THE DOLPHIN

4404 Checkweigher

INSTRUCTION MANUAL

....Clearly a Better Value

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Contents

1. Compliance

1.1.1. Compliance with FCC rules

Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when this equipment is operated in a commercial environment. If this unit is operated in a residential area, it may cause some interference and under these circumstances, the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.

(FCC = Federal Communications Commission in the U.S.A.)

1.1.2. Compliance with European Directives

This appliance complies with the statutory EMC (Electromagnetic Compatibility) directive 89/336/EEC and the Low Voltage Directive 73/23/EEC for safety of electrical equipment designed for certain voltages.

Note: The displayed value may be adversely affected under extreme electromagnetic influences.

1.1.3. C-Tick Approval

This appliance complies with the statutory requirements of ACA (Australian Communications Authority) and is registered at the Trademark Office. The C-Tick mark N92 (Compliance Trademark) indicates compliance with the EMC (Electromagnetic Compatibility) framework

1.1.4. HACCP Compliance

HACCP (Hazard Analysis Critical Control Pont) is an internationally accepted prevention and risk based assessment for equipment used in the food industry. The Dolphin high-speed in-motion Checkweigher feature of 304 stainless steel tubular design and construction is an accepted method for HACCP compliant designs.

2. Outline and Features

The Dolphin Checkweigher is manufactured from 304 stainless steel and has been electropolished for its appealing appearance. It utilises a custom-made load cell as its weight sensor. The Dolphin consists of five main components; the main frame support assembly, two conveyors, motor control electronics, load cell and digital weight controller. This makes the Dolphin very easy to support and repair should the need ever arise.

The Dolphin was designed for the checking and/or grading the weight of products that are passed over its conveyors, the Dolphin has five weighing modes and selection functions to classify five levels of checked weights.

☑ *Tubular Stainless Steel Construction*
   The main assembly and steel components are made from 304 Stainless Steel and they are electropolished for protection and appearance

☑ *Easy Maintenance*
   The Dolphin conveyors can be removed for cleaning without the need of any tools, all conveyors have adjustable belt tracking controls and variable speed controls.

☑ *Water-resistant*
   The classification of the control cabinet and motors are equivalent to IP-65 IEC 529.
   IP: International Protection.
   6:      Protection against ingress of Dust, no ingress of dust.
   5:      Protection against ingress of Water, protected against water jets.

☑ *Intelligent AD-4404 Controller*
   The controller can store the details of 100 Products including codes, names, weight target, tolerance levels, error values and all total quantities all of these can also be displayed at the same time. The operator display is a bright blue vacuum fluorescent (VFD) 18mm large character display.

☑ *Operation guidance*
   Messages that assist the operator are displayed on the AD-4404 controller, so operators can operate the Dolphin without referring to the instruction manual.

☑ *Full weighing sequences*
   The following five modes are available in the AD-4404 controller;
   Automatic mode, conveyor stop mode, OK mode, manual mode and simple mode.
   The Dolphin can be linked to an external metal detector.

☑ *Current Loop and RS-485 interface*
   The controller provides as standard Current loop Serial and RS485 Serial I/O. RS485 allows up to 32 controllers to be connected to a programmable controller or a personal computer. The protocols are standard ASCII and RTU Modbus.

☑ *Optional accessories* *(There are three expansion slots available for options)*
   Interface options: AC 250 V direct drive relay, RS232 & RS422 serial interface, parallel BCD interface, parallel I/O and analog output.
   Fieldbus options: CC-Link, DeviceNet and PROFIBUS.

3. Installation

3.1. Unpacking

Remove the wooden crate top from the pallet base and check that the contents have not been damaged during transportation. If you suspect that a component is either missing or damaged, please contact you A&D dealer.

Please note that the electrical voltages and options have already been set and incorporated internally prior to the equipment being shipped.

In the figures below, the optional comparator lights and alarm (option 01) are shown, but this only applies to those customers whom have ordered the comparator light and alarm option 01

SIDE VIEW

FRONT VIEW
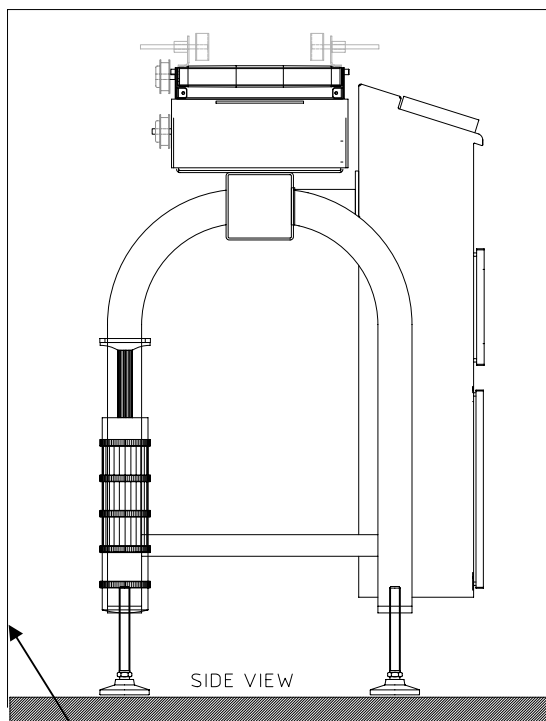
Remove the crate top by removal of Tek screws
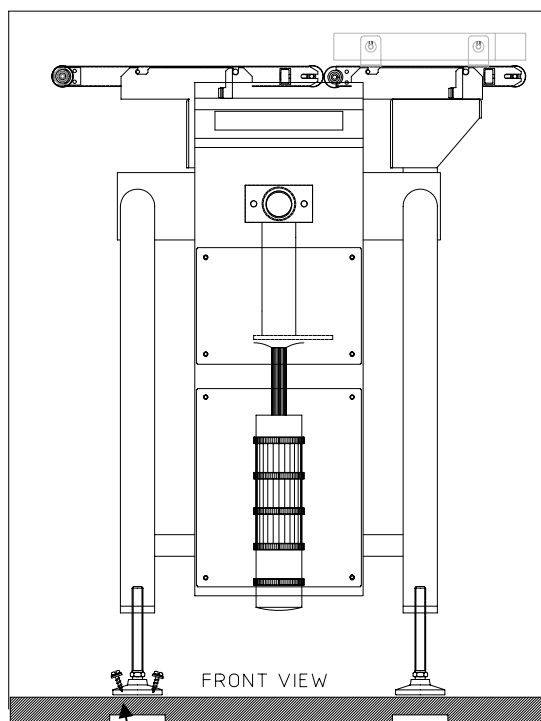
Remove 8 x Tek Screws

3.1.1.   Assembly

❑ **Comparator "Traffic Lights & Alarm "**
   Option 01 - Comparator Lights & Alarm (if ordered) are fitted upside down for the purpose of safety in packaging and transportation (Figure 1). Carefully remove the 2 x S.S socket head cap screws, whilst holding the comparator lights with your other hand, then rotate the comparator 180° degrees (Figure 2) to the correct operational position and then re-fit the 2 x S.S socket head cap screws.

Figure 1   **Figure 2**
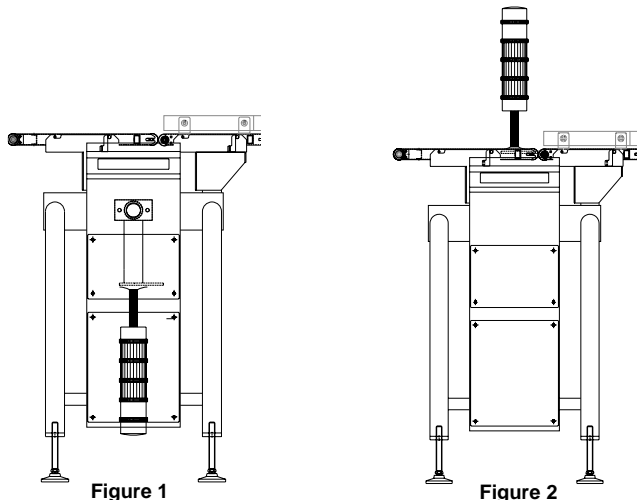
❑ **Conveyors**
   The weigh conveyor has its loadcell overload screw locked down for safety during transportation. Please adjust both the overload and under load stops to a clearance of 1mm minimum (Figure 3). This can be done by the use of a feeler gauge or by setting the maximum weight on the weigh conveyor and lower/raise the lock nut until the weight is no longer affected. Then fit both the Weigh and infeed conveyors as per the example below (Figure 5). Remember to connect the drive belt before pressing the conveyor into position.

1mm Min

Figure 3   **Figure 4**   **Figure 5**
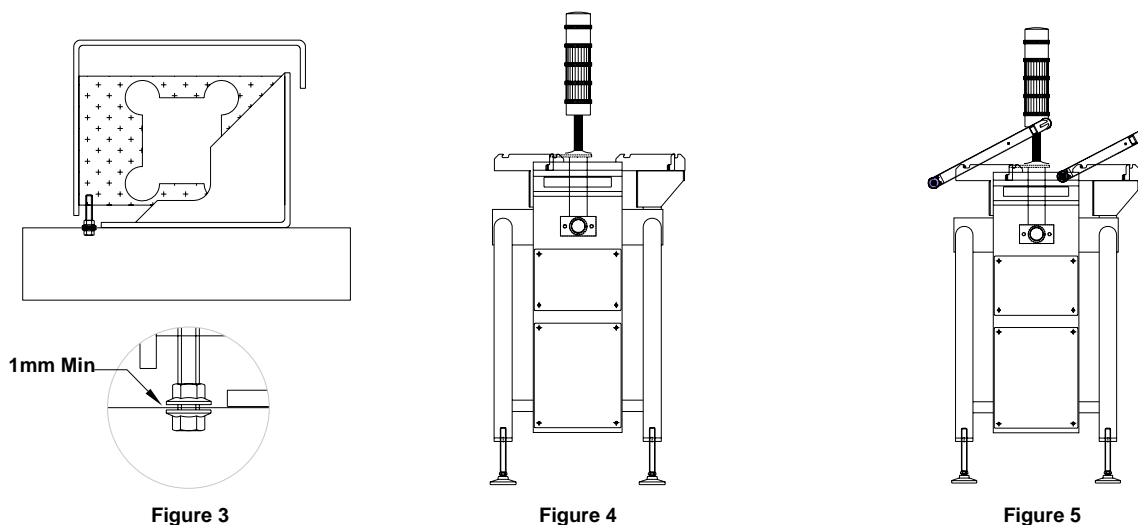
❑ **Product Guides**
   The in-feed conveyor is fitted standard with product guides; please adjust these to suit the actual product size that is to be check weighed. Please allow for a clearance of no less than 2-3mm on both sides of the product, the product guides can be adjusted to accommodate up to a 200mm wide product.
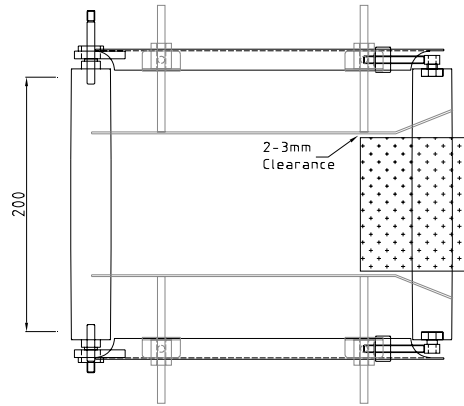
❑ **Reject Conveyor Assembly**
   Option 02 – Flipper Rejection can be ordered as version "P" Pneumatic, "E" Electric-Servo as their mechanical drive for the flipper operation. These units are basically ready to be used straight out of the box. Once fitted into the conveyor line and leveled, all that is required is to plug the 2 x Electrical/Pneumatic harnesses from the checkweigher backbone into the Flipper Reject system.
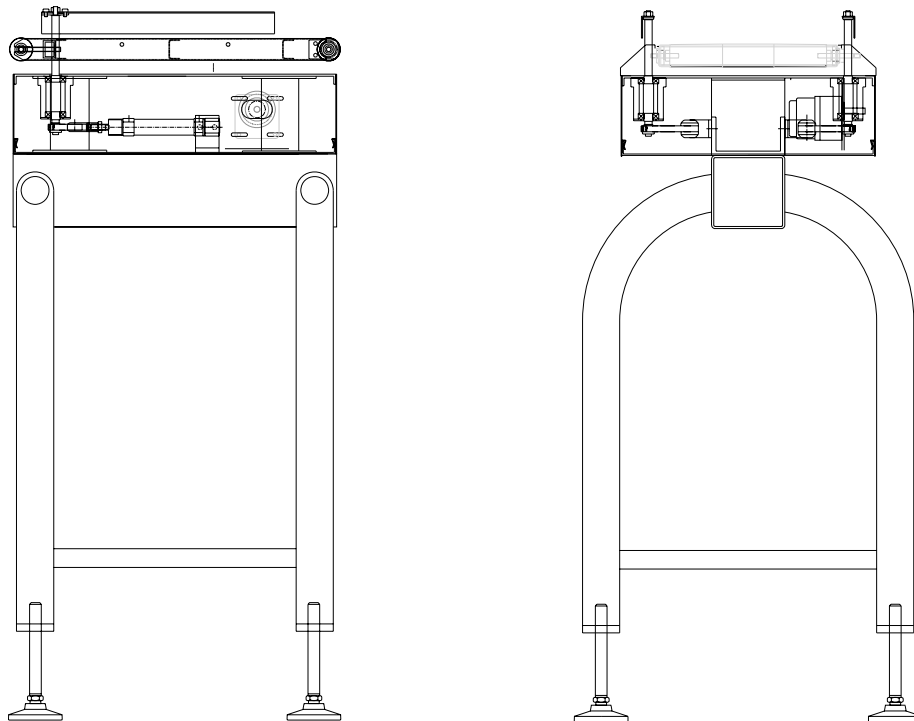
3.1.2.   Mechanical – Installation Precautions

❑ **Vibration**
Place this equipment on a firm solid base. Checkweighing accuracy cannot be guaranteed on a weak, vibrating or flexible flooring. The checkweiger must be secured to the floor by use of eight M8 dynabolts in the four levelling feet.

❑ **Operating temperature and humidity**
☞   Operating temperature range: From 0°C (32°F) up to 40°C (104°F)
☞   Maximum temperature variation should be less than 5°C (9°F) /hr
   Sharp changes in temperature will have an adverse effect on accuracy
☞   Operating humidity range: max. 85% RH (no condensation)

❑ **Air Currents**
Ensure that this equipment is not directly exposed to air currents. If the checkweigher is located near an electric fan, air conditioner, air vent, etc., the accuracy will be affected.

❑ **Line speed**
When a product is conveyed to the checkweigher on a conveyor belt, the line speed should be kept the same or slightly slower. When a product is conveyed from the checkweigher, the line speed should be kept the same or slightly faster.

❑ **Alignment**
The position and direction of products to be checked should be the same each time. If the position changes, weighing accuracy will be adversley affected.

❑ **Change over distance**
There must be a gap of approximatley 3mm (0.12 Inches) between the feed conveyor and the loading conveyor of the weigher.

❑ **Change over height**
The checkweigher should be set to approximatley 0 to 3mm (0.12 Inches) lower than the feed conveyor on the input side, and approximatley 0 to 3mm higher on the output side.

❑ **Positioning**
Installation measures should be taken to prevent collision with the checkweigher from the front and rear. Overloading and impact loads should always be avoided.

❑ **High pressure and steam**
The Dolphin has been designed to meet the requirements of IP65, however great care should be taken if high pressure or steam hoses are to be used around the Dolphin. Removal or extra protection should be the first method employed.

3.1.3.　　Mechanical – Spacing Conveyors

The use of a feeding spacing/pacing conveyor is used to speed up products to create the proper gap/pitch that is required for accurate weighments. These conveyors are required to run faster than the customer's product feed conveyor. In order to be effective the customer's conveyor must deliver the product at the same consistent pitch and belt speed, as any variations will cause pitch errors and weighing errors.

Product Direction

Correct Pitch

Customers product conveyor
consistantly spaced product, with too short pitch

Spacing/Pacing Conveyor
Faster to correct gap pitch

Weigh Conveyor running the
same speed as Spacing/Pacing
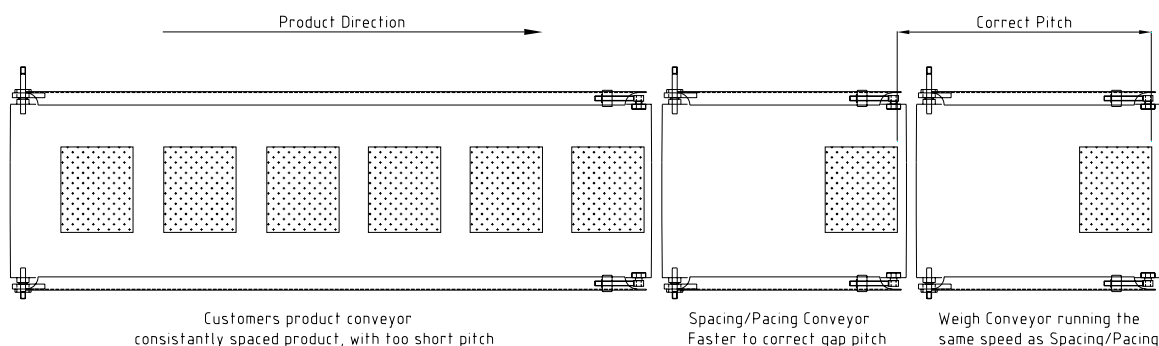
3.1.4.　　Mechanical – Timing Conveyors

If the customer's conveyor system cannot guarantee consistent accuracy in pitch, or if the products pitch is too large and the conveyor speed is fast, a timing conveyor can be used to slow the products down to set a consistent pitch

Product Direction

Correct Pitch

Customers product conveyor
consistantly spaced product, with too short pitch

Timing Conveyor slower
than product conveyor

Spacing/Pacing Conveyor
Faster to correct gap pitch

Weigh Conveyor running the
same speed as Spacing/Pacing
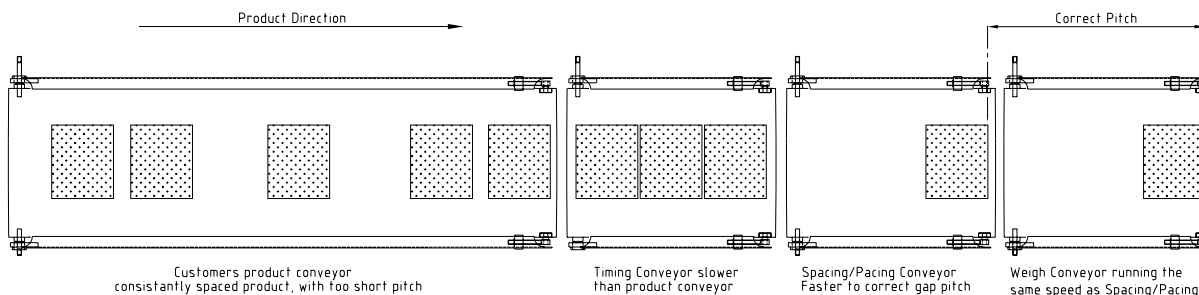
3.1.5.   Electrical – Installation Precautions

Before use, confirm the following items for a safe operation.

❑ **Grounding the Dolphin**
  Supply the Dolphin with a separate earth ground line, segregated from other equipment such as motors, inverters or another power sources. Unless the Dolphin is correctly grounded you may receive an electric shock, cause an operation error or catch fire.

❑ **Use an adequate power cord**
  Confirm the 204VAC power cord has not been damaged during transport, and that the 240VAC receptacle type suits the working environment. If the voltage range of the cord is lower than the power line voltage, it may cause leakage or catch fire.

❑ **Fuse**
  The fuse is installed to help prevent the controller from electrical overload.
  The controller is equipped with many safety circuits. Therefore, the fuse is not damaged in normal operation. If the fuse is damaged, do not replace it; contact your local A&D dealer. This trouble may have been caused by strong electric discharge.

❑ **Flammable gases**
  Do not install the Dolphin where flammable gases are present.

❑ **Heat radiation of the AD-4404 controller**
  Space has been carefully considered in the control cabinet to allow all instruments to radiate heat sufficiently. If extra equipment is required to be fitted into the cabinet then the use of a cooling fan to keep the operating temperature within specifications may be required.

❑ **Removing the covers**
  Disconnect the equipment from the power source before removing the covers to avoid receiving an electric shock.

  Do not touch the internal circuits within 60 seconds after turning off the 240VAC mains power; this will avoid you from receiving an electric shock.
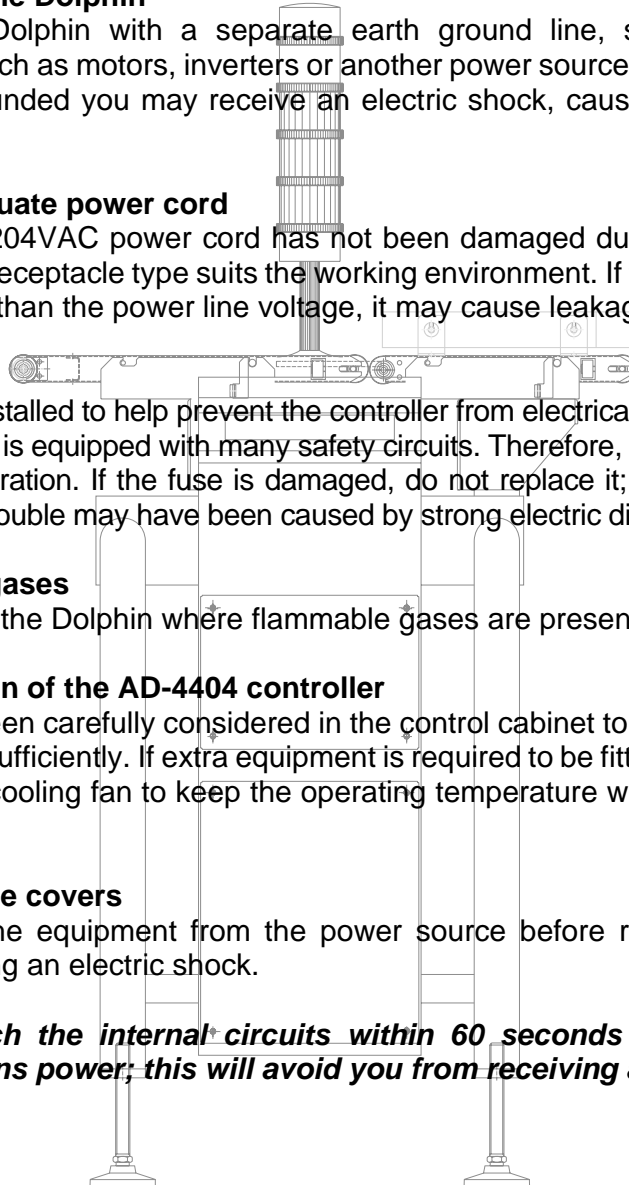
3.1.6.   Trial Operation

Five easy steps to operate the Checkweigher for the first time.

