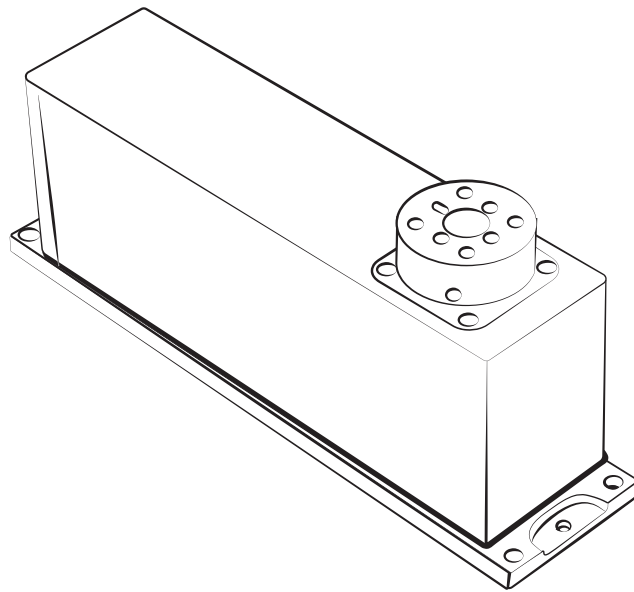


# GLC

Digital high precision load cell

TECHNICAL MANUAL

ENGLISH





## **IMPORTANT**

- To ensure safe and proper use of the balance, please read this manual carefully.
- After reading this manual, store it in a safe place near the balance, so you can review it as needed.

# Introduction

---

Thank you for purchasing our product.

To ensure smooth and efficient use of this product, please read this manual carefully before starting use. After reading, please store it with care for future reference when needed.



- Be sure to follow the instructions in this manual when you install and operate this product and during maintenance and inspections.
- DINI ARGEO accepts no responsibility for any injury or damage caused because of failure to follow instructions in this manual or due to incorrectly using or modifying the product without permission.

- The weight measuring sensor you have purchased cannot be used for trading transactions or as legal proof in a court of law.
- When installing, operating, or performing maintenance and inspections on this product, give sufficient attention not only to the descriptions in this manual and labels on this product but also any safety precautions.
- This manual is copyrighted and may not be reproduced in whole or in part without prior permission in writing.
- If you have any questions about this manual or need more detailed information, please have the model name (type) and the manufacture number ready and contact the retailer from whom the weight measuring sensor was purchased for assistance.
- Please understand that some parts of this manual might not match the actual product due to modifications or other such changes.
- Descriptions in this manual are subject to change without notice for purposes of product improvement.

# Contents

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# 1 How to use this manual

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Please read this instruction manual carefully to fully understand the contents before use. Hazards and damage resulting from incorrect use of this product are indicated by the following categories.

The drawings shown below indicate the category of instructions you must comply with. Be sure to follow the instructions below to prevent bodily injury and/or material damage.

Symbol	Meaning
 <b>DANGER</b>	This symbol indicates the possibility of death or serious injury and a high probability of imminent danger.
 <b>WARNING</b>	This symbol indicates the possibility of death or serious injury.
 <b>CAUTION</b>	This symbol indicates the possibility of injury or only physical damage.
	This symbol indicates that performing a certain action is "prohibited."
	This symbol indicates that always performing a designated action is "mandatory."
	This symbol is used to urge the reader to be extra careful or to emphasize certain information.
	This symbol is used for the information that can be used as reference when operating the product.

# 2 Precautions for use

## 2-1 Basic Precautions

■ This section describes general precautions to be taken when using the product.



	<b>Never disassemble, modify, or repair the product</b> <ul style="list-style-type: none"><li>• This may cause malfunctions or emit excess heat.</li><li>• Heat emissions might lead to an explosion or fire.</li><li>• Request a repair from the retailer where you purchased the product.</li></ul>
	<b>Do not use any power supply other than DC24V power supply.</b> <ul style="list-style-type: none"><li>• Using a non-specified power supply may cause malfunctions or excess heat.</li><li>• Heat generation may lead to an explosion or fire.</li></ul>
	<b>Do not install the product in locations where there is the possibility of leakage of flammable gas such as gasoline or thinner.</b> <ul style="list-style-type: none"><li>• This device does not have an explosion-proof structure. Should flammable gas leak and remain around this device then explosions or fires might occur.</li></ul>
	<b>Do not operate the power supply with wet hands.</b> <ul style="list-style-type: none"><li>• Connecting or disconnecting the power plug or operating the power switch with wet hands might cause electric shocks, short circuits, or corrosion.</li></ul>



	<b>Do not use the product in environments with a high ambient temperature or humidity.</b> <ul style="list-style-type: none"><li>• Doing so might cause electrical shocks or short circuits.</li><li>• The operating temperature and humidity range of this product are between 10 to 30°C and 80%rh or lower.</li></ul>
	<b>The DC24V power supply line for this device should only be used with this device and kept separate from other 24 volt DC driven devices for the following reasons.</b> <ul style="list-style-type: none"><li>• This device might not operate incorrectly due to strong noise intruding from power supply lines of other DC24V motor-driven devices.</li><li>• This device might not start correctly due to surge current from other DC24V motor-driven devices.</li><li>• Other DC24V motor-driven devices might not operate correctly due to the circuit design of this device.</li></ul>
	<b>When selecting the switching power supply current-carrying capacity of the dedicated DC24V power supply line, use approximately 0.7A per device as a general guide (device might not start up at a current-carrying capacity of less than 0.7A).</b> <ul style="list-style-type: none"><li>• This device might not start properly if the power supply current-carrying capacity is too low.</li></ul>



