# SJ-ETHER/SJ Series

## Features

## Ultraminiature Block Type

- Three kinds of CPU of card size are available.
- The main body is equipped with up to 14 input/ output points such as discrete and analog points, depending on the type of CPU, and it enables control from a single CPU.
- The block type comes without a base as a means for eliminating wasted space and prioritizing space-savings.


## Features

### Network controller <SJ-ETHER>

Data transfer and monitoring is sped up through the built-in Ethernet port.
By handling general-purpose protocol such as EtherNet/IP, CC-Link IE Field Basic, and MODBUS/TCP, it becomes ideal for the device's network controller.
Changing small scale devices, the factory environment and single devices to IoT is realized through low costs.

### Installing PID control

Ideal for devices that demand control of analog quantity.
It can switch to manual, automatic, and cascade mode for up to 16 loops.

- Each loop can program independent sample rate
- Installs functions controlled in manual, automatic and cascade modes
- 2 types of bumpless processing
- Secured alarm information
- Ramp/Soak with maximum segment amount of 16
- Auto-tuning

* The basic type requires an analog extension unit.

### Motion control <SJ-ETHER>

With I/O built into the main body, connection to highspeed counter input and pulse output is possible. With a single CPU, small-sized machines and equipment can be controlled easily and smoothly.
〔High-speed counter〕
Up/Down counter max 3ch
Multiple system signals can be counted separately. It accurately measures high-speed pulses and implements precise control.
Pulse/Direction counter max 6ch
Handles max 100 kHz. It also smoothly controls precise operation.
〔Positioning function〕
Pulse output
Outputs pulse and direction signals. Can operate with high diligence in controlling the regular and reverse rotation of the motor.
Also,
- Linear interpolation of 2 or 3 axes.
- Multistage control
- Speed control

### Introduce with minimal size

With a compact minimum case size of W 53.5 x H 85 mm which holds 3 built-in ports including an Ethernet port, and built-in I/O interface (Basic type: input 8 points, output 6 points. Analog type: input 4 points, output 4 points, analog input 2ch, analog output 2ch), it makes singular control possible.
It meets various demands including importing to small-scale devices, constructing support systems, and capital investment with reduced costs.

### Can be driven by existing 24 V power source

The 24 V power source currently being used by other devices can be applied as is, and there's no need to prepare a separate power source unit exclusively. It is ne to add and operate an expansion power source module for having merged it with the composition of the environment and each type of expansion unit.

### Analog I/O built into the main body <Analog Type>

0 to 5 V/4 to 20 mA 12bit installed.
You can control analog signals such as temperature, humidity, pressure and ow rate. By sending data in a higher rank via Ethernet, devices of singular control are also changed to IoT. With the expansion unit it can also handle thermocouple/resistance temperature detector.

### Peripheral equipment

Communication ports that carry out communications conforming to Ethernet, RS-232C and RS-485 are equipped with 3 systems. You can simultaneously and easily connect a wide variety of peripheral equipment, from network devices to programmable monitors and card readers.If you connect to a PC, you can carry out debugging in realtime while operating equipment devices.

### Up to 128 kinds of audio data can be registered and controlled. <Sound Type>

Using the data conversion software dedicated to the sound type of KOSTAC SJ, the SJ series can easily create and edit dedicated sound source data from sound source files in "WAV format" used normally in Windows®. Voice sound sources can be freely selected and combined using the program of the PLC.

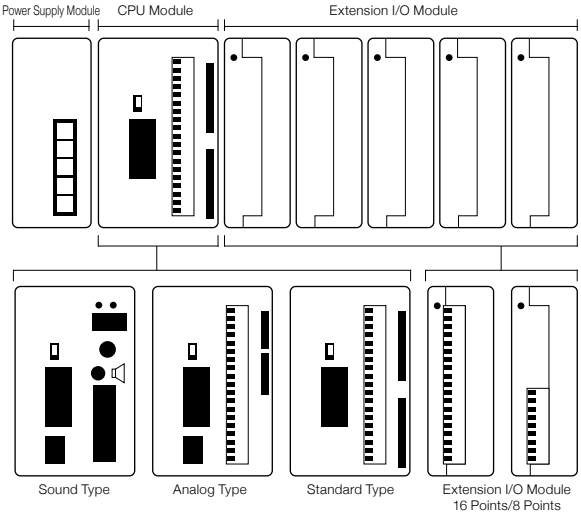
### Reproduce sound through connected speakers <Sound>

The SJ series has a power amplifier built into the CPU. Sound can be played back through speakers when connected to it. Equipped with sound volume adjustment functions, it can be operated using the volume of the main body and PLC programs. A low-power-consumption mode when it produces no sound is also available.

## System Specification

### Module configuration

Maximum system configuration:
[Power supply module] + [CPU module] + [8 extension I/O module]

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# SJ-ETHER/SJ Series
## Specifications

## Model Number List

| Name | Outline | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SJ-ETHER Series CPU Module*1 | Basic Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-11DD1EP-D | 8 | 24 V DC Sync/Source | 6 | 5 to 27 V DC Sync | 140 | Open | |
| | SJ-11DD2EP-D | 8 | 24 V DC Sync/Source | 6 | 24 V DC Source | 140 | Open | |
| | SJ-11DREP-D | 8 | 24 V DC Sync/Source | 6 | Relay 1 A | 160 | Open | |
| | Analog Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-12DD1EP-D | 4 | 24 V DC Sync/Source | 4 | 5 to 27V DC Sync | 145 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| | SJ-12DD2EP-D | 4 | 24 V DC Sync/source | 4 | 24 V DC Source | 144 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| | SJ-12DREP-D | 4 | 24 V DC Sync/source | 4 | Relay 1 A | 155 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| SJ-ETHER Series CPU Module*2 | Basic Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-11DD1E-D | 8 | 24 V DC Sync/source | 6 | 5 to 27V DC Sync | 140 | Open | |
| | SJ-11DD2E-D | 8 | 24 V DC Sync/source | 6 | 24 V DC Source | 140 | Open | |
| | SJ-11DRE-D | 8 | 24 V DC Sync/source | 6 | Relay 1 A | 160 | Open | |
| | Analog Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-12DD1E-D | 4 | 24 V DC Sync/source | 4 | 5 to 27V DC Sync | 145 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| | SJ-12DD2E-D | 4 | 24 V DC Sync/source | 4 | 24 V DC Source | 144 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| | SJ-12DRE-D | 4 | 24 V DC Sync/source | 4 | Relay 1 A | 155 | Open | |
| | | 2 | 0 to 5 V/4 to 20 mA 12bit | 2 | 0 to 5 V/4 to 20 mA 12bit | | Open | |
| SJ Series CPU Module | Standard Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-00DD1-D | 8 | 24 V DC Sink/source | 6 | 5 to 27 V DC Sink | 140 | Open | |
| | SJ-00DD2-D | 8 | 24 V DC Sink/source | 6 | 24 V DC Source | 140 | Open | |
| | SJ-00DR-D | 8 | 24 V DC Sink/source | 6 | Relay 1 A | 160 | Open | |
| | SJ-00AR-D | 8 | 100 to 120 V AC | 6 | Relay 1 A | 160 | Open | |
| | Sound Type | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | SJ-30DD1-D | 5 | 24 V DC Sink/source | 5 | 5 to 24 V DC Sink | 155 | Open | |
| Power Supply Module | AC Power Supply Module | | | | | | | |
| | Model Number | Function | | | | Weight (g) | Price | |
| | C0-01AC | 24 V DC 1.3 A type | | | | 170 | Open | |
| Extension IO Module | Input/Output Module | | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price | |
| | | Points | Function | Points | Function | | | |
| | J-08ND3 | 8 | 12 to 24 V DC Sink/source | | | 80 | Open | |
| | J-08ND3-1 | 8 | 3.3 to 5 V DC Sink/source | | | 80 | Open | |
| | J-16ND3 | 16 | 24 V DC Sink/source | | | 90 | Open | |
| | J-08NA | 8 | 100 to 120 V AC | | | 80 | Open | |
| | J-08TD1 | | | 8 | 3.3 to 27 V DC Sink | 80 | Open | |
| | J-08TD2 | | | 8 | 12 to 24 V DC Source | 80 | Open | |
| | J-16TD1 | | | 16 | 5 to 27 V DC Sink | 90 | Open | |
| | J-16TD2 | | | 16 | 12 to 24 V DC Source | 90 | Open | |
| | J-08TA | | | 8 | 17 to 240 V AC SSR 0.3 A | 100 | Open | |
| | J-08TR | | | 8 | Relay 1 A | 110 | Open | |
| | J-04TRS | | | 4 | Relay SPDT 7 A | 125 | Open | |

# SJ-ETHER/SJ Series

## Specifications

| Name | Outline | | | | | | |
|---|---|---|---|---|---|---|---|
| Extension IO Module | Analog Type | | | | | | |
| | Model Number | Input | | Output | | Weight (g) | Price |
| | | Points | Function | Points | Function | | |
| | C0-04AD-1 | 4 | 0 to 20 mA 13 bit | | | 82 | Open |
| | C0-04AD-2 | 4 | 0 to 10 V 13 bit | | | 82 | Open |
| | C0-04DA-1 | | | 4 | 4 to 20 mA 12 bit | 82 | Open |
| | C0-04DA-2 | | | 4 | 0 to 10 V 12 bit | 82 | Open |
| | C0-4AD2DA-1 | 4 | 0 to 20 mA 13 bit | 2 | 4 to 20 mA 12 bit | 86 | Open |
| | C0-4AD2DA-2 | 4 | 0 to 10 V 13 bit | 4 | 0 to 10 V 12 bit | 86 | Open |
| | C0-04RTD | 4 | Resistance temperature detector 16 bit | | | 86 | Open |
| | C0-04THM | 4 | Thermocouple 16 bit | | | 86 | Open |
| Associated Equipment | Peripheral Device | | | | | | |
| | Model Number | Function | | | | Weight (g) | Price |
| | PC-DSOFT5 | Programmer software for computer | | | | 145 | Open |
| | Cable / Connector for program | | | | | | |
| | Model Number | Function | | | | Weight (g) | Price |
| | S-9CNS1 | Conversion connector between DOS/V and Z-20JP | | | | | Open |
| | Z-20JP | Programmer connection cable 2 m, modular jack on both ends | | | | | Open |
| | Maintenance Product | | | | | | |
| | Model Number | Function | | | | Weight (g) | Price |
| | D2-BAT-1 | CPU memory backup battery for analog / sound type | | | | | Open |

*1 EtherNet/IP, Modbus/TCP
*2 CC-Link IE Field Basic, Modbus/TCP

## Performance Specifications (Common)

| Items | Specifications | | | |
|---|---|---|---|---|
| | SJ-ETHER Series | | SJ Series | |
| | Basic | Analog | Sound Type | Standard Type |
| Control System | Stored program: Cyclic arithmetic processing system | | | |
| Language System | Simultaneous use of relay symbol type and stage type | | | |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 22 | | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 | |
| Processing Speed | Sequence instructions: 0.1 µs ~<br>Data processing instructions: 0.2 µs ~ | | Sequence instructions: 0.37 µs ~<br>Data processing instructions: 2.96 µs ~ | |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K | | | |
| Input Relay (I) | 1,024 points (I 0 to 1,777) | | 256 points (I 0 to 377) | |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) | | 256 points (Q 0 to 377) | |
| Internal Relay | 2,048 points (M 0 to 3,777) | | | |
| Stage | 1,024 points (S 0 to 1,777) | | | |
| Timer | 256 points (T 0 to 377) | | | |
| Counter | 128 points (C 0 to 177) | | | |
| Special Relay (SP) | 512 points (SP 0 to 777) | | 256 points (SP 0 to 377) | |
| Timer Elapsed Value Register | 256 word (R 0 to 377) | | | |
| Timer / Counter Elapsed Value | 256 word (R 1,000 to 1,377) | | 128 word (R 1,000 to 1,177) | |
| Data Register | 12,960 word (R 400 to 777, R 1,400 to 7,377, R 10,000 to 27,777) | | 7,488 word (R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) | |
| Special Register | 128 word (R 7,400 to 7,777) | | 320 word (R 700 to 777, R 7,400 to 7,777) | |
| Accumulator | 32-bit x 1 | | | |
| Data Stack | 32-bit x 8 stack | | | |
| Calendar, Clock | Stored data: Year, month, day, day of week, hour, minute, second (Backup battery: D2-BAT-1) | | | No |
| Password | BCD8 digit 2 level (Usual password, restricted password) | | | |
| Input/Output Allocation | Free location (Only for automatic allocation) | | | |
| PID Function | 16-loops | | | |
| Operation Mode | RUN / STOP / TERM | | | |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some timer / counter elapsed value registers, data registers and special registers during power failures. | | | |
| Diagnosis Function (Hardware) | Watchdog timer, cell voltage fall | | | Watchdog timer |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer<br>- Communication error (Programmer port, general-purpose communication port) | | | |
| Installation | DIN rail or 2 screws | | | |
| Conforming DIN Rail | TH35Fe/TH35AI | | | |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated)<br>Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack Protocol: DirectNET(M/S), MODBUS(M/S), Non-procedural(M/S), K sequence (S) | | Transmission method: RS-232C compatible (Non-isolated)<br>Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack Protocol: K sequence (S) | |
| Communication Function: Port 2 | Transmission method: RS- 485 compatible (Non-isolated)<br>Transmission speed: 2,400, 4,800, 9,600, 19,200, 38,400 bps<br>Connection: Terminal block 3 pins<br>Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S) | | Transmission method: RS-232C compatible (Non-isolated)<br>Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: 6-pin modular (Female) jack Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) | |

# SJ-ETHER/SJ Series
## Specifications

| Items | Specifications | | | |
|---|---|---|---|---|
| | SJ-ETHER Series | | SJ Series | |
| | Basic | Analog | Sound Type | Standard Type |
| Communication Function: Port 3 | Transmission method: Ethernet<br>Transmission speed: 100BASE-TX, 10BASE-T (Automatic negotiation)<br>Connection: RJ45 format modular connector<br>Protocol: EtherNet/IP (s)*1 / CC-Link IE Filed Basic(slave) *1 / Modbus / TCP (m/s) | | Transmission method: RS- 485 compatible (Non-isolated)<br>Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: Terminal block 3 pins<br>Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) | No |

*1 Select the applicable model number.

