# ML50 Compact Logic Controller

AUTOMATION
MADE EASY & COMPACT

# Honeywell Solutions for Machine Automation

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MasterLogic 50 Series **MAIN UNIT**

# Modular "SU" type(MLI-D_ _ SU) and Economic "E"(MLI-D_ _ E)

## General specification

| | Item | Descriptions | | | | Standard |
|---|---|---|---|---|---|---|
| 1 | Ambient | 0~55℃ | | | | |
| 2 | Storage | -25~+75℃ | | | | |
| 3 | Ambient humidity | 5~95%RH (Non-condensing) | | | | |
| 4 | Storage humidity | 5~95%RH (Non-condensing) | | | | |
| 5 | Vibration resistance | Occasional vibration | | | 10 times each direction (X, Y and Z) | IEC61131-2 |
| | | Frequency | Acceleration | Pulse width | | |
| | | 10 ≤ f < 57Hz | - | 0.075mm | | |
| | | 57 ≤ f < 150Hz | 9.8m/s²(1G) | - | | |
| | | Continuous vibration | | | | |
| | | Frequency | Acceleration | Pulse width | | |
| | | 10 ≤ f < 57Hz | - | 0.035mm | | |
| | | 57 ≤ f < 150Hz | 4.9m/s²(0.5G) | - | | |
| 6 | Shock resistance | - Peak Acceleration : 147m/s₂(15G) - Duration : 11ms<br>- Pulse waveform : Half-sine, 3times each direction per each axis | | | | IEC61131-2 |
| 7 | Noise resistance | Square wave impulse noise | ±1,500V | | | Internal Standard |
| | | Electrostatic discharge | 4kV | | | IEC61131-2<br>IEC61000-4-2 |
| | | Radiated electromagnetic | 27 ~ 500MHz, 10V/m | | | IEC61131-2<br>IEC61000-4-3 |
| | | Fast transient/ Burst noise | Main unit | Expansion module | | IEC61131-2<br>IEC61000-4-4 |
| | | | 2kV | 1kV | | |
| 8 | Operating Ambience | Free from corrosive gasses and excessive dust | | | | |
| 9 | Altitude | Up to 2,000m | | | | |
| 10 | Pollution level *1 | Less than equal to 2 | | | | |
| 11 | Cooling | Air-cooling | | | | |

*1 Pollution level indicates the degree to which conductive material is generated in the environment where the equipment is used. Pollution level 2 is the condition that only non-conductive pollution occurred but temporary conductivity may be produced due to condensing.

