

# Operating Instructions

## Digital display module for Pressure Transmitter

Type series

EDN.71X



### Contents

- 1. General information ..... 2
- 2. Safety
  - 2.1 Safety Symbols ..... 3
  - 2.2 User Qualifications ..... 3
  - 2.3 Safety Guidelines ..... 3
  - 2.4 Transportation and Storage ..... 3
- 3. Installation
  - 3.1 Installation Point and Environment ..... 4
  - 3.2 Type of sealing (Leak Prevention) ..... 4
  - 3.3 Electrical System Connection ..... 4
- 4. Designation and Dimensions
  - 4.1 Designation ..... 5
  - 4.2 Dimensions ..... 5
- 5. Installation and Commissioning
  - 5.1 Electrical connections ..... 6
  - 5.2 Electrical Wiring Diagram ..... 6
  - 5.3 Open the Display Cover ..... 7
  - 5.4 Display Screen Layout and Operation Buttons ..... 7
- 6. Display mode Settings
  - 6.1 Shortcut key Settings ..... 8
  - 6.2 Display settings ..... 8
  - 6.3 Relay settings ..... 9
  - 6.4 Communication Protocol Settings ..... 10
- 7. Ordering information ..... 14

## 1. General Information

- The installation and operating instructions for the pressure transmitter must refer to the ASME B40.1-1991 standard.

This manual contains only the abbreviated regulations and the points that should be emphasized regarding safety and installation.

- The instruments specified in this manual are designed and manufactured using the latest technology.
- The accident prevention regulations of the applicable region and the general safety regulations regarding the scope of use of the measuring instrument must be strictly adhered to. Furthermore, these operating instructions are part of the product and must always be kept near the equipment, readily accessible to qualified personnel at all times.
- The manufacturer shall not be liable for any claims or applications based on installation, operation, or device functioning contrary to the manufacturer's intended use.
- The pressure transmitter is used to measure pressure, and the measured pressure is output as an electrical signal.  
(e.g., output 4-20mA, 0-10V)
- The technical specifications and design of the pressure transmitter are subject to change.
- If problems occur during use, please contact us below.  
Dahotronic Co., Ltd. / Quality Control: 02-865-7001

## 2. Safety

### 2.1 Safety Symbols



Warning : Warning indicates a potentially hazardous situation that could result in serious injury or death if not avoided.



Caution: Caution indicates a potential hazardous situation that may cause minor injury or damage to property or the environment if not avoided.



Caution: Caution indicates a potential hazardous situation that may cause minor injury or damage to property or the environment if not avoided.

### 2.2 User Qualifications



Approved operators must be skilled personnel who, based on their experience and knowledge in technical training, measurement and control techniques, and national regulations, can perform relevant tasks and independently recognize potential hazards in accordance with current standards and guidelines.

### 2.3 Safety Guidelines



- When using hazardous fluids, all relevant laws and regulations must be strictly adhered to in addition to all standard specifications.
- In hazardous or dangerous areas, required protective equipment must be worn. Do not touch the pressure sensor section with hard or sharp objects.
- If the pressure transmitter causes bodily injury, damage to property or the environment, or if the issue cannot be resolved through appropriate measures, immediately cease operation of the pressure transmitter.
- If the pressure signal ceases, take measures to prevent accidental operation.

### 2.4 Transportation and Storage



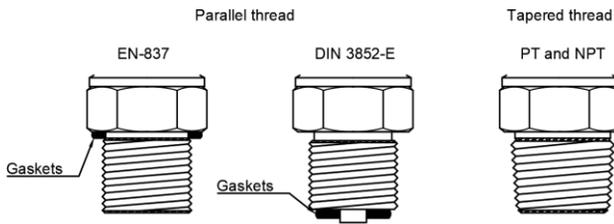
Damage may occur during transportation due to impact or unexpected external conditions. Please inspect the pressure transmitter before installation. Do not remove the packaging box until the pressure transmitter arrives at the installation site. Keep it securely packaged to prevent damage during transport.

