Autonics

PANEL METER
MT4N SERIES
M A N U A L

Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

■ Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;
⚠ Warning Serious injury may result if instructions are not followed.
⚠ Caution Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.
⚠Caution: Injury or danger may occur under special conditions.

⚠ Warning

1. **In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.**
   It may cause a fire, human injury or damage to property.
2. **It must be mounted on the panel.**
   It may cause electric shock.
3. **Do not connect, inspect or repair terminals when it is power on.**
   It may cause electric shock.
4. **Do not disassemble or modify this unit. Please contact us if it is required.**
   It may cause a fire or electric shock.
5. **Please check the number of terminal when connecting power or measured input.**
   It may cause a fire.

⚠ Caution

1. **This unit shall not be used outdoors.**
   It might shorten the life cycle of the product or cause electric shock.
   Use this product indoors only. Do not use the product outdoors or at locations subject to the temperatures or humidity outside.(Example: rain, dirty, frost, sunlight, condensation, etc.)
2. **When connecting wire, AWG20(0.50mm²) should be used and tighten screw bolt on terminal block with 0.74N·m to 0.90N·m strength.**
   It may cause a malfunction or a fire due to contact failure.
3. **Please observe the rated specification.**
   It might shorten the life cycle of the product and cause a fire.
4. **Do not use beyond of the rated switching capacity of relay contact.**
   It may cause insulation failure, contact melt, contact failure, relay broken and fire etc.
5. **In cleaning the unit, do not use water or an organic solvent. And use dry cloth.**
   It may cause a fire and give an electric shock.
6. **Do not use this unit in place where flammable or explosive gas, humidity, direct ray of the light, radiant heat, vibration or impact, etc. exists.**
   It may cause a fire or explosion.
7. **Do not inflow dust or wire dregs into the unit.**
   It may cause a fire or mechanical malfunction.
8. **Please wire properly after checking the polarity of measurement terminals.**
   It may cause a fire or explosion.

■ Ordering information

MT 4 N – DV – E N

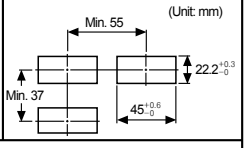
Control output	N: Without output function 0: Relay output(2 points) 1: NPN Open collector output(OUT1,GO,OUT2) 2: PNP Open collector output(OUT1,GO,OUT2) 3: Relay(OUT1)+PV transmission(DC4-20mA)output 4: Relay(OUT2)+RS485 communication output
Power supply	E: 12-24VDC/AC 4: 100-240VAC
Input	DV: DC Volt DA: DC Ampere AV: AC Volt AA: AC Ampere
Size	N: DIN W48×H24mm
Digit	4: 9999(4 Digit)
Item	MT: Multi Meter

■ Front panel identification

① OUT1 : Preset output of OUT1
② GO : Preset Go output of OUT1/OUT2
③ OUT2: Preset output of OUT2
④ MODE: MODE key
⑤ : Shift key ⑧ mV, V unit
⑥ : Down key ⑨ mA, A unit
⑦ : Up key ⑩ Hz unit

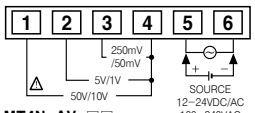
■ Panel cut-out

(Unit: mm)

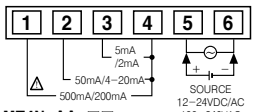


■ Terminal connection

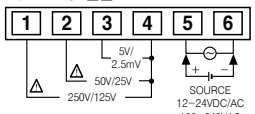
- **MT4N-DV-□□**



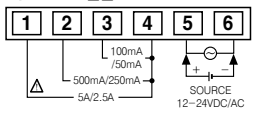
- **MT4N-DA-□□**



- **MT4N-AV-□□**

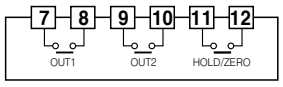


- **MT4N-AA-□□**

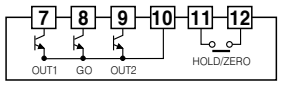


〈Option〉

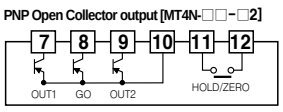
- **Relay output [MT4N-□□-□0]**



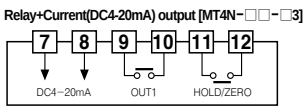
- **NPN Open Collector output [MT4N-□□-□1]**



