

Autonics LCD Display Multi Panel Meter

MX4W SERIES

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.
※ Δ symbol represents caution due to special circumstances in which hazards may occur.

Warning Failure to follow these instructions may result in serious injury or death.
Caution Failure to follow these instructions may result in personal injury or product damage.

▲ Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
- Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel to use.
- Failure to follow this instruction may result in electric shock or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in electric shock or fire.
- Check 'Connections' before wiring.
- Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.
- Failure to follow this instruction may result in electric shock or fire.

▲ Caution

- When connecting the power/measurement input, use 24(0.20mm²) to AWG 15(1.65mm²) cable and tighten the terminal screw with a tightening torque of 0.78 to 0.98N·m.
- Failure to follow this instruction may result in fire or malfunction due to contact failure.
- Use the unit within the rated specifications.
- Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.
- Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
- Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit.
- Failure to follow this instruction may result in fire or product damage.

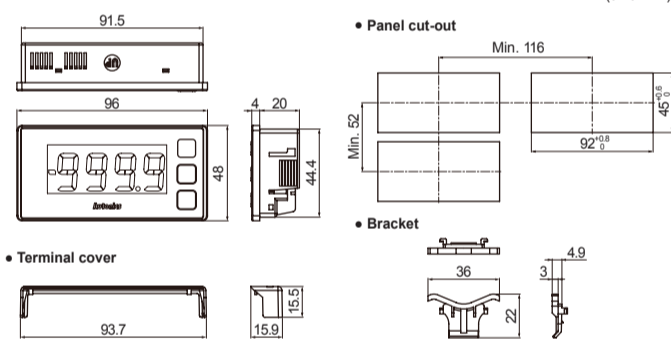
■ Model

| Model | Measurement input | Power supply | Output |
|-----------|-------------------|---------------------------------|---------------------------|
| MX4W-V-FN | | | Indicator |
| MX4W-V-F1 | DC/AC voltage | 24-240VAC 50/60Hz, 24-240VDC | NPN open collector output |
| MX4W-V-F2 | | | PNP open collector output |
| MX4W-A-FN | | | Indicator |
| MX4W-A-F1 | DC/AC current | | NPN open collector output |
| MX4W-A-F2 | | | PNP open collector output |

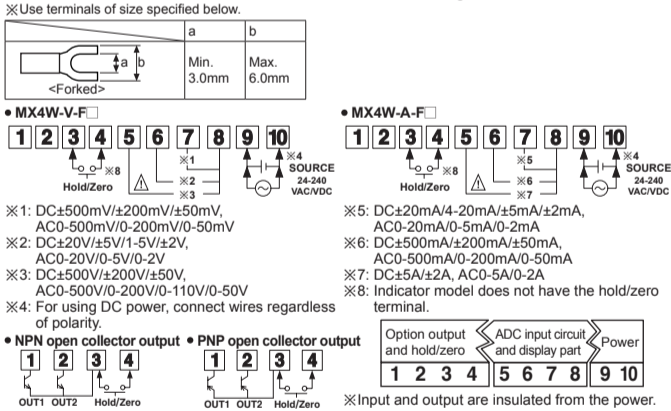
■ Unit Description

- Measurement value display part
 - \square key : Press the key to enter parameter groups, return RUN mode, move parameters, or save the setting values.
 - \leftarrow key : Press the key to move digits, enter parameters, or move parameter setting values.
 - \rightarrow key : Press the key to change digit value, enter or change parameters, or change the parameter setting value.
- Control output (OUT1/OUT2) indicator (red, indicator model: white)
 - MAX/MIN indicator (green, indicator model: white)
: When input is over/low the range, HHHH or LLLL appears.
 - AC/DC indicator (green, indicator model: white)
 - Unit (V/mV/A/mA/Hz%) indicator (yellow, indicator model: white)

