

STRAIN GAUGE TRANSMITTER
(front configurable)

MODEL **MXLC**

BEFORE USE

Thank you for choosing us. Before use, please check contents of the package you received as outlined below. If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Signal conditioner (body + base socket).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2 and Installation Category II (transient voltage 2500V). Basic insulation (input to output to power input: 300V) is maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel.
- Insert a noise filter for the power source connected to the unit. TDK-Lambda Noise Filter Model RSAN-2006 or equivalent is recommended.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.
- Install lightning surge protectors for those wires connected to remote locations.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
 100 – 240V AC rating: 85 – 264V, 47 – 66 Hz, approx. 10VA
 24V DC rating: 24V ±10%, approx. 7W
 110V DC rating: 85 – 150V, approx. 7W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

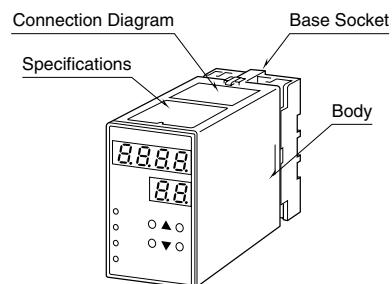
■ EXCITATION

- Be sure to use the excitation of the unit.
- Adjust excitation voltage so that the current is below the maximum current of the excitation.

■ AND

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

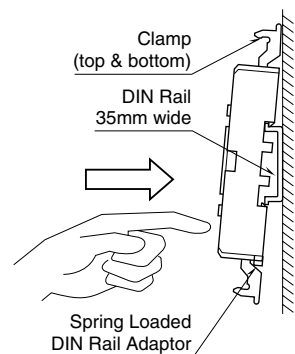


INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separate the body from the base socket.

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Position the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



■ WALL MOUNTING

Refer to “EXTERNAL DIMENSIONS.”

Shape and size of the base socket are slightly different with various socket types.

FRONT PANEL CONFIGURATION & PROGRAMMING

PROGRAMMING PROCEDURE

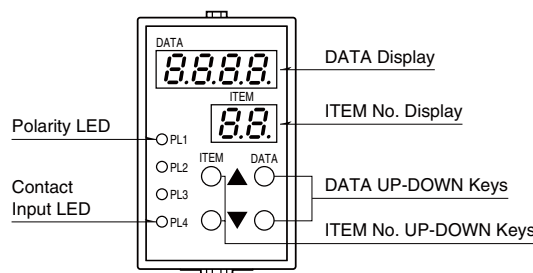
- 1) Press ITEM UP or DOWN key until ITEM display indicates "01".
- 2) Press DATA UP or DOWN key and choose "2" on DATA display.

1: Data indication only.

2: All parameters are modifiable.

- 3) Press ITEM UP or DOWN key until ITEM display shows the ITEM No. you need to change.
- 4) Press DATA UP or DOWN key and choose a DATA No. or value you need on DATA display.
- 5) Repeat above 3 and 4. (Entered data is stored 1 sec. after the operation has been complete.)
- 6) Press ITEM UP or DOWN key until ITEM display indicates "01".
- 7) Press DATA UP or DOWN key and choose "1" on the display.
- 8) Press ITEM UP or DOWN key until ITEM display indicates "P".
DATA display shows process input. You can now check data setting by choosing ITEM No.

Note: DO NOT press UP and DOWN keys simultaneously.



