

Autonics SMALL MULTI PANEL METER M4NN SERIES INSTRUCTION MANUAL



Thank you for choosing our Autonics product. Please read the following safety considerations before use.

Safety Considerations

Please observe all safety considerations for safe and proper product operation to avoid hazards. **Warning** Failure to follow these instructions may result in serious injury or death.

Caution Failure to follow these instructions may result in personal injury or product damage.

Warning

- 1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.
2. Install on a device panel to use.
3. Do not connect, repair, or inspect the unit while connected to a power source.
4. Check 'Connections' before wiring.
5. Do not disassemble or modify the unit.

Caution

- 1. When connecting the power/measurement input, use AWG 24(0.20mm²) to AWG 20(0.50mm²) cable and tighten the terminal screw with a tightening torque of 0.74 to 0.90N·m.
2. Use the unit within the rated specifications.
3. Use dry cloth to clean the unit, and do not use water or organic solvent.
4. Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
5. Keep metal chip, dust, and wire residue from flowing into the unit.

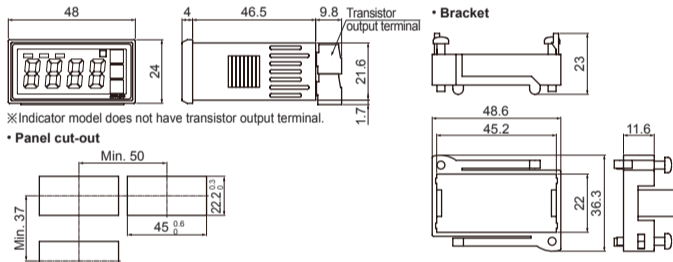
Ordering Information

Table with columns for Model, Control output, Power supply, Input, Type, Size, Digit, and Item. Includes details for M4NN-DV-1N, M4NN-DA-1, M4NN-AV-1, and M4NN-AA-1.

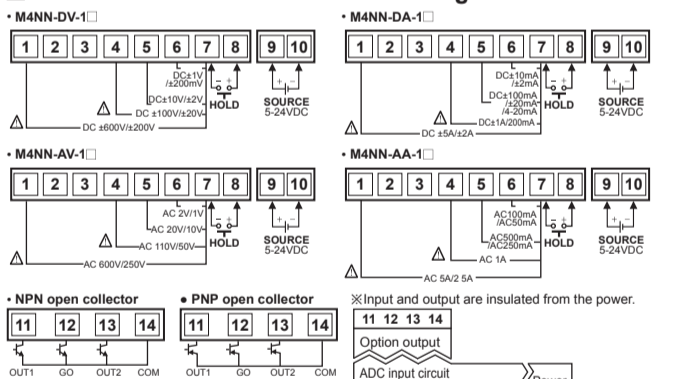
Unit Description



Dimension



Connections and Insulated Block Diagram



Monitoring Max./Min. Value

It monitors Max./Min. value of display value based on current display value and then display the data in HPEL mode and LPEL mode of parameter 0 group. Set delay time (0 to 30 sec) in PEEL mode of parameter 2 group in order to avoid caused by initial overcurrent or overvoltage.

Minus Input Display Setting

- When minus input is unnecessary, or when display 0 not to display minus input due to display minus input due to unstable input value around 0, set FF this minus input display function.
When setting FF, low-limit value of input range is set 0 and it displays minus input as 0.
The low-limit value of L SC, U L L G parameters is changed based on "0". Min. display value is "0" and H SC/H G parameters display max. value of the input range.

AC Frequency Measurement

It measures input signal frequency when it is an AC input. It uses fixed decimal point by t parameter setting of parameter 1 group, measured range can be changed by setting and measured range of decimal point position is as below chart. It is available to adjust upper gradient at bH and bL of parameter 1 group. In order to measure frequency normally, input signal, over 10% F.S. of the measured range, should be supplied.

Table showing decimal point position and measurement range for AC frequency measurement.

Accuracy of frequency measurement: Below 1kHz, F.S. ±0.1rdg ±2digit. From 1 to 10kHz, F.S. ±0.3rdg ±2digit.
bH: 0.100 to 9.999 (gradient adjustment of high-limit value)
bL: 10², 10¹, 10⁰, 10⁻¹ (index adjustment of bH)

Error Display

Table with columns for Display, Description, and Error Code. Lists error codes like HHHH, FHH, LLLL, dHH, dLL and their corresponding descriptions.

