## MicroLogix 1200 Controller



The MicroLogix 1200 controller provides more computing power and flexibility than the MicroLogix 1000 controller to solve a variety of application needs.

Available in 24- and 40-point versions, the I/O count can be expanded by using rackless I/O modules. This results in larger control systems, greater application flexibility and expandability at a lower cost and reduced parts inventory.

A field-upgradable flash operating system that helps to make sure you will always be up-to-date with the latest features, without having to replace hardware. The controller can be easily updated with the latest firmware via a website download.

## Advantages for the MicroLogix 1200 Controller

- Large 6 KB memory ( 4 KB User Program with 2 KB User Data) to solve a variety of applications.
- High performance expansion I/O options (up to six modules depending on current/power budget).
- Four high-speed inputs (for controllers with 24V DC inputs) that can be used individually as latching (pulse-catch) inputs, event interrupts, or alternately combined as one 20 kHz high-speed counter featuring eight modes of operation.
- One high-speed output that can be configured as 20 kHz pulse train output (PTO) or as pulse width modulated (PWM) output (availableon controllers with embedded 24V DC outputs).
- One, 1 ms, selectable timed interrupt (STI).
- High-resolution, 1 ms timers.
- The same advanced communication options as the MicroLogix 1000 controller, including peer-to-peer and SCADA/RTU networks, DF1 full-duplex, DF1 half-duplex slave, DH-485, DeviceNet and EtherNet/IP , plus DF1 half-duplex master, Modbus master and slave, and DF1 radio modem protocols.
- ASCII read/write capability.
- An additional Programming/HMI Port, providing connectivity to a DF1 full-duplex compatible device such as an operator interface or programming terminal (MicroLogix 1200R controllers only, catalog number 1762-LxxxxxR).
- Communication toggle pushbutton that allows the controller's Channel 0 port to toggle between user configured communication parameters and factory default settings for an easy means to switch from Modbus RTU or ASCII protocols (which do not support programming) to DF1 full-duplex (to upload/download, monitor, or edit your program), so a programming computer is able to connect to a controller with an unknown or incorrect communication parameter settings for troubleshooting.
- Optional real-time clock, to allow control to be based on actual time of day, day of week, or other calendar related timing.
- Optional memory module, for external program backup, transport and transfer to another controller. Control program and data are securely backed up to internal flash memory when power is not applied.
- Data file download protection prevents critical user data from being altered via program downloads from programming computers or memory modules.
- Two built-in analog trim potentiometers.
- 32 -bit signed integer math.
- Floating-point and double integer data file support.
- Built-in PID capabilities.
- Finger-safe terminal blocks meet global safety standards.
- Removable terminal blocks on 40-point controllers allow pre-wiring.
- Regulatory agency certifications for world-wide market (CE, C-Tick, UL, c-UL, including Class 1 Division 2 Hazardous Location).


## Select Family: MicroLogix 1000, 1200 or 1500 Controller

Review the Features, Programming Instructions, Controller Specifications, and Controller Dimensions to determine which level of MicroLogix controller is required.

## Features

## Step 1 - Select:

- controller family - based on memory, I/O added functionality, programming instructions and dimensions
- consider future expansion requirements
- consider requirement for online editing
- consider the need for networked communication


## MicroLogix Controllers Feature Comparison Chart

| Controller | MicroLogix 1000 | MicroLogix <br> 1200/1200R | MicroLogix 1500 <br> 1764-LSP, 1764-LRP |
| :--- | :--- | :--- | :--- |
| Bulletin Number | 1761 | 1762 | 1764 |

Memory (in user words) User Program/User Data

| Up to 1 KB | 1 KB combined <br> (preconfigured) |  |  |
| :--- | :--- | :--- | :--- |
| Up to 6 KB |  | $4 \mathrm{~KB} / 2 \mathrm{~KB}$ | $3.6 \mathrm{~KB} / 4 \mathrm{~KB} 1764-\mathrm{LSP}$ |
| Up to 7 KB |  |  |  |
| Up to 8 KB |  |  | $10 \mathrm{~KB} / 4 \mathrm{~KB} 1764-\mathrm{LRP}$ |
| Up to 14 KB |  | Flash | Battery back-up static RAM |
| Online editing |  | Optional |  |
| Nonvolatile program and data | EEPROM | Eptional <br> Memory Module (for program <br> back-up and transport) | Through hand-held <br> programmer |

