

# AD-8917

## DIGITAL DISPLAY UNIT

### INSTRUCTION MANUAL

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owners-AD-8917-v.1.b 89.11.10 OYM

## DIGITAL DISPLAY UNIT

**AD**  
A&D Company, Limited

# CONTENTS

Warranty, FCC rules .....	Page 2
<b>1. INTRODUCTION.....</b>	<b>Page 3</b>
<b>2. PERFORMANCE</b>	
2.1 Display .....	Page 3
2.2 Setting Switches.....	Page 3
2.3 Rear Panel .....	Page 3
2.4 General Specifications .....	Page 3
2.5 Accessories.....	Page 3
2.6 Option.....	Page 4
<b>3. METHOD OF OPERATING</b>	
3.1 Installation and Connection.....	Page 5
3.2 Panel Descriptions .....	Page 6
3.3 Basic Operation.....	Page 8
3.4 Settings.....	Page 9
3.5 Mode Descriptions.....	Page 12
3.6 Serial I/O.....	Page 13
3.7 Overload and Errors.....	Page 17
3.8 Examples of Use .....	Page 18
<b>4. MAINTENANCE</b>	
4.1 Check Operation.....	Page 22
4.2 Troubleshooting.....	Page 23
<b>5. EXTERIOR VIEWS.....</b>	<b>Page 24</b>

## **Warranty**

Warranty rights vary from country to country but it is the general intention of A&D Co., Ltd., to offer customers a one year warranty on this product from the day it is purchased. In some countries consumer protection legislation states that your dealer is responsible for offering a warranty and under these circumstances please refer to your local dealer.

In the U.S.A. the product (if defective) should be returned, freight prepaid by the customer, to A&D Engineering Inc. in California and in Europe the product can be returned freight prepaid to A&D Instruments GmbH in Frankfurt, West Germany. Elsewhere the product can be returned to A&D Co., Ltd. in Japan. In any event please contact your nearest A&D office, before shipping, to confirm that the product is covered by this warranty. Simple repairs can be carried out by your local dealer under warranty and this may be the fastest method of solving your problem.

This warranty only applies to product failures due to defective materials and/or workmanship. This warranty will be rendered invalid if, upon inspection, it is found that the product was: Abused; used for a purpose for which it was not designed; mishandled; placed in a hostile environment; repaired by unauthorized personnel; improperly installed or not adjusted in accordance with instructions given in this manual.

If repair under warranty is confirmed by A&D, then the product will be repaired (or replaced, at the discretion of A&D) and then returned to the customer at no extra cost.

## **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 equipment is operated in a commercial environment. If this unit is operated in a residential area it might 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. INTRODUCTION

The AD-8917 is an external display unit that can be connected to the current output terminal of a weighing indicator, truck scale or platform scale to display measured values. The unit displays either gross weight, net weight or tare weight. Connecting them in series, different measurement items can be selected independently.

- Applicable A&D models: 4316, 4321, 4322, 4323, 4347, 8117, 8916 and also FV and FW Series

# 2. PERFORMANCE

## 2.1 Display

- Display element: Seven-digit fluorescent lamp display (character height: 13 mm)
- Display color: Cobalt blue
- Display items: Weights (gross weight, net weight and tare weight), accumulated total and accumulation count

## 2.2 Setting Switches

The modes and various other items can be set by using the dip switches on the rear of the front panel.

## 2.3 Rear Panel

The rear panel has a serial I/O connector, control input connector, power cable connector and fuse holder.

## 2.4 General Specifications

Power supply: 100, 115, 200, 220 or 240VAC +10%/-15%, 50/60Hz, about 5VA

Weight: About 1 Kg (About 2.2 lb)

Relative humidity: 85% RH or less (no condensation)

Outside dimensions: 144 (W) x 179 (D) x 72 (H) mm  
(5.7 x 7.1 x 2.8 inch)  
(See the exterior views.)

Panel cut dimensions: 138 +1.0/-0 x 68 +0.7/-0 mm  
(5.4 +0.04/-0 x 2.7 +0.03/-0 inch)

Connectable distance: About 100 m

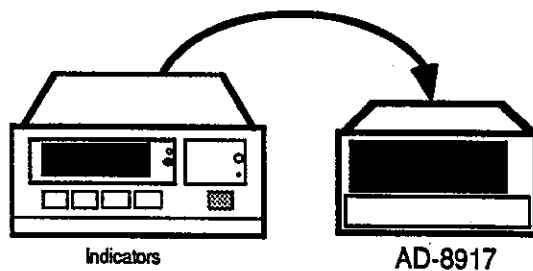
## 2.5 Accessories

- |   |          |                                       |
|---|----------|---------------------------------------|
| <input type="checkbox"/> Fuse:                    | 1 (0.3A) | <input type="checkbox"/> Unit sticker |
| <input type="checkbox"/> Control input connector: | 1        |                                       |
| <input type="checkbox"/> Serial output connector: | 1        |                                       |
| <input type="checkbox"/> Power cable:             | 1        |                                       |

## 2.6 Option:

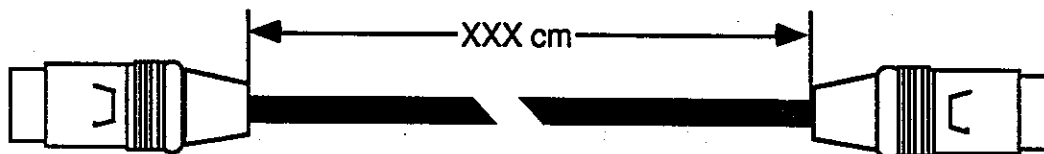
### KO:359-XXX Serial Output Connecting Cable

This cable is used for receiving data from weighing indicators.

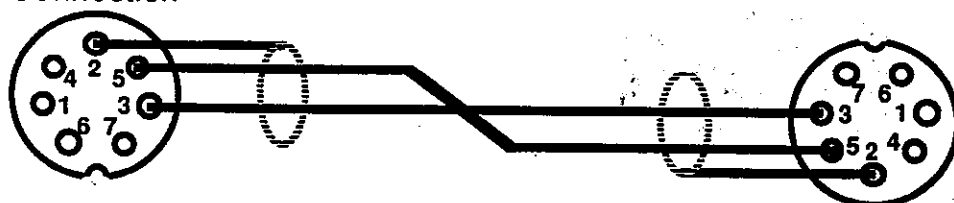


KO:359 - 200	(cable length:200 cm)
400	(cable length:400 cm)
600	(cable length:600 cm)
800	(cable length:800 cm)
1000	(cable length:1,000 cm)
1200	(cable length:1,200 cm)
1400	(cable length:1,400 cm)

#### Exterior View



#### Connection



3 - 3      connected  
5 - 5      connected  
2 - 2      shielded  
other pins not connected

## 3.METHOD OF OPERATION

### 3.1 Installation and connection

#### 3.1.1 Installing the power cable and connecting the ground wire

This is a precision electronic unit requiring careful handling.

