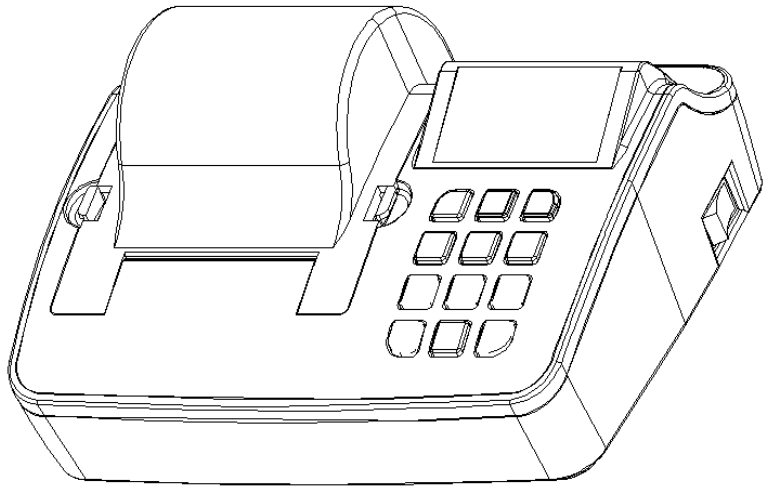
DOT MULTI PRINTER

INSTRUCTION MANUAL



CONTENTS

1. Specifications

1-1 Items supplied

The following items are supplied:

- Printer
- Test paper
- Adapter
- Serial cable
- Instruction Manual

1-2 General Specifications

ITEM	Specifications
Printing method	8 Pin Serial Impact dot matrix system
Number of dot per line	240 DOT
Printing speed	1.6 LINE/SEC
Columns number	30 Columns (in English)
Font size	English: 8x14, Korean: 16x14
Support language	English/Korean (Options available in the internal program setting mode)
LCD	8 x 2 LINE (BACK LIGHT Function)
Printer Mode	Statistical calculation mode, Clock mode
Cartridge	EPSON ERC-09
Printing paper	57mm(w) x 60mm(dia) ROLL PAPER
Printing width	48mm
Interface	- SERIAL RS-232C,Current Loop - RS-485(OPTION) BAUDRATE = 300/600/1200/2400/4800/9600/19200bps PARITY = None/ Even/ Odd DATA WIDTH = 8/7 bit STOP BIT = 1/2 STOP
	2 External Input Port
Power	DC +12V 1.5A (External AC Adapter)
Operating temperature range	-15℃ ~ 50℃
Storage temperature range	-20℃ ~ 70℃
Certificates	KC Certification, CE Certification
Dimensions (mm)	174.3(W) x 141.3(D) x 86.9(H)

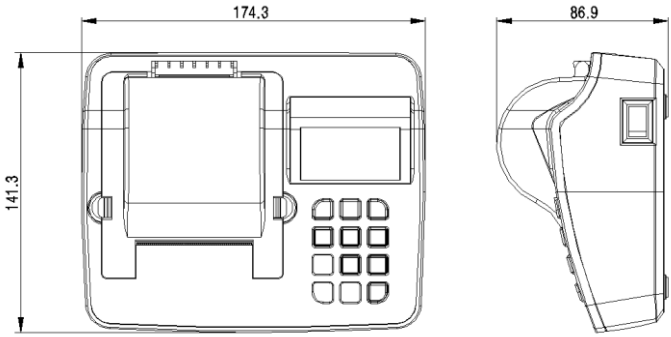
- Specifications are subject to change for improvement without notice.

1-3 Compatibility

Company	Model
AND	Balance, Scale
SARTORIUS	CP4201, BP410
CAS	AD Series, BW Series, CI Series, CUW/CUX Series, MW Series
OHAUS	Adventurer Series, Explorer Series
PRECISA	480S,/480SCS Series, 24D Series, XB-4200C
MATTLER	AB204-S, PG5002-S
SHIMADZU	EL Series, BX-K Series, UW, UX Series, BL Series
DESCOM	GT-150,PC-100W
SHINKO	AJ-D/AJH-D
SETRA	EL Series
UNIPULSE	F701-C, F741-M
SEWHA	SI 4010
RADWAG	PS210/C/1, PS6000/X, PC750/Y
ACOM	PC-100