1
| Press the black rocker power switch on the top right corner of the Dolphin stainless steel enclosure.
| Confirm that the photoelectric sensor LED is illuminated RED.
| Confirm that the AD-4404 controller display turned on, and it displays a zero reading "0.0" under the Gross heading.

2
| If the AD-4404 display does not show a zero reading, press and <u>hold</u> the orange

SHIFT Key then also press [→T← TARE ZERO →O←] key at the same time.

3
| Press the [CODE RECALL CODE SET] Key and select Code 0 "Test-System" using the [✛] Key, then press the ENTER key. *"Note: to go back press and hold the SHIFT key first"*

4
| Press the [START ◇] key, and both conveyors will start to run. After one minute check to make sure that both the conveyor belts are tracking in a parallel plane. If they are not adjust them slightly using the knurled knob on both sides of the conveyors.
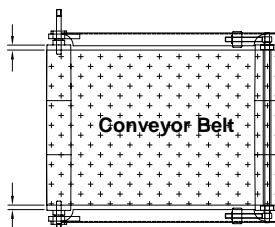
Conveyor Belt

5
| Place the test sample on the in-feed conveyor belt and make sure a weight reading of 100g +/- 1g is recorded on the controller as in the below sample.

3.2. AD-4404 Control Panel

Main display
Weighing data is displayed.

Status indicators

Graphic status indicator

Alphanumerical keys and numerical keys

Weighing unit

Standby indicator

Sub-display
Selected principal data. Example: Total data, parameters and code, guidance are displayed.

Display

Status indicator

Judgment symbol

Type of display

Weighing unit

Weighing value

Operation status

Count result

Name and Code number

Graph of level
Hi Hi
Hi
OK
Lo
Lo Lo

Comparison parameter (setpoint data)
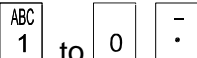
3.2.1. Keys

START	The **START** key of the conveyor belt.
STOP	The **STOP** key of the conveyor belt.
SHIFT	The key to select a function of a key.
CODE RECALL / CODE SET	The key to call the code. Pressing the **CODE RECALL** key to recall the code. Pressing and holding the **SHIFT** key, press the **CODE SET** key to select the principal codes for display in the sub-display.
↯	The key to move the cursor or scroll the function number. Pressing and holding the **SHIFT** key, press the ↯ key to decrease the code number.
A/a	The key to select alphabetical keys, upper keys, lower keys or numerical keys.
ABC 1 to 0 , − ·	**Alphanumeric** keys.
ESC / OFF	The escape key. The **ESC** key is used to undo the last key action and to return to the previous mode. Pressing and holding the **OFF** key more than three seconds in weighing mode, turn off the display (Standby mode).
ENTER / ON	The **ENTER** key for parameter settings. The **ON** key turns on the display while in standby mode. Pressing and holding this key, press the ↯ key to enter the menu. Pressing and holding the **TARE** key, press the **ON** key after turning off, the indicator displays gross value and does not to compensate zero.
F1 / F2	Pressing this key, the key works as the **F1** key. Pressing and holding the **SHIFT** key, press this key, the key works as the **F2** key. Preset the function of the **F1** and **F2** key at `othef-2` and `othef-3` in the function list.
BUZZER STOP / CLEAR TOTAL	The key to shut off the buzzer. Pressing and holding the **SHIFT** key, press the **CLEAR TOTAL** key to clear the total data of the current code.
→T← TARE / ZERO →O←	Pressing the key, this key works as the **TARE** key. The tare key is used to display the net value that subtracts the tare weight from the gross value. Pressing and holding the **SHIFT** key, press the **ZERO** key, this key works as the zero key. The current weighing display becomes zero and displays sign CZ.

3.2.2.   Symbols

Main display	While weighing sequence mode stops, weighing data is displayed. While weighing sequence mode operates, each judged weighing value is held and is displayed.
Sub display	Code numbers, operation guidance, graph, set point and others are displayed selectively.
Weighing unit	The indicator that is displayed when the weighing unit is selected in the calibration mode.
Status indicator	The current weighing status is displayed.
Graphic status indicator	The current weighing situation is displayed with symbols. The classification number is displayed, when an error occurred or an alarm is indicated.
STABLE	The sign is illuminated when the current weighing display is stable.
GROSS	The sign is illuminated when the main display is the gross data.
NET	The sign is illuminated when the main display is the net data.
TARE ENT	**Tare ent**ered. The sign is illuminated when a tare value stored.
HOLD	The sign is illuminated when the main display is held.
CZ	**C**enter of **Z**ero. The sign is illuminated when the gross value is within the center of the zero point of zero calibration.
ZR.ERR	**Z**ero **err**or. Error message for zeroing the gross data of the main display.
SQ.ERR	The **seq**uence **err**or sign. Indicates a weighing sequence error.
ALARM 1	An error sign preset to **alarm 1**.
ALARM 2	An error sign preset to **alarm 2**.
Operate ▲	The sign is illuminated while the weighing sequence works. The sign is turned on and off while the weighing sequence is pause.
BUSY ▲	The sign is illuminated while material is weighed and data is processed.
ZTR ▲	**Z**ero **tr**ack function. The sign is illuminated for one second when zero track function works.
0. BAND ▲	The **zero band** sign. When the gross data is within the range of the zero band (around the zero point), this sign is illuminated.
D.COMP ▲	**D**ynamic **comp**ensation function to correct weighing value. The sign is illuminated when the coefficient is not 1 in the automatic mode.
Lo ▲	The weighing data is lighter than lower limit. Data < Lower limit.
OK ▲	The weighing data is acceptable. Lower limit $\leq$ Data $\leq$ Higher limit
Hi ▲	The weighing data is heavier than higher limit. Higher limit $<$ Data

▼ 3.3. AD–4404 Rear Panel

Loadcell terminal.
Eight 350Ω loadcells can be connected in parallel.

Built-in RS-485 terminal.
Possible use: to read weighing data, write parameters, connect 32 indicator units using the multi-drop connection.

EXC+
SEN+
SEN-
EXC-
SIG+
SIG-
SHLD

LOADCELL

Option Slot 1

Option Slot 2

Option Slot 3

RS-485
A
B
SG

C.LOOP

FG

1
2
3
4
5
6

ON
OFF

Main power switch

CONTROL I/O

Power cord terminal
AC85V ~ 250V

Option slots to connect three optional accessories in maximum. Example: BCD output, Relay output, Analog output and field bus.

Control I/O to connect to external control units.
11 input terminals,
11 output terminals,
An input common terminal
An output common terminal

Built-in current loop output Use to connect A&D external monitor or printer.

4. AD-4404 Controller Operation

4.1. Key Operation Examples

❑ This section describes how to use the AD-4404 keyboard and their function.

Caution **The key operation immediately affects to the status of the indicator. Always check the keys to select before proceeding.**

4.1.1.　Standby Mode

OFF	Press and hold the (ESC) **OFF** key about three seconds in the weighing mode. Then the indicator enters the standby mode and displays the standby indicator. In the standby mode, All interface circuits are turned off and only the internal circuits work.
ON	The (ENTER) **ON** key is used to turn on the indicator.

4.1.2.　Cursor Operation

There is a cursor on a segment (an item) that is turned on and off.

⊹	The ⊹ key is used to move the cursor forward.
SHIFT + ⊹	Press and hold the **SHIFT** key and press the ⊹ key to move the cursor backward.
ENTER	The **ENTER** key is used to enter the selected item.
ESC	The **ESC** key is used to return to the previous mode and to undo the last key operation.

4.1.3.　Inputting Characters

A character can be input in a current segment (an item) in the appropriate mode.

A/a	The **A/a** key is used to change the input data from upper case, lower case alpha to numerical.
Alphanumerical	The **alphanumerical** keys and the **ENTER** key are used to enter the parameters and to select a code number directly.
ENTER	The **ENTER** key is used to specify the alphanumerical data.
ESC	The **ESC** key is used to undo the last key operation and to return to the previous mode.

4.1.4.　　Calling a Code

Step 1 Press the **CODE RECALL** key in either operation mode or normal stop mode.
Step 2 Set the code number with the following keys:

✛	The ✛ key is used to increase the code number.
SHIFT + ✛	Press and hold the **SHIFT** key and press the ✛ key to decrease the code number.
Numerical	The **numerical** keys and the **ENTER** key is used to select a code number directly and to enter the parameters.
ENTER	The **ENTER** key is used to specify the number.
ESC	The **ESC** key is used to undo the last key and to return to the previous mode.

4.1.5.　　Entering a Correction Mode

Step 1 Press and hold the **SHIFT** key and press the **CODE RECALL** key in the operation mode or normal stop mode.
Step 2 Select the code number using the following keys:
　　　✛, **SHIFT +** ✛, **Numerical**, **ENTER**, **ESC** keys
Step 3 Edit some items of the code using the **numerical** and **ENTER** keys.
Step 4 Press the **ESC** key to return to the previous mode.

4.1.6.　　Entering The Menu

Step 1 Press and hold the **ENTER** key and press the ✛ key in either operation mode or normal stop mode.
　　　Then the first layer of the menu is displayed.
Step 2 Use the following keys in the menu :
　　　✛, **SHIFT**, **Alphanumerical**, **A/a** , **ENTER**, **ESC** keys
Step 3 Press the **ESC** key several times to return to normal stop mode.

4.2.1.   Mode Map and Menu

START

Connecting power cord

Removing and re-connecting power cord

Standby mode

ENTER ON | ESC OFF Over 3sec.

Several times ESC OFF

Weighing mode (Operation mode, Stop mode, Emergency stop mode)

CODE RECALL / CODE SET → Calling a Code

SHIFT | CODE RECALL / CODE SET → Editing a Current Code
Correcting code and setpoints on the sub-display

ENTER ON | ↕

Outline of Menu

```
Code Edit ──────── Edit
                   Search
                   Delete ──────── Total, Setpoints and Total, All Totals, All Codes
                   Copy
                   Tare

CAL ────────────── CAL ─────────── Unit, Decimal point, Division, Capacity, Zero input,
Calibration                         Mass value, Span input
                   G ───────────── Gravity Acceleration Correction

Function ───────── Reference Function ┬ General ──── Weight, Sub display, Others
Parameters                            │ Sequence ── Basic, Control I/O, Timer, Zero track, Others
List                                  │ Control I/O ─ Input, Output
                                      │ Serial ───── C. Loop, RS-485
                                      └ Option ───── Slot 1, Slot 2, Slot 3
                   Set Function ──────┬ General ──── Weight, Sub display, Others
                                      │ Sequence ── Basic, Control I/O, Timer, Zero track, Others
                                      │ Control I/O ─ Input, Output
                                      │ Serial ───── C. Loop, RS-485
                                      └ Option ───── Slot 1, Slot 2, Slot 3

Check ──────────── Monitor Mode ────┬ Control I/O
                                    │ C. Loop      Current Loop
                                    │ RS-485
                                    │ A/D          Internal AD count
                                    └ Option ───── Slot 1, Slot 2, Slot 3
                   Test Mode ───────┬ Control I/O
                                    │ C. Loop      Current Loop
                                    │ RS-485
                                    │ A/D          Internal counts
                                    └ Option ───── Slot 1, Slot 2, Slot 3

SystemMgmt ─────── Init ───────────┬ RAM
System             Initialization  │ Code
Management                         │ Function
                                   │ CAL
                                   └ All
                   Remote Setup ───┬ Data
                                   └ Software
```

Use ↕ , ENTER ON , ESC OFF principally.

4.2.2. Status of Weighing Mode

- ❑ Weighing mode comprises of the following modes.

- ❑ **Operation mode** includes the following check weighing (weighing sequence).
  Automatic mode
  Conveyor stop mode
  OK mode
  Manual mode
  Simple mode

- ❑ The normal **stop mode** displays the current weighing value.
  Use this mode generally to enter parameters of the function list into the indicator.

- ❑ The **emergency stop mode** assumes that the preset input terminal is connected to the emergency stop key.

- ❑ The "Input" means key operation, command from peripheral equipment or signal level of the preset input terminal.

Operation Mode
Check weighing sequence is working.

The stop input is entered.   The operation input is entered.

Stop Mode
Current sequence is stopped.

> **Normal Stop Mode**
> - ❑ A status error occurs, while not in a weighing sequence, this mode works.
> - ❑ When the indicator is turned on and an error occurs, this mode works.
> - ❑ When not a BUSY signal and a stop command is input, this mode works.

An error occurs during operation.   A stop input is entered.

> **Pause**
> - ❑ An error occurs during a weighing sequence, this mode works.
> - ❑ When a stop input is entered during BUSY, this mode works.

An emergency stop signal is active.   Emergency stop signal is inactive.

Emergency Stop Mode
Current sequence is stopped.

> - ❑ If an emergency stop signal is entered, this mode works.
> - ❑ This mode cannot enter into the operation mode directly.

An emergency stop signal is active.

---

5. Codes

- A code is necessary to weigh the product and is commonly used in all modes.
- The AD-4404 can store 100 sets of codes without any power supply.
- When recalling a code in this operation mode, this is the code that will be used.
- There are two ways to operate the code.
  - The way to edit principal parameters of the code in the sub-display.
  - The way to operate (Edit, Search, Delete, Copy, Tare) the code in menu `Code Edit`.
- Select a backup method of code at `Save data` [`othf-8`].
- If `Save in flash memory` [`othf-8`] [`2`] is selected, when opening menu `Code Edit`, the current sequence is stopped.

  [Function] - [Set function] - [General] - [Others] - [Save data]

- Select a method to recall the code at `Code recall method` [`5qf-81`].

  [Function] - [Set function] - [Sequence] - [Others]

- Each code stores the following parameters.
  These parameters can be accessed at the menu `Edit` of `Code Edit`.

Display Symbol	Item Name and Description
`Code **`	Code number `**` is 0 to 99.
`Name`	Name 12 characters
`Target`	Target weight
`Hi`	High limit
`Lo`	Low limit
`HiHi`	High-high limit
`LoLo`	Low-Low limit
`Zero Band`	Zero band
`Full`	Full filling
`PT`	Preset Tare
`Tgt#`	Target count The number to stop the conveyor.
`Tot#`	Total count Total number that judged weighing.
`OK#`	OK count Lo $\leq$ weight $\leq$ Hi
`NG#`	NG count weight $\leq$ Lo or Hi $\leq$ weight
`Hi#`	Hi count Hi $<$ weight $\leq$ HiHi or Hi $<$ weight
`Lo#`	Lo count LoLo $\leq$ weight $<$ Lo or weight $<$ Lo
`HiHi#`	HiHi count HiHi $<$ weight
`LoLo#`	LoLo count weight $<$ LoLo
`FMD#`	Foreign matter detection count
`Duplication#`	Duplication count
`Crush#`	Crush count
`Max`	Maximum
`Min`	Minimum
`Average`	Average
`STD`	Standard deviation σ_{n-1}
`STDP`	Population standard deviation σ_n
`Total`	Total of the weighing value

⏬ 5.1. Use of the Codes

5.1.1. Recalling a Code

❑ A preset code can be recalled to use it always.

Caution: If the code number is changed during operation, the I/O status is changed, too.

Step 1 Press the **CODE RECALL** key.
Step 2 Enter code number using the **numerical** keys. Press the **ENTER** key to recall it.
Then the I/O status and the display are changed.

5.1.2. Editing a Code in the Sub-display

❑ The set points, LoLo, Lo, Target, Hi and HiHi can be edited in the sub-display always.
Refer to `Selection of comparison` [5q f-2] for selection of set point.
[Function] - [Set function] - [Sequence] - [Basic] - [Selection of comparison]

❑ Preset sub-display form to edit set points.
[Function] - [Set function] - [General] - [Sub-display]

Caution   If the code number or its parameter is changed during operation, the I/O status is changed, too.

Step 1 Press and hold the **SHIFT** key and press the **CODE SET** key.
Step 2 Enter the setpoint using the **numerical** keys. Press the **ENTER** key to store it and proceed to the next setpoint.
Step 3 Continue step 2 until entering all setpoints.
Step 4 Press the **ESC** key twice to return to previous mode.

5.2. The Menu of Code Edit

❏ The code can operate with the following menu of `Code Edit`.
   ❏ `Edit` .... Edits full parameters of the code.
   ❏ `Search` .... Finds a blank code.
   ❏ `Delete` .... Deletes all data or a part of the data for the code.
      ❏ `Total` .... Deletes total for a code.
      ❏ `Set point & Total` .... Deletes set point and total for a code.
      ❏ `All Totals` .... Deletes total for all codes.
      ❏ `All Codes` .... Deletes all codes.
   ❏ `Copy` .... Copies all parameters of a code to another code.
   ❏ `PT` (Preset tare) .... Stores the current tare value to the preset tare of the specified code.

5.2.1. Edit

❏ This menu item can edit all of the parameters of the code.

Step 1 Press and hold the **ENTER** key and press the ✛ key to enter the menu.
Step 2 Select `Code Edit` using the ✛ key. Press the **ENTER** key.
Step 3 Press the **ENTER** key to enter the menu `Edit`.
Step 4 Enter a code number using the **numerical** keys. Press the **ENTER** key.
Step 5 Edit each parmeter of the code using **alphanumerical** keys.
        Press the **ENTER** key to enter a new parameter and proceed to the next item.
Step 6 Press the **ESC** key several times to return to the previous mode.

5.2.2. Search

❏ This menu item can find a blank code.

Step 1 Press and hold the **ENTER** key and press the ✛ key to enter the menu.
Step 2 Select `Code Edit` using the ✛ key. Press the **ENTER** key.
Step 3 Select `Serach` using the ✛ key. Press the **ENTER** key.
Step 4 Press the **ENTER** key. Then the code number of a blank code is displayed.
Step 5 Press the **ESC** key several times to return to previous mode.

5.2.3.   Delete

❏   This menu item can delete all or a part of the data for the code.

Step 1   Press and hold the **ENTER** key and press the ✛ key to enter the menu.
Step 2   Select `Code Edit` using the ✛ key. Press the **ENTER** key.
Step 3   Select `Delete` using the ✛ key. Press the **ENTER** key.
Step 4   Select menu using the ✛ key. Press the **ENTER** key.
   ❏ `Total`......................................Deletes total for a code.
   ❏ `Set point & Total`...................Deletes set point and total for a code.
   ❏ `All Totals` ....Deletes total for all codes.
   ❏ `All Codes` ....Deletes all codes.

   In case that `Total` or `Setpoint & Total` is selected.
Step 5   Enter a code number using the **numerical** keys.
   Press the **ENTER** key to delete it. Then `Deleted` is displayed.

   In case that `All Totals` or `All Codes` is selected.
Step 6   Press the **ENTER** key to delete it. Then `Deleted` is displayed.

Step 7   Press the **ESC** key several times to return to previous mode.

5.2.4.   Copy

❏   This menu item can copy all parameters of a code to another code.

Step 1   Press and hold the **ENTER** key and press the ✛ key to enter the menu.
Step 2   Select `Code Edit` using the ✛ key. Press the **ENTER** key.
Step 3   Select `Copy` using the ✛ key. Press the **ENTER** key.
Step 4   Enter the number of a source code using the **numerical** keys. Press the **ENTER** key.
Step 5   Enter the number of new code using the **numerical** keys. Press the **ENTER** key.
   Then `Copied Code#` is displayed.
Step 6   Press the **ESC** key several times to return to previous mode.

5.2.5.　　Preset Tare

- ❏ This menu item can store the current tare value to preset tare (PT) of the specified code.
- ❏ Preset the Preset tare=0 choose [genff-12].

　[genf-12]　Preset tare=0 choose
　　　　　　[1]　Last tare...............If preset tare of the recalled code is zero, the previous tare value is used.
　　　　　　[2]　Last tare...............If preset tare of the recalled code is zero, the tare value is cleared.

[Function] - [Set function] - [General] - [Basic] - [Preset tare=0 choose]

Step　1　Press and hold the **ENTER** key and press the ✤ key to enter the menu.
Step　2　Select Code Edit using the ✤ key. Press the **ENTER** key.
Step　3　Select PT (preset tare) using the ✤ key. Press the **ENTER** key.
Step　4　Enter the code number using the **numerical** keys.
Step　5　Press the **ENTER** key. Then Copied tare value is displayed.
Step　6　Press the **ESC** key several times to return to previous mode.

⏬ 5.3. Recalling a Code

❑ The method to recall a code can be selected at `Code recall method` [5qf-81].

Function and parameter	
5qf-81 1	Code recall method Key/Serial I/F
5qf-81 2	Code recall method Parallel I/F
5qf-81 3	Code recall method External switch control

[Function] - [Set function] - [Sequence] - [Other]

Detail of Parameters

[5q f-81] `Code recall method`

[1] `Key/Serial I/F`
A code is recalled with key operation or input data of the interface.
The last data input has effect.

In case of using the **Key Operation**:
❑ Press the **CODE RECALL**. Enter a code number and press **ENTER** key.

In case of using the **Serial Interface**:
The code number can be entered by command mode.
❑ Built-in RS-485.
❑ RS-422/485 interface of OP-03.
❑ RS-232C interface of OP-04.

In Case of **Field Bus Interface**:
The code number is specified by PLC data.
❑ CC-link of OP-20.
❑ DeviceNet of OP-21.
❑ PROFIBUS of OP-22.

[5q f-81] `Code recall method`

[2] `Parallel I/F`
A code is recalled with input data of the control I/O or parallel interface.
Use BCD code.

In Case of **Parallel Interface**:
The code number can be specified with BCD code. Example: encoder switch.
❑ Control I/O.
❑ Parallel interface of OP-05.

[5q f-81] `Code recall method`

[3] `External switch control`
Method of 1 or 2 can be selected at an input terminal specified to code number 48 in control I/O or OP-05. Terminal status is as follows:

Off: 1, `Key/Serial I/F`
On: 2, `Parallel I/F`. Code number of 2 is kept until next input.

Caution

❑ **When selecting** `Parallel I/F` [2]**, do not specify the same function to the control I/O and OP-05.**

Example:

❑ When selecting `External switch control` [3], select `External switch control` [`1nf-01`] [48] to terminal 1.

❑ When selecting `External switch control` [3], select `External switch control` [`05f-01`] [48] to terminal 1 of OP-05.

❑ When reducing the number of wires for the parallel interface, connect all common wires together and select the interface with the wires specified to `External switch control` [3].

❑ The function is used to weigh and classify (judge or check) the article put on the weighing conveyor in `automatic mode` [5q f-1] [1] and `conveyor stop mode` [5q f-1] [2].

❑ The actions of the selectors can be selected at `Selection of comparison` [5q f- 2] and `Selector 1 condition` [5q f-22] to `Selector 1 condition` [5q f-22].
Example: "If it includes foreign matter, push it using selector 1.". [5q f-22] [000000100].

❑ The action of the conveyor can be selected at `Conveyor stop condition` [5q f-21].
Example: "If it is OK, pause conveyor and pick up it by hand". [5q f-21] [001000000].