I/0

| Embedded Digital I/O, max | 32 | 40 | 28 |
| :--- | :--- | :--- | :--- |
| Embedded Analog I/O | Two current and two <br> voltage inputs with one <br> current or voltage output <br> on 20 pt. controllers |  |  |
| Local Expansion I/0, max | None | 96 | 512 |
| Thermocouple/RTD | None | Expansion | Expansion |
| Networked Expansion I/0, max | None | DeviceNet network using 1769-SDN <br> scanner can own 63 slave devices <br> (such as a 1769-ADN adapter with up <br> to 30 I/O modules per 1769-ADN <br> adapter) |  |
|  |  |  |  |


| Trim Potentiometers |  | 2 | 2 |
| :--- | :--- | :--- | :--- |
| PID |  | $\checkmark$ | $\checkmark$ |
| High Speed Counters <br> (embedded) | One @ 6.6 kHz | One @ 20 kHz | Two @ 20 kHz |
| High Speed Counters <br> (expansion) |  |  | with 1769-HSC counter <br> With two quadrature or four <br> pulse/count @ 1 MHz |
| Real Time Clock |  | Optional | Optional |
| Motion: Pulse Width Modulated |  | 1 @ 20 kHz | 2 @ 20 kHz |
| Motion: Pulse Train Outputs |  | 1 @ 20 kHz | 2 @ 20 kHz |
| Data Access Tool |  |  | Optional |
| Data Logging |  | $\checkmark$ | 48 KB |
| Recipe Storage |  | Uses user program memory or 48 KB <br> data logging memory |  |
| Floating Point Math |  | $\checkmark$ |  |

Programming

| Windows - RSLogix 500/Micro <br> Software | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :--- | :--- | :--- | :--- |
| Hand-held Programmer | $\checkmark$ |  |  |

Communication

## MicroLogix Controllers Feature Comparison Chart

| Controller | MicroLogix 1000 | MicroLogix <br> $\mathbf{1 2 0 0 / 1 2 0 0 R}$ | MicroLogix 1500 <br> 1764-LSP, 1764-LRP |  |
| :--- | :--- | :--- | :--- | :---: |
| Bulletin Number | $\mathbf{1 7 6 1}$ | $\mathbf{1 7 6 2}$ | $\mathbf{1 7 6 4}$ |  |
| RS-232 Ports | (1) 8-pin mini DIN | (1) 8-pin mini DIN <br> (1) 8-pin mini DIN <br> Programming/HMI | (1) 8-pin mini DIN <br> (1) 9-pin D-shell |  |
| DeviceNet Peer-to-Peer <br> Messaging, slave I/0 | With 1761-NET-DNI | With 1761-NET-DNI | With 1761-NET-DNI <br> With 1769-SDN |  |
| DeviceNet Scanner |  |  | With 1769-SDN |  |
| EtherNet/IP | With 1761-NET-ENI or <br> 1761-NET-ENIW | With 1761-NET-ENI or <br> 1761-NET-ENIW | With 1761-NET-ENI or <br> 1761-NET-ENIW |  |
| Web Server Capabilities | With 1761-NET-ENIW | With 1761-NET-ENIW | With 1761-NET-ENIW |  |
| DH-485 <br> SCADA RTU - DF1 half-duplex <br> slave <br> SCADA RTU - DF1 radio modem with <br> 1761-NET-AICNetwork with <br> $1761-N E T-A I C ~$ | Network with 1761-NET-AIC |  |  |  |
| SCADA RTU - Modbus RTU slave | $\checkmark$ | $\checkmark$ |  |  |
| SCADA RTU - Modbus RTU <br> master |  | $\checkmark$ | $\checkmark$ |  |
| ASCII - Read/Write | $\checkmark$ | $\checkmark$ |  |  |
| Operating Power |  |  |  |  |

Operating Power

| $120 / 240 \mathrm{~V} \mathrm{AC}$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :--- | :--- | :--- | :--- |
| 24 V DC | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| 12 V DC |  |  |  |

Agency Certifications

| CE, C-Tick, UL, and C-UL <br> (including Class I, Division 2 <br> Hazardous Location) | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :--- | :--- | :--- | :--- |

## Programming Instructions

MicroLogix controllers have the range of functionality necessary to address diverse applications. The controllers use the following types of instructions:

- Basic instructions (for example, Examine if On, Examine if Off)
- Data Comparison instructions (for example, Equal, Greater than or Equal, Less than or Equal)
- Data Manipulation instructions (for example, Copy, Move)
- Math instructions (for example, Add, Subtract, Multiply)
- Program Flow Control instructions (for example, Jump, Subroutine)
- Application Specific instructions (for example, Programmable Limit Switch, Sequencer)
- High-speed Counter instruction
- High-speed pulse train output (PTO) and pulse width modulated (PWM) instructions (for MicroLogix 1200 and 1500 controllers only)
- Communication instruction (including ASCII for MicroLogix 1200 and 1500 controllers only)
- Recipe instruction (MicroLogix 1500 controllers only)
- Data Logging instruction (MicroLogix 1500 1764-LRP processor only)


