Autonics

PANEL METER MT4Y SERIES

(Ec PL us



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

Caution for your safety

 $\ensuremath{\mathbb{X}}\xspace$ Please keep these instructions and review them before using this unit.

se observe the cautions that follow;

A Warning Serious injury may result if instructions are not followed.

A 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.

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 properly, it is required to install fail-safe device.

It must be mounted on the Panel.

It must be mounted on the Panel.

- It must be mounted on the Panel.
 It may cause electric shock.
 Do not connect, inspect and repair terminals when it is power on.
 It may cause electric shock.
 Do not disassemble and modify this unit. Please contact us if it is required.
 It may cause electric shock and a fire.
 Please check the number of terminal when connecting power line or measured input.
 It may cause a fire.

▲ Caution

I. 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.

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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 organic solvent. And use dry cloth. It might cause an electric shock or a fire.

6. Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray the sun,

to not use this unit in place where there are radiant heat, vibration and impact etc. It may cause a fire or explosion.

 Do not inflow dust or wire dregs into the unit.

It may cause a fire or mechanical malfunction.

8. Please connect properly after checking the polarity of measurement terminals It may cause a fire or explosion.



1 HI: High output indication of preset 1. Hr. High output indication of preset
-6. ② GO: Go output indication of preset
③ LO: Low output indication of preset
④ MODE: Mode Key
⑤ 图 ② Control key
⑥ Unit label part

•MT4Y - DA - 4

•MT4Y - AA - 4

■ Panel cut-out Min. 91 31.5-0 68-07

1 2 3 4 5 6 7

1 2 3 4 5 6 7

100mA/50mA -500mA/250mA-

•NPN open collector output [MT4Y - - - 41]

8-9-10-11-12-13

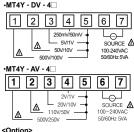
•Relay+Current(DC4-20mA) output [MT4Y - - - 43]

SOURCE ▲ 100-240VAC 50/60Hz 5VA

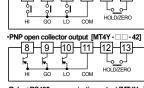
— 5A/2A

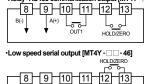
(Unit mm)

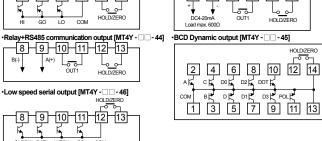
*There are no 1, 2, 3 output indication in Indicator type ■ Terminal connection



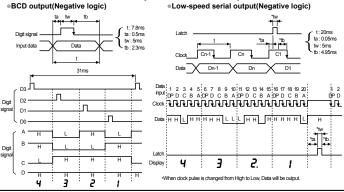
SOURCE A 100-240VAC 50/60Hz 5VA •Relay output [MT4Y - . . . 40] 8 9 10 11 12 13





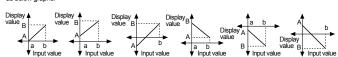


■ Time chart of serial output and BCD output



■ Prescale function[PA 1: 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 measured input. If measured inputs are 'a' or 'b' and particular values are 'A' or 'B', it will display a=A, b=B as below graphs.



Error display function

Display	Description	
нннн	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-5E setting value	
d-LL	Flashes when display input is exceeded L - 5C setting value	
F-HH	Flashes when input frequency is exceeded the max. display value of measurement range	
ouEr	Flashes when it exceeds zero range (±99)	

**After flashing " au E r " 2 times when it exceeds the zero range, it returns to RUN mode

■ Monitoring max./min. display value function

X"LLL" is displayed when the measured input is 4-20mA.

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*The above specifications are subject to change without notice.

Specifications MT4Y

Power consumption		5VA		
Display method		7Segment LED Display(Red)		
Display accuracy		23°C±5°C≠ DC Type: FS±0.1% rdg±2digit /AC Type: FS±0.3% rdg±3digit (Frequency: FS±0.1% rdg±2digit) FS ±0.3% rdg ±3digit max. only for 5A terminal10°C to 50°C≠ DC/AC Type: FS±0.5% rdg±3digit		
Input spe	cification	DC Voltage/Current, AC Voltage/Current, AC Frequency		
Max. allov	wable input	110% F.S. for each measured input range		
A/D conv	ersion method	Practical oversampling using successive approximation ADC		
Sampling	cyde	50ms (DC), 16.6ms (AC 60Hz)		
Max. indic	cation range	-1999 to 9999 (4Digit)		
Preset output		Relay output Contact capacity:250VAC 3A, 30VDC 3A/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: Asynchronous method, Protocol: Modbus type Serial/BCD output == NPN Open collector output, 12-24/VDC Max. 50mA/(Resistive load) DC4-20mA output == Resolution: 12,0000/vision (Load resistance max. 6000.), Response time:Max. 450ms		
AC measurement function		Selectable RMS or AVG		
Frequency measurement function		Measured range:0.100 to 9999Hz(Variable by decimal point position)		
Hold function*1		Includes(External hold function)		
Environ-	Ambient temperature	-10 to 50°C, Storage: -20 to 60°C		
ment	Ambient 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		(÷ . 41. ,		

