

Autonics

PANEL METER
MT4Y 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

- In case of using this unit with machinery(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it is required to install fail-safe device.
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, inspect and repair terminals when it is power on.
It may give an electric shock.
- Do not disassemble and modify this unit, when it is required.
Please contact us.
It may cause an electric shock and a fire.
- Please check the number of terminal when connecting power line or measuring input.
It may cause a fire.

Caution

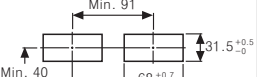
- This unit shall not be used outdoors.
It might shorten the life cycle of the product or give an electric shock.
- When connecting wire, No.20AWG(0.50mm²) should be used and tighten screw bolt on terminal block with 0.74N·m to 0.90N·m strength.
It may cause a malfunction or fire due to contact failure.
- Please observe the rated specification.
It might shorten the life cycle of the product and cause a fire.
- 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.
- In cleaning the unit, do not use water or an oil-based detergent
It might cause an electric shock or fire.
- Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray the sun, 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.
- Please connect properly after checking the polarity of measuring terminals.
It may cause a fire or explosion.

Front panel identification

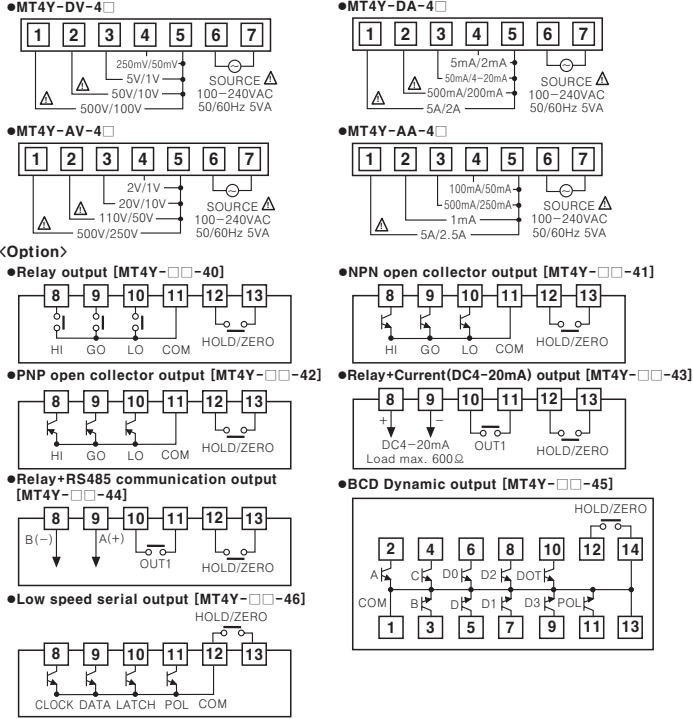


*There are no 1, 2, 3 output indication in Indication type.

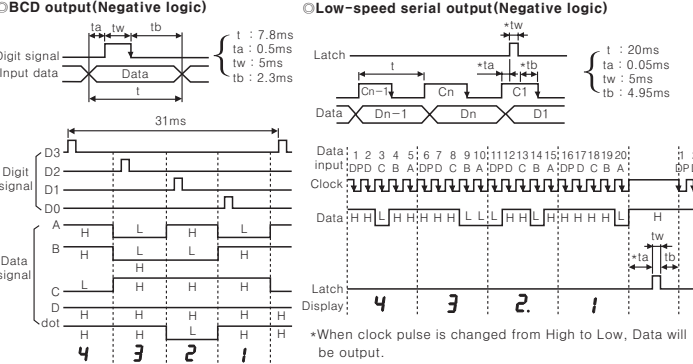
Panel cut-out



Terminal connection

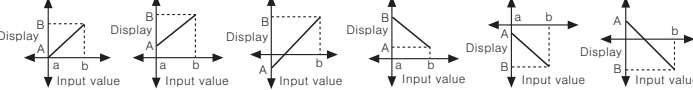


Time chart of Low-speed serial output and BCD output



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 graphs.



