

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.

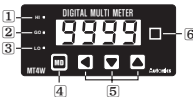
▲ Warning

- 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.

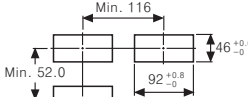
■ Front panel identification



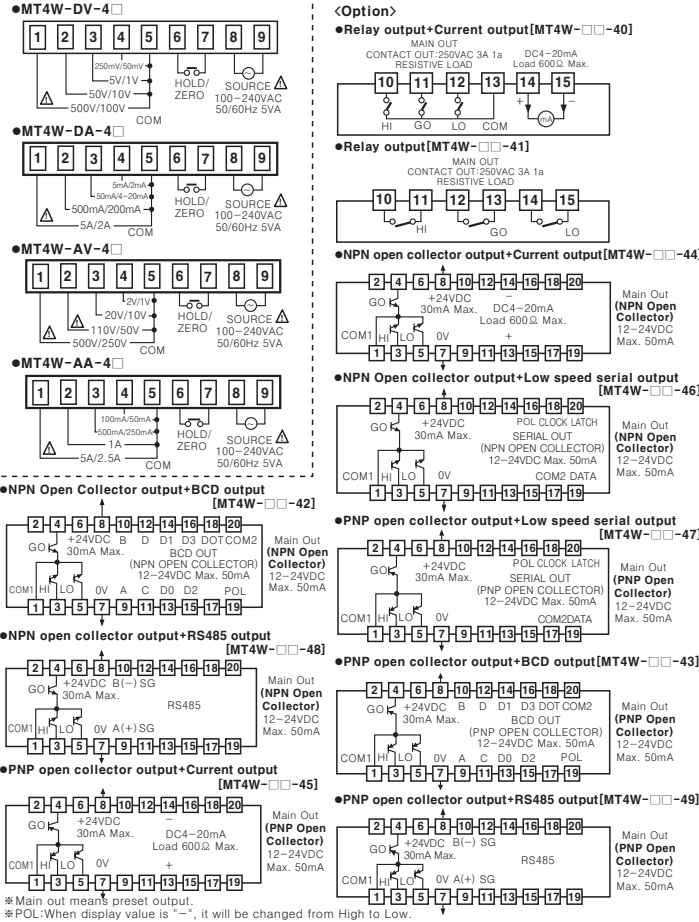
- Hi-High output indication of preset
- GO:GO output indication of preset
- LO:Low output indication of preset
- [MD] Key: Mode Key
- [] [] [] [] : Control key
- Unit

*There are no 1, 2, 3 output indication in Indication type.

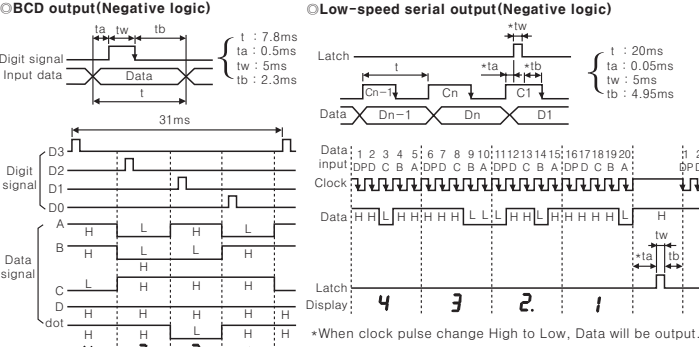
■ Panel cut-out



■ Terminal connection

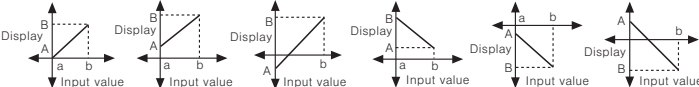


■ Time chart of serial output and BCD output



■ Prescale function[PA1 : H-SC/L-SC 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	*"LLLL" indication is only for 4~20mA input terminal of MT4W-DA model.
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 max.indication range:-1999	
F-HH	Indication value for measuring frequency exceeds max. measuring range:9999	
ovEr	Exceeds zero adjusting range: -99	

*The above specifications are changeable at anytime without notice.