	<p>■ <b>Do not strike the diaphragm or packing section of the weight measuring sensor with a sharp object.</b></p> <ul style="list-style-type: none"> <li>• This might make a hole, through which water or dust could penetrate into the device.</li> </ul>
	<p>■ <b>Do not perform high-pressure washing of the diaphragm or packing section of the weight measuring sensor.</b></p> <ul style="list-style-type: none"> <li>• This might allow water to penetrate into the device.</li> </ul>
	<p>■ <b>Do not put the weight measuring sensor in water.</b></p> <ul style="list-style-type: none"> <li>• This may allow water to penetrate into the device and lead to malfunctions.</li> </ul>
	<p>■ <b>Do not move the weight measuring sensor during weighing.</b></p> <ul style="list-style-type: none"> <li>• When the weight measuring sensor is moved during weighing, the zero point or span may change.</li> <li>• When the weight measuring sensor is moved with a container or tare attached to it, a large inertial force is generated internally which might drastically reduce the durability.</li> </ul> <p>This might operate improperly in particular when the weight measuring sensor rapidly accelerates or decelerates rapidly.</p>
	<p><b>Place any motor-driven devices or units having moving parts at least 20mm away from the weight measuring sensor by 20mm.</b></p> <ul style="list-style-type: none"> <li>• Placing magnetic material (such as iron) near the weight measuring sensor may generate an error in the measured weight value.</li> </ul>
	<p><b>For accurate mass weighing, a warm-up of 1 hour or longer is required.</b></p> <ul style="list-style-type: none"> <li>• The weight value measured right after power-on might contain an error. Do not use the unit until after warm-up is fully complete.</li> </ul>
	<p><b>Ground the switching power supply line used with the dedicated DC24V power supply of this device.</b></p> <ul style="list-style-type: none"> <li>• This will prove effective in improving the device noise immunity.</li> <li>• This will prove effective for preventing electric shock and ensuring safety.</li> </ul>
	<p><b>Attach and ground a noise filter upstream of the switching power supply used with the dedicated DC24V power supply for this device.</b></p> <ul style="list-style-type: none"> <li>• This will prove effective for improving the device noise immunity.</li> </ul>
	<p><b>Ground the indicator and weight measuring sensor of this device.</b></p> <ul style="list-style-type: none"> <li>• This will prove effective for improving the device noise immunity.</li> </ul>
	<p>■ <b>Load or unload the sample gently.</b></p> <ul style="list-style-type: none"> <li>• Do not weigh an object by dropping it onto the weighing pan or weighing jig. Though the weight measuring sensor has a built-in overload protection mechanism and thus sufficient shock resistance, it might malfunction due to impacts from repeated dropping.</li> </ul>
	<p><b>Put this product in a package when relocating it.</b></p> <p>Before relocating a unit that has this product built in it, remove this product from the unit and put this product in the package that came with it.</p> <p>If the device is relocated without removing it from a unit, it might malfunction due to impacts during shipping.</p>



## 2-2 Precautions for embedding the device

This section describes precautions to be taken especially when embedding this device into a unit.



	<p>■ <b>When securing the weighing pan or tare to the installation boss, do not apply a turning force or pressing load to it that is higher than the allowable values.</b></p> <p>When a force higher than the allowable value is applied, the mechanical section may become damaged.</p>
	<p>■ <b>Completely debug automated equipment before embedding the device in that equipment.</b></p> <p>After debugging and handling of the automated equipment and various positioning has been completed, embed the actual product (weight measuring sensor) in that unit and then operate it. Using the product before debugging is complete might damage the product.</p>