■ Dimensions



■ Connections and Insulated Block Diagram



■ Specifications

| Model | MX4W-V-F | MX4W-A-F |
|-------------------------------------|---|---------------|
| Measurement input | DC/AC voltage | DC/AC current |
| Max. allowable input | DC input: approx. -110 to 110% of each measurement input range (when not using minus input: -10 to 110%) AC input: approx. 110% of each measurement input range | |
| Power supply | 24-240VAC~50/60Hz, 24-240VDC | |
| Allowable voltage range | 90 to 110% of the rated voltage | |
| Power supply | Max. 5VA (24-240VAC~50/60Hz), Max. 3W (24-240VDC) | |
| Display method ^{*1} | 12-segment (measurement value display part: white, character height: 19mm), other display parts (red, green, yellow, indicator model: white) LCD method | |
| Display accuracy | 23°C±5°C - DC input: ±0.1% F.S. ±2-digit, AC input: ±0.3% F.S. ±3-digit *The terminal for 5A of current input, ±0.3% F.S. ±3-digit 0°C to 50°C - DC/AC input: ±0.5% F.S. ±3-digit *The terminal for 5A of current input, ±1% F.S. ±3-digit | |
| Display cycle | 0.2 to 5.0 sec (select per 0.1 sec) | |
| A/D conversion method | Sigma-Delta ($\Sigma\Delta$) analog-to-digital converter | |
| Sampling cycle | DC input: 50ms (resolution 1/20,000), AC input: 16.6ms (resolution 1/20,000) | |
| Max. display range | -9999 to 9999 (4-digit) | |
| Preset output ^{*2} | NPN/PNP open collector output * Load current: max. 100mA * Residual voltage: max. 1VDC= (NPN), max. 2VDC (PNP) | |
| AC measurement ^{*3} | Select RMS value/AVG value measurement methods | |
| Frequency measurement ^{*3} | Measurement range: 0.100 to 1200Hz (varies depending on the decimal point) | |
| Insulation resistance | Over 100M Ω (at 500VDC megger) | |
| Dielectric strength | 3,000VAC 50/60Hz for 1 min (between all terminals and case) | |
| Noise immunity | ±2kV the square wave noise (pulse width: 1 μ s) 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 temp.: -10 to 50°C, storage: -20 to 60°C Ambient humi.: 35 to 85%RH, storage: 35 to 85%RH | |
| Insulation type | Double insulation or reinforced insulation (mark: \square), dielectric strength between the measurement input part and the power part: 1kV | |
| Approval | CE, UL | |
| Weight ^{*4} | Approx. 100g (approx. 77g) | |

*1: When using the unit at low temperature (below 0°C), display cycle is slow due to characteristics of LCD.
Control output operates normally.
*2: Indicator model (MX4W-V-FN) does not have the function.
*3: AC, frequency measurement are available when input type is AC.
*4: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.
※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Measurement Input

