

Autonics

PANEL METER MT4W SERIES

M A N U A L



It Indicates an upgraded part.

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

- In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), It requires installing fail-safe device, or contact us for information on type required. It may result in serious damage, fire or human injury
- It must be mounted on Panel. It may give an electric shock.
- Do not connect terminals when it is power on. It may give an electric shock.
- Do not disassemble and modify this unit, when it requires. If needs, please contact us. It may give an electric shock and cause a fire.
- Please check the number of terminal when connect power line or measuring input. It may cause a fire.

Caution

- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock.
- When wire connection, No.20AWG(0.50mm²) should be used and screw bolt on terminal block with 0.74N · m to 0.90N · m strength. It may result in malfunction or fire due to contact failure.
- Please observe specification rating. It might shorten the life cycle of the product and cause a fire.
- Do not use the load beyond rated switching capacity of Relay contact. It may cause insulation failure, contact melt, contact failure, relay broken, fire etc.
- In cleaning the unit, do not use water or an oil-based detergent. It might cause an electric shock or fire that will result in damage to the product.
- Do not use this unit at place where there are flammable or explosive gas, humidity, direct ray the sun, radiant heat, vibration, impact etc. It may cause explosion.
- Do not inflow dust or wire dregs into inside of this unit. It may cause a fire or mechanical trouble.
- Please connect properly after checking the polarity of measuring terminals. It may cause a fire or explosion.

Specifications

Series	MT4W
Power supply	100~240VAC 50/60Hz(90 to 110% of rated voltage)
Power consumption	5VA
Display method	7Segment LED Display(Red)
Display accuracy	23°C +5°C DC Type: Voltage/Current: +0.1% F.S. +2Digit 35~85%RH AC Type: Voltage/Current: +0.3% F.S. +3Digit, Frequency: +0.1% F.S. +2Digit -10°C~50°C DC/AC Type: Voltage/Current: +0.5% F.S. +3Digit, Frequency: +0.6% F.S. +2Digit When +1.0% F.S. +3Digit only for 5A terminal of MT4W-DA, AA Type
Input	VDC/Current, VAC/Current, AC Frequency
Max. input	110% for input spec.
A/D conversion method	Succession approximation method+Double integral method
Sampling cycle	50ms(DC), 16.6ms(AC 60Hz)
Max. indication range	1/12,000
Max. indication digit	-1999 ~ 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, Transmission method:2wires half duplex, Transmission code:ASCII Code(8Bit), Tuning method:Sub-synchronization, Protocol:Modbus type Serial/BCD output: NPN Open collector output, 12~24VDC Max. 50mA(Resistive load) 4~20mA output: Resolution: 8000 division(Load resistance max. 600Ω)
AC measuring function	Selectable RMS or AVG
Frequency measuring function	Measurement range:0.100~9999Hz(Fixed decimal point type)
Hold function	Outer hold function
Ambient temperature	-10 ~ 50°C(at non-freezing status)
Storage temperature	-20 ~ 60°C(at non-freezing status)
Ambient humidity	35 ~ 85%RH