❑ There are five kinds of `Selection comparison` [5q f-2].
❑ A maximum of six selectors can be selected.

Function and parameter		Description		
5qf-2 1	Selection of comparison 3 levels with target	Lo output OK output Hi output	$Net <$ (target - Lo) $\leq Net \leq$ (target + Hi) $< Net$	(target - Lo) (target + Hi)
5qf-2 2	Selection of comparison 3 levels without target	Lo output OK output Hi output	$Net <$ Lo $\leq Net \leq$ Hi $< Net$	Lo Hi
5qf-2 3	Selection of comparison 5 levels with target	LoLo output Lo output OK output Hi output HiHi output	$Net <$ (target - LoLo) (target - LoLo) $\leq Net <$ (target - Lo) (target - Lo) $\leq Net \leq$ (target + Hi) (target + Hi) $< Net \leq$ (target + HiHi) (target + HiHi) $< Net$	
5qf-2 4	Selection of comparison 5 levels without target	LoLo output Lo output OK output Hi output HiHi output	$Net <$ LoLo LoLo $\leq Net <$ Lo Lo $\leq Net \leq$ Hi Hi $< Net \leq$ HiHi HiHi $< Net$	

5qf-22	Selector 1 condition	1: push, 0: not pushed
5qf-23	Selector 2 condition	Example: 11011111
5qf-24	Selector 3 condition	
5qf-25	Selector 4 condition	
5qf-26	Selector 5 condition	
5qf-27	Selector 6 condition	

Each bits means as follows:
LoLo,
Lo,
OK,
Hi,
HiHi,
Foreign material detection,
Duplication,
Crush

⬇ 5.5. Detection Method

- There are four detection methods for the article.
  - Detecting the front of the article with the position sensor.
  - Detecting the end of the article with the position sensor.
  - Detecting gross above the zero band.
  - Detecting gross within the zero band.

- Place the position sensor at the front of the weighing conveyor.
  The position sensor is assumed to be a photoelectric sensor or laser sensor

- Use the `Chattering timer` [5q f-42] to prevent an error.
  Use the `Eval delay timer` [5q f-43], when the article is detected.

5.5.1.　Detecting Front with Position Sensor

- Select `Top edge` of the `Detector` [5q f-29] [1].

- Procedure:
  1　The front of the article crosses to the position sensor.
  2　When the sensor output changes from OFF to ON, `Chattering timer` [5q f-42] starts.
  3　When `Chattering timer` [5q f-42] is up, `Eval delay timer` [5q f-43] starts.
  4　When `Eval delay timer` [5q f-43] is up, the detection has effect.

Memo
- If the article is packed in a clear bag, use a long delay time to prevent an error with `Chattering timer` [5q f-42].

5.5.2.　Detecting End with Position Sensor

- Select `Tail edge` of the `Detector` [5q f-29] [2].
- The tolerance of `Eval delay timer` [5q f-43] is wide, because the timer starts after the article is put on the weighing conveyor that moves in various velocities.
- Procedure:
  1　The end of the article crosses to the position sensor.
  2　The sensor output changes from ON to OFF.
  3　`Eval delay timer` [5q f-43] starts.
  4　When `Eval delay timer` [5q f-43] is up, the detection has effect.

5.5.3.　　Detecting Gross Value above Zero Band

❑ Select `Over zero band of gross` of the `Detector` [5q f-29] [3].

❑ Procedure:
   1　The article is moved on the weighing conveyor.
   2　When the gross is above the zero band, the detection has effect.

Caution
❑ **This method cannot be used for high velocity and intolerable vibration of the weighing conveyor, because it cannot detect duplication of the articles or the position of the article.**

5.5.4.　　Detecting Gross Value within Zero Band

❑ Select `Zero band of gross` of the `Detector` [5q f-29] [4].

❑ Procedure:
   1　When the gross value is within the zero band, the detection has effect.

5.6.　Check to Forward the Article

❑ The function is used to forward the compared article from the weighing conveyor.

❑ Select `OK mode` of the `Weighing mode` [5q f-1] [3] to use the check.

❑ Select the mode at `Detector` [5q f-29].

❑ Procedure for this mode:
   1　When the comparison has effect,
     the article is forwarded from the weighing conveyor and
     `Conveyor stop delay timer` [5q f-59] starts.
   2　The conveyor moves, until `Conveyor stop delay timer` [5q f-59] is up.

⯯ 5.7. Duplication of the Articles

□ When the next article is placed on the weighing conveyor before the last article is forwarded from the conveyor, an error message and `SQ.ERR2` is displayed and duplication is output.

□ The total of the weighing value classifies the duplication in the total data.

Caution
□ **Trim the** `Chattering timer` **[5q f-29] and placement of the position sensor to avoid duplication.**

When the next article reaches the weighing conveyor and the last weighing is not finished due to the short interval, an error is output.

| Box 5kg | Box 5kg | Box 5kg | Box 5kg |

Leading conveyor   Weighing conveyor   Forwarding conveyor

Selector

Position sensor   Loadcell
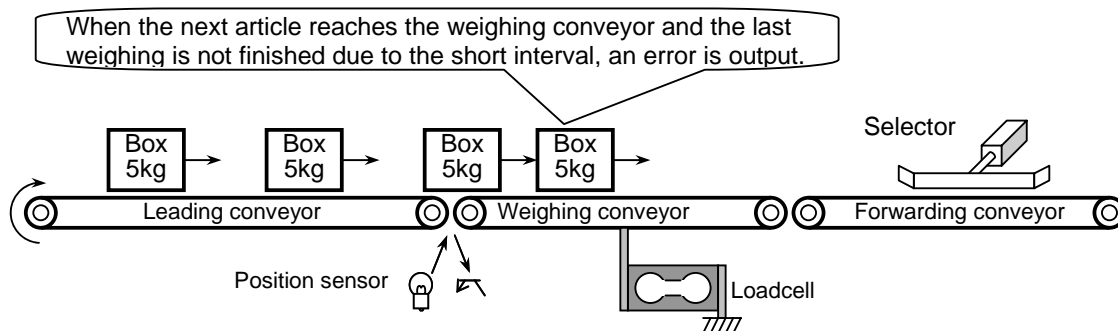
⯯ 5.8. Crush of the Articles

□ When articles move between the weighing conveyor and the selector, an error message and `SQ.ERR6` is displayed and crush is output.

□ At maximum, the AD-4404 can control ten articles that are waiting for the selector.

□ The total of the weighing value is classified as crushed in the total data.

When the interval is short and the distance between the weighing conveyor and selector is long and the quantity of moving articles is more than ten, an error is output.

10 boxes maximum

light   light   light   light

Selector

Leading conveyor   Weighing conveyor   Forwarding conveyor

Position sensor   Loadcell
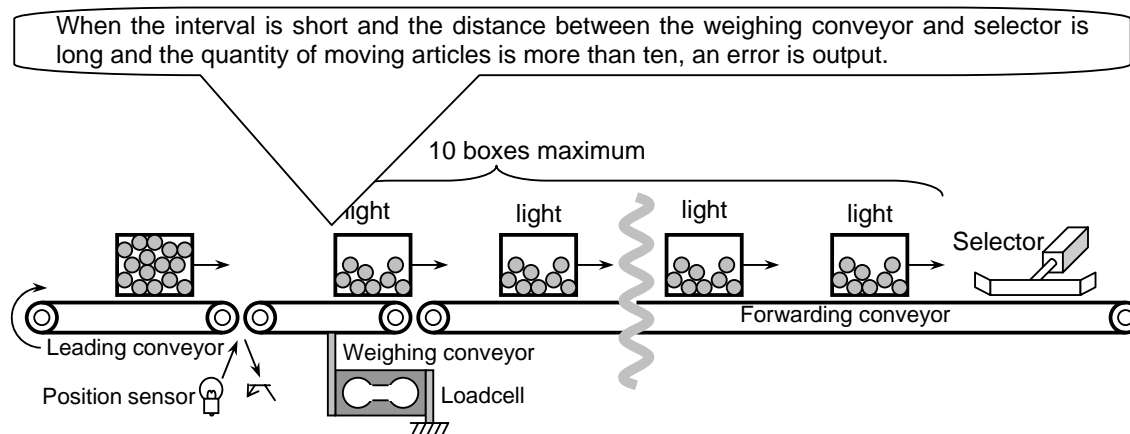
▼ 5.9. BUSY Output

❑ The BUSY output is turned on at loading the article on the weighing conveyor.
The BUSY output is turned off until selector classification has completed.
The AD-4404 can control up to ten articles continuously.

❑ If an article is loaded on the weighing conveyor after the busy state is off, it can avoid
duplication and crush of the articles. It is effective to have a long weighing interval.

❑ The BUSY signal is output on the following condition.

❑ The BUSY signal is output, when the following timer is counting.
- ❑ `Eval delay timer` [5q f-43]
- ❑ `Average timer` [5q f-44]
- ❑ `Selection out 1 delay timer` [5q f-46]
- ❑ `Selection out 2 delay timer` [5q f-47]
- ❑ `Selection out 3 delay timer` [5q f-48]
- ❑ `Selection out 4 delay timer` [5q f-49]
- ❑ `Selection out 5 delay timer` [5q f-50]
- ❑ `Selection out 6 delay timer` [5q f-51]
- ❑ `Select output 1 timer` [5q f-52]
- ❑ `Select output 2 timer` [5q f-53]
- ❑ `Select output 3 timer` [5q f-54]
- ❑ `Select output 4 timer` [5q f-55]
- ❑ `Select output 5 timer` [5q f-56]
- ❑ `Select output 6 timer` [5q f-57]

▼ 5.10.   Stop Input during BUSY

❑ Procedure for a stop input during operation:
1 When a stop input is entered while BUSY is turned on, the status changes to pause.
2 All timers are held. Status indicators blink.

❑ Procedure to continue the current weighing:
1 When an operation input is entered during pause, all timers restart counting.

❑ Procedure for a stop input during pause:
1 When a stop input is entered during pause, status changes to stop mode.
2 All timers are reset. Status indicators are turned off.

Refer to " 4.2.2. Status of Weighing Mode".

⏬ 5.11. Output for Foreign Matter Detection

❑ Procedure:
1 When the sensor detects foreign matter and sends the signal to the AD-4404, the foreign matter detection is output until the AD-4404 judges the signal and totals it.

❑ The output can be used to control peripherals.
This signal means that there is foreign matter between the sensor and the weighing conveyor.

❑ Procedure for a stop input during the detection:
1 When a stop input is entered during the detection, the status changes to pause.
2 All timers are held. Status indicators blink.

❑ Refer to " **Error! Reference source not found.**. Foreign Matter Detection".

⏬ 5.12. Evaluation Output

❑ There are three types of output for judgment.
   ❑ Comparison output.
   ❑ Output to selectors.
   ❑ Buzzer output.

5.12.1. Comparison Output

❑ The comparison output is used to input signals to a PLC and to a peripheral indicator.

It is output, when averaging weight and judging it.

❑ Kind of output: LoLo, Lo, OK, Hi, HiHi, Foreign matter, Duplication, Crush, NG.
Relations: Conveyor stop condition [`5q f-21`], Sub-display, I/O output,

5.12.2.   Output to Selectors

❑ The output is used to control the selector using the timer.

❑ A maximum of six selectors can be connected to the AD-4404.

❑ Output according to conditions and timers.
```
Selector 1 condition [5q f-22]
Selector 2 condition [5q f-23]
Selector 3 condition [5q f-24]
Selector 4 condition [5q f-25]
Selector 5 condition [5q f-26]
Selector 6 condition [5q f-27]
Selector 1 condition [5q f-22]
```

❑ When the interval is short and the distance between the weighing conveyor and selector is long, a maximum of ten judgments will be stored into memory for each selector.
Therefore each selector can be stored ten suits of judgment, the output delay timer and output timer. At maximum, sixty suits of data can be stored in the six selectors.
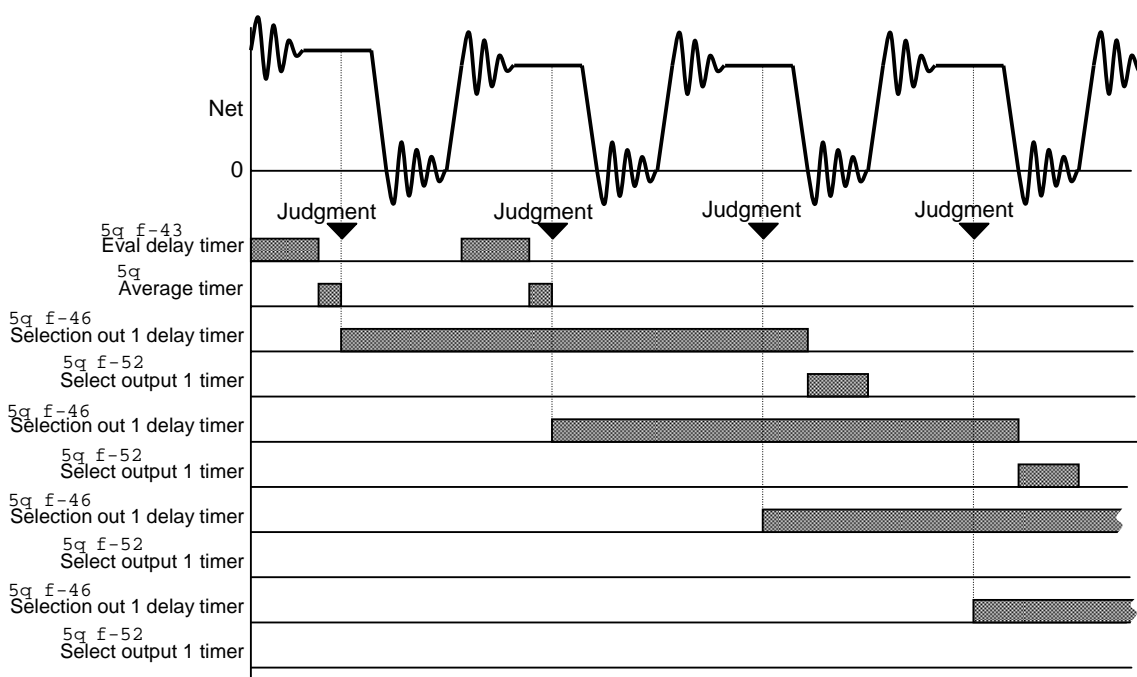
5.13. Buzzer Output

❑ The judgment of the buzzer output is the same as the judgment of comparison output. The buzzer can be select six rhythms of sound. Each buzzer condition stores conditions to sound it for LoLo, Lo, OK, Hi, HiHi, foreign matter, duplication, crush and counter limit.

`Buzzer condition 1`	`[5q f-5]`	Continuous
`Buzzer condition 2`	`[5q f-6]`	0.5 Hz
`Buzzer condition 3`	`[5q f-7]`	1 Hz
`Buzzer condition 4`	`[5q f-8]`	2 Hz
`Buzzer condition 5`	`[5q f-9]`	4 Hz
`Buzzer condition 6`	`[5q f-10]`	8 Hz]

❑ The buzzer sounds for preset time of `Buzzer ON timer` `[5q f-41]`.
❑ When the **BUZZER STOP** key is pressed, the sound can be stopped.

Caution
❑ **The buzzer needs a power supply.**
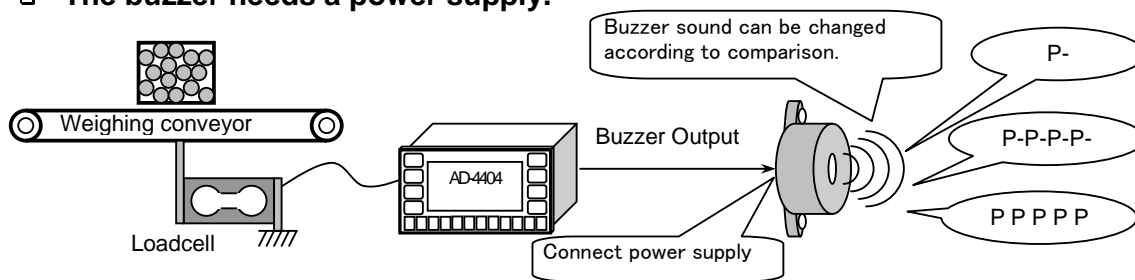
5.14. Total Function

❑ The judgment can be classified and accumulated for totals of each code.

Type	Description
Total count	Total number of all data
NG count	Count without OK data
OK count	Count of OK data
Hi count	Count of Hi data
Lo count	Count of Lo data
HiHi count	Count of HiHi data
LoLo count	Count of LoLo data
Foreign matter count	Count of foreign matter
Duplication count	Count of duplication. A detection assumes as one count.
Crush count	Count of crush. A detection assumes as one count.
Maximum	Maximum value of adequate data
Minimum	Minimum value of adequate data
Average	Average of adequate data
Standard deviation	Standard deviation of adequate data σ_{n-1}
Population standard deviation	Population standard deviation of adequate data σ_n

5.15. Safety Check Function

- ❑ The safety check function stops the check weighing sequence, when an error occurs.
- ❑ The input of a safety check function can be assigned to a terminal of the control I/O or OP-05. A maximum of eight safety check functions can be assigned to each terminal.
- ❑ When turning off a terminal assigned to safety check, an error message and `SQ.ERR` 1 is displayed and the check weighing sequence paused.

Caution
- ❑ **Do not assign the same safety check function to terminals of the control I/O and OP-05.**

Concerning Parameters

[5q f-83] Safety check	Specify use of each safety check function.
[00000000]	0: not used, 1: use

[Function] - [Set function] - [Sequence] - [Other]

[1n f-xx] In xx (Axx)	Input terminal of the control I/O.
	xx is terminal number (01 to 11).
[28] Safety check 1	Safety check 1
[29] Safety check 2	Safety check 2
[30] Safety check 3	Safety check 3
[31] Safety check 4	Safety check 4
[32] Safety check 5	Safety check 5
[33] Safety check 6	Safety check 6
[34] Safety check 7	Safety check 7
[35] Safety check 8	Safety check 8

[Function] - [Set function] - [control I/O] - [Input]

[0p f-xx] In xx (Axx)	Input terminal of OP-05.
	xx is terminal number (01 to 16).
[28] Safety check 1	Safety check 1
[29] Safety check 2	Safety check 2
[30] Safety check 3	Safety check 3
[31] Safety check 4	Safety check 4
[32] Safety check 5	Safety check 5
[33] Safety check 6	Safety check 6
[34] Safety check 7	Safety check 7
[35] Safety check 8	Safety check 8

[Function] - [Set function] - [Option] - [OP-05 parallel I/O]- [Input]

Example
- ❑ When the beam of light is interrupted and the photo sensor turns off, the sequence is stopped.

When crossing the beam, sensor turns off.

Sequence is stopped.

Sensor

SQ.ERR1
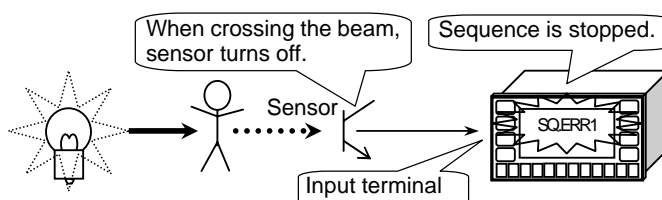
Input terminal

5.16. Zero Operation

❑ The zero operation zeroes the display and changes to the gross display.
❑ The operation can be performed from the front panel key or the input terminal of the control I/O.
❑ The adjustable range is based on the zero calibration and `Zero range` [`genf- 6`]. The range is displayed in the unit of percentage of the weighing capacity.
❑ If the operation cannot be achieved, an error message and `ZR.ERR` is displayed.
❑ The re-zero data is maintained in memory even without power.

Key Operation
Pressing and holding the **SHIFT** key, press the **ZERO** key.

Operation from Control I/O
[`1n f-xx`] `In xx (Axx)` ....The input terminal of the control I/O.
    [`01`] `Zero` ....When it turns on, zero of gross is displayed.
      xx is terminal number (01 to 11).
    [Function] - [Set function] - [control I/O] - [Input]

Concerning Parameters
[`genf-1`] `Zero range`
    Range is within 30% of the weighing capacity.
    [Function] - [Set function] - [General] - [Weight]

[`genf-9`] `Tare & zero unstable WGT`
    The prohibition of the re-zero operation in the unstable condition.
    [Function] - [Set function] - [General] - [Weight]

[`genf-13`] `Clear mode at power ON`
    Specify power-on status.
    [Function] - [Set function] - [General] - [Weight]

⏬ 5.17. Tare Operation

❑ The relation of the display is as follows:
Net = Gross - Tare

Key Operation
Press the **TARE** key.

Operation from Control I/O
[1n f-xx]   In xx (Axx) ....The input terminal of the control I/O.
    [03]   Tare ....When it turns on, zero of net is displayed.
      xx is terminal number (01 to 11).
      [Function] - [Set function] - [control I/O] - [Input]

Concerning Parameters
[genf-9]   Tare & zero unstable WGT
      The prohibition of the re-zero operation in the unstable condition.
      [Function] - [Set function] - [General] - [Weight]

[genf-10]   Tare at (-)gross weight
      The prohibition of the tare operation during negative weighing.
      [Function] - [Set function] - [General] - [Weight]

[genf-13]   Clear mode at power ON
      Specify power-on status.
      [Function] - [Set function] - [General] - [Weight]

5.17.1. Tare Clear Operation

❑ The function displays a gross value that is not compensated by the tare operation or the zero operation.

Key Operation
Step 1   Turn off the display.
Step 2   Pressing and holding the **TARE** key, press the **ON** key.

Operation from Control I/O
[1n f-xx]   In xx (Axx) ....The input terminal of the control I/O.
    [04]   Tare clear ....When it turns on, the original gross is displayed.
      xx is terminal number (01 to 11).
      [Function] - [Set function] - [control I/O] - [Input]

▼ 5.18. Preset Tare

❑ A preset tare (PT) can be stored in each code. The preset tare can be used, when the tare value is specified in advance.
The relation of the display is as follows
Net = Gross - PT

Key Operation
Store a preset value to PT of the code. Refer to "5 . Code".

Concerning Parameters
[genf-11] Preset tare
The permission of preset tare function
[Function] - [Set function] - [General] - [Weight]

[genf-12] Preset tare=0 choose
Update of preset tare
[Function] - [Set function] - [General] - [Weight]

[othf-4] Tare header
Classifying normal tare and preset tare of the serial data.
[Function] - [Set function] - [General] - [Other]

▼ 5.19. Customizing F1 and F2 key

❑ Pressing this key, the key works as the **F1** key.
Pressing and holding the **SHIFT** key and press this key, the key works as the **F2** key.
Preset the function of the F1 and F2 key at item othef-2 and othef-3 in the function list.