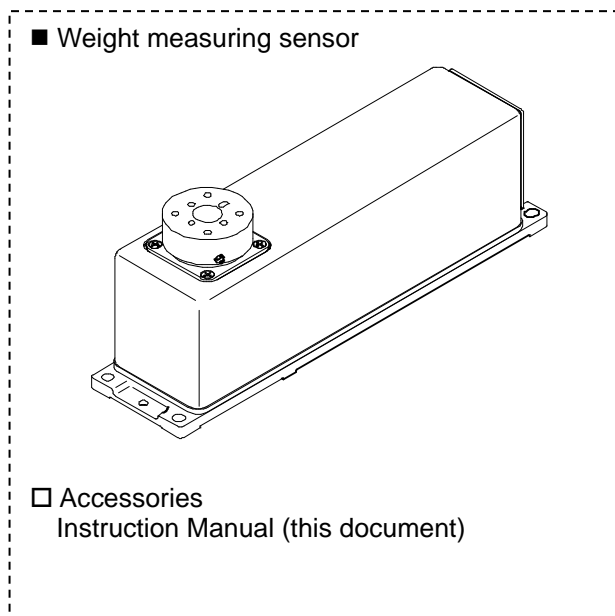


	<p>■ <b>Do not install the device in a place where air blows from an air conditioner.</b></p> <p>Weighing may become difficult due to the effect of the wind or the temperature may become unstable causing weighing errors.</p>
	<p>■ <b>Install the device away from direct sunlight.</b></p> <p>The temperature of the weight measuring sensor might become unstable which causes inaccurate weighing.</p>
	<p>■ <b>Adjust the level of the installation location to ensure the weight measuring sensor will be installed on a level surface.</b></p> <p>Weighing errors will occur if not level.</p>
	<p>■ <b>Calibrate the weight measuring sensor after the main unit is installed.</b></p> <p>(1) Be sure to calibrate the unit after it is relocated.                  (2) After that, periodically recalibrate the weight measuring sensor.</p>
	<p>■ <b>Place motor-driven devices and electromagnetic solenoids at least 50mm away from the weight measuring sensor.</b></p> <p>The unit might be affected by magnetic material that makes it unsuitable for weighing such as magnetic sources including permanent magnets. However, it is okay to place the weight measuring sensors in close contact with each other.</p>
	<p>■ <b>Eliminate static electrical charges.</b></p> <p>(1) When an insulating material such as resin is used for a tare or container, the weighed value might be wrong due to effects from static electrical charges. Use a glass windshield, a resin windshield with conductive filler, or a metal container.                  (2) To remove the static charges, ground the weight measuring sensor to the device chassis.</p>
	<p>■ <b>When IP65 performance is required, be sure to use waterproof cables and connector plugs (optional).</b></p> <ul style="list-style-type: none"> <li>Using a non-waterproof type will not satisfy protection class IP65 conditions.</li> </ul>
	<p>■ <b>Positioning of the weighing jig</b></p> <ul style="list-style-type: none"> <li>When attaching a positioning pin to determine the position of the weighing jig, use a taper pin whenever possible to protect the weight measuring sensor. If using a parallel pin is unavoidable then allow some room in the gap for inserting and removing the pin.</li> </ul>

# 3 Product configuration

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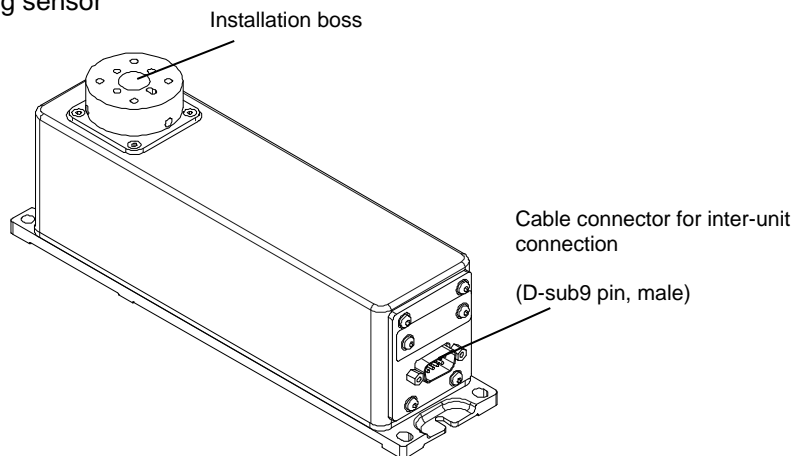
This product is composed of the following units. Should you find any missing or damaged units, contact the reseller from which this balance was purchased. For more information on the options, refer to "Appendix 1".



# 4 Names of parts

---

## ■ Weight measuring sensor



# 5 Connecting the main unit and embedding it in the equipment

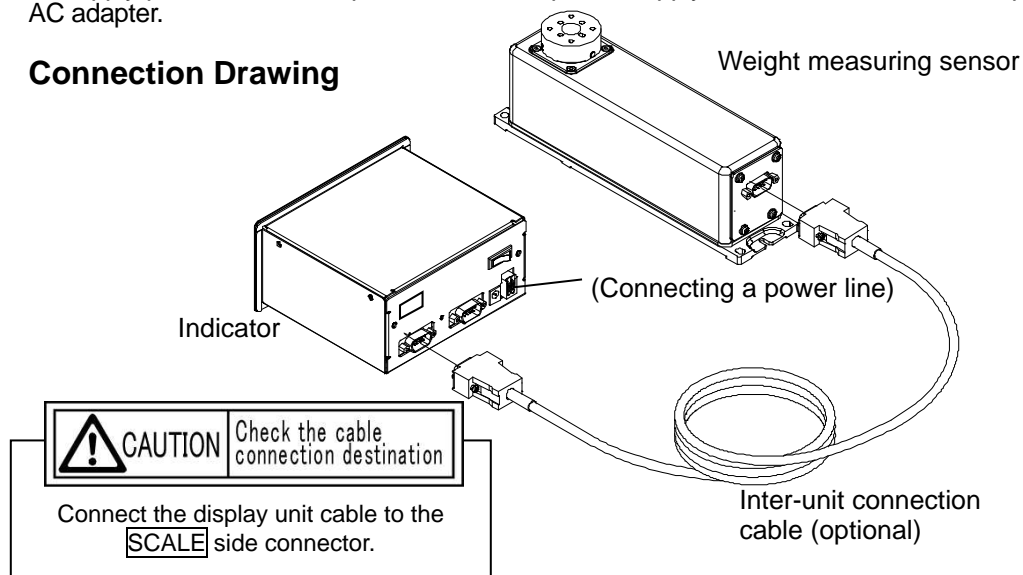
## 5-1 Connecting the main unit

Connect the indicator and the weight measuring sensor by using an inter-unit connection cable.

Tighten the cable clamping screws securely so that the cable will not come loose from the connector.

To supply power, connect a power line to the power supply terminal block or use an optional AC adapter.

