Ver 4.0

MODEL : PDN-10

USER MANUAL

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1. Features

We are grateful to you for picking up our product. If you experience problems while using it, you may refer to the user manual or contact the Technical Support Department of the company.
This product is an indicator which amplifies micro voltage of various sensors and displays in digital form. It is normally used for measuring physical volume of loadcell, pressure sensor, LVDT and torque sensor that mostly use strain gauge.
It has the following features.

1-1. Sigma-Delta Conversion System

It has middle-high speed A/D conversion equipment that detects input signal from sensor 100 times per second.

1-2. Calibration System

It has calibration system by real-weight (Standard Test Weight) and Sensor output value.

1-3. Data Back-up and Watch-Dog Function

Default value such as Maximum and Minimum is memorized in Flash Memory. So it does not need to set up the input value again even though the power supply is cut. It has Watch-Dog function for the case of System Failure due to the power change and external noise.

1-4. Standard Built-in Product

1. Body
2. User's Manual
3. Sensor and Communication Connector

2. Cautions

For running this product's functions correctly and safe use, please carefully read and understand the following details before you use this product.

You must not use this product for any other purpose apart from the contents mentioned in this manual. Please do not attempt to try any altering on this product.

2-1. Set-up Caution

- Please avoid any place with water.
- Please locate this product in the place without vibration or impact and humidity with high temperature. For installation, please avoid a direct ray of light and dust. Do not let this product contact with air including ion or salt.
- Please do not use this product in the place with inflammable gas or steam or dust.
- Please use 4-wire shield cable for sensor cable. If you use cable too long, measuring error can be occurred due to the resistance of wiring.

2-2. Catuion for use

Please wait until it becomes stable to input idle condition and real-weight load during calibration. If you press Enter Key before it gets stable condition, calibration error might be occurred.

Please do not press any Key during using this product. (Refer to 6. Set up mode and 7. Calibration for function and specification of each key)

3. Specifications.

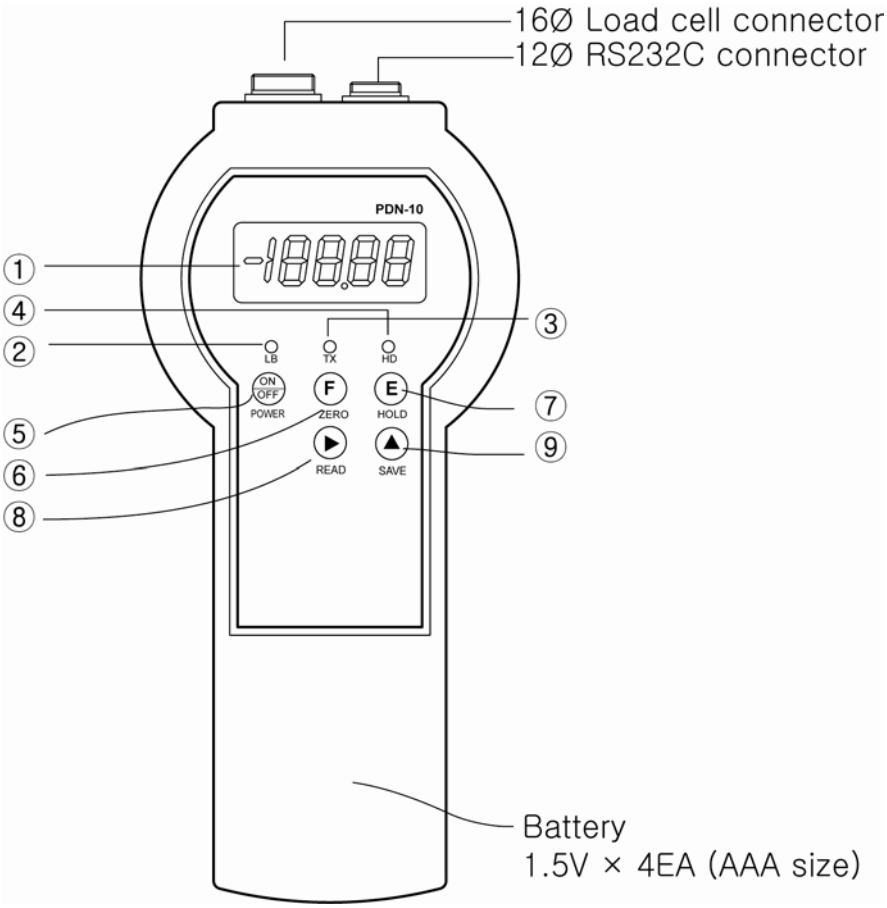
- Available sensor (DC)
  ① Micor Voltage Output Sensor (mV)
  ② Strain Gauge Type Sensor (Bridge 350Ω, 120Ω)

- Maximum Display
  - 19999 ~ +19999

- Display
  Load Display : 4 1/2 Digits LCD
  Status Display LED : Red LED (3)
  Key Switch : 5