Function	Parameter and Description	
	0	No function
	1	Print key
	2	(Do not use)
[othf-2] F1key function	3	(Do not use)
	4	Tare clear key
and	5	Gross / Net key
	6	The key to cancel last judgment
[othf-3] F2key function	7	The key to finish judgment and target count
	8	Error reset key
	9	The key to clear total data of all codes
	10	Total print key

[Function] - [Set function] - [General] - [Weight]

⏬ 5.20. Canceling Last Judgment

❑ The function can be operated with the terminal for the control I/O, when the terminal is specified to `Cancel the last result` [12].

❑ The last judgment is canceled, when the terminal is active after the judgment.

⏬ 5.21. Clearing the Total

Key Operation
❑ The total of the current code can be cleared with the following operation.
Step 1 Press and hold the **SHIFT** key and press the **CLEAR TOTAL** key.

Code Edit Mode
❑ The following totals can be cleared in menu `Code edit`.
Refer to " 5.2.3. Delete" for operation.
  ❑ `Total`......................................Deletes total for a code.
  ❑ `Set point & Total`...................Deletes set point and total for a code.
  ❑ `All Totals` ....Deletes total for all codes.
  ❑ `All Codes` ....Deletes all codes.

Control I/O
❑ There are two methods to clear the totals. These functions can be operated with the terminals of the control I/O, when the terminals are specified by the following functions.
  ❑ `Clear totals of code` [24].
  ❑ `Clear all code totals` [25].

Parallel I/O of OP-05
❑ There are two methods to clear the totals. These functions can be operated with the terminals of the parallel I/O, when the terminals are specified by the following functions.
  ❑ `Clear totals of code` [24].
 ❑ `Clear all code totals` [25].

Command of Serial Interface
❑ The totals can be cleared with the following command.
  ❑ CDTLxxxx   Total of a specified code is cleared. xxxx is the code number
  ❑ CETL   All total is cleared.

⏷ 5.22. Error Message and Alarm

❑ When the indicator detects an error in the weighing system, an error message is displayed, alarm sounds and the error status is output to the control I/O.
❑ Press the **ESC** key to clear the message.
If there is another error after pressing the **ESC** key to clear first message, the second error message is displayed.
❑ The error number can be output from the BCD output of OP-01 or the serial interface.
❑ Clear the error with the terminal of the control I/O that is specified to `Error reset` [44].
If there are multiple errors, the prior error is cleared first.
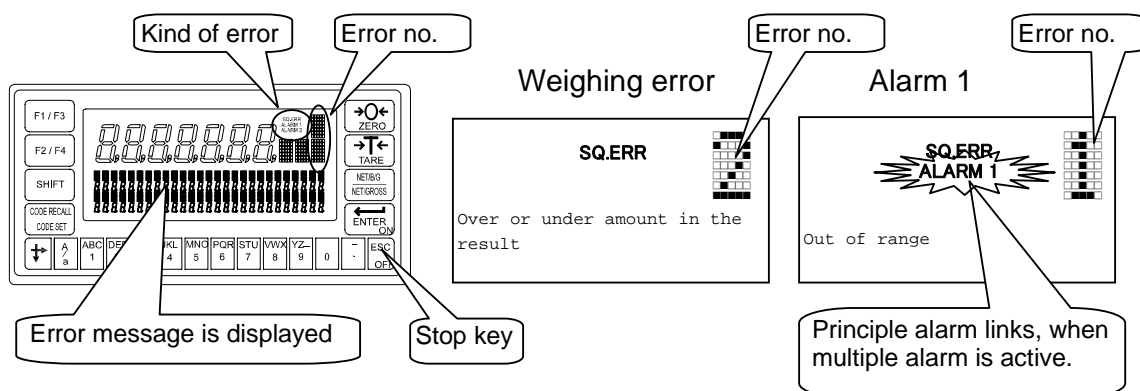
Kind of Alarm and Error
There is the following priority.

Weighing sequence error **<** Zero error **<** Alarm 1 **<** Alarm 2
SQ.ERR   ZR.ERR   **ALARM 1**   **ALARM 2**

Kind	No.	Description
		When the weighing can not continue, a message is displayed and the sequence is stopped. Cope with cause and restart the weighing.
Check weighing sequence error SQ.ERR	0	The sequence pauses. Cope with cause and restart the sequence.
	1	Safety check can not be completed. Check the safety.
	2	Duplication has occurred. Increase the interval between the articles.
	3	There is a conflict in the setpoints Check setpoint
	4	There is foreign matter on the weighing conveyor. Remove the foreign matter to start the sequence.
	5	The article includes foreign matter. Check it.
	6	A crush error has occurred due to a fast conveyor. Increase the interval between the articles.

Kind	No.	Description
Zero error ZR.ERR		When the displayed value can not be set to zero with re-zero or tare, this message is displayed.
	0	Display can not be zeroed by zero compensation.
	1	Display can not be zeroed by tare operation.
	2	Unstable display.
Alarm 1 **ALARM 1**		When the weighing value is out of range and emergency stop is performed, this symbol is displayed.
	1	The weighing value is out of range.
	9	Emergency stop has been performed.
Alarm 2 **ALARM 2**		It can not weigh. Check the weighing system. Example: loadcell cable, connectors.
	1	A/D converter is positive over count. Check the loadcell cable.
	2	A/D converter is negative over count. Check the loadcell cable.
	4	RAM error. Check the backup battery

5.23.   Graphic Status Indicator

❑ The indicator can display the weighing status and the result on the graphic status indicator.

Graphic status indicator
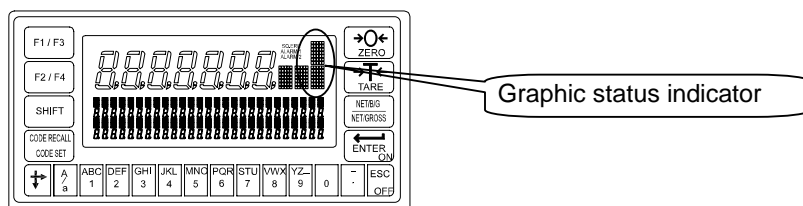
Upper Side	Description	
	LoLo	The current result is LoLo.
	Lo	The current result is Lo.
	OK	The current result is OK.
	Hi	The current result is Hi
	HiHi	The current result is HiHi
	Foreign matter	It is displayed, when detecting foreign matter.
		Other weighing errors. Duplication, Crush or etc.

Lower Side	Description	
		The conveyor is in motion.
	Loading symbol	It is displayed until the evaluation delay timer 43 is up after detecting the article on the weighing conveyor. It is not displayed in OK mode [5q f-01] [3] or manual mode [5q f-01] [4].
	Averaging symbol	It is in the process of evaluation.
	Forwarding symbol	It is displayed until the weighing value is within the zero band after forwarding the article. It is not displayed in OK mode [5q f-01] [3] or manual mode [5q f-01] [4].
	Counter finish	The counter of the article has reached the preset limitation.
	Stop	It has no symbol.

Concerning Parameters

[5ubf-2] Activity indicator
  [0] Not used.
  [1] Use.
       [Function] - [Set function] - [General] - [Sub display]

5.24. Memory Backup

❑ The indicator has two kinds of memory.

Flash memory   This memory is used to store important data without power supplied that the occurrence of re-writing them is seldom.
Life of re-writing them is approximately 100,000 times or more.
Data example: Calibration, Function, Code

Backup RAM   This memory is used to store temporary data that the occurrence of re-writing them is often.
Life of the battery is approximately 10 years at 25 ℃, normal use
Data example: Tare, Total, Re-zero data

❑ The code can be stored in flash memory or backup RAM.

Concerning Parameters

[othf-8] Save data
    [1] Save in RAM
    [2] Save in flash memory When re-writing code, the sequence is stopped.
       [Function] - [Set function] - [General] - [Other]

6. Interface

6.1. Control I/O Function

❑ The control I/O is the interface to communicate system status and sequence commands between the indicator and peripherals.
Input terminals .... 11 lines that can be selected by the function
Output terminals .... 11 lines that can be selected by the function
The output terminals use open collector transistors

❑ Preset the functions to these terminals. Refer to "**Error! Reference source not found.**. Function List".
[Function] - [Set function] - [Control I/O]

Caution
❑ **Do not assign the same function to multiple terminals of the control I/O and OP-05.**

6.1.1.   Interface Circuit

Input terminal

	Maximum	typ.
Input open voltage	14V DC	10 V DC
Input drive current	5 mA	3 mA
Saturation tolerance voltage	2 V DC	

Output terminal

	Maximum
Output voltage	40 V DC
Output current	50 mA
Saturation tolerance voltage	1.5 V at 50 mA
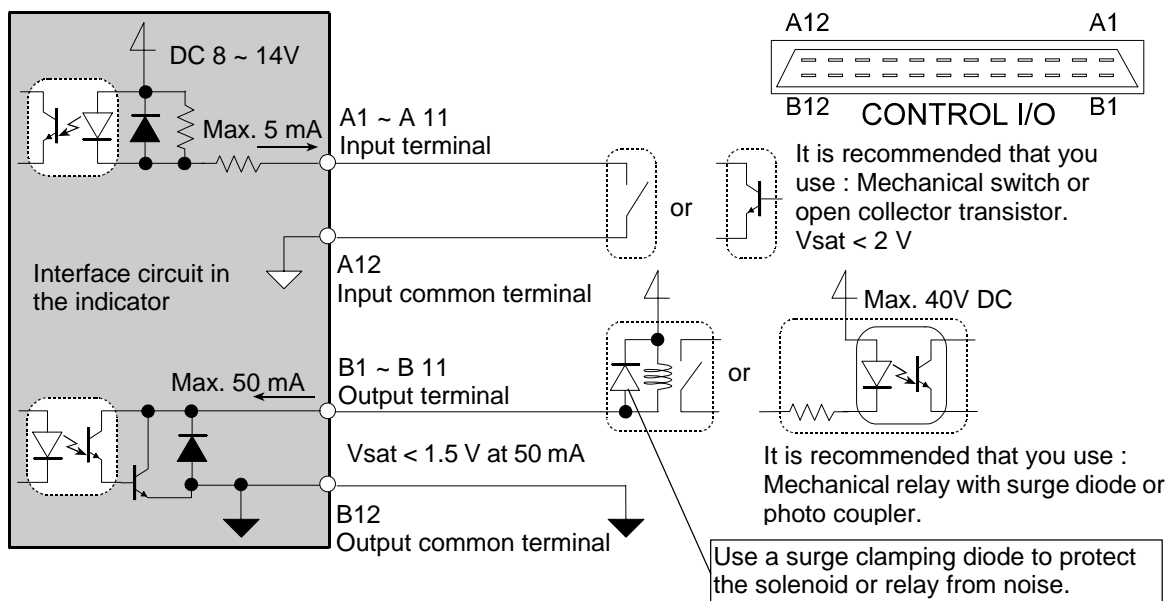
6.1.2.   Timing Chart

Caution

❑ **Keep the delay time to avoid abnormal-operation and noise.**

❑ **Keep the input signal more than 50 ms to avoid noise and chattering.**

❑ Acknowledge terminal is active for five seconds, when the indicator receives a signal.

Example

Turn off 50 ms or more.

Short signal cannot receive.

Turn on 50 ms or more.

Conveyor input

Conveyor output

Acknowledge output

10ms/div

Acknowledge is output 500 ms or more.
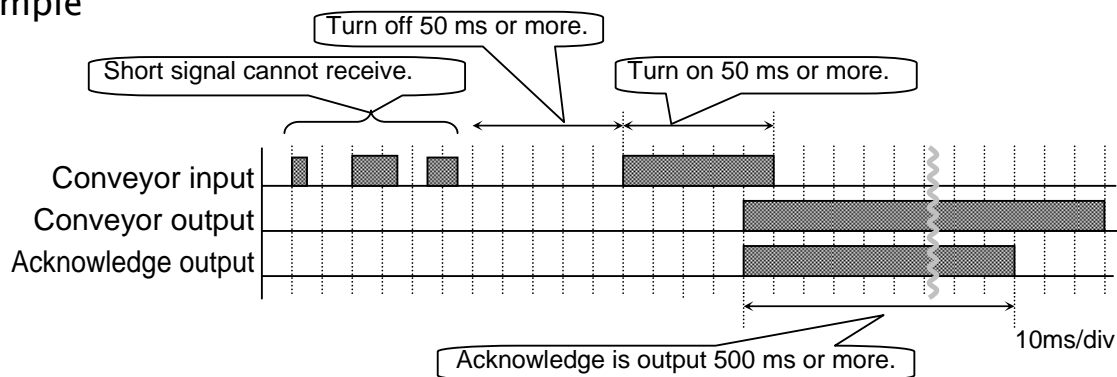
⬇ 6.2. Built-in RS-485 Interface

❑ The RS-485 interface can use commands to control the indicator. The interface can read weighing data or parameters and store parameters in the indicator.

❑ The interface can connect 32 units maximum and a personal computer using a communication cable.

❑ Each unit is specified by an address appended to the command.

Specifications

Transmission system......... EIA RS-485, Asynchronous, bi-directional, half-duplex
Data length .... 7 bits or 8 bits
Start bit .... 1 bit
Parity bit............................ Odd, Even, not used
Stop bits............................ 1 bit, 2 bits
Baud rate .... 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, (38400 bps for jet stream mode only)
Line.................................... 2 wires (2-balanced wires)
Connection .... Max. 32 units
Character code................... ASCII code
Terminator........................... CR, CR LF

Instructions for Use

❑ When using a terminator, connect it to the SDA and SDB terminals using the accessory resistor.

❑ If there is no signal ground at the host computer, it is not necessary to use the SG terminal.

❑ If a shielded cable is used, connect the FG teminal to the shield line.

❑ When connecting to the RS-232C, use a converter of an RS-232C/ RS-485 converter avilable on a market.

❑ Use a muitiple drop connection for command mode.
Do not use a multi-drop connection in stream mode or jet stream mode.

6.2.1.   Settings of Parameters for RS-485

Refer to the "**Error! Reference source not found.**. Parameter List" of the function list.
[Function] - [Set function] - [Serial] - [RS-485] - [`r5 f- 1`] to [`r5 f-13`]

6.2.2.   Connection

Terminals

Interface Circuit

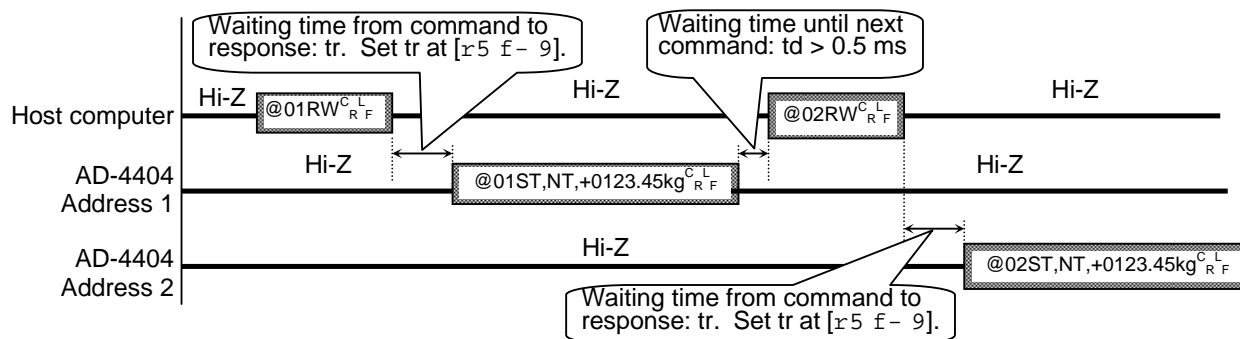Multiplue Drop Connection for Command Mode
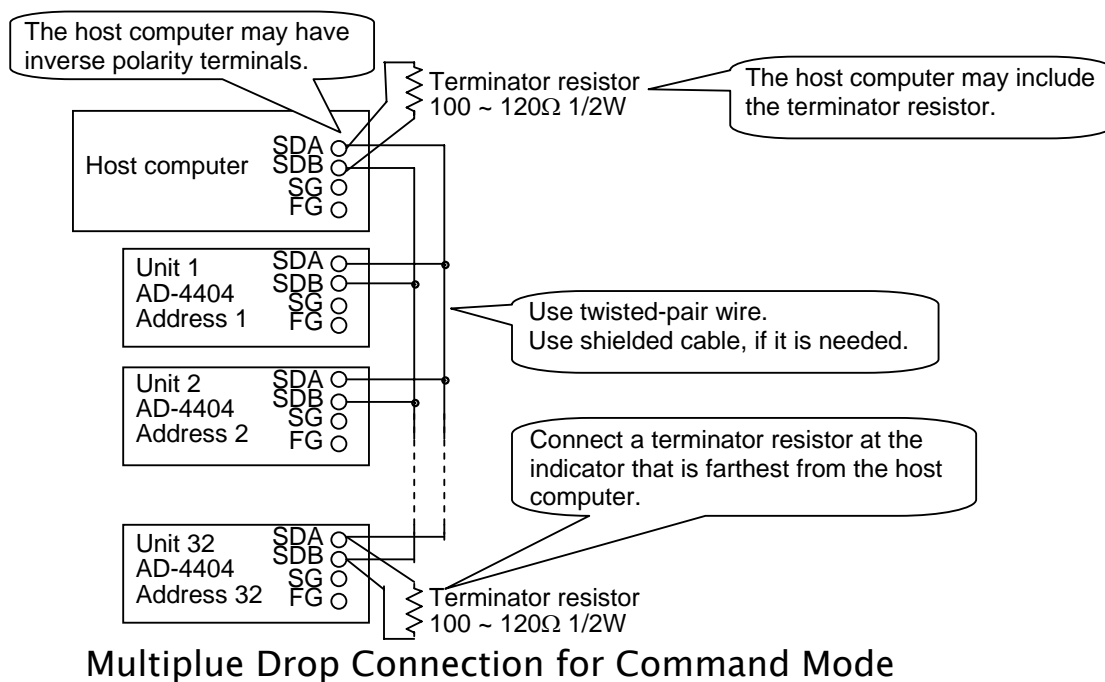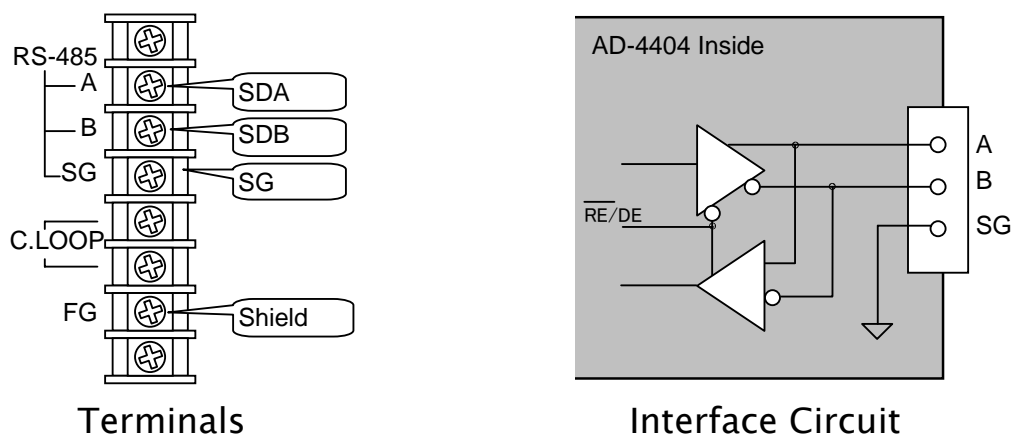
6.2.3. Timing Chart

- ❏ Keep the delay time above 0.5 ms between the last response and the next command.
- ❏ Set response time (tr). $[r5\ f-\ 9]$ < tr < $[r5\ f-\ 9]$ + 50 ms
- ❏ Use a long delay time, when there is noise.
- ❏ Hi-Z: Hi impedance

Caution
- ❏ **If next command is transmitted from computer within 0.5 ms from the end of last command, an interface error may may occur.**

6.2.4. Communication Modes

Stream Mode
  The data is output on each display update. If the data cannot be output completely due to a slow baud rate, the data is output at the next update.

Auto Print Mode
  The data is automatically printed on batch finish.

Total Print Mode
  When entering the PRINT command, data is printed.
  The PRINT command can be assigned to the control I/O, OP-05, F1 key or F2 key

Manual Print Mode
  When the preset print key is pressed or the assigned terminal is connected, the data is output.

Command Mode
  This mode is used to control the indicator, to store parameters and to read data or parameters. Use multiple drop connection.
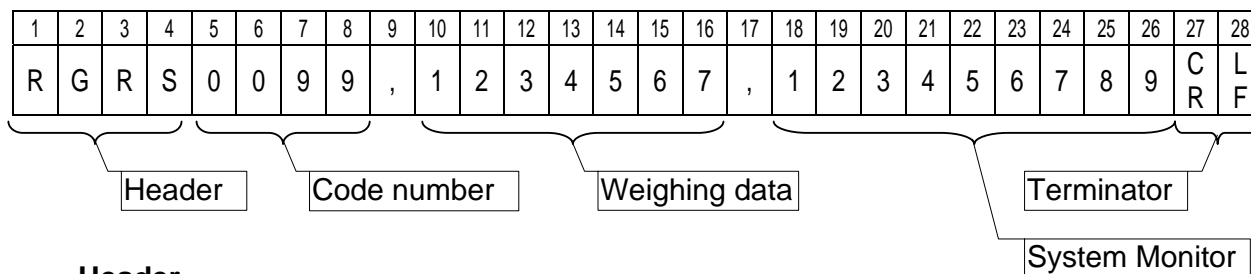
Jet Steam Mode
  The weighing data and state is output 100 time/s. The data is the gross or net value. The format is the same as the command RGRS or RNET.
  Set the baud rate to 38400 bps. If another baud rate is used, incorrect sampling may occur. Output data is repeated according to the number of Sampling frequency divider [genf-3].

6.2.5.   General Data Format

❑ This format is used for the command mode and jet stream mode.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
R	G	R	S	0	0	9	9	,	1	2	3	4	5	6	7	,	1	2	3	4	5	6	7	8	9	C R	L F

Header — Code number — Weighing data — Terminator

System Monitor

Header
Command is echoed. The echoed command is 4 characters

Code number
The code is 4 characters. A comma "," is appended after this.