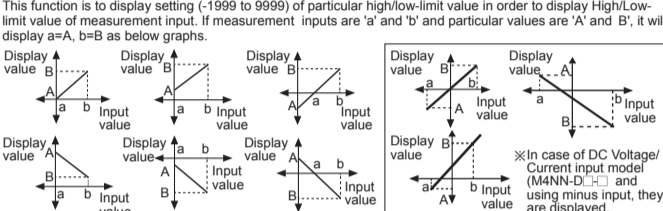
Error is cleared when the input value is within measurement range or display range. The above specifications are subject to change and some models may be discontinued without notice. Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

Specifications

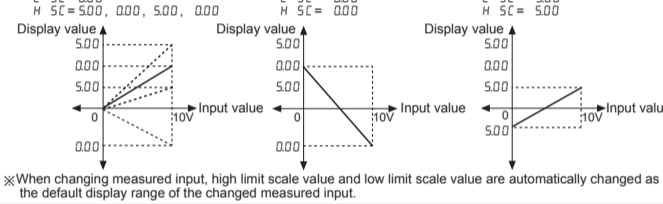
Table of specifications for M4NN-DV-1, M4NN-DA-1, M4NN-AV-1, and M4NN-AA-1 models, covering measurement input, power supply, display method, accuracy, and environmental conditions.

*1: Indicator model (M4NN-□-1N) does not have output function.
*2: AC, Frequency measurement functions are only for AC measurement type.
*3: The weight is with packaging and the weight in parenthesis is only unit weight.
*Environment resistance is rated at no freezing or condensation.

Display Scale



Display scale function is able to change display value for min./max. measured input by setting high limit scale H SC and low limit scale L SC in parameter 1 group.
E.g.) High limit scale value and low limit scale value setting (input range= 0-10V)
L SC = 0.00, H SC = 5.00, 0.00, 5.00

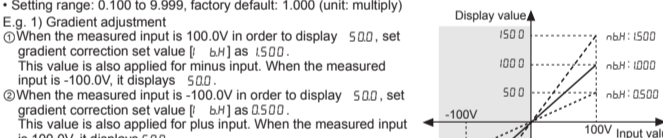


When changing measured input, high limit scale value and low limit scale value are automatically changed as the default display range of the changed measured input.

Error Correction

It corrects display error of measurement input.
bL: -99 to 99 (adjust deviation of low-limit value)
bH: 0.100 to 9.999 (correct gradient of high-limit value)
Display value = (Measured value x bH) + bL
E.g.) When the measured range is 0 to 500V, and the display range is 0 to 500.0. If the low display value is 12 to 0V input, set -12 as bL value to display 0.0 by adjusting offset of the low-limit value.

As the below (Figure 1), in case of display gradient 1 for the measured input 100V, this function is to adjust display value by adjusting the gradient as 1.5 times or 0.5 times.
Setting range: 0.100 to 9.999, factory default: 1.000 (unit: multiply)
E.g. 1) Gradient adjustment
① When the measured input is 100.0V in order to display 500, set gradient correction set value [bH] as 1500. This value is also applied for minus input. When the measured input is -100.0V, it displays 500.
② When the measured input is -100.0V in order to display 500, set gradient correction set value [bH] as 0500. This value is also applied for plus input. When the measured input is 100.0V, it displays 500.



Shaded part of Figure 1 is not displayed for the below cases.
* AC input model
* DC input model and minus input [i U] is set as FF.
* DC Current model and input range [i] is set as y 20.

E.g. 2) Display scale setting [SC H SC] and gradient adjustment [bH] (AC input)
① When the measured input AC 2.000V at the input range AC 0 to 5.000V and it displays 5000, set decimal point position [t] as 0000 before setting the scale value.
② When the measured input is AC 2.000V in order to display 5000, 12.500 should be displayed when max. input value is 5.000V. However, it cannot set because the max. set value is 9.999. Set high-limit scale value as (-L SC) value. If high scale value is set at first, set low scale value as (-H SC) value.
③ After this setting is finished, it displays 5000 when the measured input is 2.000V.

