AD-4411-BCD/485/232/DAC

Weighing Indicator

Simplified Instruction Manual

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A&D Company, Ltd.

1WMPD4005537

Detailed instruction manual

This manual provides simplified precautions and operating instructions for AD-4411-BCD/485/232/DAC. For further information about the AD-4411-BCD/485/232/DAC, please refer to the “AD-4411-BCD/485/232/DAC Instruction Manual” which is available for download from the A&D website (https://www.aandd.jp).

Introduction

The AD-4411-BCD/485/232/DAC is a weighing indicator that can convert signals from strain gauge load cells to weighing values and outputs them as BCD output, RS-485, RS-232C, and analog 4-20mA/0-10V output, respectively. It contributes to an efficient system by connecting weighing instruments to industrial control systems in plants and factories.

- 7-segment green LED display with a character height of 10mm and display resolution of ±999999.
- High-speed AD conversion of 1200 times/second and digital filter enable high speed and accuracy weighing.
- DIN96x48 panel mount type with IP65 protection on the front panel.
- PC can update the settings via USB port.

Safety precaution

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
Read the following precautions carefully before using the indicator for safe and correct usage.

⚠ WARNING

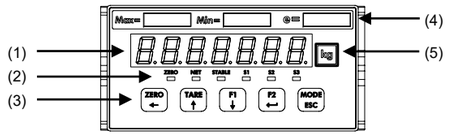
- Provide an external safety circuit to the indicator so that the safety of the whole system can be secured even if errors occur in the external power supply or the indicator.
- This indicator must be used indoors. Do not use the indicator in the following environment:
  -where the temperature and the humidity exceed the specifications
  -where corrosive gases or flammable gases exist
  -where the indicator gets wet with oil, chemicals, or water
  -where the indicator is exposed to direct sunlight
- Turn off all the external power supplies used in the system before installing or removing the indicator.
- Turn off all the external power supplies used in the system before wiring.
- Be sure to ground the indicator.

⚠ CAUTION

- Do not clamp control wires or communication cables with power lines, or do not place them close to power lines.
- Place the load cell cable sufficiently away from high frequency circuits such as high voltage power lines and inverter load circuit.
- When the front cover has dirt, wipe them with wet soft cloth. Do not use organic solvent such like benzine, thinner and alcohol. Doing so may result in deformation or discoloration of the unit.
- Suitable for use at pollution degree of 2 or less.
- Use within an altitude of 0 to 2000m
- This equipment shall be supplied from a 24V dc power source that meets the limited energy circuit requirements or LPS or NEC/CEC Class 2 (US/Canada), isolated from mains by reinforced or double insulation.

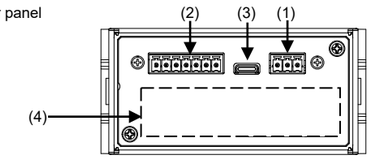
Part names

Front panel



No.	Name	Description
(1)	Main display	Displays measured value or various settings.
(2)	ZERO status	The LED is ON when the measured value is within 1/4 the minimum division.
	NET status	The LED is ON when the net value is displayed.
	STABLE status	The LED is ON when the measured value is stable.
	S1 / S2 / S3 status	The LED is ON when the S1 / S2 / S3 status ON condition (FncF07 / 08 / 09) is met.
(3)	[ZERO/←] key	Zeros the gross value. Moves the flashing digit to the left when not in measurement mode.
	[TARE/↑] key	Performs tare. Increases the flashing digit by one when not in measurement mode.
	[F1/↓] key	Performs the function set for the F1 key function (FncF05). Decreases the flashing digit by one when not in measurement mode.
	[F2/↵] key	Performs the function set for the F2 key function (FncF06). Updates the setting value entered when not in measurement mode.
	[MODE/ESC] key	Changes the operation mode. Cancels the setting value entered when not in measurement mode.
(4)	Capacity label	Attach the included capacity label, if necessary.
(5)	Unit label	Attach the included unit label, if necessary.