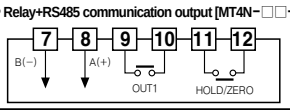
- **PNP Open Collector output [MT4N-□□-□2]**



- **Relay+Current(DC4-20mA) output [MT4N-□□-□3]**

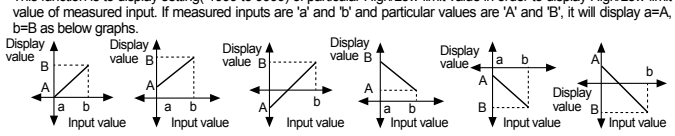


- **Relay+RS485 communication output [MT4N-□□-□4]**



■ Prescale function [PA1: H-SC / L-SC]

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



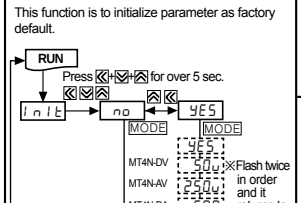
■ Error display function

Display	Description
HHHH	Flashes when measured input is exceeded the max.allowable input(110%)
LLLL	Flashes when measured input is exceeded the min.allowable input(–10%)
d-HH	Flashes when display input is exceeded H-SC setting value
d-LL	Flashes when display input is exceeded L-SC setting value
F-HH	Flashes when input frequency is exceeded the max. display value of measured range
ouEr	Flashes when it exceeds zero range(±99)

※ Zero adjusting error is returning to measurement mode after [ouEr] flashes twice.
※ Refer to "■ AC frequency measured function" for frequency measured range.

■ Initialization function

This function is to initialize parameter as factory default.



■ Display cycle delay function [PA2: dI SP]

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 dI SP of parameter 2, 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 displayed will be the average input value over 4 sec. and also will show any changes if any every 4 sec.

■ Startup compensation timer function [PA2: StAt]

This time function limits the operation of an output until the measured input(overvoltage or inrush current) is stable at moment of power on. All outputs are off during startup compensation time setting after power is applied.
Setting range: 00.0 to 99.9 (Unit: sec.) Factory default: 00.0

■ User manual for communication

Visit our website (**www.autonics.com**) to download the user manual for communication of MT series.

※ **The above specifications are subject to change without notice.**

■ Specifications

Model	MT4N	
Power supply	12–24 VDC/AC	100–240 VAC
Power consumption	DC: 3W, AC: 5VA	5VA
Display method	7 Segment LCD Display, Character height: 9mm	
Display accuracy	23℃ ± 5℃ ☞ DC Type: F.S.±0.1% rdg±2digit / AC Type: F.S.±0.3% rdg±3digit DC/AC Type: Within F.S.±0.3% rdg±3digit only for Current 5A terminal –10℃ to 50℃ ☞ DC/AC Type: F.S.±0.5% rdg±3digit	
Input specification	DC Voltage/Current, AC Voltage/Current, AC Frequency	
Max. allowable input	110% F.S. for each measured input range	
A/D conversion method	Practical oversampling using successive approximation ADC	
Sampling cycle	50ms(DC), 16.6ms(AC)	
Max. display range	–1999 to 9999(4 Digit)	
Preset output	• Relay output ☞ Contact capacity: 125VAC 0.3A, 30VDC 1A/Contact composition: N.O(1a) • NPN/PNP Open Collector output ☞ 12–24VDC ±2V 50mA Max.(Load resistance)	
Sub output (Transmission output)	• RS485 communication output ☞ Baud rate: 1200/2400/4800/9600, Communication method: 2–wire half duplex, Synchronous method: Sub–synchronization, Protocol: Modbus type • DC4–20mA output ☞ Resolution: 12,000 division(Load resistance max. 600Ω)	
AC measurement function	Selectable RMS or AVG	
Frequency measurement function	Measurement range: 0.100 to 9999Hz (Differ according to decimal point position)	
Hold function※1	Includes(Outer hold function)	
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Dielectric strength	1000VAC for 1 minute (Between external terminal and case)	2000VAC for 1 minute (Between external terminal and case)
Noise strength	±2kV the square wave noise(pulse width: 1㎲) by the noise simulator	
Vibration – Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z direction for 2 hours	
Vibration – Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z direction for 10 minutes	
Shock – Mechanical	100m/s²(Approx. 10G) in X, Y, Z directions for 3 times	
Shock – Malfunction	300m/s²(Approx. 30G) in X, Y, Z directions for 3 times	
Environment – Ambient temperature	–10 to 50℃, Storage: –20 to 60℃	
Environment – Storage humidity	35 to 85%RH, Storage: 35 to 85%RH	
Insulation type	Double insulation or reinforced insulation (Dielectric strength between the measuring input part and the power part : 1kV)	
Approval	CE	–
Unit weight	Approx. 64g	

※ 1 : The indicator has no Hold function.
※ Environment resistance is rated at no freezing or condensation.