Error display function

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

*"LLLL" is only for 4-20mA input terminal of MT4Y-DA.
*Zero adjusting error is returning to measuring mode after "ovEr" is flickering 2 times.
*Refer to "Measuring AC frequency function" for frequency measuring range.
*The above specifications are changeable at anytime without notice.

Specifications

Series	MT4Y
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 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 When ±0.3% F.S ±3Digit only for 5A terminal of MT4Y-DA, AA Type -10°C-50°C DC/AC Type≒Voltage/Current:±0.5% F.S ±3Digit, Frequency:±0.6% F.S ±2Digit
Input	DC Voltage/Current, AC Voltage/Current, AC Frequency
Max. allowable input	110% for input spec.
A/D conversion method	Practical Over sampling using successive approximation ADC
Sampling cycle	50ms(DC), 16.6ms(AC 60Hz) (1/12,000)
Max. indication range	-1999 ~ 9999(4Digit)
Max. input	110% for input spec.
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:2 wires 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) • DC4-20mA 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	Built-in(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 [5end]	Prescale [SCAL]
			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	0-50.00(Fixed)	
	0-10V [10v]	433.15kΩ	0.00-10.00(Fixed)	
	0-5V [5v]	43.15kΩ	0.00-5.000(Fixed)	
	0-1V [1v]	43.15kΩ	0.000-1.000(Fixed)	
	0-250mV [250v]	2.15kΩ	0.00-250.00(Fixed)	
	0-50mV [500v]	2.15kΩ	0.00-50.00(Fixed)	
	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 Amperes	0-500mA [500A]	0.1Ω	0.0-500.0(Fixed)	-1999-9999(Variable)
	0-200mA [200A]	0.1Ω	0.00-200.0(Fixed)	-1999-9999(Variable)
	0-50mA [500A]	1.0Ω	0.00-50.00(Fixed)	-1999-9999(Variable)
	4-20mA [200A]	1.0Ω	0.00-20.00(Fixed)	
	0-5mA [5A]	10.0Ω	0.000-5.000(Fixed)	
	0-2mA [200A]	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 [1100P]	1.087MΩ	0.0-440.0(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 [250A]	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 Amperes	0-50mA [500A]	0.5Ω	0.00-50.0(Fixed)	

Display cycle delay function [PA2: d15t mode]

It is difficult to read display value, in case, measuring input value is fluctuated frequently, it is also changed. In this case, it is able to make display value stable by delaying display cycle. Display cycle displaying time can be changed in d15t mode of Parameter 2.
If selecting 4.0s, the display value is displayed every 4sec. averaging input value for 4sec.

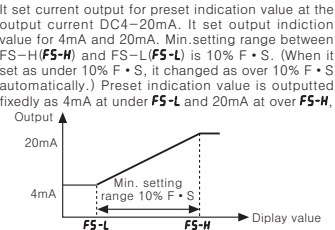
Monitoring function for Peak display value [PA0: HPEV/LPEV mode, PA2: PEVt mode]

It observes 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 PEVt mode of parameter 2 in order to prevent malfunction caused by initial over current or over voltage, when monitoring the peak value. Delay time is 0-30sec. and it will monitor the peak value after setting time. If pressing [4] [3] [2] key at HPEV and LPEV mode of parameter 0, it will be initialized.
*Monitoring function is not indicated when setting the PEK.t of parameter 2 as "0".

Initialization function

It initializes parameter setting state. When pressing [4] [3] [2] key over 5 seconds at the same time in measuring mode, former changed state is canceled and it changes as initial state.