Weighing data
Data uses BCD code, is 7 figures and does not include a decimal point.
When data is negative, a minus sign is appended to the head.
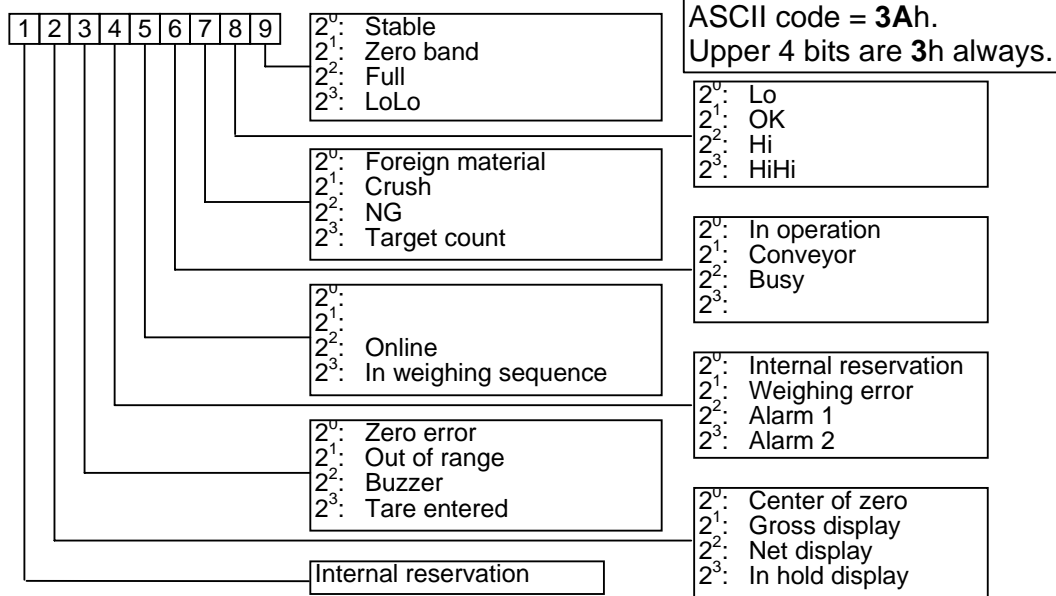A comma "," is appended after this.

Status
The status of weighing data and sequence are indicated at 36 bits.
The status bits synchronize with control I/O and options.
9 figure is ASCII code. Each lower 4 bits are used.
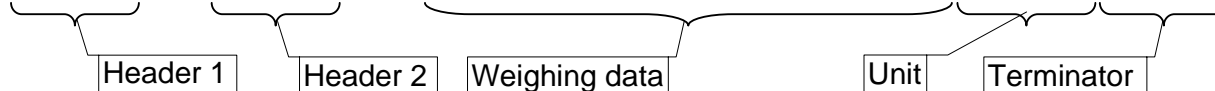Each upper 3 bits are fixed to "101".

Example: $2^3\,2^2\,2^1\,2^0$
1 0 1 0 = **A**h
ASCII code = **3A**h.
Upper 4 bits are **3**h always.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

2^0: Stable
2^1: Zero band
2^2: Full
2^3: LoLo

2^0: Foreign material
2^1: Crush
2^2: NG
2^3: Target count

2^0:
2^1:
2^2: Online
2^3: In weighing sequence

2^0: Zero error
2^1: Out of range
2^2: Buzzer
2^3: Tare entered

Internal reservation

2^0: Lo
2^1: OK
2^2: Hi
2^3: HiHi

2^0: In operation
2^1: Conveyor
2^2: Busy
2^3:

2^0: Internal reservation
2^1: Weighing error
2^2: Alarm 1
2^3: Alarm 2

2^0: Center of zero
2^1: Gross display
2^2: Net display
2^3: In hold display

Terminator
Select a terminator at `Terminator` [r5 f-7]
CR or CR + LF - CR: **0D**h,   LF: **0A**h

6.2.6.   A&D Data Format

❑ This format is used for stream mode, auto print mode and total print.
❑ This format is compatible with the AD-4325 indicator.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	T	,	N	T	,	+	0	0	1	2	.	3	4	k	g	CR	LF

Header 1   Header 2   Weighing data   Unit   Terminator

Header 1
- ST   Stable
- US   Unstable
- LO   Out of range

Header 2
- GS   Gross value
- NT   Net value
- TR   Tare value

Weighing data
The data uses BCD code, is 7 figures and includes a decimal point.
When the data is negative, a minus sign is appended to the head.
When the data is out of range, all numerical characters are space (**20**h).
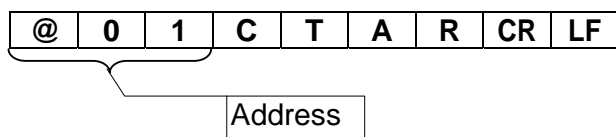
Unit
kg, g or t

Terminator
CR or CR + LF - CR: **0D**h,   LF: **0A**h

6.2.7.   Address

❑ Set the address at `Address` [`r5 f- 8`]. The address can be entered as a number between 1 and 99.

❑ 32 units can be connected to a computer. Use multiple drop connection.

❑ `Address` [`r5 f- 8`] is always appended to the data in all modes of `Communication mode` [`r5 f- 2`].

❑ An address of three figures can be used, when "0" is appended to front of the address.
If three figures are used, the response of the indicator becomes three figures.
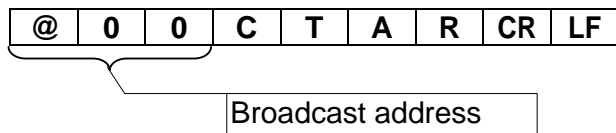Example: Address 001 to 099 can be used.

Caution
❑ **Do not assign the same address number to multiple units.**

@	0	1	C	T	A	R	CR	LF

Address

Broadcast Address
When the address @oo is used, a command is sent to all units at the same time.
Example:

@	0	0	C	T	A	R	CR	LF

Broadcast address

6.2.8. Command List

Monitor Commands

Name	Code	Description
Read displayed value	RDSP	Data specified at `Output data` [r5 f-1]
Read gross value	RGRS	
Read net value	RNET	
Read tare value	RTAR	
Read weighing result	RFIN	
Read set point	RSPTxxxx	Comparison parameters
Read code data	RCODxxxx	The details of the code.
Read total data of code	RTTLxxxx	Total weight, total count
Read error code	RERR	

xxxx: Code number appended to the leading zeros. Example: 0099

Write Commands

Name	Code	Description
Store set points	WSPTxxxx	Comparison parameters
Store code data without total	WCODxxxx	To store all parameters of the code.
Store all code data	WCOXxxxx	To store all parameters of the code.

xxxx: Code number appended to the leading zeros. Example: 0099

Control Commands

Name	Code	Description
Make zero display	CZER	
Tare	CTAR	
Tare clear	CCTR	
Change to gross display	CGRS	
Change to net display	CENT	
Call code	CCODxxxx	
Cancel the last result	CCAC	
Start operation	COPR	
Stop operation	CSTD	
Emergency stop	CSTP	
Clear total data of code	CDTLxxxx	Total data is set to 0.
Clear total data of all code	CETL	All total data is set to 0.
Reset an error	CRER	
No operation	CNOP	

xxxx: Code number appended to the leading zeros. Example: 0099.

Response Error Code

Response	Description	Note
?E	The format of command is not correct.	When an address is used,
VE	The data of command is not correct.	the address is appended to
IE	Indicator is busy.	the response.

6.2.9.   ASCII Code for Display Characters

❑ The characters use special code for the name of the code.
Therefore, some characters are not the same as U.S. code.

		Lower bits							
		0	1	2	3	4	5	6	7
Upper bits	0			Space	0	@	P	Space	p
	1			!	1	A	Q	a	q
	2			"	2	B	R	b	r
	3			#	3	C	S	c	s
	4			$	4	D	T	d	t
	5			%	5	E	U	e	u
	6			&	6	F	V	f	v
	7			'	7	G	W	g	w
	8			(	8	H	X	h	x
	9			)	9	I	Y	i	y
	A	LF		*	:	J	Z	j	z
	B			+	;	K	[	k	{
	C			,	<	L	¥	l	|
	D	CR		-	=	M	]	m	}
	E			.	>	N	^	n	●
	F			/	?	O	_	o	○

6.2.10. Protocol (Communication Procedure and Format)

Caution **When using the flash memory (** `othf-11` **= 2, "Store in flash memory") and storing new code data with "Write Commands", new code data is not stored in the flash memory and the code data stored in the flash memory has effect after restarting the power supply. If storing the code data into the flash memory is needed, perform the remote setup program of** "Error! Reference source not found.**. Remote Operation".**

Monitor Commands

Command	Protocol
RDSP Read displayed value	Current displayed the weighing value is output. 26 characters. Reply format at **gross**. Computer RDSP CR LF AD-4404 RGRS1234,1234567,123456789 CR LF Reply format at **net**. Code number, Weight value, Status Computer RDSP CR LF AD-4404 RNET1234,1234567,123456789 CR LF
RGRS Read gross value	Current gross value is output. 26 characters. Gross value is 7 figures with "-" sign at MSB when negative value and without decimal point. Computer RGRS CR LF AD-4404 RGRS1234,1234567,123456789 CR LF Code number, Gross value, Status
RNET Read net value	Current net value is output. 26 characters. Net value is 7 figures with "-" sign at MSB when negative value and without decimal point. Computer RNET CR LF AD-4404 RNET1234,1234567,123456789 CR LF Code number, Net value, Status
RTAR Read tare value	Current tare value is output. 26 characters. Tare value is 7 figures with "-" sign at MSB when negative value and without decimal point. Computer RTAR CR LF AD-4404 RTAR1234,1234567,123456789 CR LF Code number, Tare value, Status
RFIN Read weighing result	Weighing result is output. 26 characters. Net value is 7 figures with "-" sign at MSB when negative value and without decimal point. Computer RFIN CR LF Code number, Net value, Status AD-4404 RFIN1234,1234567,123456789 CR LF

Command	Protocol
RSPT Read set point or Read comparison parameters 64 Characters	This command outputs set points of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point. If code number is replaced with space codes (20h), the current set points are output. Computer RSPT0034 $^C_R{}^L_F$ AD-4404 RSPT0034,1234567,1234567,1234567, Code number, Hi, Lo, HiHi, LoLo, Zero Band, Full ,1234567,1234567,1234567,1234567 $^C_R{}^L_F$
RCOD Read code 226 Characters	This command outputs all data of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point. If code number is replaced with space codes (20h), the current code is output. Computer RCOD0034 $^C_R{}^L_F$ Code number AD-4404 RCOD0034,12345678...,123456789 $^C_R{}^L_F$ See table below

Output item order	Length
Code number	RCOD + 4
Code name	12 + 3 spaces
Target	7
Hi	7
Lo	7
HiHi	7
LoLo	7
Zero band	7
Full	7
Preset tare	7
Target count	7
Total count	7
OK count	7
NG count	7
Hi count	7
Lo count	7
HiHi count	7
LoLo count	7
Foreign matter count	7
Duplication count	7
Crush count	7
Maximum	7
Minimum	7
Average	7
Standard deviation σ_{n-1}	7
Population standard deviation σ_n	7
Total weight	9

Command	Protocol
RTTL Read total data of code 138 Characters	This command outputs total data of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point. If code number is replaced with space codes (20h), the current total data of code are output. Computer RTTL0034 $^C_R{}^L_F$ AD-4404 RTTL0034,1234567,...,123456789 $^C_R{}^L_F$ Code number, Total count, Total weight <table><tr><td>Output item order</td><td>Length</td></tr><tr><td>Code number</td><td>RCOD + 4</td></tr><tr><td>Total count</td><td>7</td></tr><tr><td>OK count</td><td>7</td></tr><tr><td>NG count</td><td>7</td></tr><tr><td>Hi count</td><td>7</td></tr><tr><td>Lo count</td><td>7</td></tr><tr><td>HiHi count</td><td>7</td></tr><tr><td>LoLo count</td><td>7</td></tr><tr><td>Foreign matter count</td><td>7</td></tr><tr><td>Duplication count</td><td>7</td></tr><tr><td>Crush count</td><td>7</td></tr><tr><td>Maximum</td><td>7</td></tr><tr><td>Minimum</td><td>7</td></tr><tr><td>Average</td><td>7</td></tr><tr><td>Standard deviation σ_{n-1}</td><td>7</td></tr><tr><td>Population standard deviation σ_n</td><td>7</td></tr><tr><td>Total weight</td><td>9</td></tr></table>
RERR Read error code	12 characters. This command outputs current error code number and type. Each left figure 0: normal, 1: error Each right figure is error code. Computer RERR $^C_R{}^L_F$ AD-4404 RERR 00 00 00 10 $^C_R{}^L_F$ Alarm2, Alarm1, Zero error, Weighing sequence error Example: Above code indicates weighing sequence error and "Weighing sequence is stopped" of error code 0.

Write Commands

Command	Protocol

WSPT
Store set points
Store comparison parameters
	64 characters.
	This command stores set points of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point.
	
	Computer WSPT0034,1234567,1234567,1234567,1234567,1234567,
	AD-4404
	        Code number, Target, Hi, Lo, HiHi, LoLo,
	        Zero Band, Full, Code number
	
	   1234567,1234567 $^C_R{}^L_F$
	           WSPT0034 $^C_R{}^L_F$

WCOD Store code data without total	96 characters. This command stores all data of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point. If code number is replaced with space codes (20h), data is stored into the current code. Computer WCOD0034,123456...,1234567 $^C_R{}^L_F$ AD-4404 WCOD0034 $^C_R{}^L_F$ Code number <table><tr><td>Output item order</td><td>Length</td></tr><tr><td>Code number</td><td>RCOD + 4</td></tr><tr><td>Code name</td><td>12 + 3 spaces</td></tr><tr><td>Target</td><td>7</td></tr><tr><td>Hi</td><td>7</td></tr><tr><td>Lo</td><td>7</td></tr><tr><td>HiHi</td><td>7</td></tr><tr><td>LoLo</td><td>7</td></tr><tr><td>Zero band</td><td>7</td></tr><tr><td>Full</td><td>7</td></tr><tr><td>Preset tare</td><td>7</td></tr><tr><td>Target count</td><td>7</td></tr></table>

Command	Protocol
WCOX Read code	226 characters. This command outputs all data of a selected code. Parameters are 7 figures with "-" sign at MSB when negative value and without decimal point. If code number is replaced with space codes (20h), the current code is output. Computer RCOD0034 $^C_R{}^L_F$　　　Code number AD-4404　　　RCOD0034,12345678...,123456789 $^C_R{}^L_F$ <table><tr><td>Output item order</td><td>Length</td></tr><tr><td>Code number</td><td>RCOD + 4</td></tr><tr><td>Code name</td><td>12 + 3 spaces</td></tr><tr><td>Target</td><td>7</td></tr><tr><td>Hi</td><td>7</td></tr><tr><td>Lo</td><td>7</td></tr><tr><td>HiHi</td><td>7</td></tr><tr><td>LoLo</td><td>7</td></tr><tr><td>Zero band</td><td>7</td></tr><tr><td>Full</td><td>7</td></tr><tr><td>Preset tare</td><td>7</td></tr><tr><td>Target count</td><td>7</td></tr><tr><td>Total count</td><td>7</td></tr><tr><td>OK count</td><td>7</td></tr><tr><td>NG count</td><td>7</td></tr><tr><td>Hi count</td><td>7</td></tr><tr><td>Lo count</td><td>7</td></tr><tr><td>HiHi count</td><td>7</td></tr><tr><td>LoLo count</td><td>7</td></tr><tr><td>Foreign matter count</td><td>7</td></tr><tr><td>Duplication count</td><td>7</td></tr><tr><td>Crush count</td><td>7</td></tr><tr><td>Maximum</td><td>7</td></tr><tr><td>Minimum</td><td>7</td></tr><tr><td>Average</td><td>7</td></tr><tr><td>Standard deviation σ_{n-1}</td><td>7</td></tr><tr><td>Population standard deviation σ_n</td><td>7</td></tr><tr><td>Total weight</td><td>9</td></tr></table>

Control Commands

Command	Protocol
CZER Make zero display	Re-zero command. Computer `CZER <CR><LF>` ⟶ AD-4404 `CZER <CR><LF>`
CTAR Tare	Tare command. Computer `CTAR <CR><LF>` ⟶ AD-4404 `CTAR <CR><LF>`
CCTR Tare clear	To clear the tare command. Computer `CCTR <CR><LF>` ⟶ AD-4404 `CCTR <CR><LF>`
CGRS Change to gross display	To display the current gross value. Computer `CGRS <CR><LF>` ⟶ AD-4404 `CGRS <CR><LF>`
CENT Change to net display	To display the current net value. Computer `CENT <CR><LF>` ⟶ AD-4404 `CENT <CR><LF>`
CCOD Recall code	To recall the code. Code number Computer `CCOD1234<CR><LF>` ⟶ AD-4404 `CCOD1234<CR><LF>`
CCAC Cancel the last result	To clear the last total data. Computer `CACC <CR><LF>` ⟶ AD-4404 `CACC <CR><LF>`
COPR Operation	To start the weighing sequence. Computer `COPR <CR><LF>` ⟶ AD-4404 `COPR <CR><LF>`
CSTD Stop	To stop the current sequence. Computer `CSTD <CR><LF>` ⟶ AD-4404 `CSTD <CR><LF>`
CSTP Emergency stop	To stop the current sequence. Computer `CSTP <CR><LF>` ⟶ AD-4404 `CSTP <CR><LF>`
CDTL Clear total data of code	Total data of specified code is set to 0. Code number Computer `CDTL1234 <CR><LF>` ⟶ AD-4404 `CDTL1234 <CR><LF>`
CETL Clear total data of all code	All total data is set to 0. Computer `CETL <CR><LF>` ⟶ AD-4404 `CETL <CR><LF>`

Command	Protocol
CRER Reset an error	Computer CRER ^C_R ^L_F ──────────────────────────► AD-4404 CRER^C_R ^L_F
CNOP No operation	Computer CNOP ^C_R ^L_F ──────────────────────────► AD-4404 CNOP^C_R ^L_F

⬇ 6.3. Modbus Interface for RS-485

❑ Modbus is a specific serial protocol that is used with the RS-485 serial interface.

❑ It is not necessary to make a program for communication between these units.
The communication uses the following memories of the monitor unit or computer.

❑ Data is specified with reference No. and address No.
Refer to the instruction for Modbus of the monitor unit or computer.

❑ The connection for Modbus is as follows.

Monitor unit or computer

Connection of RS-485 interface

Connection of 32 units maximum
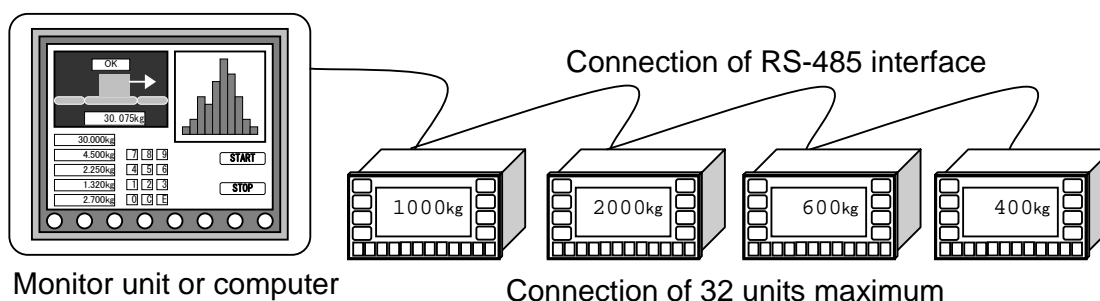
Monitor example: Monitouch V6 (checked at 2002)

❑ Set the following parameters of RS-485 interface. Refer to " **Error! Reference source not found.**. Function List"

Function and parameter		Description
r5 f-1	Output data	Select either parameter.
r5 f-2	Communication mode	Set MODBUS
6	MODBUS	
r5 f-3	Baud rate	
r5 f-4	Parity check	
r5 f-5	Character length	Select either parameter.
r5 f-6	Stop bits	
r5 f-7	Terminator	
r5 f-8	Address	Set unique address number

Reference No.

Type	Reference No.	Description
Coil	0	The same as input bits of control I/O
Input status	1	The same as output bits of control I/O
Input register	3	Register to read data
Holding register	4	Register to read and write data

Coil (Reference No.=0. Output bits)

Address	Description	Address	Description
1	Zero	9	Cancel last result
2	(Internal reservation)	10	Print total
3	Tare	11	Forced finish
4	Tare clear	12	Error reset
6	Operate	13	Manual print
7	Stop	14	Net / Gross
8	Stop buzzer	15	Clear all total

Input Status (Reference No.=1. Input bits)

A code has three items in a **total status**.
Example for code 0 is as follows:

Total status of the code 0	
Address	Description
49	Total in process
50	Over of weighing data
51	Over total count

Intput Status (Reference No.=1)		Intput Status (Reference No.=1)	
Address	Description	Address	Description
17	Stable	39	Alarm 1
18	Zero band	40	Alarm 2
19	Full	41	Zero error
20	LoLo	42	Out of weighing range
21	Lo	43	Buzzer
22	OK	44	Tarred
23	Hi	45	Center of zero
24	HiHi	46	Gross display
25	Foreign matter	47	Net display
26	Duplication	48	Hold display
27	NG	49 to 51	Total status of code 0
28	Target count	305 to 307	Total status of code 1
29	Operate	561 to 563	Total status of code 2
30	Conveyor	817 to 819	Total status of code 3
31	BUSY	1073 to 1075	Total status of code 4
32	BUSY for foreign matter	1329 to 1331	Total status of code 5
33	Crush	1585 to 1587	Total status of code 6
34	Internal reservation	1841 to 1843	Total status of code 7
35	Online. 1 Hz pulse is output, when weighing is able.	2097 to 2099	Total status of code 8
		2353 to 2355	Total status of code 9
36	Internal reservation	2609 to 2611	Total status of code 10
37		2865 to 2867	Total status of code 11
38	Weighing sequence error	3121 to 3123	Total status of code 12