■ Specification of measured input and range [PA1: In-r]

Type	Measured input and range		Input impedance	Display range [Stnd]	Prescale Display range [SCAL]
DC Volt	0-50V	[50V]	434.35kΩ	0.00 to 50.00(Fixed)	
	0-10V	[10V]	434.35kΩ	0.00 to 10.00(Fixed)	
	0-5V	[5V]	43.35kΩ	0.000 to 5.000(Fixed)	
	0-1V	[1V]	43.35kΩ	0.000 to 1.000(Fixed)	
	0-250mV	[250mV]	2.15kΩ	0.0 to 250.0(Fixed)	
	0-50mV	[50mV]	2.15kΩ	0.00 to 50.00(Fixed)	
DC Ampere	0-500mA	[500mA]	0.1Ω	0.0 to 500.0(Fixed)	
	0-200mA	[200mA]	0.1Ω	0.0 to 200.0(Fixed)	
	0-50mA	[50mA]	1.1Ω	0.00 to 50.00(Fixed)	
	4-20mA	[4-20mA]	1.1Ω	4.00 to 20.00(Fixed)	
	0-5mA	[5mA]	11.1Ω	0.000 to 5.000(Fixed)	
	0-2mA	[2mA]	11.1Ω	0.000 to 2.000(Fixed)	
AC Volt	0-250V	[250V]	1.109MΩ	0.0 to 250.0(Fixed)	
	0-125V	[125V]	1.109MΩ	0.0 to 125.0(Fixed)	
	0-50V	[50V]	222MΩ	0.00 to 50.00(Fixed)	
	0-25V	[25V]	222MΩ	0.00 to 25.00(Fixed)	
	0-5V	[5V]	22MΩ	0.000 to 5.000(Fixed)	
	0-2.5V	[2.5V]	22MΩ	0.000 to 2.500(Fixed)	
AC Ampere	0-5A	[5A]	0.01Ω	0.000 to 5.000(Fixed)	
	0-2.5A	[2.5A]	0.01Ω	0.000 to 2.500(Fixed)	
	0-500mA	[500mA]	0.1Ω	0.0 to 500.0(Fixed)	
	0-250mA	[250mA]	0.1Ω	0.0 to 250.0(Fixed)	
	0-100mA	[100mA]	0.5Ω	0.0 to 100.0(Fixed)	
	0-50mA	[50mA]	0.5Ω	0.00 to 50.00(Fixed)	

dot	Display range
0	-1999 to 9999
0.0	-199.9 to 999.9
0.00	-19.99 to 99.99
0.000	-1.999 to 9.999

(Display range is variable according to decimal point position.)

※Please wire the proper terminal to its max. input within 30 to 100% of the input terminal.
When it is higher than input, it may cause terminal breakdown and over display range. The accuracy is decreased when it is connected to the terminal under 30%.

■ Monitoring max./min. display value function

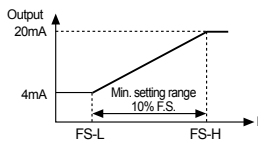
[PA 0: H.PEU / L.PEU, PA 2: PEUt]

It monitors max./min. value of display value based on the current displays value and then displays the data at H.PEU, L.PEU of parameter 0. Set the delay time(0 to 30 sec.) at PEUt of parameter 2 in order to prevent malfunction caused by initial overcurrent or overvoltage, when monitoring the peak value. Delay time is 0 to 30 sec. and it starts to monitor the peak value after the set time.When pressing any one of keys at H.PEU, L.PEU of parameter 0, the monitored data is initialized.
※Monitoring function is not indicate when the delay time is set as "00 S" at PEUt of parameter 2.

■ Current output(DC4-20mA) Scale adjustment function

[PA 2 : FS-H/FS-L]

It sets current output for the display value at the output current DC 4-20mA.
It sets display value for 4mA at FS-L and 20mA at FS-H and the range between FS-H and FS-L should be 10% F.S.(When it sets as under 10% F.S., it changed as over 10% F.S. automatically.)Preset display value is fixed to output as 4mA at under FS-L and 20mA at over FS-H.



