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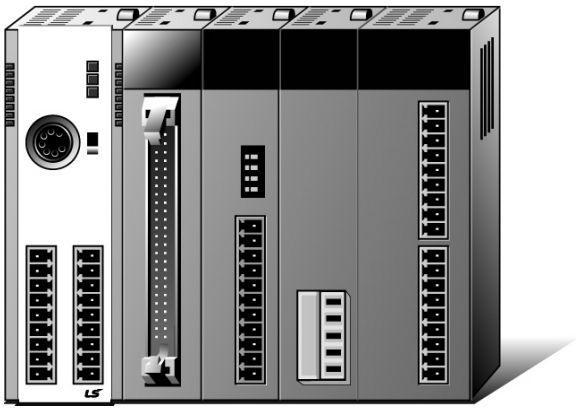
Programmable Logic Controller

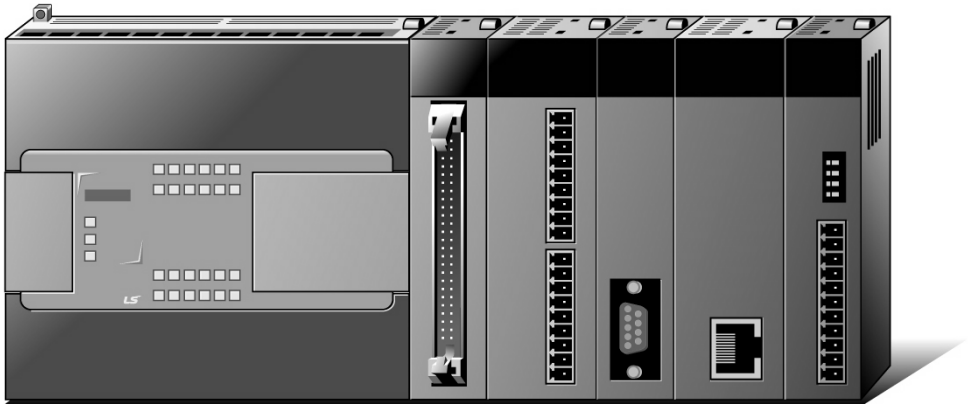
XGB Load Cell Input Module

XGT Series

User's Maunal

XBF-LD02S





Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

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Safety Instructions

Before using the product …

For your safety and effective operation, please read the safety instructions thoroughly before using the product.

- Safety Instructions should always be observed in order to prevent accident or risk with the safe and proper use the product.

- Instructions are divided into “Warning” and “Caution”, and the meaning of the terms is as follows.

⚠ **Warning**	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ **Caution**	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices

Moreover, even classified events under its caution category may develop into serious accidents relying on situations. Therefore we strongly advise users to observe all precautions properly just like warnings.

- The marks displayed on the product and in the user’s manual have the following meanings.

  ⚠ Be careful! Danger may be expected.

  ⚠ Be careful! Electric shock may occur.

- The user’s manual even after read shall be kept available and accessible to any user of the product.

Safety Instructions

Safety Instructions for design process

⚠ Warning

- **Please install a protection circuit on the exterior of PLC so that the whole system may operate safely regardless of failures from external power or PLC.** Any abnormal output or operation from PLC may cause serious problems to safety in whole system.
  - Install protection units on the exterior of PLC like an interlock circuit that deals with opposite operations such as emergency stop, protection circuit, and forward/reverse rotation or install an interlock circuit that deals with high/low limit under its position controls.
  - If any system error (watch-dog timer error, module installation error, etc.) is detected during CPU operation in PLC, all output signals are designed to be turned off and stopped for safety. However, there are cases when output signals remain active due to device failures in Relay and TR which can't be detected. Thus, you are recommended to install an addition circuit to monitor the output status for those critical outputs which may cause significant problems.

- **Never overload more than rated current of output module nor allow to have a short circuit**. Over current for a long period time may cause a fire .

- **Never let the external power of the output circuit to be on earlier than PLC power**, which may cause accidents from abnormal output or operation.

- **Please install interlock circuits in the sequence program for safe operations in the system when exchange data with PLC or modify operation modes using a computer or other external equipments** Read specific instructions thoroughly when conducting control operations with PLC.

Safety Instructions

Safety Instructions for design process

⚠ Caution

- **I/O signal or communication line shall be wired at least 100mm away from a high-voltage cable or power line.** Fail to follow this instruction may cause malfunctions from noise

Safety Instructions on installation process

⚠ Caution

- **Use PLC only in the environment specified in PLC manual or general standard of data sheet.** If not, electric shock, fire, abnormal operation of the product may be caused.

- **Before install or remove the module, be sure PLC power is off.** If not, electric shock or damage on the product may be caused.

- **Be sure that every module is securely attached after adding a module or an extension connector.** If the product is installed loosely or incorrectly, abnormal operation, error or dropping may be caused. In addition, contact failures under poor cable installation will be causing malfunctions as well.

- **Be sure that screws get tighten securely under vibrating environments.** Fail to do so will put the product under direct vibrations which will cause electric shock, fire and abnormal operation.

- **Do not come in contact with conducting parts in each module**, which may cause electric shock, malfunctions or abnormal operation.

Safety Instructions

Safety Instructions for wiring process

⚠ Warning

- **Prior to wiring works, make sure that every power is turned off.** If not, electric shock or damage on the product may be caused.

- **After wiring process is done, make sure that terminal covers are installed properly before its use.** Fail to install the cover may cause electric shocks.

⚠ Caution

- **Check rated voltages and terminal arrangements in each product prior to its wiring process.** Applying incorrect voltages other than rated voltages and misarrangement among terminals may cause fire or malfunctions.

- **Secure terminal screws tightly applying with specified torque.** If the screws get loose, short circuit, fire or abnormal operation may be caused. Securing screws too tightly will cause damages to the module or malfunctions, short circuit, and dropping.

*

- **Be sure to earth to the ground using Class 3 wires for PE terminals which is exclusively used for PLC**. If the terminals not grounded correctly, abnormal operation or electric shock may be caused.

- **Don't let any foreign materials such as wiring waste inside the module while wiring,** which may cause fire, damage on the product or abnormal operation.

- **Make sure that pressed terminals get tighten following the specified torque. External connector type shall be pressed or soldered using proper equipments.**

Safety Instructions

Safety Instructions for test-operation and maintenance

⚠ Warning

- **Don't touch the terminal when powered**. Electric shock or abnormal operation may occur.
- **Prior to cleaning or tightening the terminal screws, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- **Don't let the battery recharged, disassembled, heated, short or soldered**. Heat, explosion or ignition may cause injuries or fire.

⚠ Caution

- **Do not make modifications or disassemble each module.** Fire, electric shock or abnormal operation may occur.
- **Prior to installing or disassembling the module, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- **Keep any wireless equipment such as walkie-talkie or cell phones at least 50cm away from PLC**. If not, abnormal operation may be caused.
- **When making a modification on programs or using run to modify functions under PLC operations, read and comprehend all contents in the manual fully.** Mismanagement will cause damages to products and accidents.
- **Avoid any physical impact to the battery and prevent it from dropping as well.** Damages to battery may cause leakage from its fluid. When battery was dropped or exposed under strong impact, never reuse the battery again. Moreover skilled workers are needed when exchanging batteries.

Safety Instructions

Safety Instructions for waste disposal

⚠ Caution

- **Product or battery waste shall be processed as industrial waste.** The waste may discharge toxic materials or explode itself.

Revision History

Version	Date	Contents	Chapter
V 1.0	’15.11	First edition	-

※ The number of User’s manual is indicated right part of the back cover.

Thank you for purchasing PLC of LS IS Co., Ltd.
Before use, make sure to carefully read and understand the User's Manual about the functions, performances, installation and programming of the product you purchased in order for correct use and importantly, let the end user and maintenance administrator to be provided with the User's Manual.

The User's Manual describes the product. If necessary, you may refer to the following description and order accordingly. In addition, you may connect our website (http://www.lsis.com/) and download the information as a PDF file.

Relevant User's Manuals

Title	Description
XG5000 User's Manual (for XGK, XBC,XBM)	XG5000 software user manual describing online function such as programming, print, monitoring, debugging by using XGB(MK language) CPU
XG5000 User's Manual (for XGI, XGR, XEC)	XG5000 software user manual describing online function such as programming, print, monitoring, debugging by using XGB(IEC language) CPU
XGK/XGB Instructions & Programming User's Manual	User's manual for programming to explain how to use instructions that are used PLC system with XGK, XGB CPU.
XGI/XGR/XEC Instructions & Programming User's Manual	User's manual for programming to explain how to use instructions that are used PLC system with XGI, XGR, XEC CPU.
Ultimate Performance XGB Unit(MK/IEC)	It describes how to use XGB main unit, system configuration, mechanism ,program function ,input/output function, Built-in High-speed Counter, Datalog, PID Control, Built-in Communication function, Built-in Position, Built-in Analog input/output..
XGB hardware	It describes power, IO, extension specification and system configuration, built-in high speed counter of XGB main unit.
XBC Standard / Economic Type Main Unit (MK/IEC)	It describes power, IO, extension specification and system configuration, built-in high speed counter of XGB standard / economic type main unit.

◎ Contents ◎

Chapter 1 Overview

This user manual describes the specifications, handling and programming methods for XBF-LDD02S-type load cell input module used in combination with a basic unit of XGB PLC series (hereafter referred to as the load cell input module).
The load cell input module measures the weight by connecting the load cell of a strain gauge method, which is an external weight sensor, and provides weight calculation function and parameter settings using XG5000 integration tool.

1.1 Features

1) XBF-LD02S is an insulated 2-channel load cell input module.

2) The maximum input load cell rating is 6.0mV/V, and load cell applied voltage is 5V.

3) The maximum resolution is 1/40,000.

4) The maximum conversion rate is 5ms.

5) 8 load cells can be connected in parallel to the module.

6) 4 lines type and 6 line type wiring methods are provided. The 6 lines type can compensate for external changes such as a change in line resistance by providing a feedback circuit

7) It has a high accuracy of less than ±0.01%.(Zero Drift: ±0.25㎶/℃, Gain Drift: ±15ppm/℃)

8) The actual weight value can be confirmed by specifying the decimal point position and unit. The decimal point position can be specified up to three digits to the right of the decimal point.

9) The rated weight can be set within the six-digit range.(1~999999). (excluding the decimal point and unit)

10) It supports moving average, moving/count average and moving/time average through the weight conversion processing method.

For system configuration, the following version is necessary.

Item	Applicable version
XBC H	V2.60 or above
XBC SU	V1.70 or above
XBC U	V1.23 or above
XEC H	V2.0 or above
XEC SU	V1.60 or above
XEC U	V1.23 or above
XBMS	V3.60 or above
XG5000	V4.06 or above

1.2 Definition of Terms

1.2.1 Load cell

As a load sensor that converts weight into an electrical signal, it measures the weight converted into the electrical signal by measuring the strain in the load cell.

1.2.2 Sensitivity(㎷/V)

Load cell output voltage (㎷) per load cell applied voltage(V)

1.2.3 Remote sensing method

Load cell voltage error due to the applied voltage is caused by a change in the cable resistance value resulting from temperature changes. If two remote sensor signals (SEN+,SEN-) are connected to the voltage application device (module), the applied voltage value can be stabilized.

1.2.4 Rated load

It refers to the maximum load that can applied to the load cell, and is represented as Emax = 500kg, meaning the maximum weight value that can be measured by the load cell.

1.2.5 Gain drift

It refers to a gain variation cause by the temperature.

1.2.6 Zero drift

It is defined as a zero variation caused by the temperature.

1.2.7 Gross weight

It refers to the value of the total weight applied to the load cell, including tare weight of containers, structures and contents.

1.2.8 Net weight

It refers to the net weight value of the contents calculated by removing the tare weight from the total weight.

1.2.9 Maximum weight

It refers to the maximum weight value to be applied to the system within the range of the load cell rated load.

1.2.10 Standard weight

It refers to the standard weight value to be applied when the user performs a calibration operation within the maximum weight range.

1.2.11 Free fall compensation

It is an algorithm that compensates the difference between the actual set weight value and the weight value contained in a package due to the free fall that occurs when an object is put into a device such as a hopper.

1.2.12 Span calibration

In general, a scale performs a calibration by measuring the zero and span between the minimum and maximum weight values (calibration range).

That is, input X to obtain B from Y= AX + B(Y: output, X: input, A: slope, B (offset)) is zero, and input X to obtain A becomes span

Chapter2 Specifications

2.1 General specifications

The general specifications of the temperature controller module (XBF-LD02S) are shown in Table 2.1.

<table>
<tr><th>No.</th><th>Item</th><th colspan="6">Specification</th><th>Related Specifications</th></tr>
<tr><td>1</td><td>Working Temperature</td><td colspan="6">0 ~ 55°C</td><td></td></tr>
<tr><td>2</td><td>Storage Temperature</td><td colspan="6">–25 ~ +70 °C</td><td></td></tr>
<tr><td>3</td><td>Working Humidity</td><td colspan="6">5 ~ 95%RH, no dew condensation.</td><td></td></tr>
<tr><td>4</td><td>Storage Humidity</td><td colspan="6">5 ~ 95%RH, no dew condensation.</td><td></td></tr>
<tr><td rowspan="9">5</td><td rowspan="9">Vibration Resistance</td><td colspan="4">Intermittent Vibration</td><td>-</td><td></td></tr>
<tr><td>Frequency</td><td colspan="2">Acceleration</td><td>Amplitude</td><td>Counts</td><td rowspan="9">IEC61131-2 (IEC60068-2-6)</td></tr>
<tr><td>5≤ f <8.4Hz</td><td colspan="2">–</td><td>3.5mm</td><td rowspan="7">X, Y, Z Each Direction 10 counts</td></tr>
<tr><td>8.4≤ f ≤150Hz</td><td colspan="2">9.8m/s^2(1G)</td><td>–</td></tr>
<tr><td colspan="4">Continuous Vibration</td></tr>
<tr><td>Frequency</td><td colspan="2">Acceleration</td><td>Amplitude</td></tr>
<tr><td>5≤ f <8.4Hz</td><td colspan="2">–</td><td>1.75mm</td></tr>
<tr><td>8.4≤ f ≤150Hz</td><td colspan="2">4.9m/s^2(0.5G)</td><td>–</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>6</td><td>Shock Resistance</td><td colspan="6">• Max Shock Acceleration 147m/s^2(15G)
• Applied Time: 11ms
• Pulse Waveform: Sine Half-wave Pulse (three counts in X, Y, Z directions, respectively)</td><td>IEC61131-2 (IEC60068-2-27)</td></tr>
<tr><td rowspan="5">7</td><td rowspan="5">Noise Resistance</td><td>Square-wave Impulse Noise</td><td colspan="4">AC: ±1,500V, DC: ±900V,</td><td>Inside LSIS Test Specifications Standard</td></tr>
<tr><td>Electrostatic Discharge:</td><td colspan="4">Voltage: 4kV (Contact Discharge)</td><td>IEC61131-2 (IEC61000-4-2)</td></tr>
<tr><td>Radiation Field Noise</td><td colspan="4">80 ~ 1000MHz, 10V/m</td><td>IEC61131-2 (IEC61000-4-3)</td></tr>
<tr><td rowspan="2">Past Transient / Burst Noise</td><td>Classification</td><td>Power Module</td><td colspan="2">Digital/Analogue Input/Output Communication Interface</td><td rowspan="2">IEC61131-2 (IEC61000-4-4)</td></tr>
<tr><td>Voltage</td><td>2kV</td><td colspan="2">1kV</td></tr>
<tr><td>8</td><td>Surrounding Environment</td><td colspan="6">No Corrosive Gas or Dust</td><td></td></tr>
<tr><td>9</td><td>Working Altitude</td><td colspan="6">2,000m or below</td><td></td></tr>
<tr><td>10</td><td>Pollution Level</td><td colspan="6">2 or below</td><td></td></tr>
<tr><td>11</td><td>Cooling Method</td><td colspan="6">Natural Air Cooling</td><td></td></tr>
</table>

[Table 2.1] General Specifications

Remark

1) IEC(International Electro-technical Commission)An international private organization which promotes international cooperation for standardization in the field of electric/electronic technology, publishes international standards, and operates the conformity assessment programs.
2) Pollution Level: Pollution level represents the level of pollution in the working environment, which determines the insulation performance of a device. Pollution level of 2 refers to a state where only non-conductive pollution occurs. However, in case of condensation, a temporary condensation may occur.
3) Use of portable radio is restricted as it may affect the accuracy of the load cell module. If a radio must be used, please keep the safe distance (50 cm).Here, the safe distance includes the distance from the input cable connected to the module.

2.2 Performance specifications

2.2.1 Performance specifications of XBF-LD02S module

The performance specifications of the temperature controller module (XBF-LD02S) are shown in Table 2.2.

Items		Specifications			
Input Channel		2 Channel (Insulation between Channels)			
Load Cell Input Voltage		5VDC±5%, (8 per 350Ω load cell channel)			
Load Cell Type		Four-wire or Six-wire			
Resolution		1/40000			
Analog Input Range		0.0~6.0㎷			
Load Cell Output Sensitivity		0.125㎶(when the rated output of the load cell is 0.0 ~ 1.0㎷/ V)			
Input Accuracy		±0.01% or below (nonlinear accuracy, 25℃) Zero Drift: ±0.25㎶/℃ Gain Drift: ±15ppm//℃			
Sampling Cycle (per channel)		5㎳			
Insulation		Classification	Insulation Method	Insulation Voltage Resistance (Internal Test Specifications)	Insulation Resistance
		Input Terminal and Internal Circuits	Photo Coupler	AC 550 V 50/60 Hz 1 minute, Leakage 10 mA or below	DC500 V, 10 MΩ or above
Warm-up time		30 minutes or above			
Input Connector		8 pins Connector(CH0)/10 pins Connector(CH1)			
IO Occupation Points:		Fixed type:64 points			
Maximum number of units		7: XBM type, XBC/XEC-SU type 10: XBC/XEC-H type, XBC/XEC-U type			
Power Supply		DC 5 V(internal), DC 20.4 V~28.8V(external)			
Power Consumption	Internal (DC5V)	110㎃			
	External (DC24V)	280㎃			

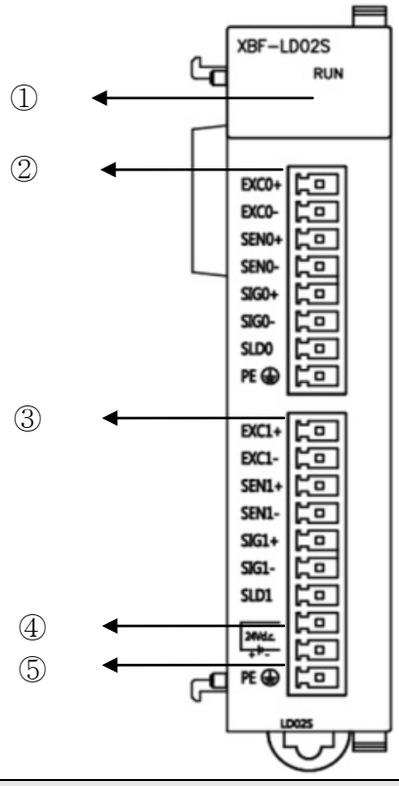
[Table 2.2] Performance Specification (XBF-LD02S)

Remark

Warm-up time: Calibration or measurement must begin 30 minutes after the power supply is applied.

2.3 Part names and Structure

2.3.1 Part names and Structure of XBF-LD02S module



No	Details
①	RUN LED
	▶Displays the H/W operation status of the XBF-LD02S module On: Module H/W normal Off: DC 5V failure or Module H/W failure Blink; Error
②	Input Connector
	▶Input Connector of XBF- LD02S Module (CH0) Load cell input sensor connection
③	Input Connector (CH1)
	▶Input Connector Of XBF- LD02S Module (CH1) Load cell input sensor connection
④	External 24V Connector
	▶External 24V Power Supply Connector of XBF_LD02S Module 24V Power Supply Unit Connection
⑤	PE Connector
	▶PE Connection Connector of XBF- LD02S Module Protective

Remark

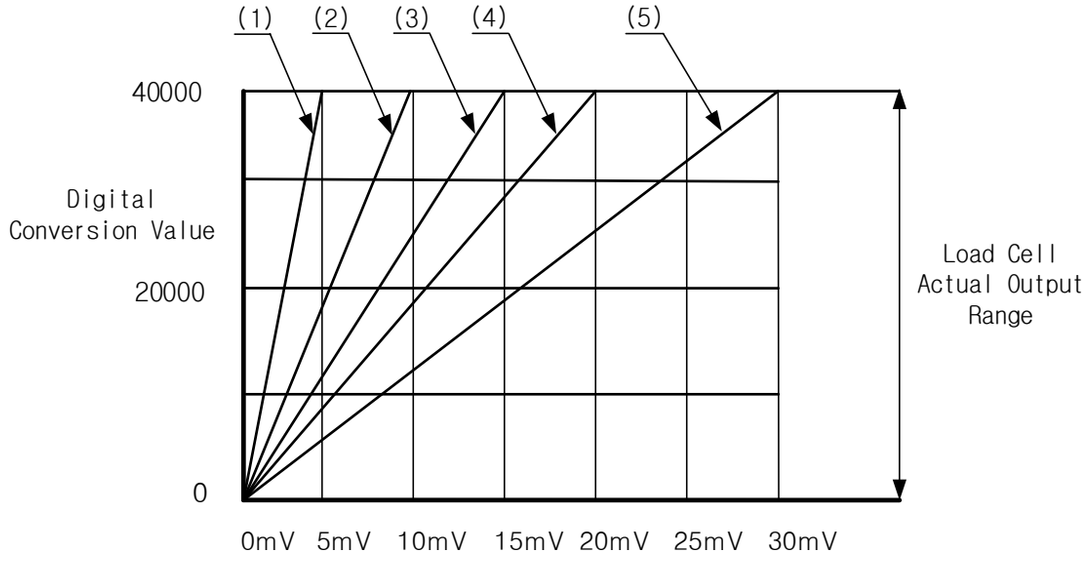
(1) The use of a separate external power source is recommended for DC power 24V, because main units are different output capacity of DC power 24V.

2.4 Input conversion characteristics

2.4.1 Input area conversion characteristics

1) Data Conversion Characteristics

This section explains the characteristics of the conversion of load cell output signals into digital data.



Graph No.	Load Cell Sensitivity	Zero Value	Maximum Weight Value	Digital Output	Maximum Resolution
(1)	1.0V	0㎷	5㎷	0~40000	0.125㎶
(2)	2.0V	0㎷	10㎷		0.25㎶
(3)	3.0V	0㎷	15㎷		0.375㎶
(4)	4.0V	0㎷	20㎷		0.5㎶
(5)	6.0V	0㎷	30㎷		0.75㎶

Zero value is when the digital output value is 0, and the digital output value of the maximum weight is 40,000.
The maximum resolution refers to the sensitivity which can be expressed by a minimum unit scale (single scale) with respect to the maximum weight value.

2) Relationship between Load Cell Output and Input Sensitivity

If the load cell sensitivity is 2.0 ㎷/V, the input sensitivity of the product is 0.25uV/digit or above.
When designing the system, the following formula must be met.
Example) Number of load cells: 4
Rated load cell capacity: 500 kg:
Rated load cell output: 2mV/V
Single scale: 0.10 kg
Power connected to load cell: 5V (= 5,000 mV)
According to the formula, (5000 mV* 2mV * 0.1Kg)/(500Kg * 4) = 0.5≥ 0.25 ㎶
Since the calculated value is larger than 0.25 ㎶, the weight system design is acceptable.

2.4.2 Accuracy

The accuracy of a load cell input module changes depending on the ambient temperature.

2.4.2.1 When the ambient temperature is 55℃

If the load cell output sensitivity is 0.0~ 2.0mV/V, the ambient temperature during calibration is 25℃, and the current ambient temperature is 55℃, accuracy is calculated as follows.
(Δt: current ambient temperature - ambient temperature during calibration)

1) Zero Drift

$$\text{Zero Drift} = \pm 40000 \times \frac{0.25\mu V/℃}{2mV/V \times 5V} \times \Delta t$$

$$\text{Zero Drift} = \pm 40000 \times \frac{0.25\mu V/℃}{2mV/V \times 5V} \times (55℃-25℃)$$

$$\text{Zero Drift} = \pm 30\ (\pm\ 0.075\%)$$

2) Gain Drift

$$\text{Gain Drift} = \pm 40000 \times \frac{15ppm/℃}{1000000} \times \Delta t$$

$$\text{Gain Drift} = \pm 40000 \times \frac{15ppm/℃}{1000000} \times (55℃-25℃)$$

$$\text{Gain Drift} = \pm 18\ (\pm 0.045\%)$$

3) Integrated Accuracy

Integrated Accuracy = Nonlinear Accuracy + Zero Drift + Gain Drift
= ±4(0.01%) ± 30(0.075%) ± 18(0.045%) = ±52(0.13%)

2.4.2.2 When the ambient temperature is 0℃

If the load cell output sensitivity is 0.0~ 2.0mV/V, the ambient temperature during calibration is 25℃, and the current ambient temperature is 0℃, accuracy is calculated as follows.

1) Zero Drift

$$\text{Zero Drift} = \pm 40000 \times \frac{0.25\mu V/℃}{2mV/V \times 5V} \times \Delta t$$

$$\text{Zero Drift} = \pm 40000 \times \frac{0.25\mu V/℃}{2mV/V \times 5V} \times (0℃-25℃)$$

$$\text{Zero Drift} = \pm 25\ (\pm\ 0.0625\%)$$

2) Gain Drift

$$\text{Gain Drift} = \pm 40000 \times \frac{15\text{ppm}/^{\circ}\text{C}}{1000000} \times \Delta t$$

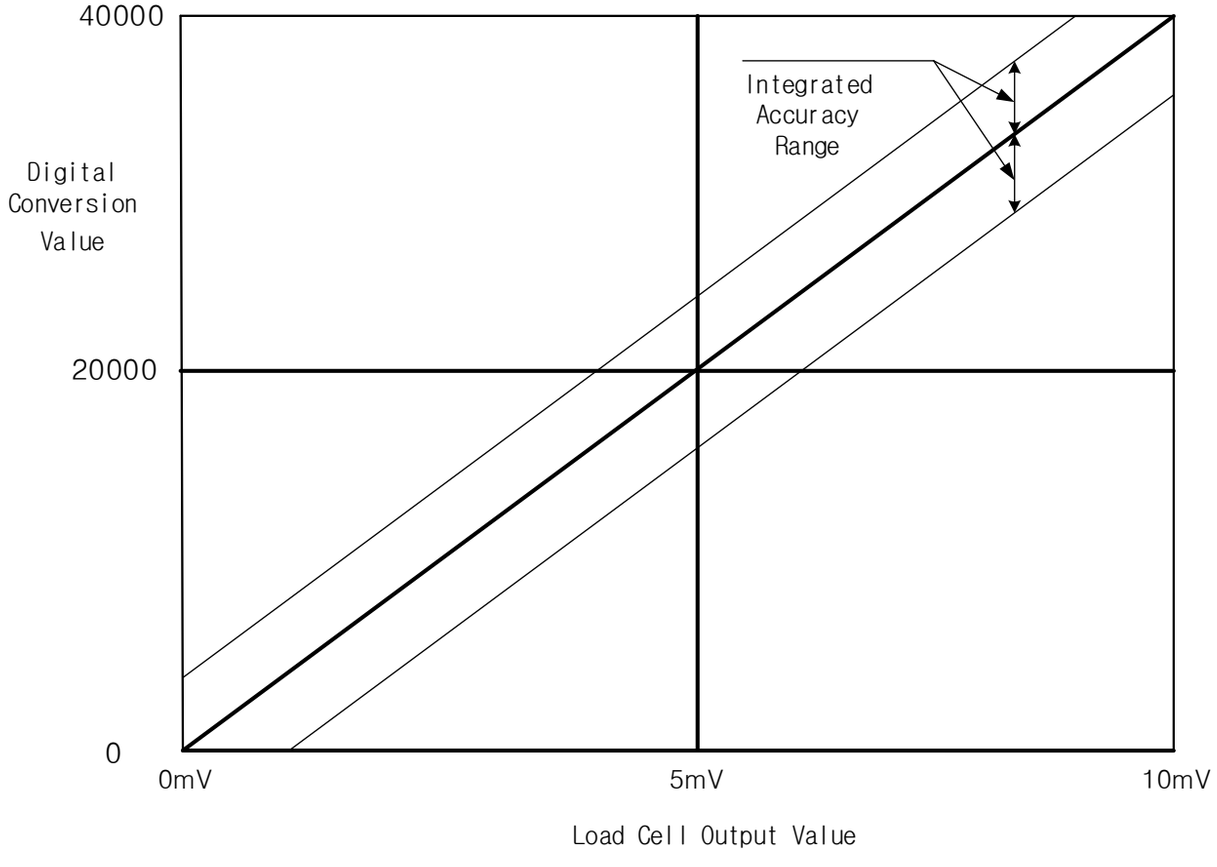
$$\text{Gain Drift} = \pm 40000 \times \frac{15\text{ppm}/^{\circ}\text{C}}{1000000} \quad X\ (0^{\circ}\text{C}\text{-}25^{\circ}\text{C})$$

$$\text{Gain Drift} = \pm 15\ (\pm 0.0375\%)$$

3) Integrated Accuracy

Integrated Accuracy = Nonlinear Accuracy + Zero Drift + Gain Drift

= ±4(0.01%) ± 25(0.0625%) ± 15(0.0375%) = ±44(0.11%)



[Accuracy Diagram]

2.5 Functions

Item	Function		Details
Load Cell Input Function	Calibration Function	2-Point Calibration Function	Before measuring the actual weight, it calibrates the measurement range of the weight system.
		1-Point Calibration Function	2-Point Calibration Function: calibrates only the zero point depending on changes in the surrounding environment such as temperature.
	Input Processing	Moving Average Function	It accumulates the input values of a designated channel in accordance with the set counts, and displays the average value of the sum as digital data.
		Moving/Count Average Function	It accumulates the moving averages of a designated channel in accordance with the set counts, and displays the average value of the sum as digital data.
		Moving/Time Average Function	It accumulates the moving averages of a designated channel for the set amount of time, and displays the average value of the sum as digital data.
		Stable Status Determination Function	It determines whether the status of the total weight value is safe.
	Zero Processing	Zero Tracking Function	It adjusts zero output values in accordance with changes of the surrounding environment, such as temperature change.
		Zero Setting, Reset Function	It temporarily adjusts zero output values when 0 is not output even after 2-point calibration due to changes of the surrounding environment such as gathering of foreign matters around the pallet caused by using the load cell for a long time. When using a container (Tare), you can also use this function to remove the weight of the container.
	Alarm Function	HL Alarm Function	Processes alarm by defining the HH, H, L, LL of inputs.
		Flag Display Function	It displays (L) L Status Flag.
			It displays (H) H Status Flag.
	Output Maintenance Function	Maximum·Minimum Value Maintenance Function	It displays the maximum / minimum values of the total weight measured while running the input channel.
		Output Value Maintenance Function	It temporarily maintains the output value of the total weight. It is executed only when the output status request flag is turned on.
	Auxiliary Functions	Free Fall calibration Function	It automatically calibrates free fall values.

Chapter 3 Installation and Wiring

3.1 Installation

3.1.1 Installation environment and suggestions

Please not the following items to ensure the reliability and stability of the system.

1) Environmental conditions
   (1) Installed on the waterproof and dust resistant control panel.
   (2) Protected from continuous impact (shock) and vibration.
   (3) Not exposed to direct sunlight.
   (4) Where there is no dew condensation caused by rapid changes in temperature.
   (5) Where the temperature is kept at 0 -55℃
2) Installation
   (1) Make sure that wiring waste does not go into the PLC when drilling and wiring operations are conducted.
   (2) Installed in a location that is good for manipulation.
   (3) Not installed in the same panel with high voltage equipment.
   (4) The distance between duct and surrounding modules should be kept at least more than 50 ㎜ away.
   (5) Grounded in a place with favorable ambient noise environment.
   (6) Installed so that wind from a cooling fan will not come in direct contact with the inside of the panel.
3) Handling precautions
   (1) Handling precautions from the opening of the module and its installation are described.
   (2) Do not drop or apply strong impact.
   (3) Do not remove PCB from the case. This may cause a failure.
   (4) Make sure that foreign matters such as wiring waste do not go into the upper part of the module in distributing wires.
   (5) Do not install or remove of the module when the power is turned on.

3.1.2 Wiring

1) Wiring precautions
   (1) Do not leave AC power line close to the external input signal line of the module. It should maintain enough distance to avoid effects from the induction noise or surge occurring from the AC side.
   (2) The wires should be selected in consideration of the ambient temperature and allowable current, and the wire specifications are as follows.

Wire specifications	
Lower	Upper
0.18mm^2 (AWG24)	1.5 mm^2 (AWG16)

   (3) Use a shielded cable to connect the load cell. Disconnect the wire from high-noise voltages or AC power wires using a shielded cable.
   (4) If the wire is too close to hot device or material or comes in direct contact with oil for a long time, it can make a short cut and therefore lead to damage or malfunction.
   (5) Check the polarity when wiring terminal blocks.
   (6) If the wire is distributed along with high voltage line and power line, it causes a induction failure, thereby contributing to malfunction or failure.
   (7) Be sure to use the same power supply as that of XGB basic unit for the external DC24V power wiring. If the external DC24V power of the module is Off/On when the XGB basic unit power is On, it can cause abnormalities in the temperature input value.

3.2 Wiring

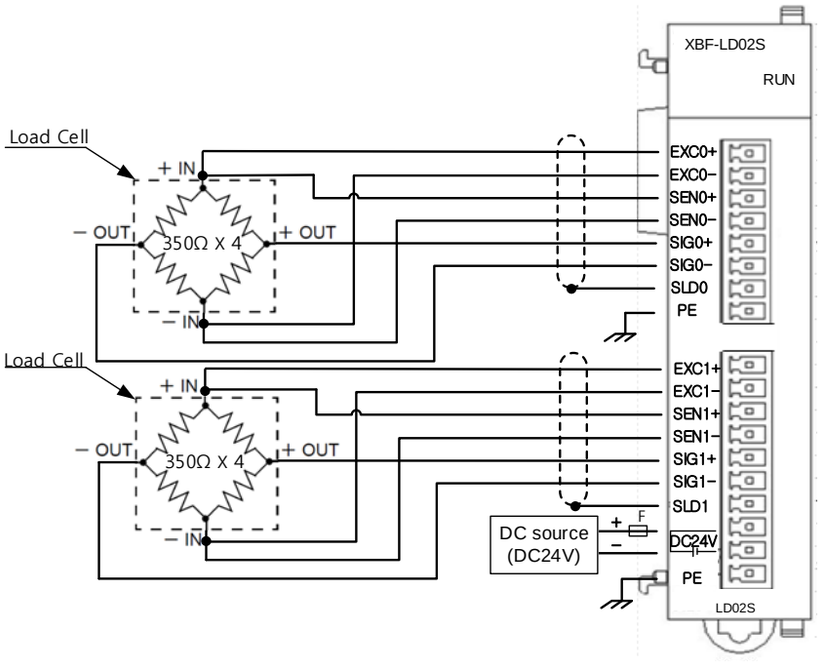
3.2.1 Input area wiring

Load cell input module offers a terminal that can connect analog input signals to a 24V power supply and FG. And it supports 4 lines type and 6 lines type as a load cell wiring method.

Terminal name	Function	Description	Remarks
EXCx+	Load cell applied voltage(+)	Voltage supplied to the load cell in the module(DC5V)	x: Input channel number
EXCx-	Load cell applied voltage(-)		
SENx+	Load cell sensing input(+)	Signal for measuring the voltage drop in EXCx+ side of the load cell cable	
SENx-	Load cell sensing input(-)	Signal for measuring the voltage drop in EXCx- side of the load cell cable	
SIGx+	Load cell signal input(+)	Load cell output voltage	
SIGx-	Load cell signal input(-)		
SLDx	Shield	Connect shield wires of the load cell cable	
DC24V	24VDC power +	External 24V supply power(24V)	
GND	24VDC power GND	External 24V supply power(GND)	
PE	Grounding	External grounding	

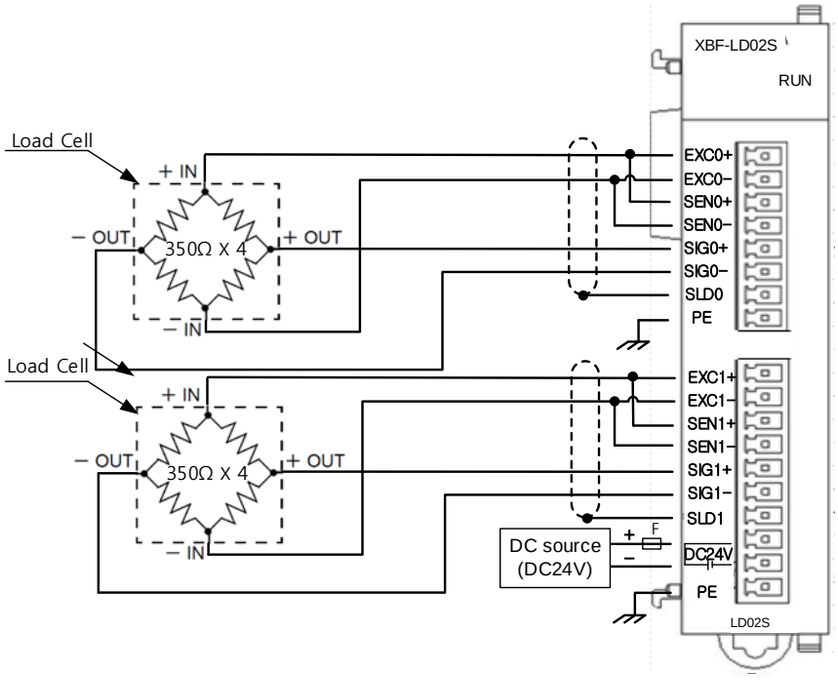
1) 6 lines type load cell

6 lines type connection method is recommended for analog input terminals of the load cell input module. The 6 lines type can compensate for external changes such as changes in line resistance since EXC+/- signal is fed back to SEN+/- signal from the load cell. It can further decrease errors than 4 lines type if a long cable is used. The figure below shows an example of wiring for 6 lines type.

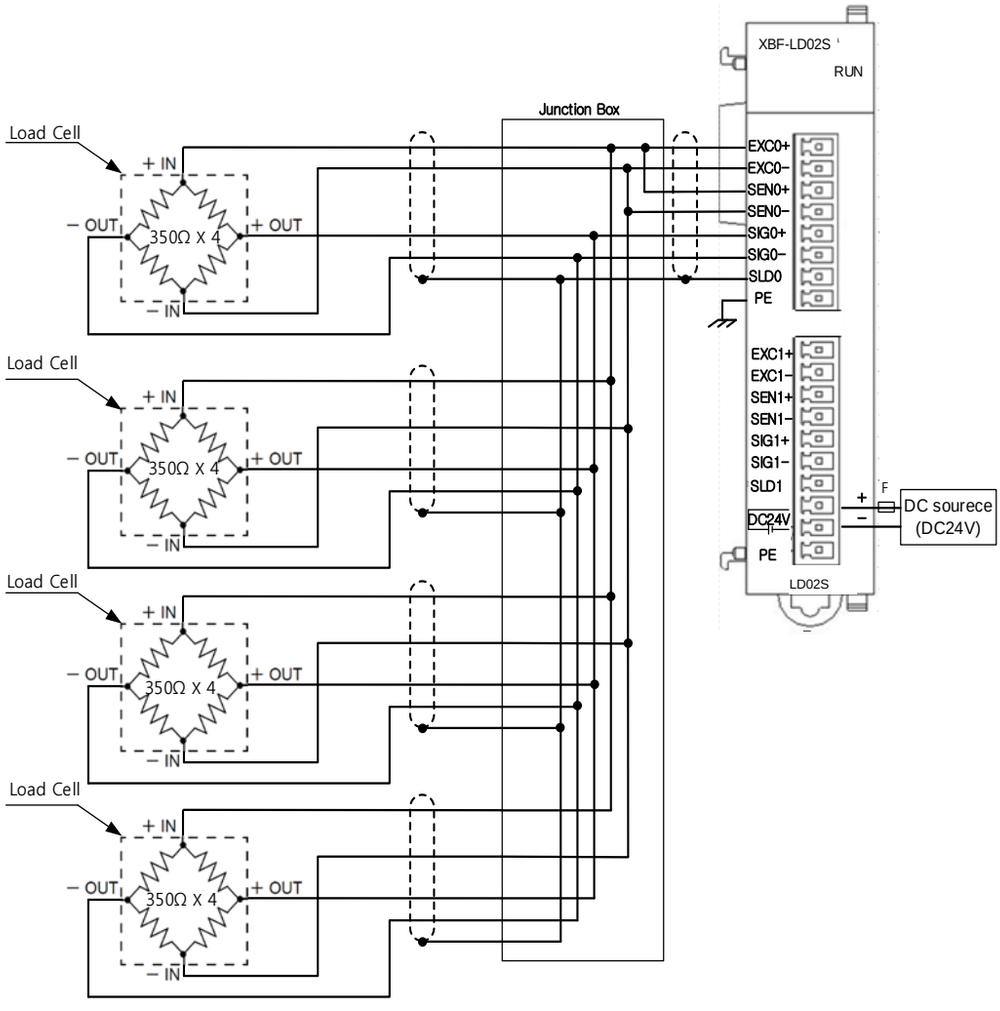


2) 4 lines type load cell

4 lines type has no sense output. In case of using 4 lines type, EXC+/- should be connected to SEN+/-. The figure below shows an example of wiring for 4 lines type system.