### Connection Drawing



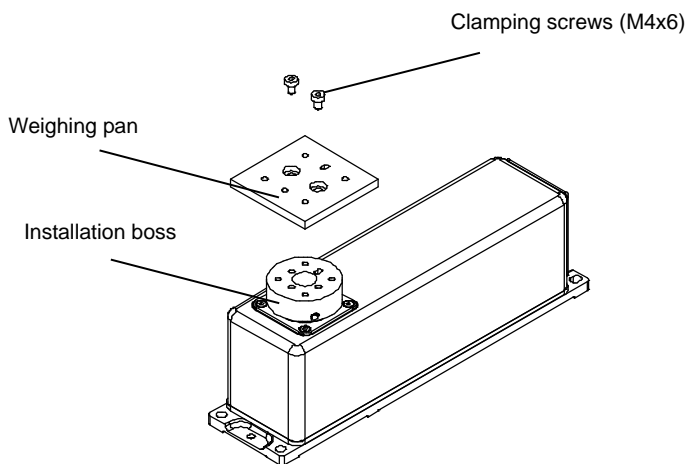
Reference

Use an optional inter-unit connection cable to connect the weight measuring sensor to the indicator.

## 5-2 Installing the weighing pan

Before use, attach the optional weighing pan or any weighing jig of 100g or heavier to the installation boss.

### ■ Example of weighing pan installation



#### Note

If the mass of the weighing pan or weighing jig is heavier than the range of the zero point adjustment to be performed at power-on, then tare is performed at power-on.

When tare is performed, the available weighing range narrows by the mass of the tare, which means that "available weighing range = capacity - mass of the tare".

To prevent damage to the mechanical section, do not apply a torque of 0.5N-m or higher to the clamping screws to attach to the weighing boss during tightening. Also, do not push down on the clamping screws and bolts too strongly.

# 6 Using the weight measuring sensor without an indicator

Weight measuring sensors can directly transmit data and receive data from external devices without connecting to an indicator. When an indicator is not connected, data can be transmitted up to 106 times/s (theoretical value). Transmit commands written in the command formats operate the weight measuring sensor.

To directly connect the weight measuring sensor to external devices, the communication cable should be branched between the RS-232C and power supply; and an external power source should be supplied from the 24 VDC power source pin of the D-Sub 9 pin. (See “6-5 Example of connection to external device.”)

**Note**

Wait at least 10 seconds after turning the power on before transmitting the first command.

The initial value is set to output stop, so at the first usage, an O1 command should be transmitted or an indicator should be connected and set to “41U. o.c 1.”

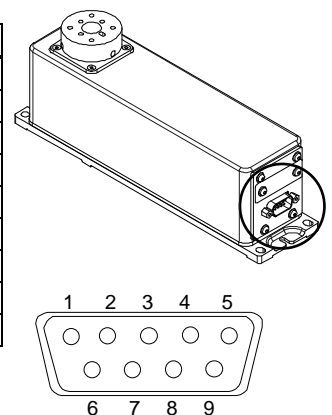
(See “Command formats 6-4-2”)

To change communication specifications and functions other than the corresponding commands of the weight measuring sensor, an indicator should be connected and the functions “4U.I.F 3” to “45U.St \*\*” should be set.

## 6-1 Connector terminal No. and their corresponding functions

Connector terminal No. and their corresponding functions

Terminal No.	Signal name	Input/output	Functions/remarks
1	DC24V	Input	Power source +24 V
2	RXD	Input	RS-232C receive
3	TXD	Output	RS-232C transmit
4	GND	-	Power source grand
5	SG	-	Signal ground
6	EXT.TARE	Input	External tare
7	FG	-	Frame grand
8	A	Input/output	RS-485 A
9	B	Input/output	RS-485 B



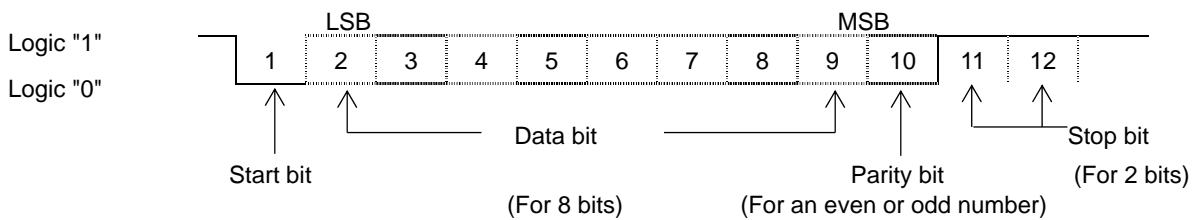
\* Use a twisted pair cable.

**Reference**

Connecting the external tare (No. 6) and the signal ground (No. 5) by a contact point or a transistor switch makes it possible to execute tare and zero adjustment from external devices. When doing so, the connection (ON) period should be 400 ms or more (maximum voltage at off: 15 V, sink current at on: 20 mA).

## 6-2 Interface specifications

- 1 Transmission method: Serial transmission asynchronous communications systems
- 2 Transmission speed: 1200, 2400, 4800, 9600, 19200, 31250, and 38400 bps
- 3 Transmission code: ASCII code (8- or 7-bit)
- 4 Signal level: Conforms to EIA RS-232C  
 HIGH level (data logic: 0) +5 to +15 V  
 LOW level (data logic: 1) -5 to -15 V
- 5 Output format: 7 digit expanded numeric format (fixed)
- 6 Bit configuration per character  
 Start bit: 1 bit  
 Parity bit: None/odd number/even number, selectable  
 Data bit: 7 bits/8bits, selectable  
 Stop bit: 1 bit/2 bits, selectable



### Weight update rate and the baud rate

The baud rate should be set to the required speed or higher based on the weight update rate while referring to the following table.