## General Specifications (Common)

| Items | Specifications | |
|---|---|---|
| | SJ-ETHER Series | SJ Series |
| Supply Voltage | 24 V DC | |
| Supply Voltage Variation Range | 20 to 28 V DC | |
| Power Consumption | Not more than 5 W<br>(When the communication port is not fed) | |
| Power Source Inrush Current | 30 A or less (1 ms or less) | |
| Allowable Instantaneous Power Failure Time | Up to 10 ms | |
| Operating Ambient Temperature | 0˚C to 55˚C IEC60068-2-14<br>(Temperature change test) | |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) | |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) | |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) | |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method | |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 | |
| Noise Resistance | Impulse 1,000 V 1 µs pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge),EN61000-4-6 (Conducted interference), EN61000-4-8(Magnetic fields) | |
| Radiation | EN55016: ClassA, Group1 | EN55011: 1998 Class A |
| Conformance Standard | UL61010-2-201 Zone2, CE (EN61131-2) | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS | |

## Sound Type Individual Specifications

| Items | Specifications | Remarks |
|---|---|---|
| Audio Output Form | Balance Output | Monaural |
| External Connection Speaker | Nominal impedance 8 Ω<br>Maximum permissible input 1 W or more | |
| Audio Output Terminal | φ3.5 mini-pin jack<br>SP+: Speaker output +<br>SP-: Speaker output - | |
| Volume Control Form | Volume for sound adjustment + Program control system (4-stage volume control) | Sound can be adjusted from a volume on the front face of the main body. The program control system can be adjusted from the PLC program. |
| Power Amplifier | D-class amplifier: TPA2001D1 equivalent | The low-power-consumption mode is set when no sound is produced. |
| Sound Synthesis System | 2-bit ADPCM2 system<br>4-bit ADPCM system<br>(Recommended) | Suitable for normal sound playback |
| | 8-bit non linear PCM system<br>8-bit straight PCM system<br>16-bit straight PCM system | Suitable for playback of sound effects including high frequency component |
| Maximum Reproduction Time | Approx. 2 hours | The playback time changes according to sound synthesis system and sampling frequency. |
| Number of Sound Comment Registrations | 128 comments | |
| Sound Rewrite System | Automatic transfer from external USB memory (USB A type connector) | The sound data in the external USB memory connected to the dedicated USB port is automatically transferred to the internal sound data storage memory. |

# SJ-ETHER/SJ Series

## Specifications

## Software Specifications Dedicated to Sound Type

Compilation Tool for sound SJ

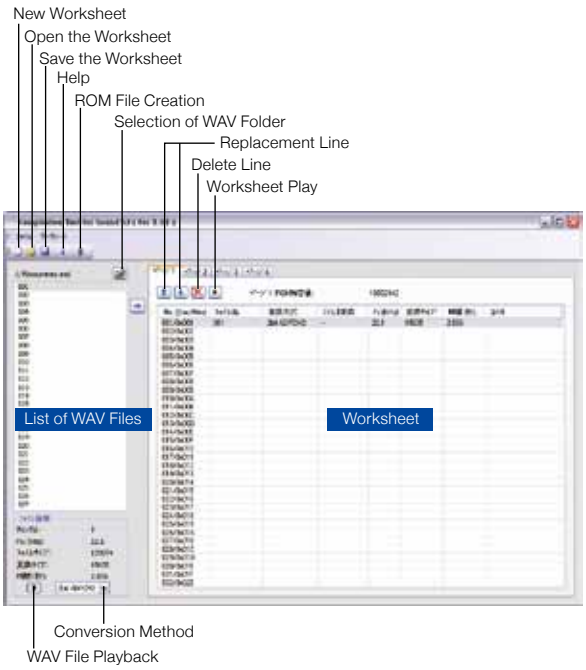
### Outline

You can easily create audio data dedicated to the KOSTAC SJ from standard audio files of Windows®.
The dedicated format that emphasizes file management security and reliability is used for the audio file data of the sound type of KOSTAC SJ. To create and manage data, you can use Koyo Electronics' original audio data creation tool developed for the KOSTAC SJ.

### Features

- Easily create dedicated files
  You can easily and quickly create audio data dedicated to the KOSTAC SJ from the standard "WAV" audio files of Windows® computers.
- The screen can be intuitively used.
  It uses an easy-to-see and easy-to-understand screen design used for spreadsheet software. You can immediately call up necessary functions from the icons.
- Voice conversion method can be selected from five kinds.
  According to the environment, you can create five kinds of audio data with, for example, an emphasis on high-quality sound, long-term reproduction, or economized file sizes.
- Worksheets divided into 4 parts
  You can divide the comments into 4 parts, so for the maximum 128, it means 32 comments per page. Just the sound source of the page that needs to be edited can be transferred while frequently used sound sources can be kept in place.

### Worksheet screen




### Audio conversion method

Audio data can be converted into the following five kinds according to application.

| Conversion Method | Suitable Applications |
|---|---|
| 1. 2-bit ADPCM2 method | Suitable for normal sound reproduction. |
| 2. 4-bit ADPCM method (Recommended) | |
| 3. 8-bit non-linear PCM method | Suitable for reproduction of sound effects that contain high frequency components |
| 4. 8-bit straight PCM method | |
| 5. 16-bit straight PCM method | |

| Approximate Reproduction Time (min.) | | Conversion Method | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Sampling Frequency | 8 kHz | 140 | 70 | 35 | 35 | 17 |
| | 12 kHz | 93 | 47 | 23 | 23 | 12 |
| | 16 kHz (Recommended) | 70 | 35 | 17 | 17 | 9 |
| | 24 kHz | 47 | 23 | 12 | 12 | 6 |
| | 32 kHz | 35 | 17 | 9 | 9 | 4 |
| | 48 kHz | 23 | 12 | 6 | 6 | 3 |

$$\text{Reproduction Time (Per Page)} \fallingdotseq \frac{1{,}024 \times 131{,}056 \text{ (bit)}}{\text{Sampling Frequency (Hz)} \times \text{Bit Length (bit)} \times 60 \text{ (sec)}}$$

### Operating Environment

| Items | Contents |
|---|---|
| PC | Supported OS: Windows 2000 / XP Interface: 1 or more USB ports<br>Hard disk free space: Approx. 1MB ROM for installation, approx. 220 MB for file creation |
| USB Memory | Format: FAT format<br>Free space: 64 MB or more*1 Recommended USB memory: Recognized as the SCSI device*2 |
| WAV Files that can be Registered | Monaural PCM format of 8-bits or 16-bits |
| Files Created in the Designated Folder on the PC | Voice data (Binary format) x 4 (File name 1 to 4.bin) / (Extension Intel HEX format) x 4 (File name 1 to 4.hex)<br>Registration information file (Text format) (File name 1 to 4.inf)<br>Worksheet file (Binary format) (File name 1 to 4.wsf) |
| Files Created in the Root Area of the USB Memory | The ROM file in the USB memory (Binary format) x 4 (vdata 01 to 04.bin)*3 |

*1 The area that can actually save data is smaller than the capacity of a USB memory drive.
*2 USB memory drives that are recognized as IDE devices cannot be used.
*3 A file is created under the name of "vdata01 to 04.bin" in the root area of the USB drive designated by the USB memory regardless of the designated file name. Moreover, the capacity of a created ROM file is fixed to 128 Mbit (=16 MB) per page regardless of the number of comments and reproduction time.

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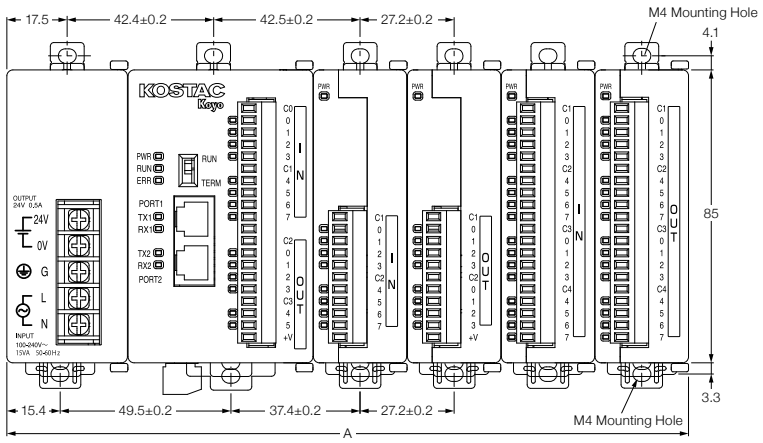
# SJ-ETHER/SJ Series
## Dimensions



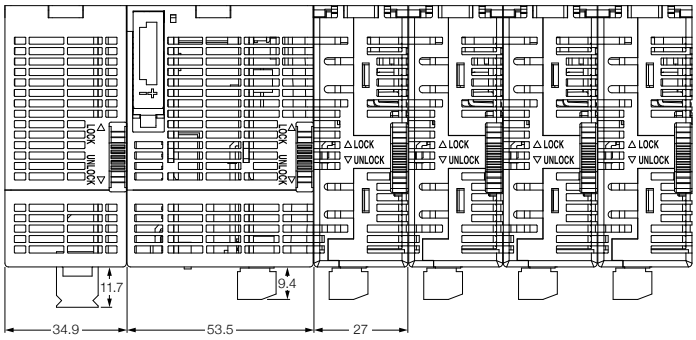
## Dimensions (Unit: mm)

### Front view



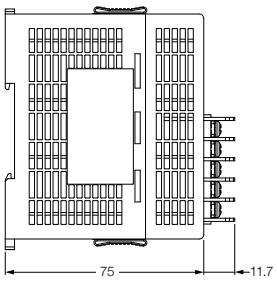

| Number of Extension IO Modules | A |
|---|---|
| 1 | 115.4 |
| 2 | 142.4 |
| 3 | 169.4 |
| 4 | 196.4 |
| 5 | 223.4 |
| 6 | 250.4 |
| 7 | 277.4 |
| 8 | 304.4 |

### Top view

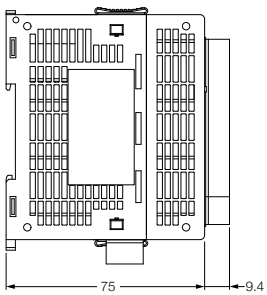



### Side view

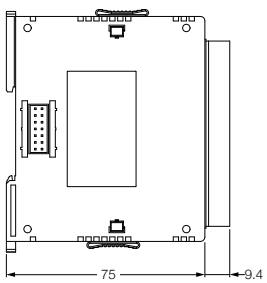
Power Supply Module




CPU Module




I/O Module

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# SJ-ETHER/SJ Series

## CPU Specifications

## Ethernet Basic Type《DC Input 8 Points, DC Output 6 Points》

**SJ-11DD1EP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications



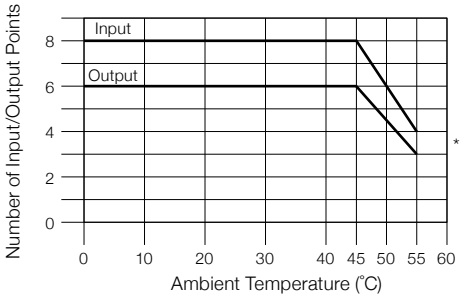
### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

### Output Specifications (Q0 to 5)

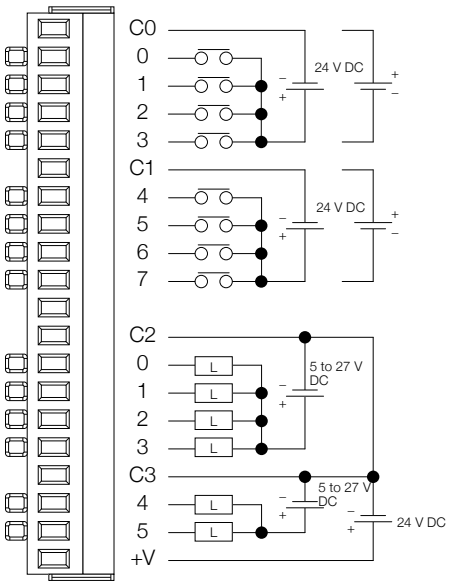
| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points |
| Output Voltage Range | | 5 to 27 V DC |
| Operating Voltage | | 4 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A/common (C3)<br>0.2 A/common (C4) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 2 (4 points/common & 2 points/common) |
| External Power Supply | | 20 to 28 V DC Up to 60 mA (All points on) |

### Derating Chart



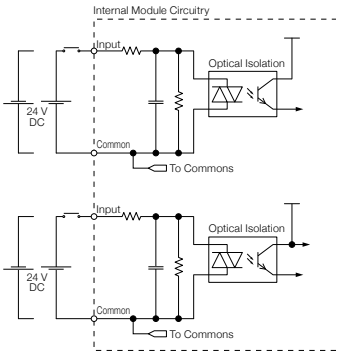

* Use every other input

### Wiring Diagram

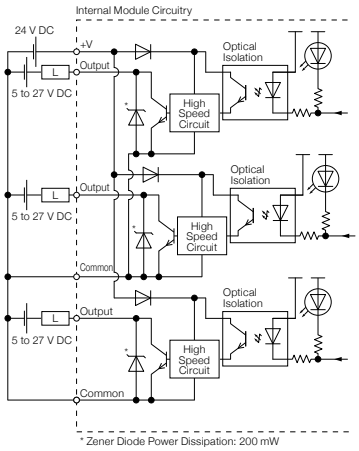



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)




* Zener Diode Power Dissipation: 200 mW

# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Basic Type《DC Input 8 Points, DC (Sourcing) Output 6 Points》

**SJ-11DD2EP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications



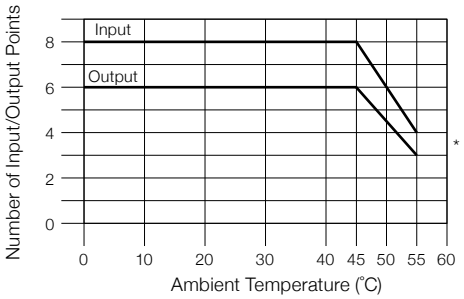
### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

### Output Specifications (Q0 to 5)

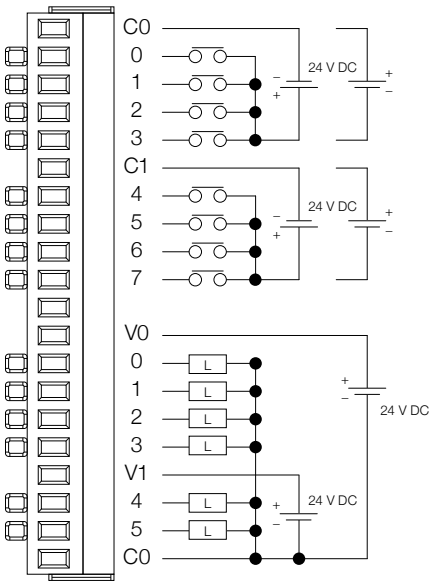
| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Source) |
| Operating Voltage | | 24 V DC |
| Output Voltage Range | | 19.2 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.6 A/common |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 1 (6 points/common) |

### Derating Chart



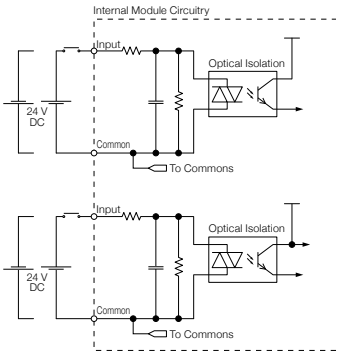

* Use every other input

### Wiring Diagram

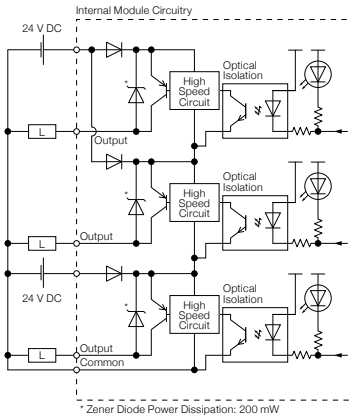



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)




* Zener Diode Power Dissipation: 200 mW

# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Basic Type《DC Input 8 Points, Relay Output 6 Points》

**SJ-11DREP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications

### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

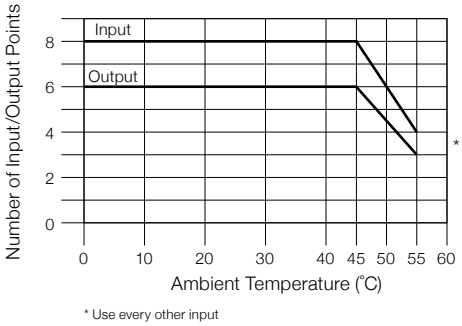
### Output Specifications (Q0 to 5)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Source) |
| Operating Voltage | | 6 to 240 V AC (47 to 63 Hz), 6 to 27 V DC |
| Output Voltage Range | | 5 to 264 V AC (47 to 63 Hz), 5 to 30 V DC |
| Output Type | | Relay, from A (SPST) |
| Maximum Current | | 1 A (Points) 4 A/common (C3)<br>2 A/common (C4) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Response Time | OFF→ON | < 15 ms |
| | ON→OFF | < 15 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 2 (4 points/common & 2 points/common) isolated |