Intput Status (Reference No.=1)		Intput Status (Reference No.=1)	
Address	Description	Address	Description
3377 to 3379	Total status of code 13	14641 to 14643	Total status of code 57
3633 to 3635	Total status of code 14	14897 to 14899	Total status of code 58
3889 to 3891	Total status of code 15	15153 to 15155	Total status of code 59
4145 to 4147	Total status of code 16	15409 to 15411	Total status of code 60
4401 to 4403	Total status of code 17	15665 to 15667	Total status of code 61
4657 to 4659	Total status of code 18	15921 to 15923	Total status of code 62
4913 to 4915	Total status of code 19	16177 to 16179	Total status of code 63
5169 to 5171	Total status of code 20	16433 to 16435	Total status of code 64
5425 to 5427	Total status of code 21	16689 to 16691	Total status of code 65
5681 to 5683	Total status of code 22	16945 to 16947	Total status of code 66
5937 to 5939	Total status of code 23	17201 to 17203	Total status of code 67
6193 to 6195	Total status of code 24	17457 to 17459	Total status of code 68
6449 to 6451	Total status of code 25	17713 to 17715	Total status of code 69
6705 to 6707	Total status of code 26	17969 to 17971	Total status of code 70
6961 to 6963	Total status of code 27	18225 to 18227	Total status of code 71
7217 to 7219	Total status of code 28	18481 to 18483	Total status of code 72
7473 to 7475	Total status of code 29	18737 to 18739	Total status of code 73
7729 to 7731	Total status of code 30	18993 to 18995	Total status of code 74
7985 to 7987	Total status of code 31	19249 to 19251	Total status of code 75
8241 to 8243	Total status of code 32	19505 to 19507	Total status of code 76
8497 to 8499	Total status of code 33	19761 to 19763	Total status of code 77
8753 to 8755	Total status of code 34	20017 to 20019	Total status of code 78
9009 to 9011	Total status of code 35	20273 to 20275	Total status of code 79
9265 to 9267	Total status of code 36	20529 to 20531	Total status of code 80
9521 to 9523	Total status of code 37	20785 to 20787	Total status of code 81
9777 to 9779	Total status of code 38	21041 to 21043	Total status of code 82
10033 to 10035	Total status of code 39	21297 to 21299	Total status of code 83
10289 to 10291	Total status of code 40	21553 to 21555	Total status of code 84
10545 to 10547	Total status of code 41	21809 to 21811	Total status of code 85
10801 to 10803	Total status of code 42	22065 to 22067	Total status of code 86
11057 to 11059	Total status of code 43	22321 to 22323	Total status of code 87
11313 to 11315	Total status of code 44	22577 to 22579	Total status of code 88
11569 to 11571	Total status of code 45	22833 to 22835	Total status of code 89
11825 to 11827	Total status of code 46	23089 to 23091	Total status of code 90
12081 to 12083	Total status of code 47	23345 to 23347	Total status of code 91
12337 to 12339	Total status of code 48	23601 to 23603	Total status of code 92
12593 to 12595	Total status of code 49	23857 to 23859	Total status of code 93
12849 to 12851	Total status of code 50	24113 to 24115	Total status of code 94
13105 to 13107	Total status of code 51	24369 to 24371	Total status of code 95
13361 to 13363	Total status of code 52	24625 to 24627	Total status of code 96
13617 to 13619	Total status of code 53	24881 to 24883	Total status of code 97
13873 to 13875	Total status of code 54	25137 to 25139	Total status of code 98
14129 to 14131	Total status of code 55		
14385 to 14387	Total status of code 56		

Intput Register (Reference No.=3. To read words)

A word, occupies an address, is length of 16 bits, A code has these items in a **total data**. Example for code 0 is as follows:

Total data of the code 0	
Address	Description
33, 34	Total count
35, 36	OK count
37, 38	NG count
39, 40	Hi count
41, 42	Lo count
43, 44	HiHi count
45, 46	LoLo count
47, 48	Count of foreign matter

Total data of the code 0	
Address	Description
49, 50	Count of duplication
51, 52	Count of crush
53, 54	Maximum data
55, 56	Minimum data
57, 58	Average data
59, 60	Standard deviation σ_{n-1}
61, 62	Population standard deviation σ_n
63, 64	Total weight

Intput Register (Reference No.=3) To read data		Intput Register (Reference No.=3) To read data	
Address	Description	Address	Description
1	Decimal point	3617 to 3647	Total data of the code 14
2	Unit. 0: blank, 1: g, 2: kg, 3: t, 4: lb	3873 to 3903	Total data of the code 15
		4129 to 4159	Total data of the code 16
3, 4	Tare mass	4385 to 4415	Total data of the code 17
5, 6	Net	4641 to 4671	Total data of the code 18
7, 8	Gross	4897 to 4927	Total data of the code 19
9	Active code No.	5153 to 5183	Total data of the code 20
10		5409 to 5439	Total data of the code 21
11		5665 to 5695	Total data of the code 22
12	Sequence error	5921 to 5951	Total data of the code 23
13	Zero error No.	6177 to 6207	Total data of the code 24
14	Alarm 1 No.	6433 to 6463	Total data of the code 25
15	Alarm 2 No.	6689 to 6719	Total data of the code 26
16	Operation mode 0: enable, 1: unable	6945 to 6975	Total data of the code 27
		7201 to 7231	Total data of the code 28
33 to 63	Total data of the code 0	7457 to 7487	Total data of the code 29
289 to 319	Total data of the code 1	7713 to 7743	Total data of the code 30
545 to 575	Total data of the code 2	7969 to 7999	Total data of the code 31
801 to 831	Total data of the code 3	8225 to 8255	Total data of the code 32
1057 to 1087	Total data of the code 4	8481 to 8511	Total data of the code 33
1313 to 1343	Total data of the code 5	8737 to 8767	Total data of the code 34
1569 to 1599	Total data of the code 6	8993 to 9023	Total data of the code 35
1825 to 1855	Total data of the code 7	9249 to 9279	Total data of the code 36
2081 to 2111	Total data of the code 8	9505 to 9535	Total data of the code 37
2337 to 2367	Total data of the code 9	9761 to 9791	Total data of the code 38
2593 to 2623	Total data of the code 10	10017 to 10047	Total data of the code 39
2849 to 2879	Total data of the code 11	10273 to 10303	Total data of the code 40
3105 to 3135	Total data of the code 12	10529 to 10559	Total data of the code 41
3361 to 3391	Total data of the code 13	10785 to 10815	Total data of the code 42

Intput Register (Reference No.=3) To read data		Intput Register (Reference No.=3) To read data	
Address	Description	Address	Description
11041 to 11071	Total data of the code 43	18465 to 18495	Total data of the code 72
11297 to 11327	Total data of the code 44	18721 to 18751	Total data of the code 73
11553 to 11583	Total data of the code 45	18977 to 19007	Total data of the code 74
11809 to 11839	Total data of the code 46	19233 to 19263	Total data of the code 75
12065 to 12095	Total data of the code 47	19489 to 19519	Total data of the code 76
12321 to 12351	Total data of the code 48	19745 to 19775	Total data of the code 77
12577 to 12607	Total data of the code 49	20001 to 20031	Total data of the code 78
12833 to 12863	Total data of the code 50	20257 to 20287	Total data of the code 79
13089 to 13119	Total data of the code 51	20513 to 20543	Total data of the code 80
13345 to 13375	Total data of the code 52	20769 to 20799	Total data of the code 81
13601 to 13631	Total data of the code 53	21025 to 21055	Total data of the code 82
13857 to 13887	Total data of the code 54	21281 to 21311	Total data of the code 83
14113 to 14143	Total data of the code 55	21537 to 21567	Total data of the code 84
14369 to 14399	Total data of the code 56	21793 to 21823	Total data of the code 85
14625 to 14655	Total data of the code 57	22049 to 22079	Total data of the code 86
14881 to 14911	Total data of the code 58	22305 to 22335	Total data of the code 87
15137 to 15167	Total data of the code 59	22561 to 22591	Total data of the code 88
15393 to 15423	Total data of the code 60	22817 to 22847	Total data of the code 89
15649 to 15679	Total data of the code 61	23073 to 23103	Total data of the code 90
15905 to 15935	Total data of the code 62	23329 to 23359	Total data of the code 91
16161 to 16191	Total data of the code 63	23585 to 23615	Total data of the code 92
16417 to 16447	Total data of the code 64	23841 to 23871	Total data of the code 93
16673 to 16703	Total data of the code 65	24097 to 24127	Total data of the code 94
16929 to 16959	Total data of the code 66	24353 to 24383	Total data of the code 95
17185 to 17215	Total data of the code 67	24609 to 24639	Total data of the code 96
17441 to 17471	Total data of the code 68	24865 to 24895	Total data of the code 97
17697 to 17727	Total data of the code 69	25121 to 25151	Total data of the code 98
17953 to 17983	Total data of the code 70	25377 to 25407	Total data of the code 99
18209 to 18239	Total data of the code 71		

Holding Register (Reference No.=4. To write words)

A word, occupies an address, is 16 bits in length.
A code has these items in a **comparison data**.
Example for code 0 is as follows:

Comparison data of the code 0	
Address	Description
1	Name, 1 to 2 characters
2	Name, 3 to 4 characters
3	Name, 5 to 6 characters
4	Name, 7 to 8 characters
5	Name, 9 to 10 characters
6	Name, 11 to 12 characters
7,8	Target value
9,10	Hi

Comparison data of the code 0	
Address	Description
11, 12	Lo
13, 14	HiHi
15, 16	LoLo
17, 18	Zero band
19, 20	Full
21, 22	Tare mass
23, 24	Target count

Holding Register (Reference No.=4) To write comparison data		Holding Register (Reference No.=4) To write comparison data	
Address	Description	Address	Description
1 to 24	C.D. of the code 0	6913 to 6935	C.D. of the code 27
257 to 280	C.D. of the code 1	7169 to 7191	C.D. of the code 28
513 to 535	C.D. of the code 2	7425 to 7447	C.D. of the code 29
769 to 791	C.D. of the code 3	7681 to 7703	C.D. of the code 30
1025 to 1047	C.D. of the code 4	7937 to 7959	C.D. of the code 31
1281 to 1303	C.D. of the code 5	8193 to 8215	C.D. of the code 32
1537 to 1559	C.D. of the code 6	8449 to 8471	C.D. of the code 33
1793 to 1815	C.D. of the code 7	8705 to 8727	C.D. of the code 34
2049 to 2071	C.D. of the code 8	8961 to 8983	C.D. of the code 35
2305 to 2327	C.D. of the code 9	9217 to 9239	C.D. of the code 36
2561 to 2583	C.D. of the code 10	9473 to 9495	C.D. of the code 37
2817 to 2839	C.D. of the code 11	9729 to 9751	C.D. of the code 38
3073 to 3095	C.D. of the code 12	9985 to 10007	C.D. of the code 39
3329 to 3351	C.D. of the code 13	10241 to 10263	C.D. of the code 40
3585 to 3607	C.D. of the code 14	10497 to 10519	C.D. of the code 41
3841 to 3863	C.D. of the code 15	10753 to 10775	C.D. of the code 42
4097 to 4119	C.D. of the code 16	11009 to 11031	C.D. of the code 43
4353 to 4375	C.D. of the code 17	11265 to 11287	C.D. of the code 44
4609 to 4631	C.D. of the code 18	11521 to 11543	C.D. of the code 45
4865 to 4887	C.D. of the code 19	11777 to 11799	C.D. of the code 46
5121 to 5143	C.D. of the code 20	12033 to 12055	C.D. of the code 47
5377 to 5399	C.D. of the code 21	12289 to 12311	C.D. of the code 48
5633 to 5655	C.D. of the code 22	12545 to 12567	C.D. of the code 49
5889 to 5911	C.D. of the code 23	12801 to 12823	C.D. of the code 50
6145 to 6167	C.D. of the code 24	13057 to 13079	C.D. of the code 51
6401 to 6423	C.D. of the code 25	13313 to 13335	C.D. of the code 52
6657 to 6679	C.D. of the code 26	13569 to 13591	C.D. of the code 53

Holding Register (Reference No.=4) To write comparison data		Holding Register (Reference No.=4) To write comparison data	
Address	Description	Address	Description
13825 to 13847	C.D. of the code 54	19969 to 19991	C.D. of the code 78
14081 to 14103	C.D. of the code 55	20225 to 20247	C.D. of the code 79
14337 to 14359	C.D. of the code 56	20481 to 20503	C.D. of the code 80
14593 to 14615	C.D. of the code 57	20737 to 20759	C.D. of the code 81
14849 to 14871	C.D. of the code 58	20993 to 21015	C.D. of the code 82
15105 to 15127	C.D. of the code 59	21249 to 21271	C.D. of the code 83
15361 to 15383	C.D. of the code 60	21505 to 21527	C.D. of the code 84
15617 to 15639	C.D. of the code 61	21761 to 21783	C.D. of the code 85
15873 to 15895	C.D. of the code 62	22017 to 22039	C.D. of the code 86
16129 to 16151	C.D. of the code 63	22273 to 22295	C.D. of the code 87
16385 to 16407	C.D. of the code 64	22529 to 22551	C.D. of the code 88
16641 to 16663	C.D. of the code 65	22785 to 22807	C.D. of the code 89
16897 to 16919	C.D. of the code 66	23041 to 23063	C.D. of the code 90
17153 to 17175	C.D. of the code 67	23297 to 23319	C.D. of the code 91
17409 to 17431	C.D. of the code 68	23553 to 23575	C.D. of the code 92
17665 to 17687	C.D. of the code 69	23809 to 23831	C.D. of the code 93
17921 to 17943	C.D. of the code 70	24065 to 24087	C.D. of the code 94
18177 to 18199	C.D. of the code 71	24321 to 24343	C.D. of the code 95
18433 to 18455	C.D. of the code 72	24577 to 24599	C.D. of the code 96
18689 to 18711	C.D. of the code 73	24833 to 24855	C.D. of the code 97
18945 to 18967	C.D. of the code 74	25089 to 25111	C.D. of the code 98
19201 to 19223	C.D. of the code 75	25345 to 25367	C.D. of the code 99
19457 to 19479	C.D. of the code 76	28673	Recall a code
19713 to 19735	C.D. of the code 77		

C.D.: Comparison data

⏬ 6.4. Built-in Current Loop Output

❑ The interface can be used to connect a printer or external monitor.

Specifications

Transmission system	EIA RS-232C, Asynchronous, bi-directional, half-duplex
Current	1 = 20mA, 0 = 0 mA, external DC current source
Data length	7 bits
Start bit	1 bit
Parity bit	Even
Stop bits	1 bit
Baud rate	600 bps, 1200 bps, 2400 bps
Code	ASCII code

6.4.1.   Connection
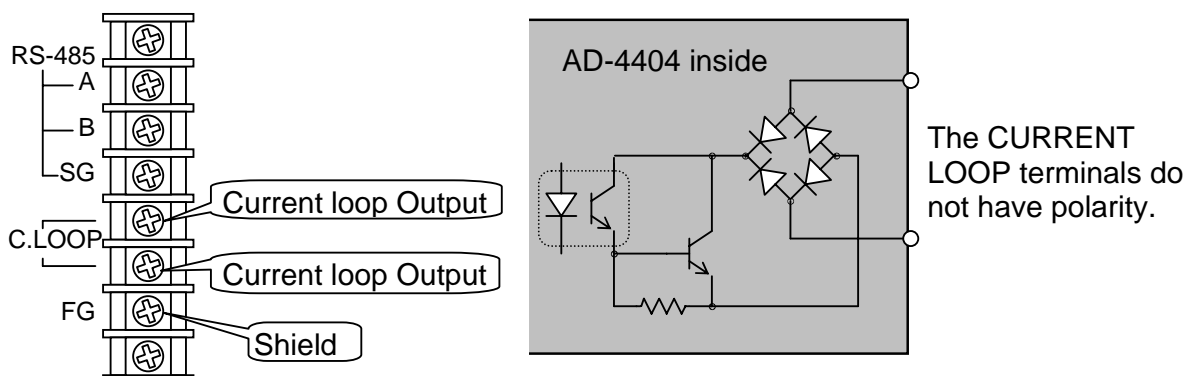
❑ The current loop output has no polarity.
❑ Use an external DC current source.
❑ Connect the FG terminal when using a shielded cable.

6.4.2.   Communication Modes

❑ There are six following.

Stream Mode
The data is output on each display update. If the data cannot be output completely due to a slow baud rate, the data is output at the next update.

Auto Print Mode
The comparison result is printed automatically.

Manual Print Mode
When the preset print key is pressed or terminal is connected, data is output.

6.4.3.   Data Format

❑ The format is the same as A&D format of the built-in RS-485.

6.4.4.   Settings of Parameters for Current Loop

❑ Refer to the "**Error! Reference source not found.**. Parameter List" of the function list.
[Function] - [Set function] - [Serial] - [C.loop] - [`5q f-01`] to [`5q f-08`]

6.4.5.   Print Format (Process Print)

❑ This mode is the function to print code data with a printer connected to the indicator.
❑ Set dump print mode in the printer.
❑ There are six kinds of process print at [`Cl f- 7`].

Concerning Parameters

[`Cl f- 7`] `Process print`
    [`0`] `Not printed`
    [`1`] `Mode 1`...................... 22 characters in a row and CR LF can be output.
                                                Data is printed in two lines. Name is 12 characters.
                                                It can be used for general printer, for "24 characters in a line" for the AD-8118A/B or other A&D printer.

    [`2`] `Mode 2`...................... Mode 2 is the same as mode 1 and can print each parameter of a code.

    [`3`] `Mode 3`...................... Data is printed in a line. Name is 9 characters.
                                                It can be used for the AD-8118A/B or other A&D printer.

    [`4`] `Mode 4`...................... Mode 4 is the same as mode 3 and can print each parameter of a code.

    [`5`] `Mode 5`...................... It can be used with "16 characters in a line" of A&D printer or for AD-8121.

    [`6`] `Mode 6`...................... Mode 6 is the same as mode 5 and can print each parameter of a code.

        [Function] - [Set function] - [Serial] - [C.loop] - [`Cl f- 7`]

[Cl f- 2] Communication mode
    [2] Auto print
       When the target count is up with auto print, data is printed automatically.
       [Function] - [Set function] - [Serial] - [C.loop]

[Cl f- 5] Parity check
       Select even or odd to adapt to the printer.
       [Function] - [Set function] - [Serial] - [C.loop]

| Mode 2 only | Short name is used. | Mode 4 only | Mode 6 only |

Mode1, 2

```
Code 35 Coffee        CRLF
#     1 OK             CRLF
              10.012 kgCRLF
#     2 LoLo           CRLF
               8.006 kgCRLF
#     3 Lo             CRLF
               9.502 kgCRLF
#     4 FMD            CRLF
              10.010 kgCRLF
#     5 Crush          CRLF
              20.106 kgCRLF
~~~~~~~~~~~~~~~~~~~~~~~~~~~
#   126 OK             CRLF
              10.002 kgCRLF
CRLF
Tot#        12345678   CRLF
NG#         12345678   CRLF
LoLo#       12345678   CRLF
Lo#         12345678   CRLF
OK#         12345678   CRLF
Hi #        12345678   CRLF
Hi Hi #     12345678   CRLF
FMD#        12345678   CRLF
Dup#        12345678   CRLF
Crush#      12345678   CRLF
Max       123456.789 kgCRLF
Min       123456.789 kgCRLF
Ave       123456.789 kgCRLF
STD       123456.789 kgCRLF
STDP      123456.789 kgCRLF
Tot       123456.789 kgCRLF
CRLF
```

Mode3, 4

```
Code 35 Coffee        CRLF
#     1 OK      10.012 kg
#     2 LoLo     8.006 kg
#     3 Lo       9.502 kg
#     4 Fo      10.010 kg
#     5 Cr      20.106 kg
~~~~~~~~~~~~~~~~~~~~~~~~~~~
#   126 OK      10.002 kg
CRLF
Tot#        12345678   CRLF
NG#         12345678   CRLF
LoLo#       12345678   CRLF
Lo#         12345678   CRLF
OK#         12345678   CRLF
Hi #        12345678   CRLF
Hi Hi #     12345678   CRLF
FMD#        12345678   CRLF
Dup#        12345678   CRLF
Crush#      12345678   CRLF
Max       123456.789 kgCRLF
Min       123456.789 kgCRLF
Ave       123456.789 kgCRLF
STD       123456.789 kgCRLF
STDP      123456.789 kgCRLF
Tot       123456.789 kgCRLF
CRLF
```

Mode5, 6

```
C35 Brazil
#     1 OK
              1234.56 kg
#     2 LoLo
              1234.56 kg
#     3 Lo
              1234.56 kg
#     4 Fo
              1234.56 kg
#     5 Cr
              1234.56 kg
~~~~~~~~~~~~~~~~~~~~~~~~~~~
#   126 OK
              1234.56 kg
CRLF
Tot#      12345678
NG#       12345678
LoLo#     12345678
Lo#       12345678
OK#       12345678
Hi #      12345678
Hi Hi #   12345678
FMD#      12345678
Dup#      12345678
Crush#    12345678
Max#   1234.56 kg
Min#   1234.56 kg
Ave    1234.56 kg
STV    1234.56 kg
STDP   1234.56 kg
Tot   12345.67 kg
CRLF
```

Standard deviation σ_{n-1}: STD
Population standard deviation σ_n : STDP

6.4.6.   Time Stamp

- ❑ If the printer has the function to print time and date, the time stamp can be appended to the printed data. Example: printer AD-8118A/B, AD-8121.
- ❑ The indicator can send the following commands.
  Date command ^E_C D   ASCII code: 1B, 44
  Time command ^E_C T   ASCII code: 1B, 54
- ❑ The time stamp can be appended to total print with `Print for data and time` [`Cl f- 8`].

Concerning Parameters

[`Cl f- 8`] `Print for data and time`

     [0] `Not printed`
     [1] `Date before total`
     [2] `Time before total`
     [3] `Date & time before total`
     [4] `Date after total`
     [5] `Time after total`
     [6] `Data & time after total`

         [Function] - [Set function] - [Serial] - [C.loop] - [`Cl f- 8`]

7. Maintenance (Monitor and Test)

7.1.1. Basic Operation

To enter the maintenance function	Press and hold the **ENTER** key and press the ✛ key in the weighing mode. Select the menu `Check` using the ✛ key and the **ENTER** key..
To select an address of the parameter	Press the ✛, **SHIFT** + ✛, **ENTER**, **ESC** keys.
To change the parameter	Press the ✛, **SHIFT** + ✛, **Alphanumerical**, **ENTER**, **ESC** keys.
To exit the mode (To return to the weighing mode)	Press the **ESC** key.

7.2. Monitor Mode

❑ The monitor mode is used to check the indicator during the weighing sequence.

7.2.1. Monitoring the Control I/O Function

❑ Used to monitor the status of the I/O terminals. If the rate is faster than the `Display refresh rate` [`genf-01`] it cannot be displayed.
  `0`: The inactive status to open the open collector of the output.
  `1`: The active status to short the open collector of the output.

```
                                      123 kg
CONTROL      00010001000              ┌──────────────────┐
               a11              a1    │ Input terminal A1 │
   I/O       00110100001              ├──────────────────┤
               b11              b1    │ Output terminal B1│
                                      └──────────────────┘
```
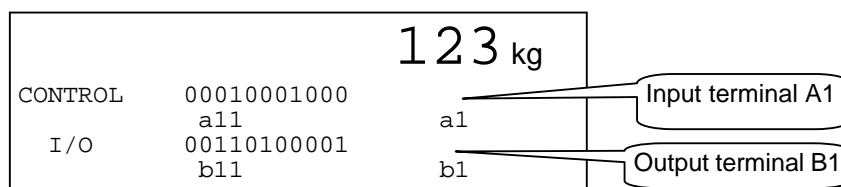
7.2.2. Monitoring Built-in RS-485 Interface

❑ The current communication data is displayed. Output is according to Communication mode [`r5 f-02`].
  ← : CR
  ↓ : LF

Parity error: `p`
Framing error:`f`

```
                               123 kg       ┌───────────────┐
                                            │ Received data │
                         RNET               └───────────────┘
                                            ┌───────────────┐
  RNET0099,1234567,123456789                │ Sent data     │
  r5-485   rcu and 5nd                      └───────────────┘
```

7.2.3.   Monitoring Built-in Current Loop Output

- ❑ The current communication data is displayed. Output is according to Communication mode [Cl f-02].
  - ← : CR
  - ↓ : LF

```
                             123 kg

                   ST,NT,+012.345kg
C loop     5nd
```

Sent data

7.2.4.   Monitoring A/D Converter

- ❑ The current A/D converter data is displayed.