Specification and range

Type	Measuring input and range	Input impedance	Standard Stnd	Prescale I SCAL I
			Display range [Fixed]	Display range [Variable]
DC Volt	0~500V [500V]	4.33315MΩ	0.0~500.0(Fixed)	
	0~100V [100V]	4.33315MΩ	0.0~100.0(Fixed)	
	0~50V [50V]	433.15kΩ	0~50.0(Fixed)	
	0~10V [10V]	433.15kΩ	0.0~10.0(Fixed)	
	0~5V [5V]	43.15kΩ	0.0~5.000(Fixed)	
	0~1V [1V]	43.15kΩ	0.000~1.000(Fixed)	
	0~250mV [250V]	2.15kΩ	0.00~250.00(Fixed)	
	0~50mV [50V]	2.15kΩ	0.00~50.00(Fixed)	-1999~9999(Variable)
	0~5A [5A]	0.01Ω	0.000~5.000(Fixed)	-1999~9999(Variable)
	0~2A [2A]	0.01Ω	0.000~2.000(Fixed)	-1999~9999(Variable)
DC Amper	0~500mA [500A]	0.1Ω	0.0~500.0(Fixed)	-1999~9999(Variable)
	0~200mA [200A]	0.1Ω	0.00~200.0(Fixed)	
	0~50mA [50A]	1.0Ω	0.00~50.00(Fixed)	
	4~20mA [20A]	1.0Ω	00.00~20.00(Fixed)	
	0~5mA [5mA]	10.0Ω	0.000~5.000(Fixed)	
	0~2mA [2mA]	10.0Ω	0.000~2.000(Fixed)	
	0~500V [500V]	4.987MΩ	0.0~500.0(Fixed)	
	0~250V [250V]	4.987MΩ	0.0~250.0(Fixed)	
	0~110V [110V]	1.087MΩ	0.0~110.0(Fixed)	
	0~50V [50V]	1.087MΩ	0.00~50.00(Fixed)	
AC Volt	0~20V [20V]	200kΩ	0.00~20.00(Fixed)	
	0~10V [10V]	200kΩ	0.00~10.00(Fixed)	
	0~2V [2V]	20kΩ	0.000~2.000(Fixed)	
	0~1V [1V]	20kΩ	0.000~1.000(Fixed)	
	0~5A [5A]	0.01Ω	0.000~5.000(Fixed)	
	0~2.5A [2.5A]	0.01Ω	0.000~2.500(Fixed)	
	0~1A [1A]	0.05Ω	0.000~1.000(Fixed)	
	0~500mA [500A]	0.1Ω	0.0~500.0(Fixed)	
	0~250mA [250A]	0.1Ω	0.00~250.0(Fixed)	
	0~100mA [100A]	0.5Ω	0.00~100.0(Fixed)	
AC Amper	0~50mA [50A]	0.5Ω	0.00~50.0(Fixed)	

Please connect proper terminal with max. input voltage is in 30~100% of the input voltage. When it is bigger than input voltage, it cause the terminal breakdown and over-range indication. The accuracy is decreased when it is connected to the terminal under 30%.

Parameter

Parameter	Display	Function	Note
PA 1 (Para-meter 1)			
I n-t	Input type	Selectable RMS/AVG in AC type	Indication in AC type only
I n-r	Input range	Selection of input range	
d15P	Display	Selection of indication type	Selectable Stnd / SCAL / Freq
Stnd	Standard	Standard scale range	Display Max. display value of Stnd
Freq	Frequency	Frequency display	
SCAL	Scale	Scale range	These mode indicates at SCAL. It sets max. display value/min. display value(-1999 to 9999)
H-S	High scale	Set max. value of display range	
L-S	Low scale	Set min. value of display range	
dot	Dot	Set Dot position	Display only SCAL/Freq describe position
lnbH	Input bias high	Compensate High-limit value of display value	Stnd/SCAL: Correction range 0.100~5.000 Freq: Correction range 0.100~9.999
lnbL	Input bias low	Compensate Low-limit value of display value	Set range: -99 to +99
lnbE	Input bias exponent	Set indication index of frequency mode	Set range: 10 ⁻¹ / 10 ⁰ / 10 ¹ / 10 ²
outE	Out type	Set operation mode of preset output	Selectable of F.L./S.L./H.L./S.L./H.L./S.L./L.S.L./L.S.L.
HYS	Hysteresis	Set hysteresis value	Setting range 1 ~ 10% F · S
PEL	Peak time	Set monitoring delay time for peak value(sec)	Setting range: 00sec ~ 30sec
d15E	Display time	Set sampling time(sec.)	Variable by 0.1sec unit of 0.1~5.0sec
ZEY	Zero Key	Set usage of front side zero adjustment key	No-Set usage of front side zero adjustment key Yes-Usage of front side zero adjustment key
Eu In	Event Input	Set external terminal(5, 7) function	Hold-Use external terminal as Hold terminal Zero-Use external terminal as zero point adjustment terminal
FS-H	Full scale High	Set the upper value output point or PV output	Min. set range: Min. 10% F · S
FS-L	Full scale Low	Set the lower value output point or PV output	Max. set range: Max. FS-H 10%
AdS	Address	Set communication address	Set range: 01 to 99
bPS	Bit per second	Set baudrate(bps)	Selectable 1200/2400/4800/9600
Loc	Lock	Set lock function	Selectable of OFF/Loc1/Loc2/Loc3
PA 0 (Para-meter 0)			
HSEL	High set	Set High setting value	Setting range can be set within indication range of Stnd/SCAL
LSEL	Low set	Set Low setting value	
HPEV	High peak	Max. value by data monitoring	Return to initial status by pressing key
LPEV	Low peak	Min. value by data monitoring	