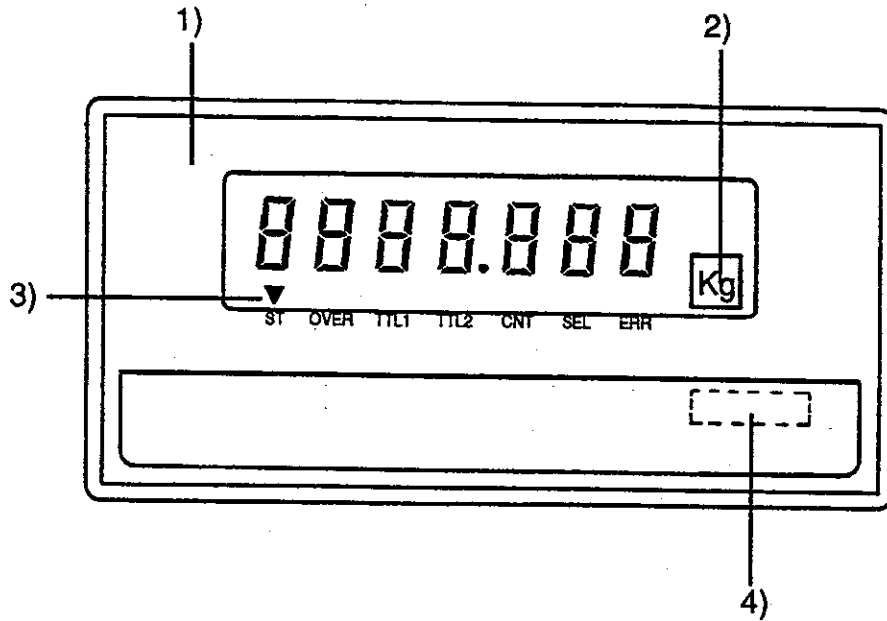
- 1) The operating temperature range is  $-5^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . ( $23^{\circ}\text{F}$  to  $104^{\circ}\text{F}$ ) Do not expose the unit to direct sunlight. Avoid sudden temperature changes, vibration, wind, water or excessive dirt. Best temperature is  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ) and 50% Relative Humidity.
- 2) The unit must be grounded. Connect the ground wire to a ground terminal not shared by other electric power equipment.
- 3) The fluctuation of local AC electricity supply should be less than  $\pm 10\%$ . IF the power supply is subject to instantaneous power fluctuations or contains noise, the unit may malfunction. Use a stable power supply not shared by other power lines.
- 4) Prepare a shielded I/O cable and connect the shielding to the shielded terminal of the connector or to the unit itself.

**Caution:** Do not connect the power plug here. The unit does not have a switch to turn off the power. The power plug should be connected only after completing the procedure described in Section 3.2 in this manual.

- 5) The front panel easily comes off. Do not hold the unit by grabbing the front panel.

## 3.2 Panel Descriptions

### 3.2.1 Front Panel



#### 1) Display

This section displays serial data (weight), accumulated total or accumulation count with status.

#### 2) Unit sticker

Attach the accessory unit sticker here.

#### 3) The display contents vary depending whether the unit is in the normal mode or accumulation mode (see 3.4).

##### (1) Normal mode (for external display unit use)

ST: Lights when the input serial data is stable.

OVER: Lights when the input serial data is overloaded.

SEL: Lights when this unit is selected.

ERR: Lights when the input serial data is incomplete or the data format is incorrect.

Total 1, Total 2, Count: Do not light.

##### (2) Accumulation mode (for external integrator use)

ST: Lights when the accumulated serial data is stable.

OVER: Lights when the accumulated total is 10,000,000 or more.

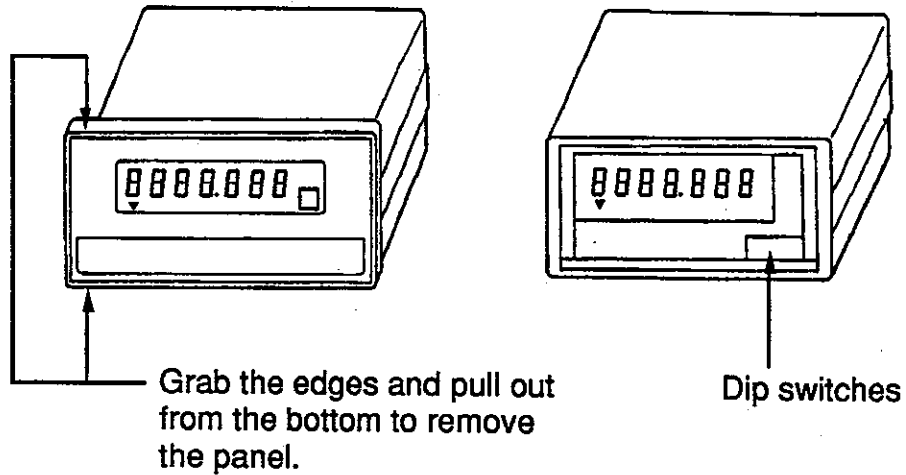
TTL1: Lights when accumulated total display or count display is selected by control input selection in Accumulation mode 2 or flashes when weight value display is selected.

TTL2: Lights when accumulated count display is selected.

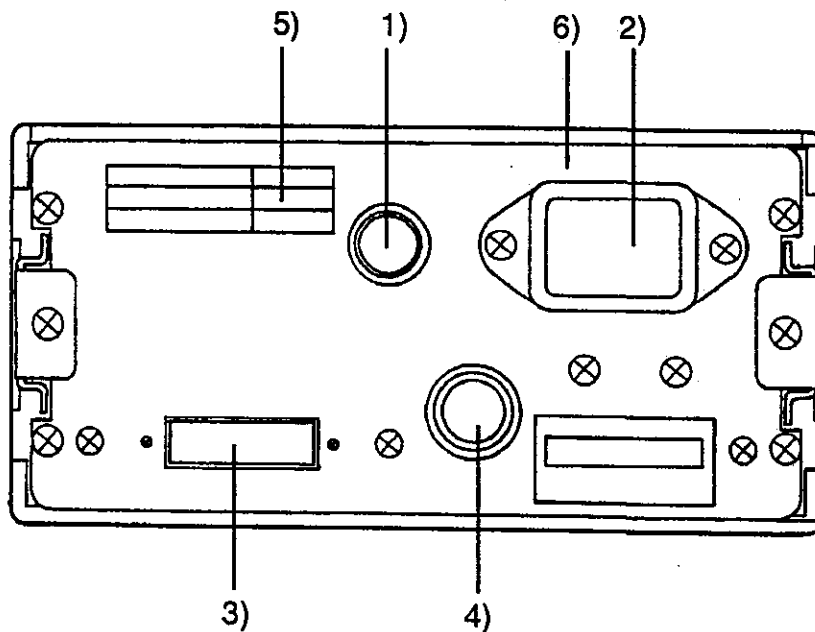
**SEL:** Lights when this unit is selected.

