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. Safety considerations are categorized as follows.

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

**The symbols used on the product and instruction manual represent the following ⚠ symbol represents caution due to special circumstances in which hazards may occur

▲ Warning

1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in fire, personal injury, or economic loss.

2. Install on a device panel to use.
Failure to follow this instruction may result in fire.

3. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.

4. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

5. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.

⚠ 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. Failure to follow this instruction may result in fire or malfunction due to contact failure.

 2. Use the unit within the rated specifications. Failure to follow this instruction may result in fire or product damage.

 3. Use dry cloth to clean the unit, and do not use water or organic solvent. Failure to follow this instruction may result in fire.

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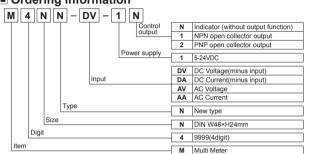
 4. Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.

 Failure to follow this instruction may result in fire or explosion.

 5. Keep metal chip, dust, and wire residue from flowing into the unit.

 Failure to follow this instruction may result in fire or product damage.

Ordering Information



Dimension

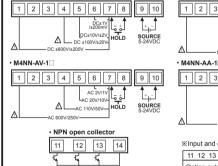
45.2

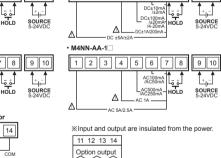
Unit Descriptions

• M4NN-DV-1

- 1. Measured value display
 2. M : MODE key
 3. A : Up key
 4. C : Shift key
 5. OUT1 (Red):
 OUT1 output indicator of preset
 6. GO(Green):
 GO output indicator of preset
 7. OUT2(Red):
 OUT2 (Uput indicator of preset
- T2 output indicator of preset

■ Connections and Insulated Block Diagram

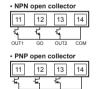


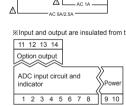


MIndicator model (M4NN-□□-1N) does not

Panel cut-out

Min. 55





■ Monitoring Max./Min. Value [PA 0 group: HPEY/LPEY, PA 2 group: PEYL]

It monitors Max./Min. value of display value based on current display value and then display the data in HPEE mode and LPEE mode of parameter 0 group. Set delay time(0 to 30 sec) in PEEE mode of parameter 2 group in order to avoid caused by initial overcurrent or overvoltage, when monitoring the peak value. Delay time is 0 to 30

■ Minus Input Display Setting [PA1 group: 51 of]

When minus input is unnecessary, or when display 0 not to display minus input due to display minus input due to display minus input due to minus input due to minus input due to minus input display function. When setting oFF, low-limit value of input range is set 0 and it displays minus input as 0. The low-limit value of t_-5t, oU_L, t_-r_0 parameters is changed based on "0". Min. display value is "0" and H_-5t/H_-r_0 parameters display max. value of the input range. The I nbH nbL loULE HYS_DOULH parameters are initialized to factory default. Kin case of DC Current measurement input model, when measured input range [in-r] is set as 4-20, this parameter is not displayed.

■ AC Frequency Measurement [PA1 group: dl 5P]

It measures input signal frequency when it is an AC input. It uses fixed decimal point by <code>dob</code> 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 <code>inbH</code> and <code>inbE</code> of parameter 1 group. In order to measure frequency normally, input signal, over 10% F.S. of the measured range, should be supplied. Please

select the proper point of measurement terminal. • Measured range							
Decimal point position	0.000	0.00	0.0	0			
Measurement range	0.100 to 9.999Hz	0.10 to 99.99Hz	0.1 to 999.9Hz	1 to 9999Hz			

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

■ Error Display

Display	Display Description		Description
нннн	HHH Flashes when measured input is exceeded the max. allowable input(+110%)		Flashes when input frequency is exceeded the max. measured range(10kHz) and
Flas	lashes when measured input is exceeded		display range (9999)
LLLL	the min. allowable input (minus input an : -110%, aff : -10%)	PF-H	Flashes when power factor display value to measured input is over than LAG 0.50
д-нн	Gisplay range (9999)		Flashes when power factor display value to measured input is less than LEAD -0.50
d-LL			,