### Relay life (ON → OFF 1 cycle)

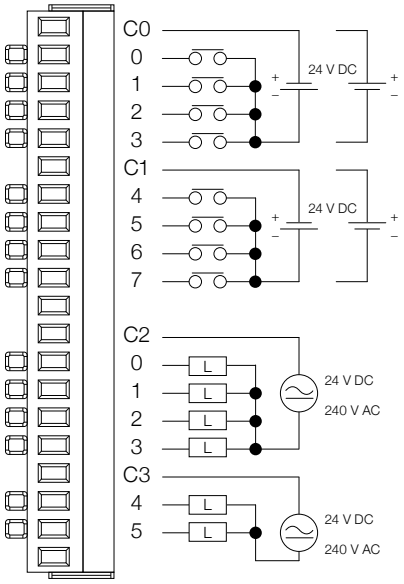
| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 250 V AC,<br>1 A Resistance Load | 500,000 cycles or more |
| 250 V AC,<br>1 A Inductive Load | 200,000 cycles or more |

### Derating Chart



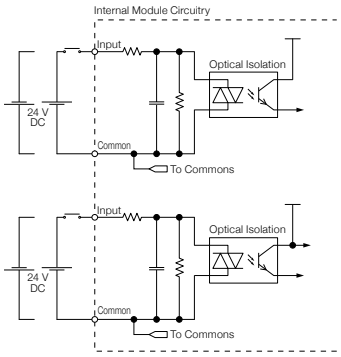

* Use every other input

### Wiring Diagram

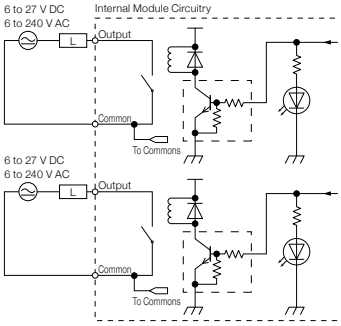



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, DC Output 4 Points, Analog Output 2 Channels》

**SJ-12DD1EP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Maximum Input Current | | 7 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications

### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points (Sink) |
| Operating Voltage | | 5 to 27 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (Common) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | < 5 µs |
| | ON→OFF | < 5 µs |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points/common) |
| External Power Supply | | 20 to 28 V DC Up to 60 mA (All points on) |

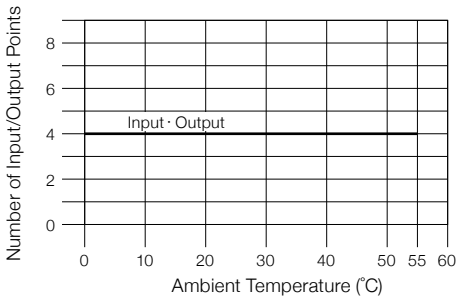
### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC (Up to 6 V DC) | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 Ω |
| Input Stability | Within ±2 LSB | ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

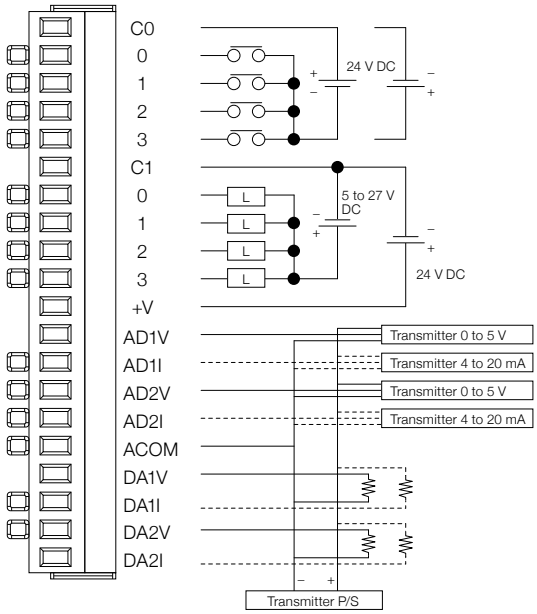
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

### Derating Chart



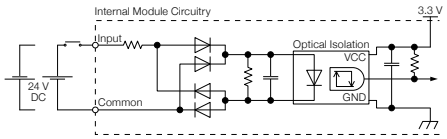

### Wiring Diagram



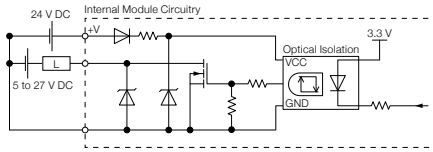

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

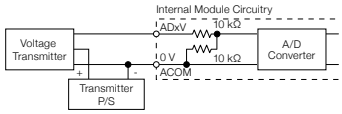
DC input (I0, I3)



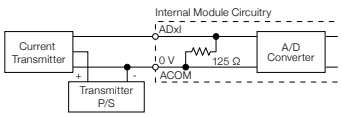

DC output (Q0 to Q3)



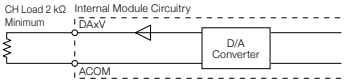

Analog voltage input selection



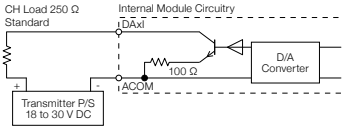

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, DC (Sourcing) Output 4 Points, Analog Output 2 Channels》

**SJ-12DD2EP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Maximum Input Current | | 7 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications

### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points (Source) |
| Operating Voltage | | 24 V DC |
| Output Voltage Range | | 19.2 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (Common) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | < 5 µs |
| | ON→OFF | < 5 µs |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points or 1 point/common) |

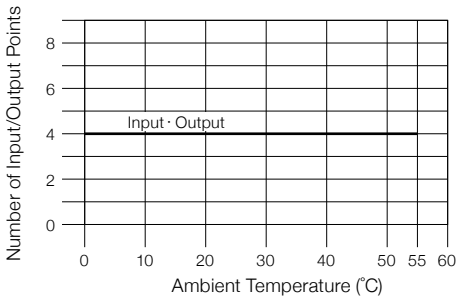
### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 Ω |
| Input Stability | Within ±2 LSB | Within ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

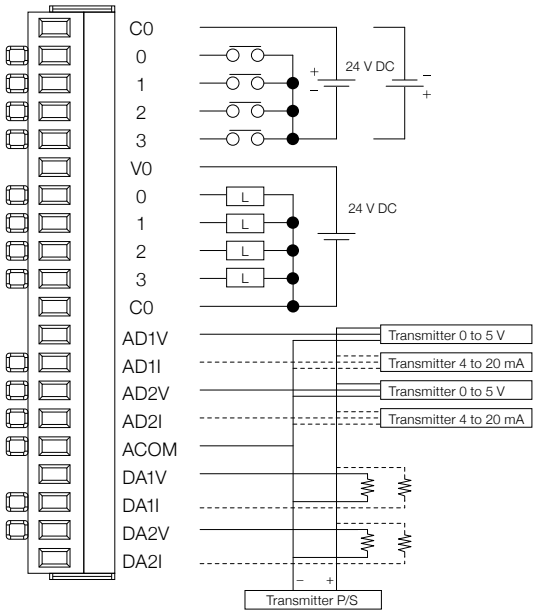
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

### Derating Chart



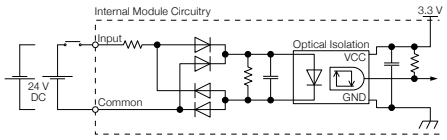

### Wiring Diagram



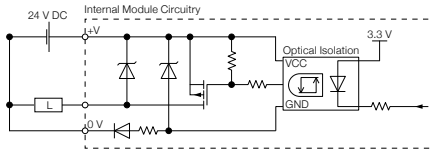

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

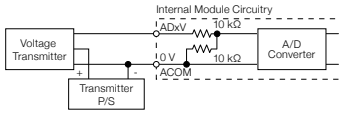
DC input (I0, I3)



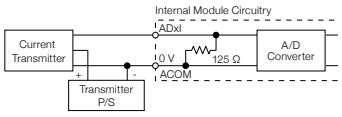

DC output (Q0 to Q3)



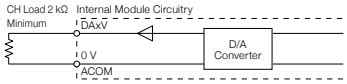

Analog voltage input selection



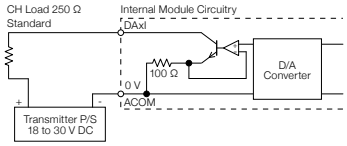

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, Relay Output 4 Points, Analog Output 2 Channels》

**SJ-12DREP-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: EtherNet/IP (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points |
| Operating Voltage | | 6 to 27 V DC/6 to 240 V AC |
| Output Type | | Relay format A (SPST) |
| AC Frequency | | 47 to 63 Hz |
| Maximum Output Current | | 1.0 A (Points) (Resistive) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Response Time | OFF→ON | < 15 ms |
| | ON→OFF | < 15 ms |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points/common) |

### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 kΩ |
| Input Stability | Within ±2 LSB | Within ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

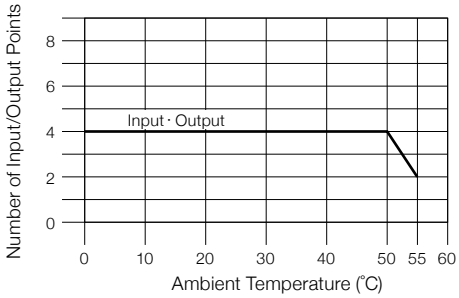
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

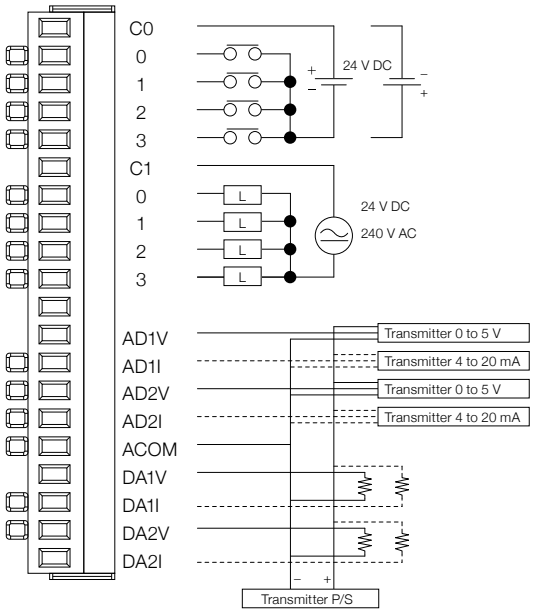
### Relay life (ON → OFF 1cycle)

| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 120 V AC,<br>1 A Resistance Load | 500,000 cycles or more |
| 120 V AC,<br>1 A Inductive Load | 200,000 cycles or more |

### Derating Chart



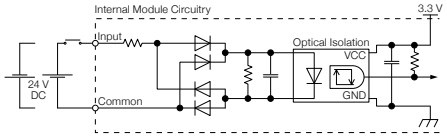

### Wiring Diagram



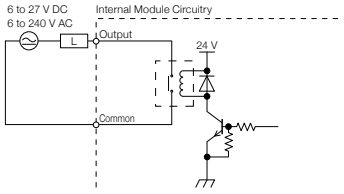

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

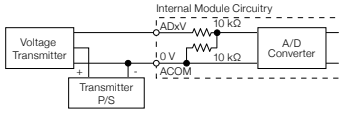
DC input (I0, I3)



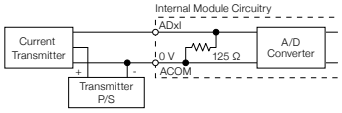

DC output (Q0 to Q3)



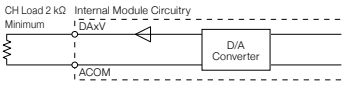

Analog voltage input selection



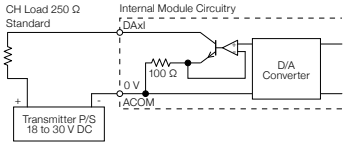

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

## Ethernet Basic Type《DC Input 8 Points, DC Output 6 Points》

**SJ-11DD1E-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/ Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications



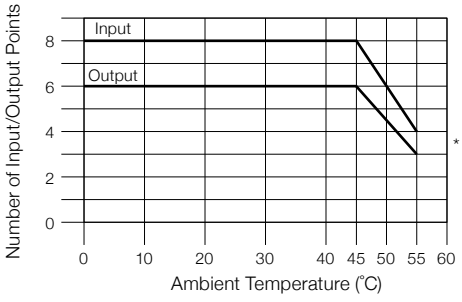
### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

### Output Specifications (Q0 to 5)

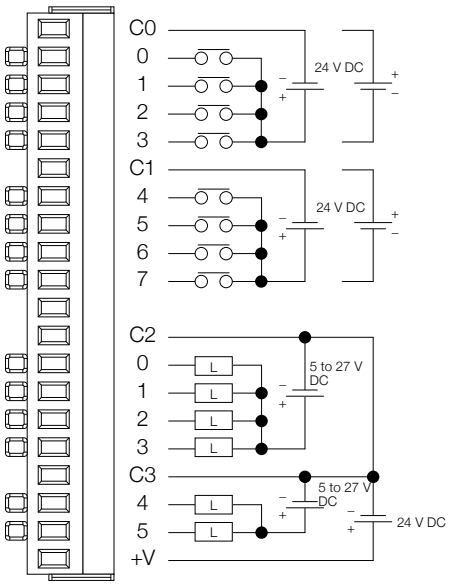
| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points |
| Output Voltage Range | | 5 to 27 V DC |
| Operating Voltage | | 4 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A/common (C3)<br>0.2 A/common (C4) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 2 (4 points/common & 2 points/common) |
| External Power Supply | | 20 to 28 V DC Up to 60 mA (All points on) |

### Derating Chart



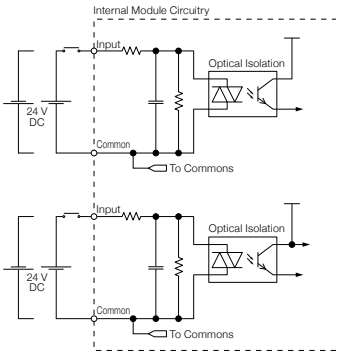

* Use every other input

### Wiring Diagram

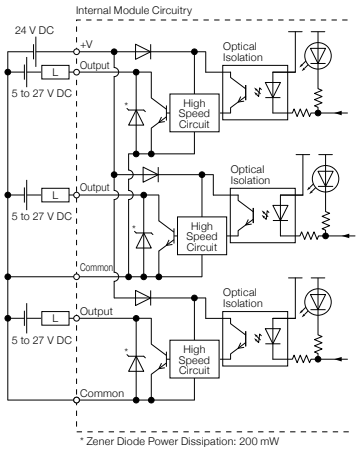



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)




* Zener Diode Power Dissipation: 200 mW

# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Basic Type《DC Input 8 Points, DC (Sourcing) Output 6 Points》

**SJ-11DD2E-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/<br>Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications

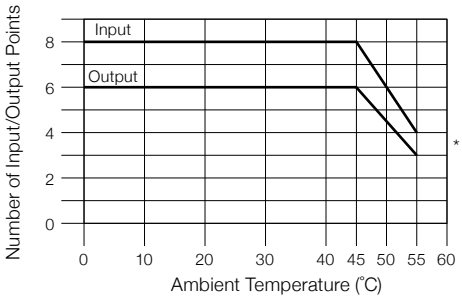
### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