3) Load cell parallel connection (4 lines type load cell)
Load cell input module can configure a hopper scale system by supporting the parallel connection of up to 8 load cells. The following figure shows an example of the parallel connection.



Remark

(1) The use of a separate external power source is recommended for DC power 24V, because main units are different output capacity of DC power 24V.

Chapter 4 Memory Structure(for XBC)

4.1 U Device area

U device area of the load cell input module is shown in Table 4.1.

4.1.1 U Device area

Device name		Symbol name	Description
Word	Bit		
U0y.00	U0y.00.0	_0y_ERR	Module error
	U0y.00.F	_0y_RDY	Module Ready
U0y.01	U0y.01.0	_0y_CH0_RUN	Channel 0 running
	U0y.01.1	_0y_CH1_RUN	Channel 1 running
	U0y.01.8	_0y_CH0_CALMOD	Channel 0 calibration model
	U0y.01.9	_0y_CH1_CALMOD	Channel 1 calibration mode
	U0y.01.E	_0y_CH0_ERR	Channel 0 error
	U0y.01.F	_0y_CH1_ERR	Channel 1 error
U0y.02	U0y.02.0	_0y_CH0_STBL	Channel 0 stable status
	U0y.02.1	_0y_CH1_STBL	Channel1 stable status
	U0y.02.2	_0y_CH0_ZERO	Channel 0 ZERO status
	U0y.02.3	_0y_CH1_ZERO	Channel 1 ZERO status
	U0y.02.4	_0y_CH0_COMPLETE	Channel 0 weigh complete status
	U0y.02.5	_0y_CH1_COMPLETE	Channel1 weigh complete status
	U0y.02.6	_0y_CH0_SP1	Channel 0 step 1 status
	U0y.02.7	_0y_CH0_SP2	Channel 0 step 2 status
	U0y.02.8	_0y_CH0_SP3	Channel 0 step 3 status
	U0y.02.9	_0y_CH0_UNDER	Channel 0 lack status
	U0y.02.A	_0y_CH0_OVER	Channel 0 over status
	U0y.02.B	_0y_CH1_SP1	Channel 1 step 1 status
	U0y.02.C	_0y_CH1_SP2	Channel 1 step 2 status
	U0y.02.D	_0y_CH1_SP3	Channel 1 step 3 status
	U0y.02.E	_0y_CH1_UNDER	Channel 1 lack status
	U0y.02.F	_0y_CH1_OVER	Channel 1 over status

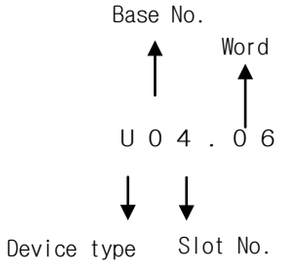
Device name		Symbol name	Description
Word	Bit		
U0y.03	U0y.03.0	_0y_CH0_ZCALEND	Channel 0 zero calibration complete
	U0y.03.1	_0y_CH1_ZCALEND	Channel 1 zero calibration complete
	U0y.03.2	_0y_CH0_SCALEND	Channel 0 span calibration complete
	U0y.03.3	_0y_CH1_SCALEND	Channel 1 span calibration complete
	U0y.03.4	_0y_CH0_CALEND	Channel 0 calibration save complete
	U0y.03.5	_0y_CH1_CALEND	Channel1 calibration save complete
U0y.04	U0y.04.0	_0y_CH0_ZSET	Channel 0 zero setting status
	U0y.04.1	_0y_CH1_ZSET	Channel 1 zero setting status
	U0y.04.2	_0y_CH0_ZRST	Channel 0 zero reset status
	U0y.04.3	_0y_CH1_ZRST	Channel 1 zero reset status
	U0y.04.4	_0y_CH0_TSET	Channel 0 tare setting status
	U0y.04.5	_0y_CH1_TSET	Channel 1 tare setting status
	U0y.04.6	_0y_CH0_WEIGHTHLD	Channel 0 output maintenance status
	U0y.04.7	_0y_CH1_WEIGHTHLD	Channel 1 output maintenance status
	U0y.04.8	_0y_CH0_MINMAXHLD	Channel 0 Minmax Hold Status
	U0y.04.9	_0y_CH1_MINMAXHLD	Channel1 Minmax Hold Status
	U0y.04.A	_0y_CH0_NEARZERO	Channel 0 near zero status
	U0y.04.B	_0y_CH1_NEARZERO	Channel 1 near zero status
	U0y.04.C	_0y_CH0_GRSMINUS	Channel 0 gross weight negative status
	U0y.04.D	_0y_CH1_GRSMINUS	Channel 1 gross weight negative status
	U0y.04.E	_0y_CH0_NETMINUS	Channel 0 net weight negative status
	U0y.04.F	_0y_CH1_ NETMINUS	Channel 1 net weight negative status
U0y.05	U0y.05.0	_0y_CH0_HOOR	Channel 0 upper alarm occurrence
	U0y.05.1	_0y_CH1_HOOR	Channel 1 upper alarm occurrence
	U0y.05.2	_0y_CH0_LOOR	Channel 0 upper alarm occurrence
	U0y.05.3	_0y_CH1_LOOR	Channel 1 lower alarm occurrence
	U0y.05.8	_0y_CH0_HHOORSTAT	Channel 0 high high status
	U0y.05.9	_0y_CH0_HOORSTAT	Channel 0 high status
	U0y.05.A	_0y_CH0_LOORSTAT	Channel 0 low status
	U0y.05.B	_0y_CH0_LLOORSTAT	Channel 0 low low status
	U0y.05.C	_0y_CH1_HHOORSTAT	Channel 1 hgh high status
	U0y.05.D	_0y_CH1_HOORSTAT	Channel 1 high status
	U0y.05.E	_0y_CH1_LOORSTAT	Channel 1 low status
	U0y.05.F	_0y_CH1_LLOORSTAT	Channel 1 low low status
U0y.06		_01_CH0_GWDATA_L	Channel 0 gross weight value (Lower)
U0y.07		_01_CH0_GWDATA_H	Channel 0 gross weight value(Upper)
U0y.08		_01_CH1_GWDATA_L	Channel 1 gross weight value (Lower)
U0y.09		_01_CH1_GWDATA_H	Channel 1 gross weight value (Upper)
U0y.10		_01_CH0_ADDATA_L	Channel 0 tare weight value (Lower)
U0y.11		_01_CH0_ADDATA_H	Channel 0 tare weight value (Upper)
U0y.12		_01_CH1_ADDATA_L	Channel 1 tare weight value(Lower)
U0y.13		_01_CH1_ADDATA_H	Channel 1 tare weight value (Upper)
U0y.14		_01_CH0_NETDATA_L	Channel 0 net weight value (Lower)
U0y.15		_01_CH0_NETDATA_H	Channel 0 net weight value (Upper)
U0y.16		_01_CH1_NETDATA_L	Channel 1 net weight value (Lower)
U0y.17		_01_CH1_NETDATA_H	Channel 1net weight value(Upper)

Device name		Symbol name	Description
Word	Bit		
U0y.18		_01_CH0_GWMAX_L	Channel 0 gross weight maximum value(Lower)
U0y.19		_01_CH0_GWMAX_H	Channel 0 gross weight maximum value (Upper)
U0y.20		_01_CH0_GWMIN_L	Channel 0 gross weight minimum value(Lower)
U0y.21		_01_CH0_GWMIN_H	Channel 0 gross weight minimum value(Upper)
U0y.22		_01_CH1_GWMAX_L	Channel1 gross weight maximum value(Lower)
U0y.23		_01_CH1_GWMAX_H	Chanel 1 gross weight maximum value(Upper)
U0y.24		_01_CH1_GWMIN_L	Channel 1 gross weight minimum value(Lower)
U0y.25		_01_CH1_GWMIN_H	Channel 1 gross weight minimum value(Upper)
U0y.26		_01_CH0_CUR_FFVAL	Channel 0 current free fall value
U0y.27		_01_CH1_CUR_FFVAL	Channel 1 current free fall value
U0y.28		_01_ECODE	Error code
U0y.29	U0y.29.0	_01_CH0_CAL1REQ	Channel 0 1-point calibration mode request
	U0y.29.1	_01_CH1_CAL1REQ	Channel 1 1-point calibration mode request
	U0y.29.2	_01_CH0_CAL2REQ	Channel 0 2-point calibration mode request
	U0y.29.3	_01_CH1_CAL2REQ	Channel 1 2-point calibration mode request
U0y.30	U0y.30.0	_01_CH0_ZCALREQ	Channel 0 zero-point calibration mode request
	U0y.30.1	_01_CH1_ZCALREQ	Channel 1 zero calibration request
	U0y.30.2	_01_CH0_SCALREQ	Channel 0 span calibration request
	U0y.30.3	_01_CH1_SCALREQ	Channel 1 span calibration request
	U0y.30.4	_01_CH0_CALSTORE	Channel 0 calibration value storage request
	U0y.30.5	_01_CH1_CALSTORE	Channel 1 calibration value storage request
U0y.31	U0y.31.0	_01_CH0_ZSETREQ	Channel 0 zero setting request
	U0y.31.1	_01_CH1_ZSETREQ	Channel 1 zero setting request
	U0y.31.2	_01_CH0_ZRSTREQ	Channel 0 zero reset request
	U0y.31.3	_01_CH1_ZRSTREQ	Channel 1 zero reset request
	U0y.31.4	_01_CH0_TAREREQ	Channel 0 tare setting
	U0y.31.5	_01_CH1_TAREREQ	Channel 1 tare setting
	U0y.31.6	_01_CH0_HOLDREQ	Channel 0 output hold request
	U0y.31.7	_01_CH1_HOLDREQ	Channel 1 output hold request
	U0y.31.8	_01_CH0_MAXMINREQ	Channel 0 Minmax Hold Request
	U0y.31.9	_01_CH1_MAXMINREQ	Channel 1 Minmax Hold Request
	U0y.31.A	_01_CH0_SEQREQ	Channel 0 sequential control request
	U0y.31.B	_01_CH1_SEQREQ	Channel 1 sequential control request
	U0y.31.C	_01_CH0_TARERSTREQ	Channel 0 tare released command
	U0y.31.D	_01_CH1_TARERSTREQ	Channel 1 tare released command

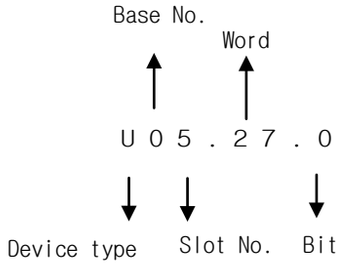
[Table 4. 1] U device area

- Lowercase letter ‘y’ in device name and symbol name represents the number of a slot equipped with a module.

1) Expressed as U04.06 in order to read ‘channel 0 gross weight value (lower) of the load cell mounted on No.0 base, No. 4 slot.



2) Expressed as U05.27.0 in order to allow ‘channel 0 calibration mode request’ of the temperature controller mounted on No. 0 base, No. 5 slot. (Expressed as U0A.27.0 if mounted on No. 10 slot)



Remark

U Device : Data read and written at all times such as conversion data of the Load Cell module, and the memory inside the PLC CPU used when reading or writing specific areas (data to be read periodically, as defined in the module) of special/communication muddles in XGB PLC by can is assigned to this area.
Like other devices it can be directly used in general commands such as MOV, CMP and ADD.
(PUT/GET commands should be used in parameter areas of the module.)

4.2 Parameter setting area(PUT/GET commands used)

- Below are descriptions on how to change parameter values using PUT/GET commands in XG5000 program.

4.2.1 Parameter setting area

No.	Read/ write	Type	Description	Signal direction
0	Read/write	WORD	Operating channel	CPU ↔ LD02S
1	Read/write	WORD	Weighing mode	CPU ↔ LD02S
2	Read/write	WORD	Input channel0 free fall compensation cycle	CPU ↔ LD02S
3	Read/write	WORD	Input channel1 free fall compensation cycle	CPU ↔ LD02S
4	Read/write	WORD	Input channel0 free fall coefficient	CPU ↔ LD02S
5	Read/write	WORD	Input channel1 free fall coefficient	CPU ↔ LD02S
6	Read/write	WORD	Input channel0 average processing method	CPU ↔ LD02S
7	Read/write	WORD	Input channel1 average processing method	CPU ↔ LD02S
8	Read/write	WORD	Input channel0 moving average value	CPU ↔ LD02S
9	Read/write	WORD	Input channel1 moving average value	CPU ↔ LD02S
10	Read/write	WORD	Input channel0 count average value	CPU ↔ LD02S
11	Read/write	WORD	Input channel1 count average value	CPU ↔ LD02S
12	Read/write	WORD	Input channel0 time average value	CPU ↔ LD02S
13	Read/write	WORD	Input channel1 time average value	CPU ↔ LD02S
14	Read/write	WORD	Input channel0 stable determination range	CPU ↔ LD02S
15	Read/write	WORD	Input channel1 stable determination range	CPU ↔ LD02S
16	Read/write	WORD	Input channel0 stable determination time	CPU ↔ LD02S
17	Read/write	WORD	Input channel1 stable determination time	CPU ↔ LD02S
18	Read/write	WORD	Input channel0 zero tracking range	CPU ↔ LD02S
19	Read/write	WORD	Input channel1 zero tracking range	CPU ↔ LD02S
20	Read/write	WORD	Input channel0 zero tracking time	CPU ↔ LD02S
21	Read/write	WORD	Input channel1 zero tracking time	CPU ↔ LD02S
22	Read/write	WORD	Input channel0 near zero range setting	CPU ↔ LD02S
23	Read/write	WORD	Input channel1 near zero range setting	CPU ↔ LD02S
24	Read/write	WORD	Sequence information	CPU ↔ LD02S
25	Read/write	WORD	Near zero input channel0,iInput channel1	CPU ↔ LD02S
26	Read/write	WORD	Input channel0 gross weight HH(Upper)	CPU ↔ LD02S
27	Read/write	WORD	Input channel0 gross weight HH(Upper)	CPU ↔ LD02S
28	Read/write	WORD	Input channel0 gross weight H(Lower)	CPU ↔ LD02S
29	Read/write	WORD	Input channel0 gross weight H(Upper)	CPU ↔ LD02S
30	Read/write	WORD	Input channel0 gross weight L(Lower)	CPU ↔ LD02S
31	Read/write	WORD	Input channel0 gross weight L(Upper)	CPU ↔ LD02S
32	Read/write	WORD	Input channel0 gross weight LL(Lower)	CPU ↔ LD02S
33	Read/write	WORD	Input channel0 gross weight LL(Upper)	CPU ↔ LD02S
34	Read/write	WORD	Input channel1 gross weight HH(Lower)	CPU ↔ LD02S
35	Read/write	WORD	Input channel1 gross weight HH(Upper)	CPU ↔ LD02S
36	Read/write	WORD	Input channel1 gross weight H(Lower)	CPU ↔ LD02S
37	Read/write	WORD	Input channel1 gross weight H(Upper)	CPU ↔ LD02S

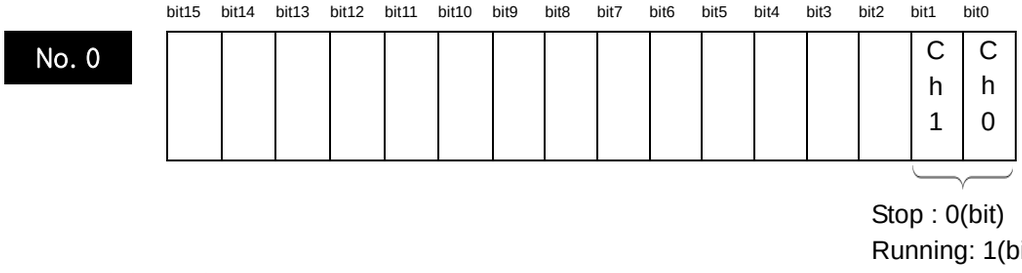
Notice) Read/write division is the representation of the standards for reading or writing a module in PLC.

No.	Read/ write	Type	Description	Signal direction
38	Read/write	WORD	Input channel1 gross weight L (Upper)	CPU ↔ LD02S
39	Read/write	WORD	Input channel1 gross weight L (Upper)	CPU ↔ LD02S
40	Read/write	WORD	Input channel1 gross weight LL(Lower)	CPU ↔ LD02S
41	Read/write	WORD	Input channel1 gross weight LL(Upper)	CPU ↔ LD02S
42	Read/write	WORD	Input channel0 final set gross weight value(Lower)	CPU ↔ LD02S
43	Read/write	WORD	Input channel0 final set gross weight value (Upper)	CPU ↔ LD02S
44	Read/write	WORD	Input channel0 step 1 gross weight(Lower)	CPU ↔ LD02S
45	Read/write	WORD	Input channel0 step 1 gross weight (Upper)	CPU ↔ LD02S
46	Read/write	WORD	Input channel0 step 2 gross weight (Lower)	CPU ↔ LD02S
47	Read/write	WORD	Input channel0 step 2 gross weight (Upper)	CPU ↔ LD02S
48	Read/write	WORD	Input channel0 free fall weight (Lower)	CPU ↔ LD02S
49	Read/write	WORD	Input channel0 free fall weight (Upper)	CPU ↔ LD02S
50	Read/write	WORD	Input channel0 weight lack value	CPU ↔ LD02S
51	Read/write	WORD	Input channel0 weight over value	CPU ↔ LD02S
52	Read/write	WORD	Input channel1 final set gross weight value(Lower)	CPU ↔ LD02S
53	Read/write	WORD	Input channel1 final set gross weight value(Upper)	CPU ↔ LD02S
54	Read/write	WORD	Input channel1 step 1 gross weight (Lower)	CPU ↔ LD02S
55	Read/write	WORD	Input channel1 step 1 gross weight (Upper)	CPU ↔ LD02S
56	Read/write	WORD	Input channel1 step 2 gross weight (Lower)	CPU ↔ LD02S
57	Read/write	WORD	Input channel1 step 2 gross weight (Upper)	CPU ↔ LD02S
58	Read/write	WORD	Input channel1 free fall weight (Lower)	CPU ↔ LD02S
59	Read/write	WORD	Input channel1 free fall weight (Upper)	CPU ↔ LD02S
60	Read/write	WORD	Input channel1 weight lack value	CPU ↔ LD02S
61	Read/write	WORD	Input channel1 weight over value	CPU ↔ LD02S
62	Read/write	WORD	Input channel0 load cell maximum capacity(Lower)	CPU ↔ LD02S
63	Read/write	WORD	Input channel0 load cell maximum capacity(Upper)	CPU ↔ LD02S
64	Read/write	WORD	Input channel0 load cell standard capacity(Lower)	CPU ↔ LD02S
65	Read/write	WORD	Input channel0 load cell standard capacity(Upper)	CPU ↔ LD02S
66	Read/write	WORD	Input channel0 calibration parameter CH0(unit specification)	CPU ↔ LD02S
67	Read/write	WORD	Input channel0 calibration parameter CH0(scale specification)	CPU ↔ LD02S
68	Read/write	WORD	Input channel0 calibration parameter CH0(decimal point)	CPU ↔ LD02S
69	Reserved			
70	Read/write	WORD	Input channel1 load cell maximum capacity(Lower)	CPU ↔ LD02S
71	Read/write	WORD	Input channel1 load cell maximum capacity(Upper)	CPU ↔ LD02S
72	Read/write	WORD	Input channel1 load cell standard capacity(Lower)	CPU ↔ LD02S
73	Read/write	WORD	Input channel1 load cell standard capacity(Upper)	CPU ↔ LD02S
74	Read/write	WORD	Input channel1 calibration parameter CH1(unit specification)	CPU ↔ LD02S
75	Read/write	WORD	Input channel1 calibration parameter CH1(scale specification)	CPU ↔ LD02S
76	Read/write	WORD	Input channel1 calibration parameter CH1(decimal point)	CPU ↔ LD02S
77	Reserved			
78	Read	WORD	Error	CPU ← LD02S

Notice) Read/write division is the representation of the standards for reading or writing a module in PLC.

1) Operating channel

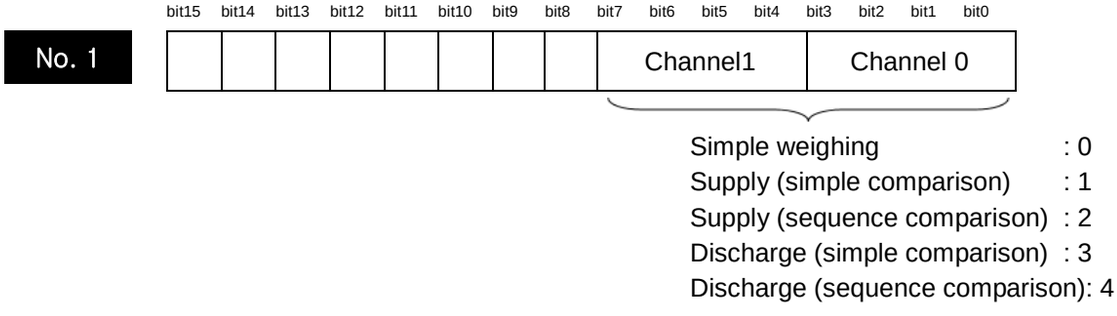
(1) The entire channel is in stop when the operating channel is not set.



2) Weigh mode

(1) Weigh mode is divided into a total of five categories, including simple weighing(0), supply(simple comparison)(1),supply(sequence comparison)(2), discharge(simple comparison)(3), and discharge (sequence comparison)(4).

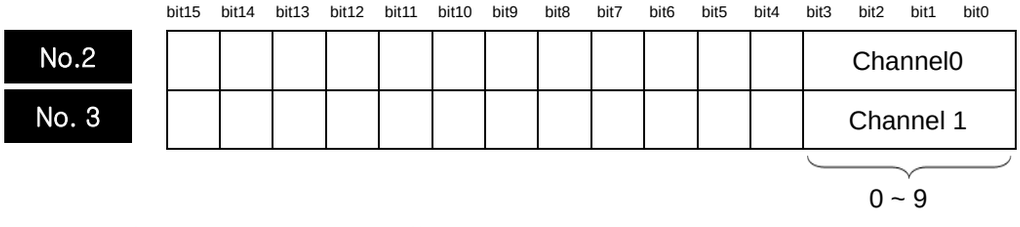
(2) When weigh mode is not set, it is set to simple weighing (0).



3) Free fall compensation cycle

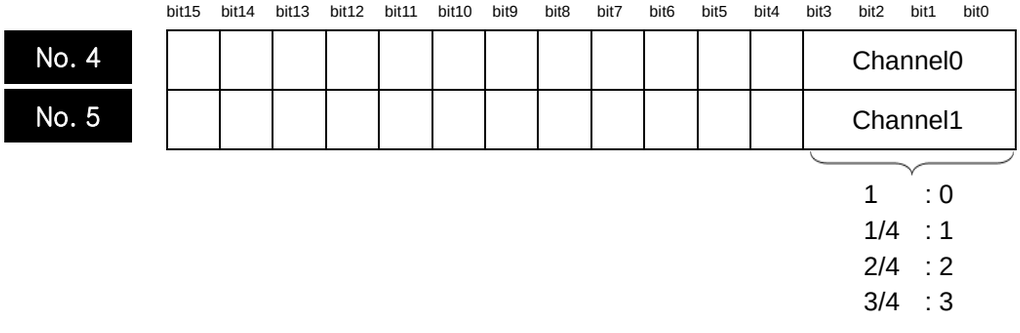
(1) Free fall compensation cycle can be set from 0 to 9, and 0 will not execute the free fall compensation.

(2) When free fall compensation cycle value is not set, it is set to 0.



4) Free fall compensation coefficient

(1) Free fall compensation coefficients can be set to 1(0), 1/4(1), 2/3(2), and 3/4(3).



5) Average processing method

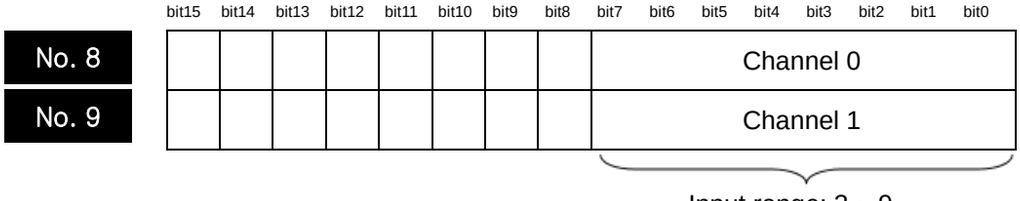
(1) Average processing methods can be set for each channel.

Moving average : 0
Moving/count average : 1
Moving /count average : 2

6) Moving average value

(1) The input range of the moving average value is from 3 to 9, and the actual range is 2^3 to 2^9.

(2) When the moving average value is not set, 5 is set.

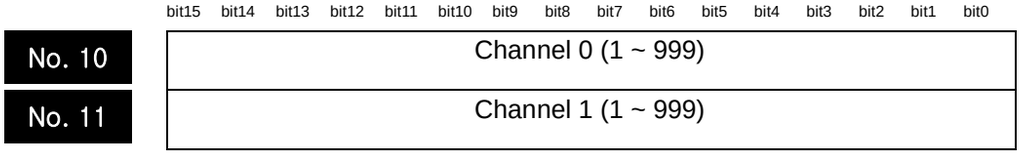


Input range: 3 ~ 9
Actual range: 2^3 ~ 2^9

7) Count average value

(1) The input range of the count average value is from 1 to 999.

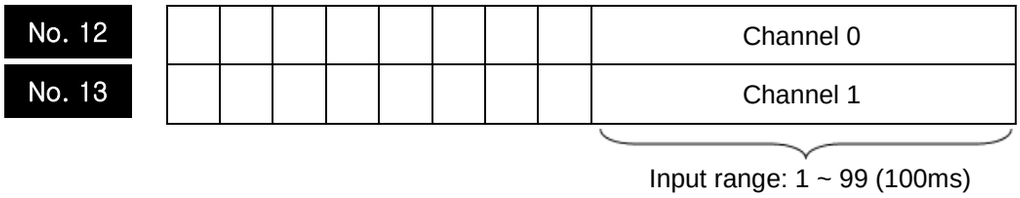
(2) When the count average value is not set, 10 is set.



8) Time average value

(1) The input range of the time average value is from 1 to 99, and setting unit is 100ms.

(2) When the time average value is not set, 1 is set.



Input range: 1 ~ 99 (100ms)

9) Stable determination range

(1) The input range of the stable determination range is from 0 to 999.

(2) When the stable determination range is not set, 5 is set.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 14	Channel 0 (0 ~ 999)															
No. 15	Channel 1 (0 ~ 999)															

10) Stable determination time

(1) The input range of the stable determination time is from 0 to 99, and setting unit is 100ms.

(2) When the stable determination range is not set, 10(1 sec) is set.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 16									Channel 0							
No. 17									Channel 1							

Input range: 0 ~ 99 (100ms)

11) Zero tracking range

(1) Zero tracking range is from 0,1 to 99.

(2) When zero tracking range is not set, it is set to 3.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 18									Channel 0							
No. 19									Channel 1							

Input range: 0, 1 ~ 99

12) Zero tracking time

(1) The input range of the zero tracking time is from 0 to 99, and setting unit is 100ms.

(2) When the zero tracking time is not set, it is set to 30.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No.20									Channel 0							
No. 21									Channel1							

Input range : 0 ~ 99

13) Near zero range settings

(1) The input range of the near zero range settings is from 1 to 99, and setting range is %.

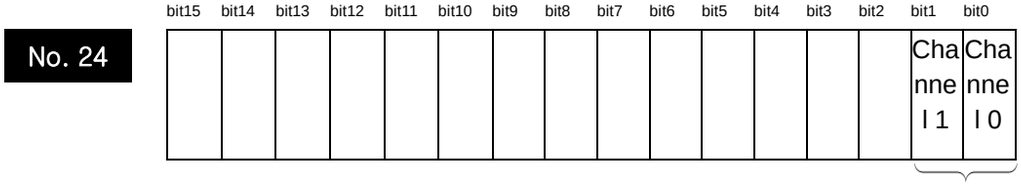
(2) When the near zero settings are not entered, it is set to 20.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 22									Channel 0							
No. 23									Channel1							

Input range: 1 ~ 99

14) Sequence information

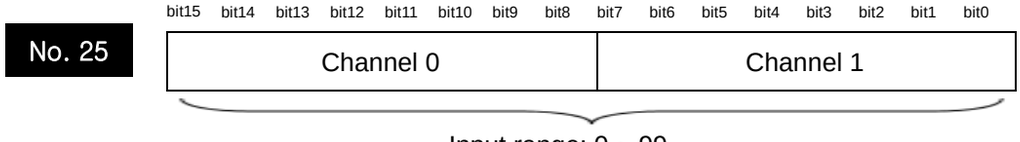
(1) It displays the setting to enable/disable alarm functions.



15) Near zero

(1) The setting range of near zero is from 0 to 99.

(2) When near zero is not set, it is set to 0.

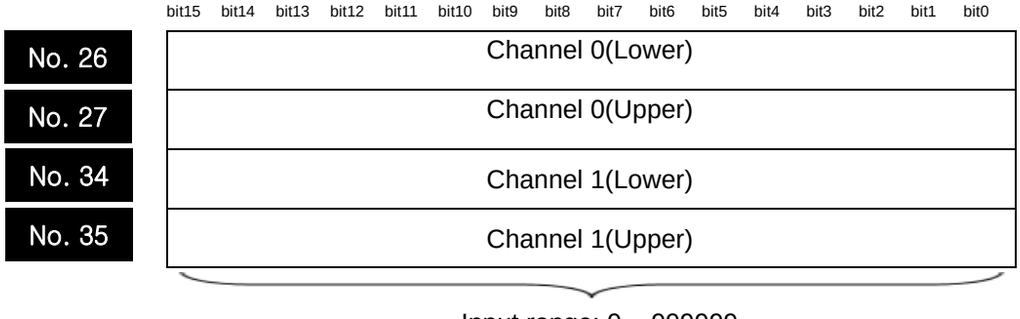


Input range: 0 ~ 99

16) Gross weight LL

(1) The setting range of gross weight LL is from 0 to 999999.

(2) When gross weight LL is not set, it is set to 0.

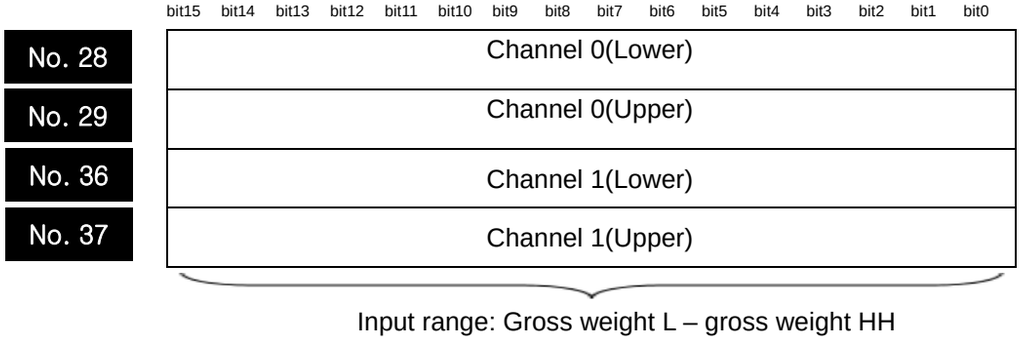


Input range: 0 ~ 999999

17) Gross weight H

(1) The setting range of gross weight H is from gross weight L to gross weight HH.

(2) When gross weight H is not set, it is set to 0.



Input range: Gross weight L – gross weight HH

18) Gross weight L

(1) The setting range of gross weight L is from gross weight LL to gross weight H.

(2)When gross weight Lo is not set, it is set to 0.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 30	Channel 0(Lower)															
No. 31	Channel 0(Upper)															
No. 38	Channel 1(Lower)															
No. 39	Channel 1(Upper)															

Input range: Gross weight L – gross weight H

19) Gross weight LL

(1) The setting range of gross weight LL is from 0 to gross weight L.

(2) When gross weight LL is not set, it is set to 0.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 32	Channel 0(Lower)															
No. 33	Channel 0(Upper)															
No. 40	Channel 1(Lower)															
No. 41	Channel 1(Upper)															

Input range: 0 – gross weight L

20) Final set gross weight

(1) The setting range of final set gross weight is from 0 to 999999.

(2) When final set gross weight is not set, it is set to 0.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 42	Channel 0(Lower)															
No. 43	Channel 0(Upper)															
No. 52	Channel 1(Lower)															
No. 53	Channel 1(Upper)															

Input range : 0 - 999999

21) Step 1 gross weight

(1) The setting range of step 1 gross weight is from 0 to 999999

(2) When step 1 gross weight is not set, it is set to 0.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 44	Channel 0(Lower)															
No. 45	Channel 0 (Upper)															
No. 54	Channel 1(Lower)															
No. 55	Channel 1(Upper)															

Input range: 0 ~ 999999

22) Step 2 gross weight

(1) The setting range of step 2 gross weight is from 0 to 999999.

(2) When step 2 gross weight is not set, it is set to 0.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 46	Channel 0(Lower)															
No. 47	Channel 0(Upper)															
No. 56	Channel 1(Lower)															
No. 57	Channel 1(Upper)															

Input range: 0- 999999

23) Free fall weight

(1) The setting range of free fall gross weight is from 0 to 999999.

(2) When free fall weight is not set, it is set to 0.

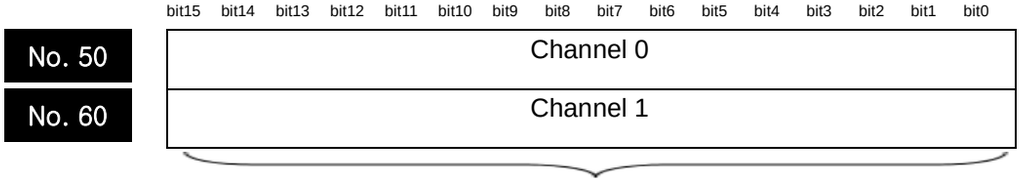
	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 48	Channel 0(Lower)															
No. 49	Channel 0(Upper)															
No. 58	Channel 1(Lower)															
No. 59	Channel 1(Upper)															

Input range: 0 - 999999

24) Weight lack value

(1) The setting range of weight lack value is from 0 to 9999.

(2) When weight lack value is not set, it is set to 0.

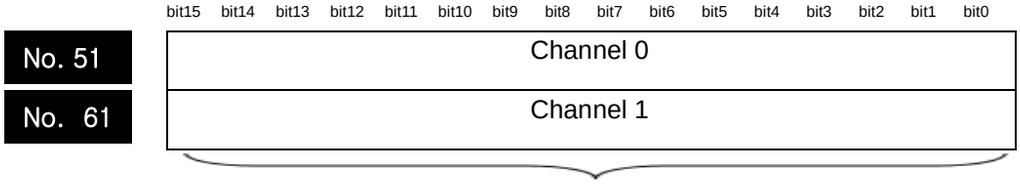


Input range: 0 - 9999

25) Weight over value

(1) The setting range of weight lack value is from 0 to 9999.

(2) When weight lack value is not set, it is set to 0.

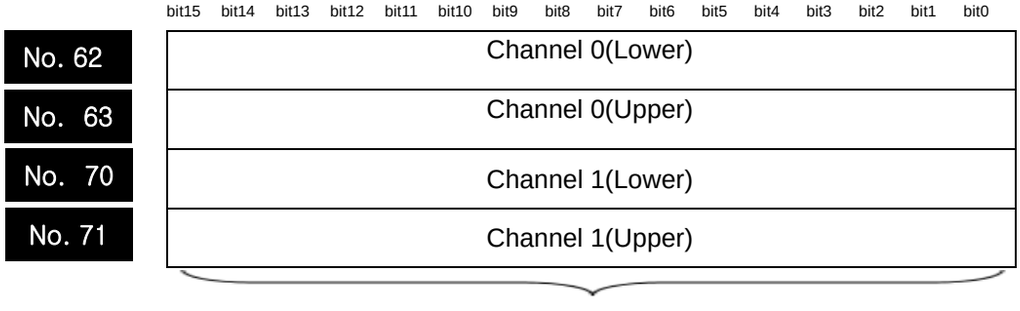


Input value: 0 - 9999

26) Load cell maximum weight

(1) The setting range of load cell maximum weight is from 0 to 999999.

(2) When load cell maximum weight is not set, it is set to 0.

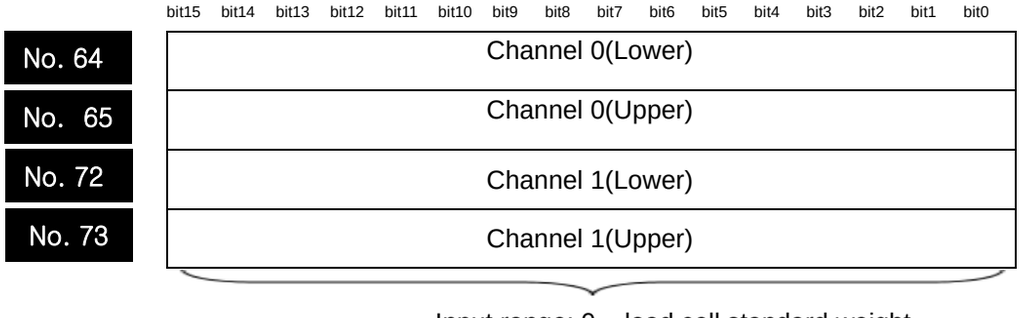


Input range: 0 - 999999

27) Load cell standard weight

(1) The setting range of standard weight is from 0 to load cell standard weight.

(2) When standard weight is not set, it is set to 0.



Input range: 0 – load cell standard weight

28) Calibration parameters

(1) Unit specification

The measuring unit of load cell input module can be divided into t, kg, g.

The measuring unit of load cell input module is set to kg as a default value..

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 66													Channel 0			
No. 74													Channel 1			

kg : 0x6B67
g : 0x0067
t : 0x0074

(2) Scale specification

The scale unit of load cell input module can be set to 1, 2, 5 and 10.

When the scale unit is not specified, it is set to 1.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 67													Channel 0			
No. 75													Channel 1			

1 : 0
2 : 1
5 : 2
10 : 4

(3) Decimal point

The decimal point of load cell input module can be set to 1, 0.1, 0.01, and 0.001.

When the decimal point is not specified, it is set to 1.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 68	Channel 0															
No. 76	Channel 1															

29) Error code

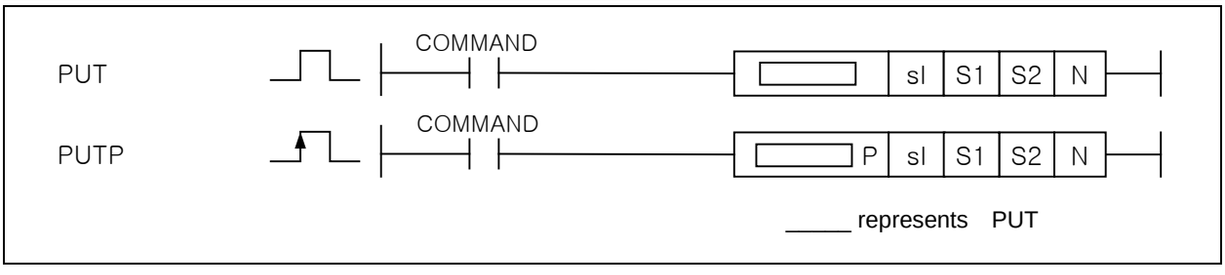
(1) Error information can be confirmed if the module is in error status.

	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
No. 78	Error code(refer to fault diagnosis in Chapter 9)															

4.2.2 Methods on how to use PUT/GET commands

1) PUT command

Command		Available areas													Step	Flag		
		PMK	F	L	T	C	S	Z	D.x	R.x	Constant	U	N	D	R	Error (F110)	Zero (F111)	Carry(F112)
PUT(P)	sl	-	-	-	-	-	-	-	-	-	O	-	-	-	-	4~7	-	-	-
	S1	-	-	-	-	-	-	-	-	-	O	-	-	-	-				
	S2	O	-	O	-	-	-	-	-	-	O	O	O	O	O				
	N	O	-	O	-	-	-	-	-	-	O	-	-	-	-				



[Area setting]

Operand	Description	Data size
sl	The number of a slot equipped with a Load Cell module(set to hexadecimal)	WORD
S1	The address of internal memory of Load Cell	WORD
S2	Start number or constant of the device in which data to be stored in the Load Cell module is stored	WORD
N	The number of data to be stored	WORD

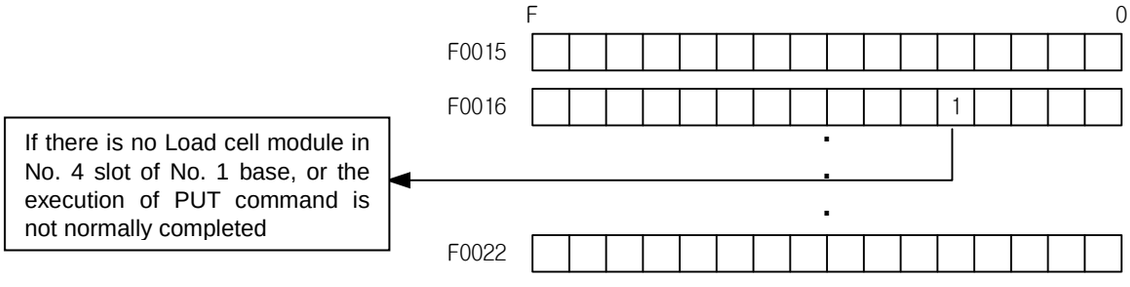
[Flag set]

Flag	Content	Device number
PUT/GET error	- If there is no Load Cell module in the specified slot. - If PUT/GET commands cannot be properly executed.	F0015 ~ F0022

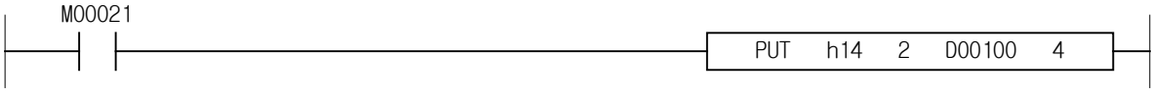
(1) This command is used in case where data is to be written in a Load Cell module that has a memory.