Rear panel



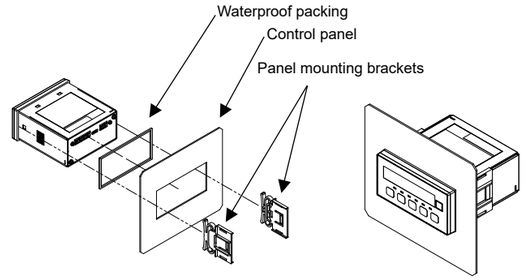
No.	Name	Description
(1)	DC power input terminals	Terminals for connection of a DC24V power supply.
(2)	Load cell input terminals	Terminals for connection of load cells.
(3)	USB connector	Connector for the connection to the configuration PC. (Type-C)
(4)	Interface connector	Connector for BCD Output. (AD-4411-BCD)
		Connector for RS-485 and Switch for termination resistor of RS-485. (AD-4411-485)
		Connector for RS-232C. (AD-4411-232)
		Connector for Analog Output. (AD-4411-DAC)

Accessories

Name		A&D Part Number	Qty.
Common accessories			
Waterproof packing		1064053659A	1
Panel mount bracket		1073035116A	2
Capacity label		1084054808	1
Unit label		1084023456A	1
Power connector		1JIMC1.5/3-ST	1
Load cell connector		1JIMC1.5/7-ST	1
AD-4411-BCD accessories			
Connector for the BCD output	Connector	1JI361J040-AG	1
	Connector cover	1JI360C040-B	1
AD-4411-485 accessories			
RS-485 connector		1JIMC1.5/4-ST	2
AD-4411-DAC accessories			
Analog output connector		1JIMC1.5/3-ST	1

Mounting to control panel

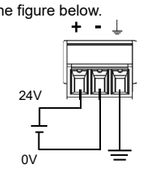
Insert the waterproof packing around the unit, and insert the unit through the front of the panel.
Insert the left and right mounting brackets into the case grooves and push until they reach the panel.



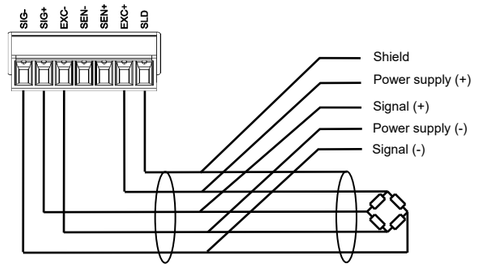
Connection to power supply and connection to load cell

Attach the accessory power connector and wire as shown in the figure below.
Applicable wire

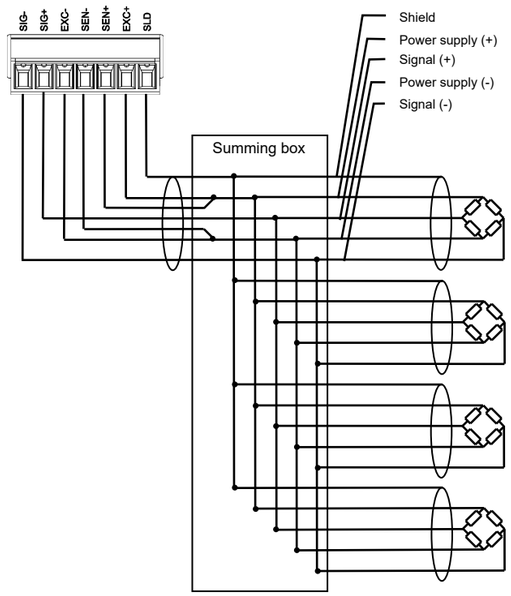
Item	Specifications
Wire size	0.14 to 1.5 mm² (AWG 26 to 16)
Wire strip length	7 mm
Tightening torque	0.22 to 0.25 Nm