4. Front Panel

4-1. Display Window on Front Panel



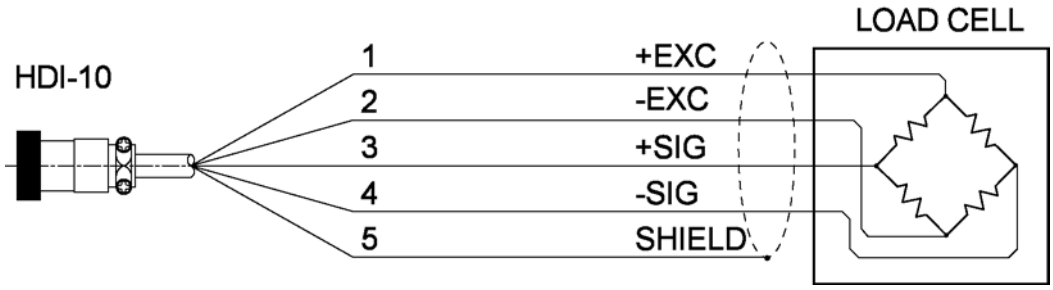
① Load Display
②,③,④,StatusDisplay LED
⑤ Power Switch On/Off
⑥ Function Key/ZERO Key
⑦ Enter Key / HOLD Key
⑧ Shift Key / READ Key
⑨ Up Key / SAVE Key

4-2. 표시창의 기능 설명

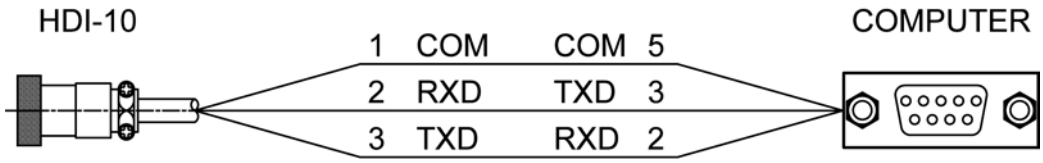
① Load Display LCD : Displays Load DATA or Set Point.
② LB Display LED : LED is lighted up when battery is Low battery.
③ TX Display LED : LED is lighted up when RS232C(Communication) is transfer .
④ HOLD 표시 LED : LED is lighted up when Load data is in HOLD mode.
⑤ ON/OFF key : Power on/off. (It stays on when power key is pressed for 3 seconds.)
⑥ F key : iThis key can be used to be out of Set-up mode (or to return to Measuring Mode) as ESC. Also, it can be used to set the display value as ZERO regardless of data value.
⑦ E key : It is used to set and save each set-up value as Enter key.
Also use HOLD/RESET KEY.
⑧ ▶ key : It is used to move action value of the flickered numbers when set up.
READ key function. Function that can confirm storing Data (A001 ~ A500).
⑨ ▲ key : Key for increasing 1 for action value of each number chosen.
SAVE key function. Sequentially save Data (A ~ A 500)

4-3. Connector Wiring Diagram

① LOAD CELL (5 pin connector 16Φ)



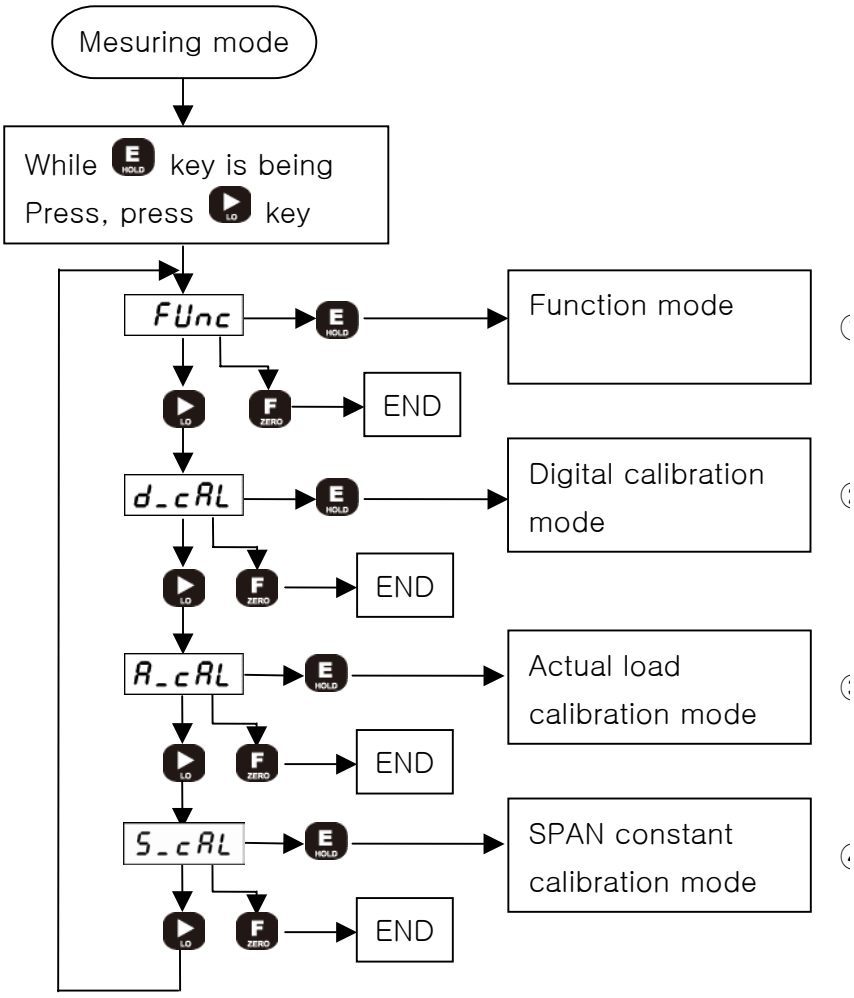
② Communication (RS232C) (4 pin Connector 12Φ)



