

MT4N Series

DIN W48 × H24mm Small size digital multi panel meter

Features

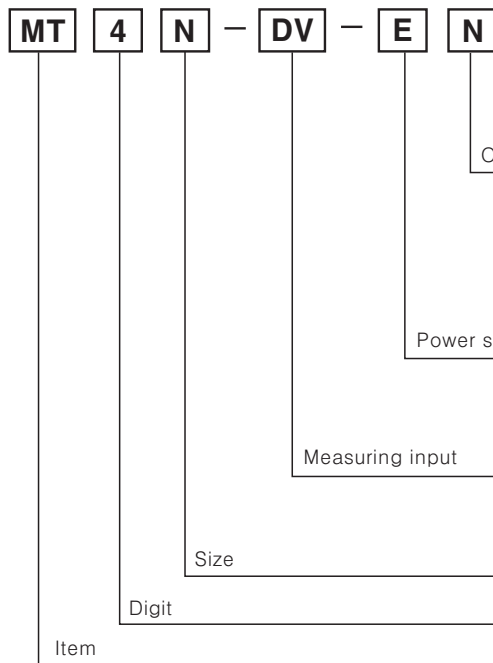
- Various output options (Default : Indicator)
RS485 communication output, current (DC4–20mA),
NPN/PNP open collector output, relay contact output
- Max. measuring inputs
: DC500V, AC500V, DC5A, AC5A
- Display range : -1999 to 9999
- High/Low scale
- AC frequency measurement : Range 0.1 to 9999Hz
- Various functions : Monitoring function for max. and
min. display value function, display cycle delay function,
zero function, high display correction function,
current output scale function
- Power supply : 12–24VDC/VAC, 100–240VAC



⚠ Please read "Caution for your safety" in operation manual before using.



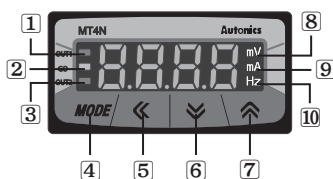
Ordering information



N	Indicator(No output function)
0	Relay contact output
1	NPN open collector output
2	PNP open collector output
3	Relay contact output+Transmission output(DC4–20mA)
4	Relay contact output+RS485 communication output
*Output (0 to 4) : Option	
E	12–24VDC/AC
4	100–240AC
DV	DC voltage
DA	DC ampere
AV	AC voltage
AA	AC ampere
N	DIN W48 × H24mm
4	9999(4 Digit)
MT	Multi Meter

※To measure the current over 5ADC, please select DV type because the shunt should be used.

Front panel identification



- 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 [←] : Shift key
- 6 [↓] : Down key
- 7 [↑] : 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

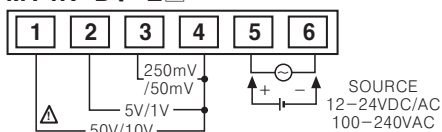
Series	MT4N-DV-E□ MT4N-DA-E□	MT4N-AV-E□ MT4N-AA-E□	MT4N-DV-4□ MT4N-DA-4□	MT4N-AV-4□ MT4N-AA-4□
Measurement input	DC voltage, ampere	AC voltage, ampere, Frequency	DC voltage, ampere	AC voltage, ampere, Frequency
Power supply	12-24VDC/AC(90 to 110% of rated voltage)		100-240AC(90 to 110% of rated voltage)	
Power consumption	DC : 3W, AC : 5VA		5VA	
Display method	7Segment LCD display, Character height : 9mm			
Display accuracy	• 23°C ±5°C ⇨ DC Type : F.S±0.1% rdg±2digit / AC Type : F.S±0.3% rdg±3digit DC/AC Type : F.S +0.3% rdg +3digit max. only for 5A terminal. • -10°C to 50°C ⇨ DC/AC Type : F.S±0.5% rdg±3digit			
Max. allowable input	110% for input spec.			
A/D conversion method	Practical oversampling using successive approximation ADC			
Sampling cycle	DC type : 50ms, AC type : 16.6ms(Resolution 1/12000)			
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 ⇨ 12-24VDC ±2V 50mA Max.(Load resistance)			
Sub output (Transmission output)	• RS485 communication output ⇨ Baud rate : 1200/2400/4800/9600, Communication method : 2 wires half duplex, Tuning method : Sub-synchronization, Protocol : Modbus RTU • Transmission(DC4-20mA) output ⇨ Resolution : 12,000 division(Load resistance max. 600Ω)			
AC measuring function	(★1) Selectable RMS or AVG			
Frequency measuring function	(★1)(★2) Measurement range : 0.100 to 9999Hz(Differ according to decimal point position)			
Hold function	(★3) Includes(Outer hold function)			
Insulation resistance	Min. 20MΩ (at 500VDC megger)			
Dielectric strength	1000VAC 50/60Hz for 1 minute (Between external terminal and case)		2000VAC 50/60Hz for 1 minute (Between external terminal and case)	
Noise strength	±2kV the square wave noise(pulse width : 1μs) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10minutes		
Shock	Mechanical	100m/s ² (10G) in X, Y, Z directions for 3 times		
	Malfunction	300m/s ² (30G) in X, Y, Z directions for 3 times		
Ambient temperature	-10 to 50°C (at non-dew status)			
Storage temperature	-20 to 60°C (at non-dew status)			
Ambient humidity	35 to 85%RH			
Insulation type	(★4)			
Approval	CE			
Unit weight	Approx. 65g			