■ AC frequency measurement function [PA 1: dI SP]

It measures input signal frequency when it is AC input.
It uses fixed decimal point[PA1: dot], measured range can be changed by setting and measured range of decimal point position is as below chart. It is available to adjust the upper gradient at [PA 1: InbH] and [PA 1: InbE]. 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.

①Measured 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

※ Accuracy of frequency measurement :
Below 1kHz, F.S. ±0.1rdg ±2digit.
From 1kHz to 10kHz, F.S. ±0.3rdg ±2digit.

② InbH: 0.100 to 9.999(Gradient adjustment of high value)
③ InbE: 10^{-2}, 10^{-1}, 10^{0}, 10^{1} (Index adjustment of InbH)

■ Error correction function

[PA 1: InbH/InbL]

It corrects display value error of measured input.
InbL :±99 (Adjust deviation of low value)
InbH: 5.000 to 0.100(Correct gradient(%) of high value)
Display value=(Measured value × InbH) + InbL
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 the InbL value to display "0.0" by adjusting the offset of the low value.
The display value to the 500V measured input varies by adjusting the offset of the low value. If this display value is "501.0", calculate 500.0/501.0 (the desired display value/ the display value), and set the 0.998 correction value as the InbH to display "500.0" by adjusting the gradient of the high value.

※ The offset correction range of InbL is within -99 to +99 regardless of dot .

■ Zero adjustment function

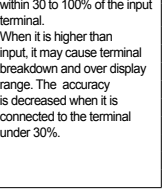
It adjusts the display value of the optional configured input value as zero by force, zero point error can be adjusted with 3 ways as below.
When zero point adjustment with front key and Hold terminal is finished normally, zero point of measurement terminal is displayed and the adjusted value at saved in InbL automatically.

Operation	Input correction value	Front key	Input external signal
Description	PA1: Direct input correction value method at InbL	Press both , keys for 3 sec. at the RUN mode.	Short-circuit external Hold terminal no.11, 12 over min.50m. ※It is enable to use in option mode.

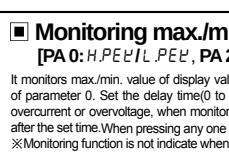
※Refer to description "■ Error correction function, ■ Error display function, ■ Parameter 2" for function and error.

■ Gradient correction function [PA 1 : InbH]

It corrects the gradient of prescale value and display value.
(Figure 1)Display value Y can be adjusted as α, β times against X input value by correction function [INB.H] and used as correction function of max. display value [H-SC]. Adjustment range is 0.100 to 5.000 and multiply current gradient.



Ex) To display "3.000" in DC 200mV input for measured input specification as 0 to 1V,
①Select 0-1VDC for measured input in Parameter 1.
②Standard specification in input: 0-1VDC and 1.000 therefore it has to be 15.000(H-SC) for 1VDC(Input) in order to display 3.000 for 200mVDC(input).
But it is unable due to setting range is 9.999.
③In this case, please check below chart. Please set as InbH×H-SC = 15.000



Setting method	H-SC	L-SC	InbH	Note
①	Unavailable	0.000	1.000	-
②	7.500	0.000	2.000	In this case, any setting methods display the same display value.
③	5.000	0.000	3.000	
④	3.750	0.000	4.000	
⑤	3.000	0.000	5.000	

■ Preset output mode [PA2: oU1t / oU2t]

Mode	Output operation	Operation
oFF	OUT1 output (No output)	No output
HI	OUT1.H, OUT1 output (Hysterisis)	Period ON: Display value≥OUT1.H Period OFF: Display value≤OUT1.H–Hys
Lo	OUT1.L, OUT1 output	Period ON: Display value≤OUT1.L Period OFF: Display value≥OUT1.L+HYS
HL	OUT1.H, OUT1.L, OUT1 output	Period ON: Display value≤OUT1.L or Display value≥OUT1.H Period OFF: Display value≥OUT.L+Hys or Display value≤OUT.H+Hys
HL-G	OUT1.H, OUT1.L, OUT1 output	Period ON: OUT1.L≤Display value≤OUT1.H+Hys Period OFF: Display value≤OUT.L+Hys or Display value≥OUT.H+Hys