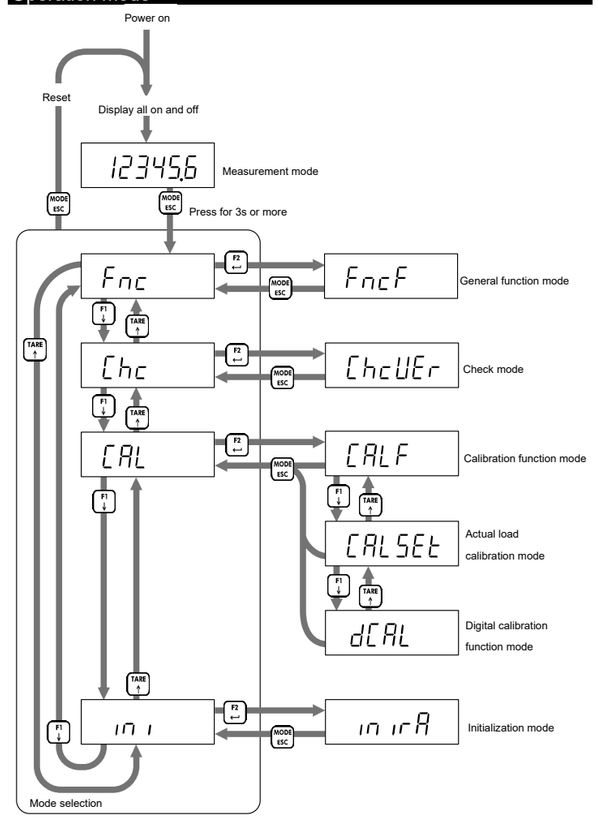
In the case of the 4-wire connection type, attach the accessory load cell connector and wire as shown below. Change the load cell connection type (CALF17) in the calibration function to 0: 4-wire type (default value = 1: 6-wire type).



6-wire connection
Set load cell connection type (CALF17) to 1: 6 wire type (Default).
When you connect the load cells in parallel, use a summing box. Attach the accessory load cell connector and wire as shown below.



Operation mode



Calibration

Calibrate the AD-4411-BCD/485/232/DAC to properly convert the signal from the load cell to a load value. Please prepare a calibration weight.

Shifts to the actual load calibration mode according to the operating mode.
Press the [F2/↵] key.

Press the [F2/↵] key.

The current load cell input signal (mV/V) will be displayed. Press the [F2/↵] key to execute zero calibration.

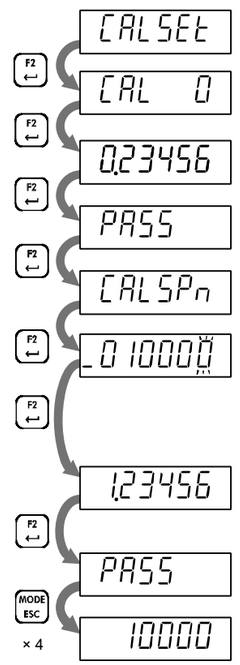
If zero calibration is successful, "PASS" will be displayed, and zero calibration will be completed.
Press the [F2/↵] key.

Press the [F2/↵] key.

Set a calibration weight value by the following key operations.
[ZERO/←] key: Moves the flashing digit to the left.
[TARE/↑] key: Increases the flashing digit by one.
[F1/↓] key: Decreases the flashing digit by one.
[F2/↵] key: Confirm the setting value.

The current load cell input signal (mV/V) will be displayed. Place the calibration weight or apply a load on the load cell. Press the [F2/↵] to execute Span calibration.

If span calibration is successful, "PASS" will be displayed, and span calibration will be completed.
Press the [MODE/ESC] key four times to return to the measurement mode.



USB

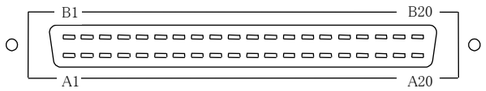
USB

The USB port allows backup of settings and logging of measurements from a PC using a dedicated Windows application. Please download the Windows application from the A&D website.