X1: The indicator type has no Hold function. XEnvironment resistance is rated at no freezing or condensation

Approx. 134g

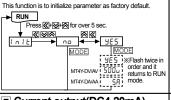
Unit weight

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

100-240VAC 50/60Hz (90 to 110% of rated voltage

Туре	Measured input and range		Input impedance	Display range [5End]	Prescale Display range [5[RL]	
DC Volt	0-500V	[500]	4.33315ΜΩ	0.0 to 500.0(Fixed)		
	0-100V	[100]	4.33315ΜΩ	0 .0 to 100.0(Fixed)	1	
	0-50V	[50]	433.15kΩ	0.00 to 50.00(Fixed)		
	0-10V	[100]	433.15kΩ	0.00 to 10.00(Fixed)	dot Display range	
DC VOIL	0-5V	[50]	43.15kΩ	0.000 to 5.000(Fixed)	0 -1999 to 9999	
	0-1V	[10]	43.15kΩ	0.000 to 1.000(Fixed)	0.0 -199.9 to 999.9	
	0-250mV	[0.25.0]	2.15kΩ	0.00 to 250.00(Fixed)	0.00 -19.99 to 99.99	
	0-50mV	[50ñu]	2.15kΩ	0.00 to 50.00(Fixed)	0.000 -1.999 to 9.999	
	0-5A	[58]	0.01Ω	0.000 to 5.000(Fixed)	(Display range is variable according to decimal point position.)	
	0-2A	[85]	0.01Ω	0.000 to 2.000(Fixed)		
	0-500mA	[0.5A]	0.1Ω	0.0 to 500.0(Fixed)		
DC	0-200mA	[85.0]	0.1Ω	0.0 to 200.0(Fixed)		
Ampere	0-50mA	[50AA]	1.0Ω	0.00 to 50.00(Fixed)	V Diana in the annual terminal te	
	4-20mA	[4-50]	1.0Ω	4.00 to 20.00(Fixed)	XPlease wire the proper terminal to its max. input within 30 to 100% of the input terminal.	
	0-5mA	[558]	10.0Ω	0.000 to 5.000(Fixed)		
	0-2mA	[865]	10.0Ω	0.000 to 2.000(Fixed)	When it is higher than input,	
	0-500V	[500]	4.987MΩ	0.0 to 500.0(Fixed)	it may cause terminal breakdown and over display range.	
	0-250V	[250]	4.987MΩ	0.0 to 250.0(Fixed)	The accuracy is decreased when it	
	0-110V	[110P]	1.087MΩ	0.0 to 440.0(Fixed)	is connected to the terminal under	
AC Volt	0-50V	[500]	1.087MΩ	0.00 to 50.00(Fixed)	30%.	
AC VOIL	0-20V	[200]	200kΩ	0.00 to 20.00(Fixed)		
	0-10V	[100]	200kΩ	0.00 to 10.00(Fixed)		
	0-2V	[20]	20kΩ	0.000 to 2.000(Fixed)	X 110P is standard specification	
	0-1V	[10]	20kΩ	0.000 to 1.000(Fixed)	440V/110VAC P.T.	
	0-5A	[58]	0.01Ω	0.000 to 5.000(Fixed)]	
AC Ampere	0-2.5A	[2.5A]	0.01Ω	0.000 to 2.500(Fixed)		
	0-1A	[18]	0.05Ω	0.000 to 1.000(Fixed)		
	0-500mA	[0.58]	0.1Ω	0.0 to 500.0(Fixed)		
	0-250mA	[0.258]	0.1Ω	0.0 to 250.0(Fixed)		
	0-100mA	[0. IA]	0.5Ω	0.0 to 100.0(Fixed)		
	0-50mA	[50AA]	0.5Ω	0.00 to 50.00(Fixed)		
■ Initialization function ■ Startup compensation timer						