5. SET UP

5-1. Types of Setting mode & Set-up

Setting mode에는 Function mode, Digital calibration mode, Actual load calibration mode, SPAN constant calibration mode로 4가지가 있습니다.



① Function mode
Acess to each function setup mode. Please refer 8-2 function mode.

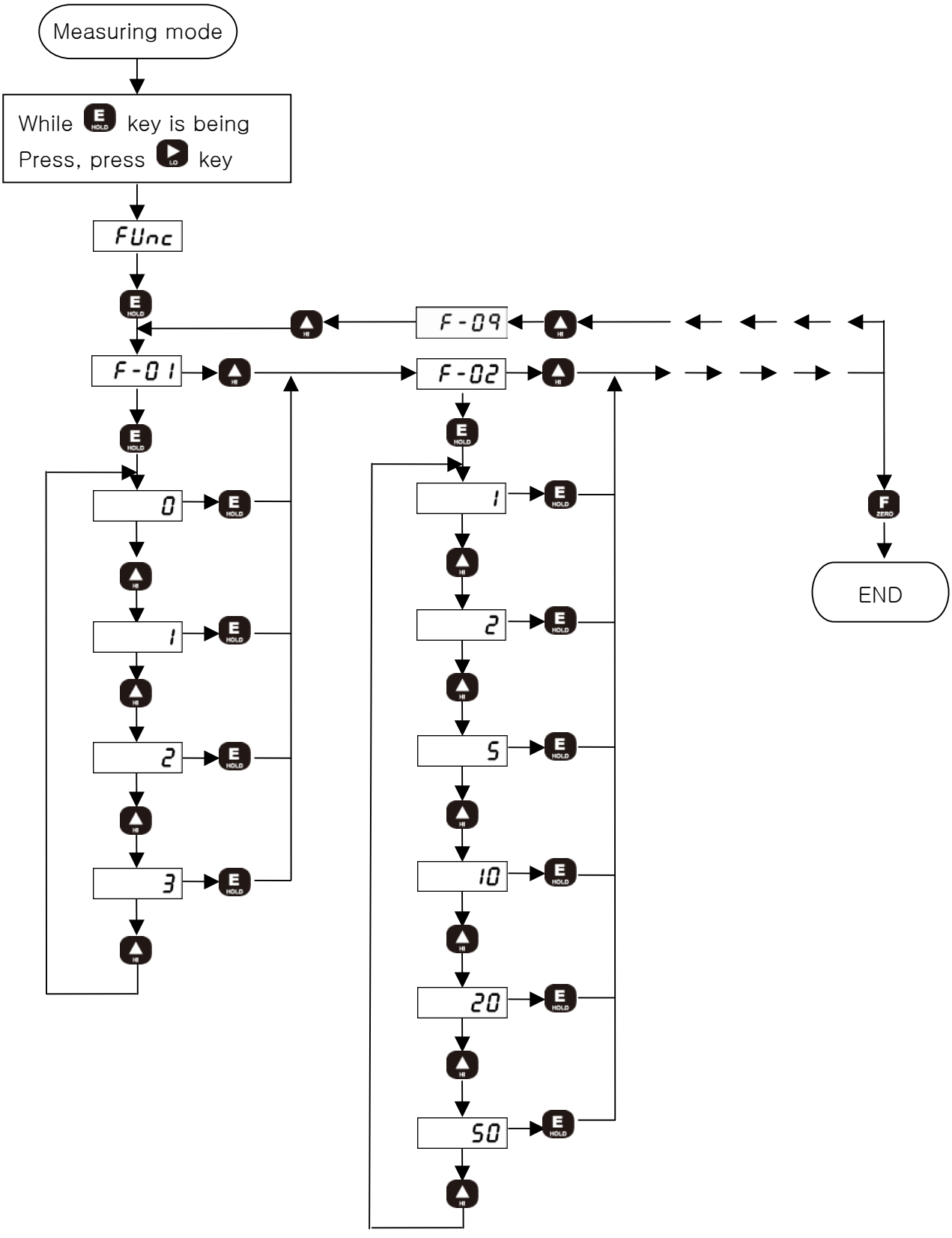
② Digital calibration mode
It is to calibrate into the sensor's output value. No need to prepare for the actual load (stand weight). Please refer 5-3 how to calibrate.