```
                           16.001 kg

     Int.Count            CAL:DS
        160008
```

Internal count

Calibration
EN: Enable
DS: Disable
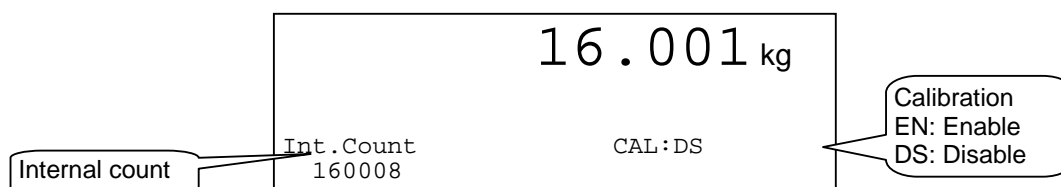
7.2.5.   Monitoring BCD Output of OP–01

- ❑ The current BCD output data is displayed.
  - 0: The inactive status to open the open collector of the output.
  - 1: The active status to short the open collector of the output.
  - The print strobe is displayed in the original logic level.

A18
Print strobe

```
                        12345 kg
OP-01    0011111000100011011
             a18                       a1
         0010010000001010000
             b18                       b1
```

A1

B1

B18
Hold input

7.2.6.   Monitoring Relay Output of OP–02

- ❑ The status of the current relay outputs is displayed. If the rate is faster than the Display refresh rate [genf-01] it cannot be displayed.
  - 0: The inactive status to open the relay.
  - 1: The active status to short the relay.

Output terminal
7 ~ 10

```
                          123 kg

OP-02      0001   10100
              10    7      5    1
```

Output terminal
1 ~ 5
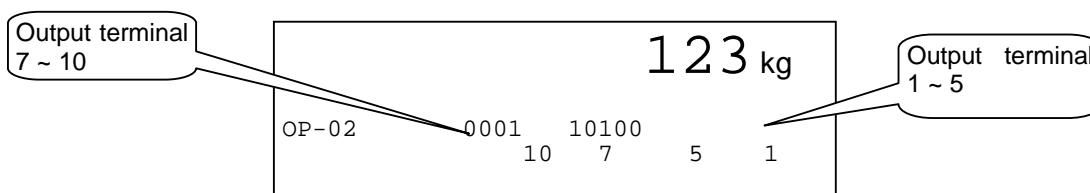
7.2.7.   Monitoring RS-422/485 Interface of OP-03

❑ The current communication data is displayed. Output is according to Communication mode [`03 f-02`].
   ← : CR
   ↓ : LF

Parity: `p`
Framing: `f`

```
                                    123 kg
                                    RNET

          RNET0099,1234567,123456789
          0p-03     rcu and 5nd
```

Received data

Sent data
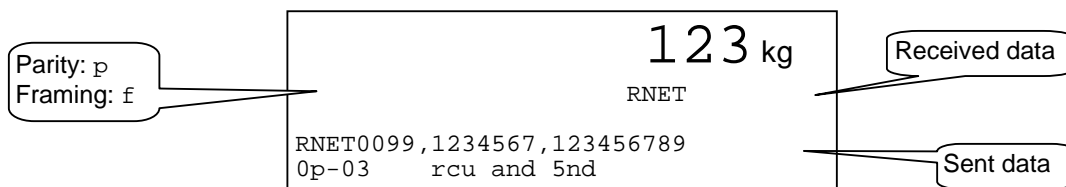
7.2.8.   Monitoring RS-232C Interface of OP-04

❑ The current communication data is displayed. Output is according to Communication mode [`04 f-02`].
   ← : CR
   ↓ : LF

Parity: `p`
Framing: `f`

```
                                    123 kg
                                    RNET

          RNET0099,1234567,123456789
          0p-04     rcu and 5nd
```

Received data

Sent data
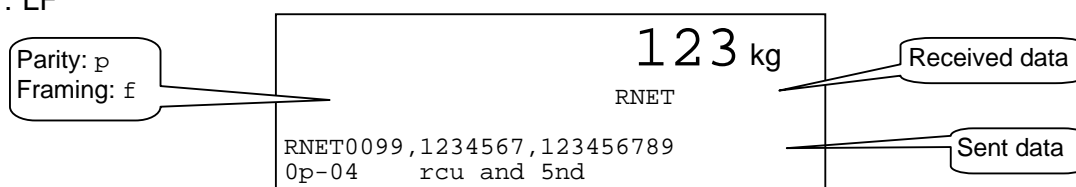
7.2.9.   Monitoring Parallel I/O of OP-05

❑ The status of current parallel I/O is displayed. If the rate is faster than the `Display refresh rate` [`genf-01`] it cannot be displayed.
   `0`: The inactive status to open the open collector of the output.
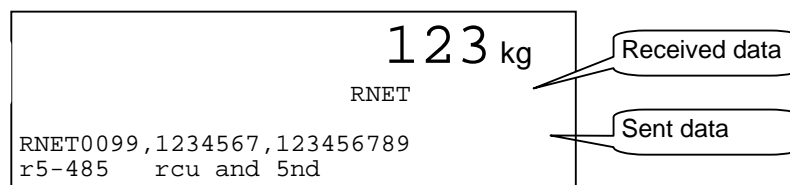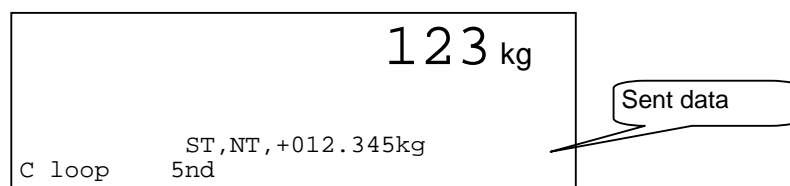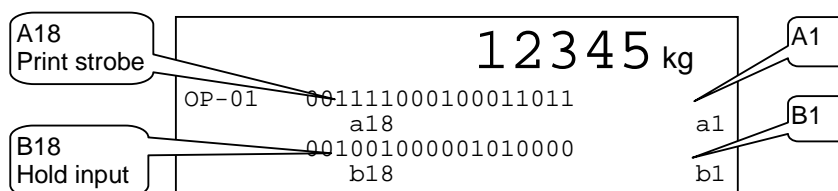   `1`: The active status to short the open collector of the output.

```
                                    123 kg
     OP-05     1001000010001000
               a16                   a1
               0101100110100001
               b16                   b1
```

Input terminal A1

Output terminal B1
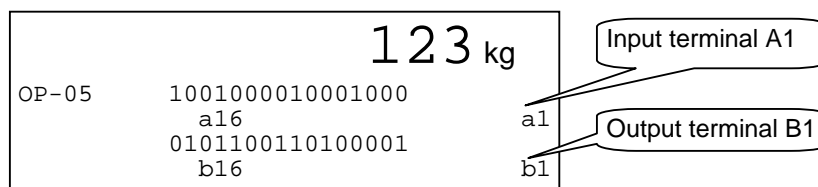
7.2.10.   Monitoring Analog Output of OP-07

❑ The current communication data is displayed.

```
                                    96.27 kg
     OP-07
               19.403 mA
```

Analog output
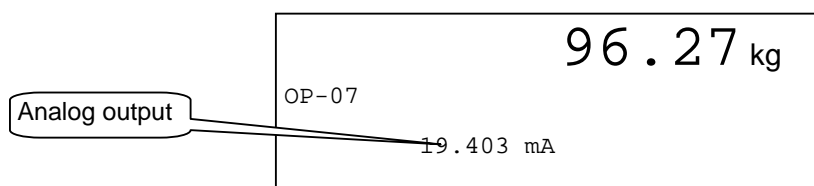
| | **7.3. Test Mode** |

- ❑ The test mode is used to check the indicator and weighing system with a test signal.
- ❑ When the test mode is used, the weighing sequence is stopped.

Caution
- ❑ **Turn off the peripherals before test. The test mode outputs a test signal. Therefore, the devices connected to system are influenced and it may cause mis-operation.**

7.3.1. Testing Control I/O Function

- ❑ Terminal displays the current input data.
- ❑ One of terminal B turns on every one second and in order. The active terminal displays "1".

```
                          123 kg
CONTROL    00010001000
           a11                   a1      Input terminal A1
   I/O     00100000000
           b11                   b1
                                          Output terminal B1
```
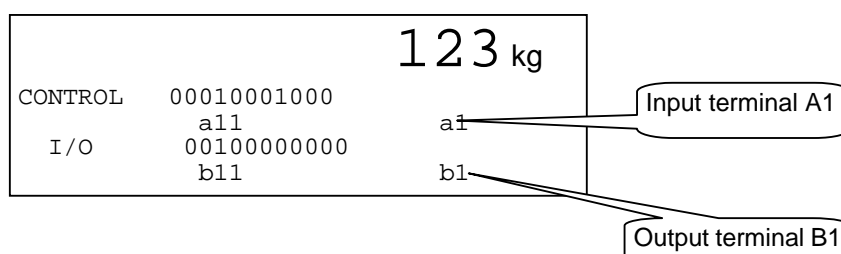
7.3.2. Testing Built-in RS-485 Interface

- ❑ Each time to press the **ENTER** key, the test data "ST,GS,+0000000kg CR LF" is output.
- ❑ The received data is displayed, when data is output.
  - ← : CR
  - ↓ : LF

```
                          123 kg
               RNET                     Received data

         ST,GS,+0000000kg← ↓
r5-485     rcu and 5nd                  Sent data
```
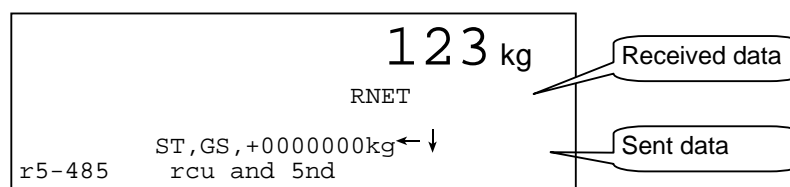
7.3.3. Testing Built-in Current Loop Output

- ❑ Each time to press the **ENTER** key, the test data "ST,GS,+0000000kg CR LF" is output.
- ❑ The received data is displayed, when data is output.
  - ← : CR
  - ↓ : LF

```
                          123 kg


         ST,GS,+0000000kg← ↓
Cloop            5nd                    Sent data
```

7.3.4. Testing A/D Converter

❑ The A/D converter data is displayed.
❑ When pressing the **ENTER** key, a test voltage can be input to the A/D converter.

A/D converter output

```
                   16.001 kg
A/D Count   L/C Output(mV/V)
   964583                     3.103872
Int.Count       Test Input
  160008                          0ff
```

Loadcell output

Internal count

Test input

7.3.5. Testing BCD Output of OP-01

❑ One of terminal A and B alternately turns on every one second and in order. The active terminal displays "1".

A18

A1

```
                 12345 kg
OP-01   000000000000000000
            a18                  a1
        000001000000000000
            b18                  b1
```

B1

B18

7.3.6. Testing Relay Output of OP-02

❑ A terminal of the relays turns on every one second and in order. The active terminal displays "1".

Output terminal 7 ~ 10

```
                        123 kg

OP-02       0001   00000
               10   7     5    1
```
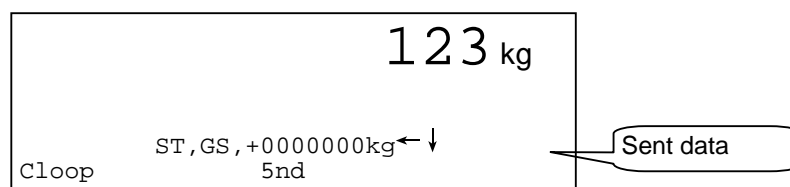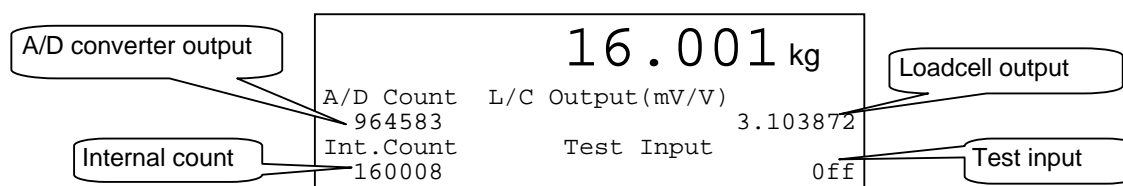
Output terminal 1 ~ 5
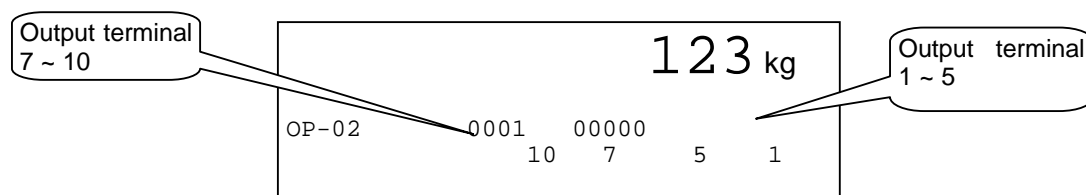
7.3.7. Testing RS-422/485 Interface of OP-03

❑ Each time to press the **ENTER** key, the test data "ST,GS,+0000000kg CR LF" is output.
❑ The received data is displayed, when data is output.
  ← : CR
  ↓ : LF

Parity: p
Framing: f

```
                      123 kg
                        RNET

         ST,GS,+0000000kg← ↓
0p-03    rcu and 5nd
```

Received data

Sent data
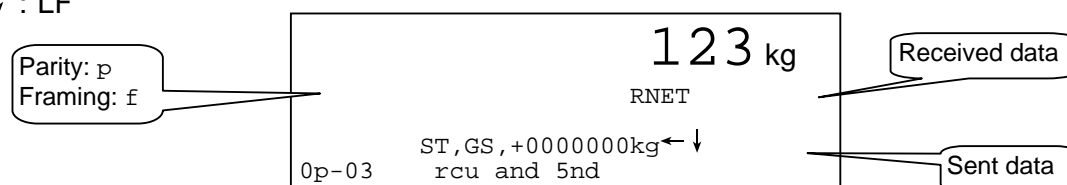
7.3.8.   Testing RS-232C Interface of OP-04

- ❑ Each time to press the **ENTER** key, the test data "ST,GS,+0000000kg CR LF" is output.
- ❑ The received data is displayed, when data is output.
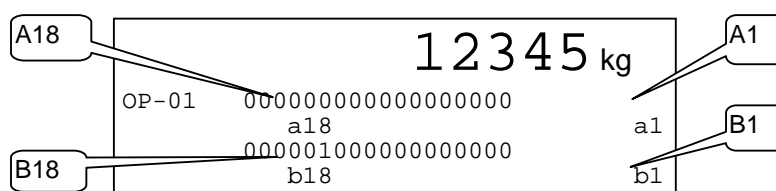 - ← : CR
  - ↓ : LF

```
                              123 kg              Received data
Parity: p
Framing: f                      RNET

                         ST,GS,+0000000kg← ↓       Sent data
                       0p-04    rcu and 5nd
```
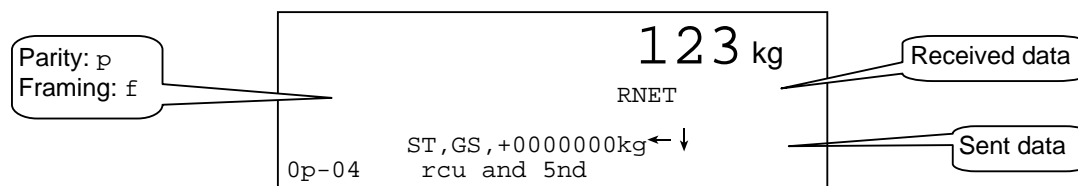
7.3.9.   Testing Parallel I/O of OP-05

- ❑ Terminals display the current input data.
- ❑ One of terminal B turns on every one second and in order. The active terminal displays "1".

```
                              123 kg            Input terminal A1
                  OP-05      0000000000000000
                               a16                     a1
                                                Output terminal B1
                            0001000000000000
                               b16                     b1
```
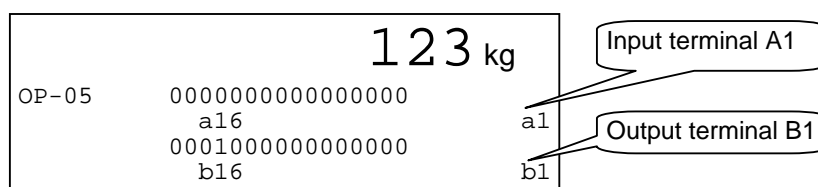
7.3.10.   Testing Analog Output of OP-07

- ❑ When pressing the **1** key, the output current is increased.
- ❑ When pressing the **2** key, the output current is decreased.