| DC voltage | | | | DC current | | | |
|-------------------------|---------|-----------------|-----------------------|-------------------------|---------|-----------------|-----------------------|
| Measurement input range | Display | Input impedance | Display range [St.Hd] | Measurement input range | Display | Input impedance | Display range [St.Hd] |
| 0.0-500.0V | 500.0 | 4.062M Ω | 0.0 to 500.0 | 0.000-5.000A | 5000 | 0.02 Ω | 0.000 to 5.000 |
| 0-500V | 500 | | 0 to 500 | 0.00-5.000A | 500 | | 0.00 to 5.00 |
| 0.0-200.0V | 200.0 | | 0.0 to 200.0 | 0.000-2.000A | 2000 | | 0.000 to 2.000 |
| 0-200V | 200 | | 0 to 200 | 0.00-2.00A | 200 | | 0.00 to 2.00 |
| 0.00-50.00V | 50.00 | 162k Ω | 0.0 to 50.00 | 0.0-50.0mA | 5000 | 0.87 Ω | 0.0 to 50.00 |
| 0.0-50.0V | 50.0 | | 0.0 to 50.0 | 0-50.0mA | 500 | | 0 to 50.0 |
| 0.00-20.00V | 20.00 | | 0.0 to 20.00 | 0.0-20.0mA | 2000 | | 0.0 to 20.00 |
| 0.0-20.0V | 20.0 | | 0.0 to 20.0 | 0-20.0mA | 200 | | 0 to 20.0 |
| 0.000-5.000V | 5000 | 4k Ω | 0.000 to 5.000 | 0.00-5.000mA | 5000 | 21.87 Ω | 0.000 to 5.000 |
| 0.00-5.00V | 500 | | 0.00 to 5.00 | 0.00-5.00mA | 500 | | 0.00 to 5.00 |
| 1.000-5.000V | 1-5R | | 1.00 to 5.00 | 0.00-20.00mA | 2000 | | 0.00 to 20.00 |
| 1.00-5.00V | 1-5b | | 1.00 to 5.00 | 0.00-2.00mA | 200 | | 0.00 to 2.00 |
| 0.000-2.000V | 2000 | 4.062M Ω | 0.000 to 2.000 | 4.00-20.00mA | 4R20 | 0.87 Ω | 4.00 to 20.00 |
| 0.00-2.00V | 200 | | 0.00 to 2.00 | 4.0-20.0mA | 4b20 | | 4.0 to 20.0 |
| 0.0-500.0mV | 5000 | | 0.0 to 500.0 | 0.000-5.000mA | 5000 | | 0.000 to 5.000 |
| 0-500mV | 500 | | 0 to 500 | 0.00-5.00mA | 500 | | 0.00 to 5.00 |
| 0.0-200.0mV | 2000 | 162k Ω | 0.0 to 200.0 | 0.00-2.00mA | 2000 | 21.87 Ω | 0.00 to 2.000 |
| 0-200mV | 200 | | 0 to 200 | 0.00-2.00mA | 200 | | 0.00 to 2.00 |
| 0.00-50.00mV | 5000 | | 0.00 to 50.00 | -5.000-5.000A | -5000 | | -5.00 to 5.000 |
| 0.0-50.0mV | 500 | | 0 to 50.0 | -5.00-5.00A | -500 | | -5.00 to 5.00 |
| -500.0-500.0V | -500.0 | 4.062M Ω | -500.0 to 500.0 | -2.000-2.000A | -2000 | 0.87 Ω | -2.00 to 2.00 |
| -500-500V | -500 | | -500 to 500 | -5.00-5.00mA | -500 | | -5.00 to 5.00 |
| -200.0-200.0V | -200.0 | | -200.0 to 200.0 | -0.00-0.500mA | -5000 | | -500.0 to 500.0 |
| -200-200V | -200 | | -200 to 200 | -500-500mA | -500 | | -500 to 500 |
| -50.00-50.00V | -50.00 | 162k Ω | -50.00 to 50.00 | -200.0-200.0mA | -2000 | 21.87 Ω | -200.0 to 200.0 |
| -50.0-50.0V | -50.0 | | -50.0 to 50.0 | -200-200mA | -200 | | -50.0 to 50.0 |
| -20.00-20.00V | -20.00 | | -20.00 to 20.00 | -50.00-50.00mA | -5000 | | -50.00 to 50.00 |
| -20.0-20.0V | -20.0 | | -20.0 to 20.0 | -50.0-50.0mA | -500 | | -50.0 to 50.0 |
| -5.000-5.000V | -5000 | 4k Ω | -5.000 to 5.000 | -20.00-20.00mA | -2000 | 0.87 Ω | -20.00 to 20.00 |
| -5.00-5.00V | -500 | | -5.00 to 5.00 | -20.0-20.0mA | -200 | | -20.0 to 20.0 |
| -2.000-2.000V | -2000 | | -2.000 to 2.000 | -5.000-5.000mA | -5000 | | -5.000 to 5.000 |
| -2.00-2.00V | -200 | | -2.00 to 2.00 | -5.00-5.00mA | -500 | | -5.00 to 5.00 |
| -500.0-500.0mV | -5000 | 4.062M Ω | -500.0 to 500.0 | -2.000-2.000mA | -2000 | 0.87 Ω | -2.000 to 2.000 |
| -500-500mV | -500 | | -500 to 500 | -2.00-2.00mA | -200 | | -2.00 to 2.00 |
| -200.0-200.0mV | -2000 | | -200.0 to 200.0 | -200.0 to 200.0 | | | |
| -200-200mV | -200 | | -200 to 200 | | | | |
| -50.00-50.00mV | -5000 | 162k Ω | -50.00 to 50.00 | -50.0 to 50.0 | | 21.87 Ω | -50.00 to 50.00 |
| -50.0-50.0mV | -500 | | -50.0 to 50.0 | | | | |
| -20.00-20.00mV | -2000 | | -20.00 to 20.00 | | | | |
| -20.0-20.0mV | -200 | | -20.0 to 20.0 | | | | |