③ Actual load calibration mode
It is to calibrate by adding the actual load (standard weight or the load you know). Please refer 5-4 how to calibrate.

④ SPAN constant calibration mode
It is to calibrate with the S.CAL value written down for load calibration. Please refer 5-5 how to calibrate.

5-2. Function mode

1) How to set function.



Function mode list

Name	Function	Setting	The standard set-up value
F-01	Decimal point	0, 1, 2, 3	1
F-02	Division	1, 2, 5, 10, 20, 50	1
F-03	Display filter	4, 8, 16, 32	16
F-04	Hold mode	Sample hold, Peak hold, Absolute peak hold	Peak hold
F-09	ID Number	0 ~ 32	1
F-10	Baud rate & PRINT	4800, 9600, 19200, 38400	9600

F-01. Decimal point (Decimal point Set-up)

(Standard setup value: 1)

Display data	Setting	
0	00000	0
1	0000.0	1
2	000.00	2
3	00.000	3

F-02. Division (Minimum display unit setup)

(Standard setup value: 1)

Display data	Setting	
1	Displayed In 1	(0, 1, 2, 3, 4 …….)
2	Displayed in 2	(0, 2, 4, 6, 8 …….)
5	Displayed in 5	(0, 5, 10, 15 …….)
10	Displayed in 10	(0, 10, 20, 30 …….)
20	Displayed in 20	(0, 20, 40, 60 …….)
50	Displayed in 50	(0, 50, 100, 150 …….)

F-03. Display filter (Display speed setup)

(Standard setup value: 16)

Display data	Setting
0	No filter
4	Average time 1/8 sec
8	Average time 1/4 sec
16	Average time 1/2 sec
32	Average time 1 sec

F-04. Hold mode

(Standard setup value: 1)

Display data	Setting	
0	Sample Hold	: To hold the display value at the time of Hold signal input.
1	Peak Hold (+)	: To hold the maximum value of display values during Hold signal input.
2	Absolute Peak Hold(+/−)	: To hold the maximum absolute value of display values during Hold signal input.

F-09. ID Number (Communication Device Number setup)

(Standard setup value: 00)

Display data	Setting
00 ~ 32	00 : Device number is not set-up(Stream mode:always transmit data) 01 ~32 : Device number is set-up(Command mode:Transmit data by command)

F-10. Baud rate & Print (Communication Speed & Print Setup)

(Standard setup value : 9.60)

Display data	Setting	Stream mode	Command mode
4.80	4800 bps	O	O
9.60	9600 bps	O	O
19.20	19200 bps	O	O
38.40	38400 bps	O	O

5.3. Measuring DATA Saving and Transmitting.

1) DATA Saving

It is used to save the measured DATA.

The value displayed on LCD window will be saved.

Please press ▲ KEY to display SAvE on the display window and then the address to be saved will be displayed as in A001.

Please press E KEY to save DATA in the displayed address.

Please press F KEY to save and escape.

You can save from # A001 to A500.

2) DATA Search

Please press ▲ KEY and then rEAd -> A001 on display window.

And you can select address by using ▶ and ▲ KEY.

Please press E KEY in the selected address to display the saved DATA.

Please press F KEY to escape from DATA search Mode.

3) DATA Delete

Please press ▶ READ KEY와 ▲ SAVE KEY and then dEL -> no on display window.