Parameter setting

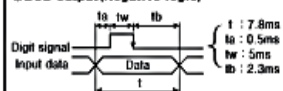
If press key for 3sec. in RUN mode PA 1 is displayed.
If press key for 4sec. in RUN mode, PA 2 will be displayed after PA 1. In case of pressing key continually, indication is stopped at PA 2.
When it pulled out from key at PA1 or PA2, it will be entered into indicating parameter.
If it will be returned to RUN when key is pressed for 3 second at each parameter.
After returning to RUN, if key is pressed within about 2 seconds again, it is entered into PA1 or PA2 again. (Refer to the below each parameter setting description.)

Parameter 0

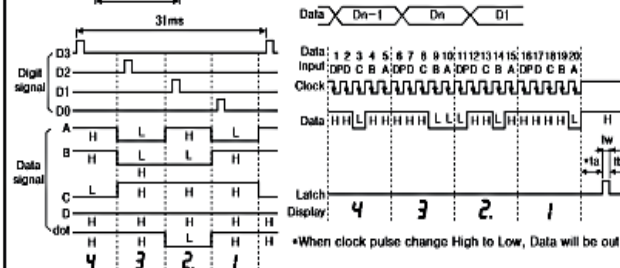
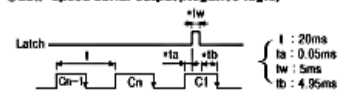
Run
key touch
HSEL: Set preset High-limit value. (When set the preset only)
Change to set with key.
LSEL: Set preset Low-limit value. (When set the preset only)
Change to set with key.
HPEV: Shows High-limit monitoring value (High Peak) in RUN mode. It will be initialized by pressing key.
LPEV: Shows Low-limit monitoring value (Low Peak) in RUN mode. It will be initialized by pressing key.
When PEK1 of Parameter 2 is set as "0", monitoring function is not displayed.

Time chart of serial output and BCD output

OBOD output(Negative logic)

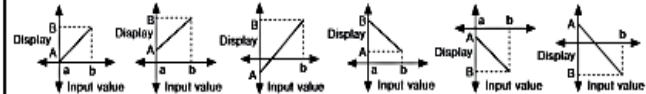


Low-speed serial output(Negative logic)



Prescale function[PA1 : H-5C/L-5C mode]

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



Error display function

Display	Description
HHHH	Measuring input exceeds available max.input range:110%F-S
LLLL	Measuring input exceeds available min.input range:-10%F-S
d-HH	Indication value for measuring input exceeds max.indication range:9999
d-LL	Indication value for measuring input exceeds min.indication range:-1999
F-HH	Indication value for measuring frequency exceeds max.measuring range:9999
ovEr	Exceeds zero adjusting range:±99

※ "LLLL" indication is only for 4-20mA input terminal of MT4W-DA model.
 ※ Zero point adjusting error is returning to measuring mode after "ovEr" is flickering 2 times.
 ※ Refer to "Hi" Measuring AC frequency function" for frequency measuring range.