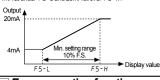
Initialization function



Current output(DC4-20mA) scale adjustment function

[PA 2: F5-H/F5-L]
ts current output for the display value at the output curren

DC 4-20mA. It sets display value for 4mA at F5-L and 20mA at F5-H and the range between F5-H and F5-L should be 10% F5.K/then it sets as under 10% F5.S, ich tanged as over 10% FS. automaticily). Preset display value is fixed to output as 4mA at under F5-L and 20mA at over F5-H.



■ Error correction function

EFTOY CORPECTION TUNCTION

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

It corrects display value error of measured input.

I nb L: ±99 (Adjust deviation of low value)

I nb H: 5000 to 1.010(Correct gradient(%) of high value)

Display value=(Measured value × I nb H) + I nb L

When the measured range is to 5500, and the display range is 0

to 500.0. If the low display value is "1.2" to 0V input set -12 as the

I nb L: value to display "20." by adjusting the offset of the low value.

The display value to the 500V measured input value) is "51 I.0" (calculate

500.06/51 (the desired display value) the display value), and set

the 0.998 correction value as the I nb H to display "500.0" by

adjusting the gradient of the high value.

X The offset correction range of I nb.L is within -99 to +99

This time function limits the operation of an output

function [PA 2: 5 L R . L]

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 supplied. Setting range: 00.0 to 99.9 (Unit: sec.)
Factory default: 00.0

■ AC frequency measurement function [PA 1: d/ 5P]

It measures input signal frequency when it is AC input. It uses fixed decimal point[PA1: do 5], measured range car 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: in b.H] and [PA 1: in b.E], 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.

per point of measurement terminal.				
Neasured range				
ecimal point osition				
leasurement inge			0.1 to 999.9Hz	1 to 9999Hz
Accuracy of frequency measurement: Below 1kHz, F.S.				

#Unrog #2digit. From 1kHz to 10kHz, F.S ② I nbH: 0.100 to 9.999 (Gradient adjustment of high value) ③ I nbE: 10°, 10°, 10°, 10° (Index adjustment of I nb.H)

Zero adjustment function

It adjusts the indication value of the optional configured input value as zero by force, zero point error can be adjusted with 3 ways as below.

When zero adjustment adjustment with front key and Hold terminal is finished normally, zero of measurement terminal is displayed and the adjusted value is saved at hold automatically.

Operation	value	Front key	signal	
Description		Press both (C), (S)	Short-circuit external Hold terminal no.12, 13 over min.50m.	
※Refer to description "■ Error correction function, ■ Error display function, ■ Parameter 2" for function and error.				

βTime

Input value

■ Gradient correction function [PA1: I nb.H]

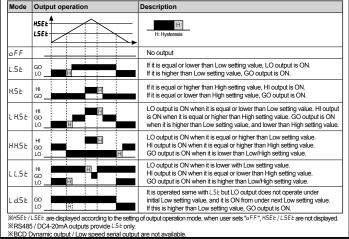
It corrects the gradient of prescale value and display value. (Figure 1)Display value Y can be adjusted as α , β times against X input value by correction function (1 - bA) and used as correction function of max. display value [H - SE]. Adjustment range is 0.100 to 5.000 and multiply current gradient.

Ex)Input:200mVDC, Display:3.000 for MT4Y-DV type | Select 0-1VDC for measured input in Parameter 1.
| Standard specification in input 0-1VDC and 1.000 therefore it has to be 15.000(H-5E) for 1VDC(Input) in order to display 3.000 for 200mVDC(Input).

But it is unable due to setting range is 9.999. In this case, please check below chart. Please set as I nb.H \times H-5 ℓ = 15.000

(Example of gradient correction) Setting method L-SE Inb.H Note 15.000 9.000 Unavailable 0.000 1.000 7.500 0.000 2.000 6.000 Display value for measured input | 5.000 | 0.000 | 3.000 | In this case, any setting methods | display the same display value. 3.000 0.000 5.000

■ Preset output mode [PA2: □UŁŁ]



■ Display cycle delay function [PA 2: df 5.b]

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 d¹ 5.½ 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.