## 3. Installation

### 3.1 Installation Point and Environment

- The sealing surface of the pressure transmitter must be clean and undamaged.
- A safe and adequate working space must be secured for electrical installation.
- The permissible ambient temperature and the temperature of the working fluid must remain within the performance limits of the pressure transmitter. Constraints on the ambient temperature range caused by the connected connectors must be strictly considered.

### 3.2 Type of Sealing (Leak Prevention)



- Parallel threads such as G1/2", G1/4", and G3/8" are sealed using flat gaskets or ED-rings.
- Tapered threads such as R1/2", R1/4", R3/8", NPT1/2", NPT3/8", and NPT1/4" are assembled after wrapping the threads with a material like PTFE Teflon tape.

## 3. Electrical System Connection

- For power supply specifications, refer to the label affixed to the body of the supplied pressure transmitter or the laser-marked specifications. Additionally, the power supply to the pressure transmitter must be provided through an energy-limited electrical circuit compliant with UL/EN/IEC 61010-1 Section 9.3, UL/EN/IEC 60950-1 Class 2 LPS, or UL1310/UL 1585 (NEC or CEC).
- Electrical connection requirements mandate that the cable diameter must match the cable bushing of the mating connector to prevent moisture ingress. The cable wires and seal of the connector to be connected must be correctly installed without damage.
- Cable terminals must be free of moisture. In enclosed spaces with high humidity, corrosion may occur on electrical pins, necessitating regular moisture removal and periodic product condition checks.
- The pressure transmitter must be shielded and grounded according to the factory's grounding design diagram.
- When installing in hazardous areas, use explosion-proof cable glands and connect cables that meet the specifications.



## 5. Installation and Commissioning

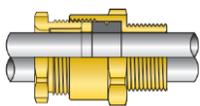
### 5.1 Electrical Connection

- Complete mechanical installation before making electrical connections to the device.
- All electrical connections must be established before supplying power.
- Use explosion-proof certified cable glands to connect cables to the terminal block at the cable gland entry point. Use explosion-proof certified cable glands to connect cables to the terminal block at the cable gland entry point.

Permissible load /  $R_L$

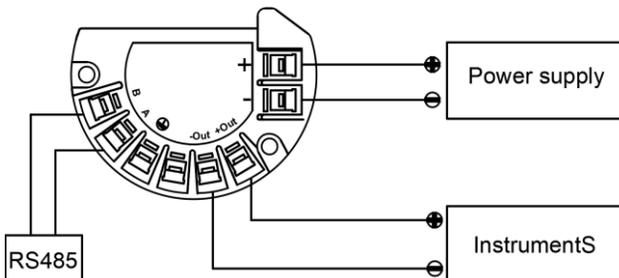
Current: 2-wire,  $R_L \text{ max} = [(V_s - V_s \text{ min}) / 0.02A] \Omega$

Voltage: 3-wire,  $R_L \text{ min} = 10k\Omega$

<p>M12 x 1.0 electrical plug</p> 	<p>Ingress Protection: IP67 Cable Size: AWG26 / 0.34mm Cable Diameter: 4mm...8mm</p>
<p>M16 x 1.0 Cable gland</p> 	<p>Ingress Protection: IP67 Explosion proof groups: IIA, IIB and IIC Cable Diameter: 3mm...6mm HEX: 22</p>

