

MT4N Series

DIN W48×H24mm Small Size Digital Multi Panel Meter

Features

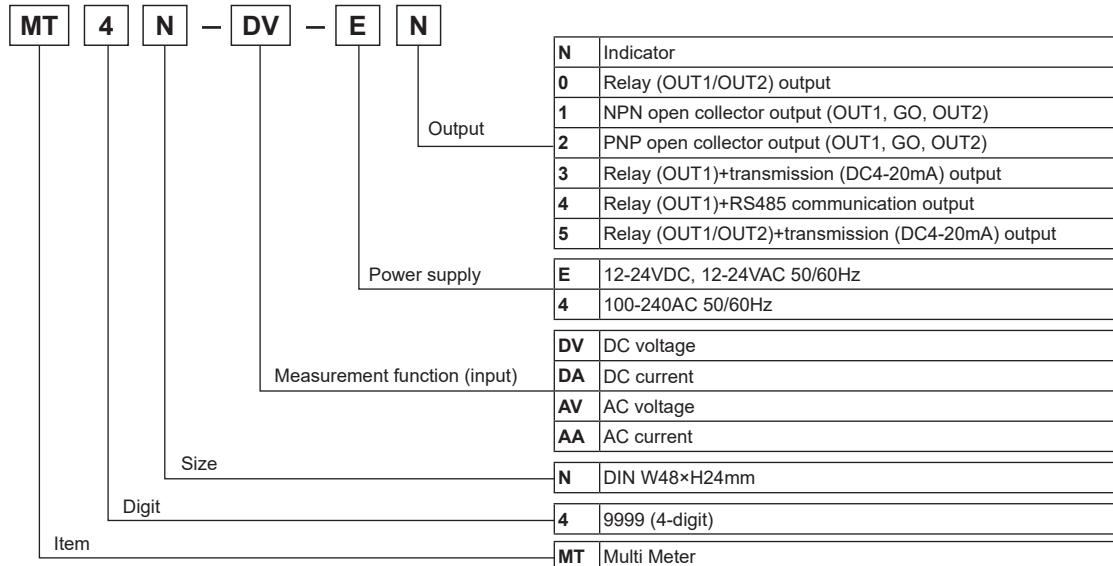
- Various input/output options (by model)
 - Input options: DC voltage, DC current, AC voltage, AC current
 - Output options: RS485 communication output, PV transmission output (DC 4-20mA), NPN/PNP open collector output, relay contact output
 - ※ default option: indicator/no output
 - Maximum allowed input: 50VDC, 250VAC, DC500mA, AC5A
 - Display range: -1999 to 9999
 - High/low-limit display scale function
 - AC frequency measurement (range: 0.1 to 9999Hz)
 - Various functions: peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction, PV transmission output (DC4-20mA) scale
 - Power supply: 12-24VDC/VAC, 100-240VAC



⚠ Please read “Safety Considerations” in the instruction manual before using.



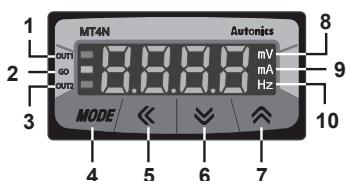
Ordering Information



※ To measure the current over DC500mA, please select DV type because the shunt should be used.

※In case of selecting frequency display, no output will be provided even if it is output support models.
(main output, sub output and RS485 communication output)

Unit Description



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

※There is no 1, 2, 3 on a display panel of MT4N-□-□N.

※ MT4N-□-□3, □4 model has output display part of OUT1 only.