Parameter	Display		Function	Note	
	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: 5End/5ERL/FrE9	
	Stnd	Standard	Standard scale range	Display max. display value of 5 End	
	FrE9	Frequency	Frequency display	Available AC type only.	
	SEAL	Scale	Scale range	There are disclosed at SSRs and the state of	
PB 1	H-SE	High scale	Set max. value of display range	These are displayed at 5ERL only . It sets max/min display value(-1999 to 9999).	
(Parameter 1)	L-5E	Low scale	Set min. value of display range	display value(=1999 to 9999).	
(Parameter 1)	dot Dot		Set decimal point position	It is displayed in 5[RL/FrE9 only and set the positio	
			Correct high-limit value of	5End/5[RL: Correction range: 0.100 to 5.000	
	l nb.H	Input bias high	display value	Fr E9: Correction range: 0.100 to 9.999	
	InbL	Input bias low	Correct low-limit value of display value	Set range:-99 to +99	
	I nb.E	Input bias exponent	Set display index of frequency mode	Set range: 10 ⁻² /10 ⁻¹ /10 ⁰ /10 ¹	
	oUt.t	Out type	Set operation mode of preset output	Selectable of f/LSE/HSE/LHSE/HHSE/LLSE/LdS	
	H95	Hysteresis	Set hysteresis value	Set range: 1 to 10% F.S.	
	SERE	Startup compensation time	Set startup compensation time	Set range: 0.0 to 99.9 sec.	
	PE L'.E	Peak time	Set monitoring delay time for peak value(sec)	Set range:00sec to 30sec	
	dl S.E	Display time	Set sampling time(sec.)	0.1 to 5.0 sec.(Variable by 0.1 sec.)	
	-Fro Zen	Zero key	Set usage of front side zero	no: Not use front side zero adjustment key	
	=cro	Zero key	adjustment key	보통5: Use of front side zero adjustment key	
PR2 (Parameter 2)	Euln	Event input	Set external terminal(12, 13) function	HoLd: Use external terminal as Hold terminal EFro: Use external terminal as zero point adjustment terminal	
	F5-H	Full scale high	Set the upper value output point or PV output	Min. set range: Min. 10% F.S.	
	F5-L	Full scale low	Set the lower value output point or PV output	Max. set range: Max. F5-н 10%	
	Adr5	Address	Set communication address	Set range : 01 to 99	
	6P5	Bit per second	Set baud rate(bps)	Selectable 1200/2400/4800/9600	
	PrEY	Parity bit	Set parity bit	Selectable nonE/EuEn / odd	
	SEP	Stop bit	Set stop bit	Selectable 1/ 2	
	r52.E	Response waiting time	Set response wating time	Set range : 5 to 99	
	LoC	Lock	Set lock function	Selectable off/Lo[1/Lo[2/Lo[3	
	H.SEE	High set	Set high setting value	Setting range can be set within the display rang	
PAO	L.SEE	Low set	Set low setting value	of Stad/SCAL	
(Parameter 0)	нРЕЦ	High peak	Max. value by data monitoring	Initializes the monitored data value by pressing a	
	LPEE	Low peak	Min. value by data monitoring	one of 🔣 🔀 keys.	

Parameter setting



**After returning to RUN mode, press MODE key within 2sec., it returns to [P A 1] or [P A 2 again.(Refer to the below each para setting description.)

Parameter 0 MODE HSEL MODE LSEE HPEL MODE

XIf PEYŁ monitoring delay time of Parameter 2 is set as "DD 5", HPEY and LPEY are not displayed. Set preset Low-limit value.
(It is not displayed when oULL mode value of PA2 is oFF)

Change the value with **E **E** **E*** **E***

It displays High-limit monitoring value (High peak) in RUN mode. It is initialized by pressing any one of keys. LPEY

It displays Low-limit monitoring value (Low peak) in RUN mode. It is initialized by pressing any one of
☑ ☑ keys.

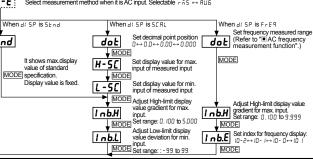
■ Parameter 1

Stnd

/n-r	Select measured input specification. (Refer to " Specification of measured input and range".)
d I SP	Set display type for measured input. Setting type is 5End ↔5ERL ↔FrE9 FrE9 is only available for AC type.