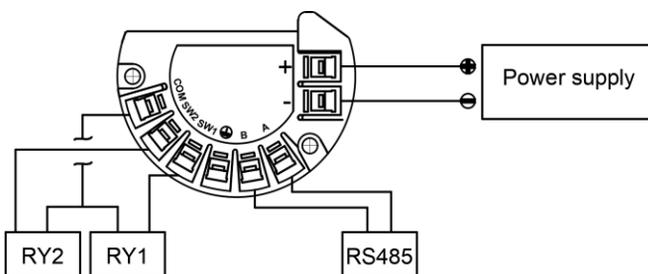
### 5.2 Electrical Wiring Diagram

#### ● Output signal diagram



Terminals	Wire
+	+Vcc
-	-Vcc
+Out	+ Signal
-Out	- Signal
A	RS485 A
B	RS485 B

#### ● Relay signal diagram

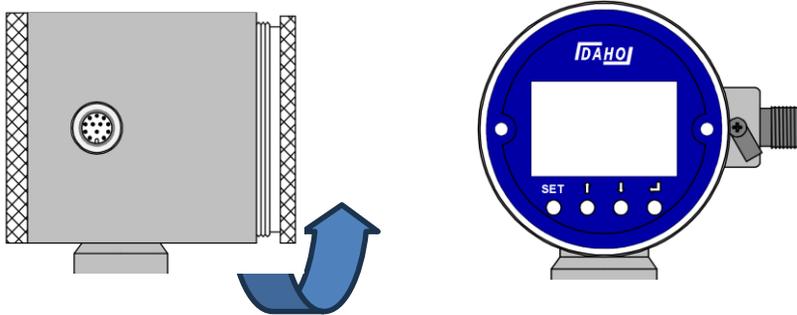


Pin No.	2-wire
+	+Vcc
-	-Vcc
A	RS 485A
B	RS 485B
SW1	Relay 1
SW2	Relay 2
COM	Relay COM

## 5. Installation and Commissioning

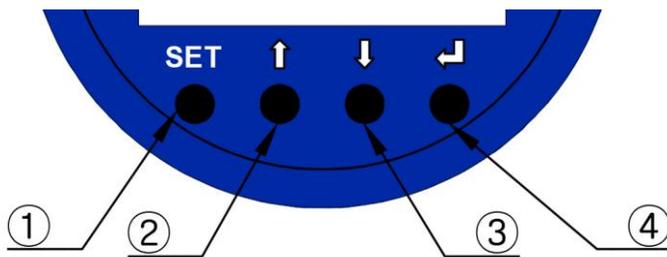
### 5.3 Opening the Display Cover

As shown in the photo below, turn the front cover to the left to remove it, allowing you to configure the display.

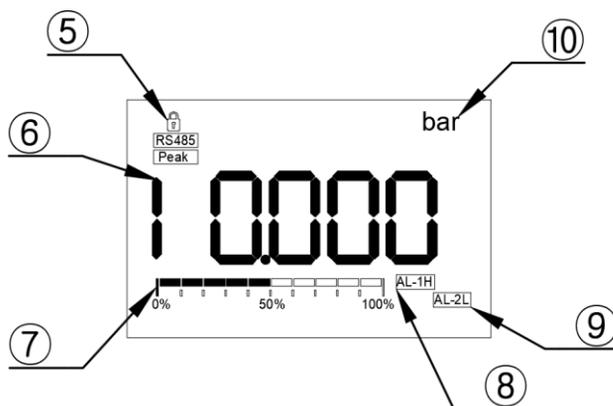


### 5.4 Display Screen Layout and Operation Buttons

The general functions of the buttons operate identically in all operating modes.



- ① Menu, Cancel
- ② Operation Button, Function Increase
- ③ Operation Button, Function Decrease
- ④ Set to Current Status, Set Current Function Valve



- ⑤ Lock Mode
- ⑥ Pressure value, Analog output signal value
- ⑦ Percentage graph of measurement range
- ⑧ Relay 1
- ⑨ Relay 2
- ⑩ Pressure Unit

## 6. Display Mode Settings

### 6.1 Shortcut Key Settings

	Maximum Value	Display the maximum value currently shown on the display. Press and hold the "↑" button for 3 seconds to set "Peak mode". Press "↓" button for 3 seconds in Peak mode to cancel.
	"Zero" Point Setting	Display the current pressure as a "0" value Press "↑"+"←" buttons simultaneously to set the current pressure value to "0"
	Lock Setting	When locked, menu settings and auto-zero settings are unavailable. Press and hold the ↑+↓ buttons for 3 seconds to lock the settings. Press and hold the ↑+↓ buttons for 3 seconds in Lock Settings to unlock.

### 6.2 Display Settings

Press and hold the "SET "+ "↓" button for 3 seconds to enter the settings menu.