(2) Word data is written as much as N from the device specified as S2 in the special memory (designated as S1) specified as sl(slot number of the Load Cell module).

(3) If there is no Load Cell module in the position specified as sl(slot number of the Load Cell module), or PUT command is not normally executed, the corresponding position bit of F0015~F0022(WORD), which is PUT/GET error Flag, is set.

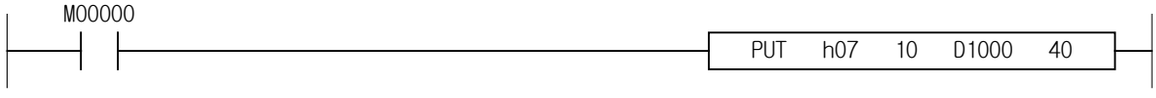


(4) As for the setting method of sl(slot number of the Load Cell module), two-digit hexadecimal number is set. As in the program below, in the case of h14, the first number '1' represents the base number, and the second '4' is the slot number.

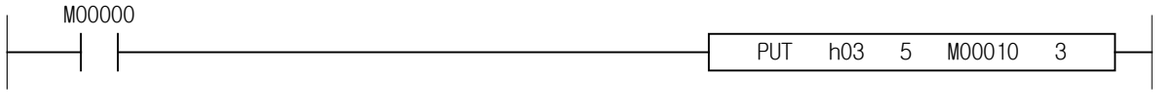


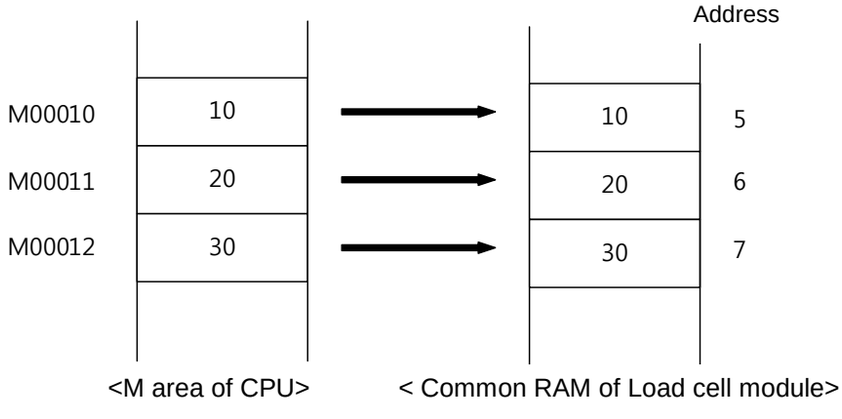
2) Example of using PUT command

(1) If input signal M00000 is On, the program writes the contents of 40 words of D1000-D1039 in the memory No. 10 to No. 49 of the Load Cell module mounted on the slot number 7 of number 0 base



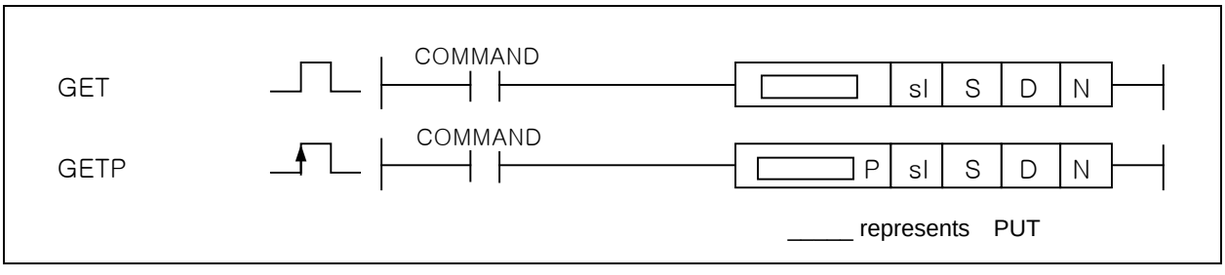
(2) The program that writes the data of 3 words of M00010-M00012 in the memory No. 5 to No. 7 of the Load Cell module mounted on the slot number 3 of number 0 base





3) GET command

Command영		Available areas														Step	Flag		
		PMK	F	L	T	C	S	Z	D.x	R.x	Constant	U	N	D	R		Error (F110)	Zero (F111)	Carry (F112)
GET(P)	sl	-	-	-	-	-	-	-	-	-	O	-	-	-	-	4~7	-	-	-
	S	-	-	-	-	-	-	-	-	-	O	-	-	-	-				
	D	O	-	O	-	-	-	-	-	-	-	O	O	O	O				
	N	O	-	O	-	-	-	-	-	-	O	O	O	O	O				



[Area setting]

Operand	Description	Data size
sl	The number of a slot equipment with a Load Cell module(set to hexadecimal)	WORD
S	Start number of internal memory of Load Cell module	WORD
D	Start number of the device in CPU in which data to be read is to be stored	WORD
N	The number of data to be read	WORD

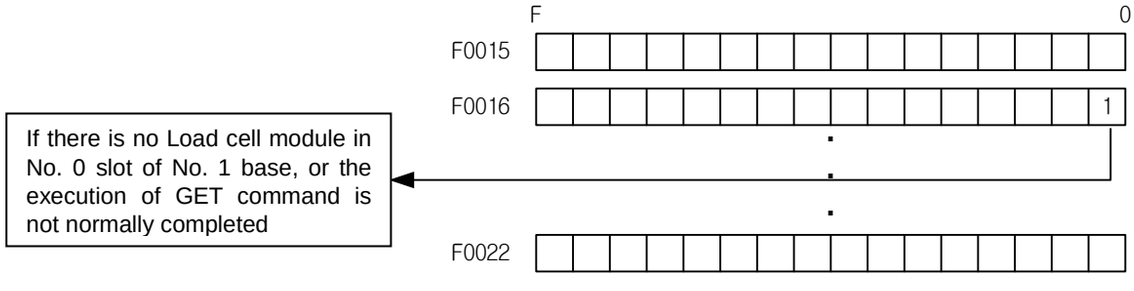
[Flag set)]

Flag	Content	Device number
PUT/GET error	- if there is no Load Cell module in the specified slot. - If PUT/GET commands cannot be properly executed.	F0015 ~ F0022

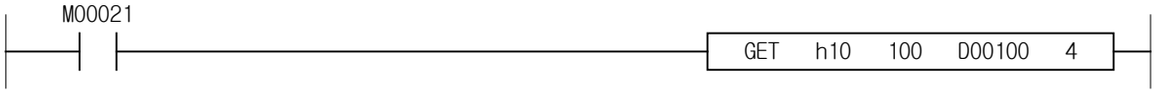
(1) This command is used in case where data of the Load Cell module that has a memory needs to be read.

(2) N word data is stored in the internal device area specified as D from the memory (designated as S: address) of the Load Cell module specified as sl(slot number of the Load Cell module).

(3) If there is no Load Cell module in the position specified as sl(slot number of the Load Cell module), or GET command is not normally executed, the corresponding position bit of F0015~F0022(WORD), which is PUT/GET error Flag, is set.

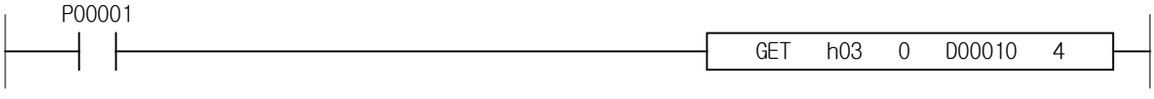


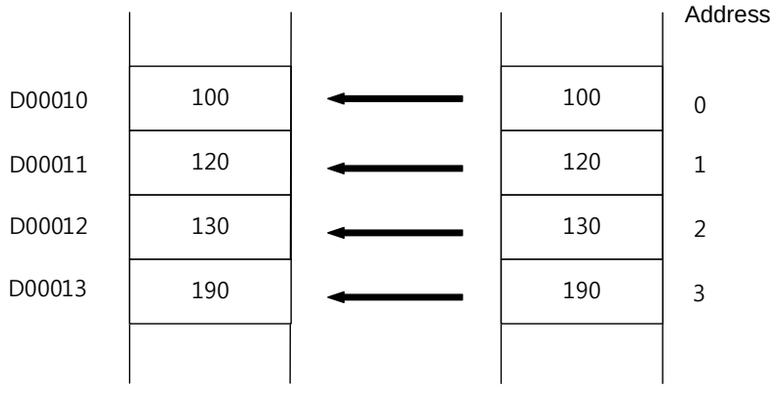
(4) As for the setting method of sl(slot number of the Load Cell module), two-digit hexadecimal number is set. As in the program below, in the case of ‘h10’, the first number ’1’ represents the base number, and the second ‘0’ is the slot number.



4) Example of using GET command

(a) If input signal P00001 is On, the data of 4 words from the internal memory No. 0 of the Load Cell module mounted on the slot number 3 of number 0 base in D00010 to D00013.





<M area of CPU> < Common RAM of Load cell module>

Chapter 5 Memory Structure(for XEC)

5.1 Global variables(Data area)

5.1.1 Global variables(Data area)

U device area of the load cell input module is shown in Table 5.1.

Global variables	Data type	Memory	Description
_01_CH0_GWMIN	DWORD	%UD0.1.10	Load cell input module: channel0 gross weight minimum value
_01_CH1_GWMAX	DWORD	%UD0.1.11	Load cell input module: channel1 gross weight maximum value
_01_CH1_GWMIN	DWORD	%UD0.1.12	Load cell input module: channel1 gross weight minimum value
_01_CH0_GWDATA	DINT	%UD0.1.3	Load cell input module: channel0 gross weight value
_01_CH1_GWDATA	DINT	%UD0.1.4	Load cell input module: channel1 gross weight value
_01_CH0_ADDATA	DWORD	%UD0.1.5	Load cell input module: channel0 tare weight value
_01_CH1_ADDATA	DWORD	%UD0.1.6	Load cell input module: channel1 tare weight value
_01_CH0_NETDATA	DINT	%UD0.1.7	Load cell input module: channel0 net weight value
_01_CH1_NETDATA	DINT	%UD0.1.8	Load cell input module: channel1 net weight value
_01_CH0_GWMAX	DWORD	%UD0.1.9	Load cell input module: channel0 gross weight maximum value
_01_CH0_CUR_FFVAL	WORD	%UW0.1.26	Load cell input module: channel0 current free fall value
_01_CH1_CUR_FFVAL	WORD	%UW0.1.27	Load cell input module: channel1 current free fall value
_01_ECODE	WORD	%UW0.1.28	Load cell input module: error code
_01_ERR	BOOL	%UX0.1.0	Load cell input module: module error
_01_RDY	BOOL	%UX0.1.15	Load cell input module: module Ready
_01_CH0_RUN	BOOL	%UX0.1.16	Load cell input module: channel0 running
_01_CH1_RUN	BOOL	%UX0.1.17	Load cell input module: channel1 running
_01_CH0_CALMOD	BOOL	%UX0.1.24	Load cell input module: channel0 calibration mode
_01_CH1_CALMOD	BOOL	%UX0.1.25	Load cell input module: channel1 calibration mode
_01_CH0_ERR	BOOL	%UX0.1.30	Load cell input module: channel0 error
_01_CH1_ERR	BOOL	%UX0.1.31	Load cell input module: channel1 error
_01_CH0_STBL	BOOL	%UX0.1.32	Load cell input module: channel0 stable status
_01_CH1_STBL	BOOL	%UX0.1.33	Load cell input module: channel1 stable statue
_01_CH0_ZERO	BOOL	%UX0.1.34	Load cell input module: channel0 ZERO status
_01_CH1_ZERO	BOOL	%UX0.1.35	Load cell input module: channel1 ZERO statue
_01_CH0_COMPLETE	BOOL	%UX0.1.36	Load cell input module: channel0 weighing complete status
_01_CH1_COMPLETE	BOOL	%UX0.1.37	Load cell input module: channel1 weighing complete status
_01_CH0_SP1	BOOL	%UX0.1.38	Load cell input module: channel0 step 1 status
_01_CH0_SP2	BOOL	%UX0.1.39	Load cell input module: channel0 step 2 status
_01_CH0_SP3	BOOL	%UX0.1.40	Load cell input module: channel0 step 3 status
_01_CH0_UNDER	BOOL	%UX0.1.41	Load cell input module: channel0 lack status
_01_CH0_OVER	BOOL	%UX0.1.42	Load cell input module: channel0 over status
_01_CH1_SP1	BOOL	%UX0.1.43	Load cell input module: channel1 step 1 status
_01_CH1_SP2	BOOL	%UX0.1.44	Load cell input module: channel1 step 2 status
_01_CH1_SP3	BOOL	%UX0.1.45	Load cell input module: channel1 step 3 status
_01_CH1_UNDER	BOOL	%UX0.1.46	Load cell input module: channel1 lack status
_01_CH0_CAL1REQ	BOOL	%UX0.1.464	Load cell input module: channel0 1-point calibration mode

Global variables	Data type	Memory	Description
_01_CH1_CAL1REQ	BOOL	%UX0.1.465	Load cell input module: channel1 1-point calibration mode
_01_CH0_CAL2REQ	BOOL	%UX0.1.466	Load cell input module: channel0 2-point calibration mode
_01_CH1_CAL2REQ	BOOL	%UX0.1.467	Load cell input module: channel1 2-point calibration mode
_01_CH1_OVER	BOOL	%UX0.1.47	Load cell input module: channel1 over status
_01_CH0_ZCALEND	BOOL	%UX0.1.48	Load cell input module: channel0 zero calibration complete
_01_CH0_ZCALREQ	BOOL	%UX0.1.480	Load cell input module: channel0 zero calibration request
_01_CH1_ZCALREQ	BOOL	%UX0.1.481	Load cell input module: channel1 zero calibration request
_01_CH0_SCALREQ	BOOL	%UX0.1.482	Load cell input module: channel0 span calibration request
_01_CH1_SCALREQ	BOOL	%UX0.1.483	Load cell input module: channel1 span calibration request
_01_CH0_CALSTORE	BOOL	%UX0.1.484	Load cell input module: channel0 calibration value storage
_01_CH1_CALSTORE	BOOL	%UX0.1.485	Load cell input module: channel1 calibration value storage
_01_CH1_ZCALEND	BOOL	%UX0.1.49	Load cell input module: channel1 zero calibration complete
_01_CH0_ZSETREQ	BOOL	%UX0.1.496	Load cell input module: channel0 zero setting request
_01_CH1_ZSETREQ	BOOL	%UX0.1.497	Load cell input module: channel1 zero setting request
_01_CH0_ZRSTREQ	BOOL	%UX0.1.498	Load cell input module: channel0 zero reset request
_01_CH1_ZRSTREQ	BOOL	%UX0.1.499	Load cell input module: channel1 zero reset request
_01_CH0_SCALEND	BOOL	%UX0.1.50	Load cell input module: channel0 span calibration complete
_01_CH0_TAREREQ	BOOL	%UX0.1.500	Load cell input module: channel0 tare setting
_01_CH1_TAREREQ	BOOL	%UX0.1.501	Load cell input module: channel1 tare setting
_01_CH0_HOLDREQ	BOOL	%UX0.1.502	Load cell input module: channel0 output hold request
_01_CH1_HOLDREQ	BOOL	%UX0.1.503	Load cell input module: channel1 output hold request
_01_CH0_MAXMINREQ	BOOL	%UX0.1.504	Load cell input module: channel0 Minmax hold status
_01_CH1_MAXMINREQ	BOOL	%UX0.1.505	Load cell input module: channel1 Minmax hold status
_01_CH0_SEQREQ	BOOL	%UX0.1.506	Load cell input module: channel0 sequential control request
_01_CH1_SEQREQ	BOOL	%UX0.1.507	Load cell input module: channel1 sequential control request
_01_CH0_TARERSTREQ	BOOL	%UX0.1.508	Load cell input module: channel0 tare released command
_01_CH1_TARERSTREQ	BOOL	%UX0.1.509	Load cell input module: channel1 tare released command
_01_CH1_SCALEND	BOOL	%UX0.1.51	Load cell input module: channel1 span calibration complete
_01_CH0_CALEND	BOOL	%UX0.1.52	Load cell input module: channel0 calibration storage complete
_01_CH1_CALEND	BOOL	%UX0.1.53	Load cell input module: channel1 calibration storage complete
_01_CH0_ZSET	BOOL	%UX0.1.64	Load cell input module: channel0 zero setting status
_01_CH1_ZSET	BOOL	%UX0.1.65	Load cell input module: channel1 zero setting status
_01_CH0_ZRST	BOOL	%UX0.1.66	Load cell input module: channel0 zero reset status
_01_CH1_ZRST	BOOL	%UX0.1.67	Load cell input module: channel1 zero reset status
_01_CH0_TSET	BOOL	%UX0.1.68	Load cell input module: channel0 tare setting status
_01_CH1_TSET	BOOL	%UX0.1.69	Load cell input module: channel1 tare setting status
_01_CH0_WEIGHTHLD	BOOL	%UX0.1.70	Load cell input module: channel0 output hold status
_01_CH1_WEIGHTHLD	BOOL	%UX0.1.71	Load cell input module: channel1 output hold status

Global variables	Data type	Memory	Description
_01_CH0_MINMAXHLD	BOOL	%UX0.1.72	Load cell input module: channel0 Minmax hold status
_01_CH1_MINMAXHLD	BOOL	%UX0.1.73	Load cell input module: channel1 Minmax hold status
_01_CH0_NEARZERO	BOOL	%UX0.1.74	Load cell input module: channel0 near zero status
_01_CH1_NEARZERO	BOOL	%UX0.1.75	Load cell input module: channel1 near zero status
_01_CH0_GRSMINUS	BOOL	%UX0.1.76	Load cell input module: channel0 gross weight negative status
_01_CH1_GRSMINUS	BOOL	%UX0.1.77	Load cell input module: channel1 gross weight negative status
_01_CH0_NETMINUS	BOOL	%UX0.1.78	Load cell input module: channel0 net weight negative status
_01_CH1_NETMINUS	BOOL	%UX0.1.79	Load cell input module: channel1 net weight negative status
_01_CH0_HOOR	BOOL	%UX0.1.80	Load cell input module: channel0 high alarm occurrence
_01_CH1_HOOR	BOOL	%UX0.1.81	Load cell input module: channel1 high alarm occurrence
_01_CH0_LOOR	BOOL	%UX0.1.82	Load cell input module: channel0 low alarm occurrence
_01_CH1_LOOR	BOOL	%UX0.1.83	Load cell input module: channel1 low alarm occurrence
_01_CH0_HHOORSTAT	BOOL	%UX0.1.88	Load cell input module: channel0 high high status
_01_CH0_HOORSTAT	BOOL	%UX0.1.89	Load cell input module: channel0 high status
_01_CH0_LOORSTAT	BOOL	%UX0.1.90	Load cell input module: channel0 low status
_01_CH0_LLOORSTAT	BOOL	%UX0.1.91	Load cell input module: channel0 low low status
_01_CH1_HHOORSTAT	BOOL	%UX0.1.92	Load cell input module: channel1 high high status
_01_CH1_HOORSTAT	BOOL	%UX0.1.93	Load cell input module: channel1 high status
_01_CH1_LOORSTAT	BOOL	%UX0.1.94	Load cell input module: channel1 low status
_01_CH1_LLOORSTAT	BOOL	%UX0.1.95	Load cell input module: channel1 low low status

[Table 5. 1] U device area

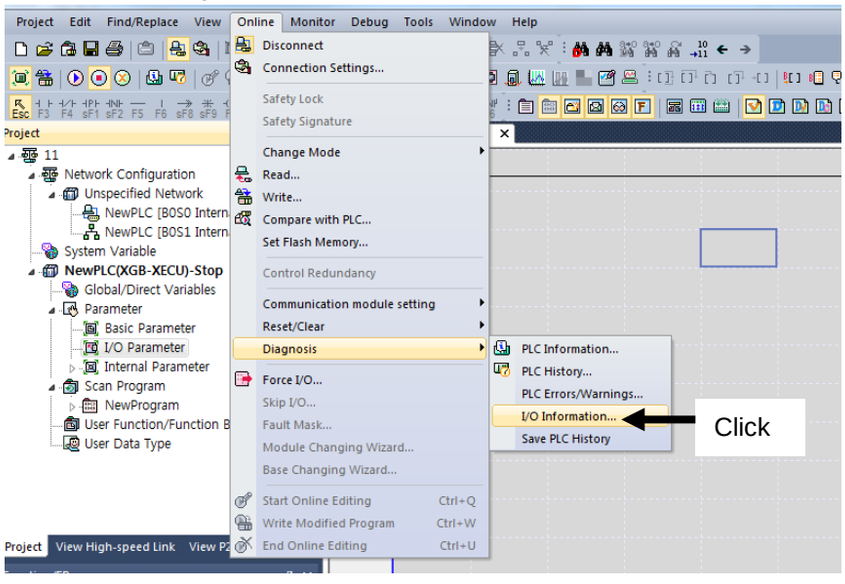
- In device allocation, xx represents the number of a base equipped with a module, and yy is the number of a slot equipped with a module.

5.1.2 Methods on how to use global variables

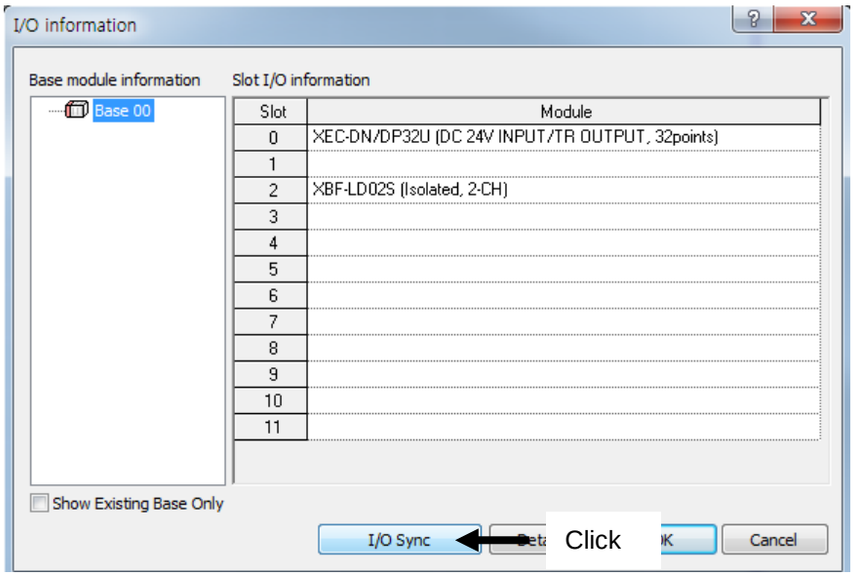
1) I/O synchronization

- Synchronize the I/O module you wish to use with XG5000.

(1) Click 'Online - Diagnosis – I/O information' in the main menu.



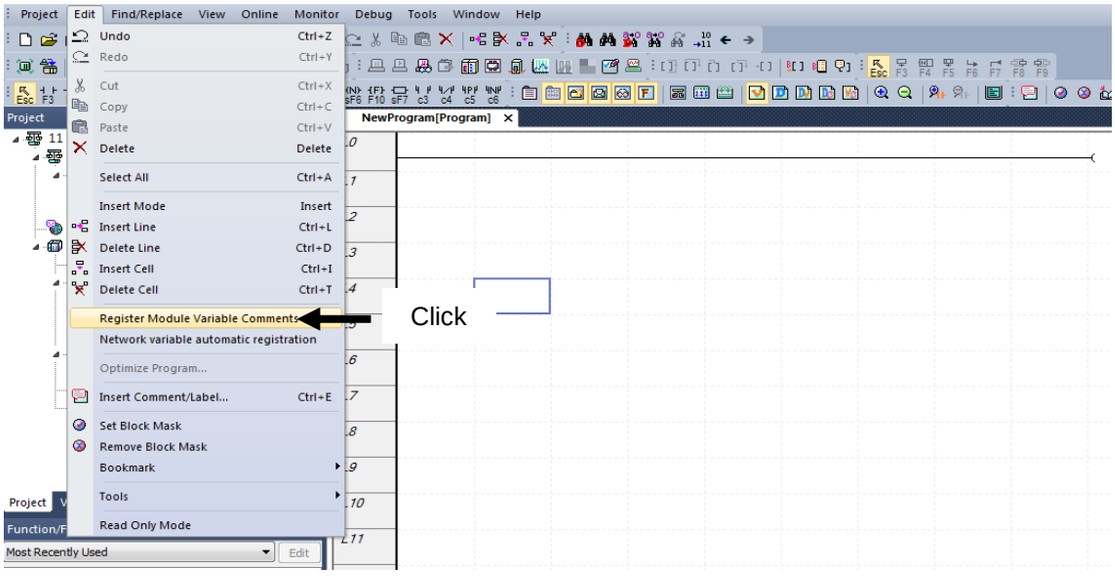
(2) Check the information of the load cell input module mounted in the I/O information window, and click I/O synchronization.



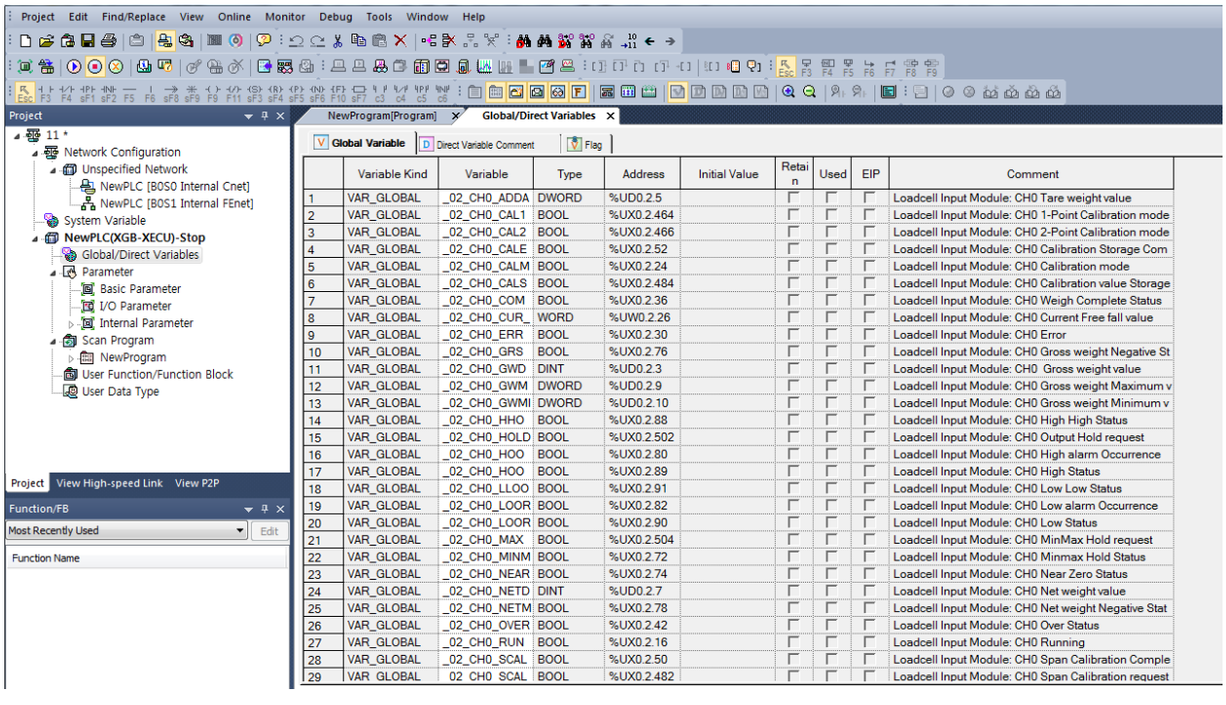
2) Registration of global variables

- Register global variables of the module set in the I/O parameter.

(1) Select [special/communication module variable automatic registration] from the main menu [Edit].



(2) Check the registered variables by double-clicking the global/direct variables of the project window.

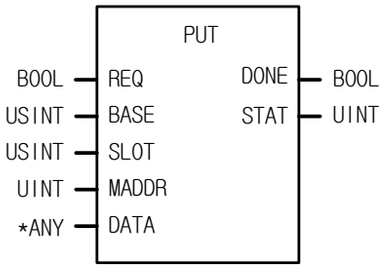


	Variable Kind	Variable	Type	Address	Initial Value	Retai n	Used	EIP	Comment
1	VAR_GLOBAL	_02_CH0_ADDA	DWORD	%UD0.2.5					Loadcell Input Module: CH0 Tare weight value
2	VAR_GLOBAL	_02_CH0_CAL1	BOOL	%UX0.2.464					Loadcell Input Module: CH0 1-Point Calibration mode
3	VAR_GLOBAL	_02_CH0_CAL2	BOOL	%UX0.2.466					Loadcell Input Module: CH0 2-Point Calibration mode
4	VAR_GLOBAL	_02_CH0_CALE	BOOL	%UX0.2.52					Loadcell Input Module: CH0 Calibration Storage Com
5	VAR_GLOBAL	_02_CH0_CALM	BOOL	%UX0.2.24					Loadcell Input Module: CH0 Calibration mode
6	VAR_GLOBAL	_02_CH0_CALS	BOOL	%UX0.2.484					Loadcell Input Module: CH0 Calibration value Storage
7	VAR_GLOBAL	_02_CH0_COM	BOOL	%UX0.2.36					Loadcell Input Module: CH0 Weigh Complete Status
8	VAR_GLOBAL	_02_CH0_CUR_	WORD	%UW0.2.26					Loadcell Input Module: CH0 Current Free fall value
9	VAR_GLOBAL	_02_CH0_ERR	BOOL	%UX0.2.30					Loadcell Input Module: CH0 Error
10	VAR_GLOBAL	_02_CH0_GRS	BOOL	%UX0.2.76					Loadcell Input Module: CH0 Gross weight Negative St
11	VAR_GLOBAL	_02_CH0_GWD	DINT	%UD0.2.3					Loadcell Input Module: CH0 Gross weight value
12	VAR_GLOBAL	_02_CH0_GWM	DWORD	%UD0.2.9					Loadcell Input Module: CH0 Gross weight Maximum v
13	VAR_GLOBAL	_02_CH0_GWMI	DWORD	%UD0.2.10					Loadcell Input Module: CH0 Gross weight Minimum v
14	VAR_GLOBAL	_02_CH0_HHO	BOOL	%UX0.2.88					Loadcell Input Module: CH0 High High Status
15	VAR_GLOBAL	_02_CH0_HOLD	BOOL	%UX0.2.502					Loadcell Input Module: CH0 Output Hold request
16	VAR_GLOBAL	_02_CH0_HOO	BOOL	%UX0.2.80					Loadcell Input Module: CH0 High alarm Occurrence
17	VAR_GLOBAL	_02_CH0_HOO	BOOL	%UX0.2.89					Loadcell Input Module: CH0 High Status
18	VAR_GLOBAL	_02_CH0_LLOO	BOOL	%UX0.2.91					Loadcell Input Module: CH0 Low Low Status
19	VAR_GLOBAL	_02_CH0_LOOR	BOOL	%UX0.2.82					Loadcell Input Module: CH0 Low alarm Occurrence
20	VAR_GLOBAL	_02_CH0_LOOR	BOOL	%UX0.2.90					Loadcell Input Module: CH0 Low Status
21	VAR_GLOBAL	_02_CH0_MAX	BOOL	%UX0.2.504					Loadcell Input Module: CH0 MinMax Hold request
22	VAR_GLOBAL	_02_CH0_MINM	BOOL	%UX0.2.72					Loadcell Input Module: CH0 Minmax Hold Status
23	VAR_GLOBAL	_02_CH0_NEAR	BOOL	%UX0.2.74					Loadcell Input Module: CH0 Near Zero Status
24	VAR_GLOBAL	_02_CH0_NETD	DINT	%UD0.2.7					Loadcell Input Module: CH0 Net weight value
25	VAR_GLOBAL	_02_CH0_NETM	BOOL	%UX0.2.78					Loadcell Input Module: CH0 Net weight Negative Stat
26	VAR_GLOBAL	_02_CH0_OVER	BOOL	%UX0.2.42					Loadcell Input Module: CH0 Over Status
27	VAR_GLOBAL	_02_CH0_RUN	BOOL	%UX0.2.16					Loadcell Input Module: CH0 Running
28	VAR_GLOBAL	_02_CH0_SCAL	BOOL	%UX0.2.50					Loadcell Input Module: CH0 Span Calibration Comple
29	VAR_GLOBAL	02_CH0_SCAL	BOOL	%UX0.2.482					Loadcell Input Module: CH0 Span Calibration request

5.1.3 PUT/GET function blocks

1) PUT function block

PUT
Write data in Load Cell module

Function block	Description
	**Input** REQ : Executes function in the case of 1 BASE : Fix the XGB '0' SLOT : Specified slot position MADDR : Module address DATA : Data to be stored in the module **Output** DONE : 1 output when executed normally STAT : Error information

* ANY: Among ANY types, WORD, DWORD, INT, USINT, DINT, and UDINT types are available

■ **Functions**

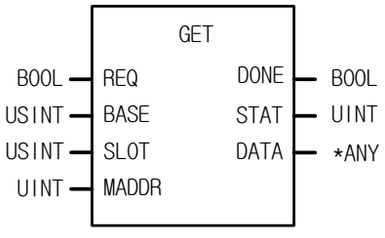
Read data from the specified Load Cell module.

Function block	Input(ANY) type	Description
PUT_WORD	WORD	Store WORD data in the specified module address(MADDR)
PUT_DWORD	DWORD	Store DWORD data in the specified module address(MADDR)
PUT_INT	INT	Store INT data in the specified module address(MADDR)
PUT_UINT	UINT	Store UNT data in the specified module address(MADDR)
PUT_DINT	DINT	Store DINT data in the specified module address(MADDR)
PUT_UDINT	UDINT	Store UDINT data in the specified module address(MADDR)

2) GET function block

GET

Read data from Load Cell module

Function block	Description
	**Input** REQ : Executes function in the case of 1 BASE : Fix the XGB '0' SLOT : Specifies slot position MADDR : module address 512(0x200) ~ 1023(0x3FF) **Output** DONE : 1 output when executed normally STAT : Error information DATA : Data read from the module

*ANY: Among ANY types, WORD, DWORD, INT, UINT, DINT, and UDINT types are available

■ **Functions**

Read data from the specified Load Cell module..

Function block	Output(ANY)type	Description
GET_WORD	WORD	Read data as much as WORD from the specified module address(MADDR)
GET_DWORD	DWORD	Read data as much as DWORD from the specified module address
GET_INT	INT	Read data as much as INT from the specified module address(MADDR)
GET_UINT	UINT	Read data as much as UINT from the specified module address(MADDR)
GET_DINT	DINT	Read data as much as DINT from the specified module address
GET_UDINT	UDINT	Read data as much as UDINT from the specified module address

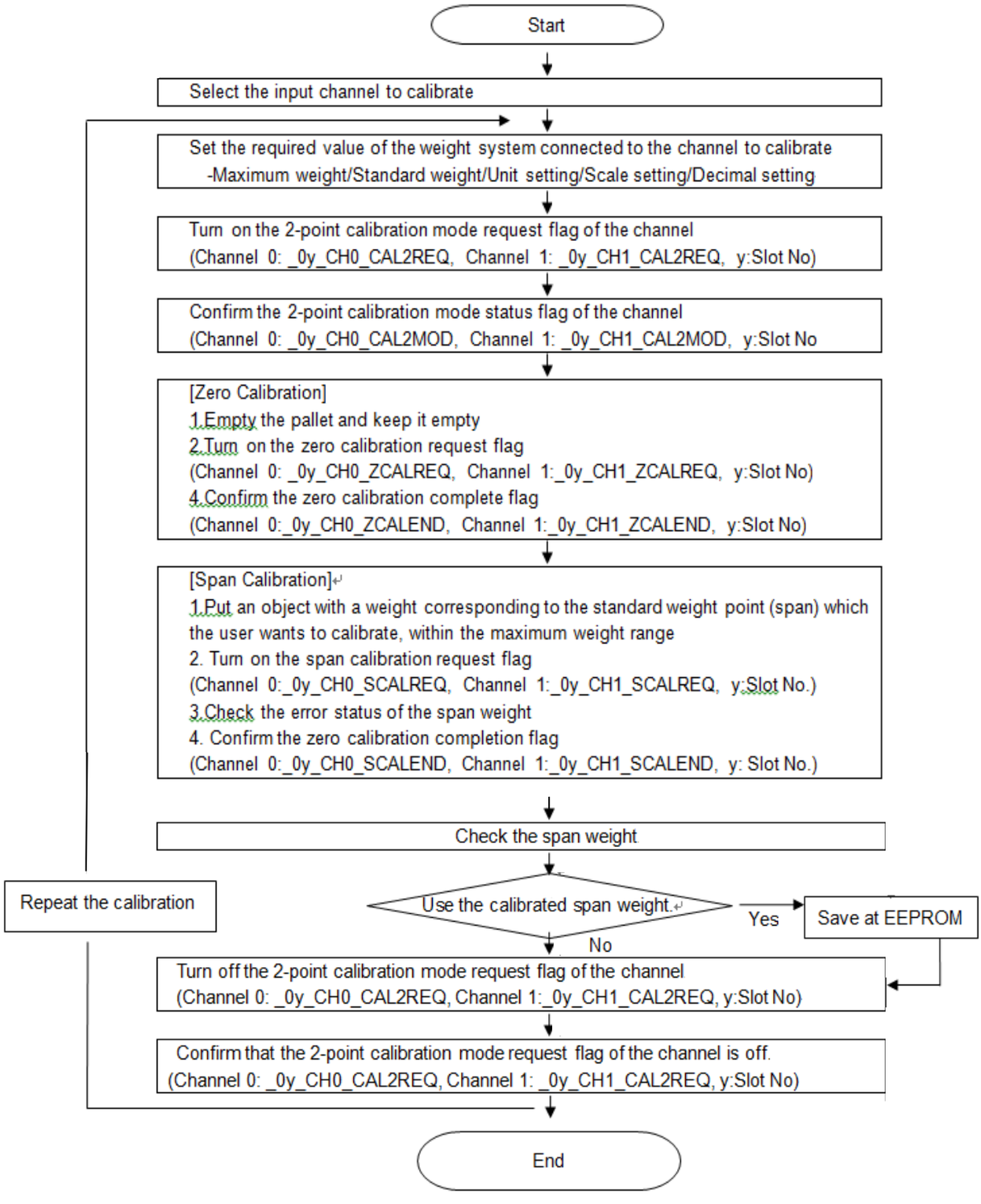
Chapter 6 Functions

6.1 Functions

6.1.1 Calibration Function

It performs calibration on the weight measurement range prior to measuring the actual gross weight.

1) 2-Point Calibration Algorithm



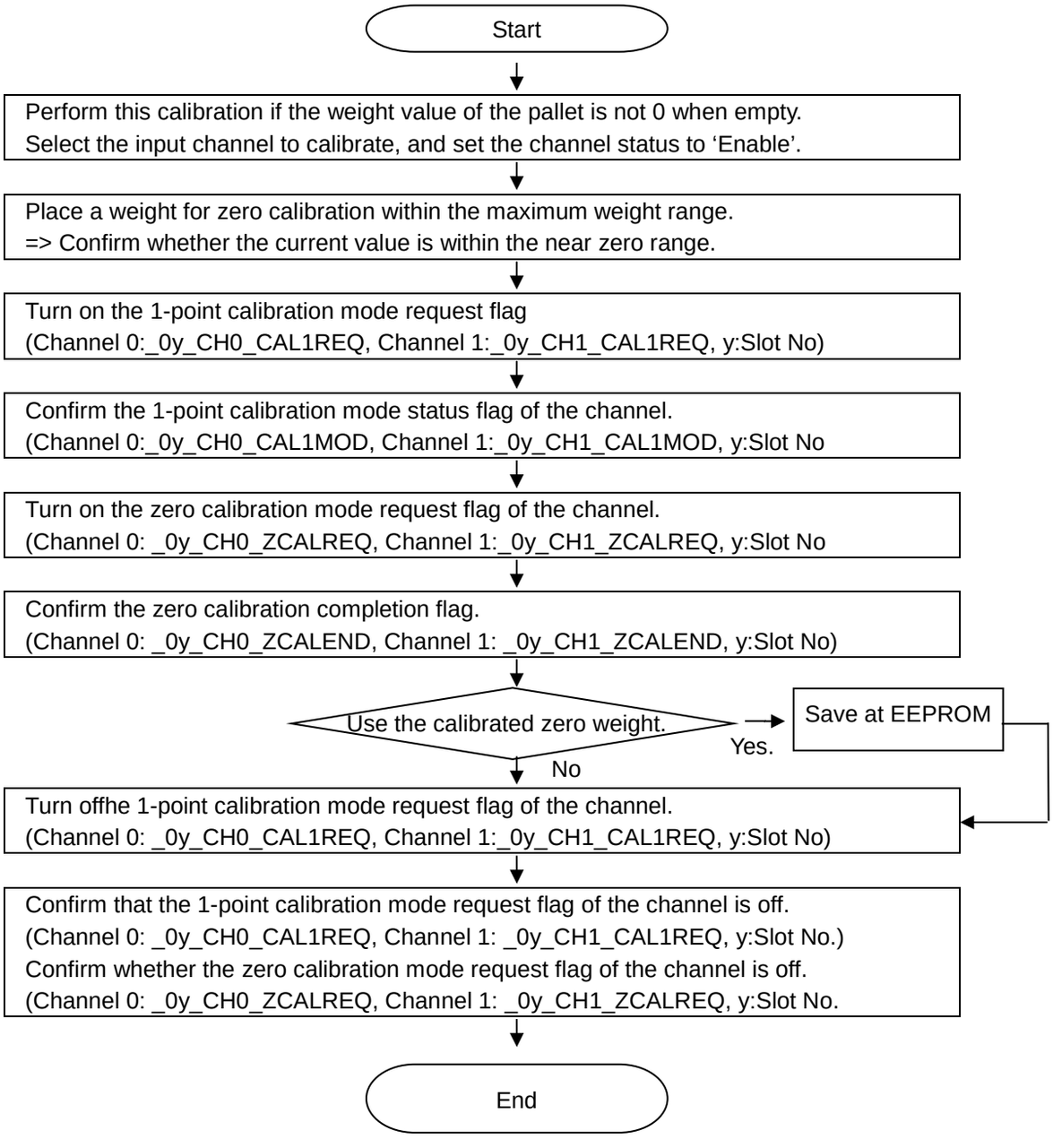
[2-Point Calibration Algorithm]

Remark

(1) In case of measuring weight after calibration, start the measurement with the pallet empty (zero point).
(2) For accurate measurement, the span weight needs to be no less than 10% of the maximum weight if the resolution is less than 1/10000, or no less than 20% of the maximum weight if the resolution is 1/10000 or higher.When the span weight is less than 10% of the maximum weight, a span calibration setting error occurs (error code 21#, where # is the channel number).
(3) The maximum resolution of XGB Load Cell input module is 40000.
If Maximum Weight / (decimal*scale) > 40000, a resolution over error occurs (error code 22#, where # is the channel number).
(4) The XGB Load Cell input module supports 1㎷/V ~ 6㎷/V sensitivity. Using a load cell with sensitivity exceeding the said range will cause an internal resolution error (error code 23#, where # is the channel number) or a zero point setting error (error code 20#, where # is the channel number).