- ※(★1) AC measuring function, and frequency measuring function are only for AC measuring input type.
- ※(★2) Frequency measuring accuracy : 1kHz Max. ±0.1% F.S, 1kHz to 10kHz Max. ±0.3% F.S
- ※(★3) The indicator has no hold function.
- ※(★4) "□" Mark indicated that equipment protected throughout by double insulation or reinforced insulation.

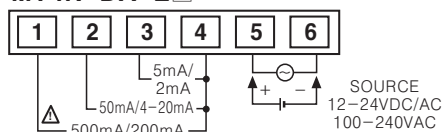
Connections

Measuring input terminal connection

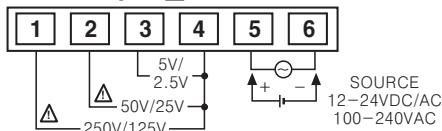
MT4N-DV-E□



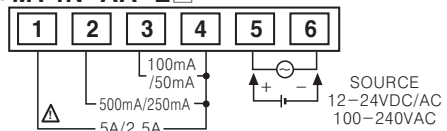
MT4N-DA-E□



MT4N-AV-E□

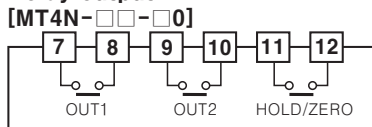


MT4N-AA-E□

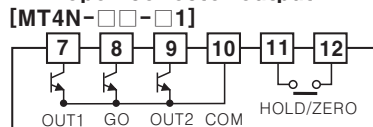


Option

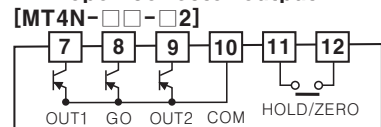
Relay output



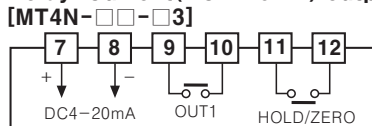
NPN open collector output



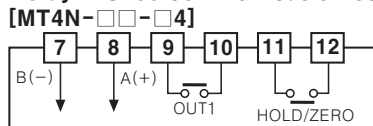
PNP open collector output



Relay+Current(DC4-20mA) output



Relay+RS485 communication output

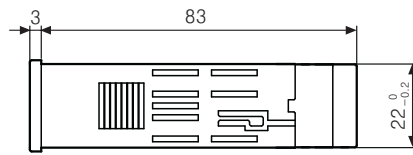
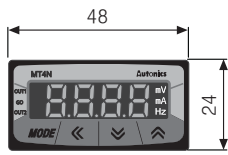


(A) Photo electric sensor
(B) Fiber optic sensor
(C) Door/Area sensor
(D) Proximity sensor
(E) Pressure sensor
(F) Rotary encoder
(G) Connector/Socket
(H) Temp. controller
(I) SSR/Power controller
(J) Counter
(K) Timer
(L) Panel meter
(M) Tacho/Speed/Pulse meter
(N) Display unit
(O) Sensor controller
(P) Switching power supply
(Q) Stepping motor & Driver & Controller
(R) Graphic/Logic panel
(S) Field network device
(T) Production stoppage models & replacement