	Light Settings	LED.At: Display light turns off after 10 seconds if no button is pressed. LED.0: Turns off the display light. LED.1 ~ 5: Sets the light brightness level from 1 to 5.
	Pressure Unit Settings	12 pressure unit settings: bar, mbar, MPa, kPa, psi, kgf/cm <sup>2</sup> , mmH <sub>2</sub> O, inH <sub>2</sub> O, mmHg, inHg, Torr, Atm
	Display Value Setting	On the main screen, select and set from four modes : mA, V, Pressure value and Pressure percentage(%) value.
	Cal Value setting	Ratio setting for full-scale value. Example: For a 10 bar pressure sensor with a Cal value of 0.5, 10 bar pressure displays as 5 bar, 5 bar pressure displays as 2.5 bar
	Scale setting	When the full-scale value is entered into the pressure sensor, the analog output and bar graph are automatically configured.
	Resolution Setting	Set the number of decimal places to display.
	Span Value Setting	The span value can be adjusted within a 30% range of full scale. When adjusting the span value, the analog display value, bar graph, and pressure display value are automatically set.
	Display value setting	u.4-20 : All pressure display values show as "0" below 4mA. b.4-20: At ≤4mA, the pressure display value shows a "- pressure value". u.0-10: At ≤ 0V, the pressure display shows "0" b.0-10: At ≤ 0V, the pressure display value shows a "- pressure value".

## 6. Display Mode Settings

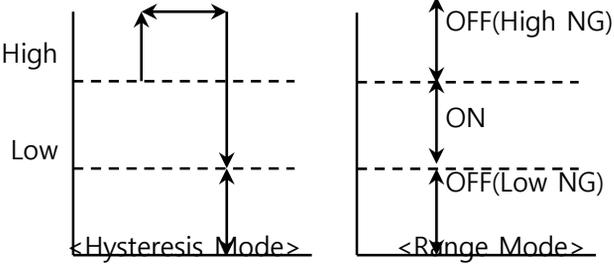
dA-H	Analog Output Maximum Value Setting	Display setting for maximum analog output value on screen -19999...99999 Input
dA-Lo	Analog Output Minimum Value Setting	Display analog output minimum value setting -19999...99999 Input
dASPD	Analog Output Speed Setting	disP: Analog output of the value displayed on the screen FASt: Analog output speed of 250 times per second
oFSEt	Display Value offset Setting	Set when you want to display a value with an offset. Enter -19999...99999 Example: Setting the offset value to 5 will display 15 bar when the pressure is 10 bar.
StEP	Display Value STEP Setting	Display data conversion value setting. Set from 1 to 255 Example: When set to 2, increasing pressure from 10.00 bar causes the last digit of the displayed value to appear as 10.02, 10.04, 10.06, 10.08, 11.00.
dISPr	Display Value Speed	Set the display value speed. Dr-1, Dr-2, dr-5, dr-10, dr-25, dr-50
bAudr	Baud Rate Setting	Set the baud rate when using the communication function.9600 bps, 19200 bps, 38400 bps, 87600 bps, 115200 bps
idSEt	Communication ID Setting	Addresses can be specified from 1 to 255.
rECAL	통신모드 설정	rC.On: A mode that responds when a request signal is sent. rC.Off: A mode in which data is continuously output at fixed time intervals. When rC.Off is set, configure the interval time in the <b>intnA</b> settings window.

### 6.3 Relay Settings

Press and hold the "SET" button for 3 seconds to enter the Relay settings menu.

r1rEF	Relay 1 Alarm Value	Relay 1 Value Input-19999...99999
r2rEF	Relay 2 Alarm Value	Relay 2 Value Input-19999...99999
rYAbS	Relay Absolute Value Mode Setting	ry1.on: Relay1 absolute value mode setting regardless of polarity ry1.off: Relay1 polarity indication y2.on: Relay2 absolute value mode mode setting regardless of polarity ry2.off: Relay2 polarity indicatio

## 6. Display Mode Settings

rYHnr	Relay Mode Settings	<p>nor: Set to Normal Mode Set to initial Normal Mode</p> <p>rng: Set to Range Mode ON within the set value range</p> <p>HYS: Set to Hysteresis Mode ON</p> 
rYon	Relay High/Low Mode Settings	<p>1.L.on: ON when below Relay 1 setpoint</p> <p>1.H.on: ON when at or above Relay 1 setpoint</p> <p>2.L.on: ON when below Relay 2 setpoint</p> <p>2.H.on: ON when at or above Relay 2 setpoint</p>
rYSPd	Relay Operation Speed Setting	<p>disP: Output based on the speed displayed on the screen</p> <p>FAST: Output at 15 times per second</p>

