F54	●	0	No operation.
		1~99	Operating. (Delay during 0.1 ~ 9.9sec, and LED lamp will be ON.)

Tension and Compression setting			
F55	●	0	No operation. (JP1 switch OFF at main board)
		1	Operating. (JP1 switch ON at main board and then must be re-calibration.)

NEAR ZERO (EMPTY) RANGE SETTING		
F80	XXX	Range near zero to check the emptiness of the indicator Ex) 000 : Near Zero Relay is operated when the display of weight is "0". 010 : Near Zero Relay is operated when the display of weight is "10" or less. 150 : Near Zero Relay is operated when the display of weight is "150" or less.

Zero Display Range Setting		
F81	XXXXXX	A function to set the display range of zero. Ex) If 50 is set, any value not less than the value is all shown with 0 on the display.

Zero Minus Value Setting	
F82	If a value is set to F82, the value minus the value set to zero is displayed.
	Ex) if 1000 is set, the zero value displayed in TEST1 Mode, for example, the value of 6000 is shown as 5000 after 1000 is deducted from the value.

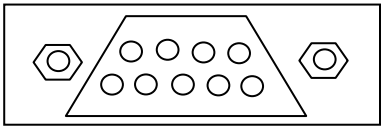
Maximum Analog Output Setting	
F83	Maximum analog output of 0 ~ 10V, 4 ~ 20mA can be set.
	Ex) If 1000 is set, 10V or 20mA output is done when the weight reaches 1000.

Equivalent Input Confirmation and Setting	
F85	Equivalent input can be confirmed and modified.

Calibration Span Constant Confirmation	
F89	Set the number to 89 using "ZERO" and "TARE" Key in F-Function Mode and press "SET" Key to show span constant on the display.

8. Interface

■ RS-232C Interface



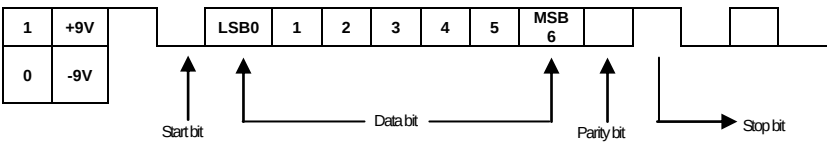
1 5

No.	Name	Use
2	RXD	RS-232C reception
3	TXD	RS-232C transmission
5	GND	RS-232C common

RS-232C Interface is sensitive to electric noises.
Therefore, it should be wired away from AC power cable or other electric wires.
The shielded cable should be used in any case.

Communication mode: It can be set from F-Function(F30~F35).

- **Signal Format**
  ①Type : EIA-RS-232C
  ②Method : Half-Duplex, full-duplex, asynchronous method
  ③Baud-rate : Optional for 2400,4800,9600, 19200, 38400,
  57600,76800,115200
  ④Data bit : 7 or 8(No, Parity)
  ⑤Stop bit : 1
  ⑥Parity bit : Optional for Even, Odd, No, Parity
  ⑦Code : ASCII



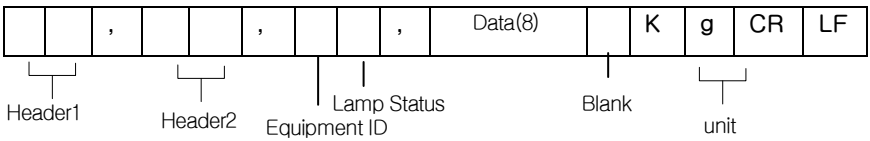
⑧ Printer Format

Data format1(Basic Format)

- Header 1 (Common for data format 2,3)

  OL : OVER LOAD, UNDER LOAD
  ST : Stable indicator
  US : Unstable indicator
- Header 2 (Common for data format 2,3)
  NT : NETWEIGHT (actual weight)
  GS : GROSS WEIGHT (gross weight)
- Data about numbers (Common for data format 2,3)
  2B(H) : "+" PLUS
  2D(H) : "-" MINUS
  2O(H) : " " SPACE
  2E(H) : " " Decimal point
- UNIT (Common for data format 2,3)
  – Kg
  – t
  – g

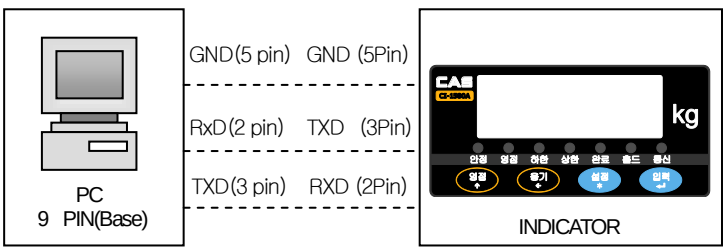
Data format(2)



- Equipment ID : Set in F34
- Lamp Status: Display of ON/OFF status in the current lamp

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
1	Stable	1	Hold	Print	Gross weight	Tare	Zero