MT4N Series

■ Dimensions

● MT4N-□□-EN



● MT4N-□□-E0



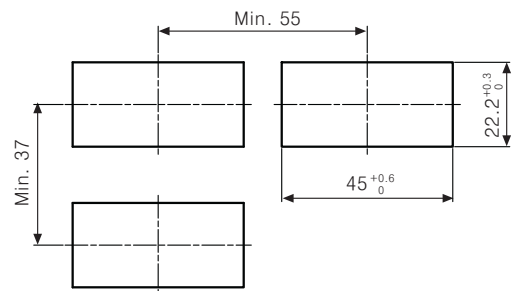
● MT4N-□□-E1, E2



● MT4N-□□-E3, E4



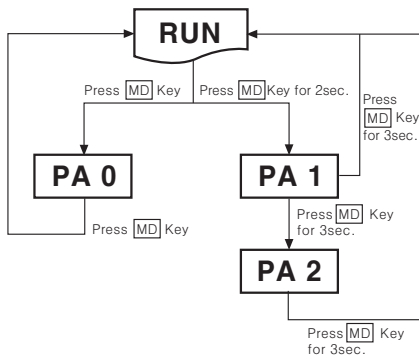
● Panel cut-out



※Process the unit after consider the above recommended cut-out fully.

(Unit:mm)

■ Parameter setting



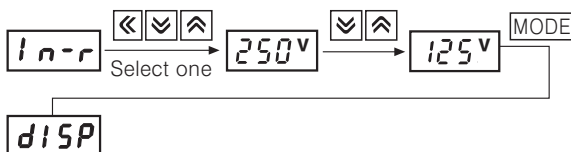
- ※ Press **[MODE]** key in **RUN** status, it will advance to **PA-0** group.
- ※ Press **[MODE]** key in **RUN** status over 2sec., **PA-1** is displayed.
- ※ Press **[MODE]** key in **RUN** status over 5sec., **PA-2** is displayed after **PA-1** and it stops at **PA-2** as press **[MODE]** key continuously.
- ※ When release **[MODE]** key at displaying **PA-1** or **PA-2**, then it will advance to each parameter.
- ※ Press **[MODE]** key over 3sec. at any position of **PA-1** or **PA-2**, it returns to **RUN** mode automatically.
- ※ If any key is untouched for 60sec. in each parameter, it returns to **RUN** mode automatically.
- ※ Press **[MODE]** key within 2sec. after return to **RUN**, it advance to previous parameter again. (See the below procedure of each parameter to set.)
- ※ It cannot advance to **PA-0** when preset output operation mode of **PA-2** is **OFF**.

■ Change the parameter setting value

1. Advance to the parameter to be changed when press **[MODE]** key continuously in **RUN** mode and release **[MODE]** key at the parameter. (Refer to "■ Parameter setting".)
2. When press **[MODE]** key in each parameter, the initial mode of the parameter is displayed. (Refer to the description of each parameter.)
3. When press one of **[←]**, **[↓]**, **[↑]** keys in display mode, saved setting value is displayed.

Ex) Select one → 250V Saved setting value flashes every 0.5sec.