XError 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,

Specifications

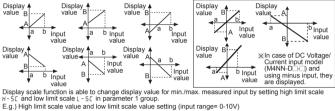
Model		M4NN-DV-1	M4NN-DA-1	M4NN-AV-1	M4NN-AA-1	
Measure	ment input	DC Voltage	DC Current	AC Voltage, Frequency	AC Current, Frequency	
Max. allowable input -110 to 110% of each measured input range (when not using minus input: -10 to 110%) Approx. 110% of		Approx. 110% of each	measured input range			
Power s	Power supply 5-24VDC=					
Allowable	voltage range	e 90 to 110% of the rated voltage (5V is fixed for lower limit)				
Power co	ower consumption Max. 3W					
Display i	Display method 7 Segment LED Display(red), Character height : 11mm					
Display a	accuracy	In 23±5°C - DC type: ±0.1% F.S. ±2digit, AC type: ±0.3% F.S. ±3digit				
Display of	cycle	0.1 to 5.0 sec (selecatable by 0.1 sec)				
			using successive appro	oximation ADC		
Sampling	g cycle	50ms(resolution 1/12,0	100)	16.6ms(resolution 1/12	,000)	
Max. dis	play range	-1999 to 9999(4 digit)				
Preset o	•	NPN/PNP open collector output: -Load voltage: max. 30VDC= -Load current: max. 100mA -Residual voltage: max. 1VDC=(NPN), max. 2VDC(PNP)				
AC measurement ^{**2}		_		Average value(AVG) m	easurement	
Frequency measurement*2		_		Measured range: 0.100 (variable by decimal po		
Insulation resistance		Over 100MΩ(at 500VDC megger)				
Dielectric strength		2000VAC for 1 minute (between all terminals and case)				
Noise immunity		±2kV the square wave noise(pulse width: 1μs) by the noise simulator				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min) in each X, Y, Z direction for 2 hours				
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min) in each X, Y, Z direction for 2 nours				
Shock	Mechanical	100m/s*(approx. 10G) in each X, Y, Z direction for 3 times				
	Malfunction	300m/s²(approx. 30G) in each X, Y, Z direction for 3 times				
Environ -ment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C				
	Ambient humidity	35 to 85%RH, storage:	85%RH, storage: 35 to 85%RH			
Connection type		Plug/Socket terminal block (accessory)				
Insulation type		Double insulation or reinforced insulation (mark: □, Dielectric strength between the measuring input part and the power part : 1kV)				
Approva	I	(€				
		A	A 02 7-	A 02 0-	A 02 0-	

Approx. 83.7g (approx. 46.7g) $\times 1$: Indicator model(M4NN- $\square \square$ -1N) does not have output function.

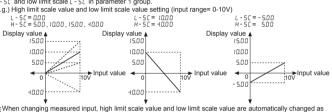
AC, Frequency measurement functions are only for AC measurement type.
 The weight is with packaging and the weight in parenthesis is only unit weight.
 Invironment resistance is rated at no freezing or condensation.

■ Prescale [PA1 group: H-5[/L-5[]

This function is to display setting(-1999 to 9999) of particular high/low-limit value in order to display High/Low-limit value of measurement input. If measurement inputs are 'a' and 'b' and particular values are 'A' and 'B', it will display a=A, b=B as below graphs.



E.g.) High limit scale value and low limit scale value setting (input range= 0-10V)



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 [PA 1 group: I nb.H/I nb.L]

(unit: mm

- It corrects display value error of measurement input.

 Inbl.: 99 to 99 (adjust deviation of low-limit value)

 Inbl.: 90 to 99 (adjust deviation of low-limit value)

 Inbl.: 90 to 99 (adjust deviation of low-limit value)

 Inbl.: 90 to 99 (adjust deviation of low-limit value)

 Display value=(Measured value × Inbl) + Inbl.

 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 ℓ2 to 0V input, set -12 as Inbl. value to display 0.0 by adjusting offset of the low-limit value.

 The display value to 500V measured input varies by adjusting the offset of low-limit value. If this display value is 50 ID, calculate 500.0/501.0 (desired display value/the display value), and set the 0.99 correction value as the 1 nbl. to display 500D by adjusting gradient of high-limit value.