## Controller Specifications

## Controller General Specifications

| Attribute | MicroLogix 1000 (Bulletin 1761) | MicroLogix 1200 <br> (Bulletin 1762) | MicroLogix 1500 (Bulletin 1764) <br> (Bulletin 1764) |
| :---: | :---: | :---: | :---: |
| Memory Size and Type | 1 KB EEPROM (approximately 737 instruction words, 437 data words) | 6 KB flash memory: 4 KB user program, 2 KB user data | 1764-LSP processor: 7 KB user memory (total user program plus data) <br> 1764-LRP processor: 14 KB user memory (total user program plus data) |
| Data Elements | 512 internal bits, 40 timers, 32 counters, 16 control files, 105 integer files, 33 diagnostic status | configurable, user-defined file structure, 2 KB max data size | configurable, user-defined file structure, 4 KB max data size |
| Throughput | 1.5 ms (for a typical 500 -instruction program) ${ }^{(1)}$ | 2 ms (for a typical 1 KB word user program) ${ }^{(2)}$ | 1 ms (for a typical 1 KB word user program $)^{(2)}$ |

(1) A typical program contains 360 contacts, 125 coils, 7 timers, 3 counters, and 5 comparison instructions.
(2) A typical user program contains bit, timer, counter, math, and file instructions.

Environmental Specifications and Certifications

| Attribute | 1761 Controllers | 1762 Controllers | 1764 Controllers |
| :---: | :---: | :---: | :---: |
| Operating Temperature | Horizontal mounting: <br> $0 \ldots 55^{\circ} \mathrm{C}\left(32 \ldots 131^{\circ} \mathrm{F}\right)$ <br> Vertical mounting ${ }^{(1)}$ : <br> $0^{\circ} \mathrm{C} \ldots 45^{\circ} \mathrm{C}\left(32^{\circ} \mathrm{F} \ldots 113^{\circ} \mathrm{F}\right)$ <br> for digital I/O, <br> $0^{\circ} \mathrm{C} \ldots 40^{\circ} \mathrm{C}\left(32^{\circ} \mathrm{F} \ldots 104^{\circ} \mathrm{F}\right)$ <br> for analog I/0 | $0 \ldots 55^{\circ} \mathrm{C}\left(32 \ldots 131{ }^{\circ} \mathrm{F}\right)$ | $0 \ldots 55^{\circ} \mathrm{C}\left(32 \ldots 131{ }^{\circ} \mathrm{F}\right)$ |
| Storage Temperature | $-40 \ldots 85^{\circ} \mathrm{C}\left(-40 \ldots 185^{\circ} \mathrm{F}\right)$ | $-40 \ldots 85^{\circ} \mathrm{C}\left(-40 \ldots 185^{\circ} \mathrm{F}\right)$ | $-40 \ldots 8{ }^{\circ} \mathrm{C}\left(-40 \ldots 185^{\circ} \mathrm{F}\right)^{(2)}$ |
| Relative Humidity | 5...95\%, noncondensing | 5...95\%, noncondensing | 5...95\%, noncondensing |
| Vibration | Operating: 5 Hz ... $2 \mathrm{kHz}, 0.381$ mm (0.015 in.) peak-to-peak, 2.5 g panel mounted ${ }^{(3)}, 1 \mathrm{hr}$ per axis Nonoperating: $5 \mathrm{~Hz} . . .2 \mathrm{kHz}$, 0.762 mm ( 0.030 in .) peak-to-peak, 5 g , 1 hr per axis | $10 \ldots .500 \mathrm{~Hz}, 5 \mathrm{~g}, 0.030$ in. max peak-to-peak, 2 hours each axis (Relay Operation: 1.5 g ) | $10 \ldots .500 \mathrm{~Hz}, 5 \mathrm{~g}, 0.030$ in. max peak-to-peak (Relay Operation: 2 g) |
| Shock, Operating | 10 and 16 Point Controllers: <br> 10 g peak acceleration ( 7.5 g DIN rail mounted) ( $11 \pm 1 \mathrm{~ms}$ duration) 3 times each direction, each axis <br> 32 Point and Analog Controllers: <br> 7.5 g peak acceleration ( 5.0 g DIN rail mounted) ( $11 \pm 1 \mathrm{~ms}$ duration) 3 times each direction, each axis | $30 \mathrm{~g} ; 3$ pulses each direction, each axis (Relay Operation: 7 g ) | without Data Access Tool installed: <br> 30 g panel mounted $(15 \mathrm{~g}$ DIN Rail mounted) <br> Relay operation: 7.5 g panel mounted (5 g DIN Rail mounted) <br> with Data Access Tool installed: <br> 20 g panel mounted ( 15 g DIN Rail mounted) <br> Relay operation: 7.5 g panel mounted (5 g DIN Rail mounted) |