Multi Panel Meter

■ Specifications

Series	MT4N-DV-E□ MT4N-DA-E□	MT4N-AV-E□ MT4N-AA-E□	MT4N-DV-4□ MT4N-DA-4□	MT4N-AV-4□ MT4N-AA-4□
Measurement input	DC voltage, current	AC voltage, current, frequency	DC voltage, current	AC voltage, current, frequency
Power supply	12-24VDC=, 12-24VAC~ 50/60Hz		100-240VAC~ 50/60Hz	
Allowable voltage range	90 to 110%			
Power consumption	DC: 3W, AC: 5VA For MT4N-E5- DC: 5W, AC: 8VA		5VA	
Display method	7-segment LCD display (red) (character height: 9mm)			
Display accuracy	• 23°C±5°C - DC input: F.S. ±0.1% rdg ±2-digit / AC input: F.S. ±0.3% rdg ±3-digit ※For 5A terminal of current Input, F.S. +0.3% rdg ±3-digit • -10°C to 50°C - DC/AC input: F.S. ±0.5% rdg ±3-digit			
Max. allowable input	110% F.S. for each measured input range			
A/D conversion method	Practical oversampling using successive approximation ADC			
Sampling cycle	DC input: 50ms, AC input: 16.6ms			
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 - Max. 12-24VDC= ±2V 50mA (resistive load)			
Sub output (transmission output)	• RS485 comm. output - Baud rate: 1,200/2,400/4,800/9,600, Communication method: 2-wire half duplex, Synchronous method: Asynchronous method, Protocol: Modbus type • DC4-20mA output - Resolution: 12,000 division (load resistance max. 600Ω)			
AC measurement ^{※1}	Selectable RMS or AVG			
Frequency measurement ^{※1}	Measurement range: 0.100 to 9999Hz (variable by decimal point position)			
Hold function ^{※2}	Includes (external hold function)			
Insulation resistance	Over 20MΩ (at 500VDC megger)			
Dielectric strength	1000VAC 50/60Hz for 1 min (between external terminal and case)	2000VAC 50/60Hz for 1 min (between external terminal and case)		
Noise immunity	±2kV the square wave noise (pulse width: 1μs) by the noise simulator			
Vibration	Mechanical 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours Malfunction 0.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min			
Shock	Mechanical 100m/s ² (approx. 10G) in each X, Y, Z direction for 3 times Malfunction 300m/s ² (approx. 30G) in each X, Y, Z direction for 3 times			
Environment	Ambient temperature -10 to 50°C, storage: -20 to 60°C Ambient humidity 35 to 85%RH, storage: 35 to 85%RH			
Insulation type	Double insulation or reinforced insulation (mark: □, dielectric strength between the measurement input part and the power part: 1kV)			
Approval	CE	—		
Weight ^{※3}	Approx. 127g (approx. 64g)			

※1: AC, frequency measurement functions are only for AC measurement input type.

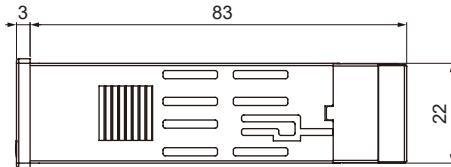
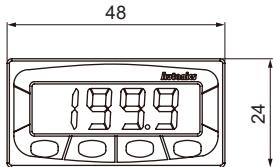
※2: The indicator has no Hold function.

※3: The weight includes packaging. The weight in parenthesis is for unit only.

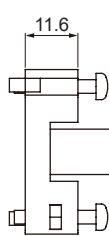
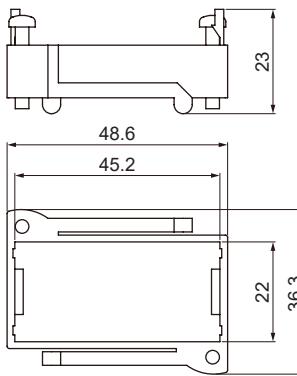
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

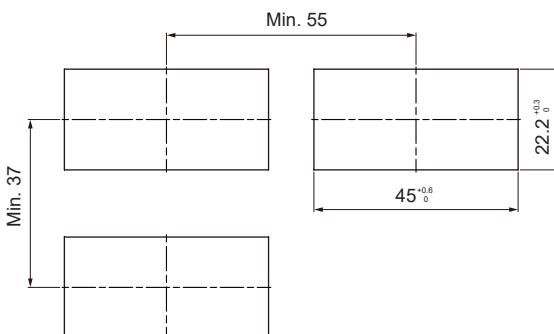
(unit: mm)



• Bracket



• Panel cut-out



SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(J) Temperature Controllers

(K) SSRs

(L) Power Controllers

(M) Counters

(N) Timers

(O) Digital Panel Meters

(P) Indicators

(Q) Converters

(R) Digital Display Units

(S) Sensor Controllers

(T) Switching Mode Power Supplies

(U) Recorders

(V) HMIs

(W) Panel PC

(X) Field Network Devices

MT4N Series

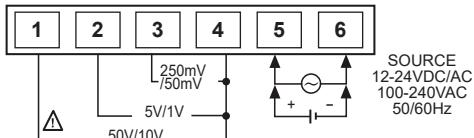
Connections

※ Use terminals of size specified below.