### Output Specifications (Q0 to 5)

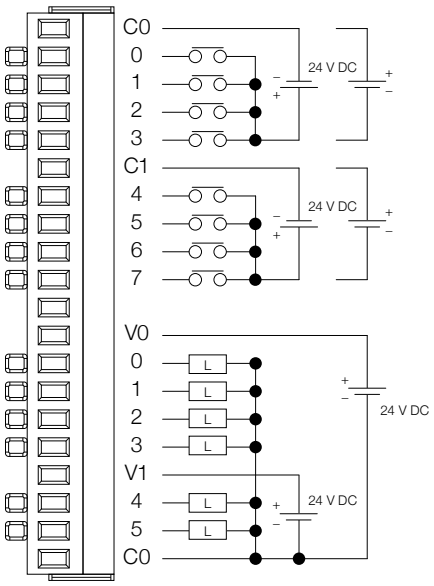
| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Source) |
| Operating Voltage | | 24 V DC |
| Output Voltage Range | | 19.2 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.6 A/common |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 1 (6 points/common) |

### Derating Chart



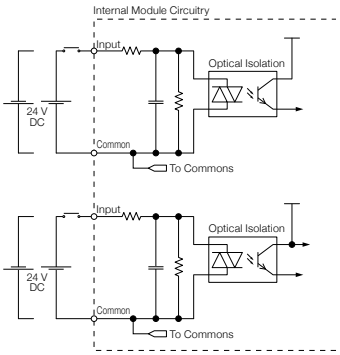

* Use every other input

### Wiring Diagram

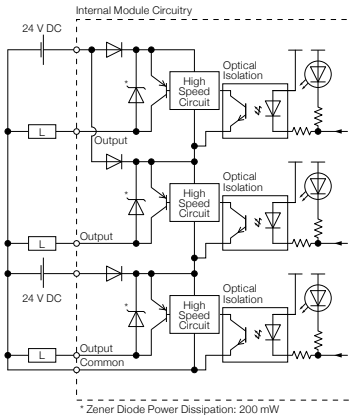



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)




* Zener Diode Power Dissipation: 200 mW

# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Basic Type《DC Input 8 Points, Relay Output 6 Points》

**SJ-11DRE-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 8 points/Output 6 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 256 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7,777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD 8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600 bps/Protocol: DirectNET (M/S), MODBUS (M/S), K sequence (S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch (10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/ Modbus/TCP (master/slave) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Input Specifications (I0 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Type 6.5 mA (24 V DC) |
| Maximum Input Current | | 7.0 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 5 µs Up to 20 µs |
| | ON→OFF | Typ 5 µs Up to 20 µs |
| Status Indicators | | Logic side (8 points, green LED) |
| Common | | 2 (4 points/common) Isolated |

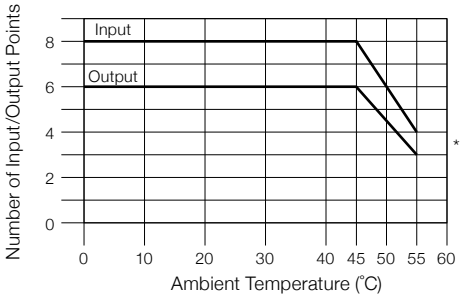
### Output Specifications (Q0 to 5)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Source) |
| Operating Voltage | | 6 to 240 V AC (47 to 63 Hz), 6 to 27 V DC |
| Output Voltage Range | | 5 to 264 V AC (47 to 63 Hz), 5 to 30 V DC |
| Output Type | | Relay, from A (SPST) |
| Maximum Current | | 1 A (Points) 4 A/common (C3)<br>2 A/common (C4) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Response Time | OFF→ON | < 15 ms |
| | ON→OFF | < 15 ms |
| Status Indicators | | Logic side (6 points, red LED) |
| Common | | 2 (4 points/common & 2 points/common) isolated |

### Relay life (ON → OFF 1 cycle)

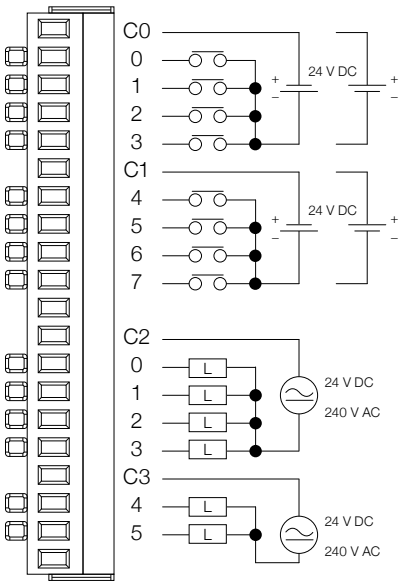
| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 250 V AC,<br>1 A Resistance Load | 500,000 cycles or more |
| 250 V AC,<br>1 A Inductive Load | 200,000 cycles or more |

### Derating Chart



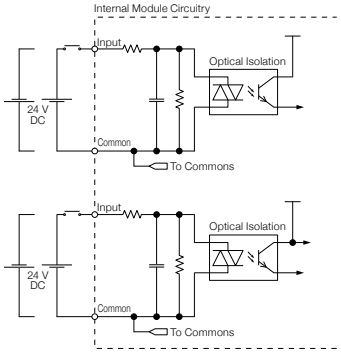

* Use every other input

### Wiring Diagram

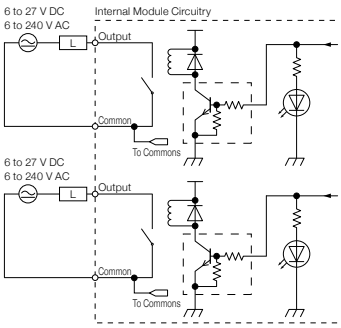



### Equivalent Circuit

DC input (I0 to I7)




DC output (Q0 to Q5)



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, DC Output 4 Points, Analog Output 2 Channels》

**SJ-12DD1E-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Maximum Input Current | | 7 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points (Sink) |
| Operating Voltage | | 5 to 27 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (Common) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | < 5 µs |
| | ON→OFF | < 5 µs |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points/common) |
| External Power Supply | | 20 to 28 V DC Up to 60 mA (All points on) |

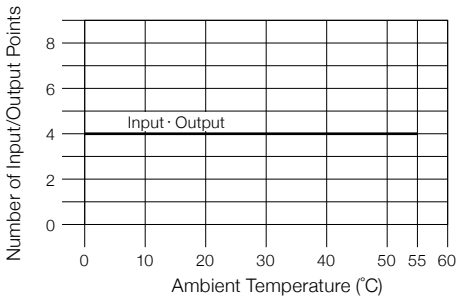
### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC (Up to 6 V DC) | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 Ω |
| Input Stability | Within ±2 LSB | ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

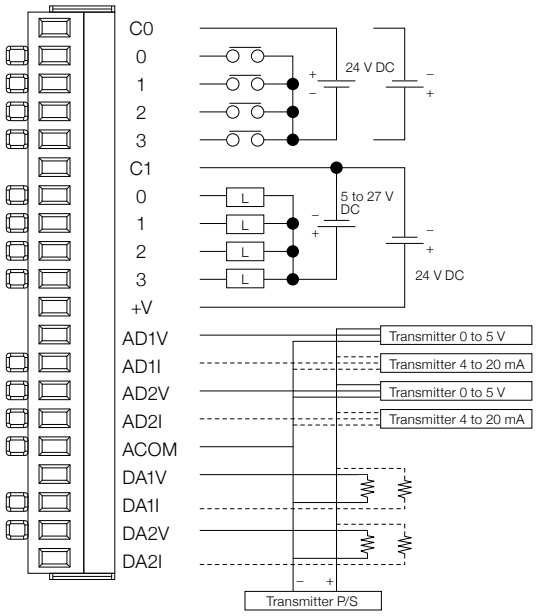
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

### Derating Chart



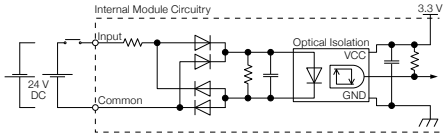

### Wiring Diagram



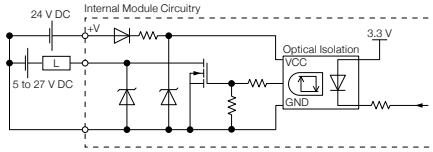

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

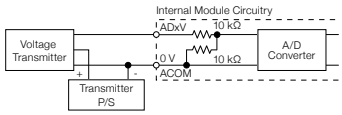
DC input (I0, I3)



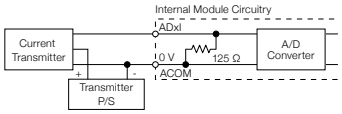

DC output (Q0 to Q3)



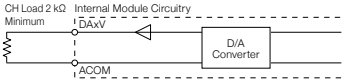

Analog voltage input selection



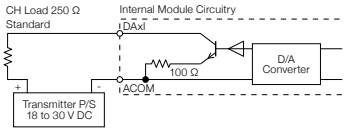

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, DC (Sourcing) Output 4 Points, Analog Output 2 Channels》

**SJ-12DD2E-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Maximum Input Current | | 7 mA (26.4 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points (Source) |
| Operating Voltage | | 24 V DC |
| Output Voltage Range | | 19.2 to 30 V DC |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (Common) |
| Minimum Output Current | | 0.2 mA |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Response Time | OFF→ON | < 5 µs |
| | ON→OFF | < 5 µs |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points or 1 point/common) |

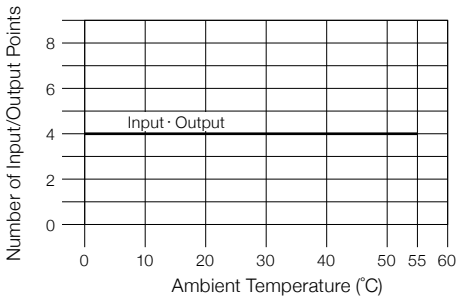
### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 Ω |
| Input Stability | Within ±2 LSB | Within ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

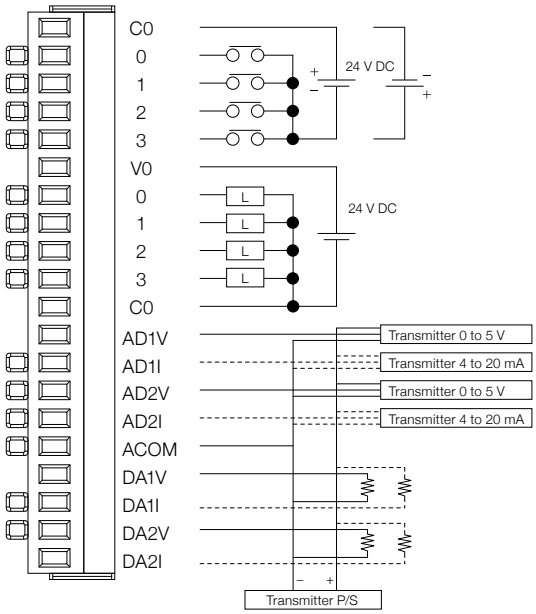
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

### Derating Chart



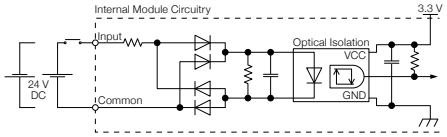

### Wiring Diagram



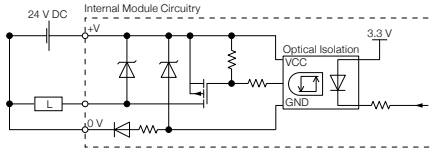

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

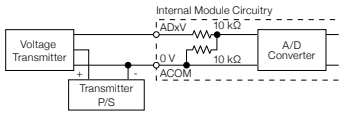
DC input (I0, I3)



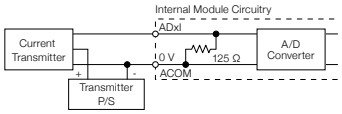

DC output (Q0 to Q3)



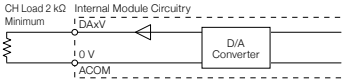

Analog voltage input selection



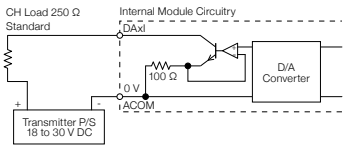

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

### Ethernet Analog Type《DC Input 4 Points, Analog Input 2 Channels, Relay Output 4 Points, Analog Output 2 Channels》

**SJ-12DRE-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When communications port parasitic) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 90% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance (Immunity) | Impulse 1,000 V 1 ms pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-6 (Conducted interference), EN61000-4-8 (Magnetic fields) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Input/Output Control System | Combination of batch transmission system and direct input/output system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 68, program execution control instructions: 166, data processing instructions: 82, IBox instructions: 19 |
| Processing Speed | Sequence instructions: 0.1 µs or less<br>Data processing instructions: 0.2 µs ~ |
| Standard Scan Time | 1.5 ms (1 K word boolean calculations per hour) |
| Implemented Input/Output Points | Input 4 points/Output 4 points<br>Analog input 2 points/Analog output 4 points |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 1,024 points (I 0 to 1,777) |
| Output Relay (Q) | 1,024 points (Q 0 to 1,777) |
| Link Relay (GI) | 2,048 points (GI 0~3,777) |
| Link Relay (GQ) | 2,048 points (GI 0~3,777) |
| Internal Relay (M) | 2,048 points (M 0 to 3,777) |
| Stage (S) | 1,024 points (S 0 to 1,777) |
| Timer (S) | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 512 points (SP 0 to 777) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Counter Elapsed Value Register | 256 word (R 0 to 377) |
| Data Register | 12,960 words (R 400 to 7777, R 1,400 to 7,377, R 10,000 to 27,777) |
| Special Register | 1,280 word (R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Available (real time clock) (year, month, date, day of the week, hours, minutes, seconds)<br>Battery-less mode retention time: 6 hours |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | - Watchdog timer - Battery voltage reduction |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Communication Function: Port 1 (Programmer Port) | RS-232C conformance modular 6P connector (RJ-12)<br>[Fixed mode] 9,600bps/protocol: DirectNET(M/S), MODBUS(M/S), K sequence(S)<br>[General mode] 2,400, 4,800, 9,600, 19,200, 38,400/Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedural (M/S), K sequence (S) |
| Communication Function: Port 2 (General Communications Port) | RS-485 conformance (uninsulated)/<br>2,400, 4,800, 9,600, 19,200, 38,400 bps/<br>3 pin terminal station Protocol:<br>DirectNET (M/S), MODBUS (M/S), K sequence (S) |
| Communication Function: Port 3 (General communications port) | Ethernet/10 Mbps/100 Mbps auto switch<br>(10 BASE/100 Base)/8 pin<br>Protocol: CC-Link IE Filed Basic (slave)/<br>Modbus/TCP (master/slave) |

### Input Specifications (I0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 4 points (Sink/source) |
| Operating Voltage | | 24 V DC |
| Input Voltage Range | | 21.6 to 26.4 V DC |
| Input Current | | Typ 6.5 mA (24 V DC) |
| Input Impedance | | 3.9 kΩ (24 V DC) |
| On-state Voltage | | > 19 V DC |
| Off-state Voltage | | < 2 V DC |
| Minimum On Current | | 4.5 mA |
| Maximum OFF Current | | 0.5 mA |
| Response Time | OFF→ON | Typ 3 µs Up to 5 µs |
| | ON→OFF | Typ 1 µs Up to 3 µs |
| Status Indicators | | Logic side (4 points, green LED) |
| Common | | 1 (4 points/common) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Output Specifications (Q0 to 3)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points |
| Operating Voltage | | 6 to 27 V DC/6 to 240 V AC |
| Output Type | | Relay format A (SPST) |
| AC Frequency | | 47 to 63 Hz |
| Maximum Output Current | | 1.0 A (Points) (Resistive) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Response Time | OFF→ON | < 15 ms |
| | ON→OFF | < 15 ms |
| Status Indicators | | Logic side (4 points, red LED) |
| Common | | 1 (4 points/common) |