Item Range of measured input MT4Y-DV 500u \$\frac{100u}{250u}\$\frac{10u}{250u}\$\frac{10u}{25 MT4Y-DA 58=28=20.58=20.28=25058=24-20=2558=258=258 MT4YAV 5000225002110P(\(\dagge)\)2500220021002202102500. MT4Y-AA 5R-⊋2.5R-⊋1R-⊋0.5R-⊋0.25R-⊋0.1R-⊋507.R-⊋5R

I n-L Select measurement method when it is AC input. Selectable r n̄ 5 ↔ RUE



■ Parameter 2

u	i didiliotoi z					
	► oUŁŁ	Select Preset output mode. Selectable: oFF⇔L5E↔H5E↔LH5E↔LL5E↔Ld5E↔oFF				
	MODE	Refer to "Preset output mode."				
		Set preset hysteresis within 10% of F.S. But, it is not displayed when <code>oUE.E</code> mode is <code>oFF</code> .				

Set startup compensation time. Set range: 0.0 to 99.9 sec. PEY.L Set monitoring delay time. Set range : 00 to 30sec.

Set display period and also variable sets by 0.1sec. within 0.1 to 5.0sec.

Select either hold input by No. 12, 13 terminal or zero point setting by external signal.

MODE

Select either hold input by No. 12, 13 terminal or zero point setting by external signal.

MODE

SEro: Zero point adjustment by hold terminal.

Set high-limit value for DC20mA output position of PV output.

*When changing input range and prescale mode, the setting value of F5-H, F5-L are changed automatically as max. and min. value input range. F5-L Set low-limit value for the DC4mA output position of PV output.

Rdr5 Set address of RS485 communication output. Set range : 01 to 99 Select baud rate of RS485 communication output.
Selectable 9600 ↔ 4800 ↔ 2400 ↔ 1200 Select parity bit of RS485 communication.
Selectable nanE / EuEn / add

MODE

↓ MODE Set response waiting time of RS485 communication Set range: 5 to 99 oFF No key lock function LoC2 Parameter 1, 2 lock LoC1 Parameter 1 lock LoC3 Parameter 0, 1, 2 lock

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")

When pressing MODE key in each parameter, the initial mode of the parameter is displayed. (Refer to the description of each

When pressing one of 【③, 【☑, 【☑ keys in display mode, the saved setting value is displayed.

Ex) Mode value setting and setting value setting value press one Press one 250u flashes every 0.5 sec.

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

to 125V. Setting value Value Press one Press one dI 5P

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

User manual for communication

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

Max. 7.2mm

■ Caution for using

Aniowabie installation environment

Off shall be used indoor ②Altitude Max. 2000m ③Pollution Degree 2

Please use the terminal(M3.5, Max.7.2mm) when connectting the AC power supply.

Uni simil be used microof (guitatible Max. 2000m) (@Pollution Degree 2 (@Installation Z. Please use the terminal(Ma.S., Max. 7.2mm) when connecting 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 weider & Sewing machine, High capacity SCR unit etc.)

7. When input is applied. If *Harth or *C1 LLL 1' & Bidaplayd, 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 fransformer, but it is very difficult to install protection components at small sez product like DP.M. Therefore, please use noise absorber circuit such as line filter, varistor in external lines when voltage faller occurs by power relay, magnet SW and high frequency equipment are operated in same line or surge occurs by spark of high voltage or thunder etc.

9. Input line: Sheld wire must be used when the measuring input line is getting longer in the place occurring lost of noise.

**It may cause malfunction if above instructions are not followed. Install it closely from D.P.M. D.P.M. INPUT DPM. · Using Single shield wire HI DPM DPM

@Installation Catergoryl

XIt may cause malfunction if above instructions are not followed. ■ Major products

Proximity sensors
Area sensors
Door/Door side sensors

Counters Rotary encoders Power controllers Panel meters

Fraphic/Logic panels
emperature controllers
fachometer/Pulse(Rate) meters
femperature/Humidity transducers
stepping motors/drivers/motion co Stepping motors/drivers/motion control

Laser marking system(CO₂, Nd: YAG)

Laser welding/soldering system

■ Photoelectric sensors ■ Fiber optic sensors ■ Pressure sensors ■ Timers ■ Display units ■ Sensor controllers

Autonics Corporation SEAS SALES :

EP-KE-77-0008H