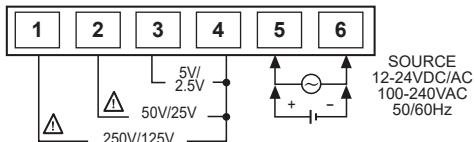
	a	b
<Forked>	Min. 3.0mm	Min. 6.0mm

Measurement input terminal connection

- MT4N-DV- □□



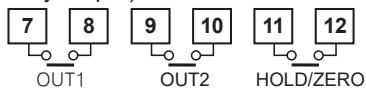
- MT4N-AV- □□



Output terminal connection

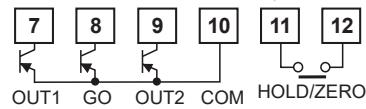
- MT4N-□-□0

(Relay output)



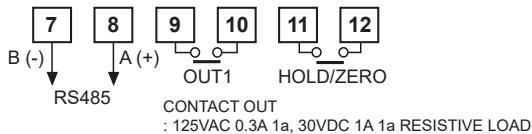
- MT4N-□-□2

(PNP open collector output)

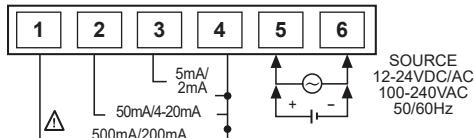


- MT4N-□-□4

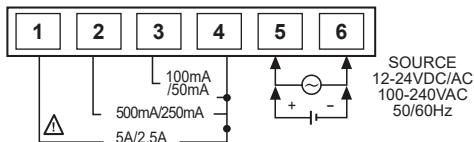
(Relay+RS485 communication output)



- MT4N-DA- □□

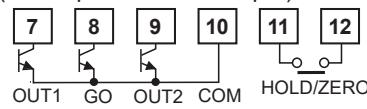


- MT4N-AA- □□



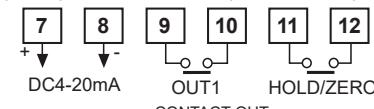
- MT4N-□-□

(NPN open collector output)



- MT4N-□-□3

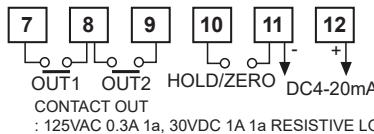
(Relay+transmission (DC4-20mA) output)



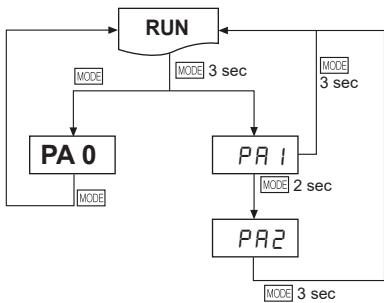
CONTACT OUT : 125VAC 0.3A 1a, 30VDC 1A 1a RESISTIVE LOAD

- MT4N-□-□5

(Relay+transmission (DC4-20mA) output)