**ERR:** Lights when the input serial data is incomplete or the data format is incorrect.

4) The dip switches used to set the unit mode are located inside the front panel. Remove the front panel as shown below (See 3.4).



### 3.2.2 Rear panel



1) Fuse (0.2/0.3 A)

In case of a power failure, check here and replace the fuse if necessary. Ampere is selected by 5).

2) Power cable connector

Connect the connector as described in Section 3.1.1. AC voltage is issued on 6).



### 3) Control input connector

This is the input section used to select or reset display data (weight value, accumulated total or accumulation count).

### 4) Serial I/O connector

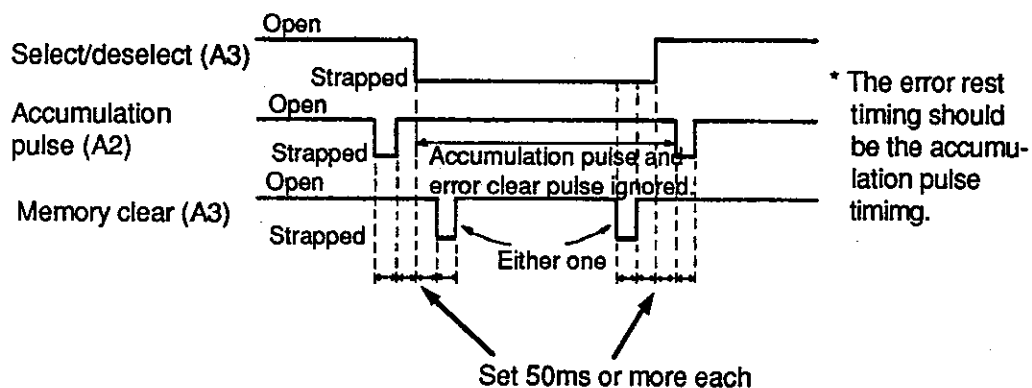
This connector interfaces the unit with A&D weighing indicators, platform scales and printers.

## 3.3 Basic Operation

### 3.3.1 Selection, de-selection and memory clear

Set control input A3 on the rear panel to open to select this unit and enable serial data input. When the data complies with the input selection effective conditions, the unit operates in the normal mode or accumulation mode as selected. If an error occurs, strap A1 to a common (B1 to B7). When A3 is strapped to a common, this unit is deselected and further serial data input is ignored. In the manual accumulation mode, an accumulation pulse is cleared and ignored and the display does not change. In the accumulation mode, however, the weight, accumulated total or accumulation count display can be selected.

When A1 is strapped to a common after deselecting the unit, the weight, accumulated total and accumulation count data can all be cleared in the normal and accumulation modes.



### 3.3.2 Non-volatile memory

The built-in battery saves the weight, accumulated total and accumulation count data when the unit power is turned off.

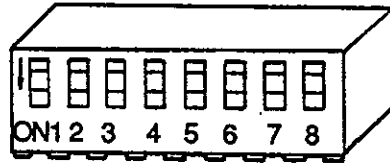
### 3.3.3 Watchdog

The watchdog function monitor the CPU to prevent external noise or abnormal power supply from causing a malfunction.

## 3.4 Settings

### 3.4.1 Dip switches

Remove the front panel to set the dip switches.



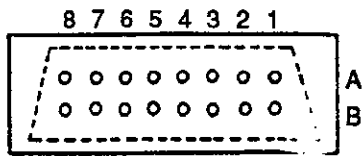
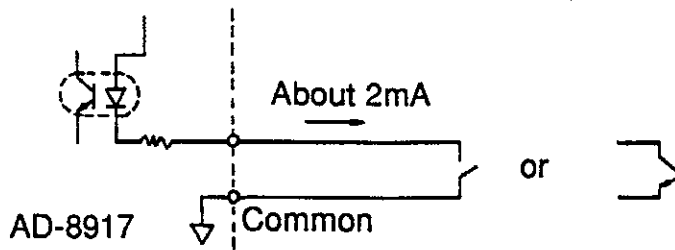
Dip switch settings and modes

No	Name	Purpose	Setting	Mode
1	Baud rate	Sets the serial interface baud rate. (The setting is effective only when the power is on.)	OFF	2400 bps
			ON	600 bps
2,3	Input selection (effective condition)	Sets the serial input data effective condition. The setting is ineffective in data format (a).  (See 3.6)	2 OFF, 3 OFF	All
			2 ON, 3 OFF	Gross weight
			2 OFF, 3 ON	Net weight
			2 ON, 3 ON	Tare weight
4	Mode selection	Sets whether this unit should accumulate totals.	OFF	Normal mode (no accumulation)
			ON	Accumulation mode
5	Polarity selection	In the accumulation mode, only the input data of an effective polarity is accumulated. The input selection setting must also match that in data format (b).	OFF	Positive
			ON	Negative
6	Accumulated method	Sets whether serial input data should be accumulated each time.	OFF	Automatic accumulation (to accumulate all input data)
			ON	Manual accumulation (to accumulate data at accumulation pulse input)
7	Accumulation mode	Sets the method of accumulation mode. (See 3.5.)	OFF	Accumulation mode 2
			ON	Accumulation mode 1
8	Check mode	Sets the check mode for maintenance only. The setting is effective only when the power is on. Then control input A1 should be open. (See 4.1)	OFF	Normal mode
			ON	Check mode

Note: Static electricity have an adverse affect on dip switch settings. Make sure that the dip switches are not charged when setting them. Since electric signals flow the board, do not place any foreign objects on the board.

### 3.4.2 Control input connector connection and operation

When switches are connected to an accessory connector, the following functions are available. (The switches are not included in the accessory set.)



View of pin arrangement from rear panel

## Connector connection and operation

Pin No.	Connection method		Command	Operation
A1,A3	A1	A3	Error reset	Turns off the error mark and releases the error state.
	↓	H		
	↓	L	Memory clear	Resets the weight, accumulated total and accumulation count to 0 after error resets.
	H	H	Selection input	Selects this unit.
	H	L	Deselection input	Deselects this unit.
A2	↓		Accumulation pulse input	Accumulates the latest input data (weight) once in the manual accumulation mode.
A4,A5	A4	A5	Accumulated total display	Displays the absolute accumulated total in the accumulation mode.
	H	H		
	L	H	Count display	Displays the accumulated count in the accumulation mode.
	H	L	Weight display	Displays the weight in the accumulation mode. This setting is not required in the normal mode.
	L	L		
A6			N.C.	
A7			N.C.	
A8,B8			FG (Shielding)	
B1-B7			Common	

\* H : Open    L : Strapped to common    ↓ : 50ms or more strapped to common  
The operation starts in 50ms.