## Performance

| Item | | Model | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MLI-DN20SU<br>MLI-DR20SU | MLI-DN30SU<br>MLI-DR30SU | MLI-DN40SU<br>MLI-DR40SU | MLI-DN60SU<br>MLI-DR60SU | MLI-DN10E<br>MLI-DR10E | MLI-DN14E<br>MLI-DR14E | MLI-DN20E<br>MLI-DR20E | MLI-DN30E<br>MLI-DR30E |
| **Control method** | | Repetitive, cyclic, interrupt, constant scan | | | | Repetitive, cyclic | | | |
| **I/O control mode** | | Refresh mode (Batch processing by scan synchronization) | | | | | | | |
| | | Direct mode by instruction | | | | | | | |
| **Programming language** | | Ladder Diagram(LD), Sequential Function Chart(SFC), Instruction List(IL), Structured Text(ST) | | | | | | | |
| **Processing speed** | | 94ns /Step (for basic instruction) | | | | 240ns /Step | | | |
| **Program capacity** | | 200kB(15k steps) | | | | 50kB(4k steps) | | | |
| **Main module I/O points** | | 20 points | 30 points | 40 points | 60 points | 10 points | 14 points | 20 points | 30 points |
| **Max. I/O points** | | 244 points | 254 points | 264 points | 284 points | 14 points | 18 points | 28 points | 38 points |
| **Data memory** | A | 16KB (Max. 16KB retain setting available) | | | | 8KB (Max. 8KB retain setting available) | | | |
| | I | 2KB(%IX 15.15.63) | | | | 256 Byte (%IX15.15.63) | | | |
| | Q | 2KB (%QX 15.15.63) | | | | 256 Byte (%QX15.15.63) | | | |
| | M | 8KB (Max. retain setting available) | | | | 4KB | | | |
| | R | 20KB (1 block) | | | | 10KB (1 block) | | | |
| | W | 20KB, Same area as 'R' | | | | 10KB | | | |
| | F | 2KB, System flag | | | | 768 bytes | | | |
| | K | 8KB, Built-in special flag | | | | 5,120 bytes | | | |
| | L | 4KB, High speed link flag | | | | 2,560 bytes | | | |
| | U | 1KB, Analog Flag | | | | 704 bytes | | | |
| **Flash** | | 20KB (2 block), R device used | | | | - | | | |
| **Number of program** | | 128 | | | | 128 | | | |
| **Operation mode** | | RUN, STOP, DEBUG | | | | RUN, STOP, DEBUG | | | |
| **Self diagnosis** | | Operation delay monitoring, memory error, I/O error, battery error, power error, etc. | | | | Operation delay monitoring, memory error, I/O error, etc | | | |
| **Program port** | | RS-232C (Loader) Remote connection using RS-232C, RS-485 | | | | 1ch RS-232C (Loader) | | | |
| **Data retention at power failure** | | Latch range setting at Basic parameter | | | | Latch range setting at Basic parameter | | | |
| **Built-in function** | | RS-232C, RS485, High-speed counter, PID control, Pulse catch, Input filter, Position control | | | | RS-232C or RS485, High-speed counter, Pulse catch, Input filter *2 | | | |
| | | External interrupt, Positioning *1 | | | | - | | | |
| **Internal current consumption** | | 252mA / 478mA | 270mA / 626mA | 288mA / 684mA | 340mA / 942mA | 180 / 250 mA | 190 / 315mA | 200 / 355 mA | 210 / 485 mA |
| **Weight(g)** | | 475g (1.05lb) | 474g (1.045lb) | 578g (1.27lb) | 636g (1.40lb) | 313(0.69lb) | 315(0.694lb) | 418(0.92lb) | 423(0.93lb) |
| | | 514g (1.13lb) | 528g (1.16lb) | 594g (1.31lb) | 804g (1.77lb) | 330((0.72lb) | 340(0.75lb) | 450(0.992lb) | 465(1.03lb) |

*1. MLC-DR_H or MLI-DR_H are not supported.
*2. Not allowable to use RS232C and RS485 at the same time.

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MasterLogic 50 Series **INPUT & OUTPUT**

# Main Unit for MLI "SU", "E"

## Digital Input | DC24V

| Model / Specification | | DC24V | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MLI-DN10E MLI-DR10E | MLI-DN14E MLI-DR14E | MLI-DN20E MLI-DR20E | MLI-DN30E MLI-DR30E | MLI-DN20SU MLI-DR20SU | MLI-DN30SU MLI-DR30SU | MLI-DN40SU MLI-DR40SU | MLI-DN60SU MLI-DR60SU |
| Input points | | 6 points | 8 points | 12 points | 18 points | 12points | 18points | 24points | 36points |
| Insulation method | | Photo-coupler insulation | | | | | | | |
| Rated input voltage/current | | DC24V / 4mA (Contact 00~03 : 7mA) | | | | DC24V / 4mA (Contact 0~7 : 9mA) | | | |
| Operation voltage range | | DC20.4~28.8V (Ripple rate < 5%) | | | | | | | |
| On voltage/On current | | DC19V or more / 3mA or more | | | | | | | |
| Off voltage/Off current | | DC6V or less / 1mA or less | | | | | | | |
| Input resistance | | 5.6kΩ (Contact 00~03 : 3.3kΩ) | | | | 5.6kΩ (P00~P07 : 2.kΩ) | | | |
| Response time | Off→On | 1 / 3 / 5 / 10 / 20 / 70 / 100ms (setting by CPU parameter) Initial value : 3ms | | | | | | | |
| | On→Off | | | | | | | | |
| Insulation pressure | | AC560Vrms / 3 Cycle (altitude 2000m) | | | | | | | |
| Insulation resistance | | 10MΩ or more by megger | | | | | | | |
| COMMON method | | 6 points | 8 points | 12 points | 18 points | 12points | 18points | 24points | 36points |
| Proper cable size | | Twisted wire 0.3 mm2 | | | | | | | |
| Operation indication | | Input On LED On | | | | | | | |
| External connection method | | 14 points connector | | 24 points connector | | 24 points connecting connector | | 42 points connecting connector | |