ITEM	MDF. CODE	DATA	CONTENTS	DEFAULT
P	N/A	-9999 – 9999	Input display in engineering unit (as set in ITEM 14/15)	---
01		1, 2	Modification code 1: Data indication only. 2: All parameters are modifiable.	1
02	N/A	0 – 99	Status indication ("0" is normally indicated.) 0: Normal 1: Memory error 10: PV overrange (out of -9999 to 9999) 20: Input overrange (out of -15 to +115%)	
03	N/A	0, 1, 2	Input range code 0: S1 (0.0 – 3.0mV/V) 1: S2 (0.0 – 10.0mV/V) 2: S3 (0.0 – 30.0mV/V)	S1: 0 S2: 1 S3: 2
04	N/A	0, 1, 2	Output range code 0: V1 (-1 – +1V) 1: V2 (-10 – +10V) 2: Z1 (0 – 20mA)	V1: 0 V2: 1 Z1: 2
05	2	0.1 – 12.0	Excitation voltage (V)	1.0
06	2	0.010 – 3.000 0.010 – 9.999 0.10 – 30.0	Sensor sensitivity S1: 0.0 – 3.0mV/V S2: 0.0 – 10.0mV/V S3: 0.0 – 30.0mV/V Used when adjusting the sensor sensitivity by its rating value. Set ITEM 07 before 06.	3.000mV/V 9.999mV/V 30.00mV/V
07	2	-30.00 – 30.00 -99.99 – 99.99 -300.0 – 300.0	0% input voltage S1: -30.00 – 30.00mV S2: -99.99 – 99.99mV S3: -300.0 – 300.0mV Sensor's zero adjustment. Approximate offset voltage.	
08	2	-30.00 – 30.00 -99.99 – 99.99 -300.0 – 300.0	100% input voltage S1: -30.00 – 30.00mV S2: -99.99 – 99.99mV S3: -300.0 – 300.0mV Used when adjusting the sensor sensitivity with an actual load. Set ITEM 07 before 08.	
09	2	10.0 – 100.0	Load ratio (%) Used when adjusting the sensor sensitivity with an actual load.	100.0
10	2	-999.9 – 999.9	Tare adjustment (%)	0.0
11/L	N/A	-15.0 – 115.0	Input indicated in % with ITEM 01 DATA 1 (of the range set in ITEM 06/07/08) Loop test output with ITEM 01 DATA 2 ('L' is indicated as ITEM No.) (Use DATA UP/DOWN key to set the output signal.)	---
12	2	-99.99 – 99.99	Zero adjustment (%) (fine adj. of the value set in ITEM 06/07/08)	0.00
13	2	0.000 – 9.999	Gain adjustment (fine adj. of the value set in ITEM 06/07/08)	1.000
14	2	-9999 – 9999	Display range scaling 0% *1	0.0
15	2	-9999 – 9999	Display range scaling 100% *1	100.0
16	2	0, 1, 2, 3	Decimal point position 0: ____ 1: ____. 2: ____. 3: ____.	1

ITEM	MDF CODE	DATA	CONTENTS	DEFAULT
17	2	0, 1, 2, 3, 4	Moving average (sampling cycle: 200 msec.) 0: No 1: 4 samples 2: 8 samples 3: 16 samples 4: 32 samples	0
18	2	0, 1, 2, 3	Contact input function 0: Tare adjustment 1: Peak hold 2: Valley hold 3: Sample hold	0
20	2	0, 1 – 60	Power-saving mode 0: Continuous display 1 – 60: Time before display turned off (minutes)	10
21	2	-1.00 – 1.00	Output code V1 0% output voltage (V) *2 100% output voltage (V) *2	-1.00
22	2	-1.00 – 1.00		1.00
21	2	-10.0 – 10.0	Output code V2 0% output voltage (V) *2 100% output voltage (V) *2	-10.0
22	2	-10.0 – 10.0		10.0
21	2	0.0 – 20.0	Output code Z1 0% output current (mA) *2 100% output current (mA) *2	4.0
22	2	0.0 – 20.0		20.0
23	N/A	---	ROM version	---

*1. Of the range set in ITEM 06/07/08. ITEM 14 < ITEM 15.

*2. ITEM 21 < ITEM 22.

■ SENSOR ADJUSTMENTS USING AN ACTUAL LOAD

1. Program Mode

Set ITEM 01 – DATA 2 to turn the unit into Program Mode.