## 3.5 Mode Descriptions

### 3.5.1 Normal mode

Input data (weight data) is displayed only when it satisfies the condition set by input selection.

### 3.5.2 Accumulation mode

Either the weight, accumulated total or accumulation count can be displayed. Input data (weight data) is displayed by the same way of Normal Mode and /or accumulated by the way described below.

### 3.5.3 Automatic accumulation mode

Any type of data(stable and/or unstable) is accumulated when it satisfies the effective condition.

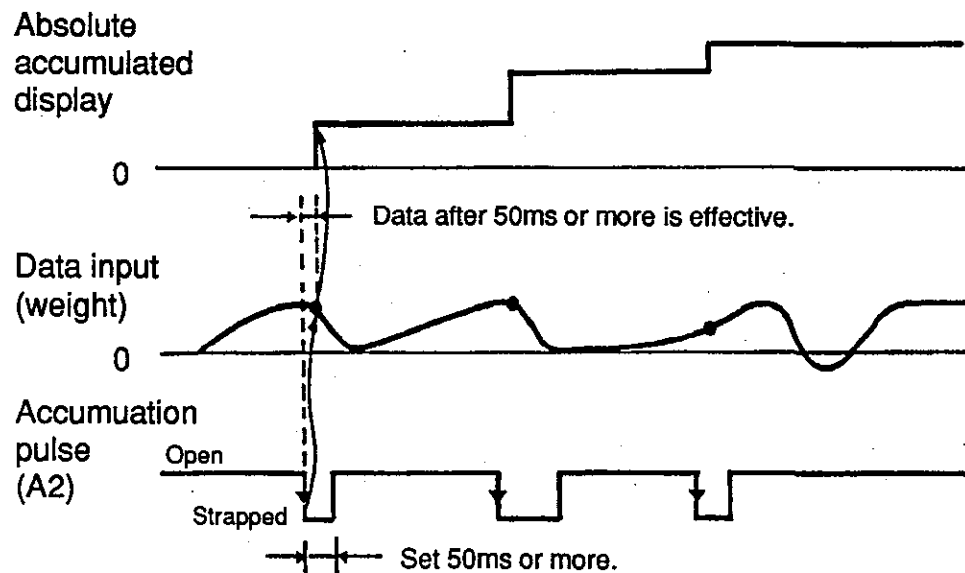
### 3.5.4 Manual accumulation mode

Input data is accumulated when an accumulation pulse is input.

However, the accumulated total is different from the total in Mode 1 to 2. The input data must satisfy the effective condition.

#### (1) Accumulation mode 1

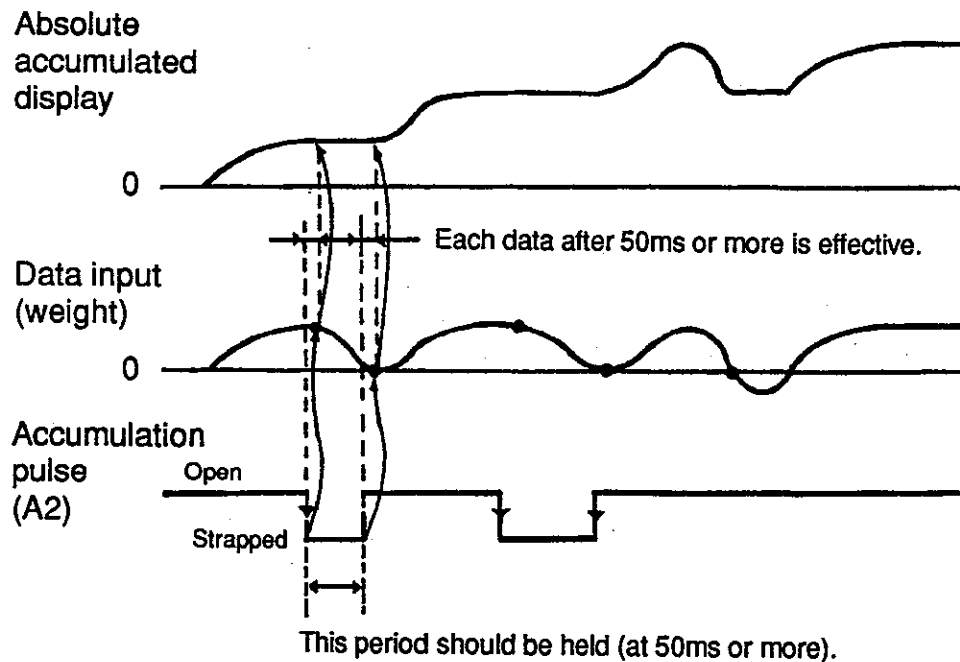
The input data immediately after the falling edge of an accumulation pulse is accumulated and the total is displayed.



## (2) Accumulation mode 2

The input data immediately after the falling edge of an accumulation pulse is executed and the total is displayed.

After the rising edge of the pulse, the input data is added to the accumulated total and the new total is displayed.



(3) The accumulation pulse is effective only when this unit is selected and held until the input data is accumulated. Note that turning off or deselecting the unit resets the pulse.

### 3.5.5 Accumulated total display

As long as the accumulated total does not exceed the limit, the seven high-order digits are displayed. for example, 1234.56789 is displayed as 1234.567. Since no rounding off is done in memory, adding 0.00001 to the value changes the total to 1234.568.

## 3.6 Serial I/O

### 3.6.1 Interface specifications

(1) System: Passive 20mA current loop

(2) Transmission system: Half duplex, Asynchronous transmission, Bi-directional

(3) Signaling system

- Baud rate: 600 and 2400 bps

- Data bit: 7

- Parity bit: 1 (even)