*Connecting method : M3 x 6 screws

## Digital Output | Relay

| Specification / Model | | Relay | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MLI-DR10E | MLI-DR14E | MLI-DR20E | MLI-DR30E | MLI-DR20SU | MLI-DR30SU | MLI-DR40SU | MLI-DR60SU |
| Output point | | 4 points | 6 points | 8 points | 12 points | 8points | 12points | 16points | 24points |
| Insulation method | | Relay insulation | | | | | | | |
| Rated load voltage/current | | DC24V 2A(resistive load)/AC220V 2A(COSΨ = 1), 5A/COM | | | | | | | |
| Min. load voltage/current | | DC5V/1mA | | | | | | | |
| Max. load voltage/current | | AC250V or DC125V / 2A | | | | | | | |
| Off leakage current | | 0.1mA (AC220V, 60Hz) | | | | | | | |
| Max. on/off frequency | | 3,600 times/hr | | | | | | | |
| Surge absorber | | None | | | | | | | |
| Service life | Mechanical | 20 million times or more | | | | | | | |
| | Electrical | Rated load voltage/current 100,000 times or more | | | | | | | |
| | | AC200V/1.5A, AC240V/1A (COSΨ = 0.7) 100,000 times or more | | | | | | | |
| | | AC200V/1A, AC240V/0.5A (COSΨ = 0.35) 100,000 times or more | | | | | | | |
| | | DC24V/1A, DC100V/0.1A (L / R = 7ms) 100,000 times or more | | | | | | | |
| Response time | Off→On | 10 ms or less | | | | | | | |
| | On→Off | 12 ms or less | | | | | | | |
| COMMON method | | 2 points/COM | 4 points/COM | | | 4 points/COM | | | |
| Operation indicator | | Output On, LED On | | | | | | | |
| External connection method | | 24-pin terminal block connector | | | | 24-pin terminal block connector | | 30 pin teminal | 42 pin terminal |

## Digital Output | Open Collector

| Specification / Model | | Open Collector | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MLI-DN10E | MLI-DN14E | MLI-DN20E | MLI-DN30E | MLI-DN20SU | MLI-DN30SU | MLI-DN40SU | MLI-DN60SU |
| Output point | | 4 points | 6 points | 8 points | 12 points | 8points | 12points | 16points | 24points |
| Insulation method | | Photo-coupler insulation | | | | | | | |
| Rated load voltage | | DC 12/24V | | | | | | | |
| Load voltage range | | DC 10.2 ~ 26.4V | | | | | | | |
| Max. Load current | | 0.5A/1 point, 2A / 1COM | | | | 0.5A/1 point, 2A / 1COM | | | |
| Off leakage current | | 0.1mA or less | | | | | | | |
| Max. voltage drop(On) | | DC 0.4V | | | | | | | |
| Surge absorber | | Zener diode | | | | | | | |
| Response time | Off→On | 1mA or less | | | | | | | |
| | On→Off | 1ms or less (Rated load, resistive load) | | | | | | | |
| COMMON Method | | 4 points/COM | | | | 4 points/COM | | | |
| External power supply | Voltage | DC12/24V ±10% (Ripple voltage ≤4 Vp-p) | | | | | | | |
| | Current | 25mA or less (DC 24V connection) | | | | 25mA or less (DC 24V connection) | | | |
| Operation indication | | Output On, LED On | | | | | | | |
| External connection method | | 14-pin connector | | 24-pin connector | | 24-pin connector | | 30-pin connector | 42-pin connector |