 The offset correction range of 1 nbl. is within -99 to 99 for 0° 0° 10 digit regardless of decimal point position [dat].

 High limit error correction function is available as "Gradient correction" and low limit error correction function is available as "Gradient correction" and low limit error correction function is available as "Gradient correction".
- function is available as "Zero adjustment".

■ Gradient Correction [PA 1 group: / ¬Ь.Н]

This function is to adjust gradient of standard display value or scale value for the input value within the mea input range. By adjusting gradient, it is available as "High limit error correction function". 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.

- Set range: 0.100 to 9.999, factory default: 1.000 (unit: multiply)

Display value

150.0

100.0

50.0

€1 nbH: ISOO

и пън: 0500

(Figure1)

40.0100.0

E.g. 1) Gradient adjustment
①When the measured input is 100.0V in order to display 150.0, set

gradient correction set value [$l \rightarrow bH$] as 1500. This value is also applied for minus input. When the measured input is -100.0V, it displays +500. BWhen the measured input is -100.0V, it displays +500. Swhen the measured input is -100.0V in order to display -500, set gradient correction set value [$l \rightarrow bH$] as 0.500. This value is also applied for plus input. When the measured input is +00.0V is displays -500.

is 100.0V, it displays 500.

| I □ bbH | Note | S00 | Shaded part of Figure 1 is not displayed for the below cases. | 4000 | S00 |

scale value.

©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 as gradient correction set value [! nbH]*high scale value [H-5C]=12.500 5.000 as the following table.

@After this set is finished, it displays 5000 when the measured input is 2.000V.

| H - 5C | L - 5C | I - b.H | Note | | 12.500 | 0.000 | 1.000 | Unavailable to set because max. set value of H - 5C is 9.999 |
 6.250
 0.000
 2.000

 3.125
 0.000
 4.000

 2.500
 0.000
 5.000
 E.03 Display scale setting [L -5E/M-5E] and gradient adjustment [L nbH] (DC minus input) (5) When the measured input DC -40mA at the input range DC -100.0 to 100.0mA and it displays 4500, set decimal point position [dob] as 0,000 before setting the scale **▲**Display value

it displays 4500, set decimal point position [pdc.] see both value.

@When the measured input is DC -40mA in order to display 4500, -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 [i -nbH|show scale value [i -nbH|show scale value [i -st] = -400.0 as the following table. Set high-limit scale value as (-(i -st)) value. If high scale value is set at first, set low scale value as (-(i -st)) value.

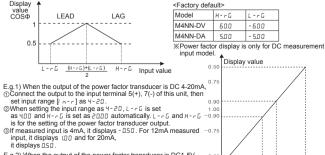
DC-40.0mA. -100.0 -40.0 400.0 -400.0 1.000 Unavailable to set because max. set value of L - 5[is +99.9]

200.0 1-19.9 2.000 100.0 1-100.0 4.000 In this case, any setting methods display the same display value. ■ Power Factor [PF] Display [PA1 group: H--G/L--G]

- 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 r □]/low-limit[t] r □] analog output value setting in the power factor transducer.
 Power factor value is displayed as cos⊘ 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.
- LEAD and LAG are invalid power.
 Set range: From min. to max. selected value from measurement input [i n r].

E.g.) When setting 200 u in I n-r, H-r G and L-r G are available to set from 1999 to 2000. When setting 10u, H-r G and L-r G are available to set from 1000 to 1000. (%H-r G > L-r G)



E.g.2) When the output of the power factor transducer is DC1-5V, O.50 Connect the output to the input terminal 5(+), 7(-) of this unit, then set the input range [? --? | a S.0.2).

Select minus input display function [71 nul] as aFF not to

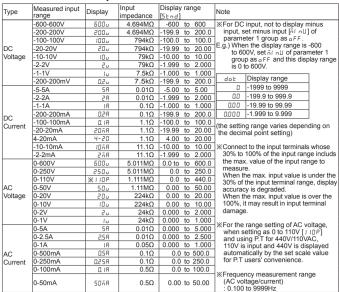
display minus value. r ω as 5.00 and L - r ω as 1.00 for the output of the power

⊕Set ₀U IŁ as HL at parameter 2 group.
②Set ₀U IH as □.9□ and ₀U IL as - □.9□

Set H-r C as 5.00 and L-r C as 1.00 for the output of the po-factor transducer.