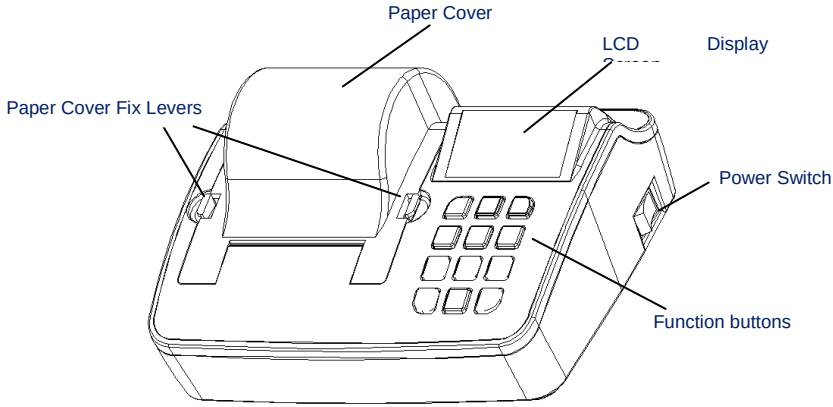
* Some other products (not shown in the table) may comply with AD-720Di.

1- 4 External View

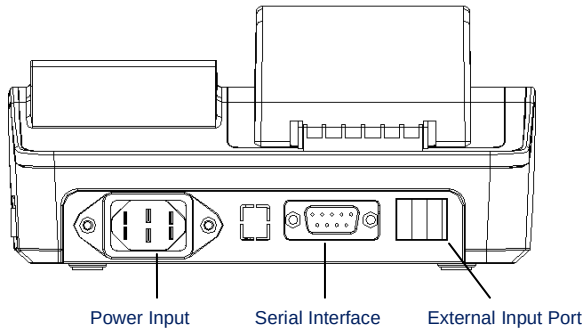


1-5 Names of Each Part

[Front]

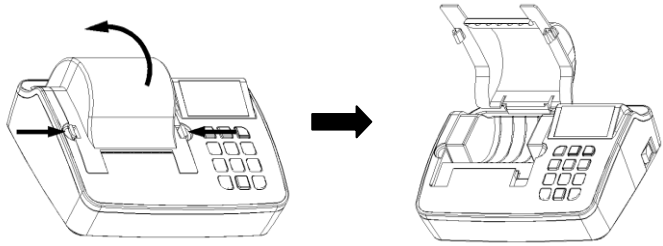


[Rare]

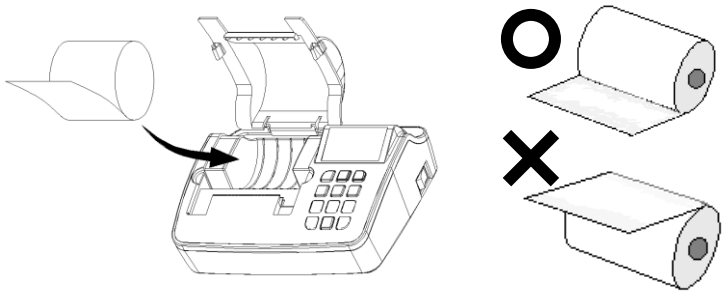


1-6 Installing the Printer Paper

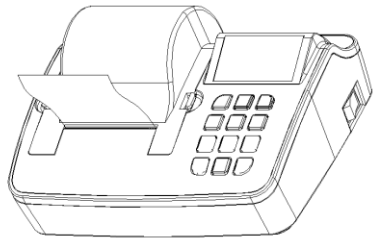
① Do not send data to the print during installing the printer paper.
② Push the both fix levers to slide the printer paper cover in the direction of the arrow.



④ Insert the printer paper as shown below (the leading edge of the printer paper should head downwards).



⑤ Push the printer paper lightly into the paper slot, then press “FEED (8) button to mount the paper automatically.
⑥ Close the printer paper cover

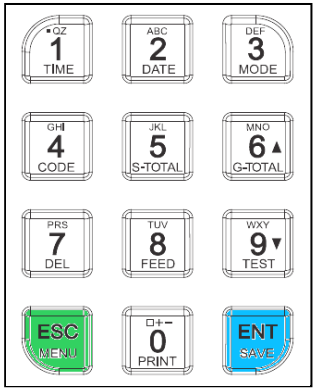


2. Functions

2-1 General Function Keys

Key	Function
"1" (TIME)	Sets the time
"2" (DATE)	Sets the date
"3" (MODE)	Sets the modes
"4" (CODE)	Inputs or changes codes (this key does not function in NORMAL MODE)
"5" (S-TOTAL)	Prints subtotals (subtotal number of prints, weights measured, etc.)
"6" (G-TOTAL)	Prints totals (Total number of prints, weight measured, max/min values, range, standard deviation, etc.)
"7" (DELETE)	Deletes the last data printed
"8" (FEED)	Slides up the printer paper
"9" (TEST)	Prints the current printer setting (when power is ON)
"0" (PRINT)	Print key (only in MANUAL MODE)
"ESC" (MENU/Cancel)	-Enters the printer setting menu (when power is ON) -Operates only in Printer Setting mode. -Clears certain setting(s).
"ENT" (Setting)	-Operates only in Printer Setting mode. -Saves the current setting(s).