■ 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℃ ±5℃ 35~85%RH DC Type≒Voltage/Current:±0.1% F.S ±2Digit AC Type≒Voltage/Current:±0.3% F.S ±3Digit, Frequency:±0.1% F.S ±2Digit -10℃~50℃ DC/AC Type ≒ Voltage/Current:±0.5% F.S ±3Digit, Frequency:±0.6% F.S ±2Digit
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) • RS485 communication output ≒ Baud rate:1200/2400/4800/9600, Transmission method:2wires half duplex, Transmission code:ASC II 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)
Sub output (Transmission output)	
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℃(at non-freezing status)
Storage temperature	-20 ~ 60℃(at non-freezing status)
Ambient humidity	35 ~ 85%RH

■ Specification and range

Type	Measuring input and range	Input impedance	Standard [S _{END}]	Prescale [S _{CAL}]
			Display range [Fixed]	Display range [Variable]
DC Volt	0~500V [<u>500u</u>]	4.33315MΩ	0.0~500.0(Fixed)	
	0~100V [<u>100u</u>]	4.33315MΩ	0.0~100.0(Fixed)	
	0~50V [<u>50u</u>]	433.15kΩ	0~50.0(Fixed)	
	0~10V [<u>10u</u>]	433.15kΩ	0.00~10.00(Fixed)	
	0~5V [<u>5u</u>]	43.15kΩ	0.00~5.000(Fixed)	
	0~1V [<u>1u</u>]	43.15kΩ	0.000~1.000(Fixed)	
	0~250mV [<u>025u</u>]	2.15kΩ	0.00~250.0(Fixed)	
	0~50mV [<u>50n</u>]	2.15kΩ	0.00~50.00(Fixed)	
	0~5A [<u>5A</u>]	0.01Ω	0.000~5.000(Fixed)	-1999~9999(Variable)
	0~2A [<u>2A</u>]	0.01Ω	0.000~2.000(Fixed)	-1999~9999(Variable)
DC Ampere	0~500mA [<u>05A</u>]	0.1Ω	0.00~500.0(Fixed)	-1999~9999(Variable)
	0~200mA [<u>02A</u>]	0.1Ω	0.00~200.0(Fixed)	-1999~9999(Variable)
	0~50mA [<u>05A</u>]	1.0Ω	0.00~50.00(Fixed)	-1999~9999(Variable)
	4~20mA [<u>20A</u>]	1.0Ω	0.00~20.00(Fixed)	
	0~5mA [<u>5A</u>]	10.0Ω	0.000~5.000(Fixed)	
	0~2mA [<u>2A</u>]	10.0Ω	0.000~2.000(Fixed)	
	0~500V [<u>500u</u>]	4.987MΩ	0.0~500.0(Fixed)	
	0~250V [<u>250u</u>]	4.987MΩ	0.0~250.0(Fixed)	
	0~110V [<u>110P</u>]	1.087MΩ	0.0~440.0(Fixed)	
	0~50V [<u>50u</u>]	1.087MΩ	0.00~50.00(Fixed)	
AC Volt	0~20V [<u>20u</u>]	200kΩ	0.00~20.00(Fixed)	
	0~10V [<u>10u</u>]	200kΩ	0.00~10.00(Fixed)	
	0~2V [<u>2u</u>]	20kΩ	0.000~2.000(Fixed)	
	0~1V [<u>1u</u>]	20kΩ	0.000~1.000(Fixed)	
	0~5A [<u>5A</u>]	0.01Ω	0.000~5.000(Fixed)	
	0~2.5A [<u>25A</u>]	0.01Ω	0.000~2.500(Fixed)	
	0~1A [<u>1A</u>]	0.05Ω	0.000~1.000(Fixed)	
	0~500mA [<u>05A</u>]	0.1Ω	0.0~500.0(Fixed)	
	0~250mA [<u>025A</u>]	0.1Ω	0.00~250.0(Fixed)	
	0~100mA [<u>10A</u>]	0.5Ω	0.00~100.0(Fixed)	
AC Ampere	0~50mA [<u>05A</u>]	0.5Ω	0.00~50.0(Fixed)	

■ Display cycle delay function [PA 2 : d1SE mode]

It is difficult to read as display value follows the measuring input value.
Display when the measuring input value is fluctuating. In this case it is able to make display value stable by delaying display cycle.Display cycle displaying time can be changed in d1SE mode of Parameter 2.
If select 4.0s, the display value is displayed every 4sec. averaging input value for 4sec.