Combinations of required baud rate speed and output rates

The weight update rate*	Necessary speed
106 times/s	19200 bps
53 times/s	9600 bps
26.5 times/s	4800 bps
13.25 times/s	2400 bps

\* The weight update rate is a theoretical value.

## 6-3 Output data format

This is a data format used to output the weight from the weight measuring sensor to external devices.

Note

The output format from the weight measuring sensor is fixed to a 7 digit expanded numeric format.

The 6 digit numeric, 7 digit numeric, and special formats cannot be used.

### 6-3-1 Data format (7 digit expanded numeric format)

This format consists of 15 characters including the terminators and a parity bit can be added.

The data length and the stop bit can be specified.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1	D1	D2	D3	D4	D5	D6	D7	D8	U1	U2	S1	S2	CR	LF
Polarity	Numeric data (including a decimal point)								Unit		Status		Terminator	

#### Polarity (P1: 1 character)

P1	Code	Description
+	2BH	When data is zero or positive
-	2DH	When data is negative

#### Numeric data (D1–D8: 8 characters)

D1–D8	Code	Description
0–9	30H–39H	Numerics 0 to 9
•	2EH	Decimal point

\* Numerics are right justified. Digits that do not contain numerics are filled with '0' (30H) and then output.

#### Unit (U1 and U2: 2 characters)

U1	U2	Code	Indicated unit
(SP)	G	20H 47H	"g"

#### Space (S1: 1 character)

S1	Code	Description
(SP)	20H	Space (fixed)

#### Status (S2: 1 character)

S2	Code	Description
S	53H	Stable data
U	55H	Unstable data
E	45H	Error data (when the capacity is exceeded by +1%)



## 6-4 Input commands

Input commands used for controlling the weight measuring sensor from external devices are categorized into the following four types.

- 1 Zero adjustment/tare command
- 2 Output control command
- 3 Span adjustment setting
- 4 Function setting

### 6-4-1 Basic operation

Basic operation

- This device uses full-duplex communication, so it can process input commands while transmitting weight data.
- After the device normally executes received input commands, it sends a normal termination response or the data requested by the input command.
- When the device cannot normally complete commands or receives invalid input commands (error), the weight measuring sensor sends an error response.

Response timing from the weight measuring sensor

The weight measuring sensor sends responses within one second, except in the following cases.

- 1 When it receives a zero adjustment/tare command  
When the function setting for tare "7. tA." is set to "weight measuring sensor becomes zero after stabilizing (stability wait)."
- 2 When it receives input commands while operating (while setting functions or during span adjustment, etc.)
- 3 When it takes time to process received input commands  
In these cases, it sends responses after it finishes processing and executing the commands.

Note

- Wait at least 10 seconds after turning the power on before transmitting the first command.
- When an input command is transmitted from an external device, the next input command should not be transmitted until the response from the weight measuring sensor is received.

## 6-4-2 Command formats

(CR) and (LF) should be added after each command body.

### 1 Zero adjustment/tare command

Command body		Code		Description	Response
C1	C2				
T	(SP)	54H	20H	<ul style="list-style-type: none"> <li>Zero adjustment</li> <li>Tare</li> </ul>	A00: Normal termination E01: Command error E04: Unable to execute zero adjustment/tare (out of scope, weight error, etc.)

### 2 Output control setting

Command body		Code		Description	Response
C1	C2				
O <sup>*1</sup>	0 <sup>*2</sup>	4FH	30H	Output stop	A00: Normal termination E01: Command error
O <sup>*1</sup>	1	4FH	31H	Continuous output	

\*1: Uppercase alphabetic character "O," \*2: Numeric "zero"

### 3 Span adjustment command

Command body		Code		Description	Response
C1	C2				
C	0	43H	30H	[Cal] key invalid	A01: Zero point adjustment has begun A02: Waiting for a weight to be put on the scale
C	3	43H	33H	Begin span adjustment *	A00: Normal termination E01: Command error E02: Error due to a prohibited setting E03: Interrupted by operation E04: Abnormal termination (when 1-Err and 2-Err occur)

[Span adjustment procedures]

Descriptions inside the parentheses are equivalent to those when using an indicator.

- When the weight measuring sensor receives a C3 command, it sends response A01 and begins zero point adjustment. ("on 0" flashes)
- After a while, when it completes the zero point adjustment, it sends response A02. ("on F.S" is displayed)  
After the response A02, a weight for span adjustment should be put on the scale. ("on F.S" flashes)
- After it completes the span adjustment, it sends response A00 and returns to the weighing mode. (the weight is displayed)

\* Once a C0 command is sent, the device will not execute the C3 command even if a C3 command is subsequently sent. To cancel it, the function should be displayed on the indicator or the power should be turned off.

\* The device will not execute a C3 command when the function on the indicator is set to "5. CA. 0" ([Cal] key invalid).

#### 4 Function setting

The following are commands equivalent to the functions on the indicator. To use functions not specified in the following table, connect an indicator and set the function.

Command body				Code				Description	Equivalent functions on the indicator
Body		Breakpoint	Numerics	C1	C2	C3	C4		
C1	C2	C3	C4	C1	C2	C3	C4		
F	0	,	0-5	46H	30H	2CH	30H - 39H	Auto zero	1. A.0 0-5
F	1	,	1-8	46H	31H	2CH		Range for determining stability	2A. S.H. 1-8
F	2	,	1-6	46H	32H	2CH		Number of times stability is determined	2b. S.C. 1-6
F	3	,	0-7	46H	33H	2CH		Number of times moving average is calculated	3A. rE. 0-7
F	4	,	1-4	46H	34H	2CH		Processing signal	3C. Fr. 1-4
F	5	,	1-4	46H	35H	2CH		Weight update rate	3b. ti. 1-4
F	6	,	1-5	46H	36H	2CH		Specifying the readability	62. d.A. 1-5

Response descriptions
A00: Normal termination
E01: Command error
E02: The numerics are out of scope or none

\* Command bodies and numerics are divided by “,” (2CH).