2) 1-Point Calibration Algorithm

It only calibrates the zero point. It must be performed only after completing 2-point calibration.



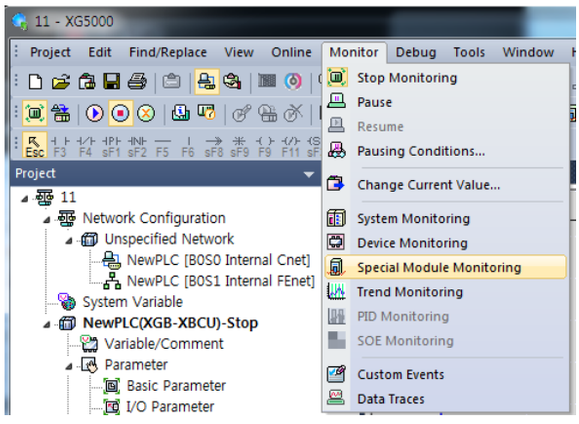
[1-Point Calibration Algorithm]

Remark

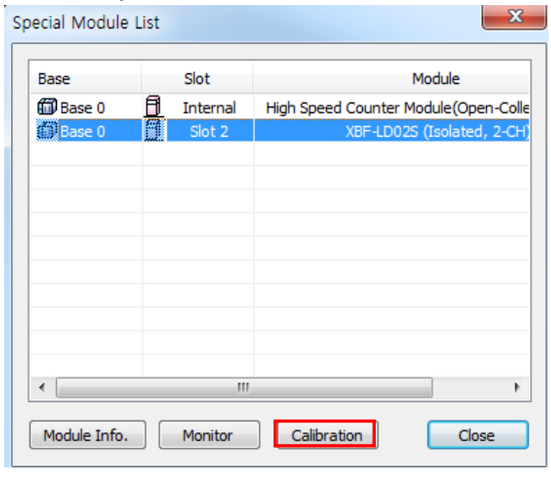
(1) The 1-point calibration setting range is the near zero range.
(2) Near zero range is represented as % of the maximum weight.
(3) If a wiring status error occurs(error code 12#, where # is the channel number), 1-point calibration will not continue. In such case, perform 2-point calibration.

3) Calibration on XG5000 Special Module Monitor Window (2-point calibration)

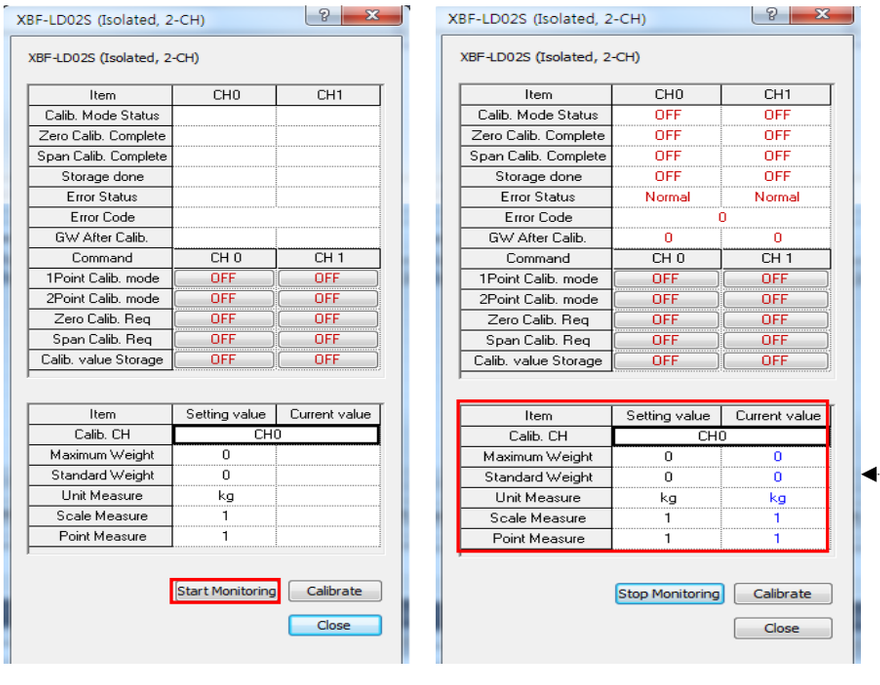
2-point calibration can be performed on the calibration window of the special module monitor.



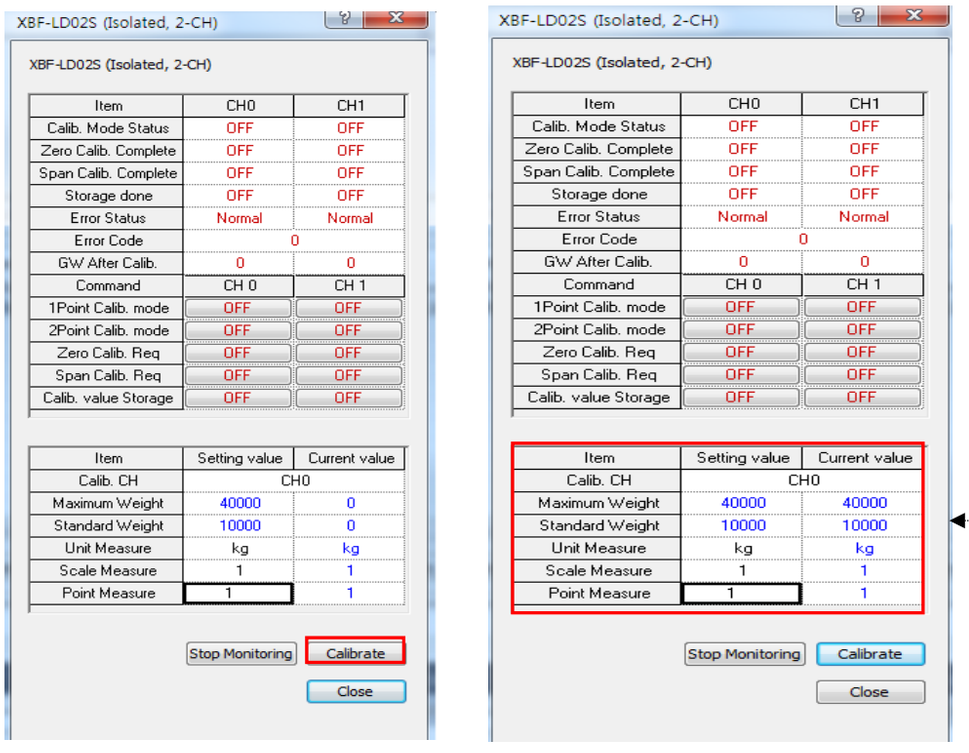
Select the load cell input module from the special module list, then click 'Calibration.'



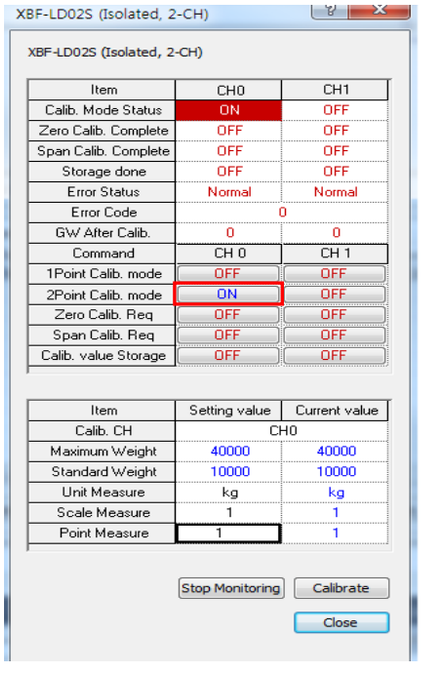
Click 'Start Monitoring' to Run calibration, then enter the calibration parts.



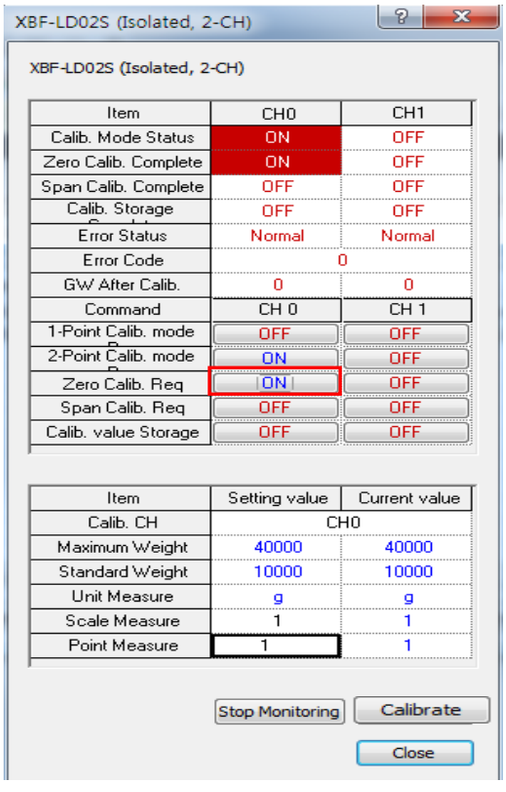
After entering the calibration parts, click 'Calibrate' to display the entered values.



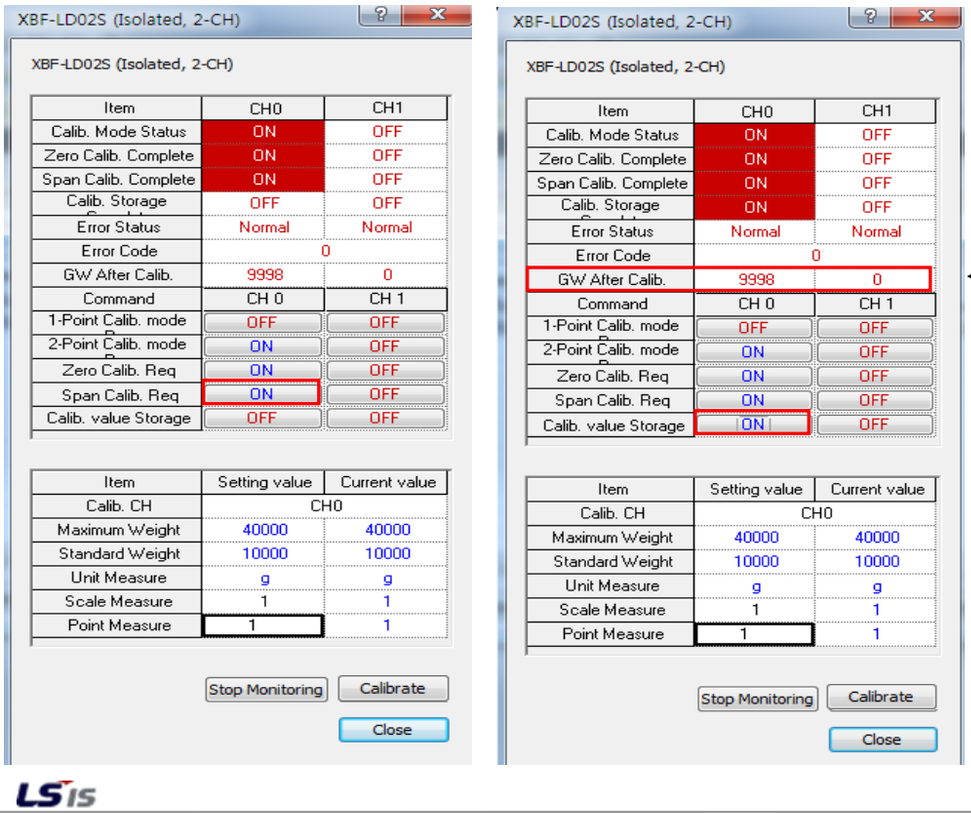
After entering the calibration item, click 'Request 2-point Calibration Mode' to turn it on. 'Calibration Mode Status' is turned on.



Click 'Request Zero Calibration' with the pallet empty to turn it on. 'Zero Calibration Complete' is turned on once the calibration is complete.



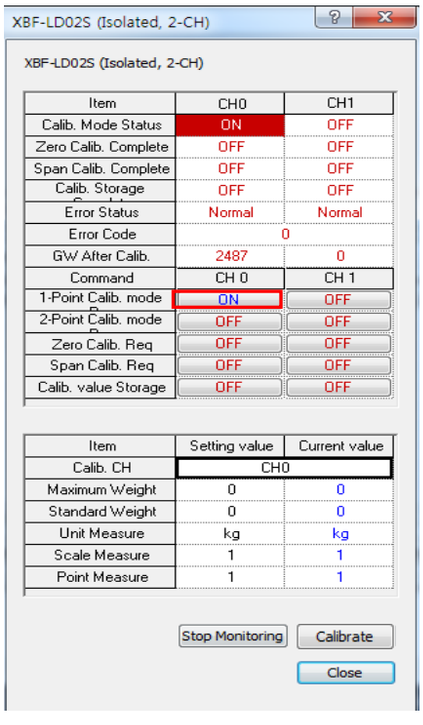
Place a weight corresponding to the standard weight, then click 'Request Span Calibration' to turn it on. 'Span Calibration Complete' is turned on once the calibration is complete. Confirm the gross weight value after calibration, then click 'Calb. Value Storage.'

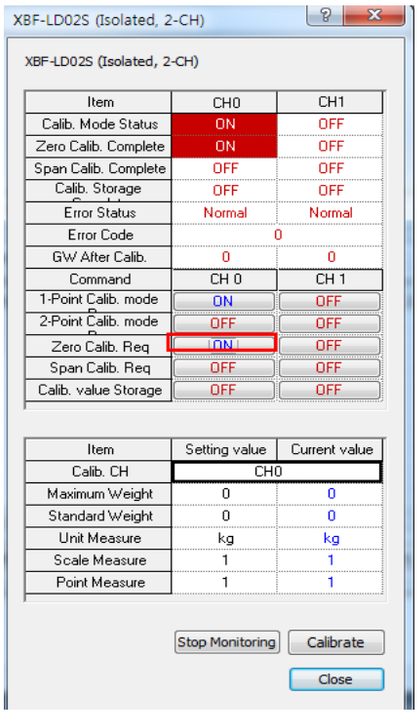


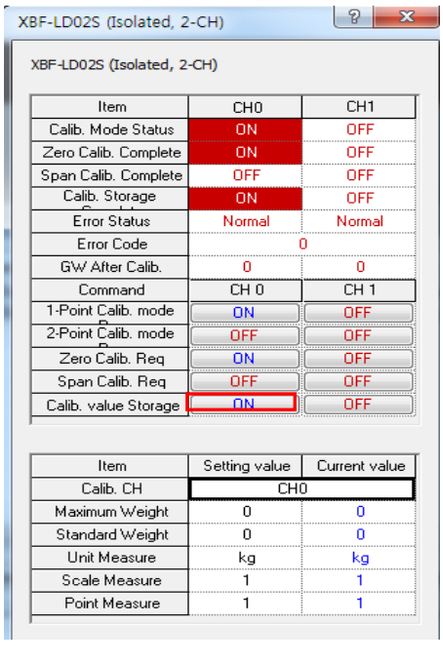
To repeat calibration, repeat the calibration after turning off 'Request 2-point Calibration Mode.'
Save and close the calibration window to apply the calibrated weight values.(Before closing the calibration window, turn off 'Request 2-point Calibration')

4) Calibration on XG5000 Special Module Monitor Window (1-point calibration)

1-point calibration should be performed after completing 2-point calibration.Turn on Request 1-point Calibration Mode. And Zero Calibration mode, 'Calibration Mode Status' and 'Zero Calibration Complete' are turned on.
Then, click 'Calb. Value Storage and close the calibration window to apply the calibrated weight values.(Before closing the calibration window, turn off 'Request 1-point Calibration')





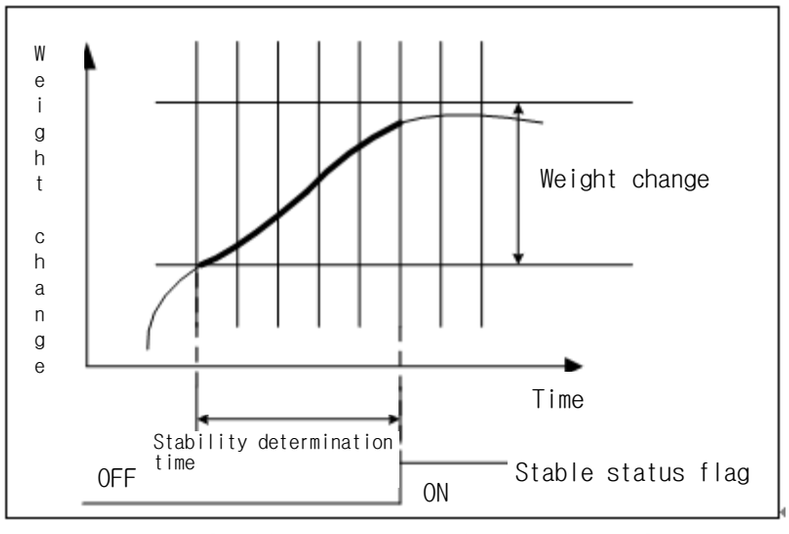


6.1.2 Stable Status Determination

It determines whether the status of the gross weight values is safe. If the gross weight values are within the stability determination range, and kept within the range for longer than the stability determination time, the stable status flag is turned on. If even one of the gross weight values exceeds the stability determination range for longer than the stability determination time, the stable status flag is turned off.

Setting Items	Set Values	Running Parameter Address
Stability Determination Range	0~999 (x minimum unit scale standard),	Channel 0:Address 14 Channel 1: Address 15
Stability Determination Time	1~99 (×100ms)	Channel 0: Address 16 Channel 1: Address 17

Items	U Device Symbol	Description
Channel 0 stable status flag	_0y_CH0_STBL	OFF: Stability determination condition is being performed ON: Stability determination condition is satisfied
Channel 1 stable status flag	_0y_CH1_STBL	



[Stable Status Determination Diagram]

6.1.3 Zero Tracking Function

It adjusts zero output values in accordance with changes of the surrounding environment, such as temperature change. If the zero point slightly changes after calibration or zero setting, a weight within the zero tracking range is automatically adjusted to 0.

Setting Items	Set Values	Running Parameter Address
Zero Tracking Setting range	0 1~99(×minimum unit scale standard)	Channel 0: Address 18 Channel 1: Address 19
Zero Tracking Setting Time	1~99(×100ms)	Channel 0: Address 20 Channel 1: Address 21

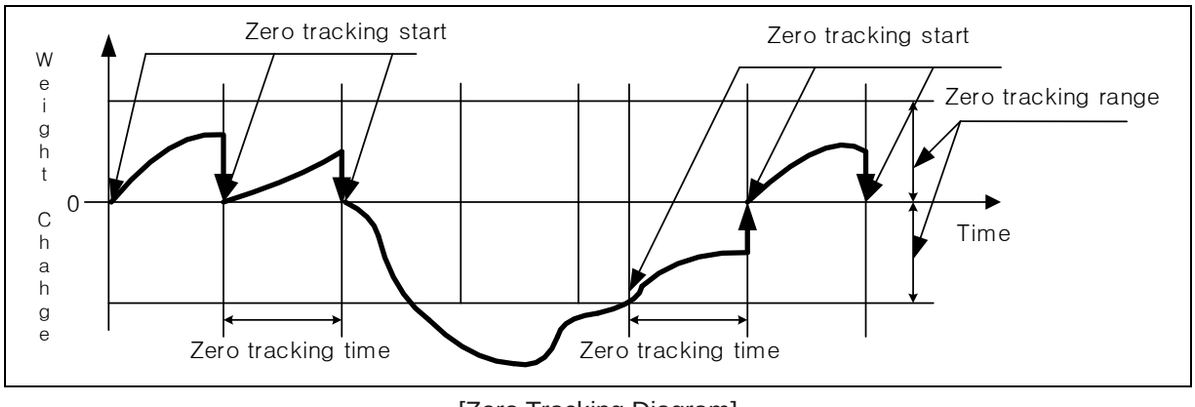
1) Zero Output Stop

After setting the zero tracking setting range and time, if the gross weight exceeds the zero tracking setting range or a value exceeding the zero tracking setting range is input, the output value will not be 0.

2) Zero Output Repeat

If the following conditions are satisfied, zero tracking is automatically repeated.

If the gross weight is within the zero tracking setting range, and satisfies both the zero tracking setting range and time, the output value is 0.



[Zero Tracking Diagram]

Remark

1) If an object (weight) with a weight value less than the zero tracking range is placed on the pallet, the zero tracking function will adjust the weight value to 0.When placing a light object, set the zero tracking setting range at 0 to measure the weight value of the object, then set the zero tracking setting range at a value less than the weight of the object.

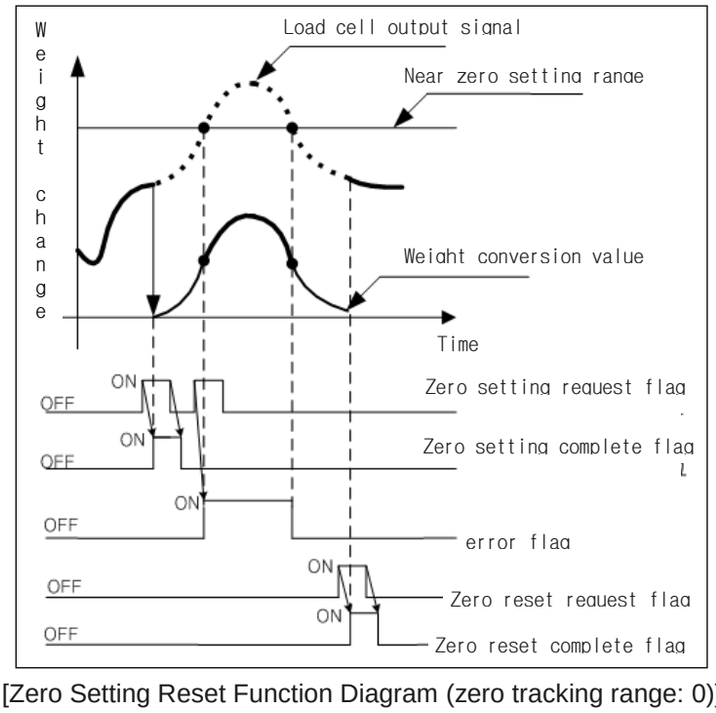
Example) If the maximum weight is calibrated at 100g, and a single scale is 1g, and the zero tracking range is set at 10 and the zero tracking time is set at 30, a 5-g object on the pallet will show up as weighing 0.In such case, set the zero setting range at 3 or below.

6.1.4 Zero Setting, Reset

It temporarily adjusts zero output values when 0 is not output even after 2-point calibration due to changes of the surrounding environment such as gathering of foreign matters around the pallet caused by using the load cell for a long time. When using a container (Tare), you can also use this function to remove the weight of the container.

When resetting the displayed weight to zero, you can perform the setting within the near zero setting range. Near zero can be set at 1~99% of the maximum weight. If the gross weight exceeds the near zero setting range, an error occurs when setting the zero point.

Items	U Device Variable	Description
Channel 0 zero setting request flag	_0y_CH0_ZSETREQ	OFF: No zero setting/reset request ON: Zero setting/reset request
Channel 1 zero setting request flag	_0y_CH1_ZSETREQ	
Channel 0 zero reset request flag	_0y_CH0_ZRSTREQ	
Channel 1 zero reset request flag	_0y_CH1_ZRSTREQ	
Channel 0 zero setting complete flag	_0y_CH0_ZSET	OFF: Zero setting not complete ON: Zero setting complete
Channel 1 zero setting complete flag	_0y_CH1_ZSET	
Channel 0 zero setting complete flag	_0y_CH0_ZRST	OFF: Zero setting not complete ON: Zero setting complete
Channel 1 zero setting complete flag	_0y_CH1_ZRST	



[Zero Setting Reset Function Diagram (zero tracking range: 0)]

Remark

1) If the PLC power is on, the currently measured value within the near zero setting range is automatically set as the zero point. The pallet must be emptied and the PLC power must be turned on before use.

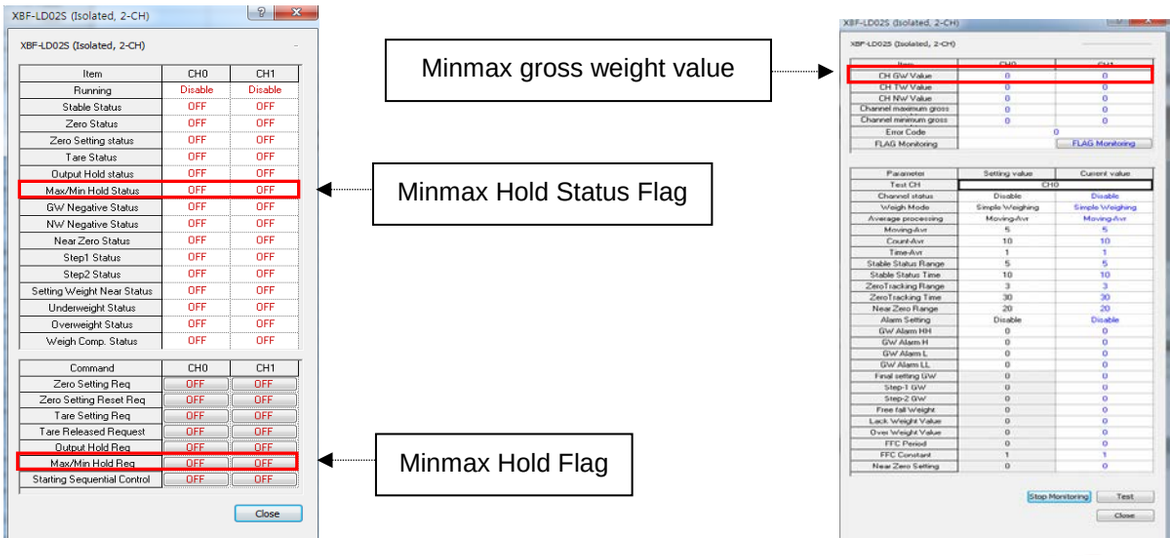
6.1.5 Maximum / Minimum Value Output Function

It displays the maximum / minimum values of the gross weight measured while running the input channel. The maximum / minimum values are automatically stored into the corresponding U device. If the maximum / minimum request flag is on, the maximum / minimum values at the time of turning the flag on are displayed. If the maximum / minimum request flag is turned off, the maximum / minimum values at the time of turning the flag off are maintained.

Items	U Device Variable	Description
Channel 0 maximum/minimum maintenance request flag	_0y_CH0_MAXMINREQ	OFF: Release maximum/minimum request ON: Maximum/minimum request
Channel 1 maximum/minimum maintenance request flag	_0y_CH1_MAXMINREQ	
Channel 0 maximum/minimum maintenance status flag	_0y_CH0_MAXMINHLD	OFF: Maximum/minimum maintenance release status ON: Maximum/minimum maintenance status
Channel 1 maximum/minimum maintenance status flag	_0y_CH0_MAXMINHLD	

Items	U Device Variable	
	XBC	IEC
Channel 0 maximum value of gross weight	_0y_CH0_GWMAX_L (lower) _0y_CH0_GWMAX_H (upper)	_0y_CH0_GWMAX
Channel 0 minimum value of gross weight	_0y_CH0_GWMIN_L (lower) _0y_CH0_GWMIN_H (upper)	_0y_CH0_GWMIN
Channel 1 maximum value of gross weight	_0y_CH0_GWMAX_L (lower) _0y_CH0_GWMAX_H (upper)	_0y_CH1_GWMAX
Channel 1 minimum value of gross weight	_0y_CH0_GWMIN_L (lower) _0y_CH0_GWMIN_H (upper)	_0y_CH1_GWMIN

You can view the maximum/minimum maintenance request flag, status flag, and the maximum/minimum weight values on the special module monitor window.



6.1.6 Output Value Maintenance Function

It temporarily maintains the output value of the gross weight. It is executed only when the output status request flag is turned on.

Items	U Device Variable	Description
Channel 0 gross weight value maintenance request flag	_0y_CH0_HOLDREQ	OFF: Release Output value maintenance function ON: Set output value maintenance function
Channel 1 gross weight value maintenance request flag	_0y_CH1_HOLDREQ	

The status flags maintained when the output value hold request flag is on, and the output values are as follows.

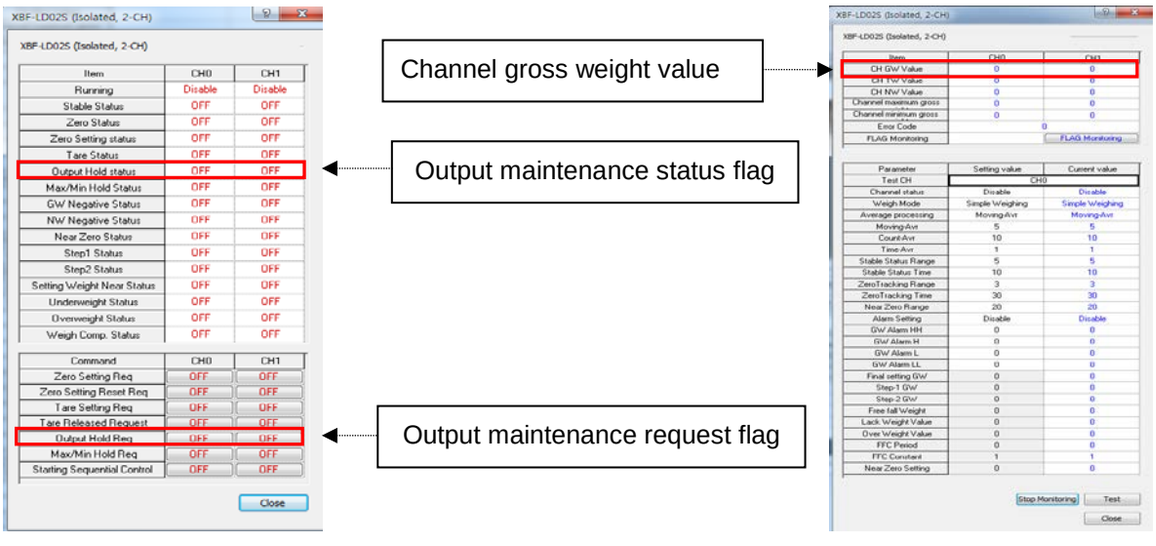
1) Output Maintenance Status Flag

Items	U Device Variable	Description
Channel 0 output maintenance status flag	_0y_CH0_WEIGHTHLD	OFF: Release output value maintenance status ON: Output value maintenance status
Channel 1 output maintenance status flag	_0y_CH1_WEIGHTHLD	

2) Output maintenance gross weight value

Items	U Device Variable	
	XBC	XEC
Channel 0 output maintenance gross weight value	_0y_CH0_GWDATA_L (lower) _0y_CH0_GWDATA_H (upper)	_0y_CH0_GWDATA
Channel 1 output maintenance gross weight value	_0y_CH1_GWDATA_L (lower) _0y_CH1_GWDATA_H (upper)	_0y_CH1_GWDATA

You can view the output maintenance request flag, status flag, and the gross weight values on the special module monitor window.



6.1.7 Alarm Output Function

It alerts the user when the gross weight reaches the preset alarm value range.

1) Alarm Condition

(1) Alarm L

Alarm L is set off if the gross weight is the same as or below the 'GW Alarm LL' value.

(2) Alarm H

Alarm H is set off if the gross weight is the same as or above the 'GW Alarm HH' value.

2) Alarm Release Condition

(1) Alarm L

Alarm L is released if the gross weight is higher than 'GW Alarm L.'

(2) Alarm H

Alarm H is released if the gross weight is higher than 'GW Alarm H.'

3) Status Flag Condition

(1) LL Status

LL status flag occurs if the gross weight is the same as or below the set 'GW Alarm LL' value.

(2) L Status

L status flag occurs if the gross weight is the same as or below the set 'GW Alarm L' value

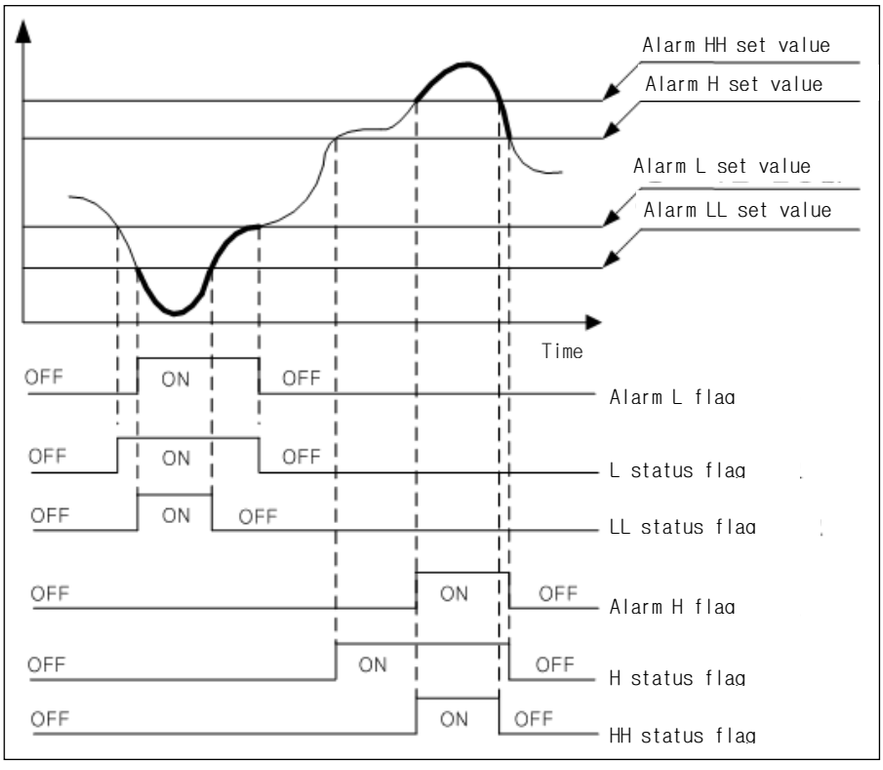
(3) H Status

H status flag occurs if the gross weight is the same as or above the set 'GW Alarm H' value

(4) HH Status

HH status flag occurs if the gross weight is the same as or above the set 'GW Alarm HH' value

Items	U Device	Description	LED Status
Channel 0 Alarm H flag	_0y_CH0_HOOR	OFF: Normal ON: Alarm occurs	Blinks at 1-second intervals
Channel 1 Alarm H flag	_0y_CH1_HOOR		
Channel 0 Alarm L flag	_0y_CH0_LOOR		
Channel 1 Alarm L flag	_0y_CH1_LOOR		
Channel 0 HH Status Flag	_0y_CH0_HHOORSTAT	OFF: Normal ON: Status occurs	Lighting Status
Channel 0 H Status flag	_0y_CH0_HOORSTAT		
Channel 0 L Status flag	_0y_CH0_LOORSTAT		
Channel 0 LL Status flag	_0y_CH0_LLOORSTAT		
Channel 1 HH Status Flag	_0y_CH1_HHOORSTAT		
Channel 1 H Status flag	_0y_CH1_HOORSTAT		
Channel 1 L Status flag	_0y_CH1_LOORSTAT		
Channel 1 LL Status flag	_0y_CH1_LLOORSTAT		



[Alarm Output Diagram]

You can set alarm values at I/O parameter, and use it when the weigh mode is set at 'simple weigh.'

XBF-LD02S (Isolated, 2-CH)

Input Parameter	CH0	CH1
Channel status	Enable	Disable
Weigh Mode	Simple Weighing	Simple Weighing
Average processing	Moving-Avr	Moving-Avr
Moving-Avr	5	5
Count-Avr	10	10
Time-Avr	1	1
Stable Status Range	5	5
Stable Status Time	10	10
ZeroTracking Range	3	3
ZeroTracking Time	30	30
Near Zero Range	20	20
Alarm Setting	Enable	Disable
GW Alarm HH	2020	0
GW Alarm H	2015	0
GW Alarm L	2010	0
GW Alarm LL	2005	0
Final setting GW	0	0
Step-1 GW	0	0
Step-2 GW	0	0
Free fall Weight	0	0
Lack Weight Value	0	0
Over Weight Value	0	0
FFC Period	0	0
FFC Constant	1	1
Near Zero Setting	0	0

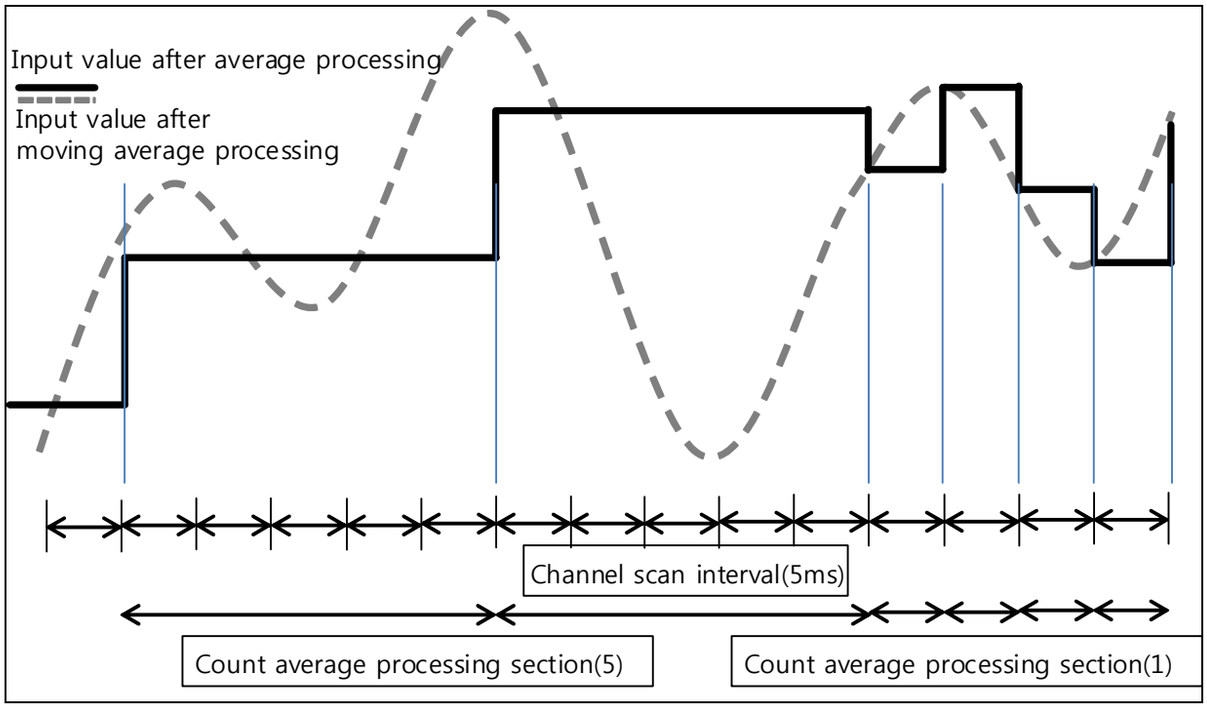
Weigh Mode Setting

Alarm Setting

6.1.8 Average Processing Function

1) Count/Moving Average

It calculates the moving average of the input values of the designated channel, accumulates for the set counts, and displays the average of the sum as digital data.