Please press ▲ KEY to select. YES

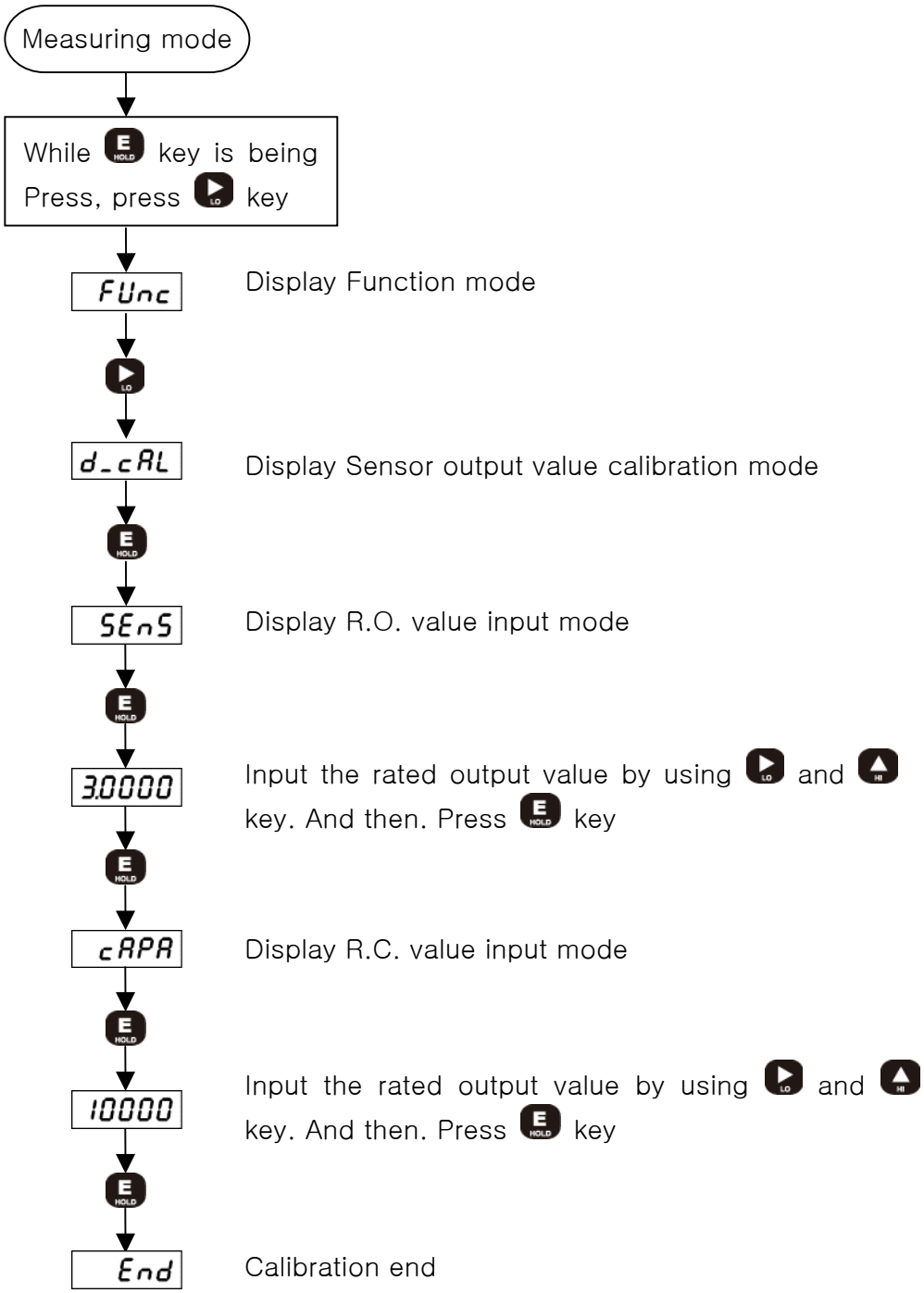
Please press E KEY to delete DATA.

(※ Note: All the saved DATA will be deleted.)

4) Please refer to p.20 SAVE DATA about DATA Transmitting.

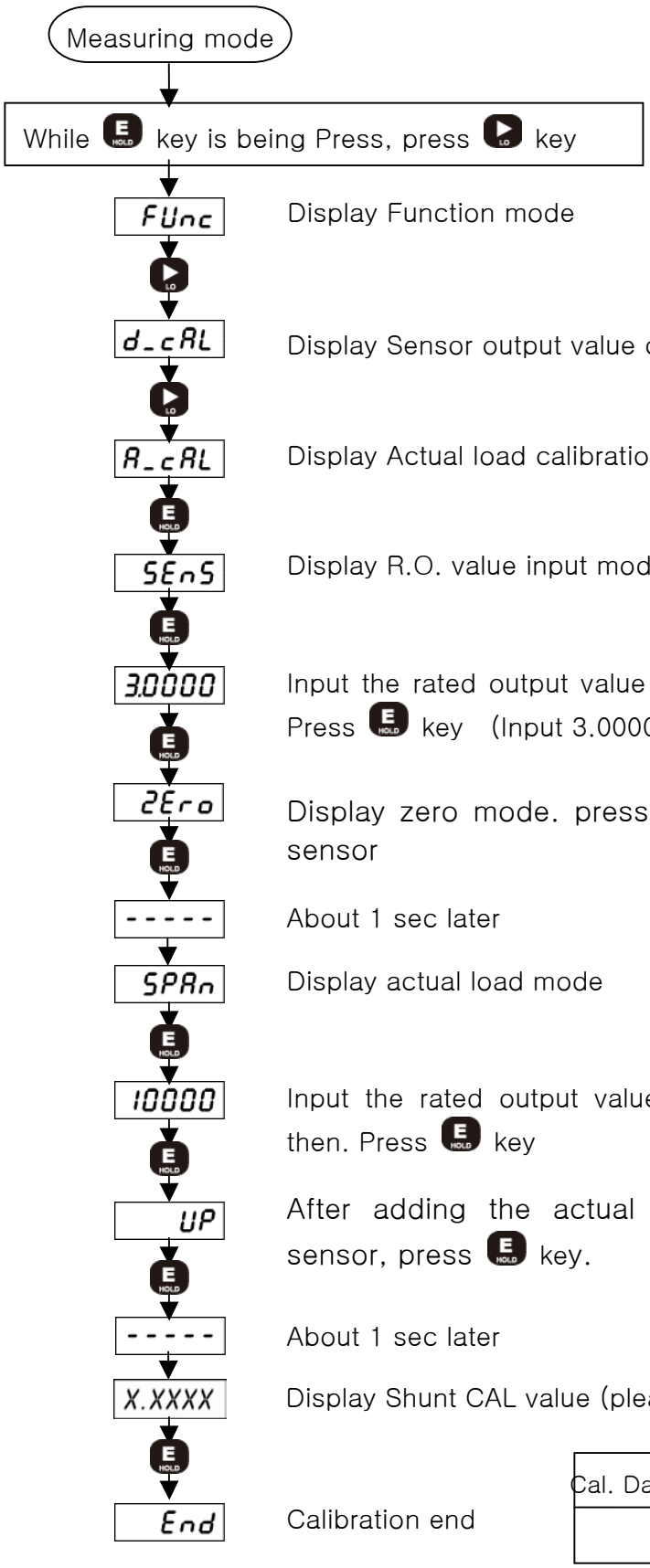
5-4. Digital calibration (Calibration by sensor output value)