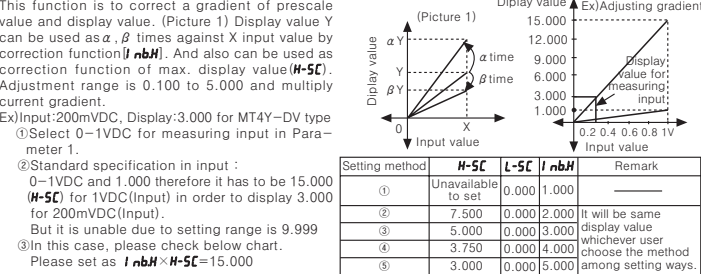
Current output (DC4-20mA) Scale adjustment function [PA2: FS-H / FS-L mode]



Error correction function [PA1: InbH / InbL mode]

This function is for correcting display value error of measuring input.
InbL:±99(Adjust deviation of Low value).
InbH:5.000 to 0.100(Correct gradient(% of High value))
Display value=(Measuring value×InbH)+InbL
Ex)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 InbL(When Low display value is "□□.1.2" in 0V input)
Display value for measuring input(500V) is decided by offset adjustment of low value. In case display value is "501.0" display value will be 500.0 by adjusting the gradient of high display value if 0.998 of correcting value is set at InbH by calculating 500.0/ 501.1 (Target display value/Current display value)
*The offset correction range of InbL is within -99 to +99 for □, D=1 digit regardless of decimal point.

Gradient correction function [PA1: InbH mode]



Preset output mode[PA2: ouEt mode]

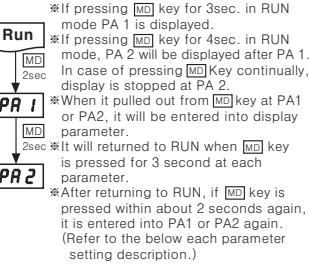
Mode	Output operation	Operation
oFF	No output	H:Hysteresis
L5t	If it is equal or smaller than Low setting value, LO output will be ON. If it is bigger than Low setting value, GO output will be ON.	
H5t	If it is equal or bigger than High setting value, HI output will be ON. If it is equal or smaller than High setting value, GO output will be ON.	
LH5t	Lo output is ON when it is smaller or same with Low setting value. Hi output is ON when it is bigger or same with High setting value. Go output is ON when it is bigger than Low setting value, smaller than High setting value.	
HH5t	Lo output is ON when it is bigger or same with Low setting value. Hi output is ON when it is bigger or same with High setting value. Go output is ON when it is smaller than Low/High setting value.	
LL5t	Lo output is ON when it is smaller with Low setting value. Hi output is ON when it is bigger or same with High setting value. Go output is ON when it is bigger than Low/High setting value.	
Ld5t	If it is operated same with L5t but Lo output does not operated under initial Low set value. If it is ON under next Low setting value. If it is higher than Low setting value, Go output will be ON.	

*H5t will be displayed from the setting of output operation mode, when user set "oFF", H5t and L5t does not displayed.
*RS485/4-20mA provides L5t only.
*BCD/Serial is not available.

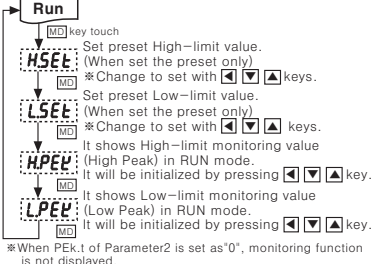
Parameter

Parameter	Display	Function	Note
In-t	Input type	Selectable RMS/AVG in AC type	Indication in AC type only
In-r	Input range	Selection of input range	
d15P	Display	Selection of display type	Selectable 5end / SCAL / FrE9
5end	Standard	Standard scale range	Display Max. display value of 5end
FrE9	Frequency	Frequency display	
SCAL	Scale	Scale range	It is displayed at SCAL, sets max. display value/min. display value (-1999 to 9999)
H-5C	High scale	Set max. value of display range	
L-5C	Low scale	Set min. value of display range	
dot	Dot	Set Dot position	Display only SCAL/FrE9 describe position
InbH	input bias high	Correct High-limit value of display value	5endSCAL:Correction range 0.100-5.000 FrE9:Correction range 0.100-9.999
InbL	input bias low	Correct Low-limit value 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
ouEt	Out type	Set operation mode of preset output	Selectable oFF/L.St/H.St/LH.St/HH.St /LL.St/Ld.St
HYS	Hysteresis	Set hysteresis value	Setting range:1 ~ 10% F·S
PEVt	Peak time	Set monitoring delay time for peak value(sec)	Setting range:00sec ~ 30sec
d15t	Display time	Set sampling time(sec.)	Variable by 0.1sec unit of 0.1-5.0sec
Ero	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
EuIn	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
H5Et	High set	Set High setting value	Setting range can be set within indication range of 5endSCAL
L5Et	Low set	Set Low setting value	
HPEV	High peak	Max. value by data monitoring	Return to initial status by pressing [4] key
LPEV	Low peak	Min. value by data monitoring	