- TIME/DATE/CODE/FEED/S-TOTAL/G-TOTAL keys can be used while undergoing interface errors.
- By pressing “5” or “6” without measurements, the printer automatically prints out “SUBTOTAL /TOTAL NO DATA” .
- When the number of measurements reaches 999 and “0” key is pressed, the printer automatically prints subtotals and totals, and resets the count to 000.

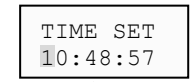


2-2 General Settings

2-2-1. Time Setting

- Switch the power on and press “1” to enter the time setting mode.
- The time is to be set in a 24-hour format, and use “0”~”9” keys to do so.

(Example)

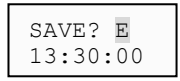


Hour Minute Second

➢ Setting the time

e.g. Set the time to 1:30PM

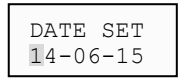
1) Press “1” to enter the time setting mode (the cursor blinks) time setting mode.
2) Press “1”, “3” (hour), “3”, “0” (minute) “0”, “0” (second) in order.
3) Press “ENT” to save the set-up time or “ESC” to cancel.



2-2-2. Date Setting

- Switch the power on and press “2” to enter the date setting mode.
- The first two digits represent the year (i.e. 00 as in 2000, 99 as 2099, etc.) and use “0” ~ “9” kyes to set the year, month and day as shown below.

(Example)

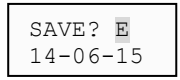


Year Month Day

➢ Setting the date

e.g. Set the date to June 15th 2014

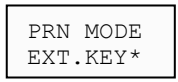
1) Press “2” to enter the date setting mode (the cursor blinks).
2) Press “1”, “4” (year) “0”, “6” (month) “1”, “5” (day) in order.
3) Press “ENT” to save the set-up date or press ESC to cancel



2-2-3. Mode Setting

- In the turning on print, press “3”key for 1~2 seconds to move “PRINT MODE” setting.
- In the print mode setting, use “▲” and “▼” buttons to change print mode.

(Display)



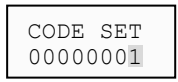
- Press “ENT” or “ESC” to save or cancel the setting screen.

"ENT" = Setting save, "ESC" = Setting cancel

2-2-4. Code Setting

- Make sure the power is on, then press “4” and hold for 1 to 2 seconds to enter “CODE SETTING”.
- Use a combination of alphabets and numbers up to 8 digits to create a code.

(Example)



➢ Setting the code

e.g. Set the code to 123456A5

1) Press “4” and hold for 1 to 2 seconds to enter the code setting mode (the cursor blinks).
2) Numbers and alphabets are only inserted backwards. Press “5”, then press “ENT” to set the last digit (i.e. 5). The cursor automatically moves to the next code to insert.
3) Alphabets are inserted by pressing the number kyes twice. Press” 2” twice to put “A” as shown in the example.
4) Press the :ENT” key after conversion “A” to the store ”A” has been moving cursors Automatically.
5) In the same way, insert the remaining 6 digits from backwards (i.e. 6, 5, 4, 3…etc.) to complete the code. When the code is completely inserted, the printer automatically saves the code setting and operates on Stand-By mode.I
6) During setting the code, press “ESC” to cancel and exit without changing the previous code setting.

2-2-5. Various Keys to Print

[Press PRINT or “0” to print measured data.]

```
Code   : 00000001

   2014-04-08          17:23:30
NO      001        40.40 g

   2005-02-16          17:23:40
NO      002        90.78 g
```

[Press “S-TOTAL” to print subtotals]

```
==========================
   *****<    subtotal     >*****
   2014-04-08          17:24:50
Code                   00000001
NO                      002
TOTAL                  131.78 g
==========================
```

[Press G-TOTAL to print totals]

```
==================
   *****<   TOTAL    >*****
   2011-04-08          17:25:50
CODE                   00000001
NO                      002
TOTAL                  131.78 g
Average                 65.39 g
MAX                     90.78 g
MIN                     40.40 g
RANGE                   50.78 g
DEV.                   25,389 g
C.V                     0.388 %
==================
```

2-2-6. Special Functions

To access these functions, press and hold one of the following buttons as shown in the table when the power is off. Then, turn the power back on while pressing and holding the selected button.

These functions allow users to access Printer Setting mode, print Printer Set-up Status and print or select Hex Dump. After completing each function, make sure the power is switched off. However, after printing Printer Set-up Status, normal operating is possible.