At the time of purchasing sensor, the rated capacity (R.C) and rated output (R.O) declared on the calibration sheet can be used for the calibration for easier calibration.



5-5. Actual load calibration

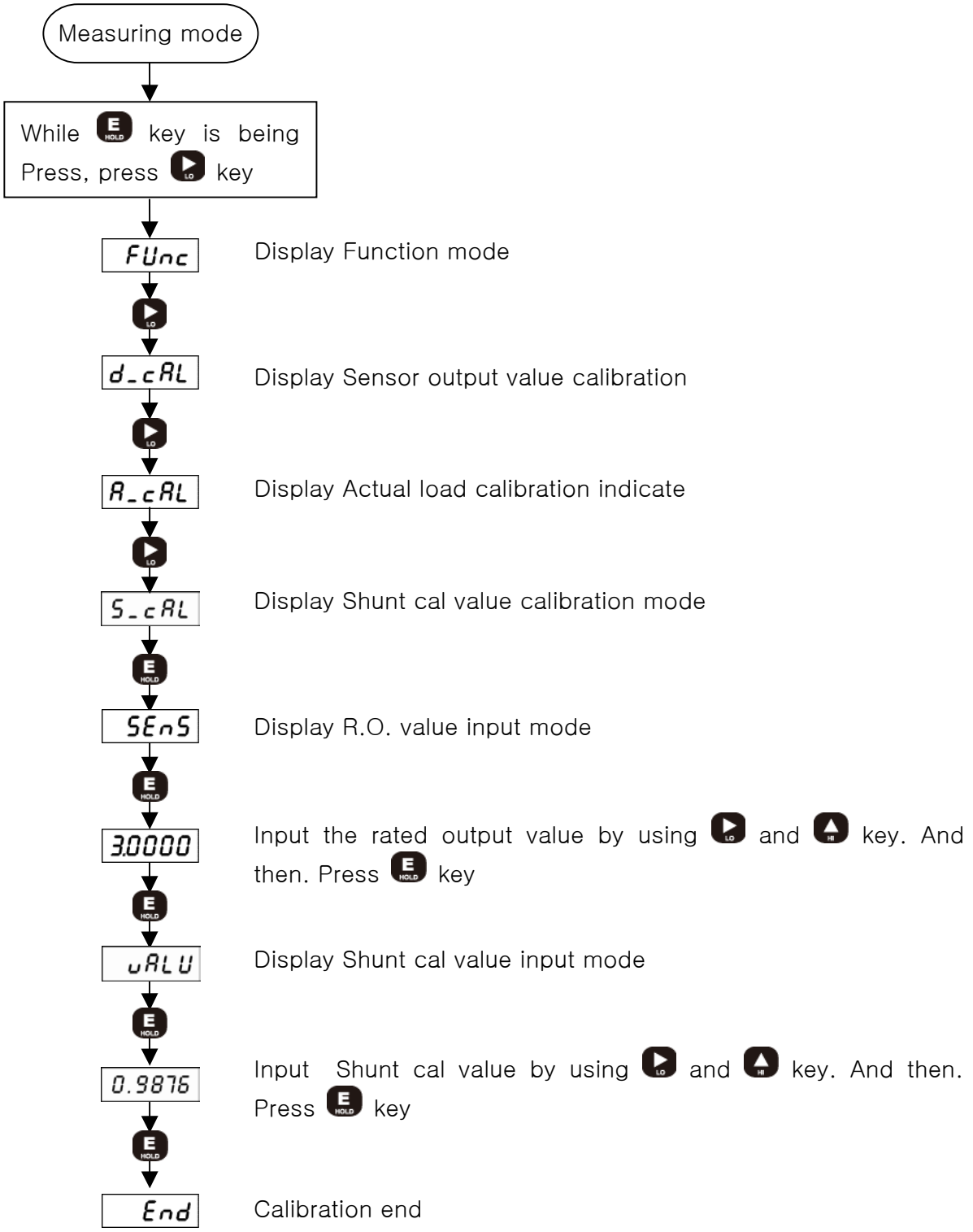
This is a calibration method by adding actual load on the sensor. Standard weight is needed.



Cal. Date	R.O. value	calibration constant vlaue

5-6. SPAN constant claibration

It is to calibrate with the S.CAL value written down for load calibration. You can calibrate without any standard weight.