Communication specification

USB Specification	Connector	Type-C
	Communication	USB 2.0 (Full-speed) virtual COM port
	Power	5V 3.0A at using bus power
Communication protocol		Modbus RTU
Slave address		1
Baud rate		115200 bps
Data length / Parity / Stop bit		8bits / None / 1 bit

BCD Output AD-4411-BCD

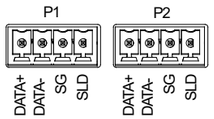


Connector for the BCD Output is provided with AD-4411-BCD.

Pin Assignment

Pin No.	Description	Description	Pin No.
A1	1	2	B1
A2	4	8	B2
A3	10	20	B3
A4	40	80	B4
A5	100	200	B5
A6	400	800	B6
A7	1000	2000	B7
A8	4000	8000	B8
A9	10000	20000	B9
A10	40000	80000	B10
A11	100000	200000	B11
A12	400000	800000	B12
A13	OFF: Overload	ON: Positive OFF: Negative	B13
A14	ON: Stable	ON: Net value OFF: Gross or Tare value	B14
A15	Decimal point position		B15
A16	A15=ON, B15=ON, A16=ON, B16=ON: None A15=OFF,B15=ON, A16=ON, B16=ON: 0.0 A15=ON, B15=OFF,A16=ON, B16=ON: 0.00 A15=ON, B15=ON, A16=OFF,B16=ON: 0.000 A15=ON, B15=ON, A16=ON, B16=OFF:0.0000 A15=ON, B15=ON, A16=ON, B16=ON:0.00000		B16
A17	Unit A17=OFF,B17=OFF : None or kg A17=OFF,B17=ON : t A17=ON, B17=ON : g		B17
A18	Strobe output	Hold input	B18
A19	Common	Common	B19
A20	Frame ground	Frame ground	B20

RS-485 AD-4411-485



Connector for the RS-485 is provided with AD-4411-485.

Applicable wire

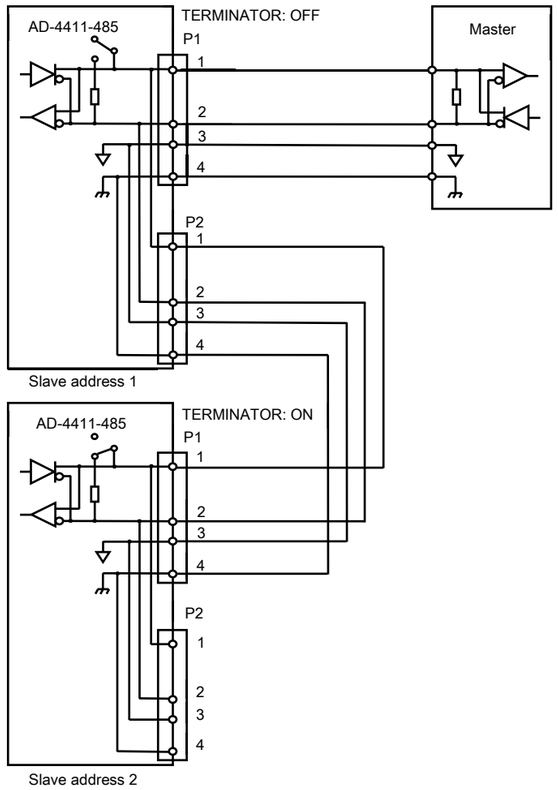
Item	Specifications
Wire size	0.14 to 1.5 mm² (AWG 26 to 16)
Wire strip length	7 mm
Tightening torque	0.22 to 0.25 Nm

TERMINATOR

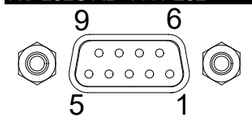
ON OFF

Switch for termination resistor of RS-485
If TERMINATOR sets ON, then enables the terminating resistor.