## Environmental Specifications and Certifications

| Attribute | 1761 Controllers | 1762 Controllers | 1764 Controllers |
| :---: | :---: | :---: | :---: |
| Shock, Nonoperating | 10 and 16 Point Controllers: <br> 20 g peak acceleration ( $11 \pm 1$ ms duration), 3 times each direction, each axis <br> 32 Point and Analog Controllers: <br> 20 g peak acceleration $(11 \pm 1$ ms duration), 3 times each direction, each axis | 50 g panel mounted ( 40 g DIN Rail mounted); 3 pulses each direction, each axis | without Data Access Tool installed: <br> 40 g panel mounted ( 30 g DIN Rail mounted) <br> with Data Access Tool installed: <br> 30 g panel mounted (20g DIN Rail mounted) |
| Agency Certification | - UL Listed Industrial Co Locations, Groups A, B <br> - C-UL Listed Industrial <br> - CE marked for all appli <br> - C-Tick marked for all ap | trol Equipment for use in Class C, D <br> Control Equipment for use in Can cable directives plicable acts | Division 2, Hazardous |
| Electrical/EMC | The controller has passed tes | at the following level |  |
| ESD Immunity | $\begin{array}{\|l} \text { EN 61000-4-2 } \\ 8 \mathrm{kV} \end{array}$ | EN 61000-4-2 <br> 4 kV contact, 8 kV air, 4 kV ind |  |
| Radiated Immunity |  |  |  |
| Radiated RF Immunity | EN 61000-4-3 <br> $10 \mathrm{~V} / \mathrm{m}, 27 \ldots 1000 \mathrm{MHz}$, $3 \mathrm{~V} / \mathrm{m}, 87 \ldots 108 \mathrm{MHz}$, $174 \ldots 230 \mathrm{MHz}$, and $470 \ldots . .790 \mathrm{MHz}$ | EN 61000-4-3 $10 \mathrm{~V} / \mathrm{m}, 80 \ldots 1000 \mathrm{MHz}, 80 \%$ a keyed carrier | plitude modulation, +900 MHz |
| Electronic Fast Transient/Burst (EFT/B) Immunity | EN 61000-4-4 <br> Power Supply, I/O: 2 kV <br> Communication: 1 kV | EN 61000-4-4 <br> Power Supply, I/O: $2 \mathrm{kV}, 5 \mathrm{kHz}$ Communication Cable: $1 \mathrm{kV}, 5 \mathrm{k}$ |  |
| Surge Transient Immunity | EN 61000-4-5 <br> Communication: 1 kV galvanic gun <br> I/0: 2 kV CM (Common mode), 1 kV DM (Differential mode) AC Power Supply: 4 kV CM (Common mode), 1 kV DM (Differential mode) | EN 61000-4-5 Communication: 1 kV galvanic I/0: 2 kV CM (common mode), AC Power Supply: 4 kV CM (Co (Differential mode) DC Power Supply: 500V CM (C (Differential mode) | gun kV DM (differential mode) mmon mode), 2 kV DM mmon mode), 500V DM |
| Conducted RF Immunity | EN 61000-4-6 <br> Power Supply, I/0: 10V, 150 kHz... 30 MHz Communication Cable 3V | EN 61000-4-6 <br> Power Supply, I/0: 10V Communication Cable 3V |  |
| (1) DC input voltage derated linearly from $30^{\circ} \mathrm{C}\left(86^{\circ} \mathrm{F}\right)(30 \ldots 26.4 \mathrm{~V})$. |  |  |  |
| (2) Recommended storage temperature for maximum battery life (5 years typical with normal operating/storage conditions) of Real-time Clock modules is $-40 \ldots 40^{\circ} \mathrm{C}\left(-40 \ldots 104{ }^{\circ} \mathrm{F}\right)$. Battery life can be significantly shorter at elevated temperatures. Applies to 1762 -RTC, 1762-MM1RTC, 1764-RTC, 1764-MM1RTC, and 1764-MM2RTC devices. |  |  |  |
| (3) DIN rail mounted controller is 1 g . |  |  |  |

# Select MicroLogix 1200 Controllers 

Step 8 - Select:

- controller - review power and I/O configurations to select a controller catalog number; see power supply and I/O specifications for more detailed information
- accessories - memory and real-time clock modules
- record your selections in the Selection Record (start on page 86)

MicroLogix 1200 Controllers Catalog Number Detail


## MicroLogix $\mathbf{1 2 0 0}$ Controller Power and I/O Configuration

| Cat. No. | Line Voltage | Number of Inputs | Number of Outputs | High Speed I/O |
| :---: | :---: | :---: | :---: | :---: |
| 1762-L24AWA, -L24AWAR | 120/240V AC | (14) 120V AC | (10) Relay | N/A |
| 1762-L40AWA, -L40AWAR | 120/240V AC | (24) 120V AC | (16) Relay | N/A |
| 1762-L24BWA, -L24BWAR | 120/240V AC | (10) Standard 24V DC <br> (4) Fast 24V DC | (10) Relay | (4) 20 kHz input |
| 1762-L40BWA, -L40BWAR | 120/240V AC | (20) Standard 24V DC <br> (4) Fast 24V DC | (16) Relay | (4) 20 kHz input |
| 1762-L24BXB, -L24BXBR | 24V DC | (10) Standard 24V DC <br> (4) Fast 24V DC | (5) Relay <br> (4) Standard 24V DC FET <br> (1) Fast 24V DC FET | (4) 20 kHz input <br> (1) 20 kHz output |
| 1762-L40BXB, -L40BXBR | 24V DC | (20) Standard 24V DC <br> (4) Fast 24V DC | (8) Relay <br> (7) Standard 24V DC FET <br> (1) Fast 24V DC FET | (4) 20 kHz input <br> (1) 20 kHz output |