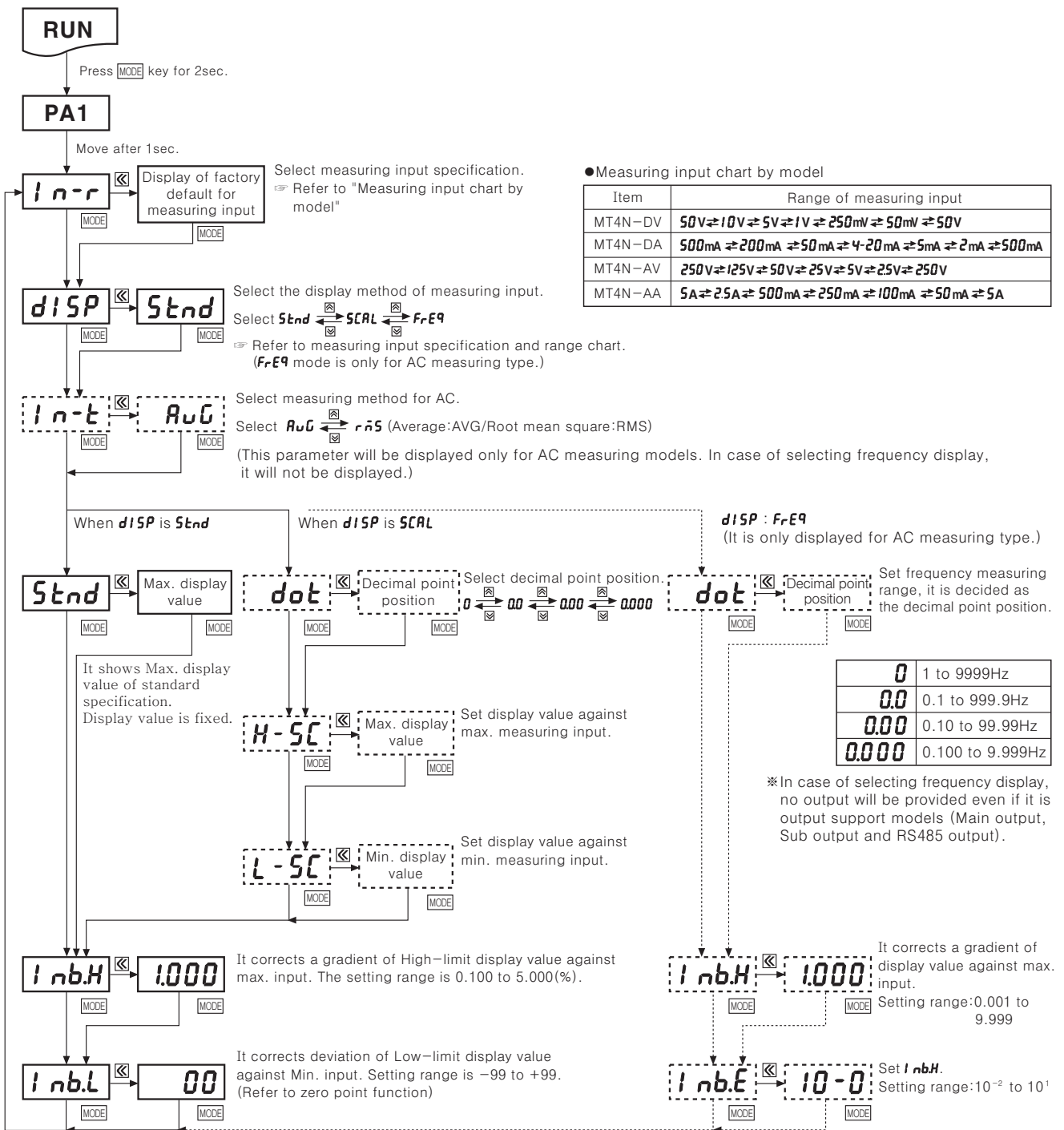
4. Change the setting value by **[↑]** or **[↓]** key.
- Ex) Change AC type measuring input from 250V to 125V.



5. When press **[MODE]** key to complete the change and it is advanced to the next mode after flash 2 times.
6. When press **[MODE]** key for 3sec. after change, it returns to **RUN** mode.