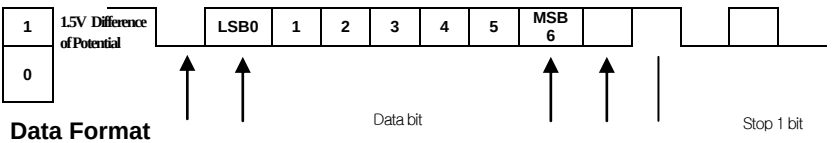
- Connection with PC (Personal Computer) and other devices



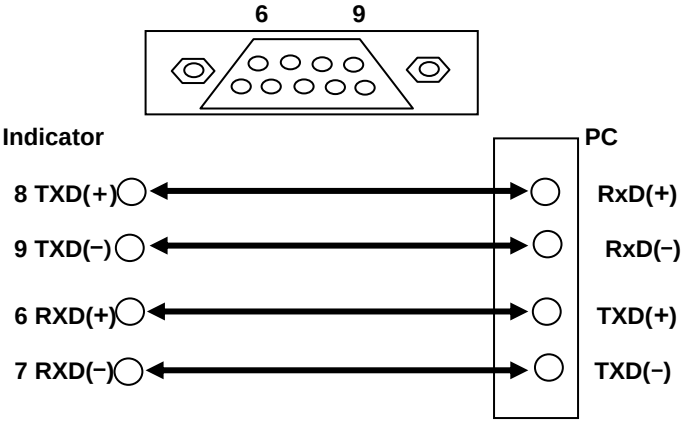
■ RS-422/485 Serial Communication (Separate Option)

RS-422/485 method is more stable for electric noises than any other communication methods as it communicate signals in the voltage difference. In addition, the wiring should be done away from AC power cable or other electric wires. The shield coax cable should be used in any case. The recommended distance in use is the dedicated line within 1.2km.

- **Signal Format**
  - ①Type : RS-422/485
  - ②Format : ⓐ Baud-Rate : 2400 ~ 115200 선택
    - ⓑ Data Bit : 7 or 8 (No Parity)
    - ⓒ Stop : 1
    - ⓓ Parity Bit : Even, Odd, No Parity 선택
    - ⓔ Code : ASCII



- **Data Format**
  The same as RS-232C
- **RS-422/485 Circuit (4P Connector)**



※ Reference

Although any of the signal level conversion methods as stated above is used, there are many cases with problems occurring from the fact that the power supply (the grounding line to be exact) for the transmission side is connected from a remote distance connection through the communication line. Noises flown in through this grounding line might lead the transmitting or receiving system to the instability. For such reasons, it is desirable to insulate and separate the power supply for the system from the power supply for communication line if it involves a long-distant transmission or it is used under the surrounding environment with many noises to the communication system.

▶ COMMAND MODE

(READ COMMAND) (STX), (ETX)

Transmit & Response	Display for Transmit & Response	Command description
PC→ Indicator	☺01RSNO♥ (ASCII) 02 30 31 52 53 4E 4F 03 (HEX)	Command to transmit the Serial Number
Indicator response	☺01RSNO000000♥ (ASCII) 02 30 31 52 53 4E 4F 30 30 30 30 30 30 03 (HEX)	
PC→ Indicator	☺01RCNO♥ (ASCII) 02 30 31 52 43 4E 4F 03 (HEX)	Command to transmit the Code Number
Indicator response	☺01RCNO000058♥ (ASCII) 02 30 31 52 43 4E 4F 30 30 30 30 35 38 03 (HEX)	
PC→ Indicator	☺01RPNO♥ (ASCII) 02 30 31 52 50 4E 4F 03 (HEX)	Command to transmit the Part Number
Indicator response	☺01RPNO19♥ (ASCII) 02 30 31 52 50 4E 4F 31 39 03 (HEX)	
PC→ Indicator	☺01RTAR♥ (ASCII) 02 30 31 52 54 41 52 03 (HEX)	Command to transmit the weight value of "KEY Tare"
Indicator response	☺01RTAR000758♥ (ASCII) 02 30 31 52 54 41 52 30 30 30 37 35 38 03 (HEX)	

PC→ Indicator	☺01RCWT♥ (ASCII) 02 30 31 52 43 57 54 03 (HEX)	Command to transmit the "Current Weight Value"
Indicator response	☺01RCWTSTNT+00027.6kg♥ (ASCII) 02 30 31 52 43 57 54 53 54 4E 54 2B 30 30 30 32 37 2E 36 6B 67 03 (HEX)	
Remark	STX(1) ID(2) Command(4) Status1(2) Status2(2) Symbol(1) Weight (Include decimal point)(7) Unit(2) ETX(1) = Total 22 BYTE	

PC→ Indicator	☺01RSP1♥ (ASCII) 02 30 31 52 53 50 31 03 (HEX)	Command to transmit the Lowest limit DATA
Indicator response	☺01RSP1001000♥ (ASCII) 02 30 31 52 53 50 31 30 30 31 30 30 30 03 (HEX)	

PC→ Indicator	☺01RSP2♥ (ASCII) 02 30 31 52 53 50 32 03 (HEX)	Command to transmit the Upper Limit DATA
Indicator response	☺01RSP2002000♥ (ASCII) 02 30 31 52 53 50 32 30 30 32 30 30 30 03 (HEX)	