MicroLogix 1200 Controller Power Supply Specifications

| Attribute |  | 1762- |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | L24AWA, L24AWAR | L40AWA, L40AWAR | L24BWA, L24BWAR | L40BWA, L40BWAR | $\begin{array}{\|l\|} \hline \text { L24BXB, } \\ \text { L24BXBR } \end{array}$ | $\begin{aligned} & \text { L40BXB, } \\ & \text { L40BXBR } \end{aligned}$ |
| Power Supply Voltage |  | 85...265V AC @ 47... 63 Hz |  |  |  | 20.4...26.4V DC Class 2 SELV |  |
| Power Consumption |  | 68 VA | 80 VA | 70 VA | 82 VA | 27 W | 40 W |
| Power Supply Inrush Current, max |  | 120V AC: 25 A for 8 ms 240V AC: 40 A for 4 ms |  |  |  | $\begin{array}{\|l\|} \hline 24 \mathrm{~V} \text { DC: } \\ 15 \mathrm{~A} \text { for } 20 \mathrm{~ms} \end{array}$ | $\begin{array}{\|l\|} \hline 24 \mathrm{~V} \text { DC: } \\ 15 \mathrm{~A} \text { for } 30 \mathrm{~ms} \end{array}$ |
| $\begin{aligned} & \text { Load Current }{ }^{(1)} \text {, } \\ & \max \end{aligned}$ | 5 V DC | 400 mA | 600 mA | 400 mA | 600 mA | 400 mA | 600 mA |
|  | 24V DC | 350 mA | 500 mA | 350 mA | 500 mA | 350 mA | 500 mA |
| Load Power, max |  | 10.4 W | 15 W | 12 W | 16 W | 10.4 W | 15 W |
| 24V DC Sensor Power |  | --- | --- | $250 \mathrm{~mA}, 400 \mu \mathrm{~F}$ capacitance, max | $400 \mathrm{~mA}, 400 \mu \mathrm{~F}$ capacitance, max | --- | --- |

[^0]
## MicroLogix 1200 Controller DC Input Power Requirements for BXB Units




MicroLogix 1200 Controller Input Specifications

| Attribute | 1762-L24AWA, 1762-L24AWAR 1762-L40AWA, 1762-L40AWAR | 1762-L24BWA, 1762-L24BXB, 1762-L40BWA, 1762-L40BXB1762-L24BWAR, 1762-L24BXBR, 1762-L40BWAR, 1762-L40BXBR |  |
| :---: | :---: | :---: | :---: |
|  |  | Inputs $\mathbf{0}$ through 3 | Inputs 4 and higher |
| On-state Voltage Range | 79...132V AC @ $47 \mathrm{~Hz} . . .63 \mathrm{~Hz}$ | $14 \ldots .26 .4 \mathrm{~V}$ DC @ $55^{\circ} \mathrm{C}\left(131^{\circ} \mathrm{F}\right)$ $14 \ldots 30.0 \mathrm{VC} @ 30^{\circ} \mathrm{C}\left(86^{\circ} \mathrm{F}\right)$ | $\begin{aligned} & 10 \ldots .26 .4 \mathrm{~V} \text { DC @ } 55^{\circ} \mathrm{C}\left(131^{\circ} \mathrm{F}\right) \\ & 10 \ldots . .30 .0 \mathrm{VCC} @ 30^{\circ} \mathrm{C}\left(86^{\circ} \mathrm{F}\right) \end{aligned}$ |
| Off-state Voltage Range | 0...20V AC | 0...5V DC |  |
| Operating Frequency | N/A | 0 Hz . . 20 kHz | $0 \mathrm{~Hz} \ldots 1 \mathrm{kHz}$ (scan time dependent) |
| Signal Delay, max | $\begin{aligned} & \text { ON Delay }=20 \mathrm{~ms} \\ & \text { OFF Delay }=20 \mathrm{~ms} \end{aligned}$ | Standard inputs: selectable from $0.5 \ldots 16 \mathrm{~ms}$ high-speed inputs: selectable from 0.025... 16 ms |  |
| On-state Current: <br> min <br> nom <br> max | $5.0 \mathrm{~mA} @ 79 \mathrm{~V}$ AC $12 \mathrm{~mA} @ 120 \mathrm{~V}$ AC 16.0 mA @ 132V AC | $2.5 \mathrm{~mA} @ 14 \mathrm{~V}$ DC 7.3 mA @ 24V DC 12.0 mA @ 30V DC | $2.0 \mathrm{~mA} @ 10 \mathrm{DC}$ 8.9 mA @ 24V DC 12.0 mA @ 30V DC |
| Off-state Leakage Current, max | 2.5 mA , max | 1.5 mA , min |  |
| Impedance, nom | $\begin{aligned} & 12 \mathrm{k} \Omega @ 50 \mathrm{~Hz} \\ & 10 \mathrm{k} \Omega @ 60 \mathrm{~Hz} \end{aligned}$ | $3.3 \mathrm{k} \Omega$ | $2.7 \mathrm{k} \Omega$ |
| Inrush Current, max | 250 mA at 120V AC | --- |  |