Multi Panel Meter

Parameter group 1



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

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

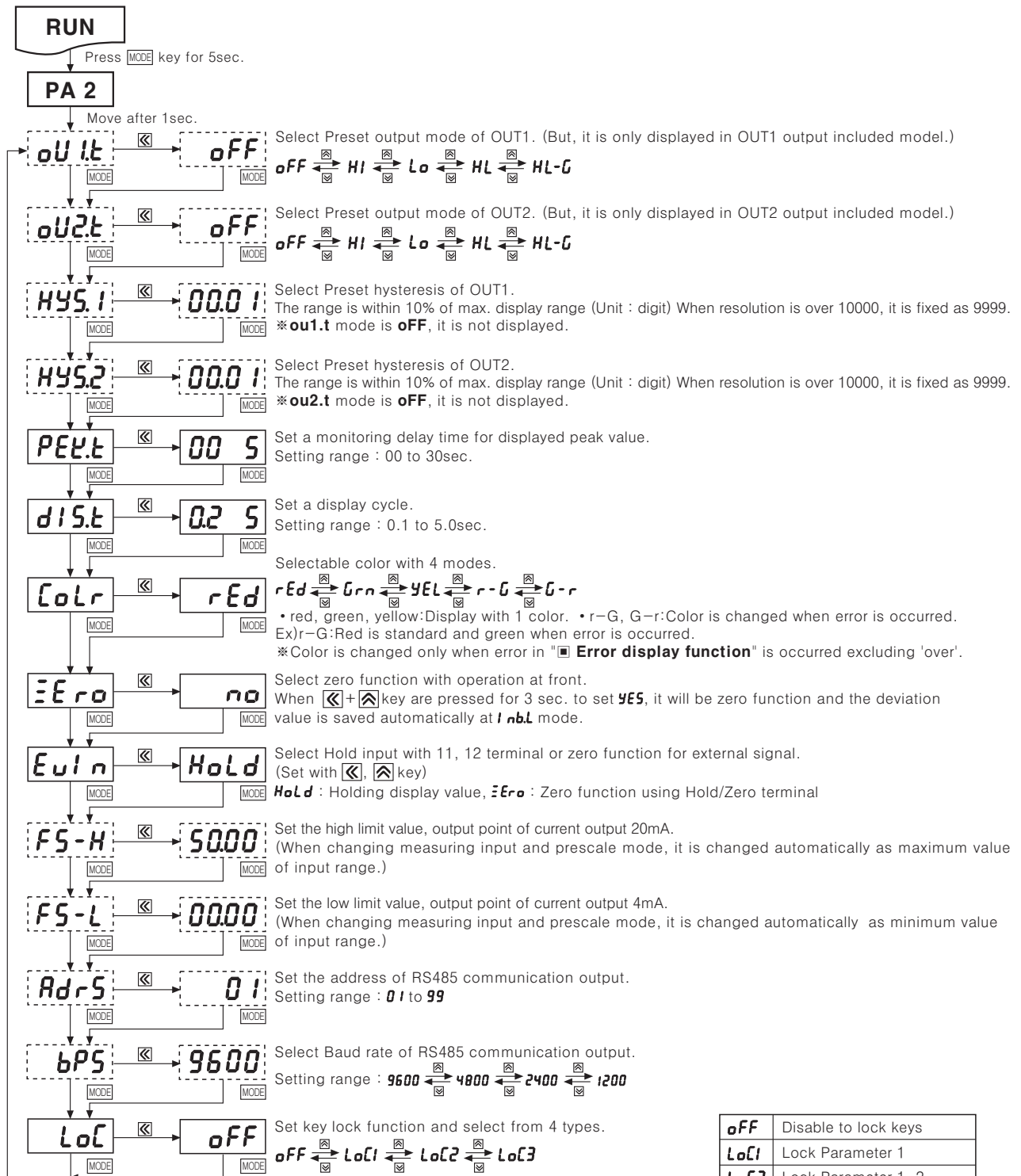
Factory defaults

Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
In-r	50	500	250	5	Inb.H	1.000	1.000	1.000	1.000
dISP	Stnd	Stnd	Stnd	Stnd	Inb.L	00	00	00	00
In-t	—	—	AuG	AuG	dot	0.00	0.0	0.0	0.000
Stnd	5000	5000	2500	5.000	Inb.E	—	—	10-0	10-0