### Analog input specifications

| Items | Voltage Input Selection | Current Input Selection |
|---|---|---|
| Number of Input Points | Up to 2 points by selecting current input and voltage input | |
| Input Voltage Range | 0 to 5 V DC | — |
| Input Current | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Input Response Time | 50 ms | 50 ms |
| Input Impedance | 20 kΩ | 125 Ω |
| Input Stability | Within ±2 LSB | Within ±2 LSB |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±0.1 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

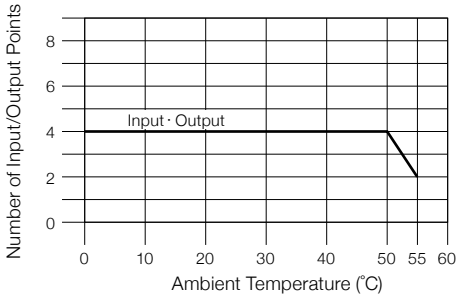
### Analog output specifications

| Items | Voltage Output Selection | Current Output Selection |
|---|---|---|
| Number of Outputs Points | Up to 2 points by selecting current output and voltage output | |
| Output Voltage Range | 0 to 5 V DC | — |
| Output Current Range | — | 4 to 20 mA (Sink) |
| Resolution | 12-bit | 12-bit |
| Conversion Time | 1 ms | 1 ms |
| Loop Supply Voltage | — | 18 to 30 V DC |
| Load Impedance | 2 kΩ or more (Output current 2.5 mA or less) | 250 Ω<br>Loop supply voltage<br>18 V DC: Up to 600 Ω<br>Loop supply voltage<br>24 V DC: Up to 900 Ω<br>Loop supply voltage<br>30 V DC: Up to 1,200 Ω |
| Full-Scale Calibration Error | ±2% or less | ±2% or less |
| Offset Error | ±25 mV or less | ±25 mA or less |
| Temperature Accuracy | ±100 ppm/°C or lower | ±100 ppm/°C or lower |

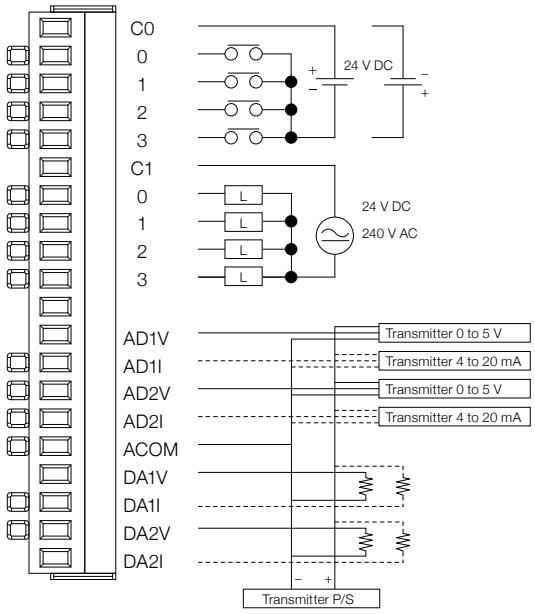
### Relay life (ON → OFF 1cycle)

| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 120 V AC,<br>1 A Resistance Load | 500,000 cycles or more |
| 120 V AC,<br>1 A Inductive Load | 200,000 cycles or more |

### Derating Chart



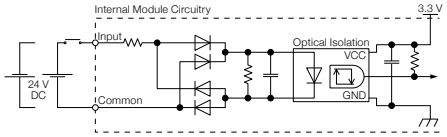

### Wiring Diagram



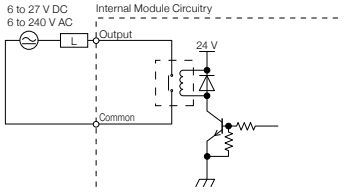

IMPORTANT: Use only one terminal (voltage or current) per channel. You must also select the analog type (voltage or current) in the CPU built-in I/O setup in the CLICK programming software (pull-down menu Setup > CPU Built-in I/O Setup).

### Equivalent Circuit

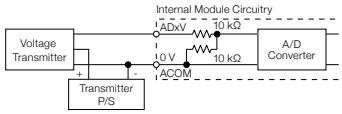
DC input (I0, I3)



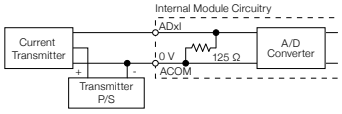

DC output (Q0 to Q3)



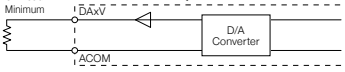

Analog voltage input selection



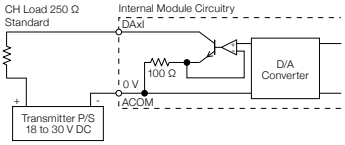

Analog current input selection




Analog voltage output selection




Analog current output selection



# SJ-ETHER/SJ Series

## CPU Specifications

### Standard Type《DC Input 8 Points, DC Output 6 Points》

**SJ-00DD1-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When the communication port is not fed) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance | Compliant with NEMA ICS3-304,<br>Impulse 1,000 V 1 µs pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI),<br>EN61000-4-4 (FTB), EN61000-4-5 (Surge),<br>EN61000-4-8 (Magnetic fields),<br>RFI: 150, 450 MHz (5W/15cm),<br>EN61000-4-6 (Conducted interference) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 |
| Number of Other Instructions | 2 |
| Processing Speed | Sequence instructions: 0.37 µs ~<br>Data processing instructions: 2.96 µs ~ |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 256 points (I 0 to 377) |
| Output Relay (Q) | 256 points (Q 0 to 377) |
| Internal Relay | 2,048 points (M 0 to 3,777) |
| Stage | 1,024 points (S 0 to 1,777) |
| Timer | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 256 points (SP 0 to 377) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Timer / Counter Elapsed Value | 128 word (R 1,000 to 1177) |
| Data Register | 7,488 word<br>(R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) |
| Special Register | 320 word (R 700 to 777, R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Soft Filter | 4 points |
| Interruption Function | External interruption: 4 points<br>Timer interruption: 1 point |
| Pulse Catch Function | 4 points |
| High Speed Counter | 20 kHz Addition counter: 2 ch, Add-Subtract counter: (Unavailable for AC type) |
| Pulse output | 20 kHz 1 ch (Unavailable for AC, relay type) |
| Operation Mode | RUN /STOP /TERM |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | Watchdog timer |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check<br>- Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Installation | DIN rail or 2 screws |
| Conforming DIN Rail | TH35Fe /TH35AI |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack<br>Protocol: K sequence (S) |
| Communication Function: Port 2 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: 6-pin modular (Female) jack<br>Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |

# SJ-ETHER/SJ Series
## CPU Specifications

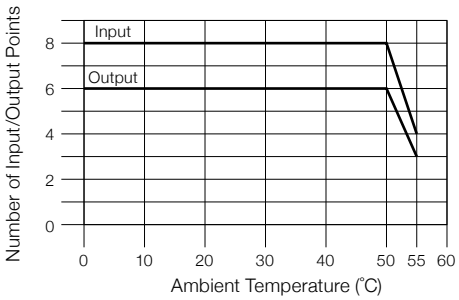
### Input Specifications
(High speed input: I0 to 1 Standard input: I2 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 24 V DC |
| Operating Voltage | | 21.6 to 26.4 V DC |
| Input Current | | High speed input: 5 mA (24 V DC)<br>Standard input: 4 mA (24 V DC) |
| Maximum Input Current | | High speed input: 6.0 mA (26.4 V DC)<br>Standard input: 5.0 mA (26.4 V DC) |
| On-state Voltage / Current | | High speed input: 19 V DC/4.5 mA<br>Standard input: 19 V DC/3.5 mA |
| Off-state Voltage / Current | | High speed input: 4 V DC/0.1 mA<br>Standard input: 7 V DC/0.5 mA |
| Input Impedance | | High speed input: 4.7 kΩ (24 V DC)<br>Standard input: 6.8 kΩ (24 V DC) |
| Response Time | OFF→ON | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 2 ms |
| | ON→OFF | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 3 ms |

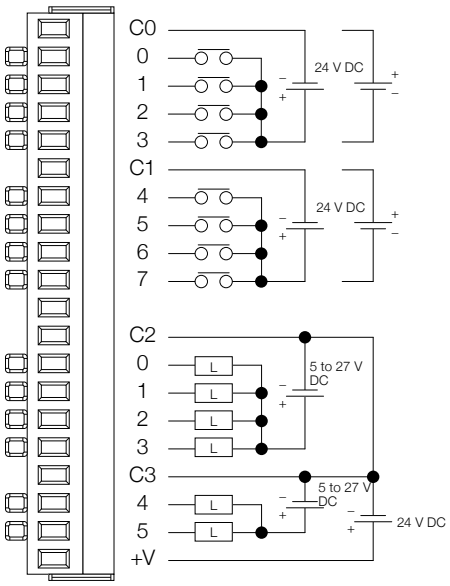
### Output Specifications (Pulse output: Q0 Standard output: Q1 to 5)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Sink) |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common & 2 points/common) |
| Output Voltage Range | | 5 to 27 V DC |
| Operating Voltage | | 4 to 30 V DC |
| Output Type | | NPN open collector |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (C2) 0.2 A (C3) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Minimum Load Current | | 0.2 mA |
| External Power Supply | | 20 to 28 V DC Up to 60 mA |
| Response Time | OFF→ON | Pulse output: Up to 20 µs, Standard 5 µs<br>Standard output: Up to 0.5 ms |
| | ON→OFF | Pulse output: Up to 20 µs, Standard 5 µs<br>Standard output: Up to 0.5 ms |
| Fuse | | None |

### Derating Chart

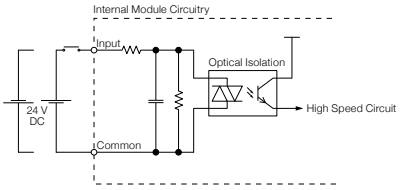



### Wiring Diagram

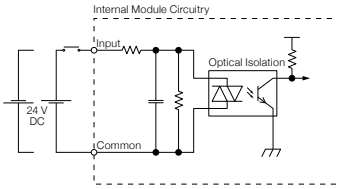



### Equivalent Circuit

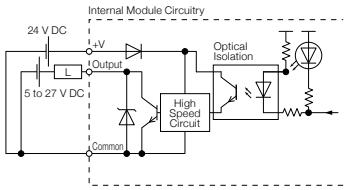
High speed DC input (I0, I1)



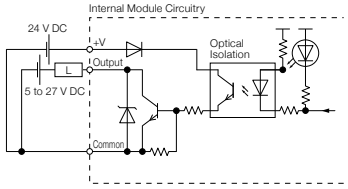

Standard DC input (I2 to I7)




Pulse DC output (Q0)




Standard DC output (Q1 to Q5)



# SJ-ETHER/SJ Series

## CPU Specifications

## Standard Type《DC Input 8 Points, DC Output 6 Points》

**SJ-00DD2-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When the communication port is not fed) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance | Compliant with NEMA ICS3-304,<br>Impulse 1,000 V 1 µs pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI),<br>EN61000-4-4 (FTB), EN61000-4-5 (Surge),<br>EN61000-4-8 (Magnetic fields),<br>RFI: 150, 450 MHz (5W/15 cm),<br>EN61000-4-6 (Conducted interference) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 |
| Number of Other Instructions | 2 |
| Processing Speed | Sequence instructions: 0.37 µs ~<br>Data processing instructions: 2.96µs ~ |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 256 points (I 0 to 377) |
| Output Relay (Q) | 256 points (Q 0 to 377) |
| Internal Relay | 2,048 points (M 0 to 3,777) |
| Stage | 1,024 points (S 0 to 1,777) |
| Timer | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 256 points (SP 0 to 377) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Timer / Counter Elapsed Value | 128 word (R 1,000 to 1177) |
| Data Register | 7,488 word (R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) |
| Special Register | 320 word (R 700 to 777, R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Soft Filter | 4 points |
| Interruption Function | External interruption: 4 points<br>Timer interruption: 1 point |
| Pulse Catch Function | 4 points |
| High Speed Counter | 20kHz Addition counter: 2 ch, Add-Subtract counter: (Unavailable for AC type) |
| Pulse output | 20 kHz 1 ch (Unavailable for AC, relay type) |
| Operation Mode | RUN /STOP /TERM |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | Watchdog timer |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Installation | DIN rail or 2 screws |
| Conforming DIN Rail | TH35Fe /TH35AI |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack<br>Protocol: K sequence (S) |
| Communication Function: Port 2 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: 6-pin modular (Female) jack<br>Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |

# SJ-ETHER/SJ Series
## CPU Specifications

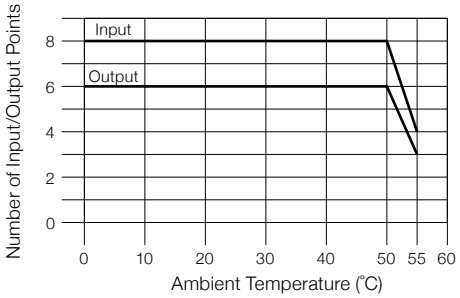
### Input Specifications (High speed input: I0 to 1 Standard input:I2 to 7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 24 V DC |
| Operating Voltage | | 21.6 to 26.4 V DC |
| Input Current | | High speed input: 5mA (24 V DC)<br>Standard input: 4mA (24 V DC) |
| Maximum Input Current | | High speed input: 6.0mA (26.4 V DC)<br>Standard input: 5.0mA (26.4 V DC) |
| On-state Voltage / Current | | High speed input: 19 V DC/4.5 mA<br>Standard input: 19 V DC/3.5 mA |
| Off-state Voltage / Current | | High speed input: 4 V DC/0.1 mA<br>Standard input: 7 V DC/0.5 mA |
| Input Impedance | | High speed input: 4.7 kΩ (24 V DC)<br>Standard input: 6.8 kΩ (24 V DC) |
| Response Time | OFF→ON | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 2 ms |
| | ON→OFF | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 3 ms |

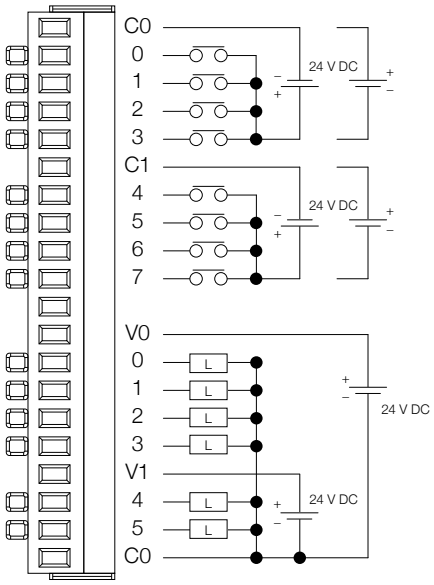
### Output Specifications (Pulse output: Q0 Standard output: Q1 to 5)