E.g. 3) Display scale setting [SC H SC] and gradient adjustment [bH] (DC minus input)
① When the measured input DC -40mA at the input range DC -100.0 to 100.0mA and it displays 600, set decimal point position [t] as 0000 before setting the scale value.
② When the measured input is DC -40mA in order to display 600, -400.0 should be displayed when min. input value is -100.0mA. However, it cannot set because the min. set value is -199.9. Set as gradient correction set value [bH] low scale value [L SC] = -400.0. Set high-limit scale value as (-L SC) value. If high scale value is set at first, set low scale value as (-H SC) value.
③ After this setting is finished, it displays 600 when the measured input is DC -40.0mA.

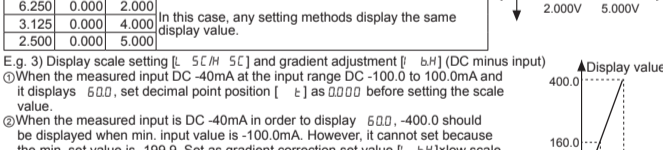
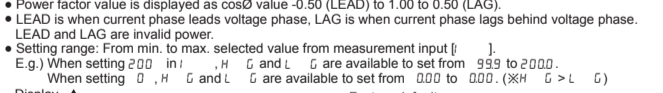


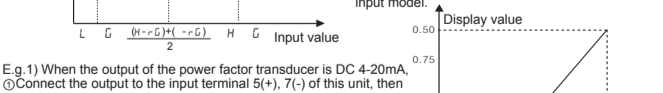
Table showing H SC, L SC, bH, and bL values for different input ranges and display values.

Power Factor [PF] Display

- This function displays LEAD and LAG by analog output signal from the power factor transducer.
It is available to accept several outputs of the power factor transducer by high-limit [H G]/low-limit [L G] analog output value setting in the power factor transducer.
Power factor value is displayed as cosθ value -0.50 (LEAD) to 1.00 to 0.50 (LAG).
LEAD is when current phase leads voltage phase, LAG is when current phase lags behind voltage phase. LEAD and LAG are invalid power.
Setting range: From min. to max. selected value from measurement input [i].
When setting 200 in [i], H G and L G are available to set from 999 to 2000.
When setting 0, H G and L G are available to set from 000 to 000. (X H G > L G)



E.g. 1) When the output of the power factor transducer is DC 4-20mA
① Connect the output to the input terminal 5(+), 7(-) of this unit, then set input range [i] as y 20.
② When setting the input range as y 20, L G is set as 400 and H G is set as 2000 automatically. L G and H G is for the setting of the power factor transducer output.
③ If measured input is 4mA, it displays 050. For 12mA measured input, it displays 050. For 20mA, it displays 050.
E.g. 2) When the output of the power factor transducer is DC1-5V,
① Connect the output to the input terminal 5(+), 7(-) of this unit, then set the input range [i] as 0.
② Select minus input display function [i U] as FF not to display minus value.
③ Set H G as 500 and L G as 100 for the output of the power factor transducer.
④ If measured input is 1V, it displays 050. For 3V measured input, it displays 1.00 and for 5V, it displays 050.



E.g. 3) When LEAD value is smaller than -0.90, LAG value is smaller than 0.90, and OUT1 is used, OUT1 value -0.90.
① Set U L L as HL at parameter 2 group.
② Set U L H as 050 and U L L as 090 at parameter 0 group.
* U L L is also same setting as U L L.

Measurement Input

Table showing measured input ranges, display values, input impedances, and display ranges for DC Voltage, DC Current, AC Voltage, and AC Current.

When "HHHH" or "LLLL" is flashes with a certain measurement input, disconnect power supply and then check the cables.

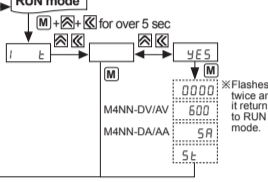
Display Cycle Delay

In some applications the measured input may fluctuate which in turn causes the display to fluctuate. By adjusting the display cycle delay function time at t SC of parameter 2 group, the operator can adjust the display time within a range of 0.1 sec to 5 sec. For example, if the operator sets the display cycle time to 4.0 sec, the display value is displayed the averaged input value over 4 sec in every 4 sec.