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MT4N Series

Parameter group 2



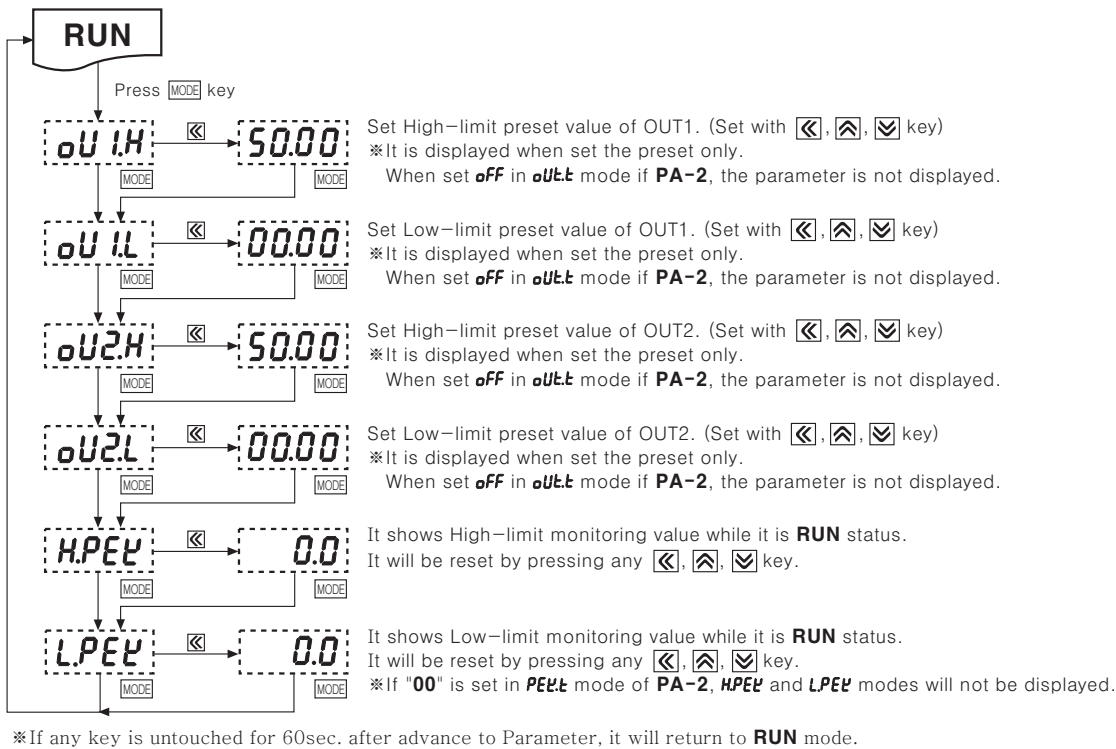
oFF	Disable to lock keys
LoC1	Lock Parameter 1
LoC2	Lock Parameter 1, 2
LoC3	Lock Parameter 0, 1 and 2

- * The dotted mode is only displayed for output type.
- * After setting each mode, press **MODE** key for 2sec. to return to **RUN** mode.
- * If any key is untouched for 60sec. after advance to PARAMETER, it will return to **RUN** mode.
- * The min. setting interval between **FS-H** and **FS-L** is 10% F · S, it is fixed as 10% of the setting value when it is small.

Factory defaults

Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
oU1.t	oFF	oFF	oFF	oFF	EErr	no	no	no	no
oU2.t	oFF	oFF	oFF	oFF	EvIn	HoLd	HoLd	HoLd	HoLd
HYS.1	000.1	000.1	000.1	000.1	FS-H	5000	5000	2500	5000
HYS.2	000.1	000.1	000.1	000.1	FS-L	0000	0000	00	0000
PEEL.t	00.5	00.5	00.5	00.5	AdrS	01	01	01	01
diS.t	0.2.5	0.2.5	0.2.5	0.2.5	bPS	9600	9600	9600	9600
CoLr	rEd	rEd	rEd	rEd	LoC	oFF	oFF	oFF	oFF

Parameter group 0



Factory defaults

Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA	Mode	MT4N-DV	MT4N-DA	MT4N-AV	MT4N-AA
oU1H	50.00	50.00	25.00	50.00	oU2L	00.00	00.00	00.00	00.00
oU1L	00.00	00.00	00.00	00.00	H.PEL	0.00	0.0	0.0	0.000
oU2H	50.00	50.00	25.00	50.00	L.PEL	0.00	0.0	0.0	0.000

Specification of measuring input and range

	Measuring input and range	Input impedance	Standard [Std]	Prescale [SCALE]
			Display range [Fixed]	Display range [Variable]
DC Volt	0-50V [50V]	434.35kΩ	0.00 to 50.00(Fixed)	-1999 to 9999(Variable) -199.9 to 999.9(Variable) -19.99 to 99.99(Variable) -1.999 to 9.999(Variable) (Display position will be changed depending on decimal point position.) *Please connect proper terminal its max. input voltage is within 30 to 100% of input terminal. When it is higher than input voltage, it may cause a breakdown of terminal and over display range and the accuracy is decreased when it is connected to the terminal under 30%.
	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 Ampere	0-500mA [500mA]	0.1Ω	0.0 to 500.0(Fixed)	
	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 Volt	0-250V [250V]	1.109MΩ	0.0 to 250.0(Fixed)	
	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 Ampere	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)	

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■ Functions

◎ AC frequency measurement function (PA1 : d15P mode)

It measures input signal frequency when it is an AC input using fixed decimal point [PA1:dot mode] and measuring range can be changed by setting and measuring range of decimal point position is as below. It is available to adjust upper gradient with [PA1:1nbH mode] and [PA1:1nbE mode]. In order to measure frequency normally, input signal, over 30% F.S of measuring range should be supplied. Please select the proper point of measuring terminal.