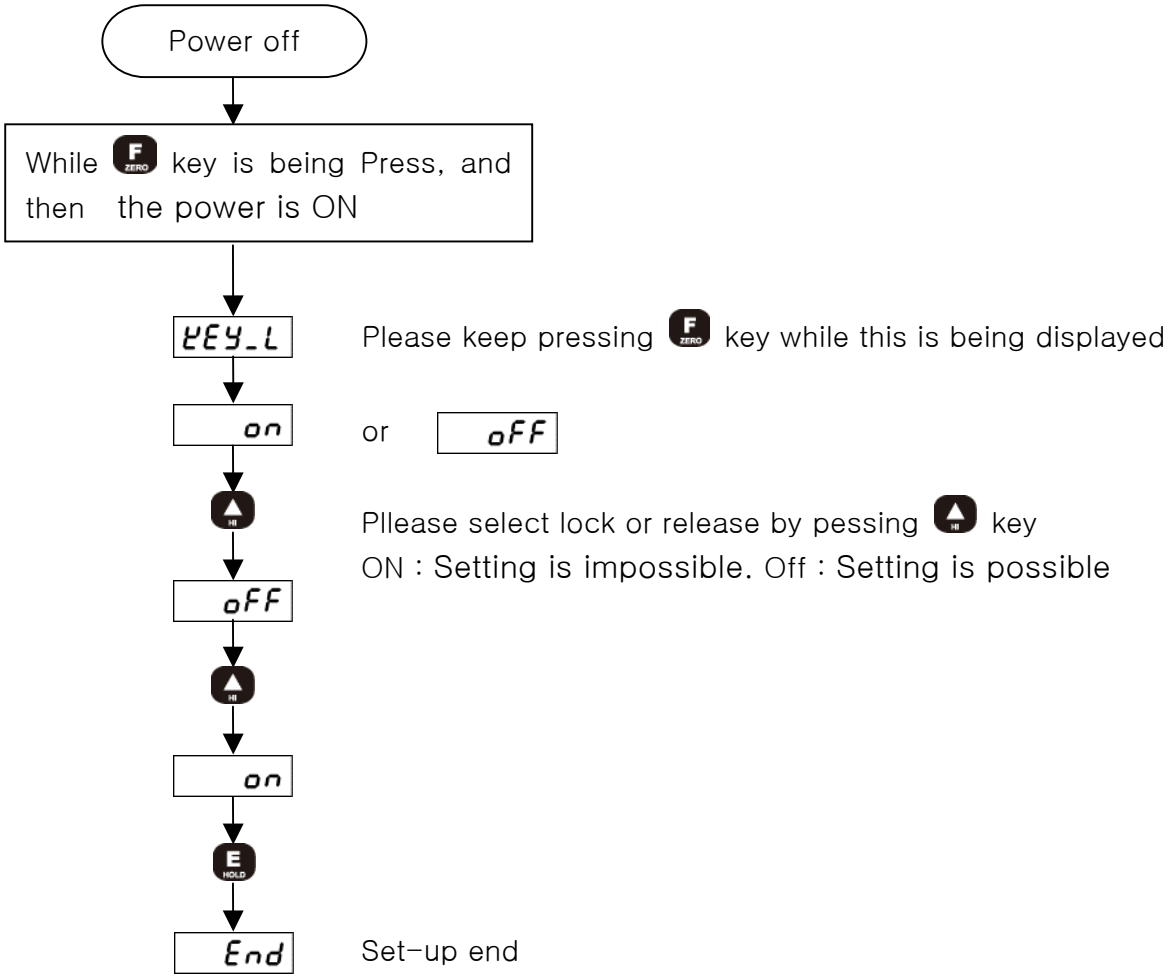


5-7 Lock Set-up

You can prevent any accidental operation due to the unnecessary key control by Lock set-up. After finishing calibration, it is recommended to set the Lock.

At the first stage, please start while the power is OFF.

Related Function when Lock is set : Function related to calibration

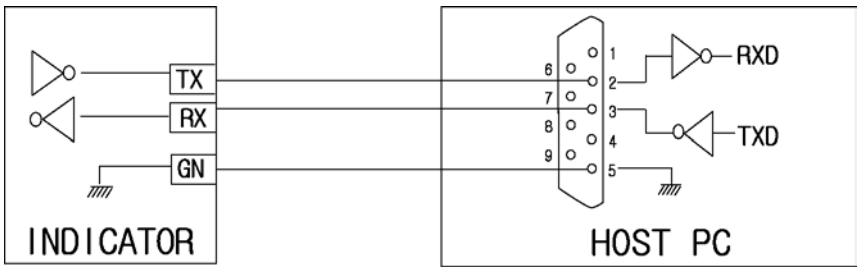


6. Product Inspection

Symptom	Cause	Action	Remark
When Display trembles.	Load cell is damaged. Load cell insulation resistance. Indirect occurrence	Load cell input, output. Check resistance Check load cell's insulation resistance.	Insulation resistance (Cable & Case > 1000 Mohm)
	Loadcell faulty	Check load cell's insulation resistance.	
	Loadcell connection is insufficient.	Check the wiring between load cell and the main device. Check the load cell's calbe's disconnection.	
When weight changes into (−).	Loadcell wiring is reversed.	Check load cell's ouput cable connection.	Output : (+SIG) (−SIG)
Displayed as "OVER" or "UNDER"	Load cell is damaged. Load cell connection is bad.	Check the load cell's condition and calbe connection.	