Key	Function
ENT SAVE (Menu/Cancel)	Enters Printer Setting mode
"9" (Test)	Prints Printer Set-up Status (Self-Test)
ENT SAVE (Set) (HEX DUMP)	Prints input data in ASCII codes to diagnose the status of received data.

[Prints Set-Up Status (SELF TEST)]

```
*[SELF TEST]*
VERSION    : V3.10(2014/06/02)
USER MODE     : AND
PRINT MODE    : MANUAL MODE
PRINT FORMAT  : TIME/WEIGHT
PRINT FORMAT2: + PRINT
DATA FORM     : FORM1
SUB FORMAT    : DEL
LINE FEED     : 1 LINE
LANGUATE      : KOREA
USER CODE     : 000001
TOTAL MODE    : TIME PRINT
CODE PRINT    : PRINT
NO PRINT      : PRINT
INTERFACE     : RS-232C Serial
                Current Loop
PROTOCOL      : 2400bps,E,7,1

CURRENT TIME/DATE :
        2014-06-03   17:04:26
```

[HEX DUMP Print Mode]

```
**< HEX DUMP PRINT START >**


53 54 2C 2B 30 30 30 36 30 2E
32 34 20 20 67 0D 0A 55 53 2C
2B 30 30 30 36 30 2E 32 34 20
```

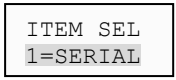
2-3 Printer Settings

This function is used to configure the printing as well as data communication methods between the printer and scales/balances.

To access this function, press and hold “ESC” for 2 to 3 seconds when the power is on.

.

(Example)



During the settings, “1=SERIAL”, “2=VENDER” and “3=MODE” blink in turn on the screen at an interval of 1 second. Press the desired setting value (either “1”, “2” or “3”)

- “1” key: Configures serial communication protocols.
- “2” key: Selects manufacturers of electronic balances/scales or indicators in use.
- “3” key: Printer Mode.

✓ Printer Setting Procedure

The following applies to all Printer Settings.

① When a desired item (either “1”, “2”, or “3”) is selected, the value of the selected item is displayed on the second line of the screen.

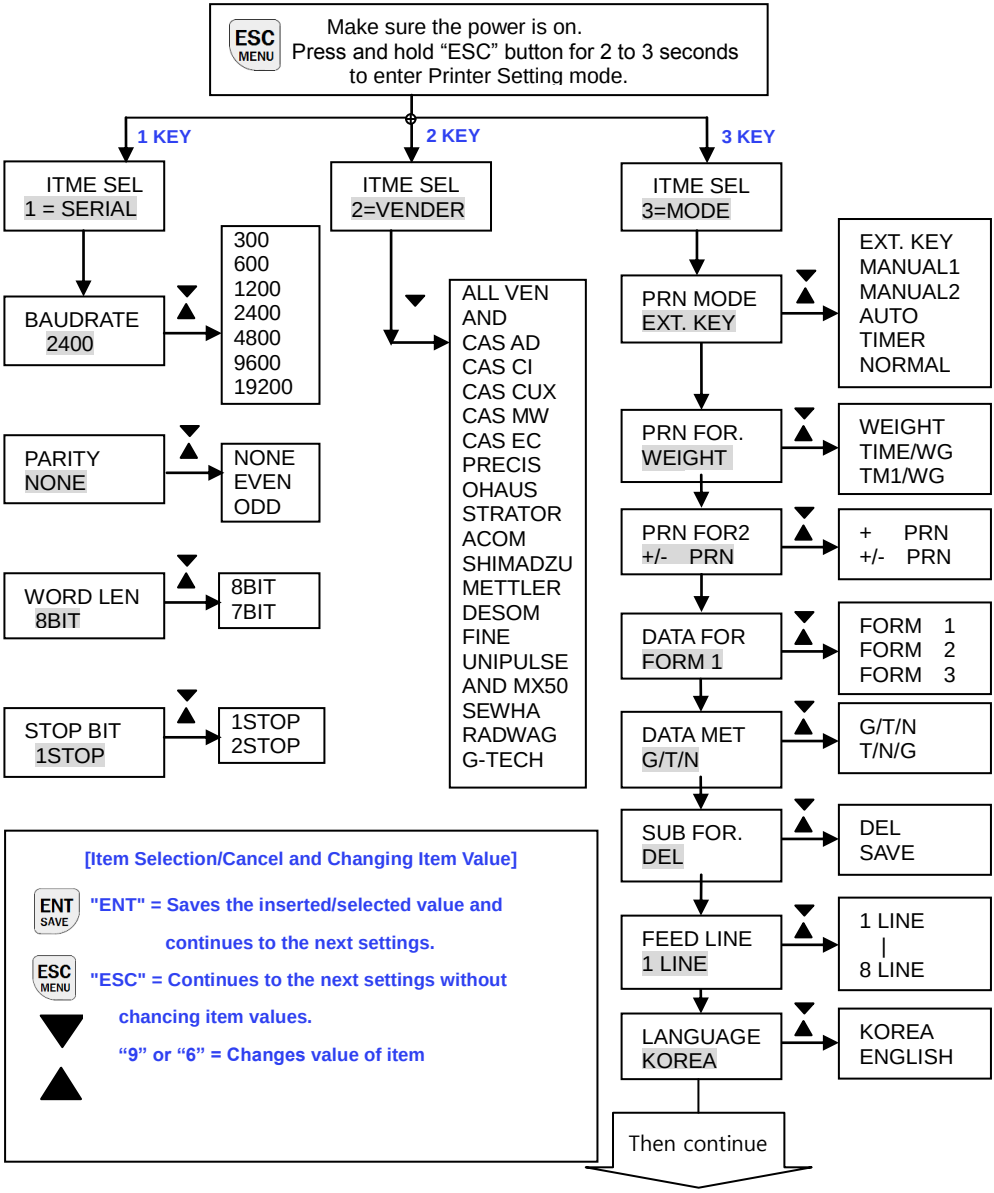
② press “▲”key and “▼”key to change the settings. “*” at the right end of the screen indicates the initial settings when the power was switched on.