① Measuring range

Decimal point position	0.000	0.00	0.0	0
Measurement range	0.100 to 9.999Hz	0.10 to 99.99Hz	0.1 to 999.9Hz	1 to 9999Hz

※ Maximum measurable frequency range is up to 3000Hz. Accuracy can not be guaranteed at higher frequency.

② 1nbH : 0.100 to 9.999

[Gradient adjustment of high value]

③ 1nbE : 10⁻², 10⁻¹, 10⁻⁰, 10¹

[Index adjustment of 1nbH]

◎ Zero adjustment function (Deviation correction function of low limit display value)

It sets preset display value as zero when min. input is entered into the measuring terminal, zero error can be adjusted with 3 ways as below.

When zero adjustment is finished normally by front key and hold terminal, zero will be displayed and the adjusted value is saved in automatically.

Operation	Input correction value	Front panel key	External input signal
Description	PA 1 : Direct input correction value method at 1nbL mode.	⏏, ⏏ keys are pressed for 3sec. at measuring mode.	Short-circuit External hold terminal no.11, 12 over min. 50m. ※ It is enable to use in option mode.

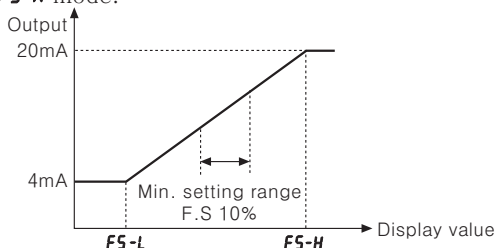
※ Refer to "◎ Error correction function", "◎ Error display function" and "■ Parameter 2" for function and error.

◎ Current output (DC4-20mA) scale function (PA2 : F5-H / F5-L mode)

It outputs DC4-20mA within the setting range of F5-H and F5-L mode to transmit the current display value to the other. When it is over the setting value of F5-H of PA 2, 20mA is outputted and 4mA for it is under the setting value of F5-L mode. (The resolution is 12,000 division and it depends on full scale range.)

※ 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.

※ In case, the display value is under F5-L, 4mA is outputted and 20mA for it is over the setting value of F5-H mode.



◎ Initialization function

It initializes as the factory default status. If press ⏏, ⏏, ⏏ keys together for 2sec. in RUN mode, 1nbL mode and the setting value (no) is displayed every 0.5 sec. and it will be initialized as the factory default when press [MODE] key after change no → YES.

◎ Error display function

Display	Description
HHHH	Flashing when measuring input is exceeded the max. allowable input(110%)
LLLL	Flashing when measuring input is exceeded the minx. allowable input(-10%)
d-HH	Lights when display input is exceeded the max. display range(9999) or H-5C setting value
d-LL	Lights when display input is exceeded the min. display range (-1999) or L-5C setting value
F-HH	Flashes when measuring frequency is exceeded the max. measuring rvalue (9999)
oUr	Flashes when it exceeds zero adjustment range(±99)

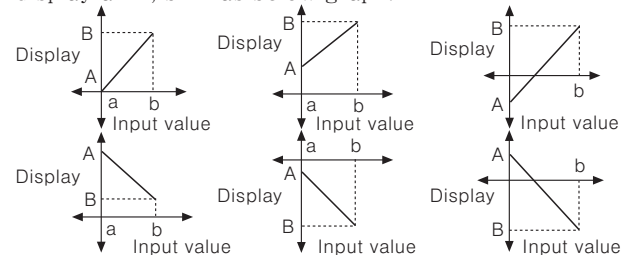
※ An error is cancelled automatically when it is in the measuring and display range.

※ "LLLL" is displayed when the measuring input is 4-20mA.

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

◎ Prescale function (PA 1 : H-5C / L-5C mode)

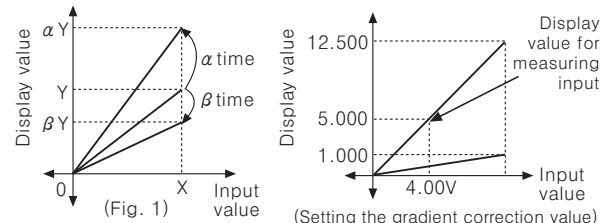
This function is to display setting (-1999 to 9999) of particular High/Low-limit value in order to display High/Low-limit value of measuring input. If measuring inputs are a or b and particular values are A or B, it will display a=A, b=B as below graph.