## MicroLogix 1200 Controller Digital Output Specifications

| Attribute | 1762- |  |  |
| :---: | :---: | :---: | :---: |
|  | L24AWA, L24BWA, L24BXB, L40AWA, L40BWA, L40BXB, L24AWAR, L24BWAR, L24BXBR, L40AWAR, L40BWAR, L40BXBR | $\begin{aligned} & \text { L24BXB, L40BXB } \\ & \text { L24BXBR, L40BXBR } \end{aligned}$ |  |
|  | Relay | FET Standard Operation | FET High-speed Operation (Output 2 only) |
| Operating Voltage Range | 5..125V DC $5 . .264 \mathrm{~V}$ | 21.6...27.6V DC | 21.6...27.6V DC |
| Continuous Current per Point, max | See MicroLogix 1500 Controller Relay Contact Rating on page 72. | See below, MicroLogix 1200 Controller FET Standard Outputs Continuous Current per Point, max. | 100 mA |
| Continuous Current per Common, max | 8.0 A | $\begin{aligned} & \text { 7.5 A for L24BXB, L24BXBR } \\ & \text { 8.0 A for L40BXB, L40BXBR } \end{aligned}$ |  |
| Continuous Current per Controller, max | 30 A or total of per-point loads, whichever is less at 150 V max 20 A or total of per-point loads, whichever is less at 240 V max |  |  |
| On-state Current, min | 10.0 mA | 1 mA | 10.0 mA |
| Off-state Leakage Current, max | 0 mA | 1 mA |  |
| Signal Delay, max - resistive load | $\begin{aligned} & \hline \text { ON Delay }=10 \mathrm{~ms} \\ & \text { OFF Delay }=10 \mathrm{~ms} \end{aligned}$ | $\begin{aligned} & \text { ON Delay }=0.1 \mathrm{~ms} \\ & \text { OFF Delay }=1.0 \mathrm{~ms} \end{aligned}$ | $\begin{aligned} & \text { ON Delay }=6 \mu \mathrm{~s} \\ & \text { OFF Delay }=18 \mu \mathrm{~s} \end{aligned}$ |
| Surge Current per Point (peak) | --- | $4 \mathrm{~A} \mathrm{for} 10 \mathrm{~ms}{ }^{(1)}$ |  |

(1) Repeatability is once every 2 seconds @ $55^{\circ} \mathrm{C}\left(131^{\circ} \mathrm{F}\right)$, once every 1 second @ $30^{\circ} \mathrm{C}\left(86{ }^{\circ} \mathrm{F}\right)$.

## MicroLogix 1200 Controller Relay Contact Rating

| Voltage, max | Amperes |  | Amperes Continuous | Voltamperes |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Make | Break |  | Make | Break |
| 240 V AC | 7.5 A | 0.75 A | 2.5 A | 1800 VA | 180 VA |
| 120 V AC | 15 A | 1.5 A |  |  |  |
| 125 V DC | $0.22 \mathrm{~A}^{(1)}$ |  | 1.0 A | 28 VA |  |
| 24 V DC | $1.2 \mathrm{~A}^{(1)}$ |  | 2.0 A |  |  |
| (1) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28 VA by the applied DC voltage. For example, $28 \mathrm{VA} / 48 \mathrm{~V} D \mathrm{DC}=0.58 \mathrm{~A}$. For DC voltage applications less than 48 V , the make/break ratings for relay contacts cannot exceed 2 A . For DC voltage applications greater than 48 V , the make/break ratings for relay contact cannot exceed 1 A . |  |  |  |  |  |

MicroLogix 1200 Controller FET Standard Outputs Continuous Current per Point, max


## MicroLogix 1200 Memory and Real-Time Clock Modules

The controller is shipped with a memory module port cover in place. You can order the memory module, real-time clock, or combination module to suit your needs.