*Connecting method : M3 x 6 screws

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MasterLogic 50 Series **Product List**

## Product List

| Item | Model | Descriptions |
|---|---|---|
| **Non-IEC** | MLC-DN32H | 100~240Vac, 16 points DC input, 16 points TR output |
| | MLC-DR32H | 100~240Vac, 16 points DC input, 16 points Relay output |
| | MLC-DN64H | 100~240Vac, 32 points DC input, 32 points TR output |
| **Block type (High Performance)** | MLC-DR64H | 100~240Vac, 32 points DC input, 32 points Relay output |
| | MLC-DN32H/DC | 24Vdc, 16 points DC input, 16 points TR output |
| | MLC-DR32H/DC | 24Vdc, 16 points DC input, 16 points Relay output |
| | MLC-DN64H/DC | 24Vdc, 32 points DC input, 32 points TR output |
| | MLC-DR64H/DC | 24Vdc, 32 points DC input, 32 points Relay output |
| **Non-IEC** | MLM-DN16S | 24Vdc, 8 points DC24V input, 8 points TR output |
| **Modular type** | MLM-DR16S | 24Vdc, 8 points DC24V input, 8 points Relay output |
| | MLM-DN32S | 24Vdc, 16 points DC24V input, 16 points TR output |
| **IEC** | MLI-DN32H | 100~240Vac, 16 points DC input, 16 points TR output |
| | MLI-DR32H | 100~240Vac, 16 points DC input, 16 points Relay output |
| **Block type (High Performance)** | MLI-DN64H | 100~240Vac, 32 points DC input, 32 points TR output |
| | MLI-DR64H | 100~240Vac, 32 points DC input, 32 points Relay output |
| | MLI-DR32H/D1 | DC 12/24V, 16-point DC input, 16-point Relay output |
| | MLI-DR64H/D1 | DC 12/24V, 32-point DC input, 32-point Relay output |
| **IEC** | MLI-DR10E | 100~240Vac, 6 points DC input, 4 points Relay output |
| | MLI-DR14E | 100~240Vac, 8 points DC input, 6 points Relay output |
| | MLI-DR20E | 100~240Vac, 12 points DC input, 8 points Relay output |
| | MLI-DR30E | 100~240Vac, 18 points DC input, 12 points Relay output |
| | MLI-DN10E | 100~240Vac, 6 points DC input, 4 points TR output(Sink) |
| | MLI-DN14E | 100~240Vac, 8 points DC input, 6 points TR output(Sink) |
| **Block type "E" (Economic type)** | MLI-DN20E | 100~240Vac, 12 points DC input, 8 points TR output(Sink) |
| | MLI-DN30E | 100~240Vac, 18 points DC input, 12 points TR output(Sink) |
| | MLI-DP10E | 100~240Vac, 6 points DC input, 4 points TR output(Source) |
| | MLI-DP14E | 100~240Vac, 8 points DC input, 6 points TR output(Source) |
| | MLI-DP20E | 100~240Vac, 12 points DC input, 8 points TR output(Source) |
| | MLI-DP30E | 100~240Vac, 18 points DC input, 12 points TR output(Source) |
| **IEC** | MLI-DN20SU | 100~240Vac, 12 points DC input, 8 points TR output(Sink) |
| | MLI-DR20SU | 100~240Vac, 12 points DC input, 8 points Relay output |
| | MLI-DN30SU | 100~240Vac, 18 points DC input, 12 points TR output(Sink) |
| | MLI-DR30SU | 100~240Vac, 18 points DC input, 12 points Relay output |
| **Block type "SU" (Standard type)** | MLI-DN40SU | 100~240Vac, 24 points DC input, 16 points TR output(Sink) |
| | MLI-DR40SU | 100~240Vac, 24 points DC input, 16 points Relay output |
| | MLI-DN60SU | 100~240Vac, 36 points DC input, 24 points TR output(Sink) |
| | MLI-DR60SU | 100~240Vac, 36 points DC input, 24 points Relay output |
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