Connection Diagram



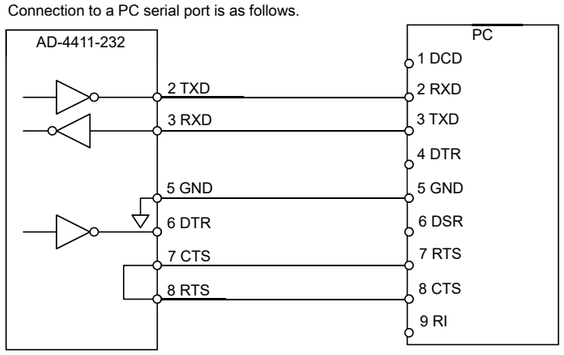
RS-232C AD-4411-232



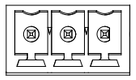
Pin Assignment

Pin No.	Description
2	TXD
3	RXD
5	GND
6	DTR
7	CTS
8	RTS
1,4,9	NC

Connection Diagram
Connection to a PC serial port is as follows.



ANALOG 4-20mA/0-10V OUTPUT AD-4411-DAC



A+ A- SLD

Pin Assignment

Item	Specifications
A+	Analog output +
A-	Analog output -
SLD	Frame ground

Applicable wire

Item	Specifications
Wire size	0.14 to 1.5 mm² (AWG 26 to 16)
Wire strip length	7 mm
Tightening torque	0.22 to 0.25 Nm

Use a 2-core twisted shield cable for the wiring. External load resistance: 600 Ω or less (for current output), 1kΩ or more (for voltage output)

Function list

Calibration function list

CALF	Setting item	Setting value	Default
01	Unit	0: None / 1: g / 2: kg / 3: t	2
02	Decimal point position	0: 0 (No decimal point) / 1: 0.0 / 2: 0.00 / 3: 0.000 / 4: 0.0000 / 5: 0.00000	0
03	Minimum division d	1: 1 d / 2: 2 d / 3: 5 d / 4: 10 d / 5: 20 d / 6: 50 d	1
04	Maximum capacity	1 to 999999	999999
05	Zero setting range	0 to 100 %	100
06	Zero tracking time	0.0 to 5.0 s	0.0
07	Zero tracking width	0: Disable / 1: 0.5 d / 2: 1.0 d / 3: 1.5 d / 4: 2.0 d / 5: 2.5 d / 6: 3.0 d / 7: 3.5 d / 8: 4.0 d / 9: 4.5 d	0
08	Stability detection time	0.0 to 9.9 s	1.0
09	Stability detection width	0 to 100 d	2
10	Zero-setting when unstable	0: Disable / 1: Enable	1
11	Taring when unstable	0: Disable / 1: Enable	1
12	Taring when the gross is negative	0: Disable / 1: Enable	1
13	Zero clear	0: Disable / 1: Enable	1
14	Power-on zero	0: Disable / 1: Enable	0
15	Condition of negative overload	0: Gross < -(Maximum capacity + 8d) / 1: Gross < -19d	0
16	NTEP	0: Disable / 1: Enable	0
17	Load cell connection type	0: 4-wire type / 1: 6-wire type	1

Digital calibration function list

dCAL	Setting item	Setting value	Default
01	Load cell input signal at zero Calibration	-7.00000 to 7.00000 mV/V	0.00000
02	Load cell input signal (at Span Calibration – at Zero Calibration)	0.00001 to 7.00000 mV/V	2.00000
03	Weight value at Span Calibration	1 to 999999	20000