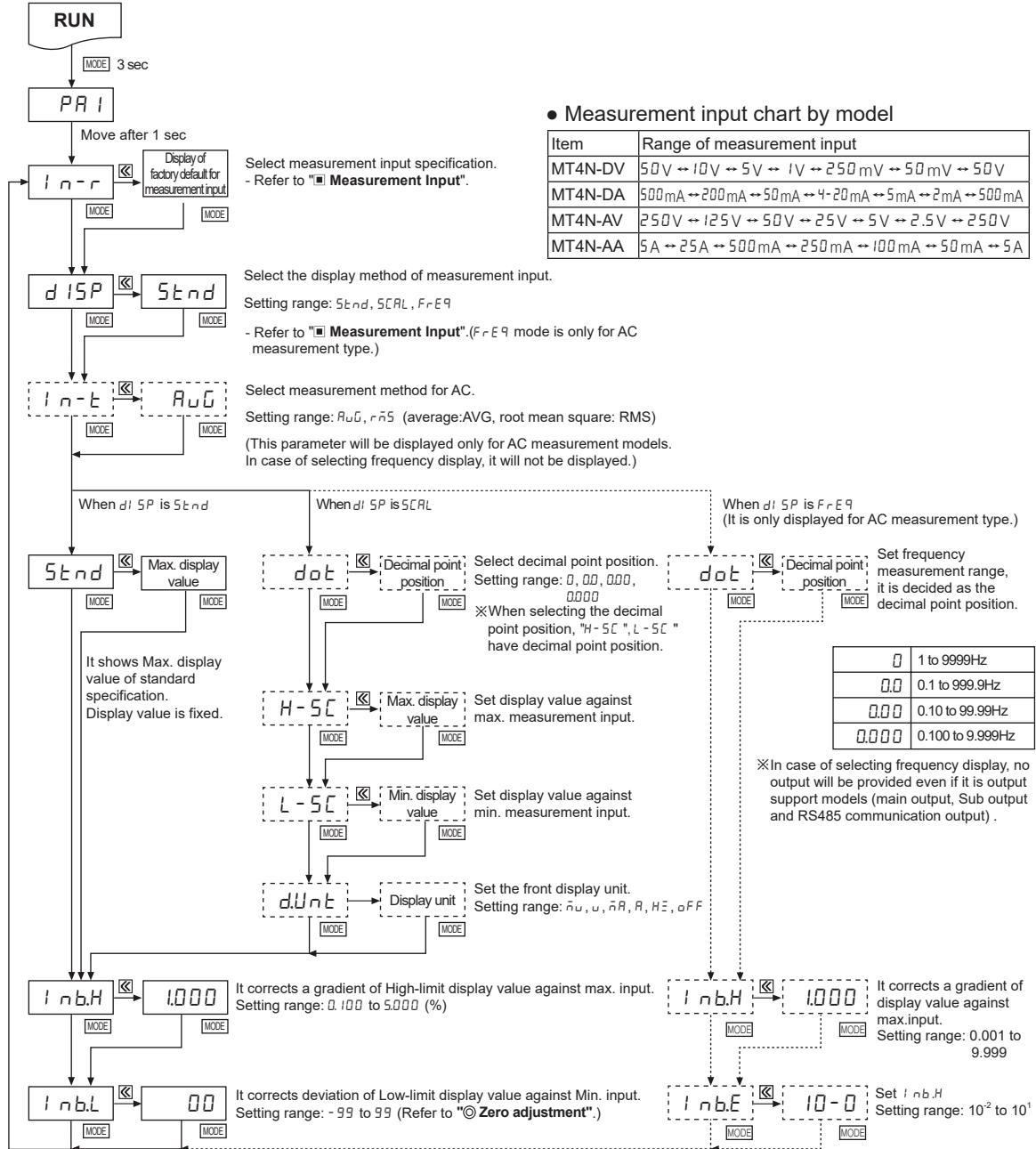


Parameter Setting



- ※ Press [MODE] key in RUN mode and it enters PA 0 group.
- ※ Press [MODE] key for over 3 sec in RUN mode, it displays [PR 1].
- ※ Press [MODE] key for over 5 sec in RUN mode, it displays [PR 2] after [PR 1]. When pressing [MODE] key continually, it stops displaying at [PR 2].
- ※ It is advanced to current display parameter releasing [MODE] key at [PR 1] or [PR 2].
- ※ Press [MODE] key for over 3 sec in any parameter groups, it returns to RUN mode.
- ※ If any key is not entered for 60 sec in each parameter, it returns to RUN mode.
- ※ After returning to RUN mode, press [MODE] key within 2 sec, it returns to previous parameter. (Refer to descriptions of each parameter group.)
- ※ PA 0 group cannot be entered when preset output mode of [PR 2] group is OFF.