※ The above specification are changeable without notice anytime.

Gradient correction function [PA1 : 1 nbn mode]

This function is to correct a gradient of prescale value and display value. (Picture 1) Display value Y can be used as α , β times against X input value by correction function $Y = \alpha X + \beta$. And also can be used as correction function of max. display value $Y = 5C$. Adjustment range is 0.100 to 5.000 and multiply current gradient.

Ex) Input: 200mVDC, Display: 3.000 for MT4W-DV type

① Select 0-1VDC for measuring input in Parameter 1.

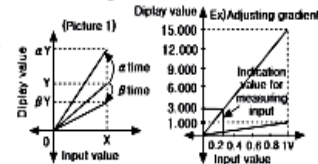
② Standard specification in input : 0-1VDC and 1.000 therefore it has to be 15.000

(W-5C) for 1VDC (input) in order to display 3.000 for 200mVDC (input).

But it is unable due to setting range is 9.999

③ In this case, please check below chart.

Please set as $1 \text{ nbn} \times W-5C = 15.000$



Setting method	W-5C	L-5C	1 nbn	Remark
①	Unavailable to set	0.000	1.000	
②	7.500	0.000	2.000	It will be same
③	5.000	0.000	3.000	Indication value whichever user
④	3.750	0.000	4.000	choose the method among setting ways.
⑤	3.000	0.000	5.000	

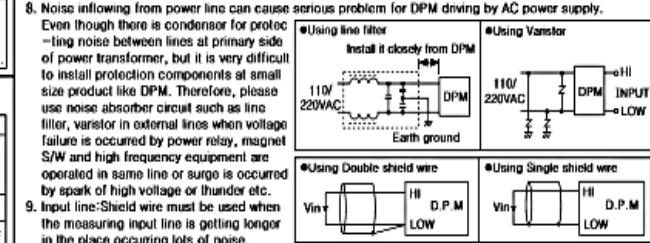
Preset output Mode[PA 2 : oUk mode]

Mode	Output operation	Operation
oFF		No output
L5t		If it is equal or smaller than Low setting value, LO output will be ON. If it is bigger than Low setting value, GO output will be ON.
H5t		If it is equal or bigger than High setting value, Hi output will be ON. If it is equal or smaller than High setting value, GO output will be ON.
Lk5t		Lo output is ON when it is smaller or same with Low set value. Hi output is ON when it is bigger or same with High set value. Go output is ON when it is bigger than Low set value, smaller than High set.
Hk5t		Lo output is ON when it is bigger or same with Low set value. Hi output is ON when it is bigger or same with High set value. Go output is ON when it is smaller than Low set, High set value.
LL5t		Lo output is ON when it is smaller with Low set value. Hi output is ON when it is smaller or same with High set value. Go output is ON when it is bigger than Low set, High set value.
Ld5t		It is operated same with L5t but Lo output does not operated under initial Low set value. It is ON from under next Low set value. If this is higher than Low set value, Go output will be ON.

※ H5t will be displayed from the setting of output operation mode, when user set "oFF", H5t & L5t does not displayed.

Caution for using

- Allowable installation environment
 - ① It shall be used indoor
 - ② Pollution Degree 2
 - ③ Altitude Max. 2000m
 - ④ Installation Category II.
- Please use the terminal(M3.5, Max.7.2mm) when connecting the AC power supply.
- Please use separated line from high voltage line or power line in order to avoid inductive noise.
- Please install power switch or circuit breaker in order to cut off the power supply.
- The switch or circuit breaker should be installed near by users for safety.
- Be sure to avoid using this unit near by machinery making strong high frequency noise. (High frequency welder & Sewing machine, High capacity SCR unit etc.)
- When input applied, if "HHHH" or "LLLL" are displayed, it has some trouble with measuring input, please check the line after power off.
- Noise inflowing from power line can cause serious problem for DPM driving by AC power supply.



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

Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO2, Nd:YAG)

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Satisfiable Partner For Factory Automation

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