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

■ Parameter

Parameter	Display	Function	Note
PA1 (Parameter 1)	In-t Input type	Selectable RMS/AVG in AC type	Available AC type only.
	In-r Input range	Selection of input range	-
	dI SP Display	Selection of display type	Selectable: Stnd/SCAL/FrE9
	Stnd Standard	Standard scale range	Display max. display value of Stnd
	FrE9 Frequency	Frequency display	Available AC type only.
	SCAL Scale	Scale range	These are displayed at SCAL only . It sets max/min. display value(-1999 to 9999).
	H-SC High scale	Set max. value of display range	
	L-SC Low scale	Set min. value of display range	
	dot Dot	Set decimal point position	It is displayed in SCAL/FrE9 only and set the position.
	d-Unt Display unit lamp	Set display unit	Set range: mV / V / mA / A / Hz / off
	InbH Input bias high	Correct High-limit gradient of display value	Stnd/SCAL : Correction range: 0.100 to 5.000 FrE9: Correction range: 0.100 to 9.999
	InbL Input bias low	Correct Low-limit gradient of display value	Set range:-99 to +99
	InbE Input bias exponent	Set display index of frequency mode	Set range: 10^{-2}/10^{-1}/10^{0}/10^{1}
PA2 (Parameter 2)	oU1t Out1 type	Select output mode of OUT1	Selectable oFF/ HI/Lo/ HL/ HL-G
	oU2t Out2 type	Select output mode of OUT2	Selectable oFF/ HI/Lo/ HL/ HL-G
	HYS.1 Out1 hysteresis	Select hysteresis of OUT1	Within 1 to F.S. 10%(Variable depending on set of input range and prescale.)
	HYS.2 Out2 hysteresis	Select hysteresis of OUT2	
	StAt Startup compensation time	Set startup compensation time	Set range: 0.0 to 99.9 sec.
	PEUt Peak time	Set monitoring delay time for peak value(sec)	Set range: 00 to 30 sec.
	dI St Display time	Set sampling time(sec)	0.1 to 5.0 sec.(Variable by 0.1 sec.)
	Colr Color	Select color	rEd / Grn / YEL / r-G / G-r
	ZEro Zero key	Set usage of front side zero adjustment key	no: Not use front side zero adjustment key YES: Use of front side zero adjustment key
	Euin Event input	Set external terminal(11, 12) function	Hold: Use external terminal as Hold terminal ZEro: Use external terminal as zero point adjustment terminal
	FS-H Full scale high	Set High-limit value output position of PV output	Min. set range: Min. 10% F.S.
	FS-L Full scale low	Set Low-limit value output position of PV output	Max. set range: Max. FS-H 10%
	AdrS Address	Set communication address	Set range : 01 to 99
	bPS Bit per second	Set baud rate(bps)	Selectable 1200/2400/4800/9600
	PrtY Parity bit	Set parity bit	Selectable nonE/EuEn/odd
	StP Stop bit	Set stop bit	Selectable 1/2
	rSbt Response wating time	Set response wating time	Set range : 5 to 99
	LoC Lock	Enable lock status	Selectable oFF/LoC1/LoC2/LoC3
PA0 (Parameter 0)	oU1H OUT1 high preset	Set value of OUT1 High-limit output	Set the range within display range of Stnd/SCAL. For MT4N-DV/DA Type, set range of oU1.H/oU2.H and oU1L/oU2.L is within -5 to 110%.
	oU1L OUT1 low preset	Set value of OUT1 Low-limit output	
	oU2H OUT2 high preset	Set value of OUT2 High-limit output	
	oU2L OUT2 low preset	Set value of OUT2 Low-limit output	
	H.PEU High peak	Max. value by data monitoring	Initializes the monitored data value by pressing any one of keys.
	L.PEU Low peak	Min. value by data monitoring	

■ Parameter setting

RUN → MODE key 2 sec. → PA1 → MODE key 2 sec. → PA2

※ Press MODE key for 2 sec. in RUN mode, [PA1](Parameter 1) is displayed.
※ Press MODE key for 4 sec. in RUN mode, [PA2] is displayed after [PA1].
When pressing MODE key continually, it stops displaying at [PA2].
※ It is advanced to current display parameter releasing MODE key at [PA1] or [PA2].
※ Press MODE key for 3 sec., it is returned to RUN at any position.
※ If any key is not touched for 60 sec. in each parameter, it returns to RUN mode.
※ After return to RUN mode, press MODE key within 2 sec., it returns to previous parameter. (Refer to the below descriptions for set parameter.)