#### 6-4-3 Examples of input commands

T△(CR)(LF)	Executing zero adjustment/tare (△: Space (20H))
C3(CR)(LF)	Begin span adjustment
O1(CR)(LF)	Begin continuous output
F0,2(CR)(LF)	Setting the operable range of auto zero to ±1d
F1,6(CR)(LF)	Setting the range for determining stability to 8d
F6,4(CR)(LF)	Setting the readability to 0.01 g

#### 6-4-4 Response format

“A00 and Exx format” responses

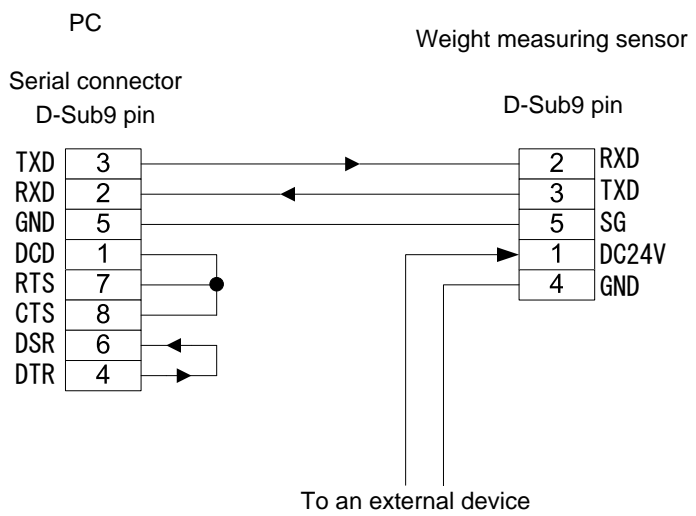
This format consists of 5 characters including the terminators (CR and LF).

1	2	3	4	5
A1	A2	A3	CR	LF
Response content			Terminator	

See “Command formats” 1,2 and 3 for response content.

# 6-5 Example of connection to external device (PC)

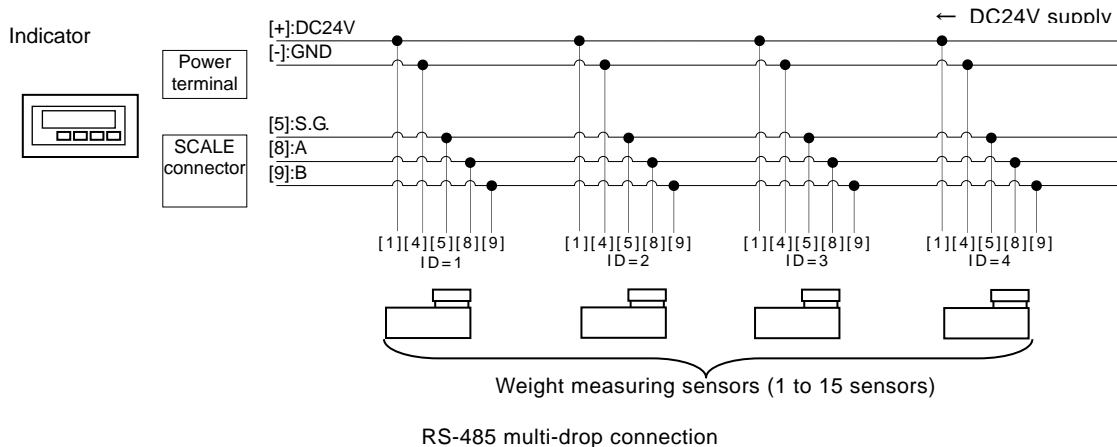
■■■ Example of connection to a PC ■■■



# 7 Using via the multi-drop connection

## 7-1 Overview of the multi-drop connection

Up to 15 weight measuring sensors can be used per indicator via the RS-485 multi-drop connection. By assigning an ID number to each weight measuring sensor in advance and specifying that ID number in the indicator, the indicator can communicate with the specified weight measuring sensor.



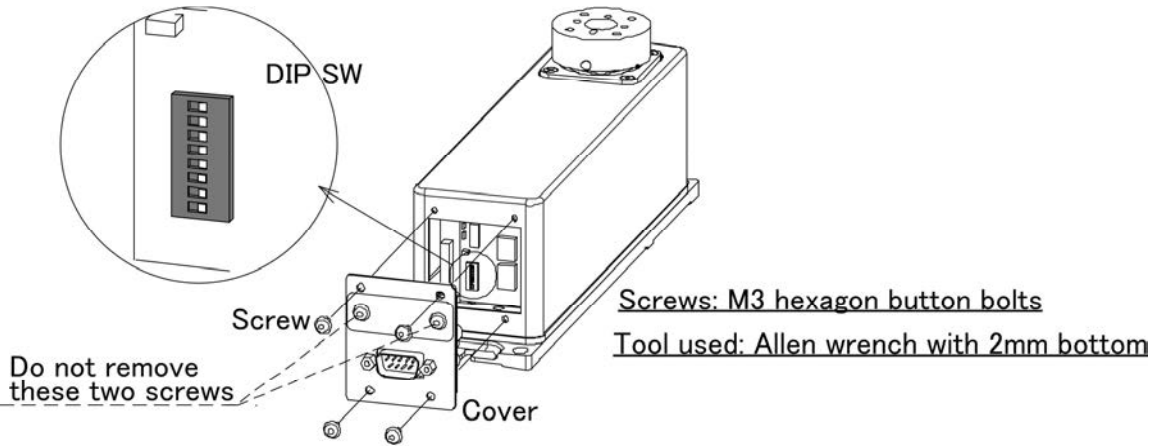
(Please consult with us for how to connect multiple weight measuring sensors from the PLC.)