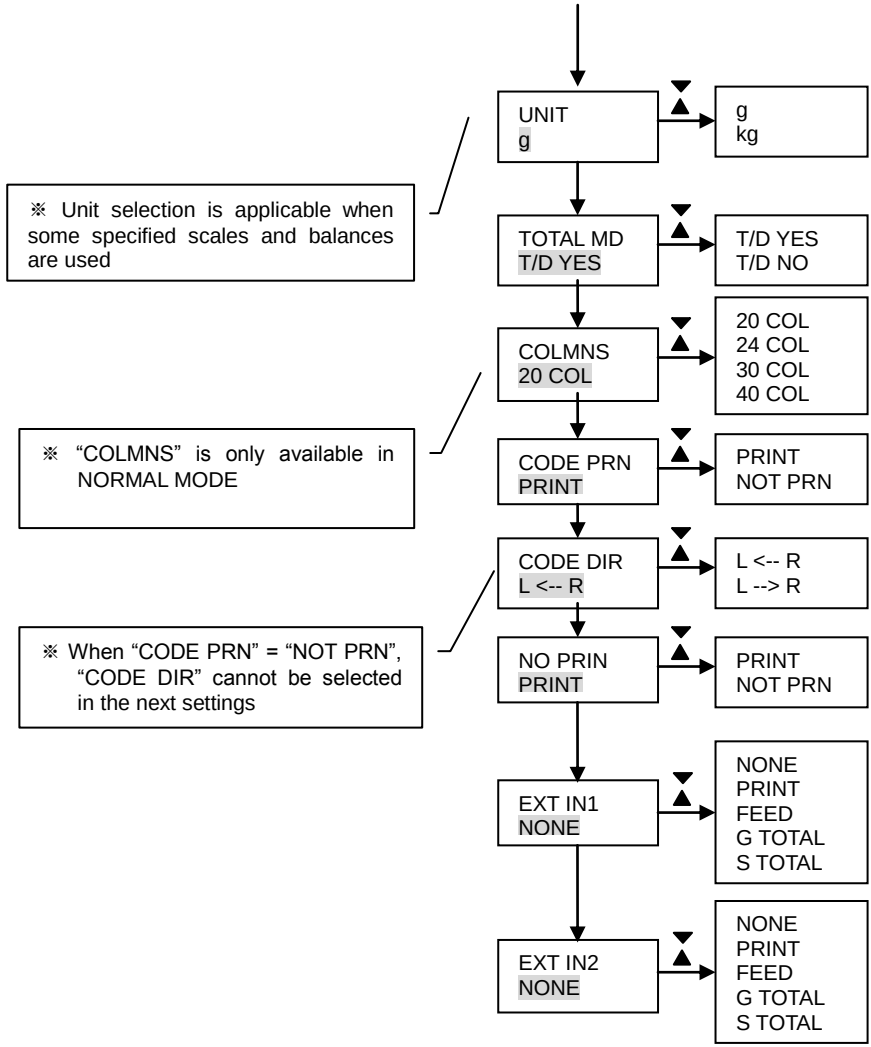
③ After the settings, press “ENT” to save or “ESC” to cancel and exit.

④ When the setting is completed, the printer automatically continues to the next setting menu.

⑤ When the printer setting is completed, turn off the power first and back on again for use.