9If measured input is 1.0, it displays - 0.50. For 3V measured input, it displays 1.00 and for 5V, Output it displays 0.50. LEAD LAG oll IH value 0.90 E.g.3) When LEAD value is smaller than -0.90, LAG value is smaller than 0.90, and OUT1 is used, out it value -0.91

■ Measurement Input [PA 1 group : / n - r]



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

■ Display Cycle Delay [PA 2 group: d/ 5.₺]

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 $d \in S_1$ of parameter 2 group, the operator can adjust the display time within a range of 0.1 sec to S 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).

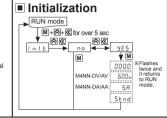
■ Zero adjustment range : -99 to 99

■ Zero adjustment method : Press

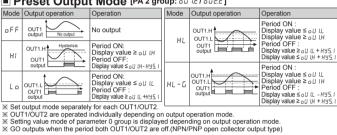
in RUN mode for 3 sec.

0.15 for 3 sec 0.00 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 nbb.

※ If zero adjustment range is exceeded, the error [ouEr] flashes twice and then move to RUN mode, maintaining previous setting value.



■ Preset Output Mode [PA 2 group: all lt / all 2.t.]



Parameter 0 Group Parameter 2 Group ► RUN mode ► RUN mode M 3 sec ↓ M 4 sec PR2 ▼M all IH High-limit preset value of all LE M It is not displayed when OUT1/2 preset output mode [oU lt, oU∂t] of parameter 2 group is oFF. Set range: Refer to ■ Input type and range. Low-limit preset value of a U LE Preset output mode _ M Set range: 10% F.S
Preset hysteresis of ¬Not dienland oUZH High-limit preset value of oUZŁ Set range: 10% FS

HYS I OUT1

OUT1

Preset hysteresis of Not displayed when preset output mode [o[U It. out2 k] of parameter 1 group is set as oFF. M White Monitoring delay time
PELE Set range: 00 to 30 sec

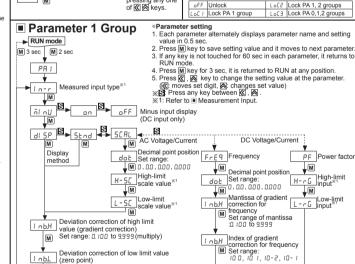
↓ M
d! SL
Set range: 0.1 to 5.0 sec
(selectable by 0.1 sec)
LoC
Set range: oFF, LoC | LoC2 LoC3

Est lublex

Set lublex

LoC | LoC | LoC4 PA 1.2 groups If monitoring delay time [PELL] of parameter 2 group is set as 00 sec [0 0 5], these are not displayed.

※ It is initialized by LPEŁ Displays low peak _



(zero point)
Set range: - 99 to 99 Factory Default X1: Not displayed for indicator model. Parameters M4NN-DV M4NN-DA M4NN-AV M4NN-AA ers M4NN-DV M4NN-DA M4NN-AV M4NN-AA Type ou II * 1 600 5.00 600.0

ou IL * 1 600 5.00 600.0

ou IL * 1 600 5.00 600.0 500u SR 600u SR Stnd 600 500 600 5000 -600 -500 0 0 1000 1000 1000 oFF 00 00 00 5 2 group)

Cautions during Use

I. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.

2. 5-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.

3. Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.

4. Keep away from high voltage lines or power lines to prevent inductive noise.

In case installing power line and input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise.

5. This unit may be used in the following environments. Earth ground

(in the environment condition rated in 'Specifications')
②Altitude max. 2,000m
③Pollution degree 2
④Installation category II

Major Products

| In Major Frooucts | Temperature Controllers | Photoelectric Sensors | Temperature/Humidity Transducers | Door Sensors | SSRs/Power Controllers | Door Side Sensors | Counters | Counters | Proximity Sensors | Proximity Sensors | Pressure Sensors | Pressure Sensors | Pressure Sensors | Display Units |

aphic/Logic Panels eld Network Devices ser Marking System (Fiber, Co₂, Nd: YAG) ser Welding/Cutting System

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