2. Excitation Voltage

Choose ITEM 05. Press Data UP or DOWN key until the data display shows the desired excitation voltage. When the value calculated by [Excitation / Resistance] exceeds 30mA, set a voltage value to fit with 30mA limit.

[E.G. 1] Max. excitation voltage 10V
Strain gauge resistance 120Ω

If you choose 10V as the excitation:
 $10V / 120\Omega = 83.3mA \rightarrow$ out of allowable range

Then you will choose 3.6V or less as calculated by the equation below:

$$30mA \times 120\Omega = 3.6V$$

3. 0% Input Voltage

Choose ITEM 07. With no load applied to the sensor, press DATA UP or DOWN key until the display value is stabilized (while the computation circuit of the unit conducts averaging process).

DATA display shows the approximate offset voltage.

$$\text{Display Value} = \text{Sensor Voltage} \times \text{Internal Coefficient}^*$$

4. 100% Input Voltage

Choose ITEM 08. With an actual known load, press DATA UP or DOWN key until the display value is stabilized (while the computation circuit of the unit conducts averaging process).

Data display shows the sensor's sensitivity span.

5. Monitor Mode

Set ITEM 01 – DATA 1 to turn the unit into Monitor Mode.

6. PV Indication

Press ITEM UP or DOWN key until ITEM display indicates "P".

If necessary, go to Display Range Scaling, Moving Average, and other adjustments.

Set the unit to Monitor Mode with ITEM P displayed other than for programming.

*If 100% load is not available, use the load ratio setting. With 10% load, set ITEM 09 – DATA 10.0 before adjustments.

■ SENSOR ADJUSTMENTS BY ENTERING VALUES

1. Turn the unit into Program Mode.

2. Excitation Voltage

Choose ITEM 05. Press DATA UP or DOWN key until the data display shows the desired excitation voltage. When the value calculated by [Excitation / Resistance] exceeds 30mA, set a voltage value to fit with 30mA limit.

[E.G. 1] Max. excitation voltage 10V
Strain gauge resistance 120Ω

If you choose 10V as the excitation:

$$10V / 120\Omega = 83.3mA \rightarrow \text{out of allowable range}$$

Then you will choose 3.6V or less as calculated by the equation below:

$$30mA \times 120\Omega = 3.6V$$

3. 0% Input Voltage

Choose ITEM 07. With no load applied to the sensor, press DATA UP or DOWN key until the display value is stabilized (while the computation circuit of the unit conducts averaging process).

DATA display shows the approximate offset voltage.

$$\text{Display Value} = \text{Sensor Voltage} \times \text{Internal Coefficient}$$

4. Sensor's Sensitivity

Choose ITEM 06. Press DATA UP or DOWN key until the display shows desired value as specified in the sensor's specification sheet.

5. Turn the unit into Monitor Mode.

6. Set to ITEM P.

If necessary, go to Display Range Scaling, Moving Average, and other adjustments.

Set the unit to Monitor Mode with ITEM P displayed other than for programming.

■ DISPLAY RANGE SCALING

[E.G.] PV display range 0.0 to 100.0 modified to show -2000 to 2000

1. Turn the unit into Program Mode.

2. Decimal Point Position

Choose ITEM 16 – DATA 0.

3. 0% Scaling Value

Choose ITEM 15 – DATA -2000.

(Negative [-] range is identified with the PL1 turned on.)

4. 100% Scaling Value

Choose ITEM 15 – DATA 2000.

5. Turn the unit into Monitor Mode.

6. Set to ITEM P.

■ SELECTING OUTPUT RANGE

[E.G.] Output range -10.0 to 10.0V modified to 1.0 to 5.0V

1. Turn the unit into Program Mode.
2. 0% Output
Choose ITEM 21 – DATA 1.0.
3. 100% Output
Choose ITEM 22 – DATA 5.0.
4. Turn the unit into Monitor Mode.
5. Set to ITEM P.