Basic function list

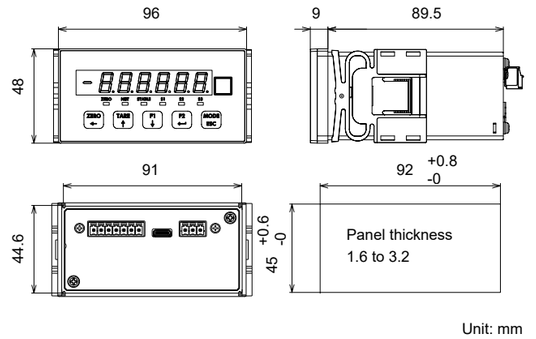
FncF	Setting item	Setting value	Default
01	Locking [ZERO/←] key	0: Disable / 1: Enable	0
02	Locking [TARE/↑] key	0: Disable / 1: Enable	0
03	Locking [F1/↓] key	0: Disable / 1: Enable	0
04	Locking [F2/↵] key	0: Disable / 1: Enable	0
05	Function of [F1/↓] key	0: None / 1: Tare clear / 2: Zero clear /	0
06	Function of [F2/↵] key	3: Gross / net display selection 4: High-resolution display selection 5: Manual print	0
07	Condition to turn S1 status ON	0: None / 1: Hi / 2: OK / 3: Lo /	0
08	Condition to turn S2 status ON	4: Zero setting error / 5: Taring error /	0
09	Condition to turn S3 status ON	6: High resolution display	0
10	Digital filter cut-off frequency [Hz]	0: 273.0 / 1: 120.0 / 2: 100.0 / 3: 84.0 / 4: 70.0 / 5: 68.0 / 6: 56.0 / 7: 48.0 / 8: 40.0 / 9: 34.0 / 10: 28.0 / 11: 24.0 12: 20.0 / 13: 17.0 / 14: 14.0 / 15: 12.0 / 16:10.0 / 17: 8.4 / 18: 7.0 / 19: 6.8 / 20: 5.6 / 21: 4.8 / 22: 4.0 / 23: 3.4 24: 2.8 / 25: 2.4 / 26: 2.0 / 27: 1.7 / 28: 1.4 / 29: 1.2 / 30: 1.0 / 31: 0.84 / 32: 0.70 / 33: 0.68 / 34: 0.56 / 35: 0.48 36: 0.40 / 37: 0.34 / 38: 0.28 / 39: 0.24 / 40: 0.20 / 41: 0.17 / 42: 0.14 / 43: 0.12 / 44: 0.10 / 45: 0.08 / 46: 0.07	30
11	Upper limit value	-999999 to 999999	10
12	Lower limit value	-999999 to 999999	-10
13	Comparison target for upper limit value / Lower limit value	1: Gross / 2: Net	1

For functions other than those listed above, see the "AD-4411-BCD/485/232/DAC Instruction Manual" on the A&D website (https://www.aandd.jp).

Specifications

External Dimension		96(W) x 48(H) x 98.5(D) mm	
Installation method		Panel mount	
Operating temperature and humidity range		-10°C to +40°C Less than 85%RH, non-condensing	
IP rating		(When the indicator is installed to the control panel) Front panel: IP65. Inside the panel: IP2X	
Power supply		DC24V -15% to +10%, 4.5W max.	
Load cell input			
	Excitation voltage	DC5V ±5% 90 mA Up to six 350 Ω load cells can be connected in parallel. 6-wire type with remote sensing	
	Signal input range	-7.0 mV/V to +7.0 mV/V	
	minimum input sensitivity	0.15 μV/d or more (d=minimum division)	
	Nonlinearity	0.005% of F.S. max.	
	Temperature coefficient	Zero drift: ±0.02 μV/°C typ. ±0.1 μV/°C max. Span drift: ±3 ppm/°C typ. ±15 ppm/°C max.	
	Sampling rate	1200 times / second	
Display			
	Main display	7-digit LED (green) with a character height of 10 mm	
	Status display	LED (red) x 6	
	Unit	Attach a label of g / kg / t	
Key switches		x 5	
External interface			
	Interface	AD-4411-BCD	BCD output
		AD-4411-485	RS-485
		AD-4411-232	RS-232C
		AD-4411-DAC	Analog output
	USB	Type-C connector, USB 2.0 (Full-speed)	

External dimension



Unit: mm

FCC - Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information
Model: AD-4411-BCD/485/232/DAC
Responsible Party: A&D ENGINEERING, INC.
Address: 4622 Runway Boulevard Ann Arbor, MI 48108, U.S.A.
Tel: [1] (888) 726-5931
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.