▶ COMMAND MODE

(WRITE COMMAND)

(STX ), (ETX ), (ACK ), (NAK )

Transmit & Response	Display for Transmit & Response	Command description
PC→ Indicator	02 30 31 57 54 41 52 03 (HEX)	Command to set the "Tare"
Indicator response	02 30 31 57 54 41 52 06 03 (HEX)	
PC→ Indicator	02 30 31 57 54 52 53 03 (HEX)	Command to set the "Tare reset"
Indicator response	02 30 31 57 54 52 53 06 03 (HEX)	
PC→ Indicator	02 30 31 57 5A 45 52 03 (HEX)	Command to set the "Zero"
Indicator response	02 30 31 57 5A 45 52 06 03 (HEX)	

PC→ Indicator	☻01WSNO0000058♥ (ASCII) 02 30 31 57 53 4E 4F 30 30 30 30 35 38 03 (HEX)	Command to change the "Serial" memorized inside
Remark	STX(1) ID(2) Command(4) S/N(6) ETX(1)	
Indicator response	☻01WSNO♠♥ (ASCII) 02 30 31 57 53 4E 4F 06 03 (HEX)	

PC→ Indicator	☻01WPNO19♥ (ASCII) 02 30 31 57 50 4E 4F 31 39 03 (HEX)	Command to change the "Part Number" to the DATA that is now being transmitted
Remark	STX(1) ID(2) Command(4) P/N(2) ETX(1)	
Indicator response	☻01WPNO♠♥ (ASCII) 02 30 31 57 50 4E 4F 06 03 (HEX)	

PC→ Indicator	☻01WCNO0000058♥ (ASCII) 02 30 31 57 43 4E 4F 30 30 30 30 35 38 03 (HEX)	Command to change the "CODE" to the DATA that is now being transmitted
Remark	STX(1) ID(2) Command(4) C/N(6) ETX(1)	
Indicator response	☻01WCNO♠♥ (ASCII) 02 30 31 57 43 4E 4F 06 03 (HEX)	

PC→ Indicator	☻01WHOL♥ (ASCII) 02 30 31 57 48 4F 4C 03 (HEX)	Command to set the "Hold"
Indicator response	☻01WHOL♠♥ (ASCII) 02 30 31 57 48 4F 4C 06 03 (HEX)	

PC→ Indicator	01WHRS♥ (ASCII) 02 30 31 57 48 52 53 03 (HEX)	Command to set the "Hold Reset"
Indicator response	01WHRS♠♥ (ASCII) 02 30 31 57 48 52 53 06 03 (HEX)	

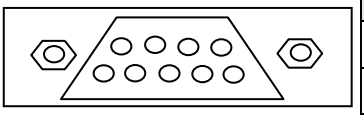
PC→ Indicator	01WSTR♥ (ASCII) 02 30 31 57 53 54 52 03 (HEX)	Command to "Start" (F21 – 2) (PACK MODE)
Indicator response	01WSTR♠♥ (ASCII) 02 30 31 57 53 54 52 06 03 (HEX)	

PC→ Indicator	01WSTO♥ (ASCII) 02 30 31 57 53 54 4F 03 (HEX)	Comand to "stop" (F21 – 2) (PACK MODE)
Indicator response	01WSTO♠♥ (ASCII) 02 30 31 57 53 54 4F 06 03 (HEX)	

PC→ Indicator	01WSP1000200♥ **(ASCII)** 02 30 31 57 53 50 31 30 30 30 32 30 30 03 **(HEX)**	Command to change the Lowest limit (SP1)
Remark	STX(1) ID(2) Command(4) LOW(6) ETX(1)	
Indicator response	01WSP1♠♥ **(ASCII)** 02 30 31 57 53 50 31 06 03 **(HEX)**	

PC→ Indicator	01WSP2000400♥ **(ASCII)** 02 30 31 57 53 50 32 30 30 30 34 30 30 03 **(HEX)**	Command to change the upper limit (SP2)
Remark	STX(1) ID(2) Command(4) HIGH(6) ETX(1)	
Indicator response	01WSP2♠♥ **(ASCII)** 02 30 31 57 53 50 32 06 03 **(HEX)**	

■ 4~20mA(0~10V) Serial Interface(Option)



1 **5**

No.	Name	Use
1	OUT	Current or Voltage Output Port
5	COM	Common Output port

- F-83 (Parts related to the analog output)

Set Max. Analog Output Value	
F83	Maximum analog output of 0 ~ 10V, 4 ~ 20mA can be set.
	Ex) If 1000 is set, the output of 10V or 20mA is done when the weight value reaches 1000.

- While Key Test Mode in TEST2 in relation with the analog setting;

press ZERO Key for the output of 4mA(or 0V).

press TARE Key for the output of 12mA(or 5V).

press SET Key for the output of 20mA(or 10V).

press ENTER Key to move to Test. (EXIT)

MEMO

MEMO

MEMO

MEMO

CI-1580A

Weighing Indicator

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