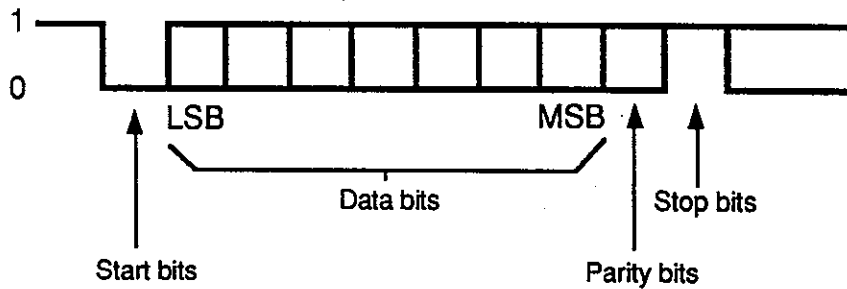
- Stop bit: 1

- Code: ASCII

(4) Output level

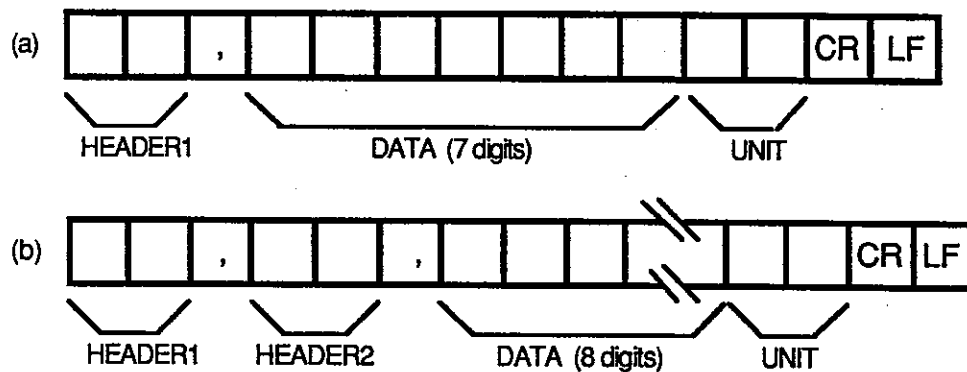
- 20mA current loop: 1=20mA, 0 = 0mA

(An external power source should be used )



### 3.6.2 Data format

The following two types of format are available:



Header 1 is one of the following four types:

- OL: Overload
- ST: Stable (weight)
- QT: Stable (quantity)
- US: Unstable

Header 2 is one of the following three types:

- NT: New weight
- GS: Gross weight
- TR: Tare weight

Data consists of ASCII characters, as well as the following:

- : 2D (hex) (minus)
- +: 2B (hex) (plus)
- ␣ : 20 (hex) (space)
- . : 2E (hex) (decimal point)

A unit consists of two characters as follows:

kg: 6B, 67 (hex)  
 t: 20, 74 (hex)  
 pc: 70, 63 (hex)  
 %: 20, 25 (hex)

\* A unit uses two ASCII characters (from 20 to 29 and 3A to 7E in hex). Note that if 2 1b. is input after 1 kg, the total value becomes 3 because the weight unit is not identified. Otherwise, 15 oz + 1 oz is displayed as 16.

Example of (a): +0.37 kg stable weight

S	T	,	+	0	0	0	.	3	7	k	g	CR	LF
---	---	---	---	---	---	---	---	---	---	---	---	----	----

\*Data containing no decimal point has six effective digits.

Ex. ST, +00037kg CR LF

Example of (b): -0.926 kg stable net weight

S	T	,	N	T	,	-	0	0	0	.	9	2	6	k	g	CR	LF
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----	----

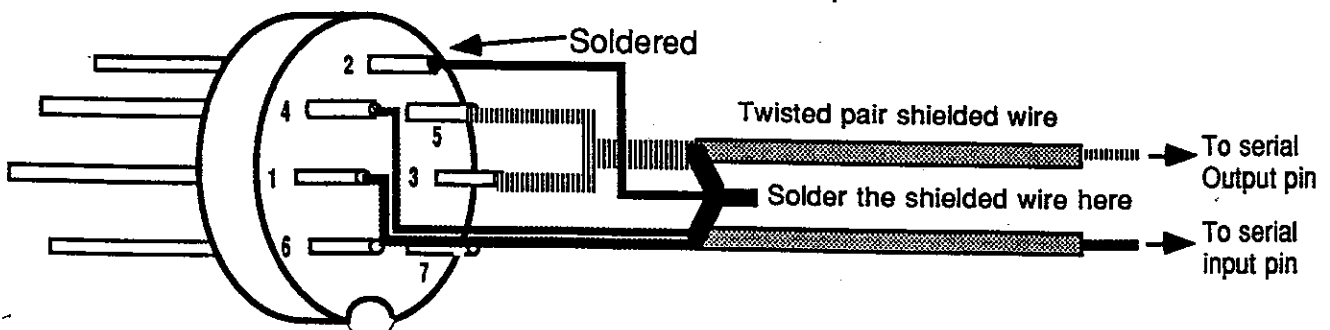
\*A "," between UNIT and CR is effective (2C (hex)).

Ex. ST, NT, -000.926 kg, CR KF

### 3.6.3 Serial I/O connector

Pin No.	Name
1	Serial output
2	Frame ground
3	Serial input
4	Serial output
5	Serial input
6	N, C
7	N, C

\*The serial input/output pins are not polarized but pin 5 is connected to the common of the control input connector.

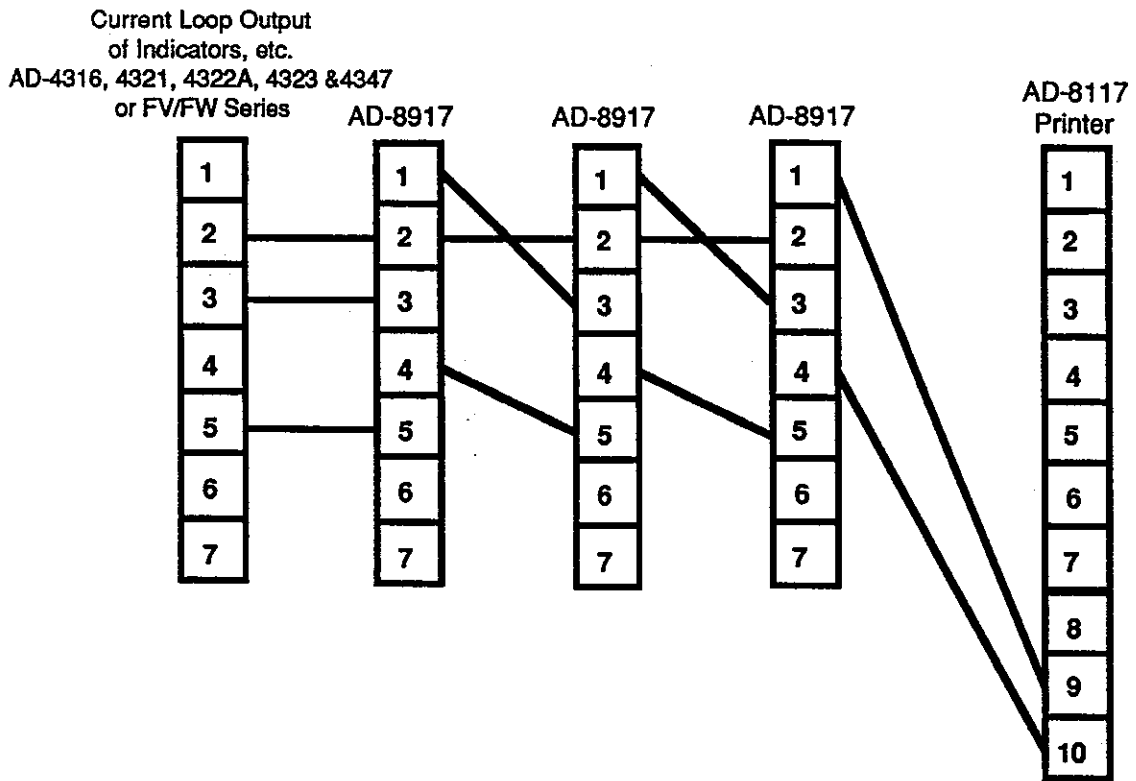




\*The maximum distance between the other equipment is about 100 m. Make sure that the cable is protected against the effects of noise or static electricity.