■ Change the parameter setting value

1. Advance to the parameter to be changed when pressing MODE key continuously in RUN mode and releasing MODE key at the parameter.(Refer to "■ Parameter setting")
2. When pressing MODE key in each parameter, the initial mode of the parameter is displayed.(Refer to the description of each parameter.)
3. When pressing one of , , keys in display mode, the saved setting value is displayed.

Ex) Mode In-r (Press one) ⇄ Setting value 250u — The saved setting value flashes every 0.5 sec.

4. Change the setting value by or key when setting value flashes.

Ex) Change AC type measured input from 250V to 125V.

Mode In-r (Press one) → Setting value 250u → Setting value 125u → MODE → dI SP

5. When confirming the setting value with MODE key , the changed setting value flashes twice and enters into the next setting.
6. It returns RUN mode from parameter by pressing MODE key for 3 sec.

■ Parameter 0

RUN → MODE
- oU1.H — Set preset High-limit value of oU1.t. (It is not displayed when oU1.t mode value of PA2 is oFF.) ※Change the value by keys.
- oU1.L — Set preset Low-limit value of oU1.t. (It is not displayed when oU1.t mode value of PA2 is oFF.) ※Change the value by keys.
- oU2.H — Set preset High-limit value of oU2.t. (It is not displayed when oU2.t mode value of PA2 is oFF.) ※Change the value by keys.
- oU2.L — Set preset Low-limit value of oU2.t. (It is not displayed when oU2.t mode value of PA2 is oFF.) ※Change the value by keys.
- H.PEU — It displays Max. monitoring value (High peak) in RUN mode. It is initialized by pressing any one of keys.
- L.PEU — It displays Min. monitoring value(Low peak) in RUN mode. It is initialized by pressing any one of keys.

※ If PEUt monitoring delay time of Parameter2 is set as "00 S", H.PEU and L.PEU are not displayed.

■ Parameter 1

PA1 → MODE → In-r — Select measured input specification. (Refer to "■ Specification of measured input and range".)
MODE → dI SP — Set display type for measured input. Setting type is Stnd ↔ SCAL ↔ FrE9. FrE9 is only available for AC type.
MODE → In-t — Select measurement method when it is AC input. Selectable rmS ↔ AVG

<Measured input specification for each model>

Model	Measured input range
MT4N-DV	50V ⇄ 10V ⇄ 5V ⇄ 1V ⇄ 250mV ⇄ 50mV ⇄ 50V
MT4N-DA	500mA ⇄ 200mA ⇄ 50mA ⇄ 4-20mA ⇄ 5mA ⇄ 2mA ⇄ 500mA
MT4N-AV	250V ⇄ 125V ⇄ 50V ⇄ 25V ⇄ 5V ⇄ 2.5V ⇄ 250V
MT4N-AA	5A ⇄ 2.5A ⇄ 500mA ⇄ 250mA ⇄ 100mA ⇄ 50mA ⇄ 5A

MODE → Stnd — It shows max. display value of standard specification. Display value is fixed.

When dI SP is Stnd:
- dot — Set decimal point position. 0↔0.0↔0.00↔0.000
- H-SC — Set display value for max. input of measured input.
- L-SC — Set display value for min. input of measured input.
- d.Unt — Set display unit. Set range:mV/V/mA/A/Hz/off
- InbH — Adjust High-limit display value gradient for max. input. Set range: 0. 100 to 5.000
- InbL — Adjust Low-limit display value deviation for min. input. Set range: -99 to 99

When dI SP is SCAL:
- dot — Set decimal point position. 0↔0.0↔0.00↔0.000
- H-SC — Set display value for max. input of measured input.
- L-SC — Set display value for min. input of measured input.
- d.Unt — Set display unit. Set range:mV/V/mA/A/Hz/off
- InbH — Adjust High-limit display value gradient for max. input. Set range : 0. 100 to 9.999
- InbL — Adjust Low-limit display value deviation for min. input. Set range: -99 to 99
- InbE — Set index for frequency display. Set range : 10-2↔10-1 ↔10-0↔10 1

When dI SP is FrE9:
- dot — Set frequency measured range. (Refer to "■ AC frequency measurementfunction" .)
- InbH — Adjust High-limit display value gradient for max. input. Set range : 0. 100 to 9.999
- InbL — Adjust Low-limit display value deviation for min. input. Set range: -99 to 99
- InbE — Set index for frequency display. Set range : 10-2↔10-1 ↔10-0↔10 1