# 7-2 Assigning ID numbers to the weight measuring sensors

To set an ID number, operate the dip switches built in the weight measuring sensor.

## 1 Remove the cover from the weight measuring sensor.

Use an Allen wrench to remove the four screws shown in the following figure and remove the cover. Do not remove any screws other than those specified in the figure. Since the cover is connected to the main unit via board wiring through a cable, these cannot be completely separated. Be careful not to cut the cable by pulling the cover too far away.

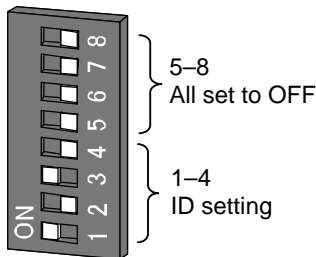


## 2 Operate the dip switches to assign an ID number.

When the cover is removed, dip switches can be seen that are used to set an ID number at rear of the main unit.

Refer to the following table to set an ID number by using a thin rod. Be careful not to damage the board and cable during setting.

Example of setting



(When ID=5)

Switches No. 1 to 4 are used to set an ID number.

When setting with the dip switches is complete, reinstall the removed cover back to the original position.

ID	Dip switch				(Initial value)
	1	2	3	4	
0	-	-	-	-	
1	ON	-	-	-	
2	-	ON	-	-	
3	ON	ON	-	-	
4	-	-	ON	-	
5	ON	-	ON	-	
6	-	ON	ON	-	
7	ON	ON	ON	-	
8	-	-	-	ON	
9	ON	-	-	ON	
10	-	ON	-	ON	
11	ON	ON	-	ON	
12	-	-	ON	ON	
13	ON	-	ON	ON	
14	-	ON	ON	ON	
15	ON	ON	ON	ON	

\* "-" indicates OFF.

### Note

Assign different ID numbers (1 to 15) for the weight measuring sensors that are connected with one another via the multi-drop connection. The setting "ID=0" can be used for a one-to-one connection only and cannot be used for the multi-drop connection.

## 7-3 Communicating with the connected weight measuring sensor

Once an ID number for a weight measuring sensor has been set, connect it to the indicator and check operation.

### 1 Connect the indicator to the weight measuring sensor.

Make a connection equivalent to that shown in the wiring diagram in Section 7-1 "Overview of the multi-drop connection."

When all the weight measuring sensors and an indicator are connected, turn on the indicator.

The indicator displays the weighed value from the weight measuring sensor having the matching ID number.

(If the ID number in the indicator does not match that of any of the weight measuring sensors, then "E1-Err" blinks or is lit.)

### 2 Make the indicator display an ID number.

Press the **Set(ID)** key.



### 3 Specify an ID number.

Use the **Zero/Tare(+)** or **Function(-)** key to display an ID number to be specified.

**Zero/Tare(+)** key: Increases the number (01→02→...→15→01)

**Function(-)** key: Decreases the number (15→14→...→01→15)

When a desired ID number is displayed, press the **Set(ID)** key.

The weighed value of the weight measuring sensor with the specified ID number is displayed.

### *Switching between ID numbers*

To communicate with a different weight measuring sensor, perform steps 2 and 2 above.

The value recorded in the weight measuring sensor is loaded as a function setting value to the indicator every time ID numbers are switched.

If a function setting value was changed from the indicator, then that value is reflected at the weight measuring sensor.

# 8 Troubleshooting

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## 8-1 Troubleshooting

Symptom	Cause	Action
The display flickers.	The weight measuring sensor may be affected by an external influence such as wind and vibration.	Change the stability decision and readability settings.
The displayed weight is incorrect.	This error is caused by the balance not being used for a long period of time or being relocated.	Perform span adjustment.
	The weight measuring sensors are not horizontal.	Check the levelness before installation.
	The tare range is set or is not set.	Unload the sample from the weighing pan and then zero the readout to continue measurement.
An error still exists after calibration.	The balance was affected by an external influence such as wind and vibration during the calibration.	There are possible effects from vibration or wind. Take wind and vibration-preventive measures or change the installation location of the balance and perform the calibration again.