Parameter 1 Group



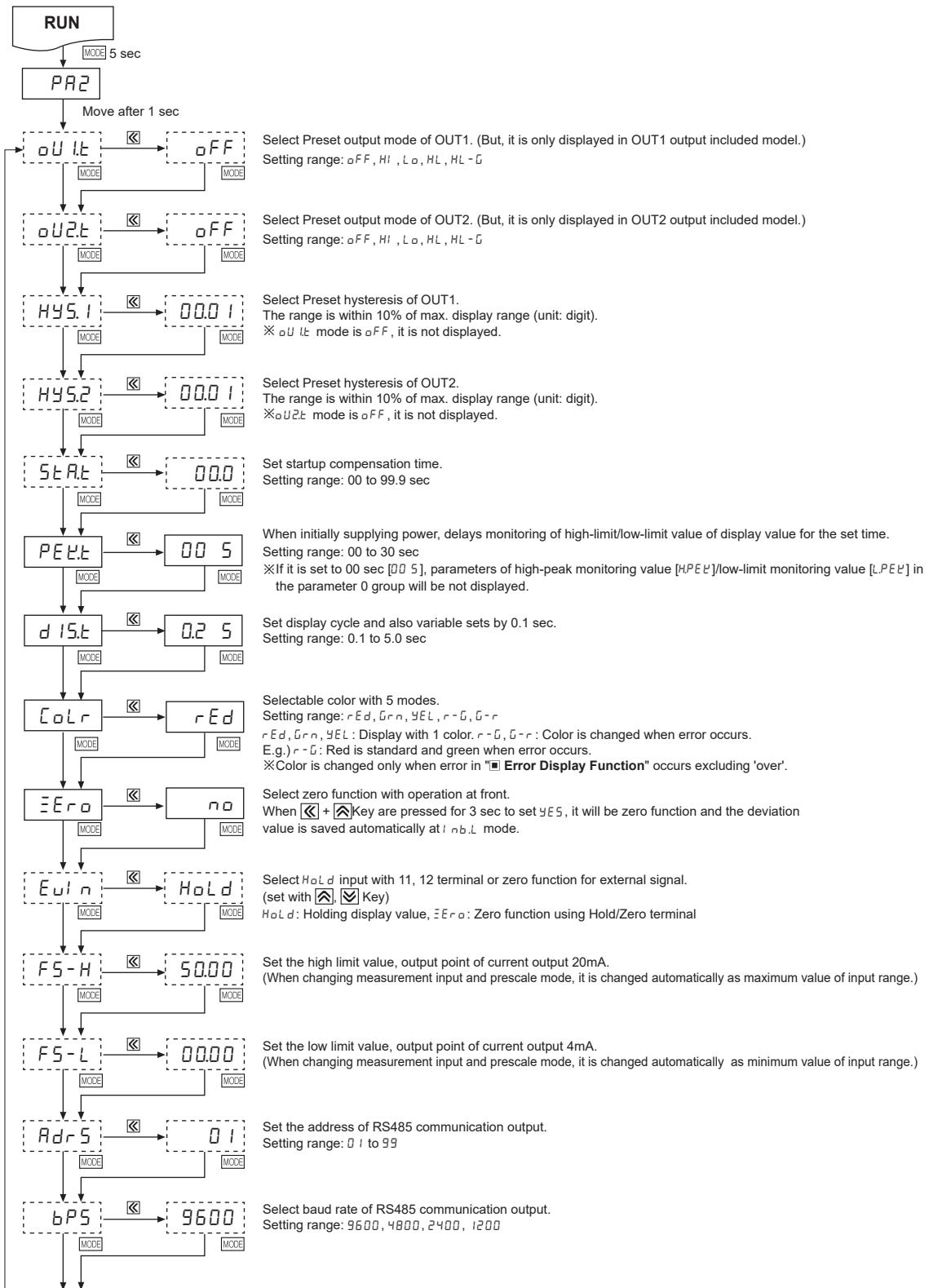
※After setting each mode, press **MODE** key for 2 sec to return to **RUN**.

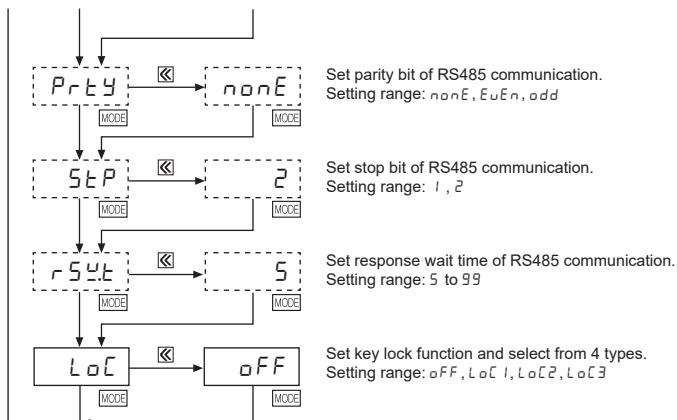
※If any key is untouched for 60 sec after advance to Parameter, it will return to **RUN**.

◎ Factory defaults

Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
<i>l n-r</i>	50	500	250	5	<i>l nb.H</i>	1.000	1.000	1.000	1.000
<i>dI SP</i>	<i>Send</i>	<i>Send</i>	<i>Send</i>	<i>Send</i>	<i>l nb.L</i>	00	00	00	00
<i>l n-t</i>	—	—	<i>RuG</i>	<i>RuG</i>	<i>dot</i>	0.00	0.0	0.0	0.000
<i>Send</i>	5000	5000	2500	5000	<i>l nb.E</i>	—	—	10-0	10-0
<i>d-Unt</i>	u	R	u	R					

Parameter 2 Group





<i>off</i>	Disable to lock keys
<i>Loc1</i>	Lock Parameter 1
<i>Loc2</i>	Lock Parameter 1, 2
<i>Loc3</i>	Lock Parameter 0, 1 and 2

※The dotted mode is only displayed for output type.

※After setting each mode, press **MODE** key for 2 sec to return to **RUN** mode.