## Real-time Clock (1762-RTC)

- Allows for time/date scheduling
- Self-contained battery provides long-term time base


## Memory Module (1762-MM1)

- User program and data back-up
- Program compare
- Data file protection
- Memory module write protection
- Removal/insertion under power


## Combination Memory and Real-time Clock Module (1762-MM1RTC)

Provides all real-time clock and memory back-up functions of the 1762-RTC and 1762-MM1 modules

## Select MicroLogix 1200 Expansion I/O

## Step 9 - Select:

- I/O modules - digital, analog, and temperature
- perform system expansion calculations
- record your selections in the Selection Record (start on page 86)

MicroLogix 1200 controllers expand by using the same 1762 I/O platform as MicroLogix 1100 controllers. The $1762 \mathrm{I} / 0$ expansion modules provide superior functionality in a small sized low-cost package. A variety of modules complement and extend the capabilities of MicroLogix 1200 controllers by maximizing the flexibility of I/O count and type.

The MicroLogix 1200 system design allows modules to be either DIN rail or panel mounted. The DIN latches and screw mounting holes are an integral part of the package design.

Controller I/O can be expanded by using up to six expansion modules per controller (depending on power budget).

See Select MicroLogix 1100 Expansion I/O on page 50 for available modules and specifications.

1762 Expansion I/O Modules Connected to a MicroLogix 1200 Controller


## Perform MicroLogix 1200 Controller System Expansion Calculations

A download is also available for system validation. On the Internet, go to http://www.ab.com/micrologix.

To have a valid system, both current and power requirements must be satisfied. Use the following worksheets to make your calculations.

Follow these steps to verify the controller power supply loading.

1. Use the following table to select the components for your system. Do not exceed the MAXIMUM LIMIT for the number of $1 / 0$ modules.
2. Fill in the current amounts and add up the TOTAL CALCULATED CURRENT.

## MicroLogix 1200 Controller Power Supply Loading - Calculate System Current

| Cat. No. |  | Bus Current Draw Attribute |  | Calculated Current for System |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | at 5V DC (mA) | at 24V DC (mA) | at 5V DC (mA) | at 24V DC (mA) |
| 1761-NET-AIC ${ }^{(1)(2)}$ |  | 0 | $120^{(2)}$ |  |  |
| 1761-NET-ENI, 1761-NET-ENIW ${ }^{(1)(2)}$ |  | 0 | $100^{(2)}$ |  |  |
| 2707-MVH232 or 2707-MVP232 ${ }^{(1)(2)}$ |  | 0 | $80^{(2)}$ |  |  |
| Cat. No. | $\begin{aligned} & \mathrm{n}=\text { Number of Modules } \\ & (6 \text { max }) \end{aligned}$ | A | B | n x A | n x B |
| 1762-IA8 |  | 50 | 0 |  |  |
| 1762-108 |  | 50 | 0 |  |  |
| 1762-IO80W6 |  | 110 | 80 |  |  |
| 1762-I016 (Series A) |  | 60 | 0 |  |  |
| 1762-0A8 |  | 115 | 0 |  |  |
| 1762-0B8 |  | 115 | 0 |  |  |
| 1762-0B16 |  | 175 | 0 |  |  |
| 1762-0W8 |  | 80 | 90 |  |  |
| 1762-0W16 (Series A) |  | 120 | 140 |  |  |
| 1762-0X6\| |  | 110 | 110 |  |  |
| 1762-IF20F2 |  | 40 | 105 |  |  |
| 1762-IF4 |  | 40 | 50 |  |  |
| 1762-0F4 |  | 40 | 165 |  |  |
| 1762-IR4 |  | 40 | 50 |  |  |
| 1762-IT4 |  | 40 | 50 |  |  |
| 1762-OV32T |  | 175 | 0 |  |  |
| 1762-0B32T |  | 175 | 0 |  |  |
| 1762-IO32T |  | 170 | 0 |  |  |
| 1762-I016 (Series B) |  | 70 | 0 |  |  |
| 1762-0W16 (Series B) |  | 140 | 180 |  |  |
| TOTAL MODULES: |  | TOTAL CALCUL | CURRENT: | (C) | (D) |
| For 1762-L24BWA, 1762-L40BWA, 1762-L24BWAR, and 1762-L40BWAR only, add sum of any User 24V DC Sensor Current |  |  |  | (E) |  |

(1) These are optional accessories. Current is consumed only if the accessory is installed.
(2) Current for the 1761-NET-AIC or 1761-NET-ENI(W) can be supplied by the controller's communication port or from an external 24V DC source. No current is consumed from the controller when a user-suppled, external source is used. If an external source is to be used, do not select the device here. The current for a $2707-\mathrm{MVH} 232$ or 2707-MVP232 MicroView Operator Interface is supplied from the controller's communication port, if directly connected.
3. Using the table below, verify that (C), (D), and (E) do not exceed the MAXIMUM LIMITS. If the MAXIMUM LIMIT is exceeded, you will need to adjust your selections.