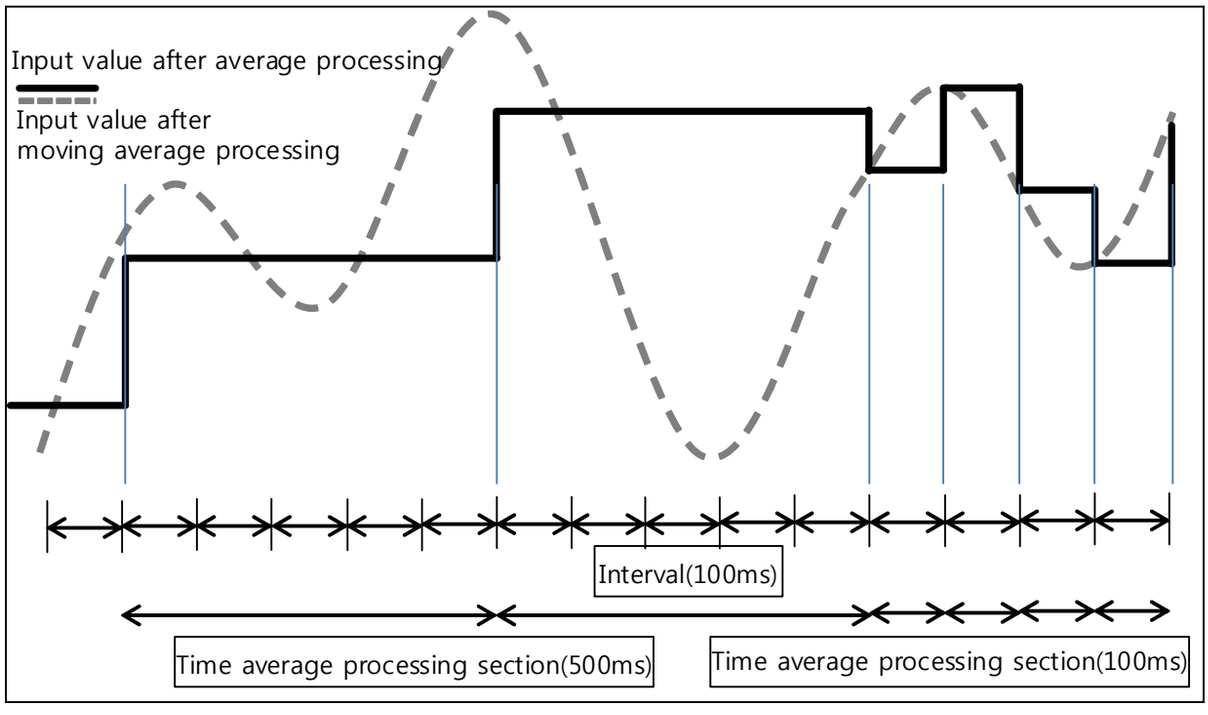
- Setting Range = 1 ~ 999[counts]
- Initial Value: 10

In case of count average, the average processing interval is calculated regardless of the number of channels used.

Average Processing Interval [㎳] = average counts ×5㎳

2) Time Average

It calculates the moving average of the input values of the designated channel, and accumulate for the set counts, and display the average of the sum as digital data.



- Setting Range = 1 ~ 999[×100㎳]
- Initial Value: 1

The minimum unit of time average is 100ms, and the average processing interval is calculated regardless of the number of channels used. As the conversion cycle within the module is 5ms, the actual counts of average processing are as follows.

$$\text{Counts of average[counts]} = \frac{\text{Set average time} \times 100[\text{ms}]}{5\text{ms}}$$

3) Moving Average

Moving average is an average processing method of adding the difference between the current value and the previous moving average divided by 2^n to the previous averaging average value. In case of moving average, average values are displayed at each scan within the module.

- set number of moving averages = 3~9
- Average number of moving averages = $2^{\text{set number of moving averages}}$ (← 2^3~2^9)
- Initial Value: 5 (←2^5)

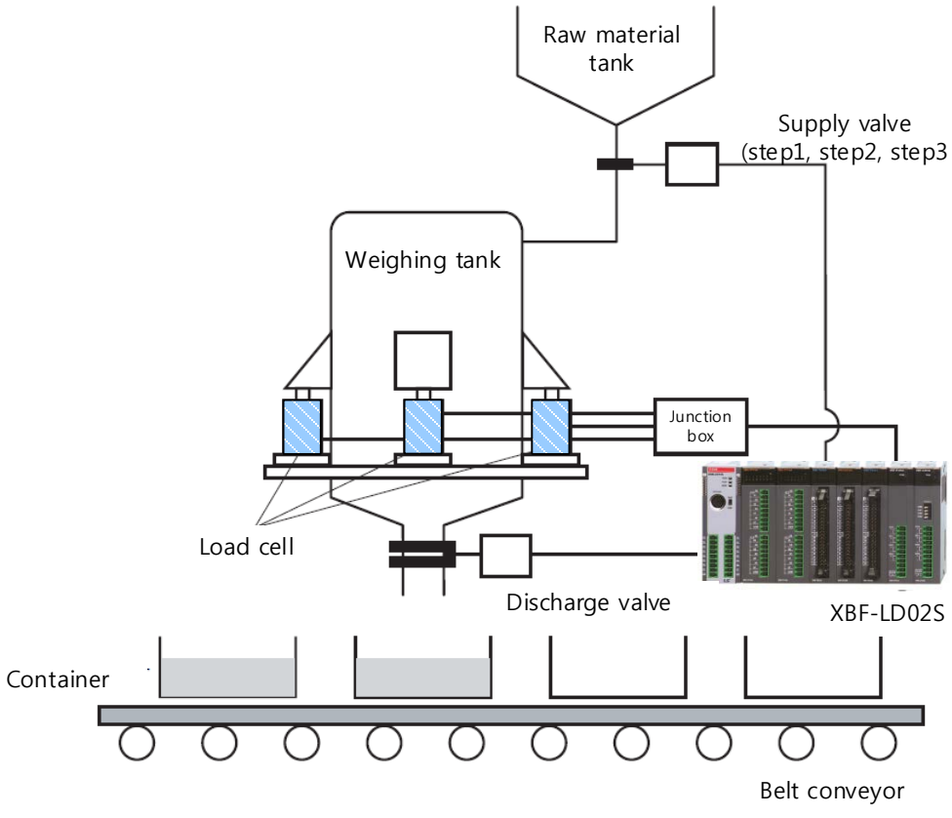
Moving average values are output in accordance with the following formula.

Moving average value (n) = moving average value(n-1) + (current value – moving average value (n-1) + remainder (n-1))/ 2^n Remainder (n) = current value - moving average value (n-1)

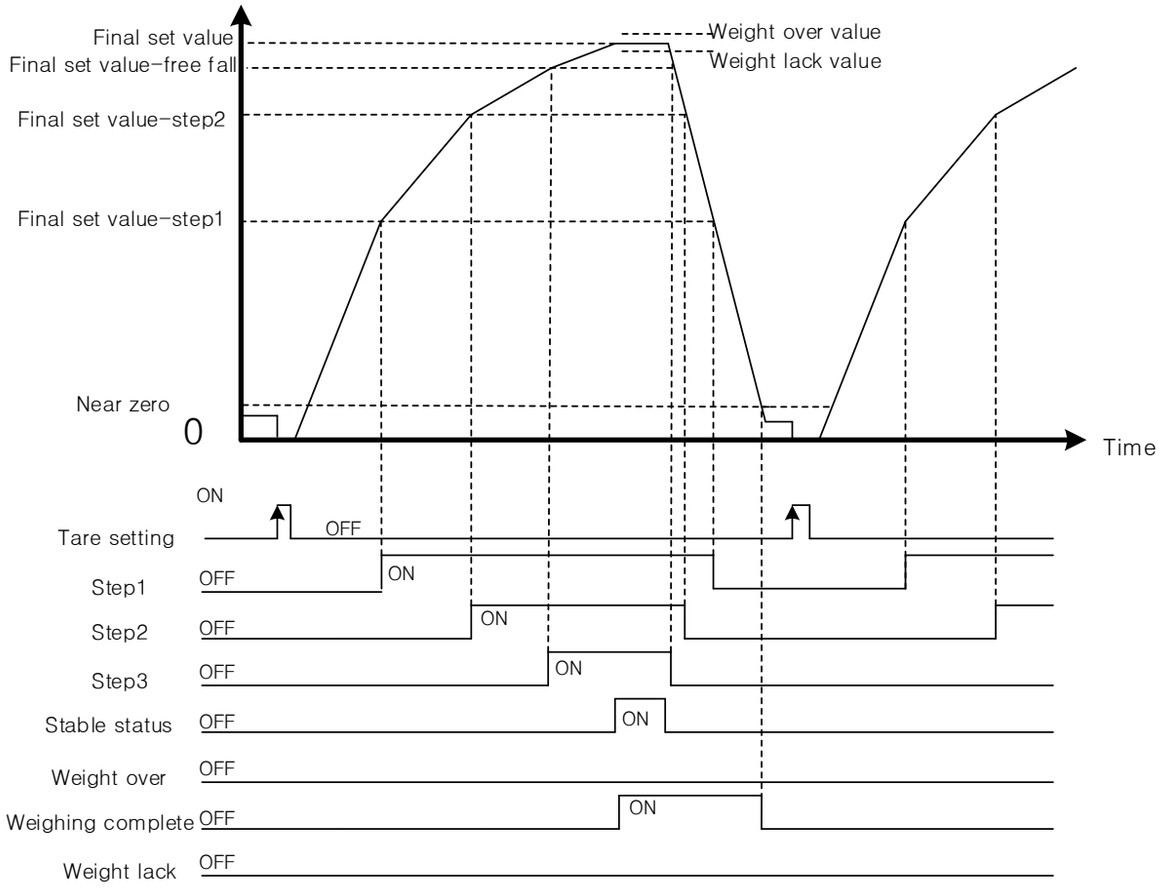
6.1.9 Free Fall Compensation function

When the weigh mode is supply (simple comparison, sequential comparison) and discharge (simple comparison, sequential comparison), it compensates the free fall value before reaching the final setting weight value. The following sections show an actual example of application.

1) System Composition Example



(1) If a near zero signal is detected, perform tare setting to remove the tare weight.
(2) Open the supply valve to begin raw material supply from the raw material tank to the weighing tank.
(3) When the weight reaches the final set value – step 1, the step 1 signal is output. Using this signal, the supply valve is closed by half.
(4) When the weight reaches the final set value - step 2, the step 2 signal is output. Using this signal, the supply valve is closed by more than half.
(5) When the weight reaches the final set value - free fall, the step 3 signal is output, and the supply valve is completely closed.
(6) When the supply valve is complete closed, the remaining raw material (free fall) in the raw material tank and the weighing tank flows into the weighing tank. If the final weight added with the inflow amount satisfies the stability condition, weighing is complete and the final discharge valve is open. .
(7) Close the discharge valve after discharging the raw material, confirm that the discharge is complete by detecting near zero signals, and then repeat steps (1) through (6).



·Step 1 Output: Current total weight value >= final set value - step 1 set value
·Step 2 Output: Current total weight value >= final set value - step 2 set value
·Step 3 Output: Current total weight value >= final set value - free fall
·Weight over output: Current total weight value > final set value + weight over value
·Weight lack output: Current total weight value < final set value - weight over value
·Weighing complete: Final set value - weight lack value <= current total weight value <+ final set value + weight over value

2) Free Fall Compensation

It compensates free fall values. The following sections show an actual example.

[Set Value]

Final set values 20000, free fall compensation value (counts):4 times, free fall compensation factor:2/4, free fall initial value:500

[Description]

Number of measurements	Measured weight value	Error	Number of free fall compensations	Free fall
1 (after connecting the initial power)	20050	+50	1	500
2	20040	+40	2	500
3	20070	+70	3	500
4	20080	+80	4	500
		+240/4 = -60 → -60*2/4=30 →530(free fall)		
5	20020	+20	1	530
6	20000	0	2	530
7	20010	+10	3	530
8	20110	+10	4	530
		+40/4 = -10 → -10*2/4=5 →535(free fall)		
9	19990	-10	1	535
10	20010	+10	2	535
11	20000	0	3	535
12	19980	-20	4	535
		-20/4 = -5 → -5*2/4=3 →532(free fall)		

When the input free fall compensation value (count) is 4, free fall is compensated if the average value of 4 weighed values is the same as or above the final set value.

·For the first 4 measurements, the measured values are adjusted by 30 by applying a factor of 2/4, as the weight over value is 60.

·For the following 4 measurements, the measured values are adjusted by 5 by applying a factor of 2/4, as the weight over value is 10.

·For the following 4 measurements, the measured values are adjusted by -3 by applying a factor of 2/4, as the weight lack value is -5.

This function calculates the average weight corresponding to the set counts, and increases the free fall value when the weight exceeds the final set value, and decreases the free fall value when the weight is less than the target value.

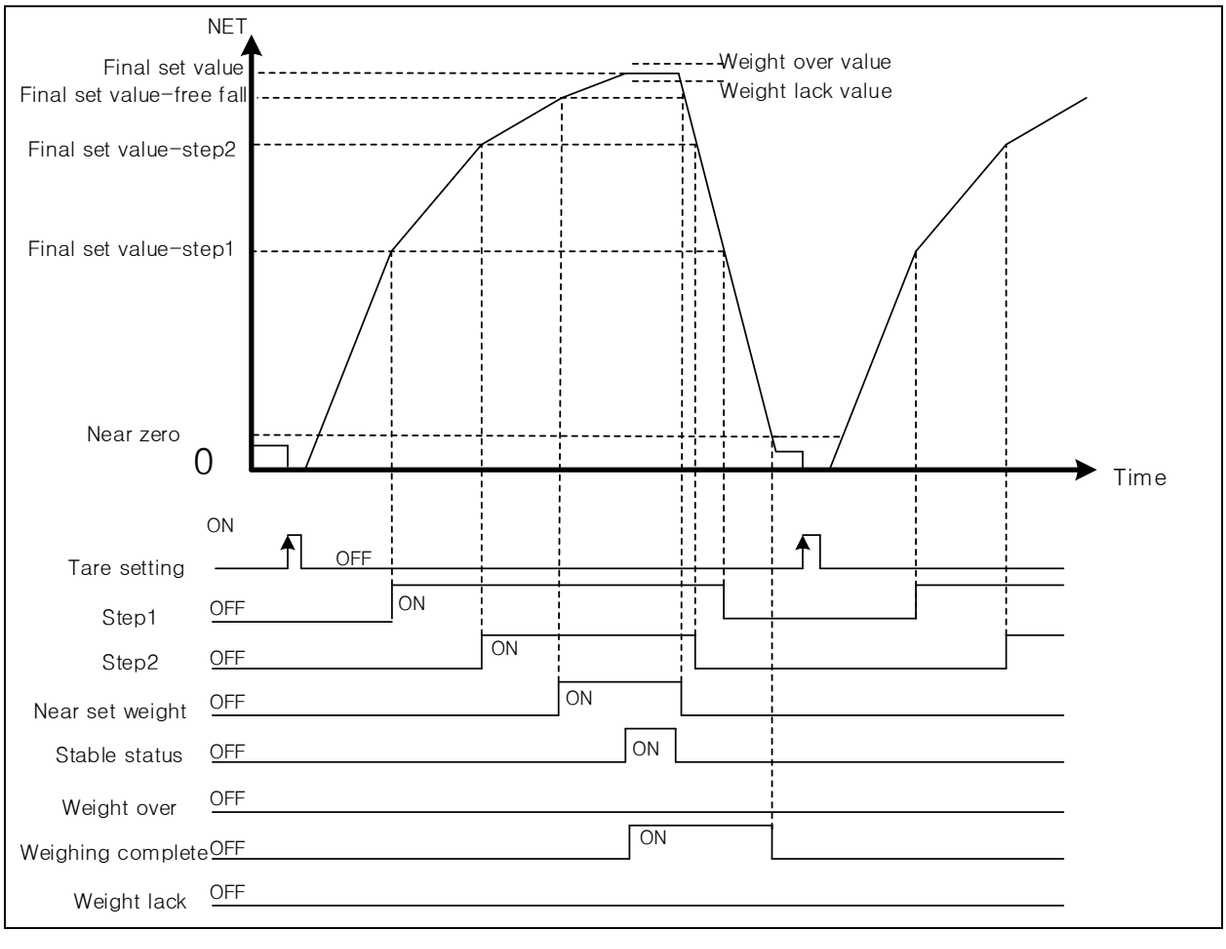
3) Supply Mode

(1) Simple Comparison

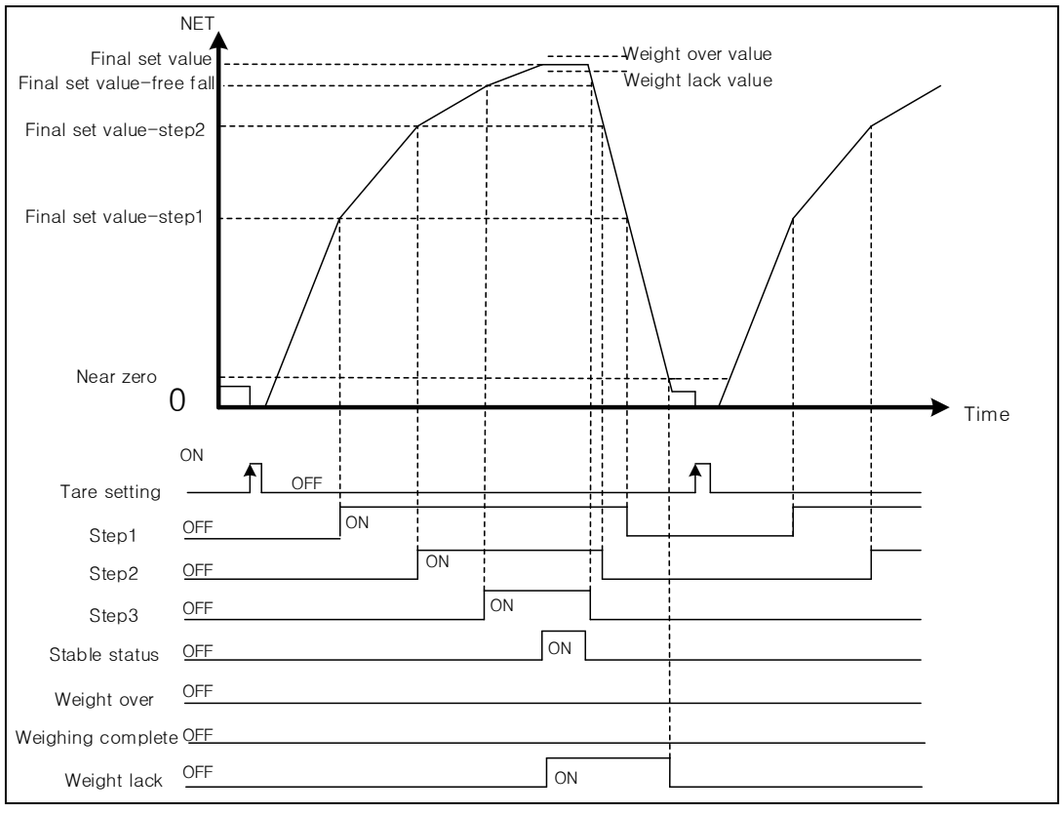
The starting point of simple comparison of the supply mode is when the net value is near zero or below near zero after tare setting. When the net weight gradually increases, the relevant flag is turned on depending on the set weight value. The order of progression and the relevant flags are as follows.

Order	Flag	Condition
1	Near zero status	Channel total weight value <= near zero range
2	When near zero, request tare setting	
3	Step 1 status	Channel net weight value >= final set value - step 1 set value
4	Step 2 status	Channel net weight value >= final set value - step 2 set value
5	Setting weight near status	Channel net weight value >= final set value - free fall value
6	Weight lack status	Channel net weight value < final set value - weight lack value
7	Weight over status	Channel net weight value > final set value + weight over value
8	Weighing complete	[Channel net weight value + weight over value >= channel net weight value >= channel net weight value - weight lack value] & stable status (on)

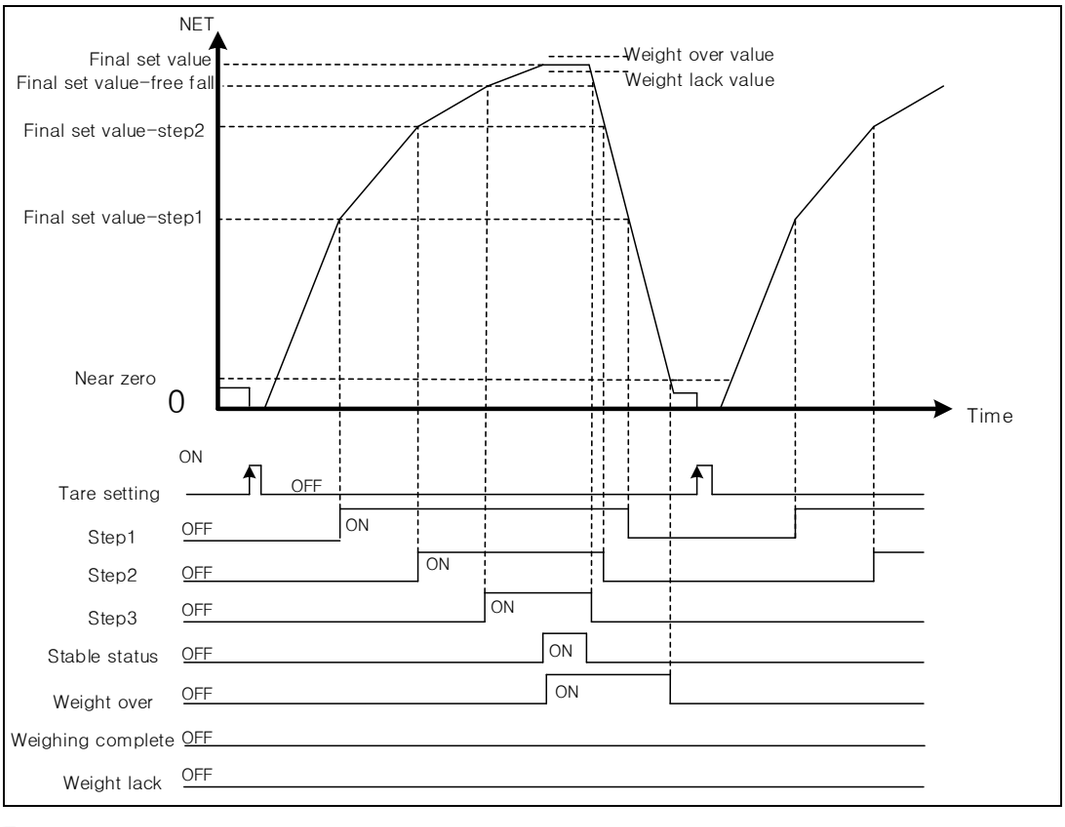
a) In case of weighing complete, the flag timing diagram is as follows.



b) In case of weight lack, the flag timing diagram is as follows.



c) In case of weight over, the flag timing diagram is as follows.

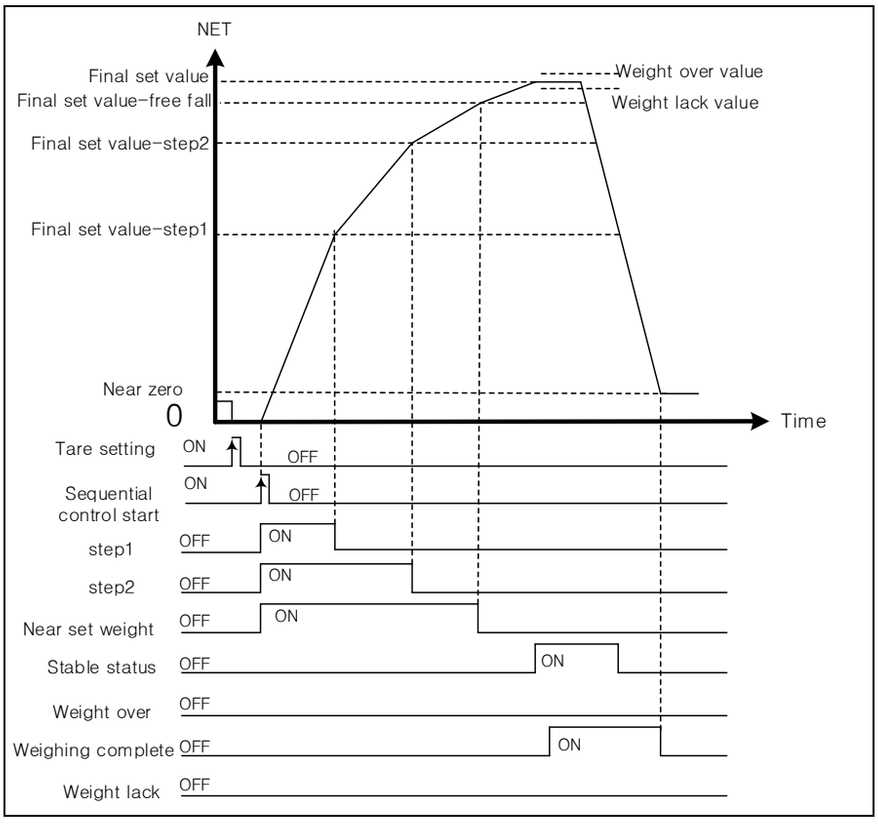


(2) Sequential Control

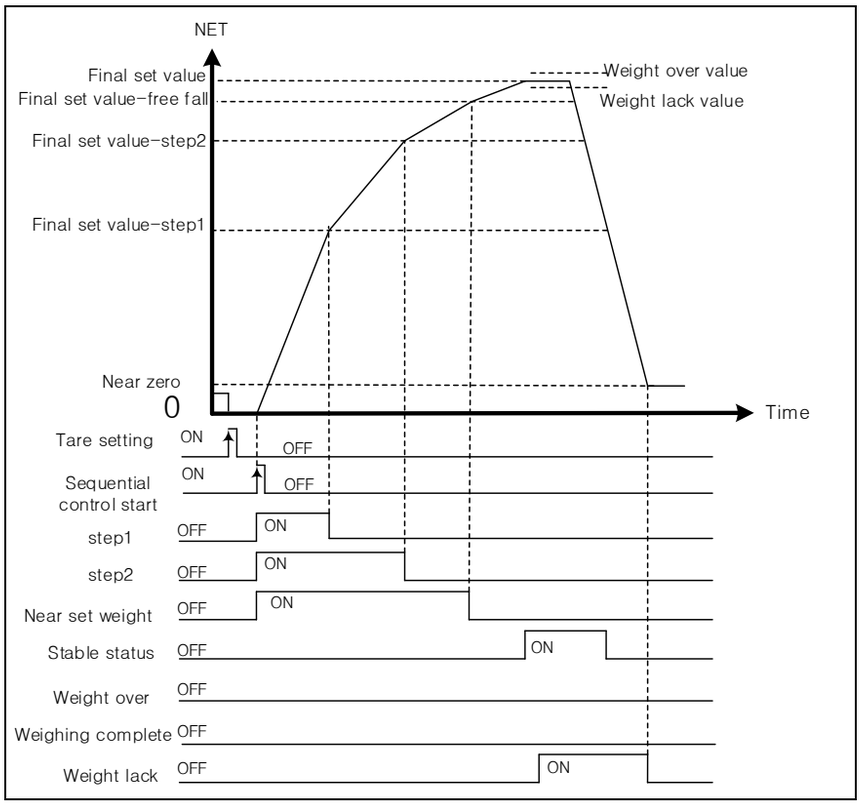
The starting point of simple comparison of the supply mode is when the net value is near zero or below near zero after tare setting and the sequential control is initiated. When the net weight gradually increases, the relevant flag is turned on depending on the set weight value. The order of progression and the relevant flags are as follows

Order	Flag	Condition
1	Near zero	Channel total weight value <= near zero range
2	When near zero, request tare setting	
3	Sequential control start	
4	Step 1 status	Channel net weight value >= final set value – step 1 set value
5	Step 2 status	Channel net weight value >= final set value – step 2 set value
6	Setting weight near status	Channel net weight value >= final set value - free fall value
7	Weight lack status	Channel net weight value < final set value - weight lack value
8	Weight over status	Channel net weight value > final set value + weight over value
9	Weighing complete	[Channel net weight value + weight over value >= channel net weight value >= channel net weight value - weight lack value] & stable status (on)

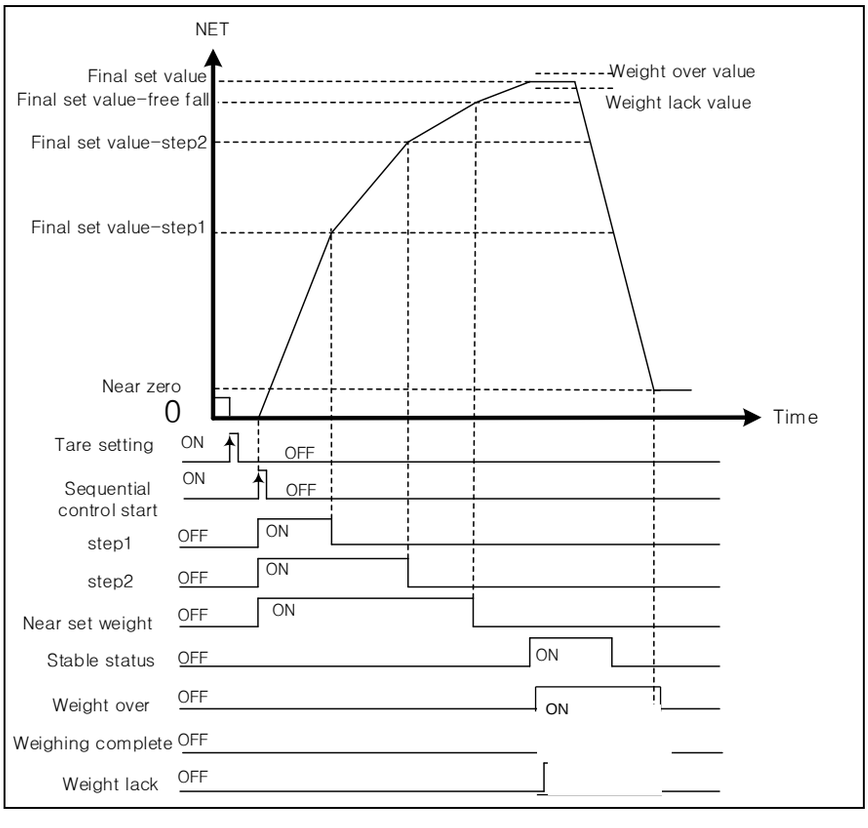
a) In case of weighing complete, the flag timing diagram is as follows.



b) In case of weight lack, the flag timing diagram is as follows.



c) In case of weight over, the flag timing diagram is as follows.



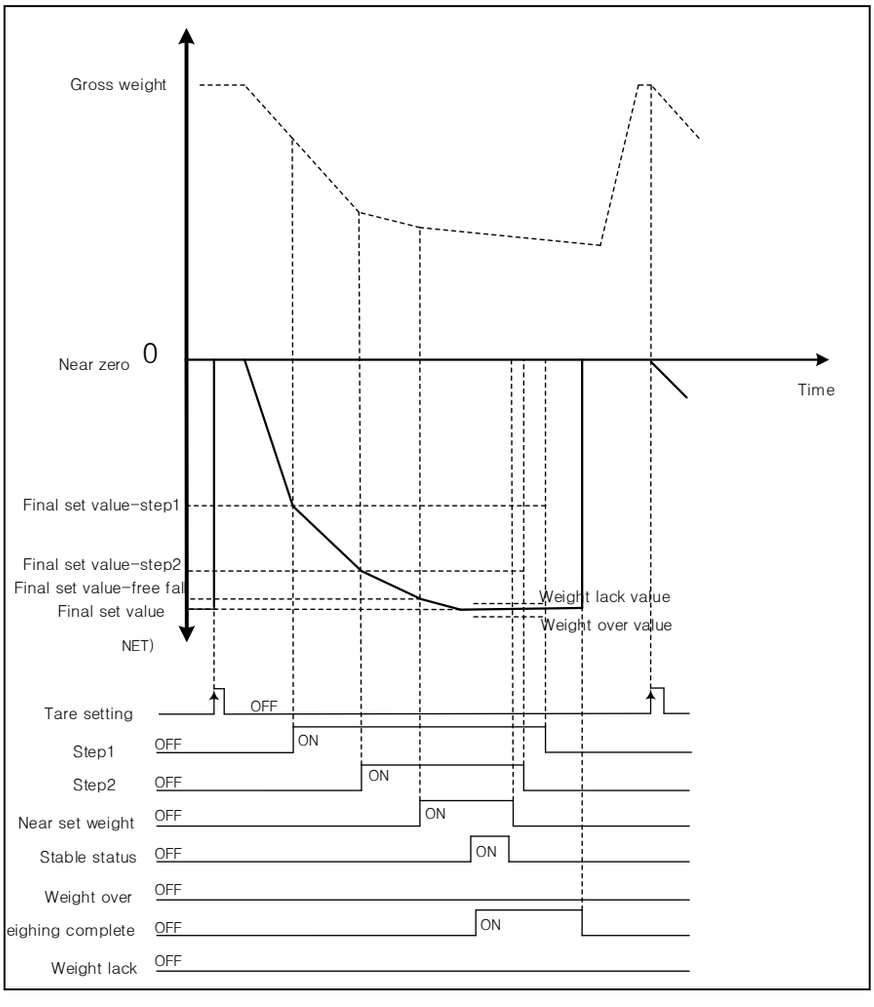
4) Discharge Mode

(1) Simple Comparison

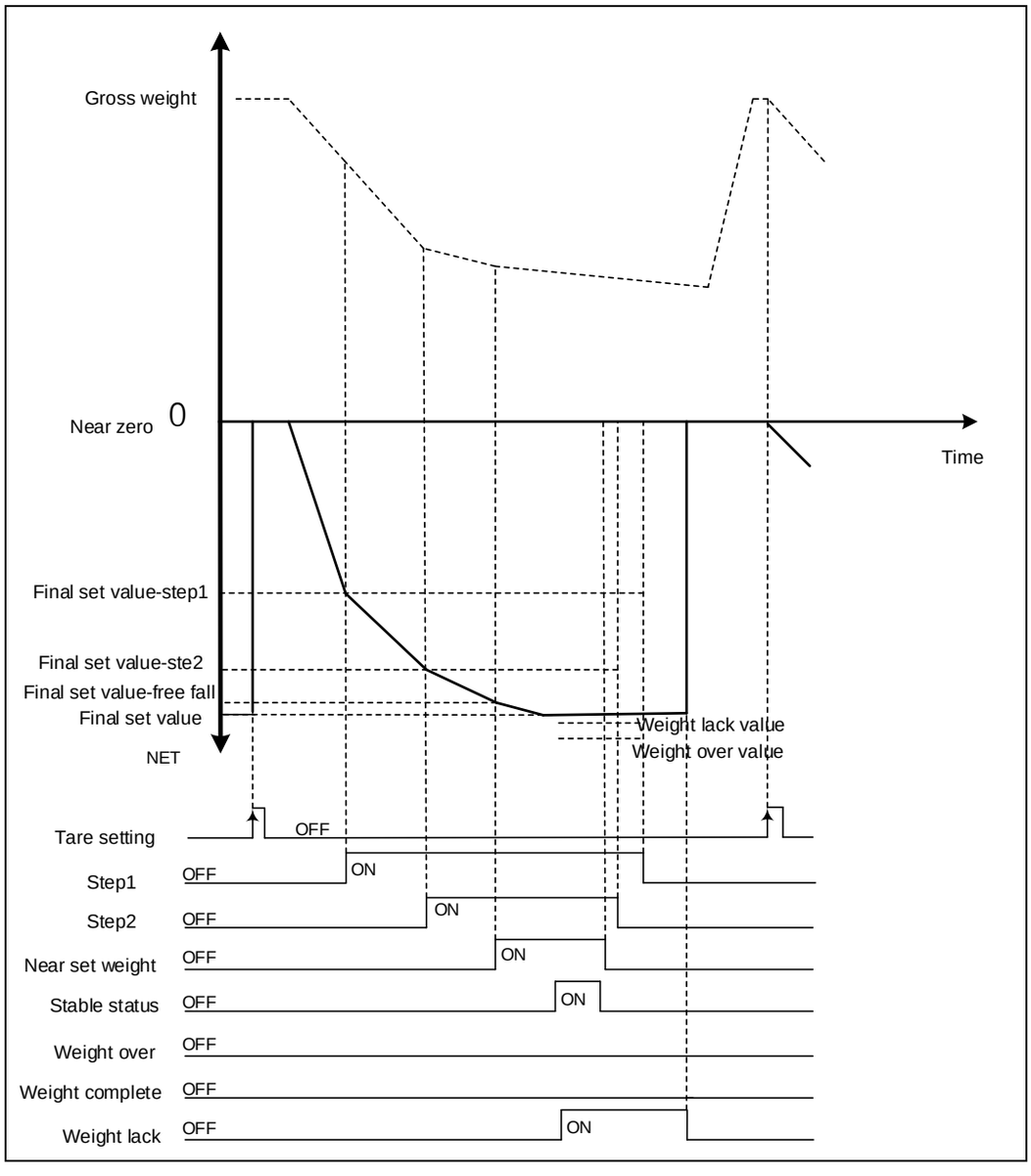
The starting point of simple comparison of the discharge mode is when the net value is near zero or below near zero after tare setting with the raw materials filled. When the net weight gradually increases in the negative direction, the relevant flag is turned on depending on the set weight value. The order of progression and the relevant flags are as follows

Order	Flag	Condition
1	Tare setting request, if the tare is filled with raw material	
2	Near zero status	Channel net weight value*(-1) <= near zero range
3	Step 1 status	Channel net weight value*(-1) >= final set value - step 1 set value
4	Step 2 status	Channel net weight value*(-1) >= final set value - step 2 set value
5	Setting weight near status	Channel net weight value*(-1) >= final set value - free fall value
6	Weight lack status	Channel net weight value*(-1) < final set value - weight lack value
7	Weight over status	Channel net weight value*(-1) < final set value + weight over value
8	Weighing complete	[Channel net weight value *(-1) + weight over value >= channel net weight value*(-1) >= channel net weight value*(-1) - weight lack value] & stable status (on)

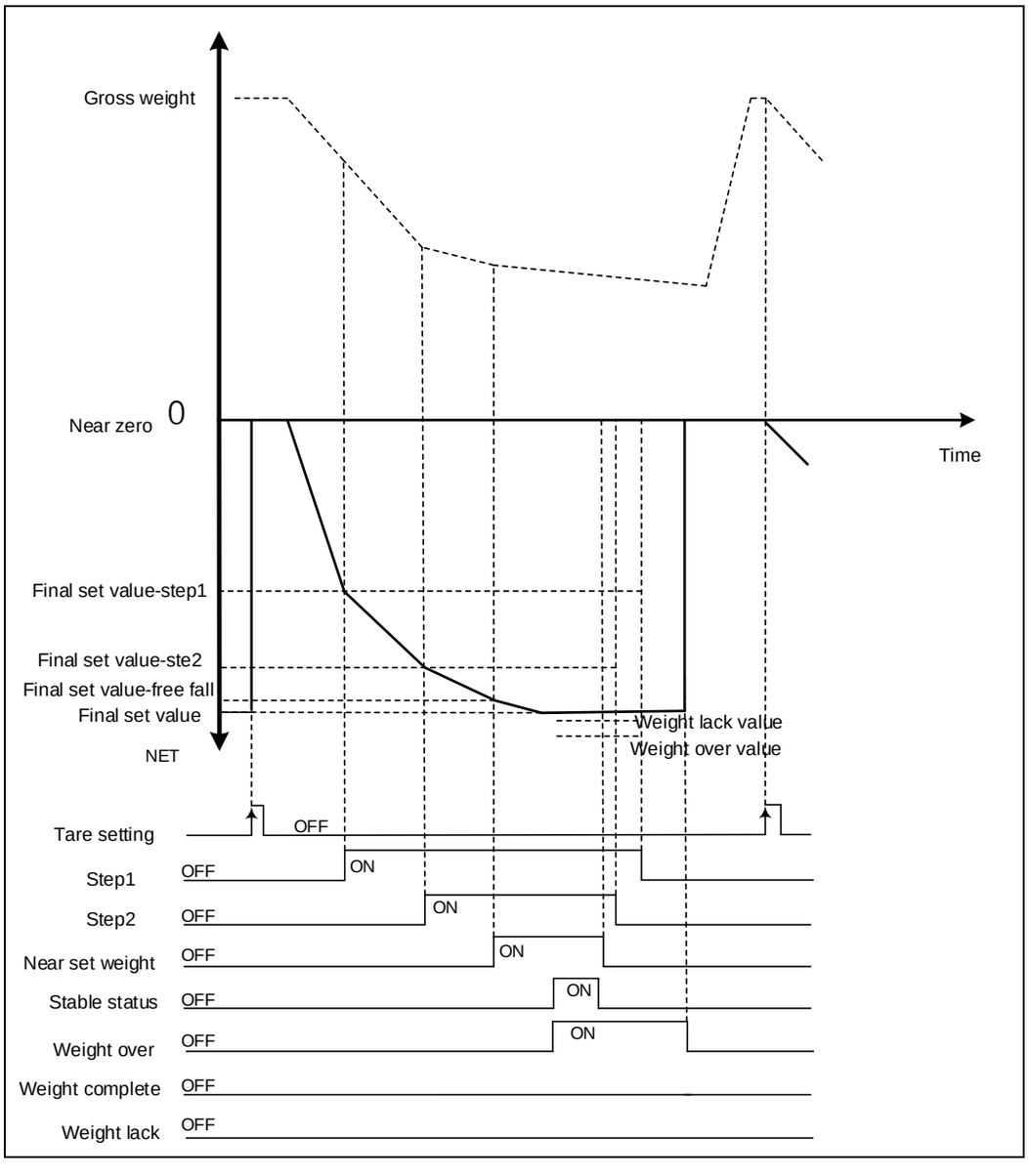
a) In case of weighing complete, the flag timing diagram is as follows.



b) In case of weight lack, the flag timing diagram is as follows.



c) In case of weight over, the flag timing diagram is as follows.