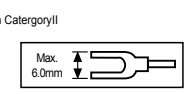
■ Parameter 2

PA2 →
- oU1E — Select Preset output mode of OUT1. Selectable : oFF↔HI↔Lo↔HL↔HL-G But, it is only displayed in OUT1 output included model.
- oU2E — Select Preset output mode of OUT2 as oFF↔HI↔Lo↔HL↔HL-G But, it is only displayed in OUT2 output included model.
- HYS.1 — Set Preset hysteresis of OUT1 within 10% of F.S. But, it is not displayed when oU1t mode is oFF.
- HYS.2 — Set Preset hysteresis of OUT2 within 10% of F.S. But, it is not displayed when oU2t mode is oFF.
- StAt — Set startup compensation time. Set range : 0.0 to 99.9 sec.
- PEUt — Set monitoring delay time. Set range : 00 to 30 sec.
- dI St — Set display period and also variable sets by 0.1 sec. Set range : 0.1 to 5.0 sec.
- Colr — Select color with 5 modes. rEd↔Grn↔YEL↔r-G↔G-r rEd,Grn,YEL : Displays with 1 color. r-G,G-r : Color is changed when error occurs. Ex) r-G : Red is standard and green when error occurs. ※ Color is changed only when error in "■ Error display function" occurs excluding 'over'.
- ZEro — Enable zero adjustment by front key operation to select YES. Press both keys at the same time for 3 sec. The deviation value is saved at InbL automatically.
- Euin — Select either hold input by terminal 11, 12 or zero set by external signal. *Hold : Display value holding, *ZEro: Zero adjustment by hold terminal.
- FS-H — Set High-limit value of DC 20mA output position of PV output. ※When changing input range and prescale mode, the setting values of FS-H and FS-L are changed automatically as max/min. value of input range.
- FS-L — Set Low-limit value for DC 4mA output position of PV output.
- AdrS — Set address of RS485 communication output. Set range : 01 to 99
- bPS — Set baud rate of RS485 communication output . Selectable : 9600↔4800↔2400↔1200
- PrtY — Set parity bit of RS485 communication. Selectable : nonE/EuEn/odd
- StP — Set stop bit of RS485 communication. Selectable : 1/2
- rSnt — Set response waiting time of RS485 communication. Set range: 5 to 99
- LoC — Set key lock function and select from 4 kinds. Selectable oFF↔LoC1↔LoC2↔LoC3↔oFF

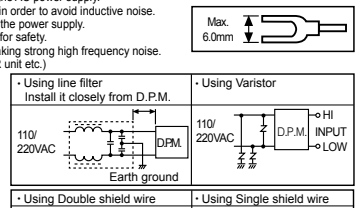
oFF	No key Lock fundion	LoC2	Parameter 1,2 lock
LoC1	Parameter 1 lock	LoC3	Parameter 0,1,2 lock

■ Caution for using

1. Allowable installation environment
   ①If shall be used indoor ②Altitude Max. 2000m ③Pollution Degree 2 ④Installation CatergoryII
2. Please use the terminal(M3.5, Max.6.0mm) when connectting the AC power supply.
3. Please use separated line from high voltage line or power line in order to avoid inductive noise.
4. Please install power switch or circuit breaker in order to cut off the power supply.
5. The switch or circuit breaker should be installed near by users for safety.
6. Be sure to avoid using the following unit near by machinery making strong high frequency noise. (High frequency welder & Sewing machine, High capacity SCR unit etc.)



7. When input is applied, if "HHHH " or "LLLL " is displayed, there is some problem with measured input, please check the line after power off.
8. Noise inflowing from power line can cause serious problem for D.P.M.(Digital Panel Meter) driving by AC power supply. Even though there is condenser for protecting noise between lines at primary side of power transformer, but it is very difficult to install protection components at small size product like D.P.M. Therefore, please use noise absorber circuit such as line filter, varistor in external lines when voltage failure occurs by power relay, magnet S/W and high frequency equipment are operated in same line or surge occurs by spark of high voltage or thunder etc.
9. Input line: Shield wire must be used when the measuring input line is getting longer in the place occurring lots of noise.



※**It may cause malfunction if above instructions are not followed.**

■ Main products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Rotary encoders
- Sensor controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Power controllers
- Graphic/Logic panels
- Temperature controllers

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