■ Monitoring function for Peak display value [PA 0 : HPEV/LPEV mode, PA 2 : PEV mode]

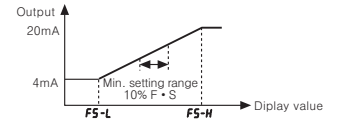
It is to observe Max./Min. value of display value by current display value and then display the data in HPEV mode and LPEV mode of parameter 0. Set delay time(0 to 30sec.) in PEV mode of parameter 2 in order to prevent malfunction caused by initial over current or over voltage, when it monitor the peak value. Delay time is 0~30sec. and it will monitor the peak value after setting time. If press [] [] [] key at HPEV and LPEV mode of parameter 0, monitoring data will be initialized.
*Monitoring function is not indicated when set the Pek.t of parameter 2 as "0".

■ Initialization function

It initializes parameter setting state. When it press [] [] [] key over 5 seconds at the same time in measuring mode, former changed state is canceled and it changes as initial state.

■ Current output (DC4~20mA) Scale adjusting function [PA2 : FS-H / FS-L mode]

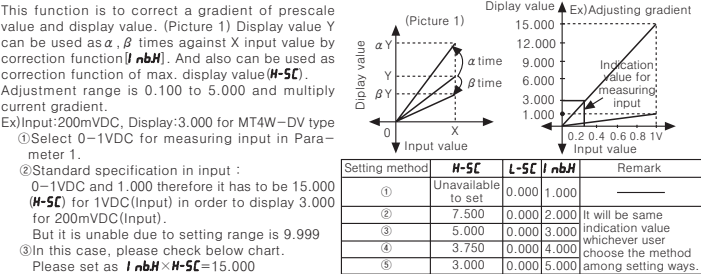
It set current output for preset indication value at the current output DC4~20mA. It set output indication value for 4mA and 20mA. Min.setting range between FS-H(FS-H) and FS-L(FS-L) is 10% F·S. (When it set as under 10% F·S, it changed as over 10% F·S automatically.) Preset indication value is outputted fixedly as 4mA at under FS-L and 20mA at over FS-H.



■ Correction function [PA1 : I nbH / I nbL mode]

This function is for correcting display value error of measuring input.
I nbL: ±99[Adjust deviation of Low value].
I nbH: 5.000 to 0.100[Correct gradient(%) of High value]
Display when the user desires measuring input specification is 0 to 500V and display value is 0 to 500.0, it is able to remove the offset of Low display value to set -12(Offset correcting value) in I nbL(When Low display value is "0" 1.2" in 0V input)
*The offset correction range of I nbL is within -99 to +99 for 0~1.000 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
*In this case, please check below chart.
Please set as I nbH: H-SC=15,000

■ Gradient correction function [PA1 : I nbH mode]



■ Preset output Mode[PA 2 : ouEt mode]

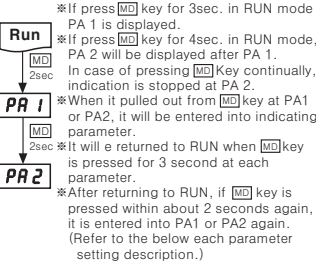
Mode	Output operation	Operation
HSEt		H: Hysteresis
oFF		No output
LSEt		If it is equal or smaller than Low setting value, LO output will be ON. If it is bigger than Low setting value, GO output will be ON.
HSEt		If it is equal or bigger than High setting value, HI output will be ON. If it is equal or smaller than High setting value, GO output will be ON.
LHSEt		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.
HHSEt		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 vale.
LLSEt		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.
LdSEt		It is operated same with L.St but Lo output does not operated under initial Low set value. It ON from under next Low set value. If this is higher than Low set value, Go output will be ON.

*HSEt will be displayed from the setting of output operation mode, when user set "oFF", HSEt/LSEt does not displayed.