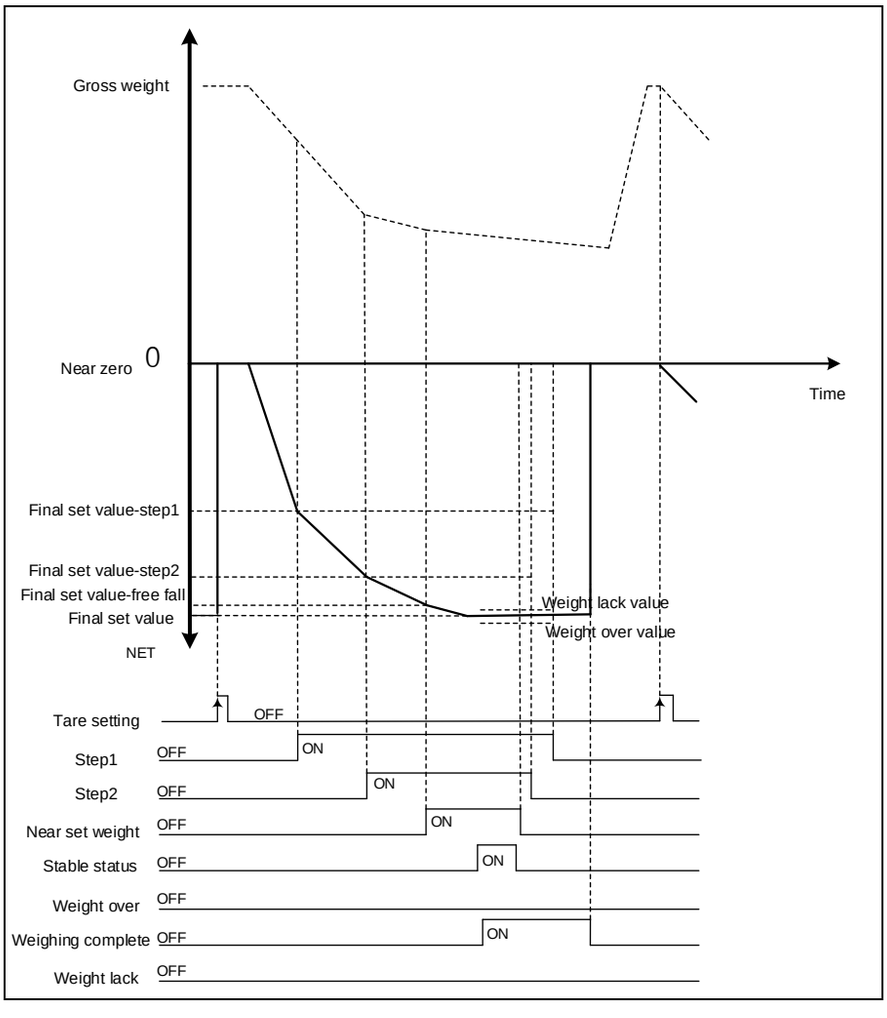


(2) Sequential Control

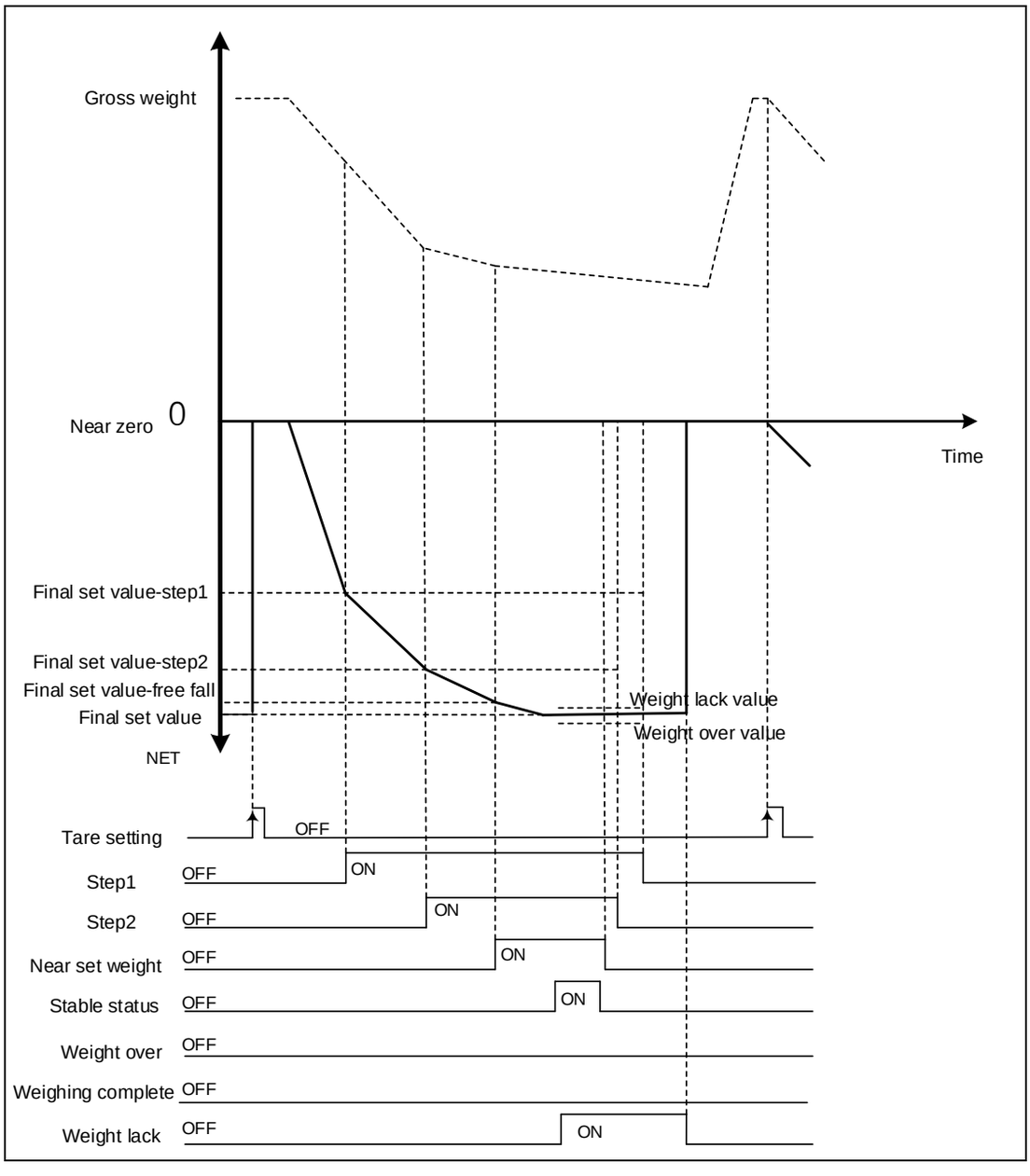
The starting point of simple comparison of the discharge mode is when the sequential control is initiated near zero after tare setting with the tare filled with the raw materials. When the net weight gradually increases in the negative direction, the relevant flag is turned on depending on the set weight value. The order of progression and the relevant flags are as follows

Order	Flag	Condition
1	Tare setting request, if the tare is filled with raw material	
2	Near zero status	Channel net weight value*(-1) <= near zero range
3	When near zero, begin sequential control	
4	Step 1 status	Channel net weight value*(-1) >= final set value - step 1 set value
5	Step 2 status	Channel net weight value*(-1) >= final set value - step 2 set value
6	Setting weight near status	Channel net weight value*(-1) >= final set value - free fall value
7	Weight lack status	Channel net weight value*(-1) < final set value - weight lack value
8	Weight over status	Channel net weight value*(-1) < final set value + weight over value
9	Weighing complete	[Channel net weight value *(-1) + weight over value >= channel net weight value*(-1) >= channel net weight value*(-1) - weight lack value] & stable status (on)

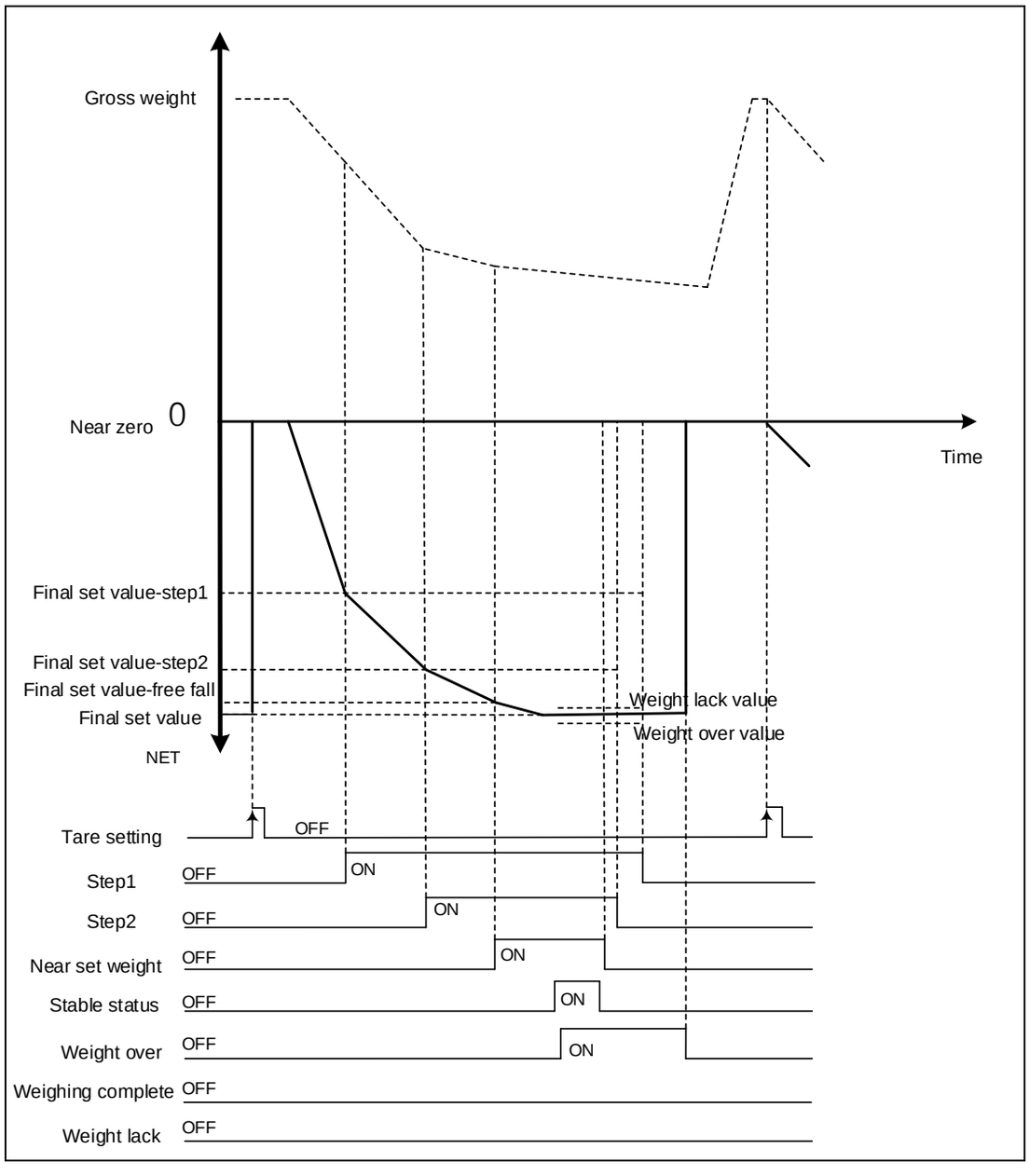
a) In case of weighing complete, the flag timing diagram is as follows.



b) In case of weight lack, the flag timing diagram is as follows.



c) In case of weight over, the flag timing diagram is as follows.

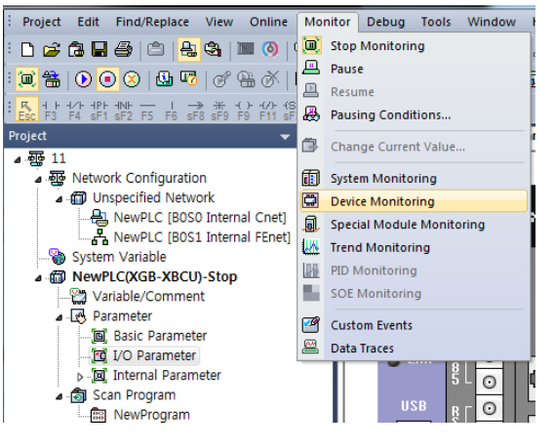


6.1.10 Special Module Monitor Function

Functions of the special module monitor are as follows.

1) Running [Special Module Monitor]

Under [Online] -> [Connection] status, go to [Monitor] -> [Special Module Monitor]The [Special Module Monitor] menu is not enabled unless the status is [Online].

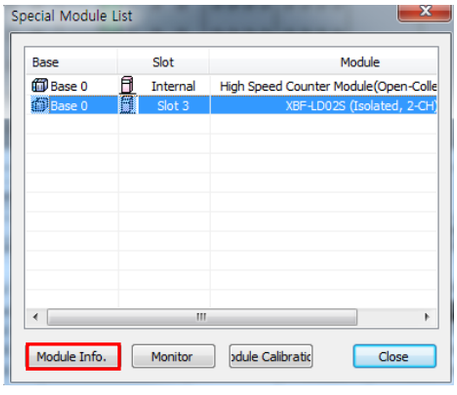


Remark

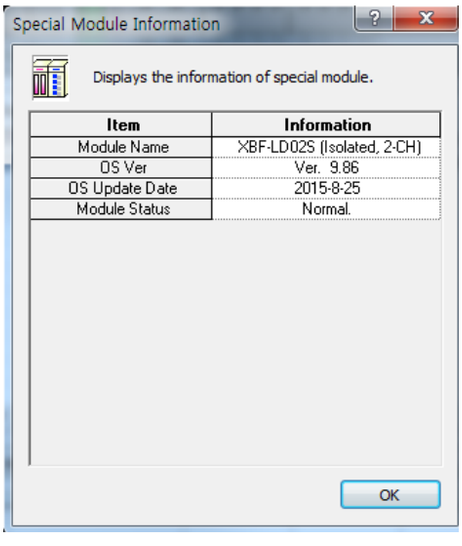
1) The screen may not be displayed normally due to insufficient system resource. In such case, close the screen, close the other applications, and run XG5000 once again.
2) The I/O parameters set under [Special Module Monitor] status are set only temporarily for testing. Therefore, the set I/O parameters are erased once the [Special Module Monitor] status is complete.
3) The test performance function of the [Special Module Monitor] allows the user to test whether the analog input module operates normally without writing the sequence program.

2) Methods on how to use [Special Module Monitor]

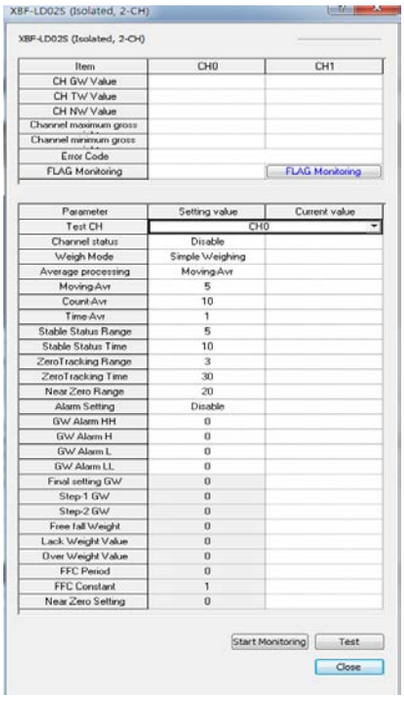
(1) With the XG5000 connected to the PLC base unit (on-line), click [Monitor] -> [Special Module Monitor]It displays the [Special Module Monitor] screen shown below, which shows the types of special modules along with the base/slot information. The list dialogue box displays the modules currently mounted on the PLC system.



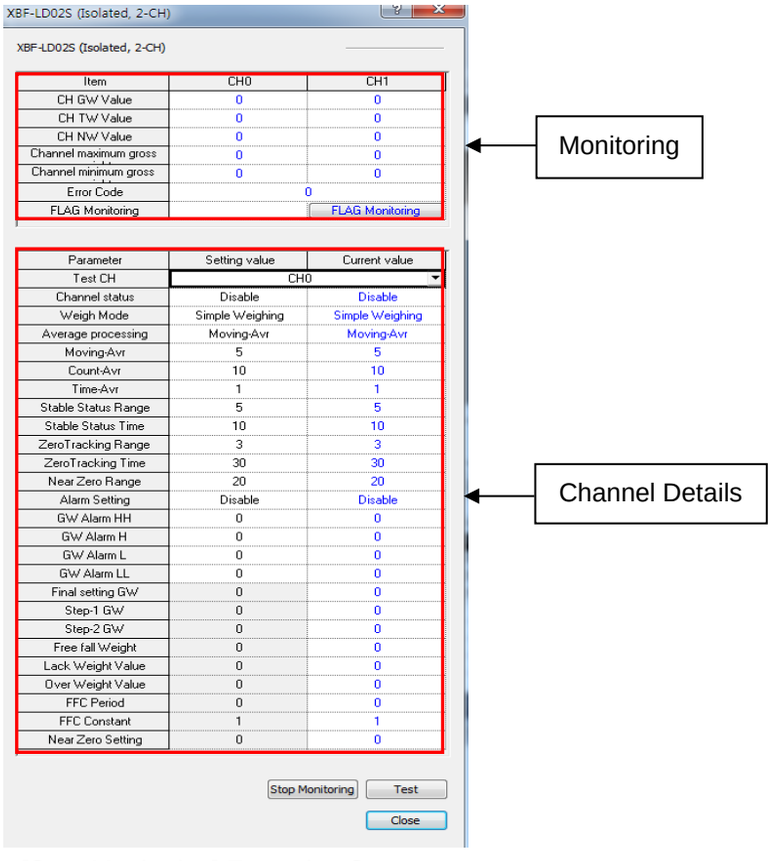
(2) Select a special module and then click [Module Information] to display the following information



(3) Click [Monitor] on the "Special Module" screen, to display the [Special Module Monitor] screen.

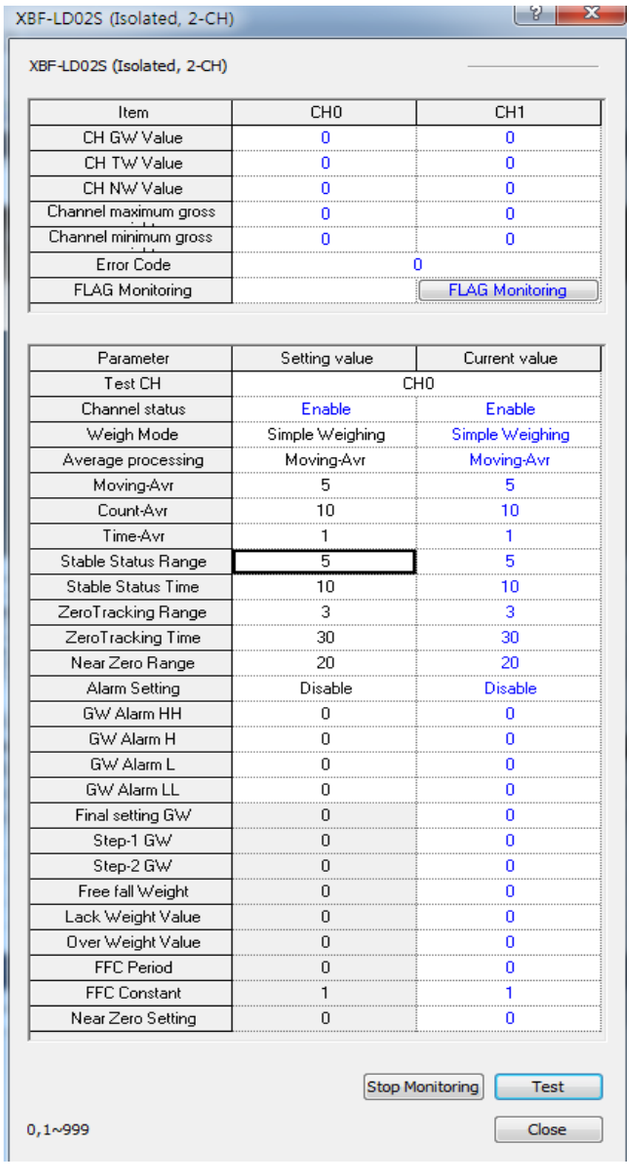


(4) [Start Monitoring]:Click [Start Monitoring] to display the input/output data of the channel currently running.



[Start Monitoring] Execution Screen

(5) [Test]:[Test] is used when changing the parameters of the currently set module. You can change parameters by clicking the set values in the fields at the bottom of the screen.[Test] can be enabled only when the PLC running status is STOP.



[Test] Execution Screen

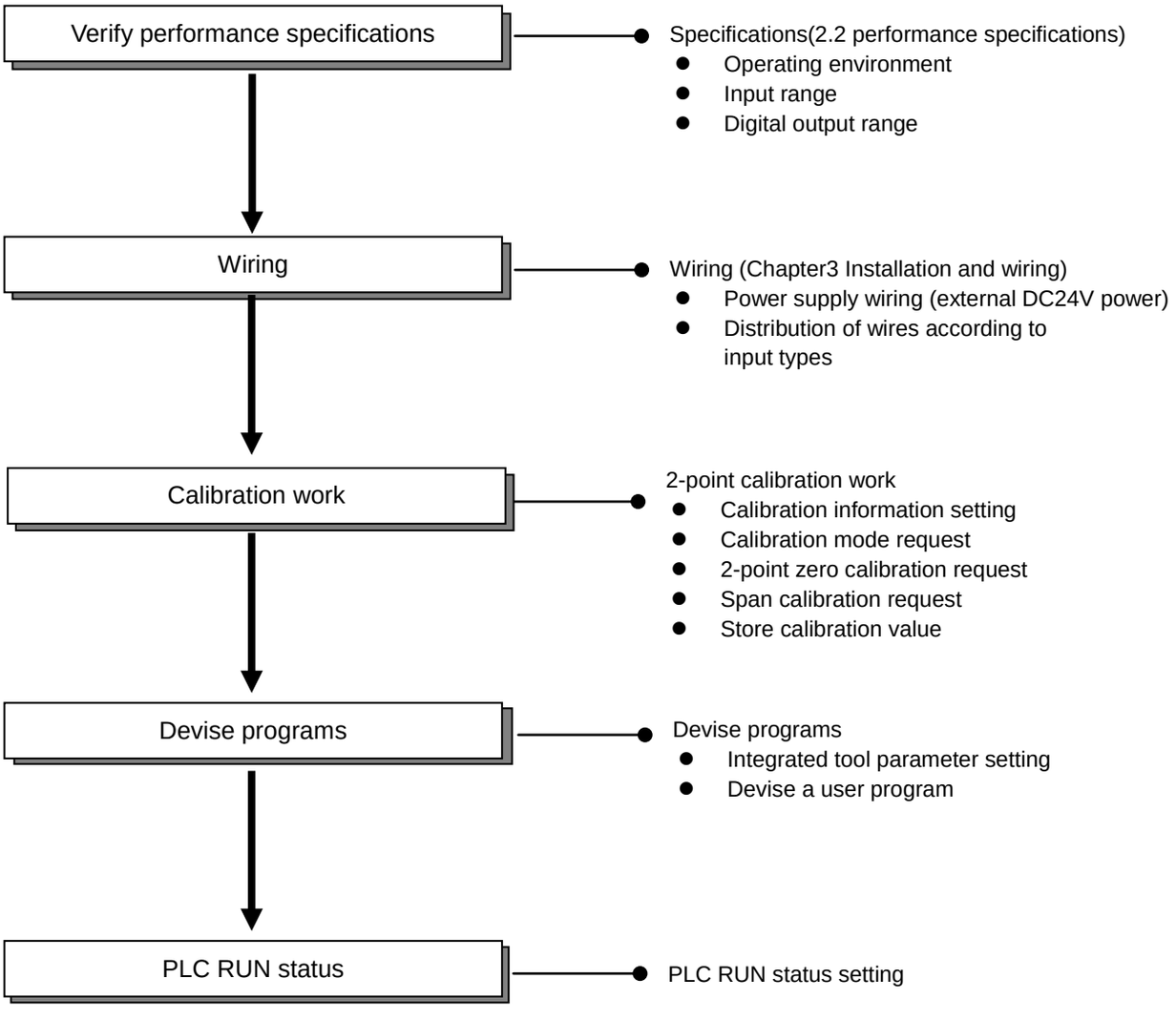
(6) Close

The [Close] button is used to exit the monitoring/test screen.

The maximum values, minimum values and current values are not stored when the monitoring/test screen is closed.

Chapter7 Programming (for XBC)

7.1 Setting procedures before running



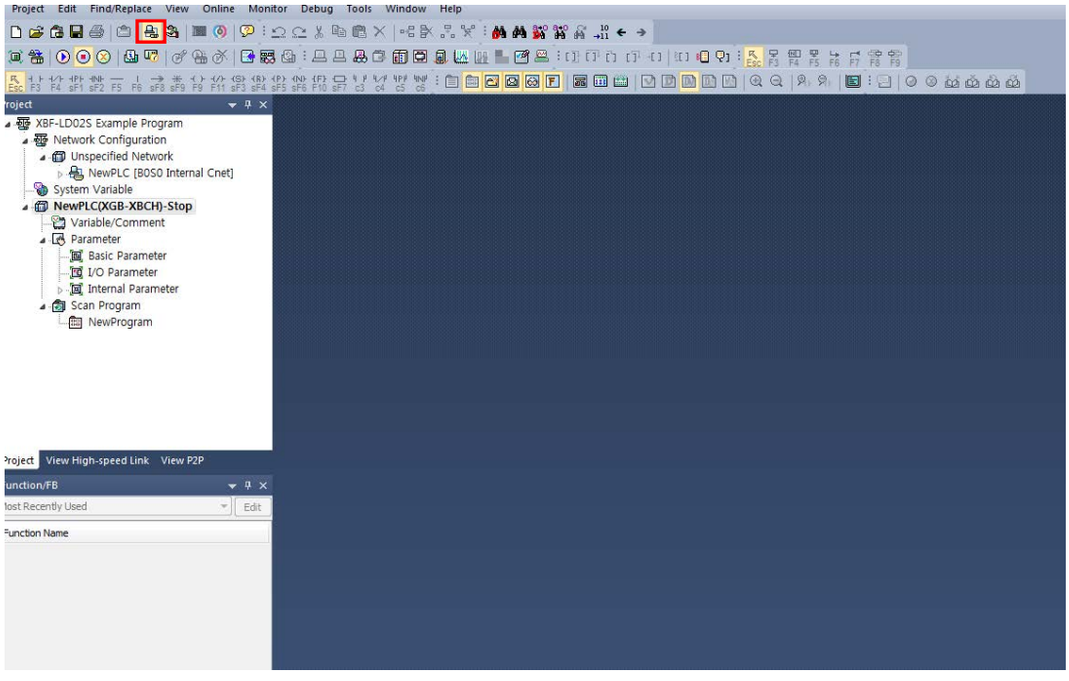
7.2 Program Example

- The example below shows mounting a load cell input module at Slot 1, and measuring the weight under the 2-point calibration mode through Channel 1.

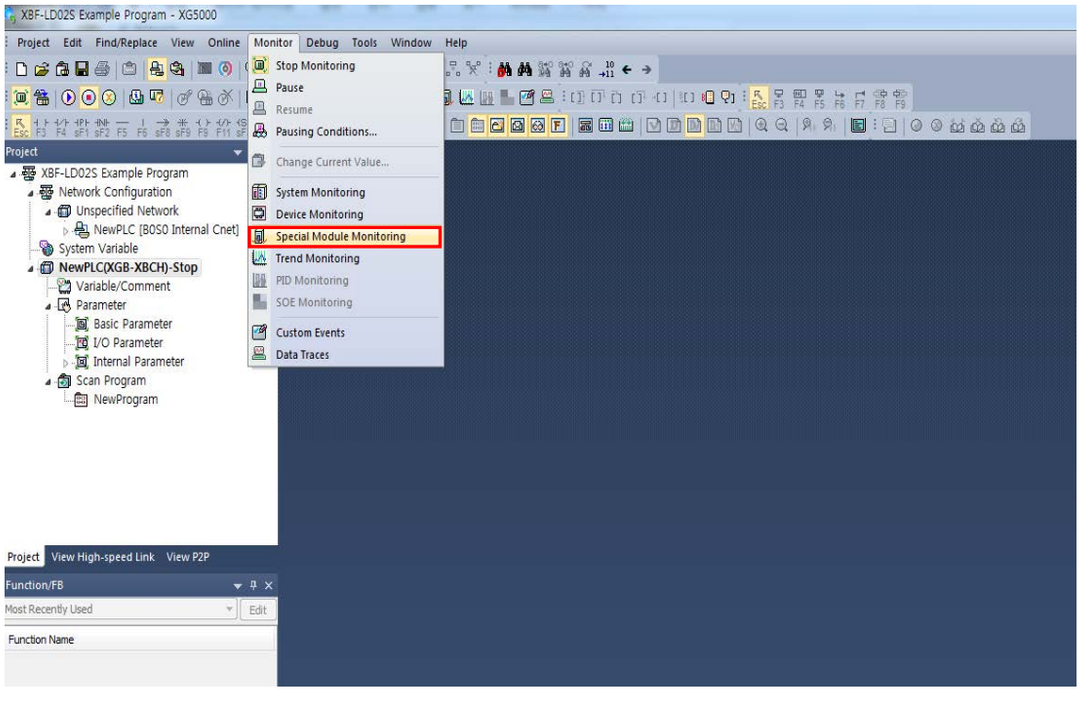
7.2.1 Calibration Setting

- This section describes how to perform calibration setting.

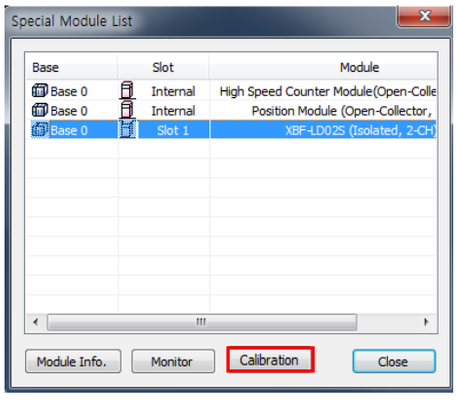
1) In the XG-5000 software, create a new project and then select [Connect].



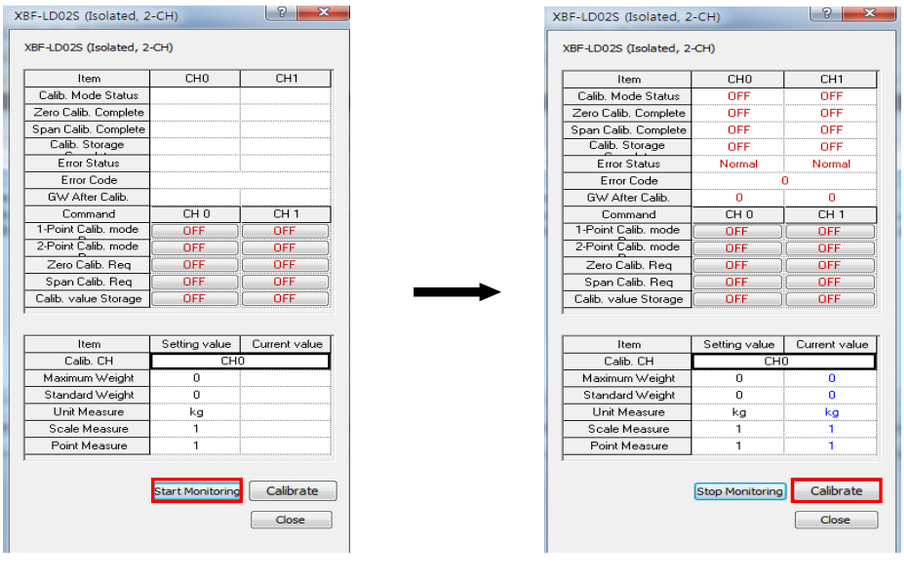
2) In the Main Menu, select [Monitor] - [Special Module Monitor].



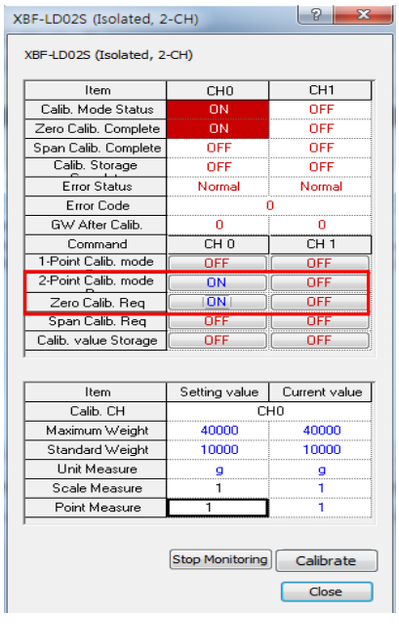
3) From the special Module List, select the Load Cell Input Module, and then select Module Calibration.



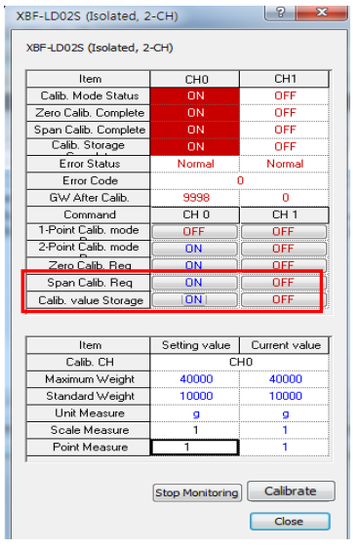
4) Run [Start Monitoring], set the maximum weight, the standard weight, the scale and the decimal point, and run calibration.



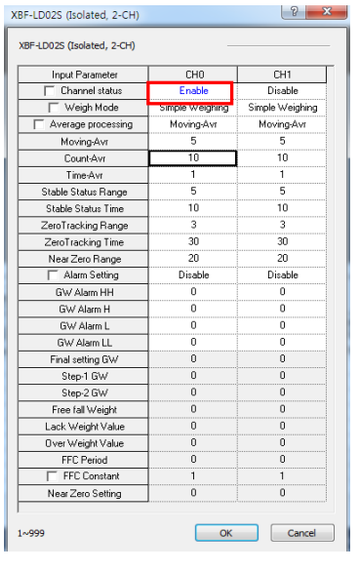
5) After the 2-point calibration mode request, perform zero calibration request.



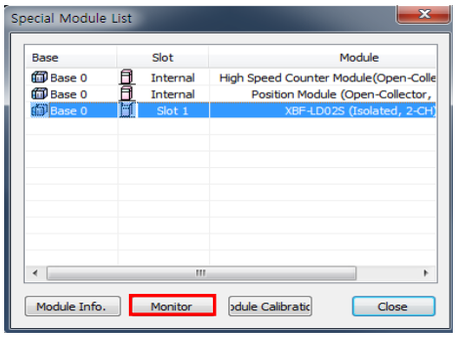
6) Place a 10kg-counterweight on the load cell, perform span calibration request, and then store the gross weight value after calibration..



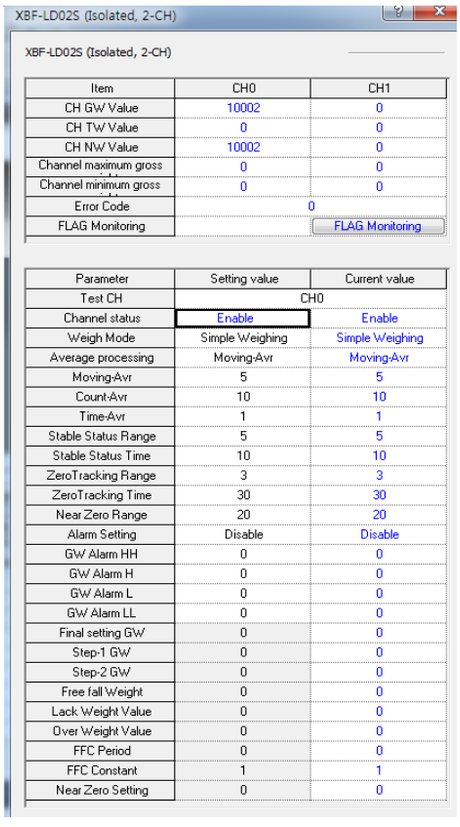
7) From the I/O Parameter on the project window, select the load cell input module, change channel 1 to running status, and then execute writing..



8) Change the PLC to RUN status, select the load cell input module on the special module monitor, and then execute monitoring.



9) Select Channel 0 and begin monitoring to convert and display the weight placed on the load cell into the preset weight value.

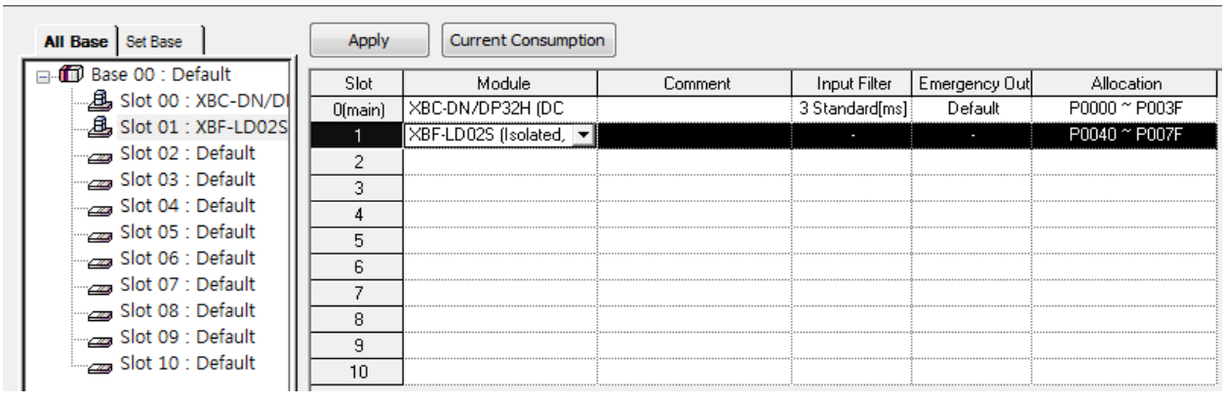


7.2.2 Automatic Registration of U Device (Module Variable)

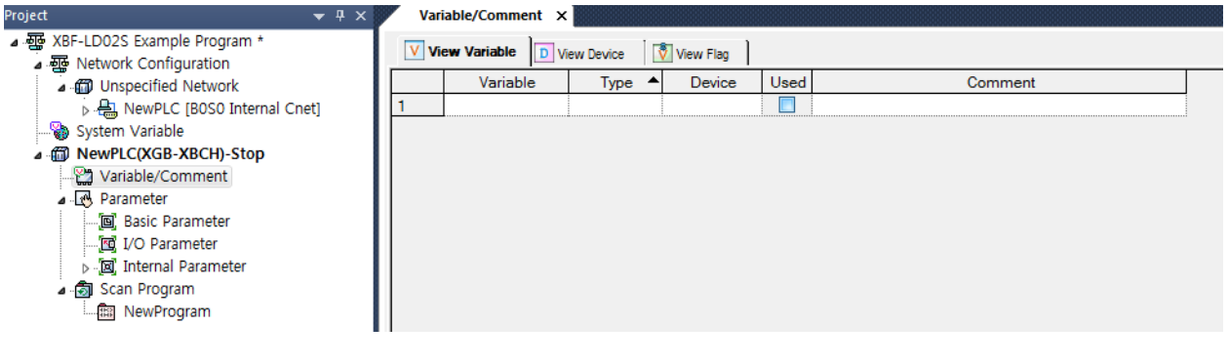
Register the variables for each module automatically by referring to the special module information set in [I/O Parameter]. A user can modify the variables or descriptions.

1) Order of Registration

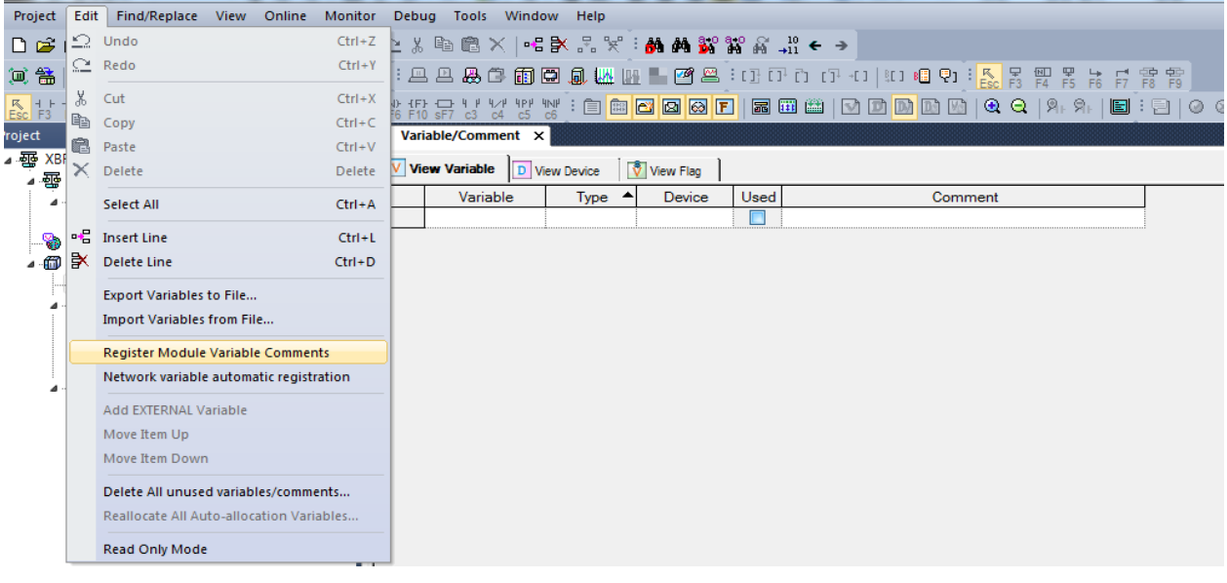
(1) In [I/O Parameter], set the Load Cell module in the slot.