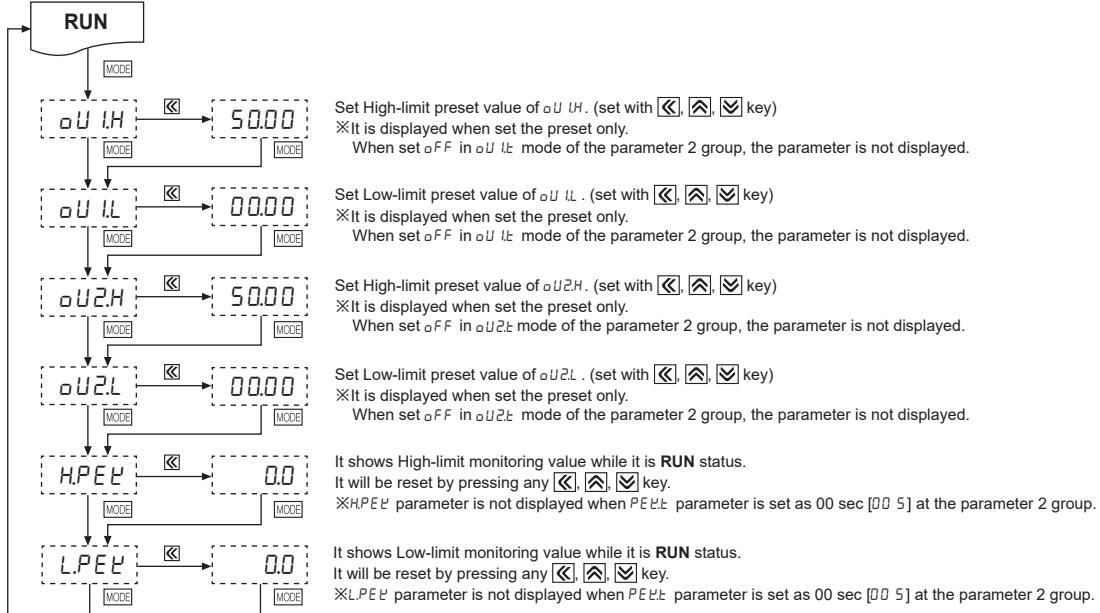
※If any key is untouched for 60 sec after advance to parameter, it will return to **RUN** mode.

※The min. setting interval between *F5-H* and *F5-L* is 10% F.S., it is fixed as 10% of the setting value when it is small.

◎ Factory defaults

Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
<i>aU1t</i>	<i>off</i>	<i>off</i>	<i>off</i>	<i>off</i>	<i>Ero</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>
<i>aU2t</i>	<i>off</i>	<i>off</i>	<i>off</i>	<i>off</i>	<i>Euln</i>	<i>Hold</i>	<i>Hold</i>	<i>Hold</i>	<i>Hold</i>
<i>HYS.1</i>	000.1	000.1	000.1	000.1	<i>FS-H</i>	5000	5000	2500	5000
<i>HYS.2</i>	000.1	000.1	000.1	000.1	<i>FS-L</i>	00.00	00.00	0.0	0.000
<i>PElt</i>	00.5	00.5	00.5	00.5	<i>Adrs</i>	01	01	01	01
<i>d15t</i>	0.25	0.25	0.25	0.25	<i>bPS</i>	9600	9600	9600	9600
<i>CoLr</i>	<i>red</i>	<i>red</i>	<i>red</i>	<i>red</i>	<i>Loc</i>	<i>off</i>	<i>off</i>	<i>off</i>	<i>off</i>

■ Parameter 0 Group



※If any key is untouched for 60 sec after advance to parameter, it will return to **RUN** mode.

◎ Factory defaults

Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Parameter	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
<i>aU1H</i>	5000	5000	2500	5000	<i>aU2L</i>	00.00	00.00	00.00	00.00
<i>aU1L</i>	00.00	00.00	00.00	00.00	<i>HPEL</i>	0.0	0.0	0.0	0.000
<i>aU2H</i>	5000	5000	2500	5000	<i>LPET</i>	0.0	0.0	0.0	0.000

SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE
(J) Temperature Controllers
(K) SSRs
(L) Power Controllers
(M) Counters
(N) Timers
(O) Digital Panel Meters
(P) Indicators
(Q) Converters
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(T) Switching Mode Power Supplies
(U) Recorders
(V) HMIs
(W) Panel PC
(X) Field Network Devices