■ Printer Settings Flow Chart




UNIT
g
g
kg
TOTAL MD
T/D YES
T/D YES
T/D NO
COLMNS
20 COL
20 COL
24 COL
30 COL
40 COL
CODE PRN
PRINT
PRINT
NOT PRN
CODE DIR
L <-- R
L <-- R
L --> R
NO PRIN
PRINT
PRINT
NOT PRN
EXT IN1
NONE
NONE
PRINT
FEED
G TOTAL
S TOTAL
EXT IN2
NONE
NONE
PRINT
FEED
G TOTAL
S TOTAL
※ Unit selection is applicable when some specified scales and balances are used
※ "COLMNS" is only available in NORMAL MODE
※ When "CODE PRN" = "NOT PRN", "CODE DIR" cannot be selected in the next settings

2-4 Detailed Printer Functions

2-4-1. Serial Communication

Item	Description
BAUDRATE	- Configures Baud rate - The second line on the screen displays optional “BAUDRATE” values, and “*” at the right end of the screen is the current printer setting value of Baud rate. - Optional values : 300/600/1200/2400/4800/9600/19200
PARITY	- Configures Parity. - The second line on the screen displays optinal “PARITY” values, and “*” at the right end of the screen is the initial current setting value of PARITY. - Optional values : NONE/EVEN/ODD
WORD LEN	- Configures Data Word Length The second line on the screen displays optional “WORD LEN” values, and “*” at the right end of the screen is the current printer setting value of WORD LEN. - Optional values : 8BIT/7BIT
STOP BIT	- Configures Stop Bit - The second line on the screen displays optional “STOP BIT” values, and “*” at the right end of the screen is the current printer setting value of “STOP BIT”. - Optional values : 1STOP/2STOP

2-4-2. Manufacturer Selection

Item	Description
VENDER	Selects the manufacturer of the scales/balances or indicators, etc. connected to the printer. - The second line on the screen displays a set of manufacturers, and “*” is the current printer setting value of VENDER. - Ensure the manufacturer of the scales/balances or indicators, etc. connected to the printer is selected correctly. If vender values do not match the manufacturers of the scales/balances or indicators, etc. connected to the printer, or the printer itself is unable to print, please select “ALL VEND”.

2-4-3. Printer Mode

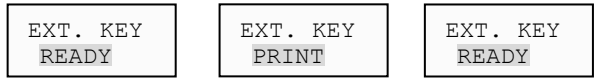
Item	Value	Description
PRN MODE (PRINT MODE)	EXT. KEY *	- Prints only when the print key on the electronic scales and balances is pressed by the user.
	MANUAL1	- Prints measured data only when "PRINT" key on the printer is pressed by the user. - Prints only when the displayed weight is stable.
	MANUAL 2	- Prints measured data only when "PRINT" key on the printer is pressed by the user. - Prints only when the displayed weight is either stable or unstable.
	AUTO	- Prints automatically when weights are loaded onto the scales and balances.
	TIMER	- Prints at a configured time interval. - Prints a selected time during the intervals.
	NORMAL	Prints data received from the scales and balances.
PRN FOR. (PRINT FORMAT)	WEIGHT *	Prints the number of measurements, and weight.
	TIME/WEIGHT	Prints the date/time, number of measurements and weight.
	TIME1/WEIGHT	Prints the date/time at the first measurement, then weight only afterwards.
PRN FOR2 (PRINT FORMAT2)	+ PRN *	Prints only when the data is "+"
	+/- PRN	Prints when the data is either "+" or "-"
DATA FORM	FORM 1 *	Prints measurement data in sequence, according to the number of measurements.
	FORM 2	Receives the measured data as "TARE" "NET" in sequence, then prints GROSS, TARE and NET in order .
	FORM 3	Prints Gross/TARE/NET by saving the "TARE" value in "7" key, and recognizing next measured data as "NET".
SUB FOR. (SUB FORMAT)	DEL *	Clears the saved data of weight and the number of measurements after printing subtotals. However, total data still remains.
	SAVE	Saves the data of weight and the number of measurements after printing subtotals and continues to accumulate values to the saved data.
FEED CON (FEED COUNT)	1 ~ 8 Default : 1	Feeds the printer paper for the user to read the printed contents. Optional values: 0 ~ 8
LANGUAGE	KOREA *	Prints in Korean
	ENGLISH	Prints in English
TOTAL MODE	T/D YES *	Prints the date and time when printing subtotals/totals.
	T/D NO	Does not print the date and time when printing subtotals/totals