(2) Double-click [Variables/Comment].

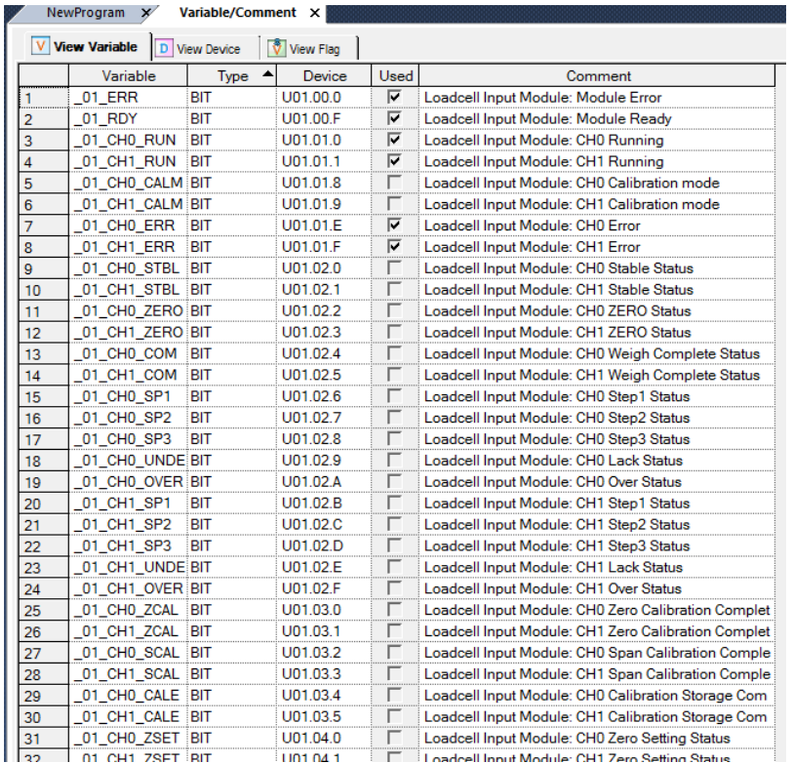


(3) In 'Edit' in the menu, select 'U Device Automatic Registration' (Register Module Variable Comments)



(4) Click 'Yes.'

(5) Variables are registered as shown below.


NewProgram | Variable/Comment

View Variable | View Device | View Flag

	Variable	Type	Device	Used	Comment
1	_01_ERR	BIT	U01.00.0	☑	Loadcell Input Module: Module Error
2	_01_RDY	BIT	U01.00.F	☑	Loadcell Input Module: Module Ready
3	_01_CH0_RUN	BIT	U01.01.0	☑	Loadcell Input Module: CH0 Running
4	_01_CH1_RUN	BIT	U01.01.1	☑	Loadcell Input Module: CH1 Running
5	_01_CH0_CALM	BIT	U01.01.8	☐	Loadcell Input Module: CH0 Calibration mode
6	_01_CH1_CALM	BIT	U01.01.9	☐	Loadcell Input Module: CH1 Calibration mode
7	_01_CH0_ERR	BIT	U01.01.E	☑	Loadcell Input Module: CH0 Error
8	_01_CH1_ERR	BIT	U01.01.F	☑	Loadcell Input Module: CH1 Error
9	_01_CH0_STBL	BIT	U01.02.0	☐	Loadcell Input Module: CH0 Stable Status
10	_01_CH1_STBL	BIT	U01.02.1	☐	Loadcell Input Module: CH1 Stable Status
11	_01_CH0_ZERO	BIT	U01.02.2	☐	Loadcell Input Module: CH0 ZERO Status
12	_01_CH1_ZERO	BIT	U01.02.3	☐	Loadcell Input Module: CH1 ZERO Status
13	_01_CH0_COM	BIT	U01.02.4	☐	Loadcell Input Module: CH0 Weigh Complete Status
14	_01_CH1_COM	BIT	U01.02.5	☐	Loadcell Input Module: CH1 Weigh Complete Status
15	_01_CH0_SP1	BIT	U01.02.6	☐	Loadcell Input Module: CH0 Step1 Status
16	_01_CH0_SP2	BIT	U01.02.7	☐	Loadcell Input Module: CH0 Step2 Status
17	_01_CH0_SP3	BIT	U01.02.8	☐	Loadcell Input Module: CH0 Step3 Status
18	_01_CH0_UNDE	BIT	U01.02.9	☐	Loadcell Input Module: CH0 Lack Status
19	_01_CH0_OVER	BIT	U01.02.A	☐	Loadcell Input Module: CH0 Over Status
20	_01_CH1_SP1	BIT	U01.02.B	☐	Loadcell Input Module: CH1 Step1 Status
21	_01_CH1_SP2	BIT	U01.02.C	☐	Loadcell Input Module: CH1 Step2 Status
22	_01_CH1_SP3	BIT	U01.02.D	☐	Loadcell Input Module: CH1 Step3 Status
23	_01_CH1_UNDE	BIT	U01.02.E	☐	Loadcell Input Module: CH1 Lack Status
24	_01_CH1_OVER	BIT	U01.02.F	☐	Loadcell Input Module: CH1 Over Status
25	_01_CH0_ZCAL	BIT	U01.03.0	☐	Loadcell Input Module: CH0 Zero Calibration Complet
26	_01_CH1_ZCAL	BIT	U01.03.1	☐	Loadcell Input Module: CH1 Zero Calibration Complet
27	_01_CH0_SCAL	BIT	U01.03.2	☐	Loadcell Input Module: CH0 Span Calibration Comple
28	_01_CH1_SCAL	BIT	U01.03.3	☐	Loadcell Input Module: CH1 Span Calibration Comple
29	_01_CH0_CALE	BIT	U01.03.4	☐	Loadcell Input Module: CH0 Calibration Storage Com
30	_01_CH1_CALE	BIT	U01.03.5	☐	Loadcell Input Module: CH1 Calibration Storage Com
31	_01_CH0_ZSET	BIT	U01.04.0	☐	Loadcell Input Module: CH0 Zero Setting Status
32	_01_CH1_ZSET	BIT	U01.04.1	☐	Loadcell Input Module: CH1 Zero Setting Status

2) Store variables

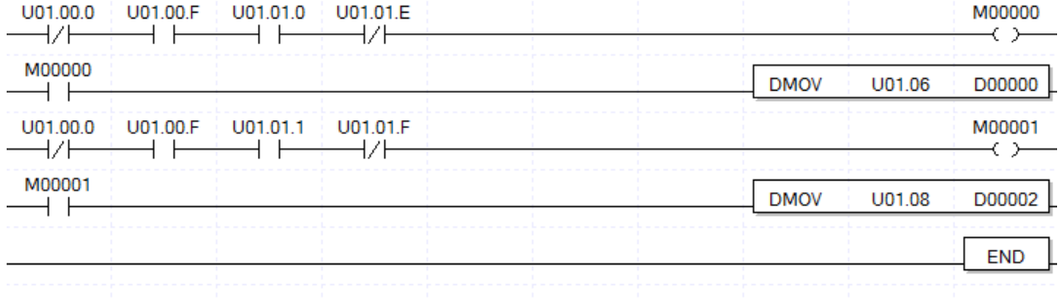
(1) The texts in the 'View Variables' tab can be stored in text files.

(2) In 'Edit' in the menu, click 'Export to Text File.'

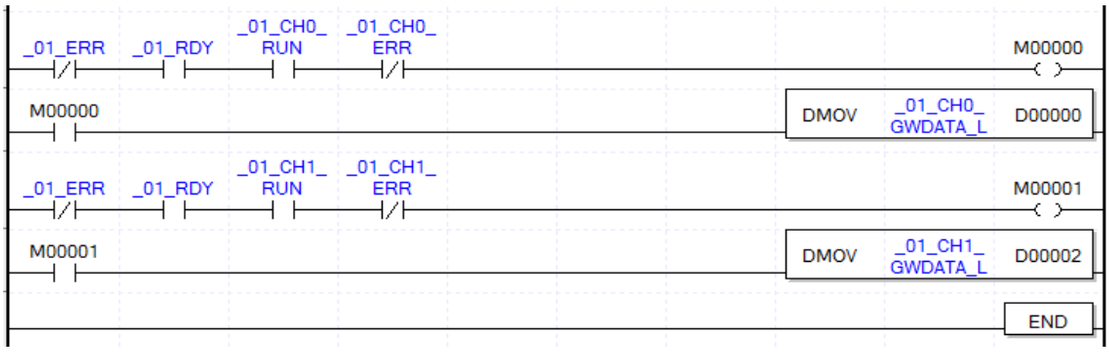
(3) The texts in the 'View Variables' tab are stored in text files.

3) View Variables in the Program

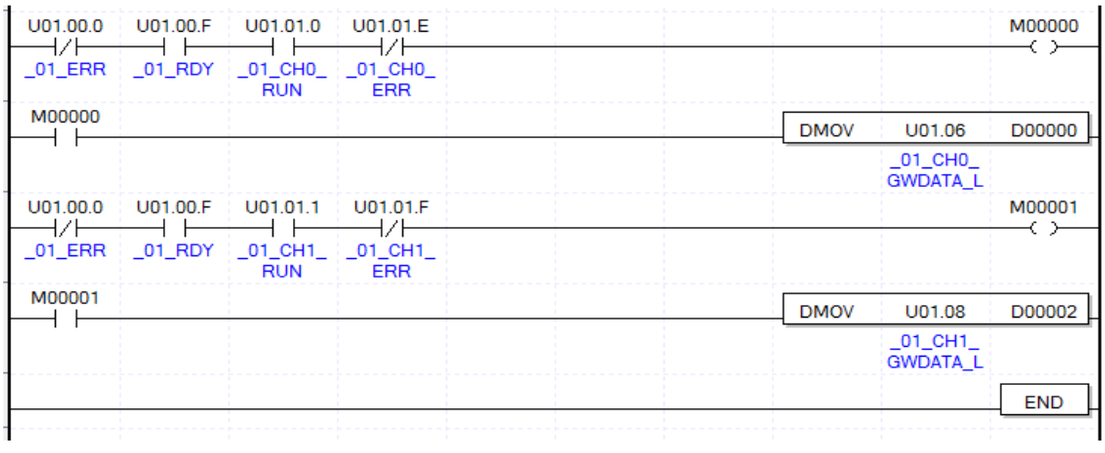
(1) The XG5000 example program is as follows.



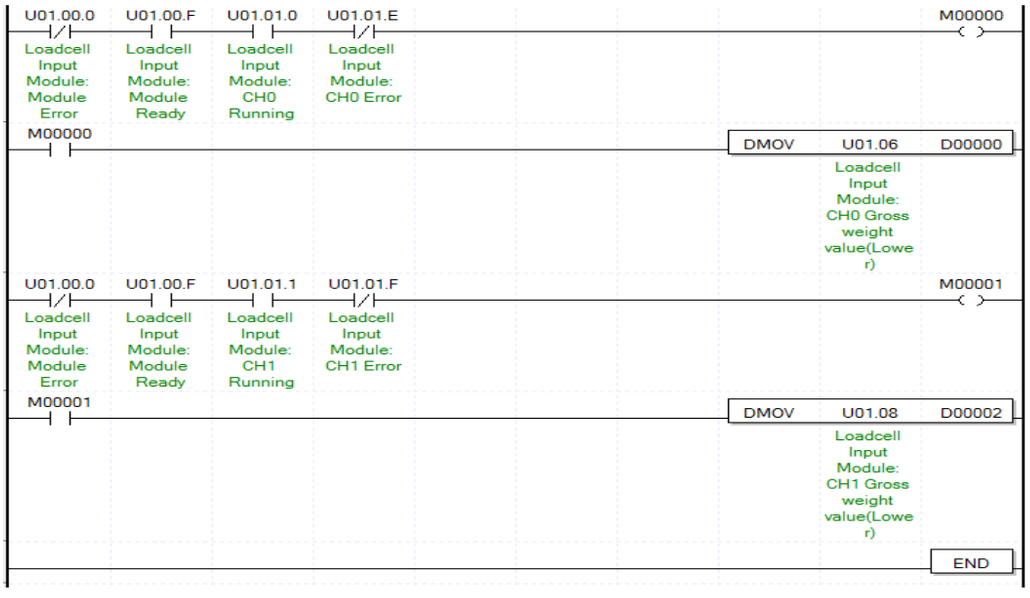
(2) At 'View' in the menu, click 'View Variables. ‘The devices are changed to variables.



(3) At 'View' in the menu, click 'View Devices/Variables ‘You can view both devices and variables.

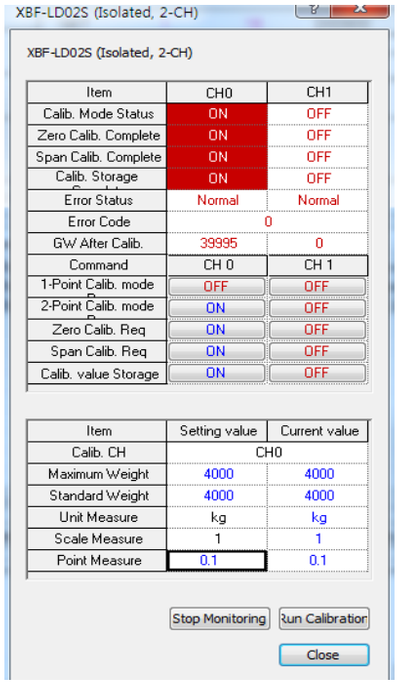


(4) At 'View' in the menu, click 'View Devices/Descriptions.' You can view both devices and descriptions.

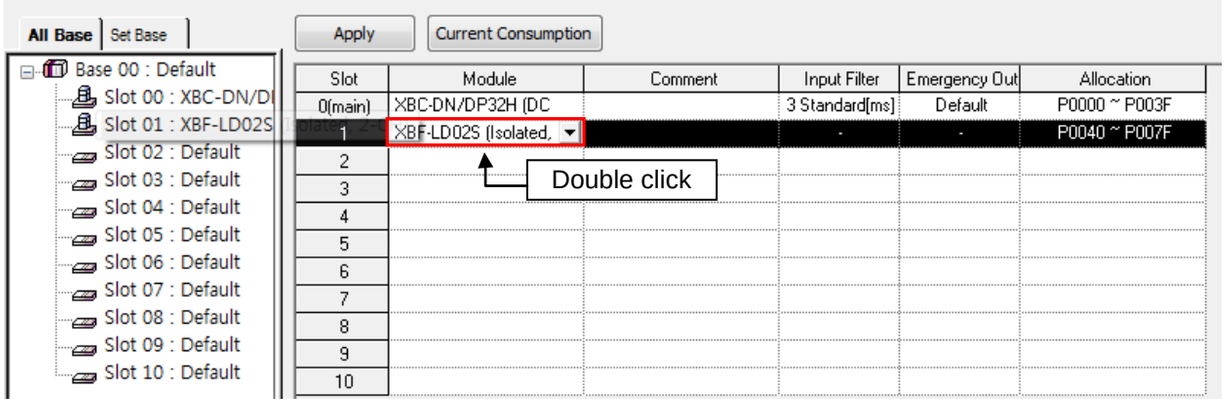


7.2.3 Weight Measurement Example

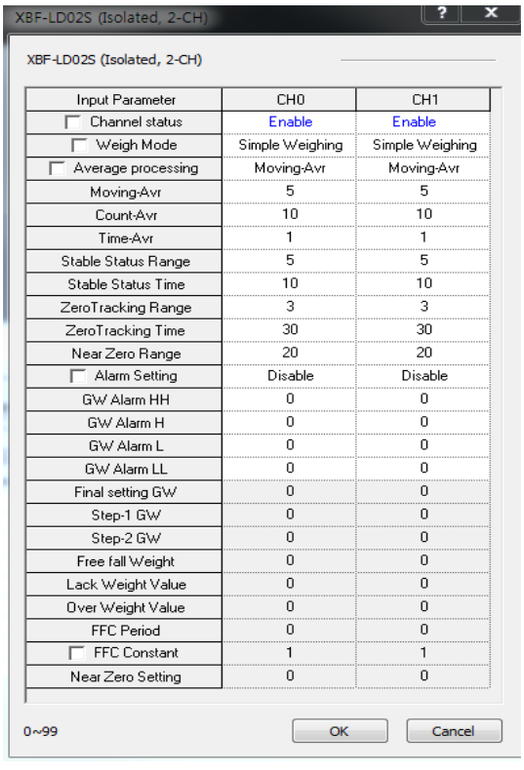
This example shows a program which reads the weight from the ladder program when maximum weight is 4,000kg and the decimal point is 0.1, this program



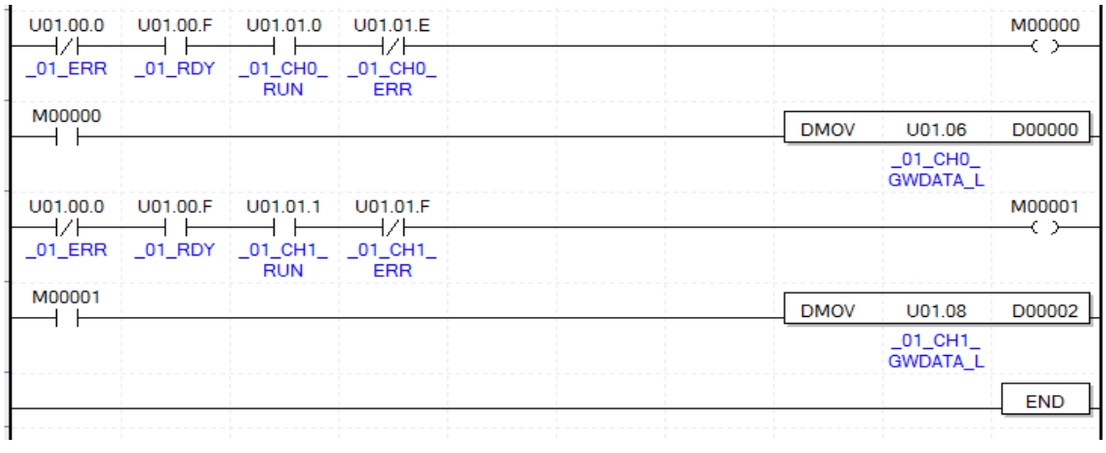
1) Go to [Monitor] - [Special Module Monitor] of XG5000. From the special Module List, select the Load Cell Input Module, and then select Calibrate Module.
2) Set the maximum weight at 4,000kg, and the decimal point at 0.1 to run calibration.
3) At I/O Parameter, double click the module name to open the parameter setting window.



4) In the setting window, set Channel 0 as running and enable simple weighing.
5) In the setting window, set Channel 1 as running and enable simple weighing.



6) Weight Measurement Program example



(1) If the module is running normally and there is no error in Channel 0, M00000 is on.
U01.00.0(Module Error) = Off
U01.00.F(Module Ready) = On
U01.01.0(Input Channel 0 in Operation) = On
U01.01.E(Input Channel 0 Error) = Off

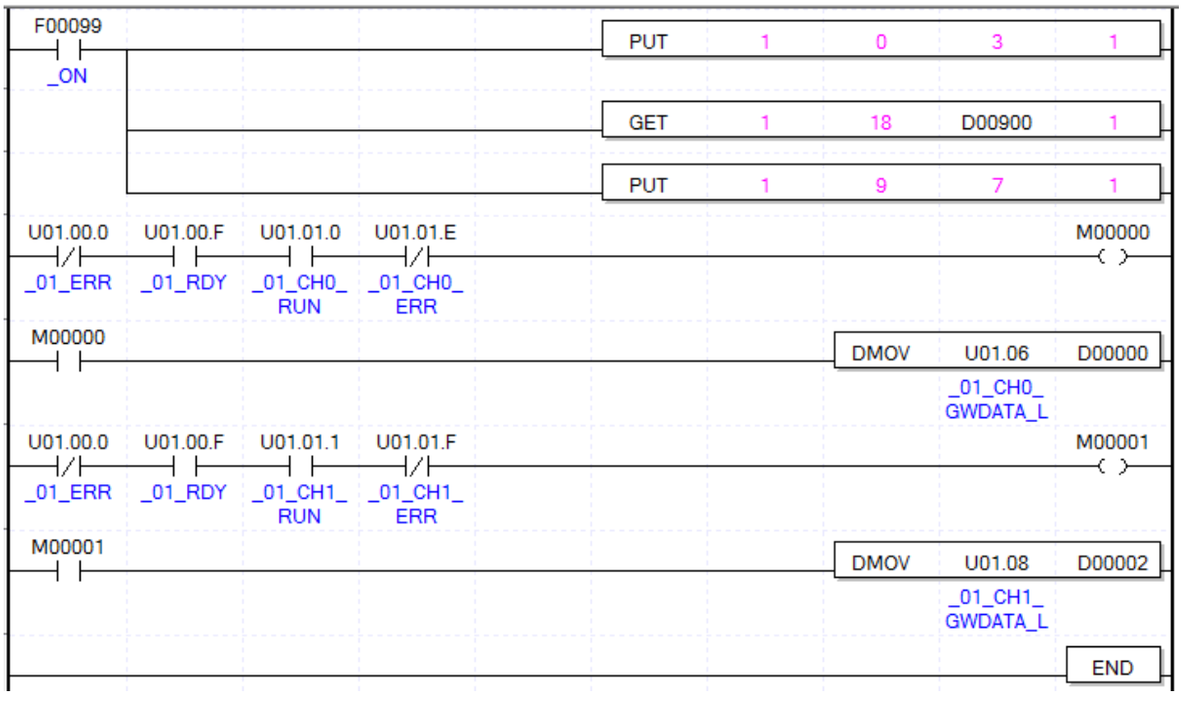
(2) When M00000 is On, the weight value (U01.06) of Channel 0 is moved to D00000.

(3) If the module is running normally and there is no error in Channel 1, M00001 is on.
U01.00.0(Module Error) = Off
U01.00.F(Module Ready) = On
U01.01.1(Input Channel 0 in Operation) = On
U01.01.F(Input Channel 0 Error) = Off

(4) When M00001 is on, the weight value (U01.08) of Channel 1 is moved to D00002.

7.2.4. Using PUT/GET Command

1) Input Program Example



(1) Use the PUT command to write '3' in the Address 0 of Slot 1 to operate Channel 0 and Channel1.
(2) Use the GET command to store the zero tracking range of Slot 1 to D00900.
(3) Use the PUT command to input '7' in Address 9 of Slot 1 to set the moving average value at 7.
(4) If the module is runing normally and there is no error in Channel 0, M00000 is on.
U01.00.0(Module Error) = Off
U01.00.F(Module Ready) = On
U01.01.0(Input Channel 0 in Operation) = On
U01.01.E(Input Channel 0 Error) = Off

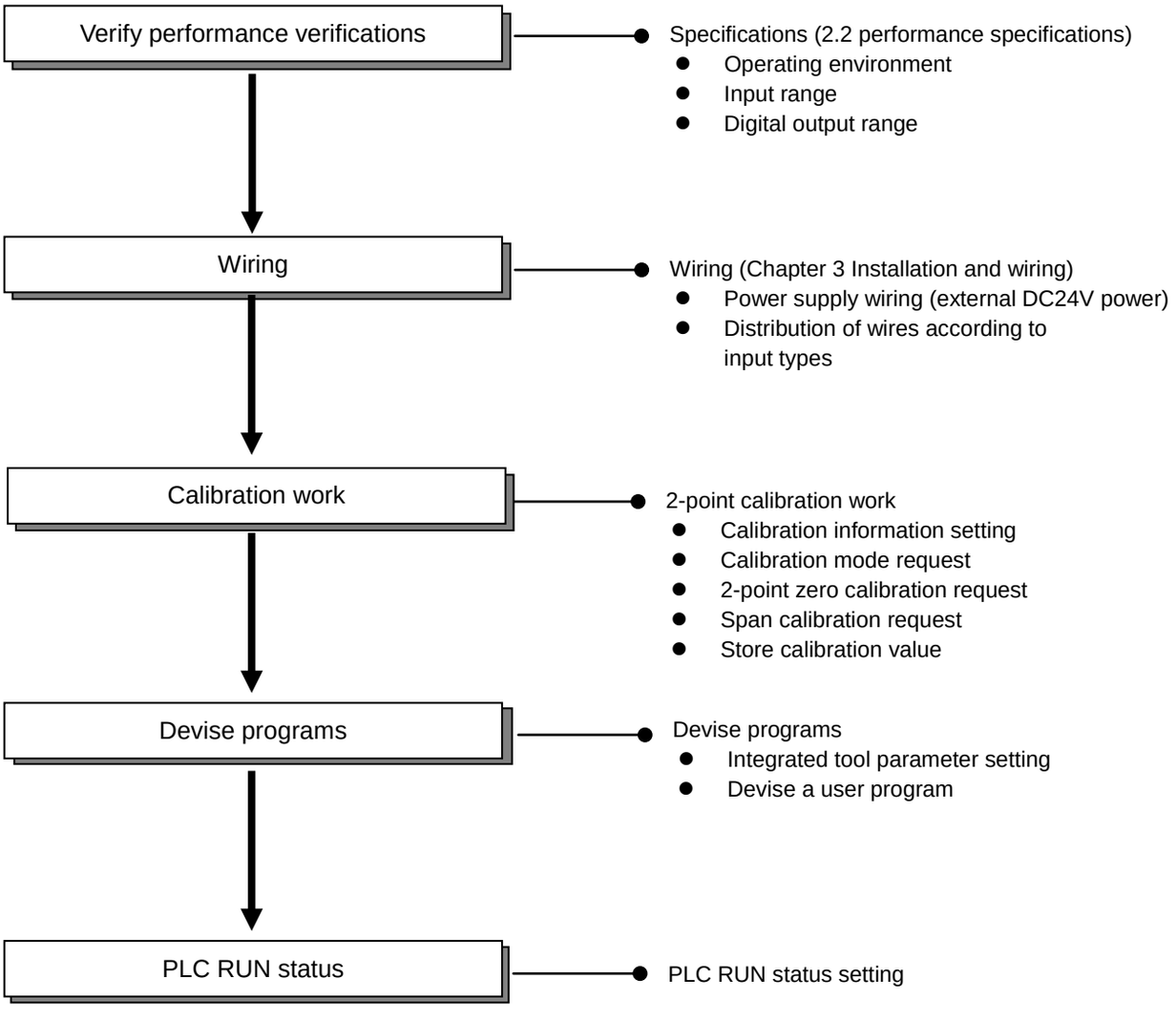
(5) When M00001 is on, the weight value (U01.06) of Channel 0 is moved to D00000.

(6) If the module is running normally and there is no error in Channel 1, M00001 is on.
U01.00.0(Module Error) = Off
U01.00.F(Module Ready) = On
U01.01.1(Input Channel 0 in Operation) = On
U01.01.F(Input Channel 0 Error) = Off

(7) When M00001 is On, the weight value (U01.08) of Channel 0 is moved to D000002.

Chapter8 Programming (for XEC)

8.1 Setting procedures before running



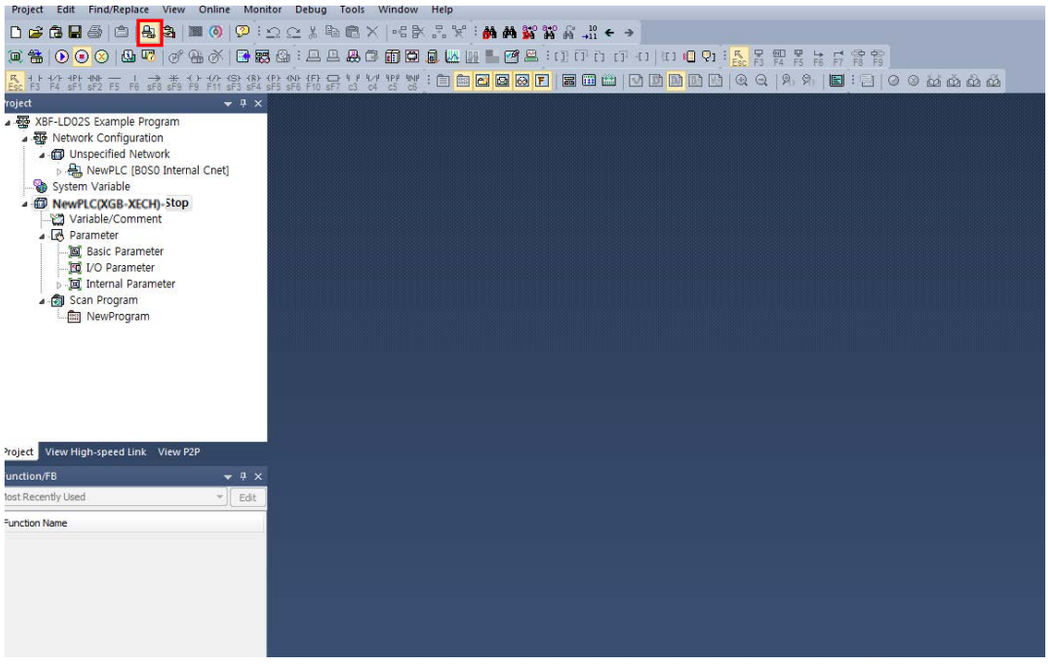
8.2 Program Example

- The example below shows mounting a load cell input module at Slot 1, and measuring the weight under the 2-point calibration mode through Channel 1.

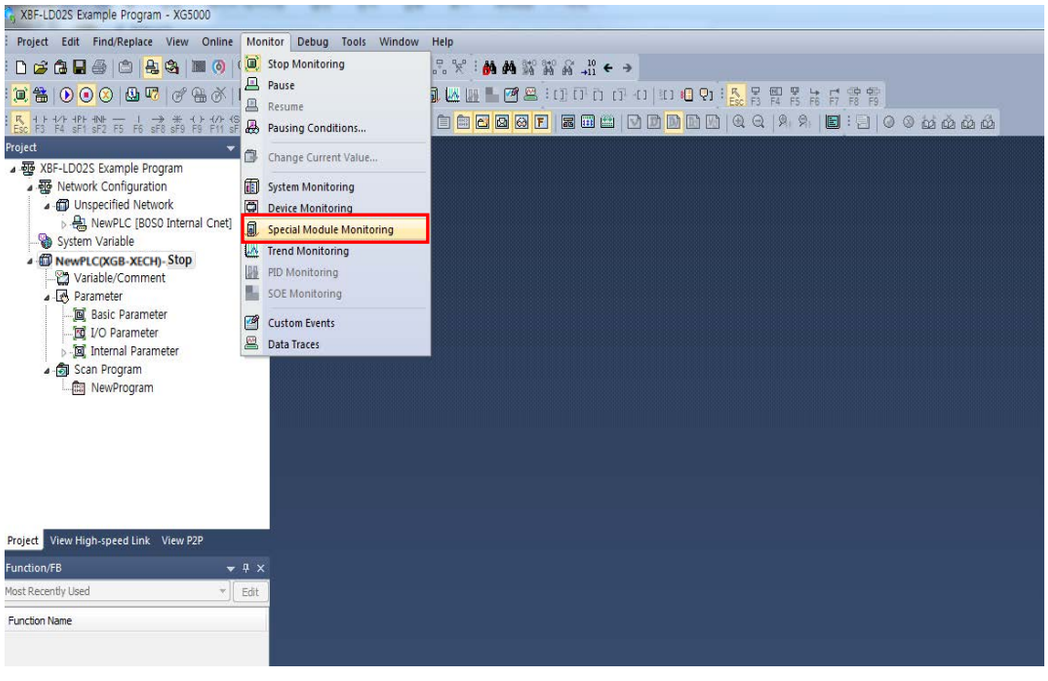
8.2.1 Calibration Setting

- This section describes how to perform calibration setting.

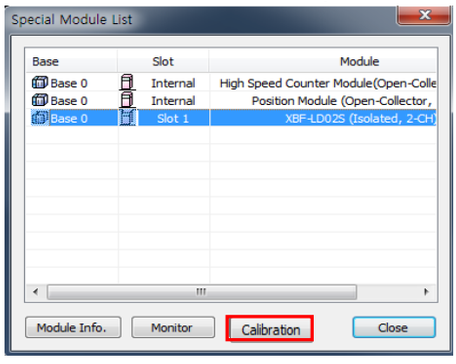
1) In the XG-5000 software, create a new project and then select [Connect].



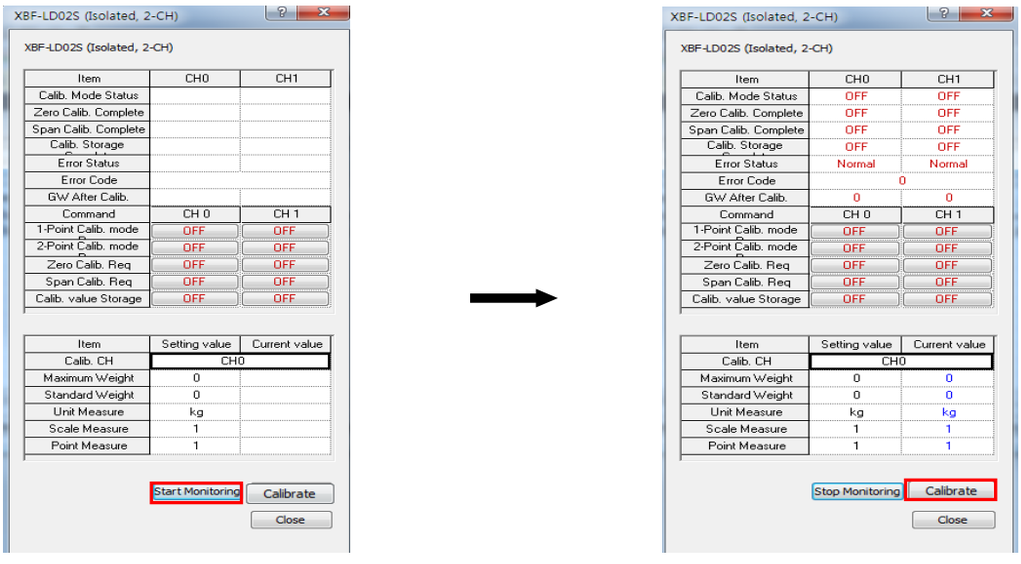
2) In the Main Menu, select [Monitor] - [Special Module Monitor].



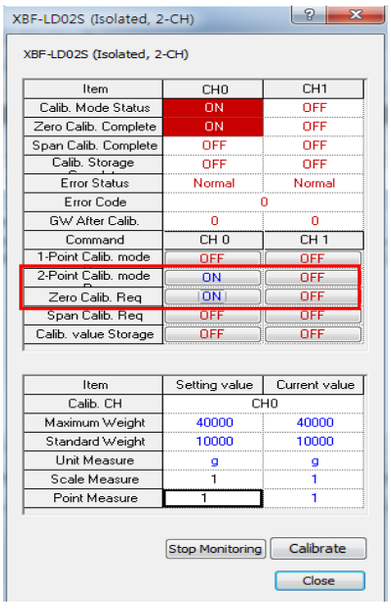
3) From the special Module List, select the Load Cell Input Module, and then select Calibration.



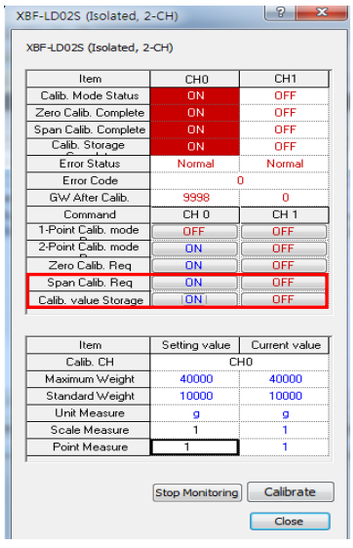
4) Run [Start Monitoring], set the maximum weight, the standard weight, the scale and the decimal point, and calibrate.



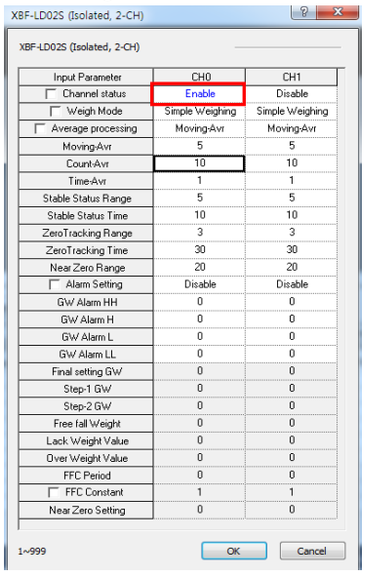
5) After the 2-point calibration mode request, perform zero calibration request.



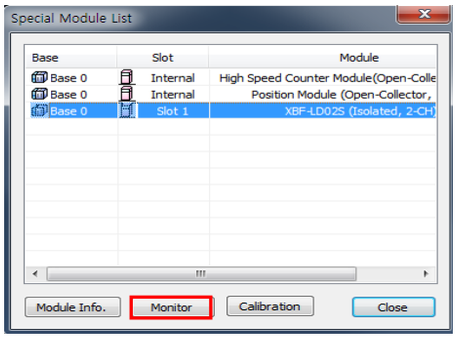
6) Place a 10kg-counterweight on the load cell, perform span calibration request, and then store the gross weight value after calibration.



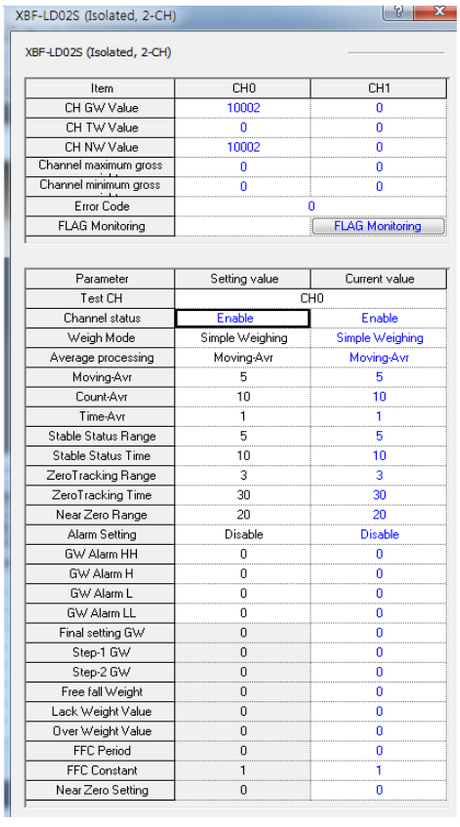
7) From the I/O Parameter on the project window, select the load cell input module, change Channel 1 to running status, and then execute writing..



8) Change the PLC to RUN status, select the load cell input module on the special module monitor, and then execute monitoring.



9) Select Channel 1 and begin monitoring to convert and display the weight placed on the load cell into the preset weight value.

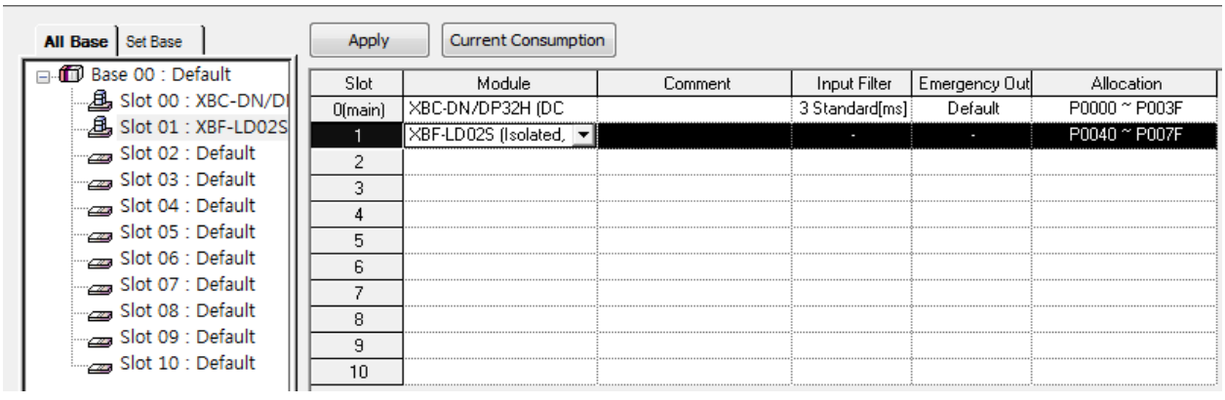


8.2.2 Automatic Registration of U device(Module Variable)

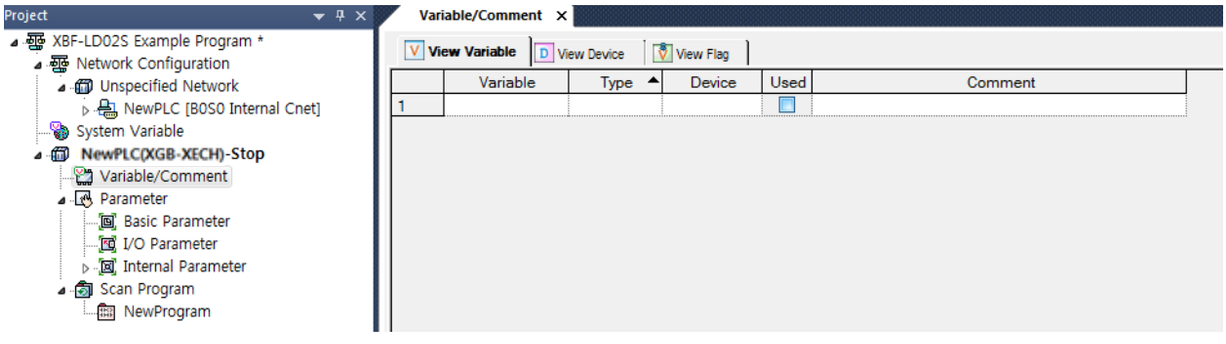
Register the variables for each module automatically by referring to the special module information set in [I/O Parameter]. A user can modify the variables or descriptions.