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points (Source) |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common & 2 points/common) |
| Output Voltage Range | | 24 V DC |
| Operating Voltage | | 19.2 to 30 V DC |
| Output Type | | PNP open collector |
| ON-time Voltage Drop | | Pulse output: 1.0 V DC (0.1 A)<br>Standard output: 0.5 V DC (0.1 A) |
| Maximum Output Current | | 0.1 A (Points) 0.4 A (C2) 0.2 A (C3) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Minimum Load Current | | 0.2 mA |
| Response Time | OFF→ON | Pulse output: Up to 20 µs, Standard 5 µs<br>Standard output: Up to 0.5 ms |
| | ON→OFF | Pulse output: Up to 20 µs Standard 5µs<br>Standard output: Up to 0.5 ms |
| Fuse | | None |

### Derating Chart

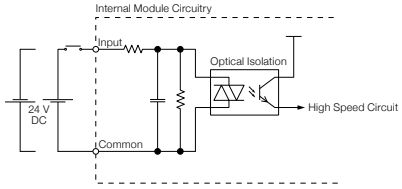



### Wiring Diagram

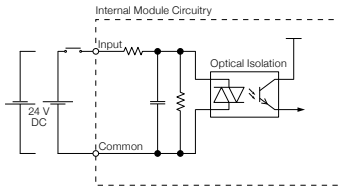



### Equivalent Circuit

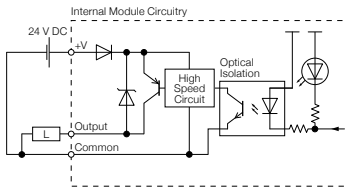
High speed DC input (I0, I1)



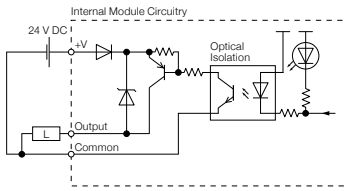

Standard DC input (I2 to I7)




Pulse DC output (Q0)




Standard DC output (Q1 to Q5)



# SJ-ETHER/SJ Series

## CPU Specifications

## Standard Type《DC Input 8 Points, Relay Output 6 Points》

**SJ-00DR-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When the communication port is not fed) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance | Compliant with NEMA ICS3-304,<br>Impulse 1,000 V 1 µs pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI),<br>EN61000-4-4 (FTB), EN61000-4-5 (Surge),<br>EN61000-4-8 (Magnetic fields),<br>RFI: 150, 450 MHz (5W/15cm), EN61000-4-6 (Conducted interference) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 |
| Number of Other Instructions | 2 |
| Processing Speed | Sequence instructions: 0.37 µs ~<br>Data processing instructions: 2.96µs ~ |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 256 points (I 0 to 377) |
| Output Relay (Q) | 256 points (Q 0 to 377) |
| Internal Relay | 2,048 points (M 0 to 3,777) |
| Stage | 1,024 points (S 0 to 1,777) |
| Timer | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 256 points (SP 0 to 377) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Timer / Counter Elapsed Value | 128 word (R 1,000 to 1177) |
| Data Register | 7,488 word (R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) |
| Special Register | 320 word (R 700 to 777, R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Soft Filter | 4 points |
| Interruption Function | External interruption: 4 points<br>Timer interruption: 1 point |
| Pulse Catch Function | 4 points |
| High Speed Counter | 20kHz Addition counter: 2 ch, Add-Subtract counter: (Unavailable for AC type) |
| Pulse output | 20 kHz 1 ch (Unavailable for AC, relay type) |
| Operation Mode | RUN /STOP /TERM |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | Watchdog timer |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check<br>- Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Installation | DIN rail or 2 screws |
| Conforming DIN Rail | TH35Fe /TH35AI |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack<br>Protocol: K sequence (S) |
| Communication Function: Port 2 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: 6-pin modular (Female) jack<br>Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Input Specifications (High speed input: I0-1 Standard input:I2-7)

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 24 V DC |
| Operating Voltage | | 21.6 to 26.4 V DC |
| Input Current | | High speed input: 5 mA (24 V DC)<br>Standard input: 4 mA (24 V DC) |
| Maximum Input Current | | High speed input: 6.0 mA (26.4 V DC)<br>Standard input: 5.0 mA (26.4 V DC) |
| On-state Voltage / Current | | High speed input: 19 V DC/4.5 mA<br>Standard input: 19 V DC/3.5 mA |
| Off-state Voltage / Current | | High speed input: 4 V DC/0.1 mA<br>Standard input: 7 V DC/0.5 mA |
| Input Impedance | | High speed input: 4.7 kΩ (24 V DC)<br>Standard input: 6.8 kΩ (24 V DC) |
| Response Time | OFF→ON | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 2 ms |
| | ON→OFF | High speed input: Up to 20 µs, Standard 5 µs<br>Standard input: Up to 10 ms, Standard 3 ms |

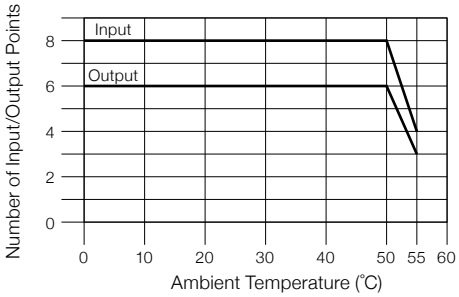
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common & 2 points/common) |
| Rated Output Voltage | | 24 V DC 240 V AC |
| Operating Voltage | | Up to 30 V DC Up to AC 264 V |
| Output Type | | Relay format A (SPST) |
| AC Frequency | | 47 to 63 Hz |
| Maximum Output Current | | 1.0 A (Points) 4.0 A (C2) 2.0 A (C3) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Response Time | OFF→ON | Up to 15 ms |
| | ON→OFF | Up to 15 ms |
| Fuse | | None |

### Relay life (ON → OFF 1 cycle)

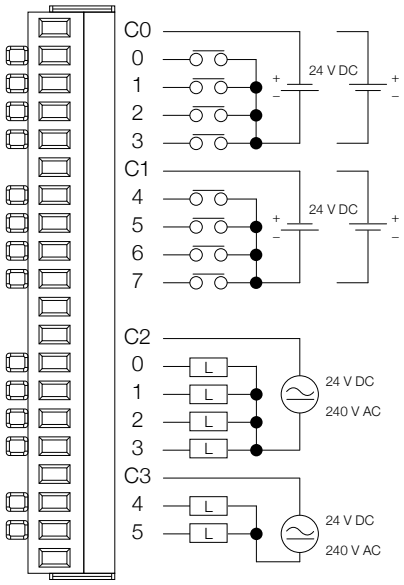
| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 250 V AC,<br>1 A Resistance Load | 300,000 cycles or more |
| 250 V AC,<br>1 A Inductive Load | 20,000 cycles or more |

### Derating Chart



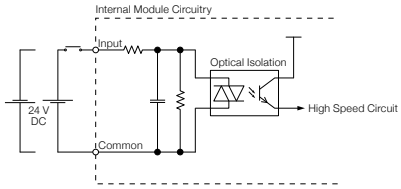

* Every other point should be turned on.

### Wiring Diagram

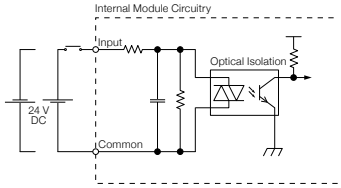



### Equivalent Circuit

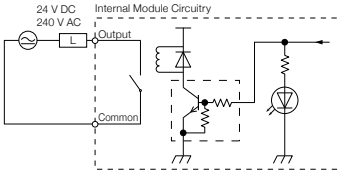
High speed DC input (I0, I1)




Standard DC input (I2 to I7)




Relay Output



# SJ-ETHER/SJ Series

## CPU Specifications

## Standard Type《AC Input 8 Points, Relay Output 6 Points》

**SJ-00AR-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W<br>(When the communication port is not fed) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C<br>IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases<br>Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance | Compliant with NEMA ICS3-304,<br>Impulse 1,000 V 1 µs pulse<br>EN61000-4-2 (ESD), EN61000-4-3 (RFI),<br>EN61000-4-4 (FTB), EN61000-4-5 (Surge),<br>EN61000-4-8 (Magnetic fields),<br>RFI: 150, 450 MHz (5W/15 cm), EN61000-4-6 (Conducted interference) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 |
| Number of Other Instructions | 2 |
| Processing Speed | Sequence instructions: 0.37 µs ~<br>Data processing instructions: 2.96 µs ~ |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 256 points (I 0 to 377) |
| Output Relay (Q) | 256 points (Q 0 to 377) |
| Internal Relay | 2,048 points (M 0 to 3,777) |
| Stage | 1,024 points (S 0 to 1,777) |
| Timer | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 256 points (SP 0 to 377) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Timer / Counter Elapsed Value | 128 word (R 1,000 to 1177) |
| Data Register | 7,488 word (R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) |
| Special Register | 320 word (R 700 to 777, R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Soft Filter | 4 points |
| Interruption Function | External interruption: 4 points<br>Timer interruption: 1 point |
| Pulse Catch Function | 4 points |
| High Speed Counter | 20kHz Addition counter: 2 ch, Add-Subtract counter: (Unavailable for AC type) |
| Pulse output | 20 kHz 1 ch (Unavailable for AC, relay type) |
| Operation Mode | RUN /STOP /TERM |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | Watchdog timer |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check<br>- Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Installation | DIN rail or 2 screws |
| Conforming DIN Rail | TH35Fe /TH35AI |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 9,600 bps (Fixed)<br>Connection: 6-pin modular (Female) jack<br>Protocol: K sequence (S) |
| Communication Function: Port 2 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures)<br>Connection: 6-pin modular (Female) jack<br>Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |

# SJ-ETHER/SJ Series
## CPU Specifications



### Input Specifications

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 100 to 120 V AC |
| Operating Voltage | | 80 to 144 V AC |
| AC Frequency | | 47 to 63 Hz |
| Input Current | | Standard 8.5 mA (100 V AC/50 Hz)<br>Standard 10 mA (100 V AC/60 Hz) |
| Maximum Input Current | | 16 mA (144 V AC/55˚C) |
| On-state Voltage / Current | | 60 V AC/5 mA |
| Off-state Voltage / Current | | 20 V AC/2 mA |
| Input Impedance | | 15 kΩ (50 Hz)<br>12 kΩ (60 Hz) |
| Response Time | OFF→ON | Up to 40 ms |
| | ON→OFF | Up to 40 ms |

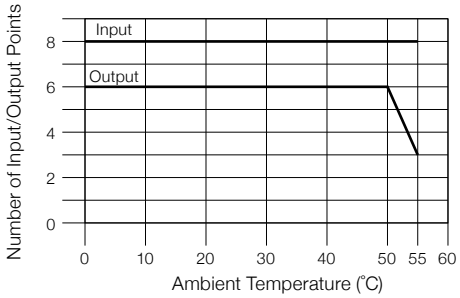
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 6 points |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common & 2 points/common) |
| Rated Output Voltage | | 24 V DC 240 V AC |
| Operating Voltage | | Up to 30 V DC Up to 264 V AC |
| Output Type | | Relay format A (SPST) |
| AC Frequency | | 47 to 63 Hz |
| Maximum Output Current | | 1.0 A (Points) 4.0 A (C2) 2.0 A (C3) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Response Time | OFF→ON | Up to 15 ms |
| | ON→OFF | Up to 15 ms |
| Fuse | | None |

### Relay life (ON → OFF 1 cycle)

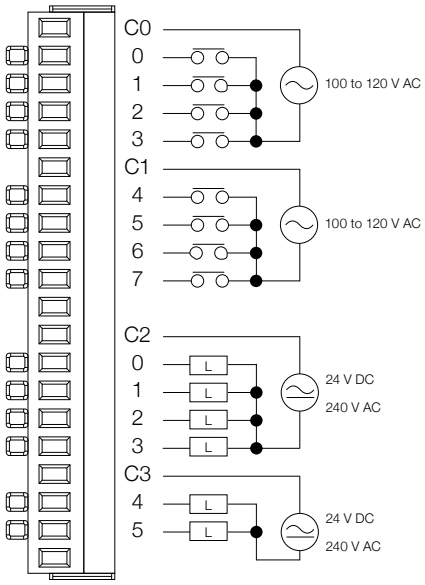
| Load Conditions | Life |
|---|---|
| 30 V DC,<br>1 A Resistance load | 300,000 cycles or more |
| 30 V DC,<br>1 A Inductive Load | 50,000 cycles or more |
| 250 V AC,<br>1 A Resistance Load | 300,000 cycles or more |
| 250 V AC,<br>1 A Inductive Load | 20,000 cycles or more |

### Derating Chart



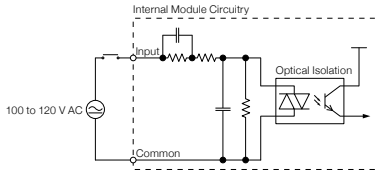

* Every other point should be turned on.

### Wiring Diagram

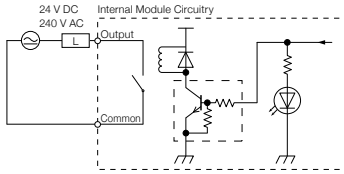



### Equivalent Circuit

AC Input




Relay Output



# SJ-ETHER/SJ Series

## CPU Specifications

## Sound Type《DC Input 5 Points, DC Output 5 Points》

**SJ-30DD1-D**


### General Specifications

| Items | Specifications |
|---|---|
| Supply Voltage | 24 V DC |
| Supply Voltage Variation Range | 20 to 28 V DC |
| Power Consumption | Not more than 5 W (When the communication port is not fed) |
| Power Source Inrush Current | 30 A or less (1 ms or less) |
| Allowable Instantaneous Power Failure Time | Up to 10 ms |
| Operating Ambient Temperature | 0˚C to 55˚C IEC60068-2-14 (Temperature change test) |
| Storage Ambient Temperature | −20˚C to 70˚C<br>IEC 60068-2-2 (Test Bb high temperature low humidity)<br>IEC 60068-2-1 (Test Ab low temperature)<br>IEC 60068-2-14 (Test Na temperature change) |
| Use / Storage Ambient Humidity | 30% to 95% (No condensation) |
| Surrounding Atmosphere in Place of Use | No corrosive gases Environmental pollution level 2 (UL 840) |
| Vibration Resistance | Compliant with MIL STD 810C, Method 514.2, IEC60068-2-6, JIS C60068-2-6, and sine wave oscillation test method |
| Impact Resistance | Compliant with MIL STD 810C, Method 516.2, IEC60068-2-27 and JIS C60068-2-27 |
| Noise Resistance | Compliant with NEMA ICS3-304, Impulse 1,000 V 1 µs pulse EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Surge), EN61000-4-8 (Magnetic fields), RFI: 150, 450 MHz (5W/15 cm), EN61000-4-6 (Conducted interference) |
| Radiation | EN55011: 1998 Class A |
| Conformance Standard | UL508, UL60079-15 Zone 2, CE (EN61131-2) |
| Other | Compliant with RoHS |

### Sound Specifications

| Items | Specifications | Remarks |
|---|---|---|
| Audio Output Form | Balance Output | Monaural |
| External Connection Speaker | Nominal impedance 8 Ω<br>Maximum permissible input 1 W or more | |
| Audio Output Terminal | φ3.5 mini-pin jack<br>SP+: Speaker output +<br>SP-: Speaker output - | |
| Volume Control Form | Volume for sound adjustment + Program control system (4-stage volume control) | Sound can be adjusted from a volume on the front face of the main body. The program control system can be adjusted from the PLC program. |
| Power Amplifier | D-class amplifier: TPA2001D1 equivalent | The low-power-consumption mode is set when no sound is produced. |
| Sound Synthesis System | 2-bit ADPCM2 system<br>4-bit ADPCM system (Recommended) | Suitable for normal sound playback |
| | 8-bit non linear PCM system<br>8-bit straight PCM system<br>16-bit straight PCM system | Suitable for playback of sound effects including high frequency component |
| Maximum Reproduction Time | Approx. 2 hours | The playback time changes according to sound synthesis system and sampling frequency. |
| Number of Sound Comment Registrations | 128 comments | |
| Sound Rewrite System | Automatic transfer from external USB memory (USB A type connector) | The sound data in the external USB memory connected to the dedicated USB port is automatically transferred to the internal sound data storage memory. |