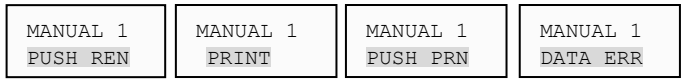
CODE PRINT	PRINT * NOT PRINT	Enables/Disables code printing.
CODE DIRECTION	L <--- R * L ---> R	Configures the code progress direction.
NO PRINTER	PRINT * NOT PRINT	Enables/Disables printing the number of measurements.
EXT IN1	NONE * PRINT FEED G TOTAL S TOTAL	Configures the functions when connected to EXT IN PORT1. When EXT IN PORT1 and GND are connected, relevant functions are operated. "PRINT" settings are only applicable in MANUAL 1/2.
EXT IN2	NONE * PRINT FEED G TOTAL S TOTAL	Configures the functions when connected to EXT IN PORT2. When EXT IN PORT2 and GND are connected, relevant functions are operated. "PRINT" settings are only applicable in MANUAL 1/2.
NORMAL COLUMN	20 COL. * 24 COL. 30 COL. 40 COL	It is performed only in NORMAL MODE from PRINTER MODE. Configures the column value (20/24/30/40).

"*" = Factory Settings.

2-4-4. Details of Printer Mode

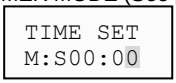
AD-720Di provides 5 Printing Modes as follows.

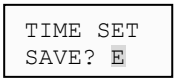
<table>
<tr><th>PRINT MODE</th><th>Description</th></tr>
<tr><td>EXT. KEY MODE</td><td>
● Prints only when “PRINT” key is pressed on the electronic scales and balances.
● "ERROR" is not displayed on the screen although the printer is connected to an electronic scale.
● Does not print by pressing “PRINT” key in this mode.
e.g.)


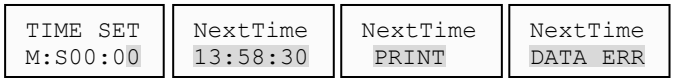
Before printing Printing After printing
</td></tr>
<tr><td>MANUAL MODE
1 / 2</td><td>
● Prints only when the user presses “PRINT” key on the printer.
● Manual mode provides 2 (1 or 2) modes. Manual_1 is available to print by print key when getting stable data and manual_2 is available to print when getting stable/unstable data.
● May be printed by an external input signal mode.
● If electronic scales/balances operate unusually for more than 6 seconds, “DATA ERR” is displayed on the screen and blinks the message. In this case, “PRINT” key does not work.
e.g.)


Before printing Printing After printing Data error
</td></tr>
<tr><td>AUTO MODE</td><td>
● Prints automatically when weight is loaded onto the scales/balances in use.
● In this mode, pressing “PRINT” key is unnecessary.
● In this mode, after printing data, the scales and balances must be reset to zero before measuring.
● If electronic scales/balances operate unusually for more than 6 seconds, “DATA ERR” is displayed on the screen and blinks the message. In this case, “PRINT” key does not work.
E.g.)


Before printing Printing After printing Data error
</td></tr>
</table>

<table>
<tr>
<td>TIMER MODE</td>
<td>
● Prints at a configured time interval.
● The interval time can be set within a range of 5 second to 1 hour.
● If electronic scales/balances operate unusually for more than 6 seconds, “DATA ERR” is displayed on the screen and blinks the message.
➢ Setting interval time
e.g.) Set the interval time to 30 seconds.
1) Enter TIMER MODE (See pg 13)


2) press buttons in the sequence of “3”,”0”(Second),”0”,”0”(Minute)
3) The screen displays as below:


To save, press "ENT" key.
- If numbers are pressed incorrectly, press “ESC” to clear the values and return to the initial setting screen.
e.g.)


Setting Screen Waiting Printing Data error
</td>
</tr>
<tr>
<td>NORMAL MODE</td>
<td>
● This mode is identical to AND’s GLP MODE(Good Laboratory Practice).
● In this mode, printing contents include the manufacturer, model name, model S/N, ID number, date, time and signature space in compliance with GLP. Calibration and calibration test include information of calibration weights and test results.
● ID numbers can be used for identifying electronic scales/balances during maintenance. .
e.g.)


Before Printing Printing After printing
</td>
</tr>
</table>

2-4-5. Printer Data Forms

Data can be printed in three different formats as below.