1) Order of Registration

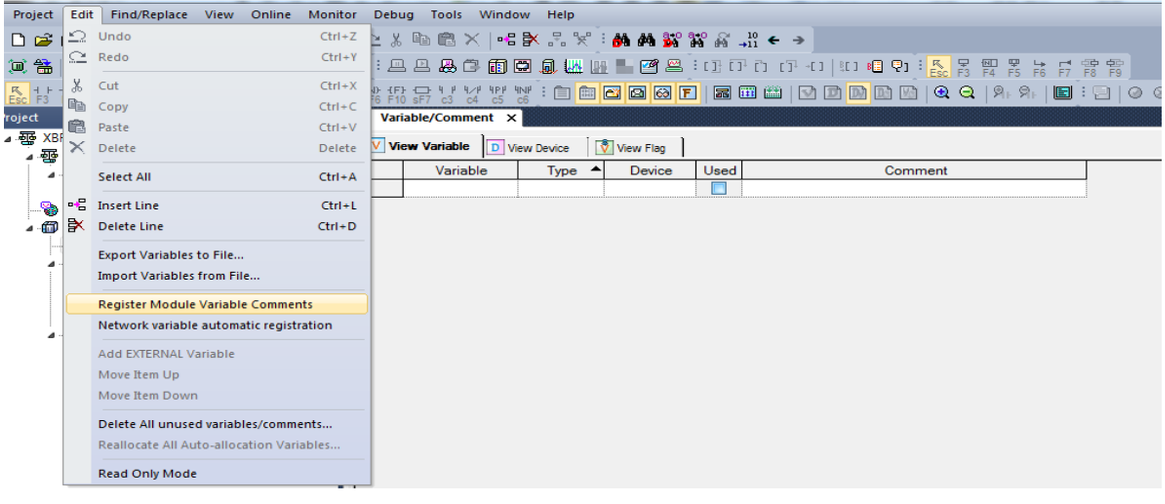
(1) In [I/O Parameter], set the Load Cell module in the slot.



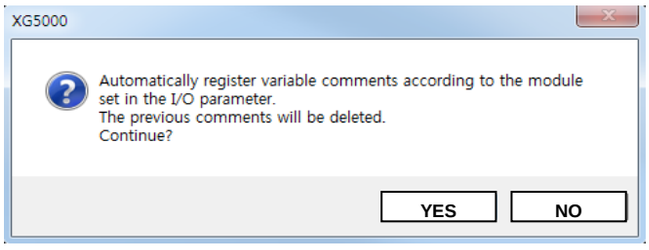
(2) Double-click [Global/Direct Variables].



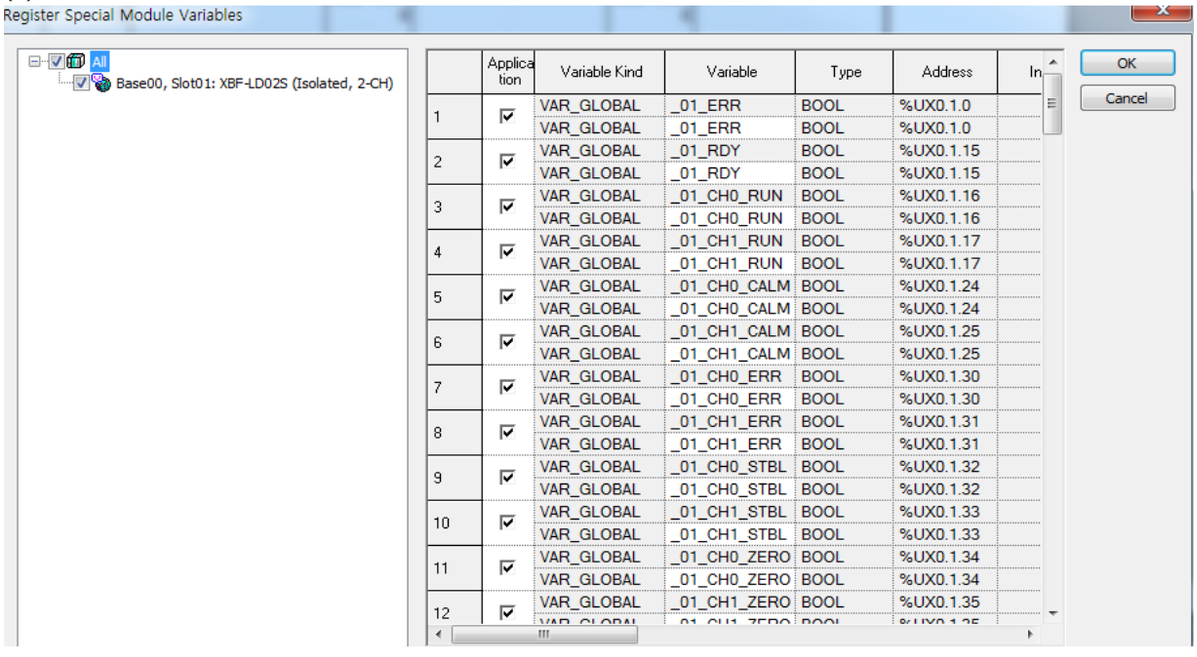
(3) In 'Edit' in the menu, select 'U Device Automatic Registration' (Special Module Variable Automatic Registration)



(4) Click 'Yes.'

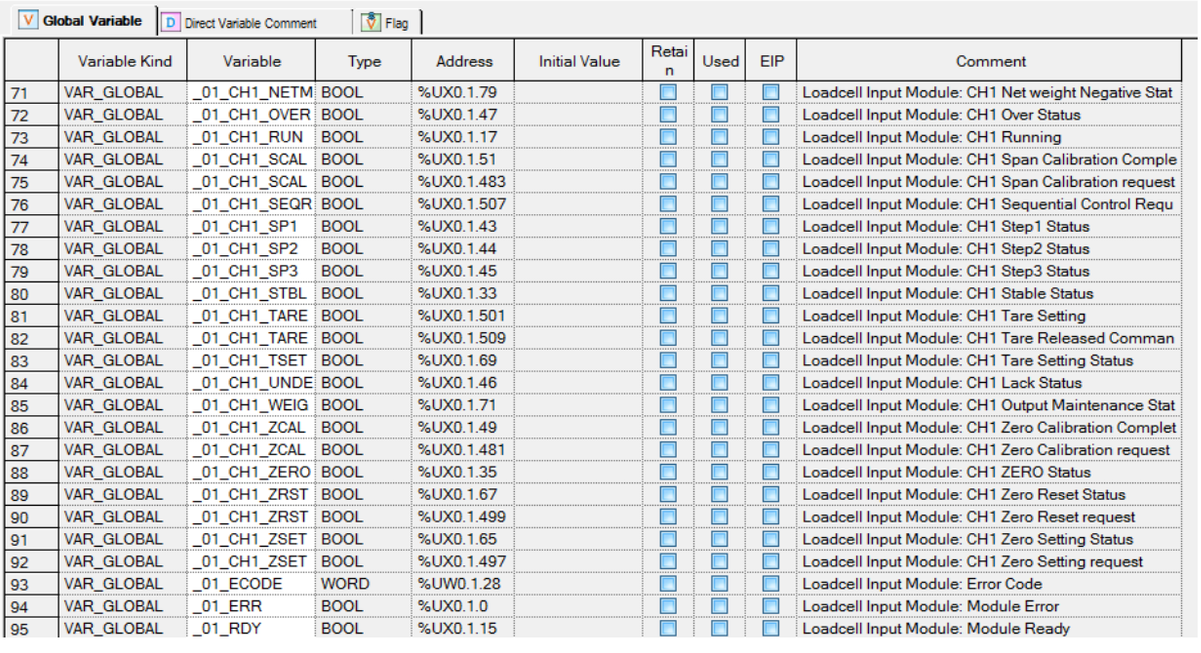


(5) Click 'OK.'



	Application	Variable Kind	Variable	Type	Address	In
1	☑	VAR_GLOBAL	_01_ERR	BOOL	%UX0.1.0	
		VAR_GLOBAL	_01_ERR	BOOL	%UX0.1.0	
2	☑	VAR_GLOBAL	_01_RDY	BOOL	%UX0.1.15	
		VAR_GLOBAL	_01_RDY	BOOL	%UX0.1.15	
3	☑	VAR_GLOBAL	_01_CH0_RUN	BOOL	%UX0.1.16	
		VAR_GLOBAL	_01_CH0_RUN	BOOL	%UX0.1.16	
4	☑	VAR_GLOBAL	_01_CH1_RUN	BOOL	%UX0.1.17	
		VAR_GLOBAL	_01_CH1_RUN	BOOL	%UX0.1.17	
5	☑	VAR_GLOBAL	_01_CH0_CALM	BOOL	%UX0.1.24	
		VAR_GLOBAL	_01_CH0_CALM	BOOL	%UX0.1.24	
6	☑	VAR_GLOBAL	_01_CH1_CALM	BOOL	%UX0.1.25	
		VAR_GLOBAL	_01_CH1_CALM	BOOL	%UX0.1.25	
7	☑	VAR_GLOBAL	_01_CH0_ERR	BOOL	%UX0.1.30	
		VAR_GLOBAL	_01_CH0_ERR	BOOL	%UX0.1.30	
8	☑	VAR_GLOBAL	_01_CH1_ERR	BOOL	%UX0.1.31	
		VAR_GLOBAL	_01_CH1_ERR	BOOL	%UX0.1.31	
9	☑	VAR_GLOBAL	_01_CH0_STBL	BOOL	%UX0.1.32	
		VAR_GLOBAL	_01_CH0_STBL	BOOL	%UX0.1.32	
10	☑	VAR_GLOBAL	_01_CH1_STBL	BOOL	%UX0.1.33	
		VAR_GLOBAL	_01_CH1_STBL	BOOL	%UX0.1.33	
11	☑	VAR_GLOBAL	_01_CH0_ZERO	BOOL	%UX0.1.34	
		VAR_GLOBAL	_01_CH0_ZERO	BOOL	%UX0.1.34	
12	☑	VAR_GLOBAL	_01_CH1_ZERO	BOOL	%UX0.1.35	

(6) Variables are registered as shown below.



	Variable Kind	Variable	Type	Address	Initial Value	Retain	Used	EIP	Comment
71	VAR_GLOBAL	_01_CH1_NETM	BOOL	%UX0.1.79		☐	☐	☐	Loadcell Input Module: CH1 Net weight Negative Stat
72	VAR_GLOBAL	_01_CH1_OVER	BOOL	%UX0.1.47		☐	☐	☐	Loadcell Input Module: CH1 Over Status
73	VAR_GLOBAL	_01_CH1_RUN	BOOL	%UX0.1.17		☐	☐	☐	Loadcell Input Module: CH1 Running
74	VAR_GLOBAL	_01_CH1_SCAL	BOOL	%UX0.1.51		☐	☐	☐	Loadcell Input Module: CH1 Span Calibration Comple
75	VAR_GLOBAL	_01_CH1_SCAL	BOOL	%UX0.1.483		☐	☐	☐	Loadcell Input Module: CH1 Span Calibration request
76	VAR_GLOBAL	_01_CH1_SEQR	BOOL	%UX0.1.507		☐	☐	☐	Loadcell Input Module: CH1 Sequential Control Requ
77	VAR_GLOBAL	_01_CH1_SP1	BOOL	%UX0.1.43		☐	☐	☐	Loadcell Input Module: CH1 Step1 Status
78	VAR_GLOBAL	_01_CH1_SP2	BOOL	%UX0.1.44		☐	☐	☐	Loadcell Input Module: CH1 Step2 Status
79	VAR_GLOBAL	_01_CH1_SP3	BOOL	%UX0.1.45		☐	☐	☐	Loadcell Input Module: CH1 Step3 Status
80	VAR_GLOBAL	_01_CH1_STBL	BOOL	%UX0.1.33		☐	☐	☐	Loadcell Input Module: CH1 Stable Status
81	VAR_GLOBAL	_01_CH1_TARE	BOOL	%UX0.1.501		☐	☐	☐	Loadcell Input Module: CH1 Tare Setting
82	VAR_GLOBAL	_01_CH1_TARE	BOOL	%UX0.1.509		☐	☐	☐	Loadcell Input Module: CH1 Tare Released Comman
83	VAR_GLOBAL	_01_CH1_TSET	BOOL	%UX0.1.69		☐	☐	☐	Loadcell Input Module: CH1 Tare Setting Status
84	VAR_GLOBAL	_01_CH1_UNDE	BOOL	%UX0.1.46		☐	☐	☐	Loadcell Input Module: CH1 Lack Status
85	VAR_GLOBAL	_01_CH1_WEIG	BOOL	%UX0.1.71		☐	☐	☐	Loadcell Input Module: CH1 Output Maintenance Stat
86	VAR_GLOBAL	_01_CH1_ZCAL	BOOL	%UX0.1.49		☐	☐	☐	Loadcell Input Module: CH1 Zero Calibration Complet
87	VAR_GLOBAL	_01_CH1_ZCAL	BOOL	%UX0.1.481		☐	☐	☐	Loadcell Input Module: CH1 Zero Calibration request
88	VAR_GLOBAL	_01_CH1_ZERO	BOOL	%UX0.1.35		☐	☐	☐	Loadcell Input Module: CH1 ZERO Status
89	VAR_GLOBAL	_01_CH1_ZRST	BOOL	%UX0.1.67		☐	☐	☐	Loadcell Input Module: CH1 Zero Reset Status
90	VAR_GLOBAL	_01_CH1_ZRST	BOOL	%UX0.1.499		☐	☐	☐	Loadcell Input Module: CH1 Zero Reset request
91	VAR_GLOBAL	_01_CH1_ZSET	BOOL	%UX0.1.65		☐	☐	☐	Loadcell Input Module: CH1 Zero Setting Status
92	VAR_GLOBAL	_01_CH1_ZSET	BOOL	%UX0.1.497		☐	☐	☐	Loadcell Input Module: CH1 Zero Setting request
93	VAR_GLOBAL	_01_ECODE	WORD	%UW0.1.28		☐	☐	☐	Loadcell Input Module: Error Code
94	VAR_GLOBAL	_01_ERR	BOOL	%UX0.1.0		☐	☐	☐	Loadcell Input Module: Module Error
95	VAR_GLOBAL	_01_RDY	BOOL	%UX0.1.15		☐	☐	☐	Loadcell Input Module: Module Ready

2) Variables Save

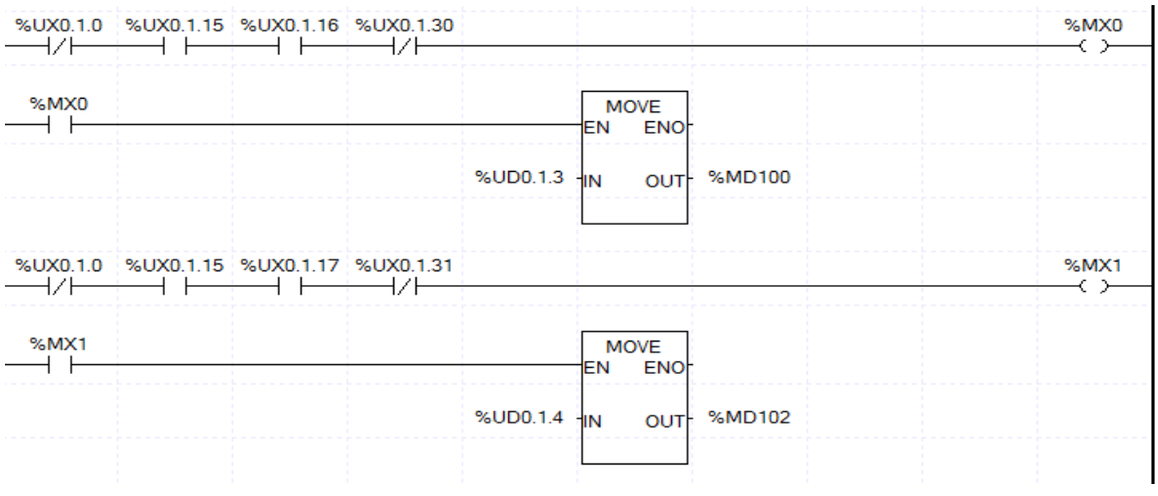
(1) The texts in the 'View Variables' tab can be stored in text files.

(2) In 'Edit' in the menu, click 'Export to Text File.'

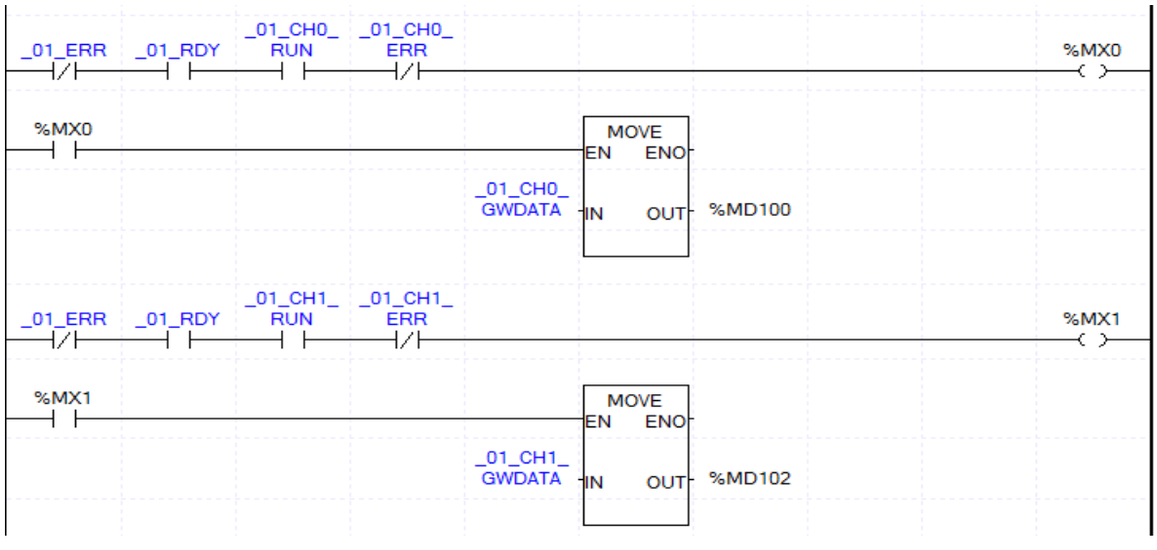
(3) The texts in the 'View Variables' tab are stored in text files.

3) View Variables in the Program

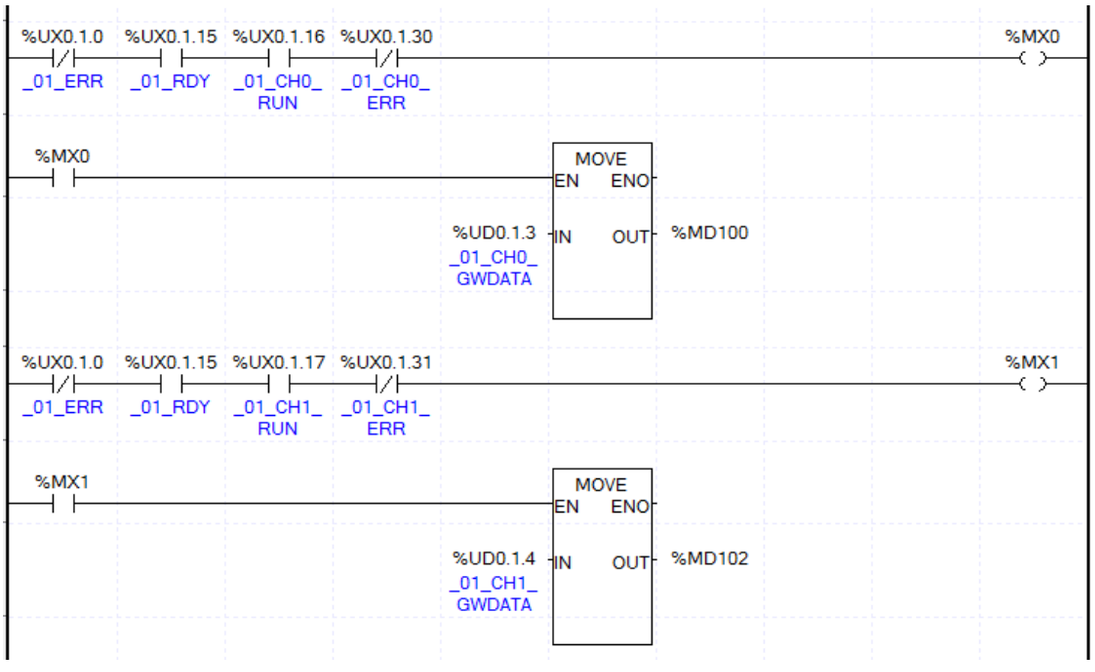
(1) The XG5000 example program is as follows.



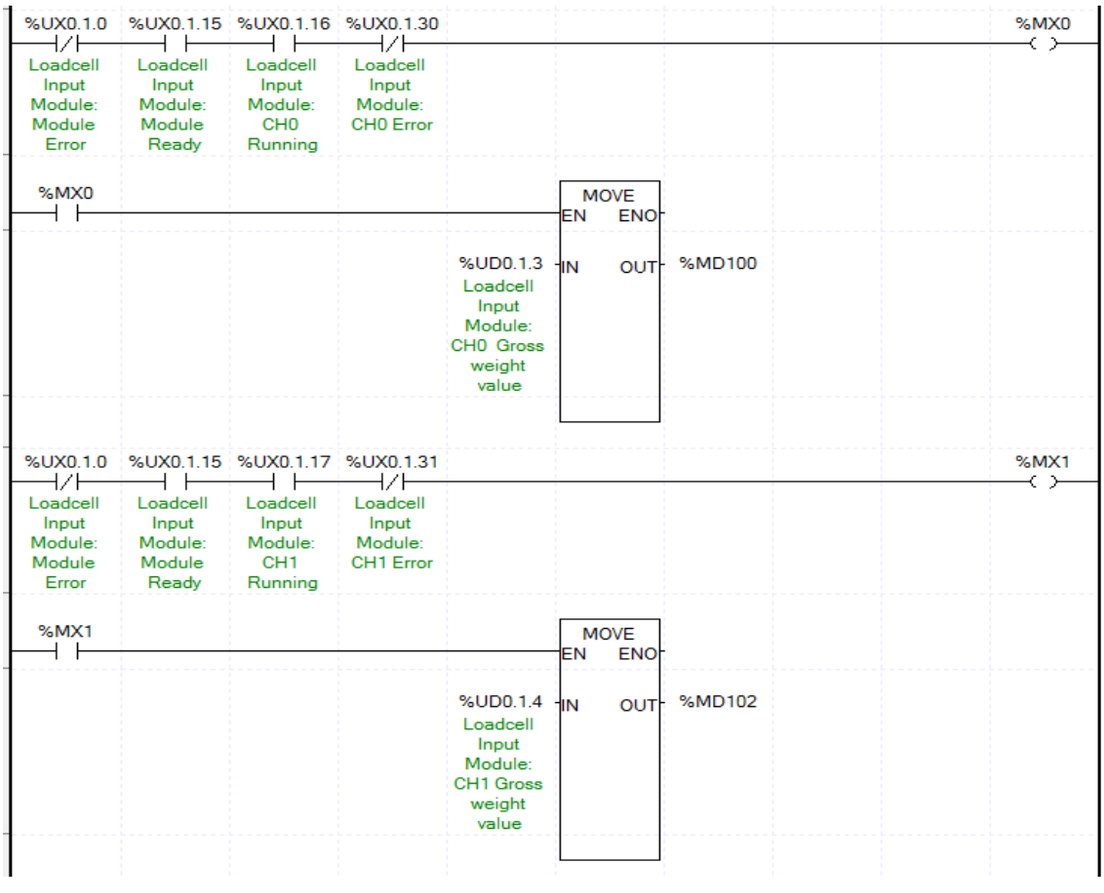
(2) At 'View' in the menu, click 'View Variables.' The devices are changed to variables.



(3) At 'View' in the menu, click 'View Devices/Variables'. You can view both devices and descriptions.

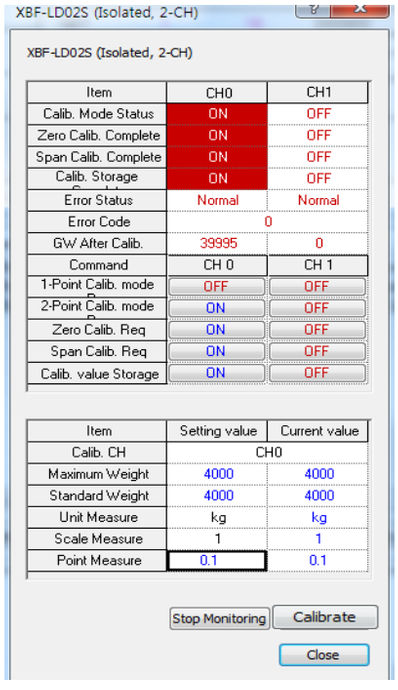


(4) At 'View' in the menu, click 'View Devices/Comments.' You can view both devices and descriptions.



8.2.3 Weight Measurement Example

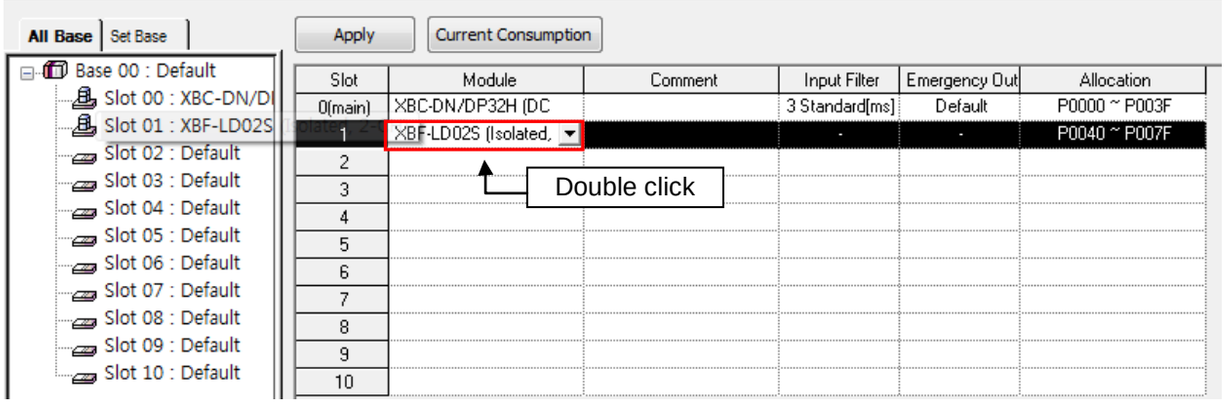
This example shows a program which reads the weight from the ladder program when maximum weight is 4,000kg and the decimal point is 0.1.



1) Go to [Monitor] - [Special Module Monitor] of XG5000. From the special Module List, select the Load Cell Input Module, and then select Calibrate Module.

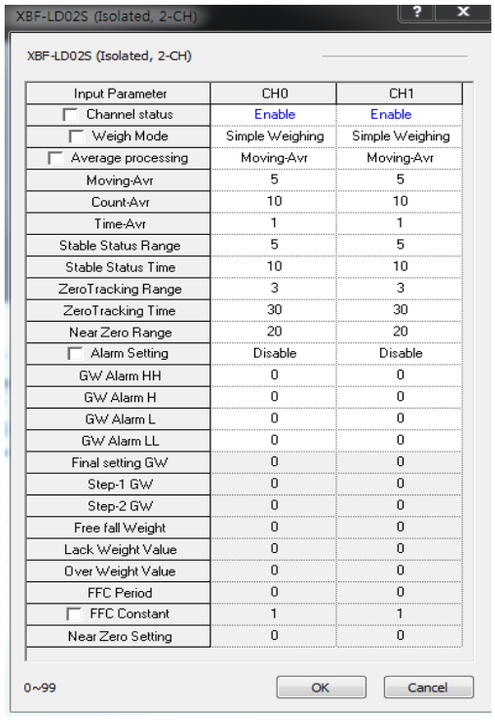
2) Set the maximum weight at 4,000kg, and the decimal point at 0.1 to run calibration.

3) At I/O Parameter, double click the module name to open the parameter setting window.



4) In the setting window, set Channel 0 as running and enable simple weighing.

5) In the setting window, set Channel 1 as running and enable simple weighing.



6) Weight Measurement Program example

(1) If the module is running normally and there is no error in Channel 0, %MX0 is on.
%UX0.1.0(Module Error) = Off
%UX0.1.15(Module Ready) = On
%UX0.1.16(Input Channel 0 in Operation) = On
%UX0.1.30 (Input Channel 0 Error) = Off

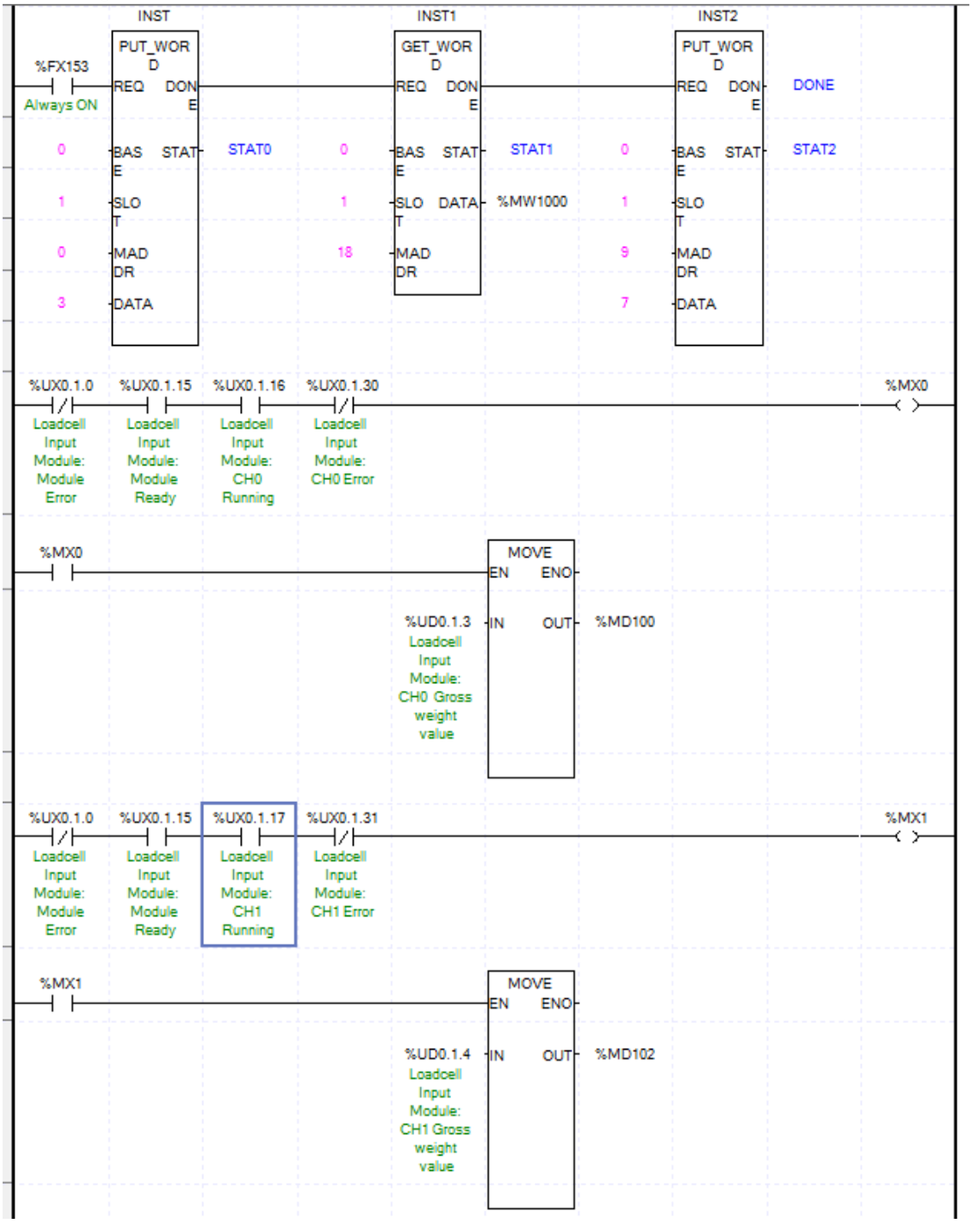
(2) When %MX0 is on, the weight value of Channel 0 (%UD01.3) is moved to %MD100.

(3) If the module is running normally and there is no error in Channel 1, %M1 is on.
%UX0.1.0(Module Error) = Off
%UX0.1.15(Module Ready) = On
%UX0.1.17(Input Channel 1 in Operation) = On
%UX0.1.31(Input Channel 1 Error) = Off

(4) When %MX1 is on, the weight value of Channel 0 (%UD01.4) is moved to %MD102.

8.2.4. Using PUT/GET Command

1) Input Program Example



(1) Use the PUT_WORD command to write '3' in the Address 0 of Slot 1 to operate Channel 0 and Channel 1.

(2) Use the GET_WORD command to store the zero tracking range of Slot 1 to %MW1000.

(3) Use the PUT_WORD command to input '7' in Address 9 of Slot 1 to set the moving average value at 7.

(4) If the module is running normally and there is no error in Channel 0, %MX0 is on.
%UX0.1.0(Module Error) = Off
%UX0.1.15(Module Ready) = On
%UX0.1.16(Input Channel 0 in Operation) = On
%UX0.1.30 (Input Channel 0 Error) = Off

(5) When %MX0 is on, the weight value of Channel 0 (%UD01.3) is moved to %MD100.

(6) If the module is running normally and there is no error in Channel 1, %M1 is on.
%UX0.1.0(Module Error) = Off
%UX0.1.15(Module Ready) = On
%UX0.1.17(Input Channel 1 in Operation) = On
%UX0.1.31(Input Channel 1 Error) = Off

(7) When %MX1 is on, the weight value of Channel 0 (%UD01.4) is move to %MD102.

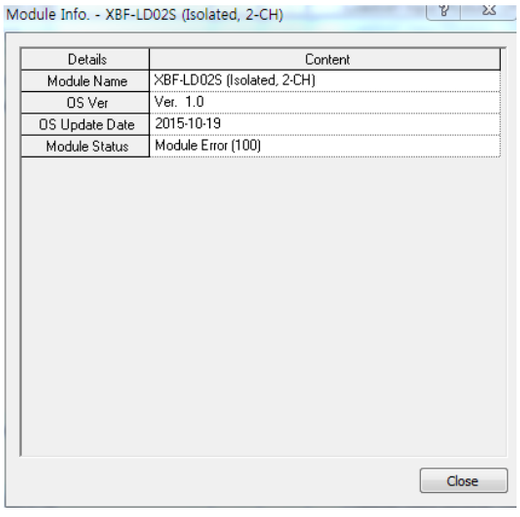
Chapter 9 Failure Diagnosis

9.1 Error code

Error code	Description	Order of priority	Remarks
100	External power supply error	1	LED blinks at one second intervals
11#	Poor ADC	2	
12#	Wiring status error	3	
13#	Initial zero setting error	4	
20#	Calibration zero setting error	5	
21#	Calibration span setting error	6	
22#	Calibration resolution over error	7	
23#	Calibration internal resolution error	8	
24#	Calibration request flag setting error	9	
30#	Zero setting error	10	
31#	Tare setting error	11	
32#	Maximum weight over error	12	
40#	Near zero setting error	13	
41#	Stable determination range setting error	14	
42#	Stable determination time setting error	15	
43#	Zero tracking range setting error	16	
44#	Zero tracking time setting error	17	
45#	Moving average processing setting error	18	
46#	Count average processing setting error	19	
47#	Time average processing setting error	20	
48#	Alarm high low setting error	21	

[Table 9.1] Error code

※ # represents the input channel number, and displayed the error code that is a value low priority, occurring several errors.



However, error code 100(external power supply error) is displayed as a module internal error (100).

9.2 Failure diagnosis

9.2.1 RUN LED is turned off.

Inspection items	Measures
Load cell input module is properly mounted on the expansion system?	Mount the load cell input module on the expansion system properly
Is the capacity of the power module mounted on the expansion sufficient?	Calculate the current consumption of each module and review the system configuration
If the load cell history module in which abnormalities occur is exchanged with the other modules, it operates normally.	Turn the power ON/OFF again. If abnormalities occur again, a failure of the module is anticipated. Please contact your local agency or branch .

9.2.2 RUN LED blinks at one second intervals.

Inspection items	Measures
Are there parameter settings that exceed the setting range? Did error corresponding to the error code occur?	Check the error code on the XG5000 special module monitor window and process the content that occurred.

9.2.3 There is no change in A/D conversion values.

Inspection items	Measures
Is the channel with no changes in A/D conversion values set to [Running]?	If it is set to [Stop], set the channel to [Running].
Are wires for the input terminal of the specified channel distributed correctly?	Correct the wiring by referring to Section 3.2.

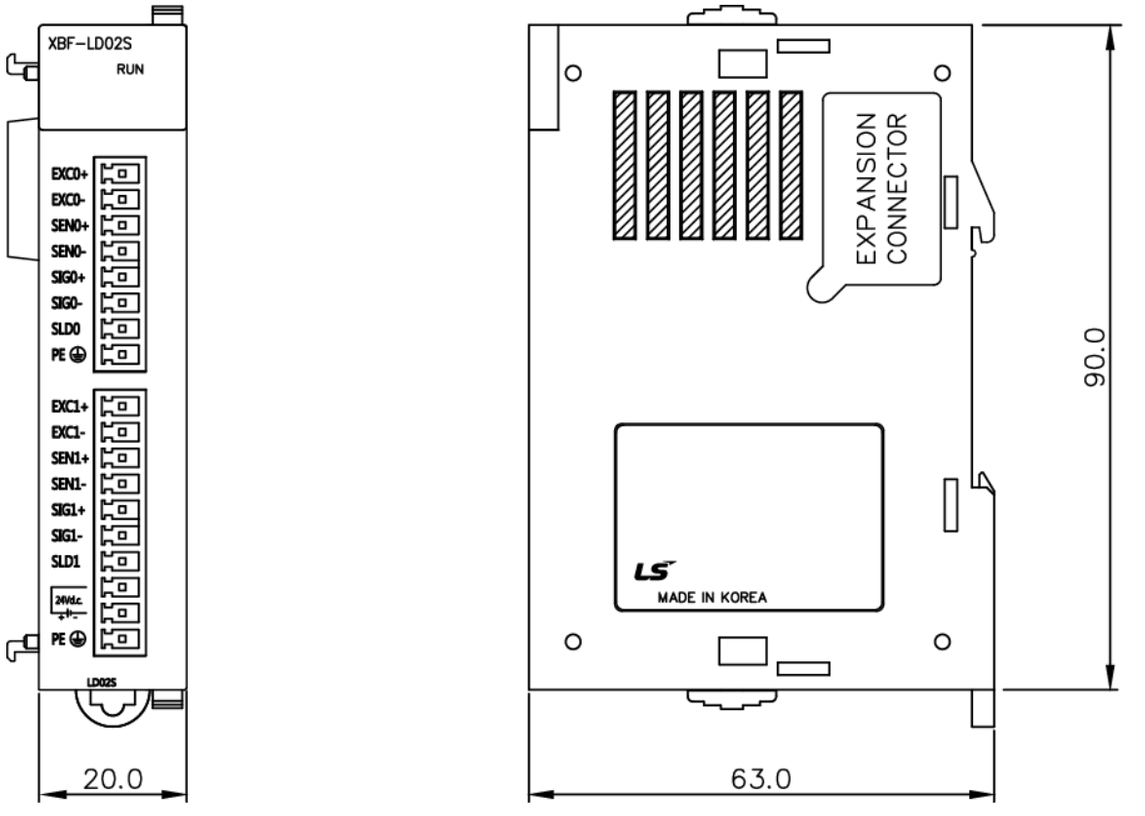
9.2.4 Relationship between input value and digital output value does not ensure a match.

Inspection items	Measures
Are wires for the input terminal of the specified channel distributed correctly?	Correct the wiring by referring to Section 3.2
Does the environment have a lot of noise?	Change the moving average processing settings

Appendix 1 External Dimensions

1) External dimensions of XBF-LD02S

Unit: mm



Warranty

1. Warranty Period

The product you purchased will be guaranteed for 18 months from the date of manufacturing.

2. Scope of Warranty

Any trouble or defect occurring for the above-mentioned period will be partially replaced or repaired. However, please note the following cases will be excluded from the scope of warranty.

1) Any trouble attributable to unreasonable condition, environment or handling otherwise specified in the manual,
2) Any trouble attributable to others' products,
3) If the product is modified or repaired in any other place not designated by the company,
4) Due to unintended purposes
5) Owing to the reasons unexpected at the level of the contemporary science and technology when delivered.
6) Not attributable to the company; for instance, natural disasters or fire

3. Since the above warranty is limited to PLC unit only, make sure to use the product considering the safety for system configuration or applications.

Environmental Policy

LSIS Co., Ltd supports and observes the environmental policy as below.

Environmental Management

LSIS considers the environmental preservation as the preferential management subject and every staff of LSIS use the reasonable endeavors for the pleasurably environmental preservation of the earth.

About Disposal

LSIS' PLC unit is designed to protect the environment. For the disposal, separate aluminum, iron and synthetic resin (cover) from the product as they are reusable.

LS values every single customers.

Quality and service come first at LSIS.

Always at your service, standing for our customers.

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※ LSIS constantly endeavors to improve its product so that information in this manual is subject to change without notice.

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