## MicroLogix 1200 Controller Maximum Load Current

| Cat. No. | Load Current | 5V DC | 24V DC | $\begin{array}{\|l\|} \hline \text { User 24V DC Sensor } \\ \text { Current } \end{array}$ |
| :---: | :---: | :---: | :---: | :---: |
| 1762-L24AWA1762-L24AWAR1762-L24BXB, 1762-L24BXBR | Calculated Value | (C) | (D) | N/A |
|  | MAXIMUM LIMIT | 400 mA | 350 mA |  |
| $\begin{aligned} & \hline \text { 1762-L24BWA } \\ & \text { 1762-L24BWAR } \end{aligned}$ | Calculated Value | (C) | (D) | (E) |
|  | MAXIMUM LIMIT | 400 mA | 350 mA | 250 mA |
| 1762-L40AWA1762-L40AWAR1762-L40BXB, 1762-L40BXBR | Calculated Value | (C) | (D) | N/A |
|  | MAXIMUM LIMIT | 600 mA | 500 mA |  |
| $\begin{aligned} & \hline \text { 1762-L40BWA } \\ & \text { 1762-L40BWAR } \end{aligned}$ | Calculated Value | (C) | (D) | (E) |
|  | MAXIMUM LIMIT | 600 mA | 500 mA | 400 mA |

4. Use the table below to verify that the system is within the power loading limits of the controller.

Fill in the (C), (D), and (E) values where indicated. Then calculate Watts and add up the Total Watts. Verify that Total Watts does not exceed the MAXIMUM POWER LIMIT. If the MAXIMUM POWER LIMIT is exceeded, you will need to adjust your selections.

## MicroLogix 1200 Controller Maximum Load Power

| Cat. No. | 5V Power Consumption Calculated Watts |  |  | 24V Power Consumption Calculated Watts |  |  | Calculated Watts (sum of 5V and 24V) | MAXIMUM POWER LIMIT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \hline \text { 1762-L24AWA } \\ & \text { 1762-L24AWAR } \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D) | x 24V | = W | W | 10.4 W |
| $\begin{aligned} & \hline \text { 1762-L24BXB } \\ & \text { 1762-L24BXBR } \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D) | x 24V | $=\mathrm{W}$ | W | 10.4 W |
| $\begin{aligned} & \hline \text { 1762-L24BWA } \\ & \text { 1762-L24BWAR } \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D)+(E) | x 24V | $=\mathrm{W}$ | W | 12 W |
| $\begin{aligned} & \hline \text { 1762-L40AWA } \\ & \text { 1762-L40AWAR } \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D) | x 24V | = W | W | 15 W |
| $\begin{aligned} & \hline 1762-\mathrm{L} 40 \mathrm{BXB} \\ & 1762-\mathrm{L} 40 \mathrm{BXBR} \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D) | x 24V | = W | W | 15 W |
| $\begin{aligned} & \hline \text { 1762-L40BWA } \\ & \text { 1762-L40BWAR } \end{aligned}$ | (C) | x 5V | $=\mathrm{W}$ | (D)+(E) | x 24V | = W | W | 16 W |

## Select Replacement Parts

## Step 14 - Select:

- replacement parts
- record your selections in the Selection Record (start on page 86)


## MicroLogix 1000 Replacement Parts

| Description | Cat. No. |
| :--- | :--- |
| Terminal Cover Doors for 1761-L32AWA, -L32BWA, or -L32AAA (2 doors per package) | 1761-RPL-T32X |
| Replacement Terminal Block — 6-position DH-485 plug/connector used with the 1761-NET-AIC. | 1746-RT30 |
| Replacement Terminal Block — 5-position DeviceNet plug/connector used with the 1761-NET-DNI. | 1761-RPL-RT00 |

## MicroLogix 1100 Replacement Part

| Description | Cat. No. |
| :--- | :--- |
| Replacement Battery | 1763-BA |

MicroLogix 1200 Replacement Parts

| Description | Cat. No. |
| :--- | :--- |
| Replacement Removable Terminal Block — (1) 25-pt double row, (1) 29-point double row for 1762-L40AWA and -L40BWA | 1762-RPLRTB40 |

## MicroLogix 1400 Replacement Parts

| Description | Cat. No. |
| :--- | :--- |
| Replacement Battery | 1747-BA |
| Replacement Removable Terminal Block — (1) 25-pt double row, (1) 29-point double row for all 1766-L32xxxx | 1762-RPLRTB40 |

## MicroLogix 1500 Replacement Parts

| Description | Cat. No. |
| :--- | :--- |
| Replacement Terminal Block — 17-pt for 1764-24AWA and 1764-24BWA inputs | 1764-RPLTB1 |
| Replacement Terminal Block — 21-pt for 1764-28BXB inputs and outputs for all base units | 1764-RPLTB2 |
| Replacement Battery | 1747-BA |


[^0]:    (1) See Perform MicroLogix 1200 Controller System Expansion Calculations on page 62 for an example system validation worksheet to calculate expansion I/O power usage.