Example:

Connecting Three AD-8917s in Series:



**Note:**

1. Connecting with the units other than above, please check the pin assignment(input and output) and connect the unit accordingly.
2. The data format should meet with AD-8917's format.

## 3.7 Overload and Errors

### 3.7.1 Normal mode

(1) If the unit is overloaded with serial input data, the OVER mark lights and the display goes blank. However, "-" is displayed for negative data and a point is displayed for data containing a decimal point.

(2) If the serial input data is incomplete or the data format is incorrect the ERROR mark lights. However, if the next input data is correct, the mark goes off automatically. When there is no more input data, reset the error to turn off the mark.

### 3.7.2 Accumulation mode

(1) If the unit is overloaded with the serial input data after an accumulation pulse in the automatic accumulation mode or manual accumulation mode, "Err OL" and the contents (weight, accumulated total or accumulation count) set by control input are alternately displayed. In this case, accumulation is not effective.

Subsequent input data (stable and/or unstable) is added to the total only when it satisfies the effective condition.

The alternate display state can be released by executing an error reset.

(2) The weight display goes blank in the manual accumulation mode except in case (1) above (or not when hold state is in mode 2). However, "-" is displayed for negative data and a point is displayed for data containing a decimal point.

In mode 2, the accumulated total display also goes blank.

(3) If the serial input data is incomplete or the data format is incorrect the ERROR mark lights. The mark does not go off even if the next input data is correct. The mark can be turned off by executing error reset. Note that alternate display does not occur.

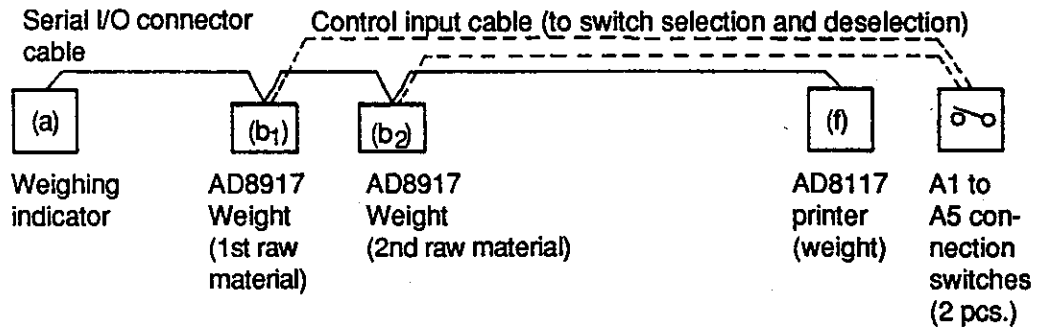
(4) If the accumulated total becomes 10,000,000 or more, the OVER mark lights and only the seven low-order digits are displayed. For example, 10,000,002.30 is displayed as 00002.30.

(5) If the accumulated count becomes 10,000,000 or more, only the seven low-order digits are displayed, but the OVER mark does not light.

\*Note that executing an error reset when this unit is deselected clears the memory at the same time.

## 3.8 Example of Use

### 3.8.1 Example of normal mode use (for combined system use)



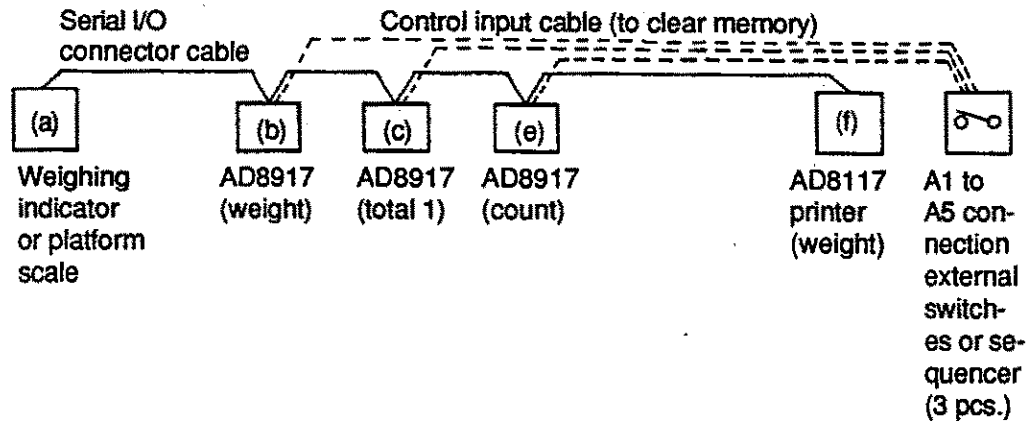
(a) is the AD4323 and the current loop output mode is stream.  
The baud rate is 2400.

(f) is set to the manual print mode and is ready to start printing immediately when the print switch is pressed.

#### Procedure

- (1) Set all dip switches of (b1) and (b2) to off and set all control input external switches to open. (Setup)
- (2) Now the first raw material should be weighed. Deselect (b2) to inhibit the acceptance of weighing data by strapping control input A3 to a common (common: B1 to B7). After the weighing result data enters (b1) at the end of weighing, deselect (b1) to store the value.
- (3) To weigh the second raw material, select (b2) by setting A3 to open. After the weighing result data enters (b2) at the end of weighing, deselect (b2) to store the value. This is useful for storing weight data at a certain timing.