※Display range of [St.Hd] will vary depending on the decimal point.
(-9999 to 9999, -999.9 to 999.9, -99.99 to 99.99, -9.999 to 9.999)
※When changing measurement input type, oU H oU L H P E R K L P E R K L S P A N H - L d o t M - S C L - S C I S P A N I Z E R o P E S P N H - R G L - R G I d U N E L o U L M Y S parameters are reset.
※Frequency measurement range (AC voltage/current): 0.100 to 1200Hz
※Check the unit indicator when selecting measurement input type.
※Parameter setting order of input range [I N - R] is followed by the above table.
E.g.) AC current: 5000 → 500 → 2000 → 200 → 2000 → 200
※When "HHHH" or "LLLL" is flashes with a certain measurement input, disconnect power supply and then check the cables.
※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.

■ Preset Output Operation Mode [PA 2 group: oU L L oU Z L]

| Operation mode | Output operation | Description |
|----------------|---|---|
| oFF | OUT1 output: No output | No output |
| Hi GH | OUT1.H: Hysteresis (HY5) OUT1 output | ON period: Display value \geq oU LH OFF period: Display value \leq oU LH - HY5.I |
| Lo W | OUT1.L: Hysteresis (HY5) OUT1 output | ON period: Display value \leq oU LL OFF period: Display value \geq oU LL + HY5.I |
| HL | OUT1.H: Hysteresis (HY5) OUT1.L: Hysteresis (HY5) OUT1 output | ON period: Display value \leq oU LL, Display value \geq oU LH OFF period: Display value \geq oU LL + HY5.I, Display value \leq oU LH - HY5.I |
| HL - G | OUT1.H: Hysteresis (HY5) OUT1.L: Hysteresis (HY5) OUT1 output | ON period: Display value \geq oU LL, Display value \leq oU LH OFF period: Display value \leq oU LH - HY5.I, Display value \geq oU LL + HY5.I |

※Set preset output mode separately for each OUT1/OUT2.
※OUT1/OUT2 are operated individually depending on the set preset output operation mode.
※High/low preset value parameters of the parameter 0 group appear by setting preset output operation mode.
※When changing preset output operation mode, oU H / oU L / oU LL / oU LH / HY5 parameters are reset.