■ TARE ADJUSTMENT

1. Turn the unit into Program Mode.
2. Contact Input Function
Choose ITEM 18 – DATA 0.
3. Turn the unit into Monitor Mode.
(ITEM 18 is set to DATA 0 as default. No need of conducting 1 through 3.)
4. Set to ITEM P.
5. Close across the contact input terminals (Di).

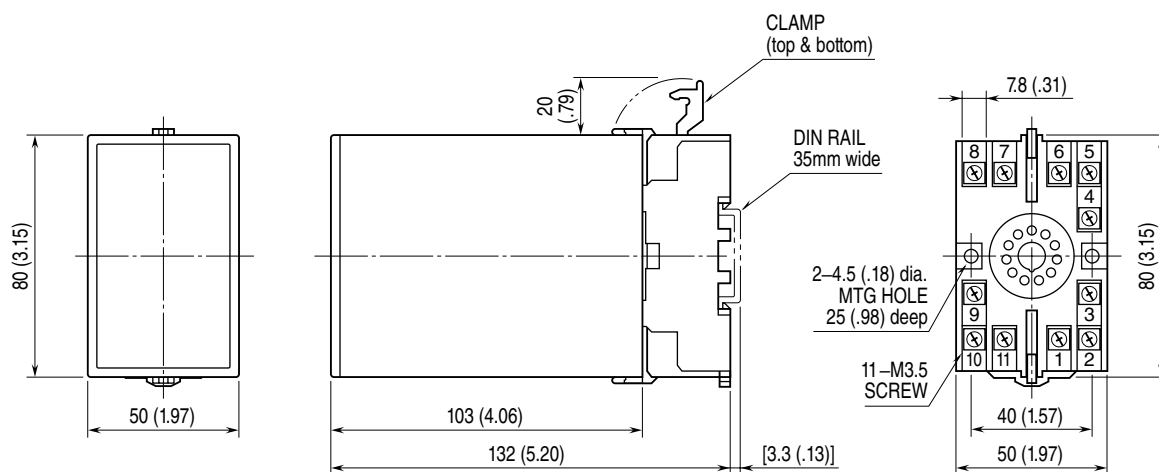
By the abovementioned procedure, the tare value is stored in ITEM 10, the PV display shows the value set by 0% Scaling Value, and the transmitter outputs the value set by 0% Output.

The abovementioned procedure is applicable to modifications from default setting.

TERMINAL CONNECTIONS

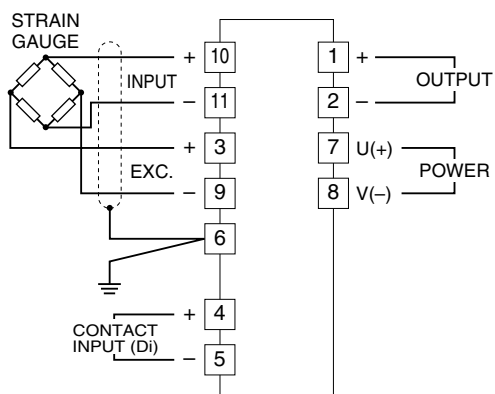
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

■ EXTERNAL DIMENSIONS unit: mm (inch)



• When mounting, no extra space is needed between units.

■ CONNECTION DIAGRAM



CHECKING

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Power input voltage: Check voltage across the terminal 7 – 8 with a multimeter.
- 3) Strain gauge: Maximum allowable current supplied to the strain gauge is 30mA. Check the resistance of the sensor.
- 4) Input: Check voltage across the terminal 10 (+) – 11 (–) with a multimeter. The voltage value at the maximum load must equal [Excitation × Strain Gauge Sensitivity].
- 5) Output: Check that the load resistance meets the described specifications.

MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION

Warm up the unit for at least 10 minutes. Apply 0%, 25%, 50%, 75% and 100% input signal. Check that the output signal for the respective input signal remains within accuracy described in the data sheet. When the output is out of tolerance, recalibrate the unit according to the “ADJUSTMENT PROCEDURE” explained earlier.

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.