MT4N Series

Measurement Input

Type	Measurement input range	Input impedance	Display range [Scale]	Prescale display range [Scale]										
DC voltage	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 current	0-500mA [500mA]	0.1Ω	0.0 to 500.0 (fixed)	<table border="1"> <tr> <td>dot</td> <td>Display range</td> </tr> <tr> <td>0</td> <td>-1999 to 9999</td> </tr> <tr> <td>0.0</td> <td>-199.9 to 999.9</td> </tr> <tr> <td>0.00</td> <td>-19.99 to 99.99</td> </tr> <tr> <td>0.000</td> <td>-1.999 to 9.999</td> </tr> </table>	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
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													
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]	101.1Ω	0.000 to 5.000 (fixed)												
0-2mA [2mA]	101.1Ω	0.000 to 2.000 (fixed)												
AC voltage	0-250V [250V]	1.109MΩ	0.0 to 250.0 (fixed)	<p>※ Connect to the input terminals whose 30% to 100% of the input range includes the max. value of the input range to measure. When the max. input value is under the 30% of the input terminal range, display accuracy is degraded. When the max. input value is over the 100%, it may result in input terminal damage.</p>										
	0-125V [125V]	1.109MΩ	0.0 to 125.0 (fixed)											
	0-50V [50V]	200kΩ	0.00 to 50.00 (fixed)											
	0-25V [25V]	222kΩ	0.00 to 25.00 (fixed)											
	0-5V [5V]	22kΩ	0.000 to 5.000 (fixed)											
	0-2.5V [2.5V]	22kΩ	0.000 to 2.500 (fixed)											
AC current	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)											

※ When "HHHH" or "LLLL" is flashes with a certain measurement input, disconnect power supply and then check the cables.

Sold Separately

Communication converter

- **SCM-WF48**
(Wi-Fi to RS485-USB wireless communication converter)



- **SCM-US48I**
(USB to RS485 converter)



- **SCM-38I**
(RS232C to RS485 converter)



Display Units (DS/DA-T Series)

- **DS/DA-T Series**
(RS485 communication input type display unit)



DS16-□T



DS22/DA22-□T



DS40/DA40-□T



DS60/DA60-□T

※ Connect RS485 communication input type display unit (DS/DA-T Series) and RS485 communication output model of MT4N Series, the display unit displays present value of the device without PC/PLC.

Functions

① AC frequency measurement

[PA1 group: d1 5P]

It measures input signal frequency when it is AC input. It uses fixed decimal point [PA 1: d₀ t], 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: I_nb.H] and [PA 1: I_nb.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.

① Measurement range

Decimal point position	0.000	0.00	0.0	0
Decimal point position	0.100 to 0.999Hz	0.10 to 99.99Hz	0.1 to 999.9Hz	1 to 9999Hz

※ Accuracy of frequency measurement:

Below 1kHz, F.S. ±0.1rdg ±2-digit.

From 1kHz to 10kHz, F.S. ±0.3rdg ±2-digit.

② I_nb.H: 0.100 to 9.999

[Gradient adjustment of high value]

③ I_nb.E: 10⁻², 10⁻¹, 10⁰, 10¹ [Index adjustment of I_nb.H]

② Zero adjustment

[Deviation correction function of low limit display value]

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 I_nb.L automatically.

Operation	Input correction value	Front panel key	Input external signal
Description	PA 1: Direct input correction value method at I _n b.L	[], [] keys are pressed for 3 sec at the RUN mode.	Short-circuit External hold terminal 11, 12 over min. 50m.

※ Refer to "④ Error correction", "⑤ Error display" and "Parameter 2 Group" for function and error.

④ Transmission (DC4-20mA) output scale

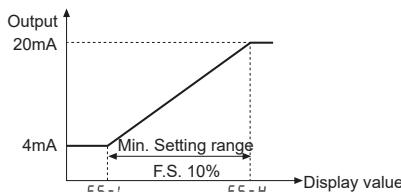
[PA 2 group: F5-H / F5-L]

It sets transmission output for the display value at the output current DC4-20mA.

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%.

※ When min. set interval between F5-H and F5-L is set as under 10% F.S., it changed as over 10% F.S. automatically.

※ Preset display value is fixed to output as 4mA at under F5-L and 20mA at over F5-H.



⑥ Initialization

It initializes as the factory default status. If press [], [], [] keys together for 2 sec in RUN mode, I_nb.L mode and the setting value [n₀] is displayed every 0.5 sec and it will be initialized as the factory default when press MODE key after change n₀ → YES.

⑦ Error display

Display	Description
HHHH	Flashes when measurement input is exceeded the max. allowable input (110%)
LLLL	Flashes when measurement input is exceeded the max. allowable input (-10%)
d-HH	Flashes when display input is exceeded max. display range (9999)
d-LL	Flashes when display input is exceeded min. display range (-1999)
F-HH	Flashes when measurement frequency is exceeded the max. measurement value (9999)
o _u E _r	Flashes when it exceeds zero adjustment range (±99)

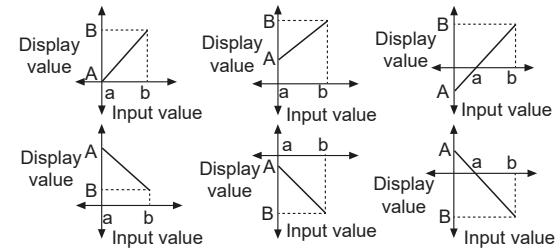
※ Error display is released automatically when it is in the measured and display range.