### Performance Specifications

| Items | Specifications |
|---|---|
| Control System | Stored program: Cyclic arithmetic processing system |
| Language System | Simultaneous use of relay symbol type and stage type |
| Number of Instructions | Sequence instructions: 54, program execution control instructions: 20, data processing instructions: 82, IBox instructions: 22 |
| Number of Other Instructions | 4 |
| Processing Speed | Sequence instructions: 0.37 µs ~<br>Data processing instructions:2.96 µs ~ |
| Program Memory Capacity (Word) | Program 7.5 K + System parameter 0.5 K |
| Input Relay (I) | 256 points (I 0 to 377) |
| Output Relay (Q) | 256 points (Q 0 to 377) |
| Internal Relay | 2,048 points (M 0 to 3,777) |
| Stage | 1,024 points (S 0 to 1,777) |
| Timer | 256 points (T 0 to 377) |
| Counter (C) | 128 points (C 0 to 177) |
| Special Relay (SP) | 256 points (SP 0 to 377) |
| Timer Elapsed Value Register | 256 word (R 0 to 377) |
| Timer / Counter Elapsed Value | 128 word (R 1,000 to 1177) |
| Data Register | 7,488 word (R 400 to 677, R 1,200 to 7,377, R 10,000 to 17,777) |
| Special Register | 320 word (R 700 to 777, R 7,400 to 7,777) |
| Accumulator | 32-bit x 1 |
| Data Stack | 32-bit x 8 stack |
| Calendar, Clock | Stored data: Year, month, day, day of week, hour, minute, second (Backup battery: D2-BAT-1) |
| Password | BCD8 digit 2 level (Usual password, restricted password) |
| Input/Output Allocation | Free location (Only for automatic allocation) |
| PID Function | 16-loops |
| Operation Mode | RUN /STOP /TERM |
| Power Failure Holding | Can retain the bit areas (M, S, T, C), some counter elapsed value registers, data registers and special registers during power failures. |
| Diagnosis Function (Hardware) | Watchdog timer, cell voltage fall |
| Diagnosis Function (Software) | - I/O arrangement check - Program memory check - Calculation monitoring timer - Communication error (Programmer port, general-purpose communication port) |
| Installation | DIN rail or 2 screws |
| Conforming DIN Rail | TH35Fe /TH35AI |
| Communication Function: Port 1 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 9,600 bps (Fixed) Connection: 6-pin modular (Female) jack Protocol: K sequence (S) |
| Communication Function: Port 2 | Transmission method: RS-232C compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures) Connection: 6-pin modular (Female) jack Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |
| Communication Function: Port 3 | Transmission method: RS-485 compatible (Non-isolated) Transmission speed: 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200 bps (Up to 38,400 bps for non-procedures) Connection: Terminal block 3 pins Protocol: DirectNET (M/S), MODBUS (M/S), Non-procedure (M/S), K sequence (S) |

# SJ-ETHER/SJ Series
## CPU Specifications

### Input Specifications

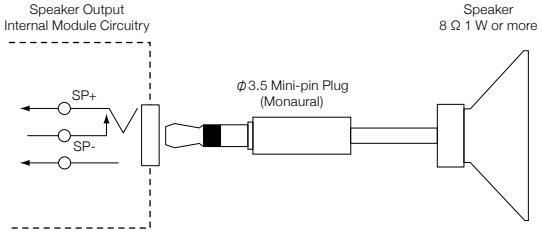
| Items | Specifications |
|---|---|
| Number of Input Points | 5 points (Sink/source) |
| Rated Input Voltage | 24 V DC |
| Rated Input Current | 4 mA |
| Input Voltage Range | 21.6 to 26.4 V DC |
| Maximum Input Current | 5.0 mA (26.4 V DC) |
| Input Impedance | 6.8 kΩ (24 V DC) |
| ON Voltage Level | 19 V DC or higher |
| OFF Voltage Level | 7 V DC or higher |
| Minimum ON-state Current | 3.5 mA |
| Minimum OFF-state Current | 1.5 mA |
| OFF→ON Response Time | 2 to 10 ms |
| ON→OFF Response Time | 3 to 10 ms |
| Status Display | No input state display |
| Common | All points have independent commons. |
| Fuse | None |

### Output Specifications (Standard output)

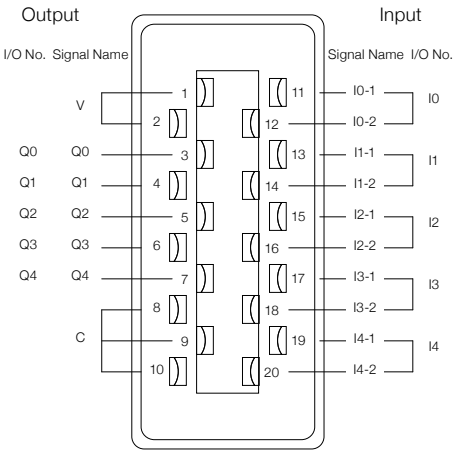
| Items | Specifications |
|---|---|
| Number of Outputs Points | 5 points (Sink) |
| Output Voltage Range | 5 to 24 V DC |
| Maximum Load Current | 0.1 A/point<br>0.5 A/common |
| Minimum Load Current | 0.2 mA |
| Maximum Leakage Current | 0.1 mA (30 V DC) |
| ON-time Voltage Drop | 0.5 V DC (0.1 A) |
| Maximum Inrush Current | 150 mA (10 ms) |
| OFF→ON Response Time | 0.5 ms or less |
| ON→OFF Response Time | 0.5 ms or less |
| Status Display | No output state display |
| Common | 5 points 1 common |
| External Power Supply | 20 to 28 V DC (60 mA) |
| Fuse | None |

### Sound terminal 3.5φ minijack connector

| Signal Name | Contents |
|---|---|
| SP+ | Speaker output + |
| SP- | Speaker output - |



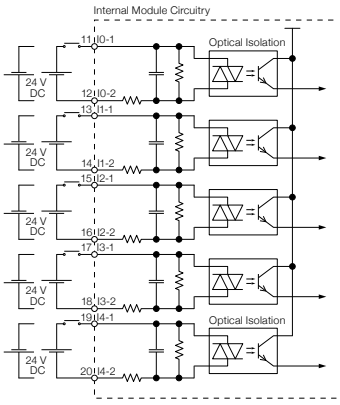

### Wiring Diagram



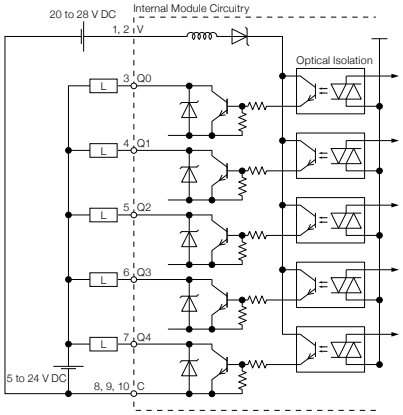

Connector Plug: 10120-3000PE (3M) Compatible

### Equivalent Circuit

Standard DC input (I0 to I4)




Standard DC output (Q0 to Q4)




Common Subject Matter
SJ-ETHER/SJ
DL05/06
DL205
D4
D3
Programmer
KPP
DirectSOFT
Terminator I/O
Features
Specifications
Dimensions
CPU Specifications
Power Supply Module
Input/Output Module
Analog Module

# SJ-ETHER/SJ Series

## Power Supply Module

## Power Supply Module

### C0-01AC

### Specifications

| Items | Specifications |
|---|---|
| Model Number | C0-01AC |
| Supply Power Source Rating | 100 V to 240 V AC 50/60 Hz |
| Allowable Voltage Range | 85 to 264 V AC |
| AC Frequency | 47 to 63 Hz |
| Maximum Apparent Power | 37 VA |
| Inrush Current | 20 A (Cold start) |
| Output Current | 24 V DC 1.3 A |
| Weight | 170 g |
| Dimensions | 35 W x 85 H x 75 D (Excluding the terminal block) |
| Installation | DIN rail or 2 screws |
| Conforming Cable Size | 0.25 to 1.65 $mm^2$ (AWG18 to 26) |
| Conforming Crimp Terminal | 1.25 |
| Allowable Tightening Torque | 0.6 Nm |
| Conforming DIN Rail | TH35Fe/TH35AI |

Common Subject Matter
SJ-ETHER/SJ
DL05/06
DL205
D4
D3
Programmer
KPP
DirectSOFT
Terminator I/O

Features
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Power Supply Module
Input/Output Module
Analog Module

# SJ-ETHER/SJ Series
## Input/Output Module



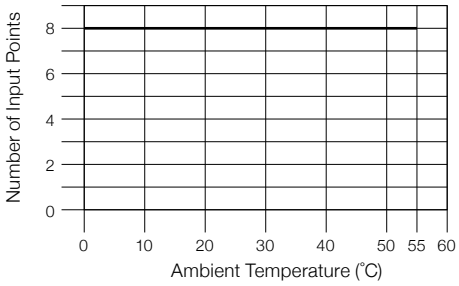
## ■Input Module《DC 8 Points》

**J-08ND3**

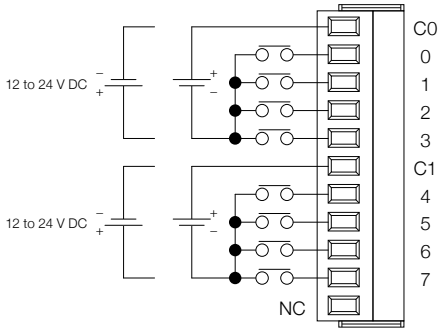
### Input Specifications

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 12/24 V DC |
| Operating Voltage | | 10.8 to 26.4 V DC |
| Peak Voltage | | 26.4 V DC |
| Input Current | | 5 mA (24 V DC) |
| Maximum Input Current | | 7 mA (26.4 V DC) |
| Required Current on the Main Power Supply Side | | Up to 30 mA |
| On-state Voltage / Current | | 8.0 V DC/1.4 mA |
| Off-state Voltage / Current | | 3.0 V DC/0.5 mA |
| Input Impedance | | 4.7 kΩ (24 V DC) |
| Response Time | OFF→ON | Up to 3.5 ms Standard 2.0 ms |
| | ON→OFF | Up to 4.0 ms Standard 2.5 ms |

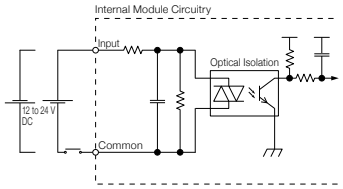
### Derating Chart




### Wiring Diagram




### Equivalent Circuit



# SJ-ETHER/SJ Series

## Input/Output Module

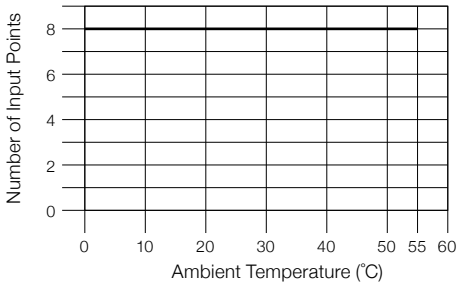
## ■Input Module《DC 8 Points》

**J-08ND3-1**

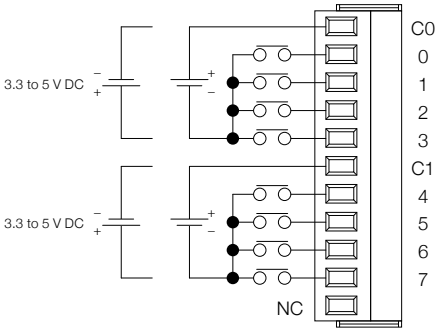
### Input Specifications

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (Sink/source) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 3.3/5.0 V DC |
| Operating Voltage | | 2.8 to 5.5 V DC |
| Peak Voltage | | 5.5 V DC |
| Input Current | | 5 mA (5 V DC) |
| Maximum Input Current | | 7.5 mA (5.5 V DC) |
| Required Current on the Main Power Supply Side | | Up to 30 mA |
| On-state Voltage / Current | | 2.2 V AC/1.4 mA |
| Off-state Voltage / Current | | 0.8 V AC/0.2 mA |
| Input Impedance | | 680 Ω |
| Response Time | OFF→ON | Up to 3.0 ms Standard 1.6 ms |
| | ON→OFF | Up to 4.0 ms Standard 2.3 ms |

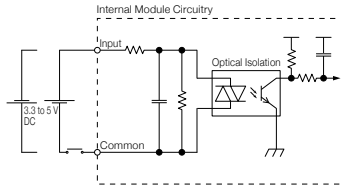
### Derating Chart




### Wiring Diagram




### Equivalent Circuit




Common Subject Matter
SJ-ETHER/SJ
DL05/06
DL205
D4
D3
Programmer
KPP
DirectSOFT
Terminator I/O
Features
Specifications
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CPU Specifications
Power Supply Module
Input/Output Module
Analog Module

# SJ-ETHER/SJ Series
## Input/Output Module



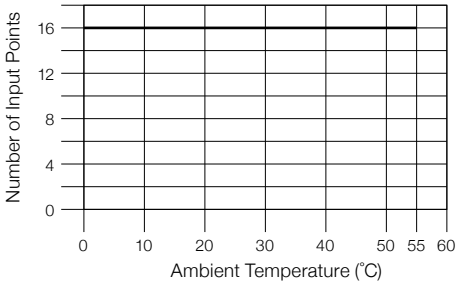
## ■Input Module《DC 16 Points》

**J-16ND3**

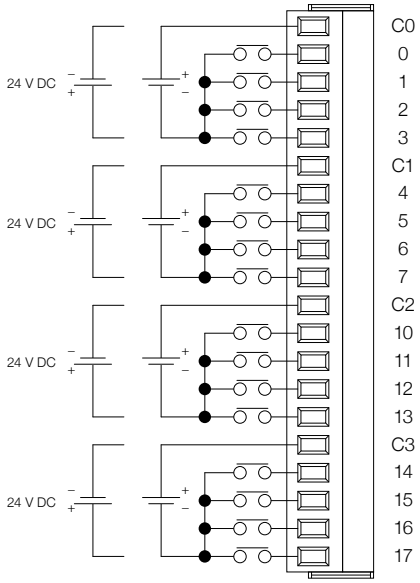
### Input Specifications

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 16 points (Sink/source) |
| Number of Occupied Inputs | | 16 points |
| Common | | 4 (4 points/common) |
| Input Voltage Range | | 24 V DC |
| Operating Voltage | | 21.6 to 26.4 V DC |
| Peak Voltage | | 26.4 V DC |
| Input Current | | 4 mA (24 V DC) |
| Maximum Input Current | | 5 mA (26.4 V DC) |
| Required Current on the Main Power Supply Side | | Up to 40 mA |
| On-state Voltage / Current | | 19.0 V DC/3.5 mA |
| Off-state Voltage / Current | | 7.0 V DC/0.5 mA |
| Input Impedance | | 6.8 kΩ (24 V DC) |
| Response Time | OFF→ON | Up to 10 ms Standard 2 ms |
| | ON→OFF | Up to 10 ms Standard 3 ms |