### 3.8.2 Example of automatic accumulation mode use (for ejection monitor)

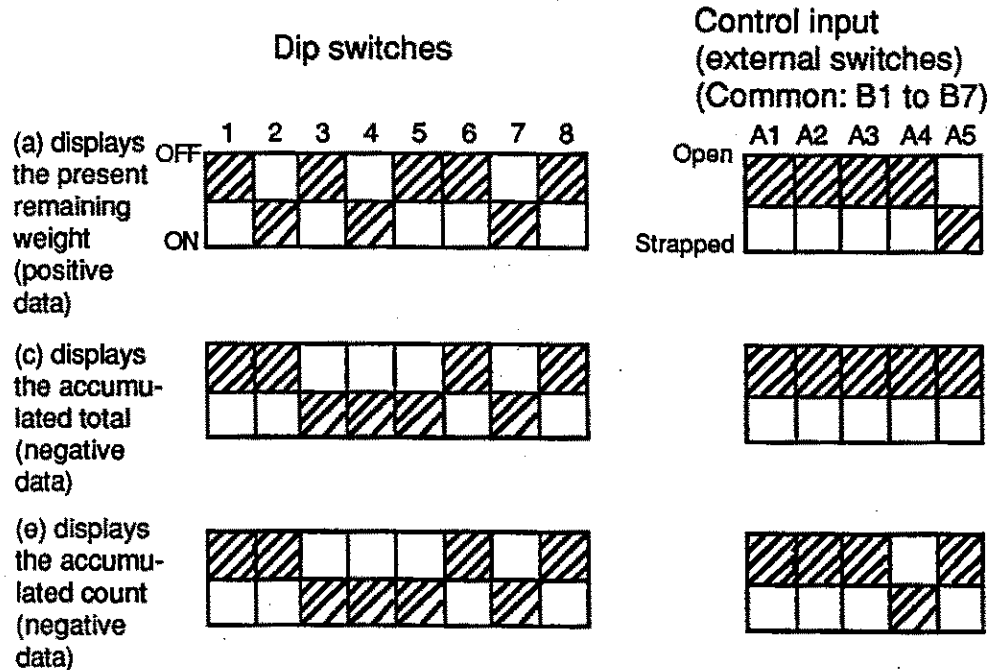


(a) is the AD4323 and the current loop output mode is auto print.

The baud rate is 2400.

(f) is set to the automatic print mode.

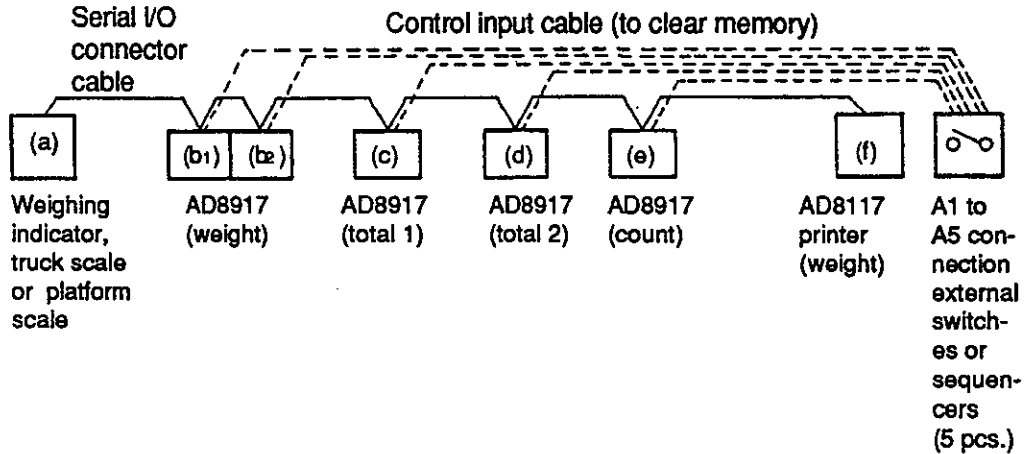
(b) to (e) are set as shown below:



#### Procedure

- (1) Clear memory. (Strap A3 to a common, then A1 to a common.)
- (2) Remove the raw material. The indicator (AD4323) then outputs the weight data once. (b) to (e) display their respective input data. (f) prints the weight of the (remove) raw material.
- (3) After removing the raw material repeat step (2).

**3.8.3 Example of manual accumulation mode use  
(for combining first and second materials several  
times in the example of 3.8.1)**

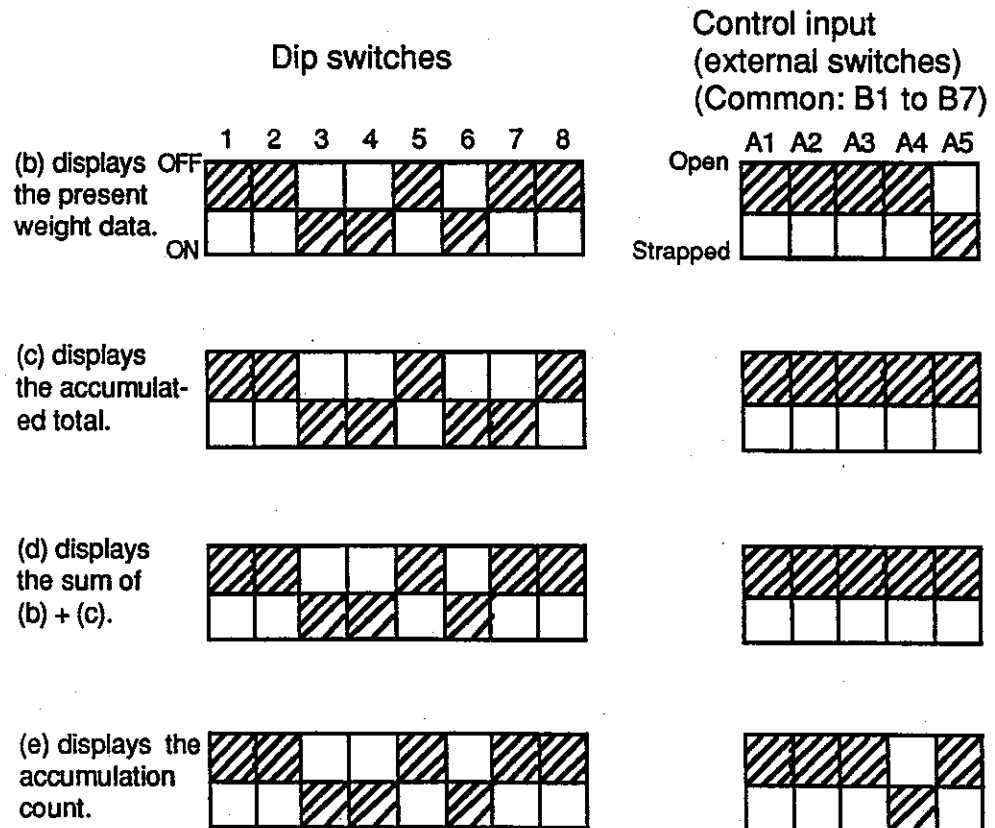


(a) is the AD4323 and the current loop output mode is stream.  
The baud rate is 2400.

(b) to (e) are set as shown below:

(The setting is to accumulate the net weights. The baud rate is 2400 and "positive" is effective data.)

(f) prints the weight data when the manual print switch is pressed.