◎ Gradient correction function (PA1 : 1nbH mode)

This function is to correct a gradient of prescale value and display value. (Fig.1) Display value Y can be used as α , β times against X input value by correction function [1nbH]. And also can be used as correction function of max. display value (H-5C). Adjustment range is 0.100 to 5.000 and multiply current gradient.

Ex) When 4.00VDC, display 5.000 for measuring input 0 to 10.00V



- ① Set the decimal position as '0.000' for prescale value.
- ② In order to display 5.000 when measuring input is 4.00VDC, 12.500 will be displayed when max. input value is 10.00V, but it cannot set the max. setting value.
- ③ Set gradient correction setting value [1nbH] × High scale value [H-5C] = 12.500 as follows.
- ④ It displays 5.000 when measuring input is 4.00V after set is finished.

Setting	H-5C	L-5C	1nbH	Other
①	Disable	0.000	1.000	—
②	6.250	0.000	2.000	It will be the same display value.
③	3.125	0.000	4.000	
④	2.500	0.000	5.000	

◎ Error correction function

(PA 1: *INB.H* / *INB.L* mode)

It corrects display value error of measured input.

INB.L : ±99 (Adjust deviation of low value)

INB.H : 5.000 to 0.100

[Correct gradient(%) of high value]

Display value = (Measured value × *INB.H*) + *INB.L*

Ex) Low value correction

When there is an application where there is a residual voltage of 1.2V, but a 0V display is desired, then it is possible by adjusting the *INB.L* parameter setting to 12 (offset correcting value or equal to 1.2V without decimal) that the desired display value of 0 can be achieved.

Ex) High value correction

When there is an application where the high actual value of display is 501 and exceeds the 500V display range, then it is possible by adjusting the *INB.H* parameter setting to 0.998 (calculated by desired value of 500/actual value of 501), that the desired value can be achieved.

※ The offset correction range of *INB.L* is within -99 to 99 for D⁰, D⁻¹ digit regardless of decimal point.

◎ Display cycle delay function




(PA 2: *DIS.t* mode)

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 *DIS.t* mode in 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 function

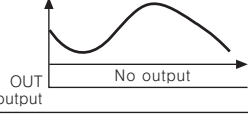
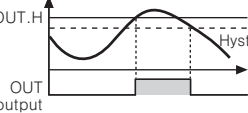
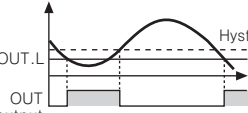
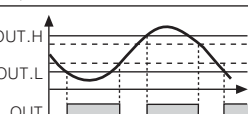
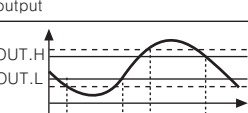
(PA 0: *HPE.t* / *LPE.t* mode, PA 2: *PE.t* mode)

It monitors Max./Min. value of display value based on current display value and then display the data in *HPE.t* mode and *LPE.t* mode of parameter 0. Set delay time (0 to 30 sec.) in *PE.t* mode of parameter 2 in order to avoid 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 set time.

When , ,  keys are pressed at *HPE.t* and *LPE.t* mode of parameter 0, it will be initialized.

※ Monitoring function is not indicated when setting the *PE.t* of parameter 2 as "0".

◎ Preset output mode (PA 2: *OUT.t* / *OUT2.t* mode)

Mode	Output operation	Operation
OFF		No output
HI		Period ON : Display value ≥ OUT.H Period OFF : Display value ≤ OUT.H-Hys
Lo		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-G		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 L-33 to L-34.)

(A) Photo electric sensor
(B) Fiber optic sensor
(C) Door/Area sensor
(D) Proximity sensor
(E) Pressure sensor
(F) Rotary encoder
(G) Connector/Socket
(H) Temp. controller
(I) SSR/Power controller
(J) Counter
(K) Timer
(L) Panel meter
(M) Tacho/Speed/Pulse meter
(N) Display unit
(O) Sensor controller
(P) Switching power supply
(Q) Stepping motor & Driver & Controller
(R) Graphic/Logic panel
(S) Field network device
(T) Production stoppage models & replacement