## 6.4 Communication Protocol Settings

### 6.4.1 Protocol A

#### 1. Current Value Request / PC → Pressure Transmitter, Sensor Data Request (( rR)

ID	Code
r	R
0x01	0x52

- ID and channel are represented as hex values 0x00...0xFF (0...255)
- When requesting the current value, Data is Index(00)

#### 2. Current Value Transmission / Pressure Transmitter → PC, Sensor Data Response( r r+010.64 L )

STX	ID	DATA							ETX
r	r	+	0	1	0	.	6	4	L
0X02	0x01	0x2B	0x30	0x31	0x30	0x2E	0x36	0x34	0x03

- r : Packet Start (Fixed Data)
- r : ID 1 (0 ~ 255 represented as Hex code 0x00 ~ 0xFF)
- DATA : +010.64
- L : Packet End (Fixed Data)

## 6. Display Mode Settings

### 6.4.2 Protocol D

#### 1. Communication Protocol

STX	ID		length		CODE	Channel		Data	CheckSum		ETX
1	2	3	4	5	6	7	8	9~n	n+1	n+2	n+3

Category	Length	내 용
STX	1	Text Start
ID	2	Output Device ID [ 00...FF: ID represented as HEX values 0x00 to 0xFF ]
Length	2	Data length: data (variable) End
CODE	1	Command codes [ R, D, T ]
Channel	2	Device Channel (01) Fixed Value
Data	Variable	Data [Index + Data Value]
CheckSum	2	CheckSum [ CheckSum value from ID to the end of Data ]
ETX	1	End of text

Data consists of an index and an actual value for each item, where the index (2 bytes) is composed of either 8 bytes or 2 bytes of data.

R: Request current value. [PC -> Pressure Transmitter]  
 D: Transmit current value. [Pressure Transmitter -> PC]

#### 2. Current Value Request / PC → Pressure Transmitter, Sensor Data Request ( ㄱ 0102R0100D6 ㄴ )

STX	ID		Length		CODE	Channel		Data		CheckSum		ETX
ㄱ	0	1	0	2	R	0	1	0	0	D	6	ㄴ
0X02	0x30	0x31	0x30	0x32	0x52	0x30	0x31	0x30	0x30	0x44	0x36	0x03

ㄱ : Packet Start (Fixed Value)  
 ID : 01 [Pressure Transmitter ID 0(0x0) ~ 255 ( 0 x FF ) ]  
 Length : DATA Length 02 (Fixed Value)  
 Data : 00 (Fixed Value)  
 CheckSum : D6  
 ㄴ : Packet End (Fixed Value)

CheckSum Calculation:  
 $0 (0x30) + 1 (0x31) + 0 (0x30) + 2 (0x32) + R (0x52) + 0 (0x30) + 1 (0x31) + 0 (0x30) + 0 (0x30)$

## 6. Display Mode Settings

### 3. Current Value Transmission / Pressure Transmitter -> PC Sensor value +0010.64 ( 010ED0100 + 0010.64010222 )

STX	ID		Length		CODE	Channel	
01	0	1	0	E	D	0	1
0X02	0x30	0x31	0x30	0x45	0x44	0x30	0x31

DATA														CheckSum		ETX
Index		Pressure Transmitter Data								Hold / Peak		Relay				
0	0	+	0	0	1	0	.	6	4	0	1	0	2	2	2	01
0x30	0x30	0x2B	0x30	0x30	0x31	0x30	0x2E	0x36	0x34	0x30	0x31	0x30	0x32	0x32	0x32	0x03

01 : Packet Start (Fixed Value)  
 ID : 01 [ Pressure Transmitter ID 0(0x0) ~ 255 ( 0 x FF ) ]  
 Length : 0E [ Data length is 0xE=14, Index(2)+DATA(8)+Hold/Peak(2)+Relay(2)] Fixed value  
 Data : +0010.64  
 Hold : 0 ( OFF )  
 Peak : 1 ( ON )  
 Relay : Relay1 Off ( 0x0 ) + Relay2 ON ( 0x2 ) = 02  
 CheckSum : 22  
 01 : Packet End (Fixed Value)