## **Procedure**

- (1) Clear memory. (Strap A3 to a common, then A1 to a common.)
- (2) The first raw material should be weighed first (b1 side). Select (b1) by setting A3 to open and deselect (b2) by strapping A3 to a common to measure the weight of (b1). After the measurement, deselect (b1) and store the value. Issue an accumulation pulse to (c) and (d) (strap A2 to a common, then set it to open) for accumulation.
- (3) Now the second raw material should be weighed (b2 side). Select (b2) and leave (b1) deselected to measure the weight of (b2). After the measurement, deselect (b2) to store the value. Issue an accumulation pulse to (c) for accumulation. Since the first combination is completed, an accumulation pulse is input to (e) and the accumulation count is set to 1. (d) clears the memory for the second combination.
- (4) Steps (2) and (3) are repeated until the value of (e) reaches the specified combination count. The value of (c) then is the gross combined total.

# 4.MAINTENANCE

## 4.1 Check Operation

This unit has a mode to check internal memory, the battery, display, dip switches, control input and serial I/O connector (input).

Set dip switch 8 (inside the front panel) to on and set control input A1 to open. Then, turn the power on.

0 0 0 0 0 0 0

(1) All segments display 0, then sequentially display 1 to 9.

• • • • • • •

(2) All segments display decimal points.

▼ ▼ ▼ ▼ ▼ ▼ ▼

(3) All segments display ▼ marks.

r A \_ F , n E

(4) The Memory Check OK message is displayed.

b A t t E r y

(5) The Battery Check OK message is displayed.

d P L . X X X X

(6) The settings of dip switches 1 to 4 are displayed sequentially from the left (1 for ON and 0 for OFF).

d P H . X X X X


(7) The settings of dip switches 5 to 8 are displayed sequentially from the left (1 for ON and 0 for OFF).

E F . X X X X X

(8) The settings of control input A1 to A5 are displayed sequentially from the left (1 for Strapped and 0 for Open).

- \_ 1 2 3 . 4 5

(9) To use the serial I/O connector check function, connect the output line to the input line. Set dip switches 2, 3 and 4 to OFF, then set control input A1 and A3 to open. (When these settings are made correctly, the display shown to the left appears.) The left figure shows the display when the unit outputs are stable net weight (ST, NT, -0123.45 t CR LF) only once. (Setting dip switch 8 to OFF after power-on outputs ST, -087.65 kg CR LF.)

-  indicates a blank.
- If an error is detected in 4), 5), or 9), ERR is displayed. 0 is also an error at 9).
- After 9), repeat the procedure from 1).
- To use the unit normally, set dip switch 8 to OFF, then turn the power OFF and ON again.

## 4.2 Troubleshooting

### 4.2.1 No messages displayed by check in 4.1

a) The power supply voltage is the same as it is issued on the rear panel?

b) Is the fuse in the holder correct and normal?

\*If the unit emits a strange smell or if you see smoke, turn the power off immediately.

### 4.2.2 Messages displayed by check in 4.1

a) Is it sure that the check operation 1) through 9) is the same as described?

b) Particularly, 6), 7) and 8) should be checked carefully.

### 4.2.3 When checks in 4.1 are done correctly

a) Is dip switch 8 set to off?

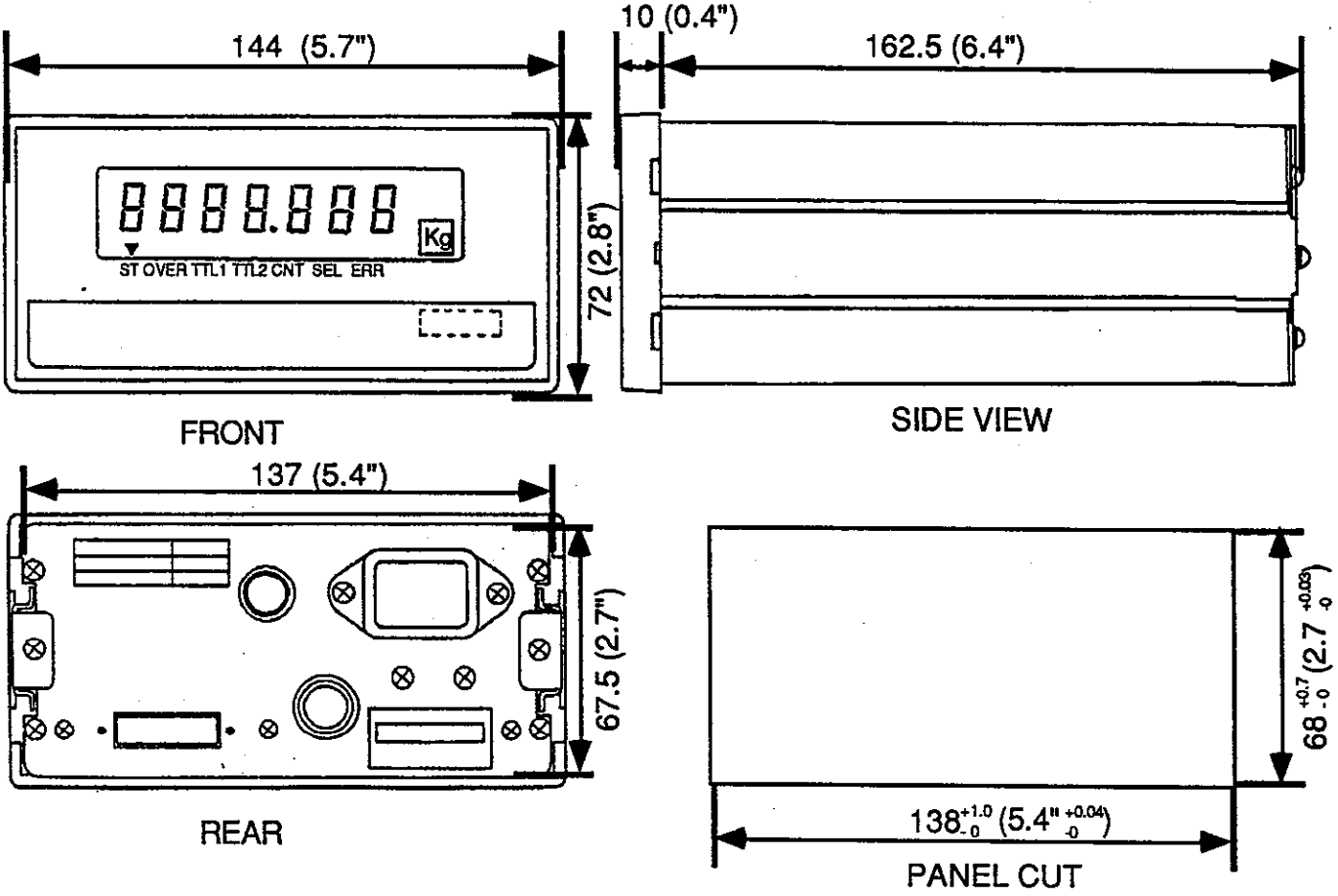
b) Does the baud rate match that of the transmitter?

c) Are the selection state and other settings correct?

d) Are the control input connector and serial I/O connector properly connected?



# 5.EXTERIOR VIEWS





# **AND**

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