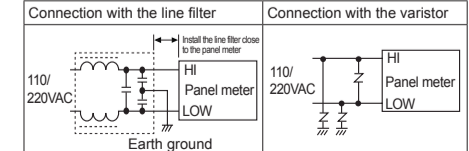
■ Factory Defaults

| Group | Parameter | MX4W-V (DC) | MX4W-V (AC) | MX4W-V (AC) | MX4W-A (DC) | MX4W-A (DC) | MX4W-A (AC) |
|----------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PA0 (PA 0 group) | oU LH ^{*1} | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| | oU LL ^{*1} | 0000 | -5000 | 0000 | 0000 | -5000 | 0000 |
| | oU ZH ^{*1} | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| | oU ZL ^{*1} | 0000 | -5000 | 0000 | 0000 | -5000 | 0000 |
| | HPEK | 00 | 00 | 00 | 00 | 00 | 00 |
| | LPEK | 00 | 00 | 00 | 00 | 00 | 00 |
| | dC AC | dC | -dC | AC | dC | -dC | AC |
| | I N - R | 5000 | -5000 | 5000 | 5000 | -5000 | 5000 |
| | dI S P | St.Hd | St.Hd | St.Hd | St.Hd | St.Hd | St.Hd |
| | I N - L | | | R V G | | | R V G |
| PA1 (PA 1 group) | d o t | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| | H - S C | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| | L - S C | 0000 | -5000 | 0000 | 0000 | -5000 | 0000 |
| | S P A N | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| | Z E R o | 00 | 00 | 00 | 00 | 00 | 00 |
| | E S P N | | | 10 - 0 | | | 10 - 0 |
| | H - R G | 5000 | 5000 | | 5000 | 5000 | |
| | L - R G | 0000 | -5000 | | 0000 | -5000 | |
| | dU N E | v | v | v | A | A | A |
| | oU L L ^{*1} | oFF | oFF | oFF | oFF | oFF | oFF |
| oU Z L ^{*1} | oFF | oFF | oFF | oFF | oFF | oFF | |
| PA2 (PA 2 group) | HY5.1 ^{*1, *2} | 00.1 | 00.1 | 00.1 | 00.1 | 00.1 | 00.1 |
| | HY5.2 ^{*1, *2} | 00.1 | 00.1 | 00.1 | 00.1 | 00.1 | 00.1 |
| | S t R t | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 | 00.0 |
| | P E R K | 00.5 | 00.5 | 00.5 | 00.5 | 00.5 | 00.5 |
| | dI S t | 02.5 | 02.5 | 02.5 | 02.5 | 02.5 | 02.5 |
| | dI - L | H o L d | H o L d | H o L d | H o L d | H o L d | H o L d |
| | L o C | oFF | oFF | oFF | oFF | oFF | oFF |
| | oU L L ^{*1} | oFF | oFF | oFF | oFF | oFF | oFF |
| | oU Z L ^{*1} | oFF | oFF | oFF | oFF | oFF | oFF |
| | L o C | oFF | oFF | oFF | oFF | oFF | oFF |

*1: Does not appear in indicator models.
*2: It will vary depending on input range [I N - R] setting.

■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Keep away from high voltage lines or power lines to prevent inductive noise.
In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
Do not use near the equipment which generates strong magnetic force or high frequency noise.



4. This unit may be used in the following environments.
 ①Indoors (in the environment condition rated in 'Specifications')
 ②Altitude max. 2,000m
 ③Pollution degree 2
 ④Installation category II

■ Zero Adjustment

Forces the display value of measured input to 0 (Zero).
 • Zero adjustment range: -99 to 99
 • Zero adjustment method:
 ① Hold \leftarrow \rightarrow keys for 3 sec at the same time.
 ② Set display holding/zero adjustment [dI - L] of parameter 2 group as zero adjustment [Z E R o]. Short 3, 4 terminals and zero adjustment is available.
 ※When zero adjustment is completed by ① or ② method, the display part displays zero and the adjusted value is saved at [Z E R o] of parameter 1 group automatically.
 ※If zero adjustment range is exceeded, the error [P E R] flashes twice and it returns to RUN mode, by maintaining previous setting value.

■ Parameter Group

- ① Parameter (0 to 2 group) setting
 1. Each parameter and corresponding setting value will flash alternately every 0.5 sec.
 2. Press the \leftarrow