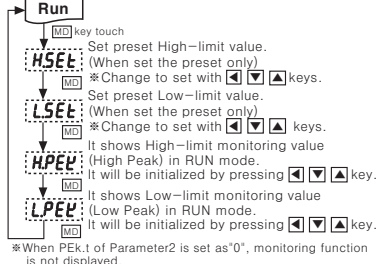
■ Parameter

Parameter	Display	Function	Note
I n-r	Input type	Selectable RMS/AVG in AC type	Indication in AC type only
I n-r	Input range	Selection of input range	
d1SP	Display	Selection of indication type	Selectable S _{END} / S _{CAL} / FrE9
S _{END}	Standard	Standard scale range	Display Max. display value of S _{END}
FrE9	Frequency	Frequency display	
S _{CAL}	Scale	Scale range	These mode indicates at S _{CAL} . It sets max. display value/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 Dot position	Display only S _{CAL} FrE9 describe position
I nbH	input bias high	Compensate High-limit value of display value	S _{END} S _{CAL} Correction range 0.100~5.000 FrE9:Correction range 0.100~9.999
I nbL	input bias low	Compensate Low-limit value of display value	Set range: -99 to +99
I nbE	input bias exponent	Set indication index of frequency mode	Set range:10 ⁻¹ / 10 ¹ / 10 ⁰ / 10 ¹
ouEt	Out type	Set operation mode of preset output	Selectable oFF/L.St/H.St/LH.St/HH.St /L.St/Ld.St
HYS	Hysteresis	Set hysteresis value	Setting range 1 ~ 10% F·S
PEV	Peak time	Set monitoring delay time for peak value(sec)	Setting range:00sec ~ 30sec
d1SE	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(6, 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%
AdrS	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 oFF/Loc1/Loc2/Loc3
HSEt	High set	Set High setting value	Setting range can be set within indication range of S _{END} S _{CAL}
LSEt	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	

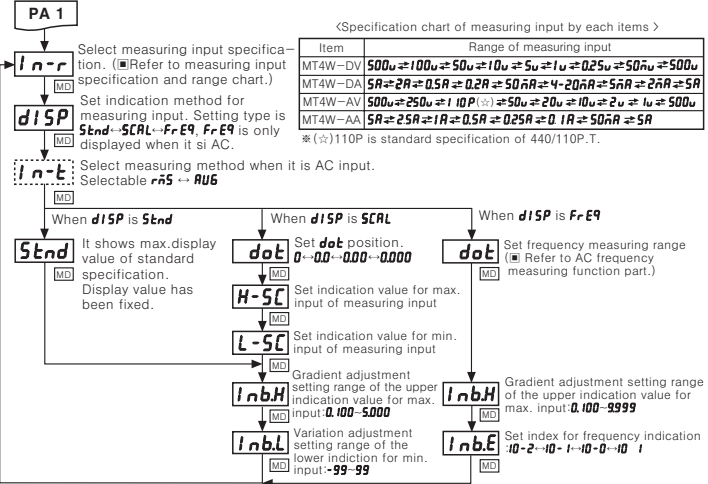
■ Parmeter setting



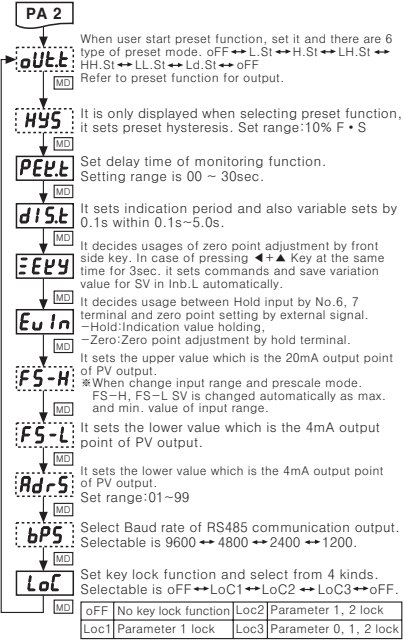
■ Parameter 0



■ Parameter 1



■ Parameter 2



■ Change the para-meter setting value

- Press [] key continuously in RUN mode, then release the [] key at the parameter you want. (See "■ Parmeter setting")
- Press [] key at the parameter in order to change the mode of parameter. (See "■ Parmeter")
- Current setting value and mode in parameter are flickered repeatedly.
Ex) I n-r ↔ 500u
It shows that current measuring input is 500V.
- When the current setting value and mode are flickered, if press [] [] key, only the current setting value is flickered.
Ex) I n-r ↔ 500u ↔ 500u
It shows that setting value is changeable as flickering it.
- When the setting value is flickered, change the setting value by using [] or [] key.
Ex) I n-r ↔ 500u ↔ 500u
It shows how to change the measuring input of AC type.
- When confirming the setting value with [] key, the changed setting value flickers 2times and enters into next setting.
- It returns RUN mode from parameter by pressing [] key for 3sec.

■ Caution for using

- Allowable installation environment
① If shall be used indoor ③ Pollution Degree 2
② 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. 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 DPM. Therefore, please use noise absorber circuit such as line filter, varistor in external lines when voltage failure is occurred by power relay, magnet S/W and high frequency equipment are operated in same line or surge is occurred by spark of high voltage or thunder etc.
- Input line:Shield wire must be used when the measuring input line is getting longer in the place occurring lots of noise.

■ Major products

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

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