<table>
<tr><th>Format</th><th>Description</th></tr>
<tr><td>FORM 1</td><td>● This format allows users to print measured data in sequence.
Printing format e.g.)
[Measured Data Printing]
CODE : 00000001
2011-04-08 17:23:30
NO 001 40.40 g
2005-02-16 17:23:40
NO 002 90.78 g
[Total Printing]
==========
*****< TOTAL >*****
2011-04-08 17:25:50
CODE 00000001
NO 002
TOTAL 131.78 g
Average 65.39 g
MAX 90.78 g
MIN 40.40 g
RANGE 50.78 g
DEV. 25,389 g
C.V 0.388 %
==========</td></tr>
<tr><td>FORM 2</td><td>● Receives measured data as “TARE” and ”NET”, then prints GROSS, TARE, and NET in sequence.
● Saves the first measured data as ‘TARE’ value (not printed).
● Saves the second measured data as “NET” value and prints GROSS, TARE and NET in sequence.
● Saves the second measured data as “TARE” value (not printed).
● Saves the fourth measured data as “NET” value and prints GROSS, TARE and NET in sequence.
(in sequence? In order?..)
e.g.)</td></tr>
</table>

MANUAL 2 TARE RDY	: Ready to receive TARE value.
MANUAL 2 TARE RDY	: Press “0” key to save TARE data.
MANUAL 2 NET RDY	: Ready to receive NET value.
MANUAL 2 PRINT	: Print “0” key to save NET data and proceeds to printing

e.g.)

[Measured Data Printing]

```
SERIAL  : 001
CODE    : 00000001
GROSS   :       +36.450 kg
TARE    :        +1.300 kg
NET     :       +35.150 kg

SERIAL  : 002
CODE    : 00000001
GROSS   :       +58.600 kg
TARE    :        +1.300 kg
NET     :       +57.300 kg
```

[Total Printing]

```
= = = = = = = = = = = = = = = = =
  *****<   TOTAL   >*****
  2014-04-08          17:25:50
CODE              00000001
Weighing Count             002
  GROSS           +95.050 kg
    TARE           +2.6000 kg
     NET           +92.450 kg
Average           +47.450 kg
Max.              +58.600 kg
Min.              +36.450 kg
Range              22.150 kg
Standard Deviation   1.250 kg
Variation            2.629 %
= = = = = = = = = = = = = = = = =
```

※ Average, maximum and minimum are based on GROSS value for TOTAL printing.

FORM 3

- Press “ENT” key to save the tare value of the measured data. Prints Gross/TARE/NET by saving the “TARE” value in “ENT” key, and recognizing next measured data as “NET”.
- Press “ENT” key to save the first measured data (not printed).
- After, weighing data makes print by print key "0" key while realizing “NET”' value continuously.

```
MANUAL 2
PUSH PRN
```
: Ready to receive TARE value by pressing “ENT” key.

```
MANUAL 2
TARE SAV
```
: when TARE data is saved, “TARE SAV” is displayed for 2 seconds on the screen.

```
MANUAL 2
PUSH PRN
```
: Press “0” key to save the net data and print.

e.g.)

[Measured Data Printing]

```
SERIAL  : 001
CODE    : 00000001
GROSS   :      +36.450 kg
TARE    :       +1.300 kg
NET     :      +35.150 kg

SERIAL  : 002
CODE    : 00000001
GROSS   :      +58.600 kg
TARE    :       +1.300 kg
NET     :      +57.300 kg
```

[Total Printing]

```
= = = = = = = = = = = = = = = = =
  *****<  TORAL  >*****
  2014-04-08        17:25:50
CODE              00000001
Weighing Count         002
  GROSS          +95.050 kg
    TARE          +2.6000 kg
     NET          +92.450 kg
Average          +47.450 kg
Max.             +58.600 kg
Min.             +36.450 kg
Range             22.150 kg
Standard Devi.     1.25 kg
Variation (%)      2.629 %
= = = = = = = = = = = = = = = = =
```

※ Average, maximum and minimum are based on GROSS value for TOTAL printing.

3. Communication Interface

Connector = D-SUB 9 MALE

3-1 RS-232C Serial Pin

Pin No	Signal	Direction	Description
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	DTR	Output	● This signal indicates whether the printer can receive data or is not.
5	GND	-	Signal Ground

3-2 RS-485 Serial Pin (Optional)

Pin No	Signal	Direction	Description
6	RTX+	Input/ Output	Data send-receive.
7	RTX-	Input/ Output	Data send-receive.

3-3 Current Loop Pin

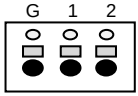
Pin No	Signal	Direction	Description
1	RXD	Input/ Output	Data send-receive.
5	GND	-	Signal Ground

3- 4 External Input Pin

- This signal allows users to print by the outer switch contact, when connected to serial interface.
- This function can be supported by external input port.
- Contact methods include Relay, Switch, and Photo-coupler.

3-4-1. Connecting External Input

Connector = USL-5HB2-3P



[External Connector Pin]

Pin No	Signal	Direction	Description
G	GND	-	Signal Ground
1	EXT IN 1	-	External input 1 .
2	EXT IN 2	-	External input 2

◆ Switch contacts e.g.)