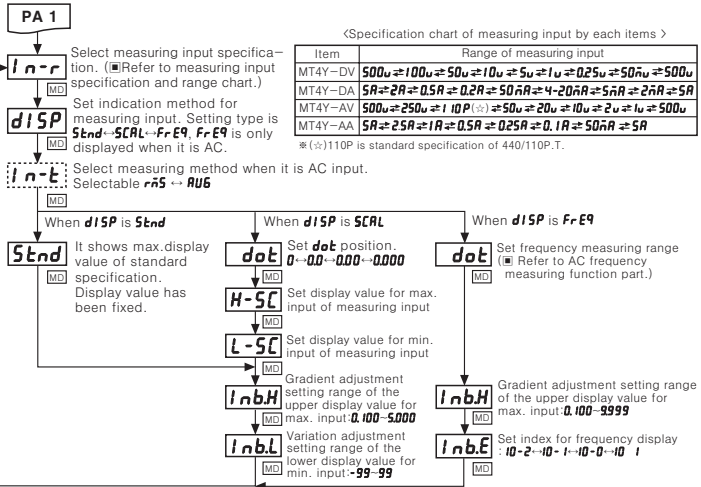
Parameter setting



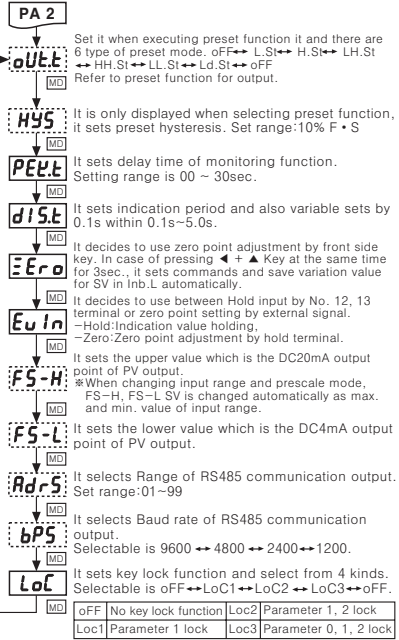
Parameter 0



Parameter 1



Parameter 2



Change the para-meter setting value

- Press [4] key continuously in RUN mode, then release the [4] key at the parameter. (See "Parameter setting")
- Press [4] key at the parameter in order to change the mode of parameter. (See "Parameter")
- Current setting value and mode in parameter are flickered repeatedly. Ex) [In-r] ↔ [500v]
It shows that current measuring input is 500V.
- When the current setting value and mode are flickered, if press [4] [3] [2] key, only the current setting value is flickered. Ex) [In-r] ↔ [500v] [4] [3] [2] [4] [3] [2] [4]
It shows that setting value is changeable as flickering it.
- When the setting value is flickered, change the setting value by using [4] or [3] key. Ex) [In-r] ↔ [500v] [4] [3] [2] [4] [3] [2] [4]
It shows how to change the measuring input of AC Type.
- When confirming the setting value with [2] times, the changed setting value flickers 20times and enters into next setting.
- It returns RUN mode from parameter by pressing [4] key for 3sec.

Caution for using

- Allowable installation environment
 - ① If 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 is applied, if "HHHH" or "LLLL" are displayed, there are some problem 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)

Autonics Corporation
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Satisfiable Partner For Factory Automation

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