※ "LLLL" is displayed when the measurement input is DC4-20mA.

※ After flashing "o_uE_r" 2 times when it exceeds the zero adjustment range, it returns to RUN mode.

⑧ Display scale [PA 1 group: H-SCE / L-SCE]

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.

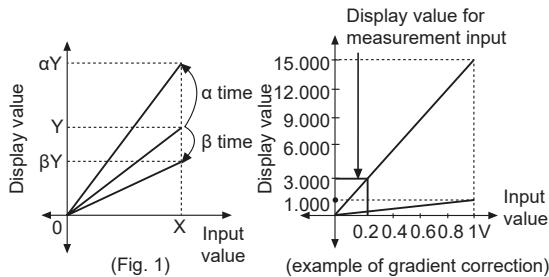


MT4N Series

◎ Gradient correction [PA1 group: I_{nbH}]

It corrects the gradient of prescale value and display value. (Fig. 1) Display value Y can be adjusted as α , β times against X input value by correction function [I_{nbH}] and used as correction function of max. display value [$H-5C$]. Adjustment range is 0.100 to 5.000 and multiply current gradient.

E.g.) To display "3.000" in DC 200mV input for measured input specification as 0 to 1V.



- ① Select 0-1VDC[I_U] for measured input in Parameter 1.
 - ② Standard specification in input: 0-1VDC and 1.000 therefore it has to be 15.000[$H-5C$] 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 $I_{nbH} \times H-5C = 15.000$

Setting	$H-5C$	$L-5C$	I_{nbH}	Note
①	Disable	0.000	1.000	—
②	7.500	0.000	2.000	
③	5.000	0.000	3.000	In this case, any setting methods display the same display value.
④	3.750	0.000	4.000	
⑤	3.000	0.000	5.000	

◎ Error correction [PA 1 group: I_{nbH} / I_{nbL}]

It corrects display value error of measured input.

I_{nbL} : ±99 [Adjust deviation of low value]

I_{nbH} : 5.000 to 0.100 [Correct gradient (%) of high value]

Display value= (measured value $\times I_{nbH}$) + I_{nbL}

E.g.) When the measured range is 0 to 500V, and the display range is 0 to 500.0. If the low display value is "1.2" to 0V input, set -12 as I_{nbL} value to display "0.0" by adjusting offset of the low value. The display value to 500V measured input varies by adjusting the offset of low value.

If this display value is "501.0", calculate 500.0/501.0 (desired display value/the display value), and set the 0.998 correction value as the I_{nbH} to display 500.0 by adjusting gradient of high value.

※The offset correction range of I_{nbL} is within -99 to 99 for D⁰, D¹ digit regardless of decimal point.

◎ Display cycle delay [PA 2 group: $d1S_t$]

In some applications the measured input may fluctuate which in turn causes the display to fluctuate. By adjusting the display cycle delay function time in the $d1S_t$ 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.

◎ Monitoring peak display value

[PA 0 group: $HPEU$ / $LPEU$, PA 2 group: PEU]

It monitors max./min. value of display value based on the current displays value and then displays the data at $HPEU$, $LPEU$ of parameter 0. Set the delay time (0 to 30 sec) at PEU 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 $HPEU$, $LPEU$ of parameter 0, the monitored data is initialized.

※ $HPEU$, $LPEU$ parameters is not displayed when monitoring delay time [PEU] of parameter 2 group is set as 00 sec [00 5].

◎ Preset output operation mode

[PA 2 group: $out1$ / $out2$]

Mode	Output operation	Operation
OFF		No output
$H1$		Period ON : Display value ≥ OUT.H Period OFF : Display value ≤ OUT.H-Hys
$L1$		Period ON : Display value ≤ OUT.L Period OFF : Display value ≥ OUT.L+Hys
HL		Period ON : Display value ≤ OUT.L or Display value ≥ OUT.H Period OFF : Display value ≥ OUT.L+Hys or Display value ≤ OUT.H-Hys
$HL-D$		Period ON : OUT.L ≤ Display value ≤ OUT.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 by output operation mode selection.

※GO is outputted within the period both OUT1/OUT2 are off. (NPN/PNP open collector output type.)

■ Communication Output

(refer to MT4N/MT4Y/MT4W Command Features section.)