7. RS232C

Since RS232C Interface is very sensitive of electric noise. So please do the wiring from AC Power and electric wires separately. Also you must use the shield calbe always.



Indicator	Host PC
TX(Transmission Data)	RXD(Receive Datea), No.2 Pin
RX(Receive Datea)	TXD(Transmission Data), No.3 Pin
GN(Ground)	GND(Ground), 5 Pin

1. TYPE : EIA-232C
2. Method : Half-duplex, asynchronous method.
3. Baud-rate : Select one of 2400, 4800, 9600, 19200bps
4. Parity : No Parity
5. Data bit : 8 bit
6. Stop bit : 1bit

Stream mode (Ex. Data +1234.5 transmission)

CODE	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
ASCII	S	T	,	N	T	,	+	0
HEX	53H	54H	2CH	4EH	54H	2CH	2BH	30H

CODE	BYTE9	BYTE10	BYTE11	BYTE12	BYTE13	BYTE14	BYTE15	BYTE16
ASCII	1	2	3	4	.	5	CR	LF
HEX	31H	32H	33H	34H	2EH	35H	0DH	0AH

1) BYTE1, BYTE2
   . DATA Stable : S T . DATA Unstable : U S
   . DATA OVERFLOW: O L . DATA UNDERFLOW : U L
2) BYTE3 ~ BYTE6 : fixed character (, N T ,)
3) BYTE7 ~ BYTE14 : DATA 8 BYTE(including +/-)
4) BYTE15 : CARRIAGE RETURN
5) BYTE16 : LINE FEED

8. Command mode

Please set up the device No. referring to INDICATOR Manual.
(Can setup from 1 to 32 channel.)

1. Command form (PC -> INDICATOR)

CODE	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5
ASCII	I	D	0	1	P
HEX	49H	44H	30H	31H	50H

1) BYTE1, BYTE2 : Fixed character (ID)
2) BYTE3, BYTE4 : device number (1 ~ 32)
3) BYTE5 : command order (P, H, R, Z)

2. Command chart

Command		
ASCII	HEX	
P	50H	Transmit the current value of order equipment.
H	48H	Hold for order equipment.
R	52H	Release hold for order equipment.
Z	5AH	Operate the current value of order equipment as ZERO.

3. Transmission DATA form (INDICATOR -> PC)

CODE	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
ASCII	I	D	0	0	1	,	+	0
HEX	53H	54H	30H	30H	31H	2CH	2BH	30H

CODE	BYTE9	BYTE10	BYTE11	BYTE12	BYTE13	BYTE14	BYTE15	BYTE16
ASCII	1	2	3	4	.	5	CR	LF
HEX	31H	32H	33H	34H	2EH	35H	0DH	0AH

1) BYTE1, BYTE2 : Fixed character (ID)
2) BYTE3 ~ BYTE5 : Device number (1 ~ 32)
3) BYTE6 : Fixed character (,)
4) BYTE7~BYTE14 : DATA 8byte (including +/-)
5) BYTE15 : CARRIAGE RETURN

6) BY9. Save data Transfer (A001 ~A500)

1. Command Form (PC -> INDICATOR)

CODE	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5
ASCII	A	0	0	1	P
HEX	41H	30H	30H	31H	50H

1) BYTE1, BYTE2 : Fixed Charactor (A)
2) BYTE3, BYTE4 : Save Data (1 ~ 500)
3) BYTE5 : Command Order (P, D, U))

2. Command chart

Command		explanation
ASCII	HEX	
P	50H	Save Data A001 ~ ~500 data transfer
D	44H	Transfer till Save Data command
U	55H	Transfer since Save Data command

EX) A001P : AD001 ~ AD500
A005D : AD001 ~ AD005
A050U : AD050 ~ AD500

3. Transmission Data Form (INDICATOR -> PC)

CODE	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
ASCII	A	D	0	0	1	,	+	0
HEX	41H	54H	30H	30H	31H	2CH	2BH	30H

CODE	BYTE9	BYTE10	BYTE11	BYTE12	BYTE13	BYTE14	BYTE15	BYTE16
ASCII	1	2	3	4	.	5	CR	LF
HEX	31H	32H	33H	34H	2EH	35H	0DH	0AH

1) BYTE1, BYTE2 : Fixed Charactor (AD)
2) BYTE3 ~ BYTE5 : Save Data (1 ~ 500)
3) BYTE6 : Fixed Charactor (,)
4) BYTE7~BYTE14 : DATA 8byte ((Including +/-)
5) BYTE15 : CARRIAGE RETURN
6) BYTE16 : LINE FEED