```
                              96.27 kg
                  OP-07
Analog output
                                  20 mA
```
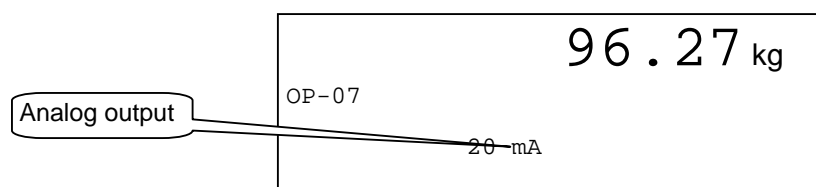
7.3.11.　In Outline of the Function List

Category Address	Start Item
`Function`	
`Function reference`	
`General`	
`Weight`	`genf- 1`
`Sub display`	`5ub f 1`
`Other`	`othf- 1`
`Sequence`	
`Basic`	`5) f- 1`
`Control`	`5) f-21`
`Timer`	`5) f-41`
`Zero Track`	`5) f-71`
`Other`	`5) f-81`
`Control I/O`	
`Input`	`1n f- 1`
`Output`	`0utf- 1`
`Serial`	
`C. Loop`	`Cl f- 1`
`RS-485`	`r5 f- 1`
`Option`	
`Slot1`	Refer to options below.
`Slot2`	
`Slot3`	
`Set Function`	
The same as the "`Function reference`".	

Options

Category Address	Start Item
`Option`	
`Slot` nn　(nn: Slot number for the option to be installed in)	
BCD output,　　OP-01	`01 f- 1`
Relay output,　　OP-02	`02 f- 1`
RS-422/485,　　OP-03	`03 f- 1`
RS-232C,　　OP-04	`04 f- 1`
Parallel I/O,　　OP-05	`05 f- 1`
Analog output,　　OP-07	`07 f- 1`
CC-link interface,　　OP-20	`20 f- 1`
DeviceNet interface,　　OP-21	`21 f- 1`
PROFIBUS,　　OP-22	`22 f- 1`

8. Specifications

General

Support Assembley	Manufactured from 304 Stainless Steel
Power supply	230 VAC, 50Hz, (Stable power source)
Power consumption	Approximately 60 VA
Physical dimensions	700 (W) x 900 (H) x 560 (D) mm (No Option 01)
Weight	Approximately 45.5 kg
Operation temperature	0°C to 40 °C
Battery life of backup RAM	5 years at 40 °C.

Electrical Components

PE Sensor	Sick WT160-E480
	Sunx VF-D500-3
Motors	Oriental AXUM210-GN Brushless DC
	Oriental Gear Head 2GN6K
Speed Controllers	Oriental AXUD10C
Speed Meter	Oriental SDM496
Load Sensor	ADC LC-107 3.2K Aluminium Load Cell

Controller A/D Unit

Input sensitivity	Up to 0.3 μV / digit
Zero adjustment range	0 to 2 mV /V (0 to 20 mV)
Measuerment range	0 to 3.2 mV /V (0 to 32 mV)
Loadcell excitation voltage	10 V DC ±5%
Maximum loadcells	8 pieces in parallel with 350Ω loadcell
Span temperature coefficient	8 ppm/ °C
Zero temperature coefficient	0.2 μV +8 ppm/ ℃ of dead load typ.
Non-linearity	0.01 % of F. S.
Input noise	Below ±0.3 μVp-p
A/D conversion	Δ-Σ conversion
A/D resolution	Approximately 1/1,000,000
Maximum display	16000 (to be able to cancel limitation)
Sampling rate	100 times per second
Backup method	Calibration: Flash memory
	Function: Flash memory
	Code data: Backup RAM or flash memory
	Total data of code data: Backup RAM

Controller Display

Main display	Fluorescent display, cobalt blue, height: 18mm, 7segment, 7 figures
Sub-display	Fluorescent display, cobalt blue, height: 5mm, 7segment, 54 figures and 5x7 dots, 54 figures
State indicator	Fluorescent display, cobalt blue, 8△ pieces, 10 symbols, 5x7 dots
Unit indicator	Fluorescent display, cobalt blue, height: 11mm, 5x7 dots, 2 figures
Symbols	Fluorescent display, cobalt blue, height: 11mm, 5x7 dots, 2 figures

Weighing sequence modes

Weighing modes: 1 - Automatic Mode   2 - Conveyor Stop Mode
                              3 - OK Mode   4 - Manual Mode   5 - Simple Mode

Code data

Max. number of material codes   100 codes, Elements of the material code:
Name, Target weight, Hi, Lo, HiHi, LoLo, Zero band, Full, Preset tare, Target count, Total count, OK count, NG count, Hi count, Lo count, HiHi count, LoLo count, Foreign matter detection count, Duplication count, Crush count, Maximum, Minimum, Average, Standard deviation σ_{n-1}, Population standard deviation σ_n, Total of the weighing value

Connectors and interfaces

Power supply terminal, Loadcell terminal, Standard I/O terminal, Standard RS-485 interface, Current loop, keys and display

Standard I/O terminal

Refer to "6.1. Control I/O Function".

Standard RS-485 interface

Refer to "6.2. Built-in RS-485 Interface". Refer to "6.3. Modbus Interface for RS-485".

Current loop Refer to "6.4. Built-in Current Loop Output".

BCD Output Option OP-01

Refer to "Your A&D Mercury Dealer for BCD Output of Option, OP-01".

Relay Output Option OP-02

Refer to " Your A&D Mercury Dealer for Relay Output of Option OP-02".

RS-422/485 Interface Option OP-03

Refer to " Your A&D Mercury Dealer for RS-422/485 Interface of Option OP-03".

RS-232C Interface Option OP-04

Refer to " Your A&D Mercury Dealer for RS-232C Interface of Option OP-04".

Parallel I/O Option OP-05

Refer to " Your A&D Mercury Dealer for Parallel I/O of Option OP-05".

Analog Output Option OP-07

Refer to " Your A&D Mercury Dealer for Analog Output of Option OP-07".

CC Link interface of Option OP-20

Refer to "Your A&D Mercury Dealer for CC Link Interface Option-20".
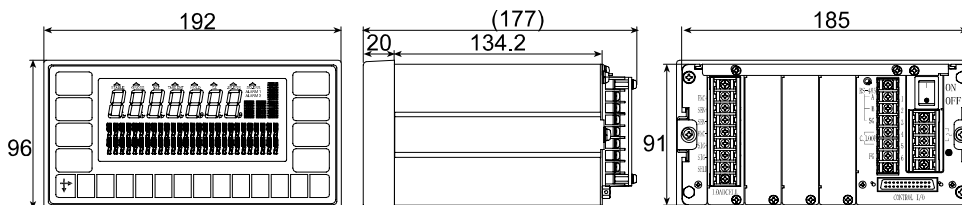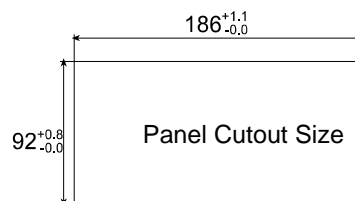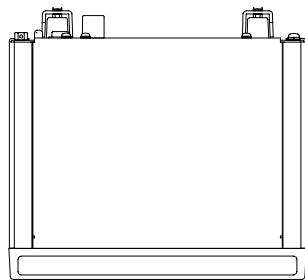
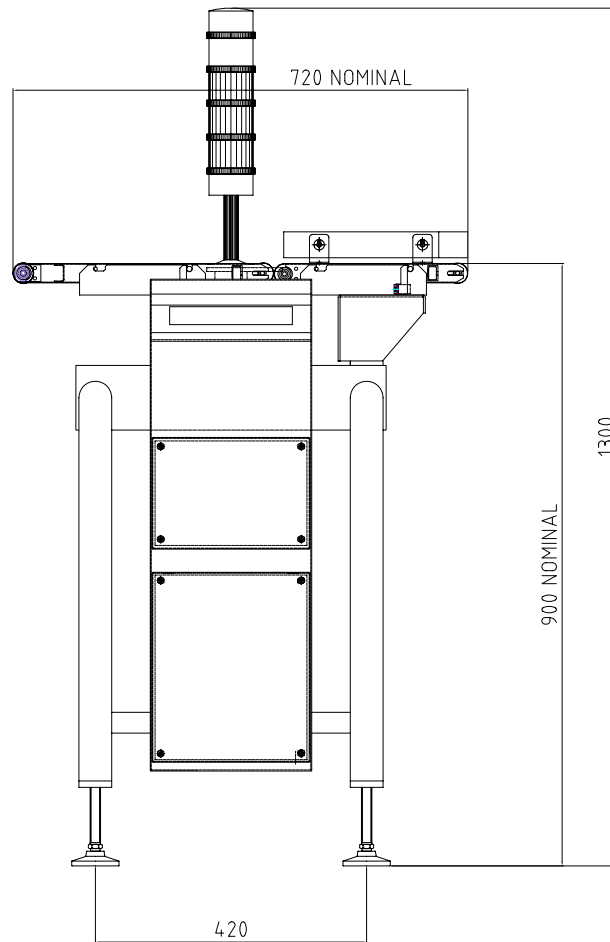## DeviceNet interface of Option OP-21

Refer to "Your A&D Mercury Dealer for DeviceNet Interface Option-21.

PROFIBUS interface of Option OP-22

Refer to "Your A&D Mercury Dealer for Profibus Interface Option-22.

720 NOMINAL

1300

900 NOMINAL

420

$186^{+1.1}_{-0.0}$

$92^{+0.8}_{-0.0}$

Panel Cutout Size

192

(177)

185

20

134.2

96

91

8.2. Spares and Options

SPARES:

Controller – AD4404 Checkweigher…………………1	06138400
Load Cell – 3.2Kg Load Cell ……………………...1	7LC-107-3.2K
Motors – Oriental Brushless DC Motor ………....1	AXUM210-GN
Belts – Timing Belt Conveyor ..…………………...1	BXL-120CH
Belts - Conveyor Belt 270mm …….……………...1	MC07951.021
Belts - Conveyor Belt 370mm …….……………...1	MC07950.021
Belts - Conveyor Belt 640mm …….……………...1	MC08922.021
Sensor - Sick WT160-E480………………………1	WL150N430
Relay Board...1	MC08909.000
I/O connector 1	JI-361J024-AG
I/O connector cover 1	JI-360C024-B
RS-485, terminator resistor 100 Ω 1	RC-1/2100R
Cover of power supply terminal............................1	07-40008561
Cover of RS-485 and current loop........................1	TM-ML250C-A61.4
Cover of loadcell teminal 1	07-4008560
Rubber Gaskit for panel mounting........................1	06-4008562

Checkweigher Options:

Option 01 – Colour Traffic Lamps 1	03051050
Option 02 – Flipper Rejection ……………………1	03051051
Option 03 – Air Blast Rejection ……………….... 1	03051052
Option 04 – Push Ram Rejection ……………… ..1	03051053
Option 05 – Metal Detector …………………….1	03051054

AD-4404 Controller Options:

Option 01 – Parallel BCD Output …………….…...1	06138401
Option 02 – Relay Output …….……………….… ..1	06138402
Option 03 – RS422/RS485 Serial I/O ….………..1	06138403
Option 04 – RS232 Serial I/O …..……………… ..1	06138404
Option 05 – Parallel I/O ..……………………… ..1	06138405
Option 07 – Analogue Output …..……………… ..1	06138407
Option 20 – CC-Link Interface ….………….…… ..1	06138420
Option 21 – DeviceNet Inbterface………………..1	06138421
Option 22 – Profibus Interface …..……………. ..1	06138422

PART No:	SUB No:	DESCRIPTION	QTY
06138800	MC07901.005	THE DOLPHIN: CW-CONVEYOR RETAINING PLATE	1
MC07901.005	MC07941.005	THE DOLPHIN: CW-RETAINING PLATE ANGLE	2
06138800	MC07902.005	THE DOLPHIN: CW-CONVEYOR DECK - 336mm	1
06138800	MC07903.005	THE DOLPHIN: CW-CONVEYOR DECK - 236mm	1
06138800	MC07904.005	THE DOLPHIN: CW-WEIGH CONVEYOR LH CHANNEL	1
06138800	MC07905.005	THE DOLPHIN: CW-WEIGH CONVEYOR RH CHANNEL	1
06138800	MC07906.005	THE DOLPHIN: CW-INFEED CONVEYOR LH CHANNEL	1
06138800	MC07907.005	THE DOLPHIN: CW-INFEED CONVEYOR RH CHANNEL	1
06138800	MC07908.005	THE DOLPHIN: CW-CONV CENTRE CHANNEL	1
06138800	MC07909.000	THE DOLPHIN: CW-INFEED CONVEYOR GUIDE RAIL ASSY	1
MC07909.000	MC07922.005	THE DOLPHIN: CW-INFEED CONV GUIDE RAILSLIDE	2
MC07909.000	MC07923.005	THE DOLPHIN: CW-INFEED CONV: GUIDE RAIL PIN	2
06138800	MC07911.000	THE DOLPHIN: CW-INFEED CONVEYOR GUIDE RAIL SUPPORT	1
MC07911.000	MC07920.005	THE DOLPHIN: CW-INFEED CONV GUIDE RAIL SUPPORT BUS	4
MC07911.000	MC07921.005	THE DOLPHIN: CW-INFEED CONV GUIDE RAIL SUPPORT PLA	4
06138800	MC07912.013	THE DOLPHIN: CW- CONVEYOR THUMBWHEEL	1
06138800	MC07913.013	THE DOLPHIN: CW- DRIVER ROLLER	1
06138800	MC07914.013	THE DOLPHIN: CW- FOLLOWER ROLLER	1
MC07917.000	MC07915.005	THE DOLPHIN: CW-INFEED CONVEYOR BASE PLATE	1
MC07917.000	MC07916.005	THE DOLPHIN: CW-LEG INSERT	1
06138800	MC07918.000	THE DOLPHIN: CW-DISPLAY ARM ASSY	1
MC07918.000	MC07927.005	THE DOLPHIN: CW-DISPLAY ARM TOP PLATE	1
MC07918.000	MC07929.005	THE DOLPHIN: CW-DISPLAY ARM BOTTOM PLATE	1
MC07918.000	MC07930.005	THE DOLPHIN: CW-DISPLAY ARM TUBE	1
06138800	MC07919.000	THE DOLPHIN: CW-CONTROL CABINET-4404	1
06138800	MC07932.000	THE DOLPHIN: CW-CONV ADJ. ROD ASSY	1
MC07932.000	MC07931.005	THE DOLPHIN: CW-CONV ADJ. ROD BUSH	4
MC07932.000	MC07933.005	THE DOLPHIN: CW-CONV ADJ. ROD THREAD	4
06138800	MC07934.005	THE DOLPHIN: CW-OPTIC ANGLE BRACKET	1
MC07935.000	MC07929.005	THE DOLPHIN: CW-DISPLAY ARM BOTTOM PLATE	1
06138800	MC07936.005	THE DOLPHIN: CW-CABINET SHELF, 4404	1
06138800	MC07937.005	THE DOLPHIN: CW-CABINET PRINTER DOOR	1
MC07937.005	MC07938.021	THE DOLPHIN: CW-CABINET PRINTER WINDOW	1
06138800	MC07939.005	THE DOLPHIN: CW-LOAD CELL TOP PLATE	1
06138800	MC07940.005	THE DOLPHIN: CW-LOAD CELL BASE PLATE	1
06138800	MC07942.005	THE DOLPHIN: CW-CONVEYOR RETAINING PLATE ANGLE, LH	1
06138800	MC07943.005	THE DOLPHIN: CW-CONVEYOR RETAINING PLATE ANGLE, RH	1
06138800	MC07944.005	THE DOLPHIN: CW-CONVEYOR RETAINING PLATE PIN	1
06138800	MC07945.005	THE DOLPHIN: CW-CONVEYOR ROLLER BRACKET	1
06138800	MC07946.005	THE DOLPHIN: CW-CONVEYOR FOLLOWER ROLLER AXLE	1
06138800	MC07949.005	THE DOLPHIN: CW-CABINET: INSTRUMENT PANEL	1
06138800	MC07950.021	THE DOLPHIN: CW-CONVEYOR BELT - 370mm	1
06138800	MC07951.021	THE DOLPHIN: CW-CONVEYOR BELT - 270mm	1
06138800	MC07952.005	THE DOLPHIN: CW-CABINET DOOR	1
06138800	MC07986.000	THE DOLPHIN: CW-CABINET LOWR SUPP TUBE ASSY	1
MC07986.000	LB0029	CHECKWEIGHER: CABINET LOWER SUPPORT TUBE MACHINING	1
MC07986.000	MC07929.005	THE DOLPHIN: CW-DISPLAY ARM BOTTOM PLATE	1
06138800	MC07987.005	DOLPHIN: CABINET HINGE	1

9. Trouble Shooting

SYMPTOM	DESCRIPTION / SOLUTION
When the 240VAC mains power is connected and the mains power switch is pressed the 4404 controller does not turn on nor is their any display.	The 4404 has its own power switch on the rear panel, while this is normally left in the on position, it may have been turned to the off position accidentally.
The 4404 Controller starts and all conveyors run but the Hi, HiHi, OK, LoLo and Lo Outputs do NOT switch to the ON state.	The Tolerance data in the Code menu has been set at 0.00. Enter the Code Menu and edit this code number with the correct weight value in the field that is showing 0.00 (s).
The Colored Traffic lamp/s do not illuminate when a non conforming item passes over the checkweigher.	All the lamps are 12VDC globes. This particular one or others may be blown. Remove the cover and replace the globe.
The conveyors do not stop when Metal has been detected and/or a duplication of product has been weighed over the checkweighers.	In the Function Sequence menu (Sq F-21) the Conveyor Stop Condition has been set to Nonstop. Change Sq F-21 bits 6 & 7 to On (1) 0000011100.
The Buzzer sounds continuously, it never stops.	In the Code Menu a Target Count has been set. Edit this Code number and Increase the Target Count or set it to Zero. (Please Note: Zero will never cause an alarm)
The Buzzer sounds continuously, it never stops.	In the Function Sequence menu Sq F-5 sets the Buzzer condition. Bit 9 is for Target Finished 000000000
The Weigh and Infeed conveyors have stopped.	In the Code Menu a Target Count has been set. Edit this Code number and Increase the Target Count or set it to Zero. (Please Note: Zero will never cause an alarm)
The Weigh and Infeed conveyors have stopped.	In the Function Sequence menu Sq F-21 set the Bits 1 to 9 will stop the conveyors. For Metal detection Bit 6 on (1) will stop the conveyors 000000000.
The Gross weight being displayed on the 4404 controller in Static Mode is very unstable and it is affecting the weighing results.	In the Function General menu Gen F-2 the digital Filter has been set to either "Not used" or the filter selected it is too low for the system requirements. Select a new filter setting to suit the weighing requirements.
The Gross weight being displayed on the 4404 controller in Dynamic Mode is very unstable and it is affecting the weighing results.	In the Function Sequence menu Sq F-11 the LPF Filter has been set to either "No Filter" or the filter selected it is too low for the system requirements. Select a new filter setting to suit the weighing requirements

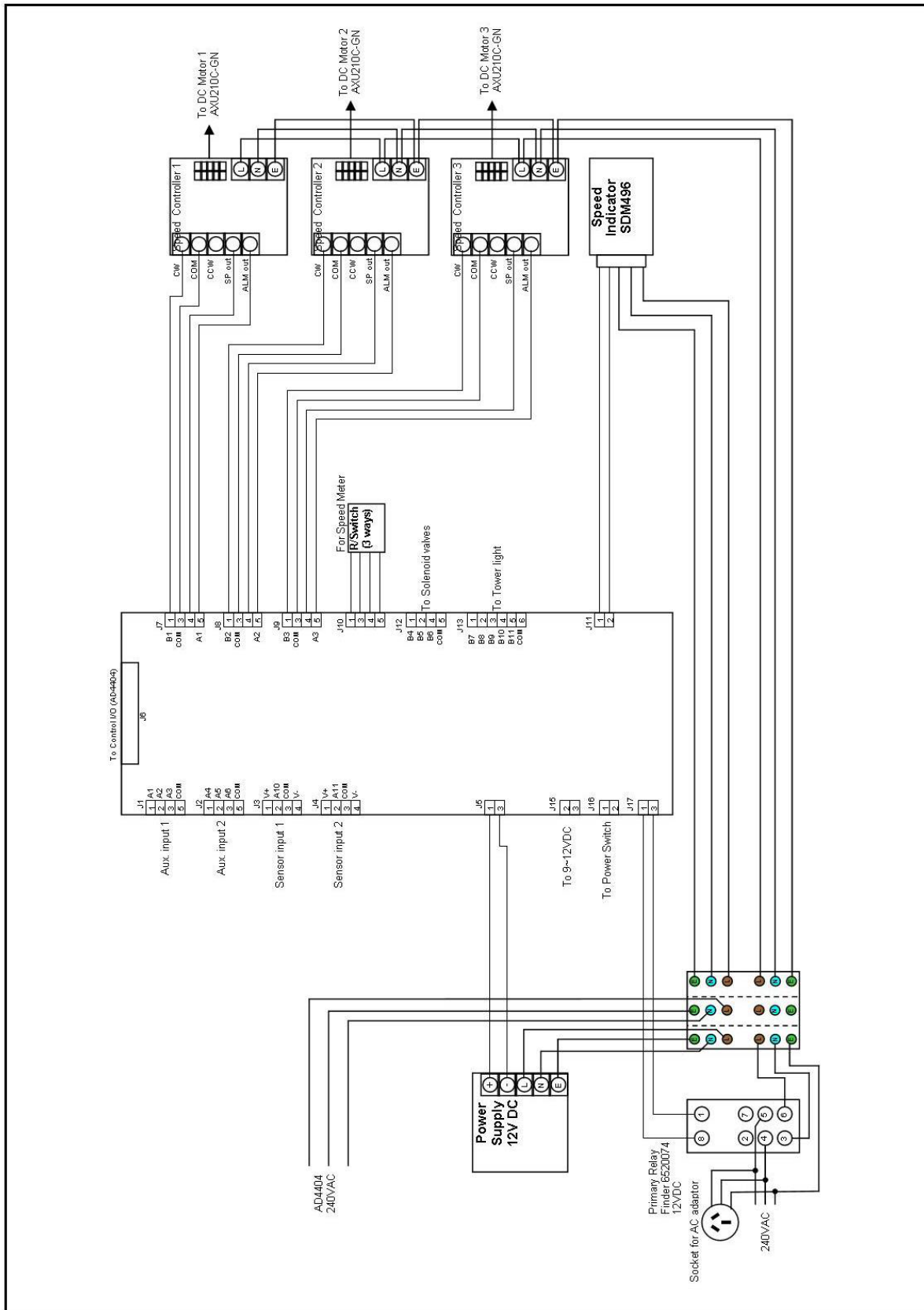| SYMPTON	DESCRIPTION / SOLUTION
One or more conveyor/s stop during operation. One or more conveyor/s will not run after the Start button has been pressed, yet other lights and conveyors do function.	The conveyor motor/s have tripped the protection circuit. Switch the 240VAC mains power OFF for 10 seconds. Remove the cause of the conveyor jamming then re-apply 204VAC mains power. **Note:** The conveyor motors have a thermal overheating protection device Temperature 130°C ±5°C Closed at 82°C ±15°.
The checkweigher functions correctly, however the recorded weight on the 4404 controller is lower than the static weighed (correct) weight.	In the Function Sequence (Basic) menu Sq F-11 the LPF Filter has been set to is high for the system. Select a new filter setting to suit the weighing requirements
I need to run the checkweigher conveyors so product can pass over the belts, but I do not want to start the checkweigher, nor do I want to record the product details	The checkweigher has a built in remote Manual input function (39), it is connected to A2 of the 4404 controllers input.
I need to run the products slower over the checkweigher.	You need to contact your authorized A&D service company.
I need to run the products faster over the checkweigher	You need to contact your authorized A&D service company.
The Flipper reject system is not opening soon enough to divert the rejected product	In the Function Sequence (Timer) menu Sq F-46 selection out 1 delay timer has been set too long. Lower the timer value and try the reject product again.
The Flipper reject system is not waiting long enough to divert the reject product	In the Function Sequence (Timer) menu Sq F-52 selection out 1 timer has been set too short. Raise the timer value and try the reject product again.
The Flipper reject system is it hitting the rejected product too hard, or not hard enough to exit the reject belt.	The Reject Flipper system is a pneumatic device which functions from the supply of clean air. The air supply filter should be set a standard to 100cfm. Depending on the product weight this may be increased or decreased.
Can I connect the Checkweigher to a Printer, Personal Computer or both at the same time.	Yes, to a printer by the standard Current Loop output and to a Personal Computer by the standard RS485 Serial output. You can also fit other serial output option cards.
The RED LED remote display does turn on but, it does not display any characters or weighing data.	The RS485 Serial protocol setup in the 4404 controller does not match the required serial input for the remote display. (9600 Baud, 8 Data Bits, No Parity, 1 Stop Bit).

9.1. 4404 Controller I/O Map

	AD4404		Relay Brd Connect	Description	Remarks
	Function code	**I/O Terminal No.**			
Digital INPUTS	INF-01	A1	J1-1	To Terminal 1 (Red)	External EM Stop Input
	INF-02	A2	J1-2	To Terminal 2 (White)	External Manual Conveyor Run
	INF-03	A3	J1-3	To Terminal 3 (Blue)	NC - Future Use
	INF-04	A4	J2-1	Emergency switch	EM Stop on Dolphin Cabinet
	INF-05	A5	J2-2	N/C	NC - Future Use
	INF-06	A6	J2-3	N/C	NC - Future Use
	INF-07	A7	J7-5	Alarm Out Motor 1	Input AD4404 for Alarm Condition
	INF-08	A8	J8-5	Alarm Out Motor 2	Input AD4404 for Alarm Condition
	INF-09	A9	J9-5	Alarm Out Motor 3	Input AD4404 for Alarm Condition
	INF-10	A10	J3-2	Sensor 1 input	Sick WT160 Sensor Input
	INF-11	A11	J4-2	N/C	NC - Future Use
Digital OUTPUTS	OUTF-01	B1	J7-1	Operate Motor 1	In-Feed Conveyor - Output
	OUTF-02	B2	J8-1	Operate Motor 2	Weigh Conveyor - Output
	OUTF-03	B3	J9-1	Operate Motor 3	Reject Conveyor - Output
	OUTF-04	B4	J12-1	Solenoid Valve 1	Reject Flipper - Output
	OUTF-05	B5	J12-2	N/C	NC - Future Use
	OUTF-06	B6	J12-4	N/A	NO Connection Available
	OUTF-07	B7	J13-1	Lo Lo	Tower Light LoLo - Output
	OUTF-08	B8	J13-2	Lo Lo	Tower Light Lo - Output
	OUTF-09	B9	J13-3	OK	Tower Light OK - Output
	OUTF-10	B10	J13-4	Hi	Tower Light Hi - Output
	OUTF-11	B11	J13-5	Buzzer/Alarm	Tower Light Buzzer - Output

	AD4404			Description	Remarks
	Function code	**OP-02 Terminal No.**	**Wire Color**		
Relay OUTPUTS	02F01	1	Red	EM Stop	External EM Stop Signal to MCC
	02F02	2	White	Duplication	External Duplication Signal to MCC
	02F03	3	Blue	N/C	NC - Future Use
	02F04	4		N/C	NC - Future Use
	02F05	5		N/C	NC - Future Use
	02F06	6		N/C	NC - Future Use
	02F07	7		N/C	NC - Future Use
	02F08	8		N/C	NC - Future Use
	02F09	9		N/C	NC - Future Use
	02F10	10		N/C	NC - Future Use

To DC Motor 1 AXU210C-GN
To DC Motor 2 AXU210C-GN
To DC Motor 3 AXU210C-GN

Speed Controller 1
Speed Controller 2
Speed Controller 3

L N E

CW COM CCW SP out ALM out

Speed Indicator SDM496

For Speed Meter
R/Switch (3 ways)
To Solenoid valves
To Tower light

To Control I/O (AD4404)

J7 B1 COM A1 — 1 4 5
J8 B2 COM A2 — 1 4 5
J9 B3 COM A3 — 1 4 5
J10 — 1 3 4 5
J12 B4 B5 B6 — 1 2 6
J13 B7 B8 B9 B10 B11 COM — 1 2 3 4 5 6
J11 — 1 2

J6

J1 A1 A2 A3 COM — 1 2 3 5   Aux. input 1
J2 A4 A5 A6 COM — 1 2 3 5   Aux. input 2
J3 V+ A10 COM V- — 1 2 3 4   Sensor input 1
J4 V+ A11 COM V- — 1 2 3 4   Sensor input 2
J5 — 1 3
J15 — 1 2   To 9~12VDC
J16 — 1 2   To Power Switch
J17 — 1 3

Power Supply 12V DC
+ | N L E

AD4404 240VAC

Primary Relay Finder 6520074 12VDC
Socket for AC adaptor
240VAC

10. Index

NOTES

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