Checksum calculation:

$0 (0x30) + 1 (0x31) + 0 (0x30) + E (0x45) + D (0x44) + 0 (0x30) + 1 (0x31) +$   
 $DATA( 0x2A7) = 0x422 / \text{Only the lower 1 byte (0x22) is subject to checksum}$

### 4. Hold, Peak, Zero / PC -> Pressure Transmitter

STX	ID		Length		Code	Channel		INDEX		On / Off		CheckSum		ETX
01	0	1	0	4	T	0	1	1	1	0	1	3	D	01
0x02	0x30	0x31	0x30	0x34	0x54	0x30	0x31	0x31	0x31	0x30	0x31	0x33	0x44	0x03

01 : Packet Start (Fixed Value)  
 ID : 01 [Pressure Transmitter ID 0(0x0) ~ 255 ( 0 x FF ) ]  
 Length : Data Length 04 (Fixed Value )  
 T : External Input Code (Fixed Value)  
 Channel : 01 ( Fixed Value )  
 Data : External Input [ hold(11), Peak(12), Zero(13) + On(01) / Off(00) ]  
 CheckSum : 3D  
 01 : Packet End (Fixed Value)

Checksum Calculation :

$0 (0x30) + 1 (0x31) + 0 (0x30) + 4 (0x45) + T (0x54) + 0 (0x30) + 1 (0x31) + 1 (0x31) +$   
 $0 (0x30) + 1 (0x31) = 0x23D / \text{Only the lower 1 byte (0x3D) is subject to the checksum}$

## 7. Order Information

Model Code EDN.71 . . . . . B . . . . .

Main model	
0	Thread connection
3	Sanitary diaphragm
4	For homogenizer application Homogenizer diaphragm
5	a/w MDB Diaphragm with threaded connection
6	a/w MDF Diaphragm with flange connection
7	a/w MDI Diaphragm with two-stage flange connection

Output signal	
O1	4...20 mA / 2-wire system
O2	0...10 V / 3-wire system
O3	0...5 V / 3-wire system
O4	1...5 V / 3-wire system
O5	0.5...4.5 V / 5V ratiometric
O6	0.5...4.5 V / 12...30V

Electrical connection	
FP	Flameproof connecting cable gland
M	M12 connector

Option	
2S	2 switches, relays

Process connection	
G2	G 1/2"(PF 1/2")
G3	G 3/8"(PF 3/8")
G4	G 1/4"(PF 1/4")
R2	R 1/2"(PT 1/2")
R3	R 3/8"(PT 3/8")
R4	R 1/4"(PT 1/4")
N2	NPT 1/2"
N4	NPT 1/4"

Option code	
ACxx	Accessories
PCDxx	St. steel Adapter
PAA	Absolute pressure range
DMCC	DAHO manufacturing calibration card
KC	KOLAS calibration certificate

Accuracy	
A4	≤ 0.5 % F.S
A5	≤ 0.35 % F.S
A6	≤ 0.3 % F.S
A7	≤ 0.25 % F.S
A8	≤ 0.15 % F.S
A9	≤ 0.1 % F.S

Pressure range code, unit bar			
R19	-1...0	R40	0...50
R23	0...1	R41	0...60
R24	0...1.2	R42	0...70
R25	0...1.5	R43	0...100
R26	0...1.6	R44	0...150
R27	0...2	R45	0...160
R28	0...2.5	R46	0...200
R29	0...3	R47	0...250
R30	0...4	R48	0...300
R31	0...5	R49	0...350
R32	0...6	R50	0...400
R33	0...10	R51	0...450
R34	0...15	R52	0...500
R35	0...16	R53	0...600
R36	0...20	R54	0...700
R37	0...25	R55	0...1000
R38	0...35	RYY	Others in request
R39	0...40		



DAHO Tronic Limited

 90, Gyeongin-ro 53-gil, Guro-gu,  
Seoul  
STX W-Tower 209 (08215)

 Tel: 02-865-7001  
Fax: 02-865-7109  
mail: [info@daho.co.kr](mailto:info@daho.co.kr)  
www.daho.co.kr