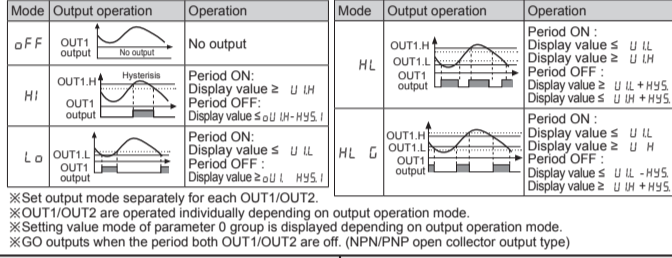
Zero Adjustment

Forces the display value of measured input to 0 (Zero).
Zero adjustment range: -99 to 99
Zero adjustment method: Press [bL] and [bH] key in RUN mode for 3 sec.
When zero point adjustment with front key and hold terminal is finished normally, zero point of measurement terminal is displayed and the adjusted value is saved in i bL.
If zero adjustment range is exceeded, the error [E] flashes twice and then move to RUN mode, maintaining previous setting value.

Initialization

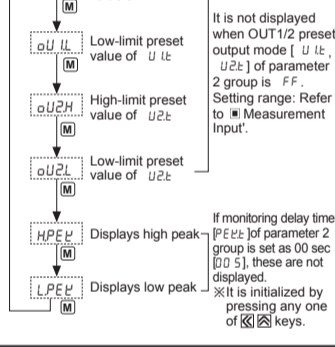


Pre-set Output Operation Mode

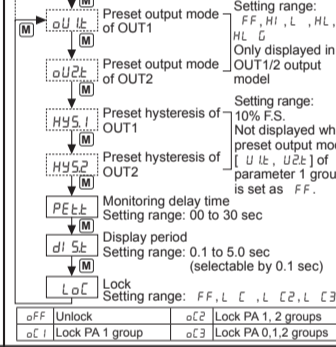


Set output mode separately for each OUT1/OUT2.
OUT1/OUT2 are operated individually depending on output operation mode.
Setting value mode of parameter 0 group is displayed depending on output operation mode.
GO outputs when the period both OUT1/OUT2 are off. (NPN/PNP open collector output type)

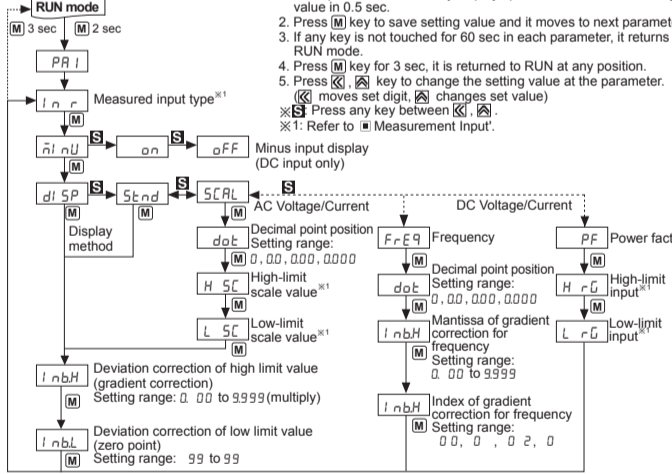
Parameter 0 Group



Parameter 2 Group



Parameter 1 Group



Factory Default

Table showing factory default values for various parameters across different models.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
5-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
Keep away from high voltage lines or power lines to prevent inductive noise.
In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
Do not use near the equipment which generates strong magnetic force or high frequency noise.
This unit may be used in the following environments:
Indoors
Altitude max. 2,000m
Pollution degree 2
Installation category II

Major Products

- Photocell Sensors, Temperature Controllers, Fiber Optic Sensors, Temperature/Humidity Transducers, Door Sensors, SSRs/Power Controllers, Door Side Sensors, Counters, Area Sensors, Timers, Proximity Sensors, Panel Meters, Pressure Sensors, Tachometer/Pulse (Rate) Meters, Rotary Encoders, Display Units, Connector/Sockets, Sensor Controllers, Switching Mode Power Supplies, Control Switches/Lamps/Buzzers, I/O Terminal Blocks & Cables, Stepper Motors/Drivers/Motion Controllers, Graphic/Logic Panels, Field Network Devices, Laser Marking System (Fiber, Co., Nd: YAG), Laser Welding/Cutting System