# Appendices

## Appendix 1 Specifications

### Weight measuring sensor specifications

Model	GL -620	GL -3200
capacity	620g	3200g
Readability (d)	0.001g,0.002g,0.005g, 0.01g, and 0.02g	0.01g,0.02g,0.05g,0.1g, and 0.2g
Weight measurement method	Electromagnetic force balancing method	
Repeatability ( $\sigma$ )	0.001g	
Linearity	$\pm 0.002g$	
Sensitive drift	$\pm 2$ ppm/ $^{\circ}C$ or less (10 to 30 $^{\circ}C$ )	
Temperature and humidity ranges	Temperature: 10 to 30 $^{\circ}C$ Humidity: 80%rh or lower (without condensation)	
Power supply	DC 24 V $\pm 10\%$ , 0.1 A	
Material	Stainless steel	
Overload protection level	Approx. 2 kg <sup>*1</sup> Approx. 0.1 N·m <sup>*1</sup>	Approx. 5.5 kg <sup>*1</sup> Approx. 0.3 N·m <sup>*1</sup>
Mass	Approx. 2.2 kg	
Protection code (IP code)	IP65 <sup>*2</sup>	
Options	Weighing pan (SUS304) D-Sub9 pin plug (Water-proof type) Water-proof harness (5m,10m)	

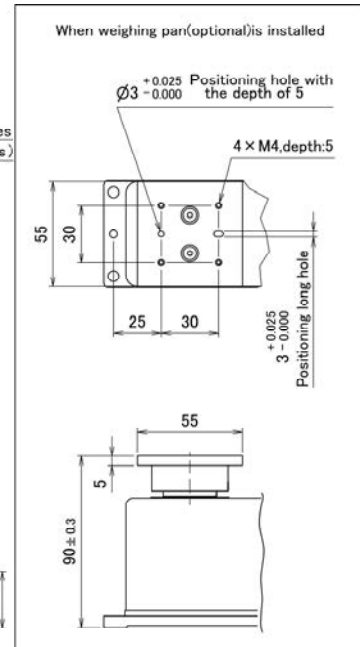
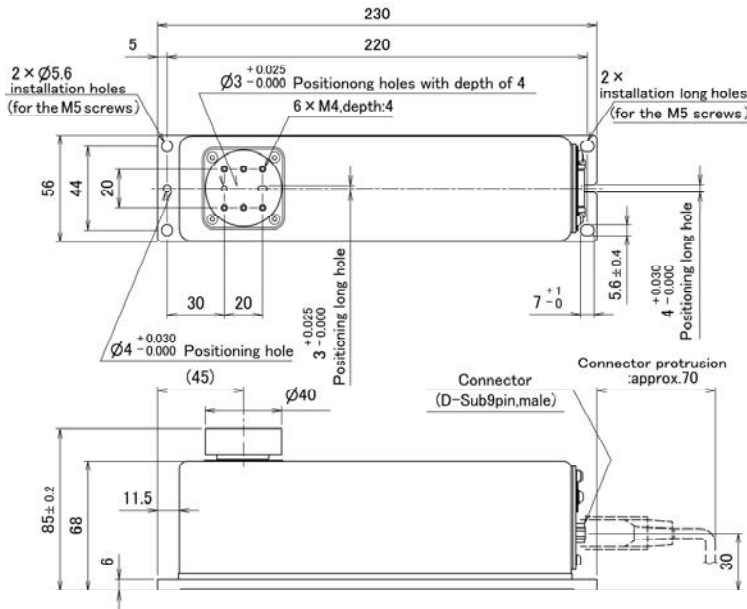
\*1 These are theoretical values and might not always match the actual values. Also, these values do not guarantee the balance performance when the release mechanism activates.

\*2 Applicable only when the optional waterproof type D-Sub9 pin plug or a one-side waterproof type inter-unit connection cable is used.

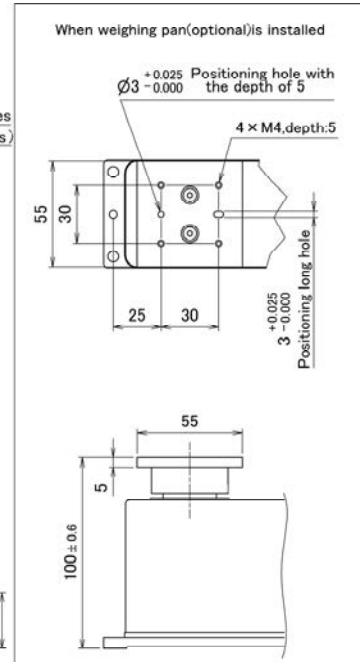
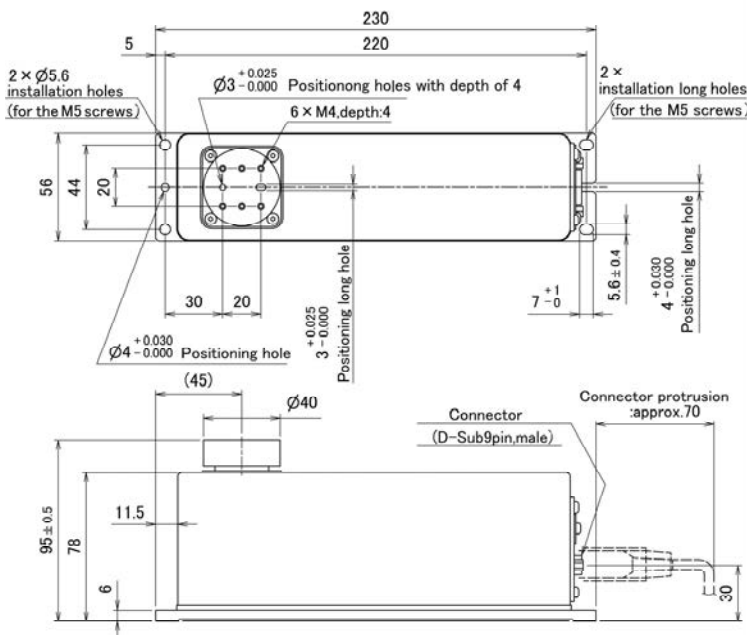
# Appendix 2 Outlines

## ■ Weight measuring sensor

### • GL -620



### • GL -3200







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