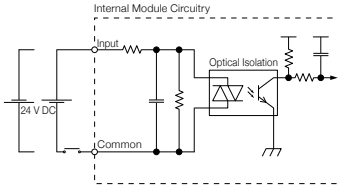
### Derating Chart




### Wiring Diagram




### Equivalent Circuit



# SJ-ETHER/SJ Series

## Input/Output Module

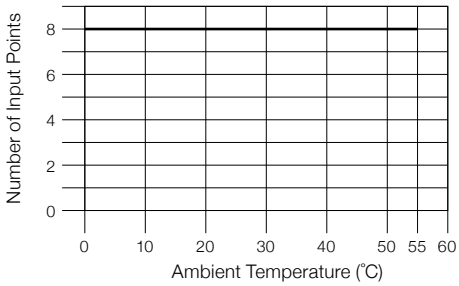
## Input Module《AC 8 Points》

**J-08NA**

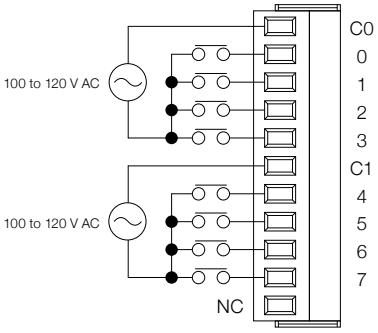
### Input Specifications

| Items | | Specifications |
|---|---|---|
| Number of Input Points | | 8 points (AC) |
| Number of Occupied Inputs | | 8 points |
| Common | | 2 (4 points/common) |
| Input Voltage Range | | 100 to 120 V AC |
| Operating Voltage | | 80 to 144 V AC |
| Peak Voltage | | 144 V AC |
| AC Frequency | | 47 to 63 Hz |
| Input Current | | 8.5 mA (100 V AC/50 Hz)<br>10 mA (100 V AC/60 Hz) |
| Maximum Input Current | | 16 mA (144 V AC) |
| Required Current on the Main Power Supply Side | | Up to 30 mA |
| On-state Voltage / Current | | 70 V AC/5 mA |
| Off-state Voltage / Current | | 20 V AC/2 mA |
| Input Impedance | | 15 kΩ (50 Hz)<br>12 kΩ (60 Hz) |
| Response Time | OFF→ON | Up to 40 ms |
| | ON→OFF | Up to 40 ms |

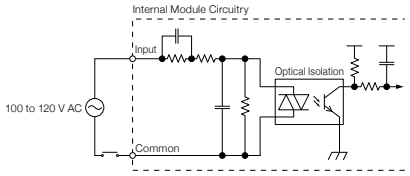
### Derating Chart




### Wiring Diagram




### Equivalent Circuit




Common Subject Matter
SJ-ETHER/SJ
DL05/06
DL205
D4
D3
Programmer
KPP
DirectSOFT
Terminator I/O
Features
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CPU Specifications
Power Supply Module
Input/Output Module
Analog Module

# SJ-ETHER/SJ Series
## Input/Output Module



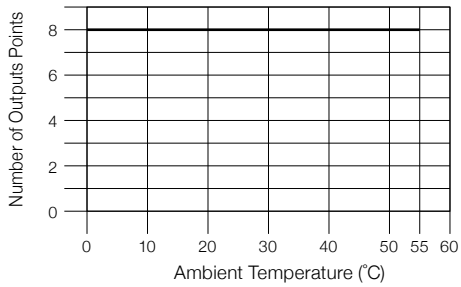
## ■Output Module《DC 8 Points》

**J-08TD1**

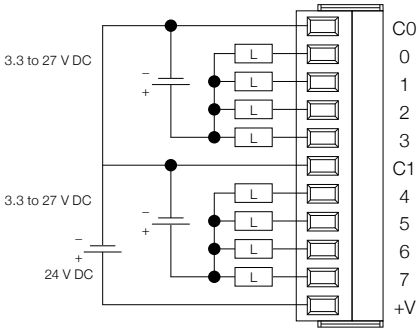
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 8 points (Sink) |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common) |
| Output Voltage Range | | 3.3 to 27 V DC |
| Operating Voltage | | 2.8 to 30 V DC |
| Peak Voltage | | 30 V DC |
| Output Type | | NMOS FET |
| ON-time Voltage Drop | | 1.5 V DC (0.3 A) |
| Maximum Output Current | | 0.3 A (Points)/1.2 A (Common) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 1 A (10 ms) |
| Minimum Load Current | | 0.5 mA |
| External Power Supply | | 24 V DC (±10%)  Up to 15 mA |
| Required Current on the Main Power Supply Side | | Up to 50 mA |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Fuse | | None |

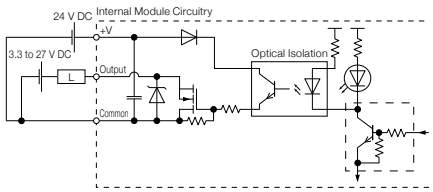
### Derating Chart




### Wiring Diagram




### Equivalent Circuit

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Power Supply Module
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Analog Module

# SJ-ETHER/SJ Series

## Input/Output Module

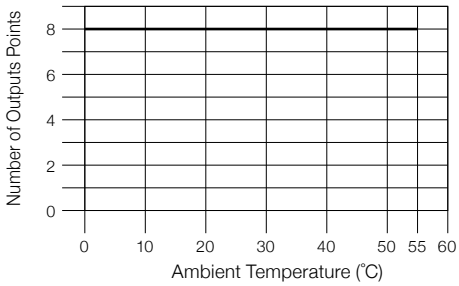
## Output Module《DC 8 Points》

### J-08TD2

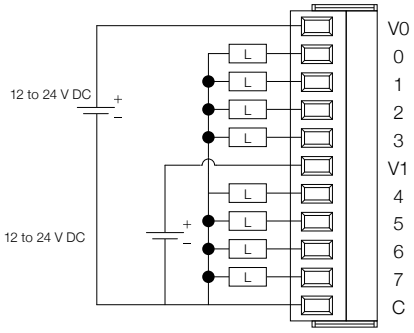
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 8 points (Source) |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common) |
| Output Voltage Range | | 12/24 V DC |
| Operating Voltage | | 9.6 to 30 V DC |
| Peak Voltage | | 30 V DC |
| Output Type | | PMOS FET |
| ON-time Voltage Drop | | 1.5 V DC (0.3 A) |
| Maximum Output Current | | 0.3 A (Points)/1.2 A (Common) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 1 A (10 ms) |
| Minimum Load Current | | 0.5 mA |
| Required Current on the Main Power Supply Side | | Up to 50 mA |
| Response Time | OFF→ON | Up to 1 ms |
| | ON→OFF | Up to 1 ms |
| Fuse | | None |

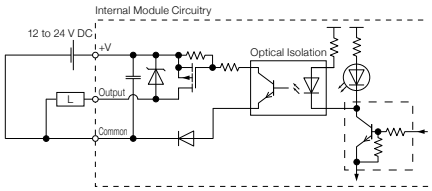
### Derating Chart




### Wiring Diagram




### Equivalent Circuit



# SJ-ETHER/SJ Series
## Input/Output Module



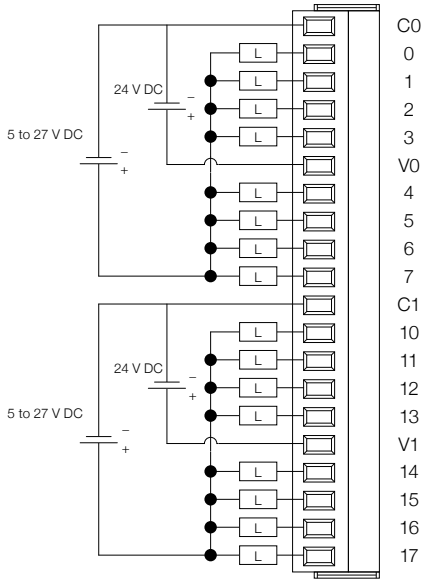
## ■Output Module《DC 16 Points》

**J-16TD1**

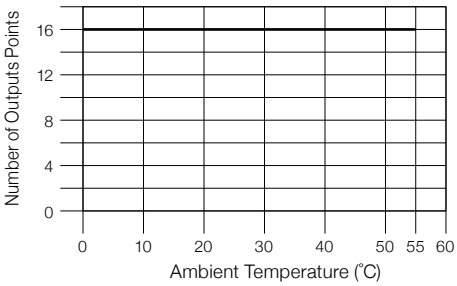
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 16 points (Sink) |
| Number of Occupied Outputs | | 16 points |
| Common | | 2 (8 points/common) |
| Output Voltage Range | | 5 to 27 V DC |
| Operating Voltage | | 4 to 30 V DC |
| Peak Voltage | | 30 V DC |
| Output Type | | NPN open collector |
| ON-time Voltage Drop | | 0.5 V DC (0.1 A) |
| Maximum Output Current | | 0.1 A (Points)/0.8 A (Common) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Minimum Load Current | | 0.2 mA |
| External Power Supply | | 24 V DC (±10%)　Up to 100 mA |
| Required Current on the Main Power Supply Side | | Up to 80 mA |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Fuse | | None |

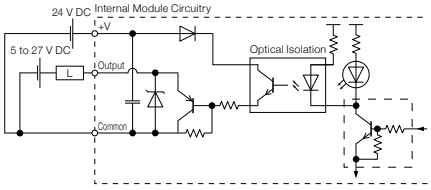
### Wiring Diagram




### Derating Chart




### Equivalent Circuit



# SJ-ETHER/SJ Series

## Input/Output Module

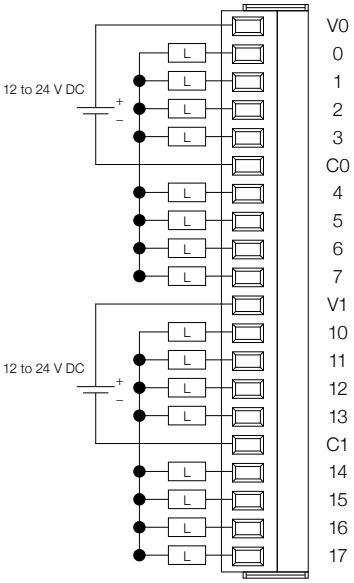
## Output Module《DC 16 Points》

### J-16TD2

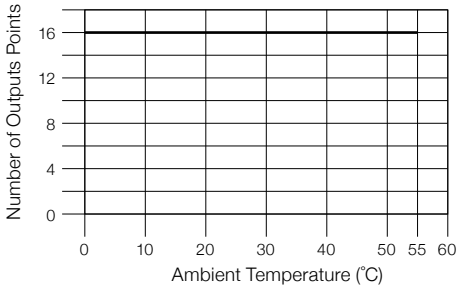
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 16 points (Source) |
| Number of Occupied Outputs | | 16 points |
| Common | | 2 (8 points/common) |
| Output Voltage Range | | 12/24 V DC |
| Operating Voltage | | 9.6 to 30 V DC |
| Peak Voltage | | 30 V DC |
| Output Type | | PNP open collector |
| ON-time Voltage Drop | | 0.6 V DC (0.1 A) |
| Maximum Output Current | | 0.1 A (Points)/0.8 A (Common) |
| Maximum Leakage Current | | 0.1 mA (30 V DC) |
| Maximum Inrush Current | | 150 mA (10 ms) |
| Minimum Load Current | | 0.2 mA |
| Required Current on the Main Power Supply Side | | Up to 80 mA |
| Response Time | OFF→ON | Up to 0.5 ms |
| | ON→OFF | Up to 0.5 ms |
| Fuse | | None |

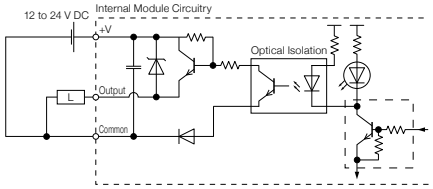
### Wiring Diagram




### Derating Chart




### Equivalent Circuit



# SJ-ETHER/SJ Series
## Input/Output Module



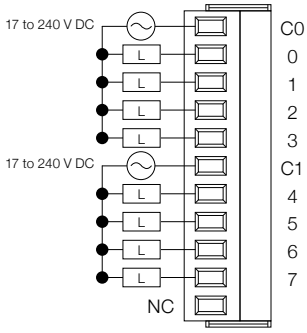
## ■Output Module《AC 8 Points》

**J-08TA**

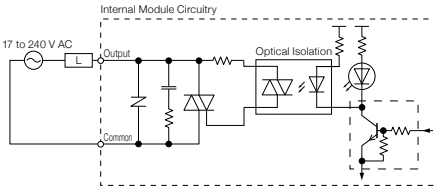
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 8 points (AC) |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common) |
| Output Voltage Range | | 17 to 240 V AC |
| Operating Voltage | | 13.5 to 288 V AC |
| Peak Voltage | | 288 V AC |
| Output Type | | SSR |
| AC Frequency | | 47 to 63Hz |
| ON-time Voltage Drop | | 1.5 V AC (0.1 A or more)<br>3.0 V AC (Below 0.1 A) |
| Maximum Output Current | | 0.3 A (Points)/1.2 A (Common) |
| Maximum Leakage Current | | 4 mA (288 V AC) |
| Maximum Inrush Current | | 10 A (10 ms) |
| Minimum Load Current | | 10 mA |
| Required Current on the Main Power Supply Side | | Up to 80 mA |
| Response Time | OFF→ON | Up to 1 ms |
| | ON→OFF | Up to 1 ms + 1/2 cycle |
| Fuse | | None |

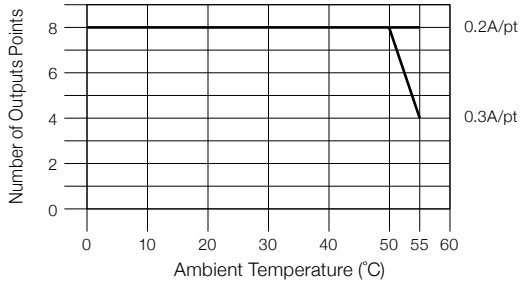
### Wiring Diagram




### Equivalent Circuit




### Derating Chart




* Every other point should be turned on.

# SJ-ETHER/SJ Series

## Input/Output Module

## Output Module《Relay 8 Points》

**J-08TR**

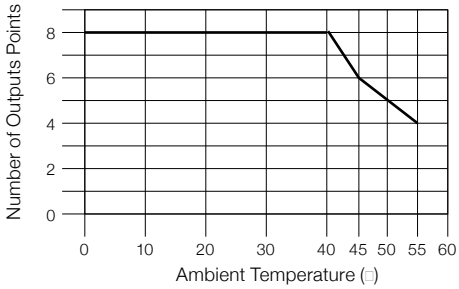
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 8 points |
| Number of Occupied Outputs | | 8 points |
| Common | | 2 (4 points/common) |
| Rated Output Range | | 24 V DC/240 V AC |
| Operating Voltage | | Up to 30 V DC Up to 264 V AC |
| Output Type | | Relay format A (SPST) |
| Maximum Output Current | | 1 A (Points)/4 A (Common) |
| Maximum Leakage Current | | 0.1 mA (264 V AC) |
| Maximum Inrush Current | | 3 A (10 ms) |
| Minimum Load Current | | 5 mA (5 V DC) |
| Required Current on the Main Power Supply Side | | Up to 100 mA |
| Response Time | OFF→ON | Up to 15 ms |
| | ON→OFF | Up to 15 ms |
| Fuse | | None |

### Relay life (ON → OFF 1 cycle)

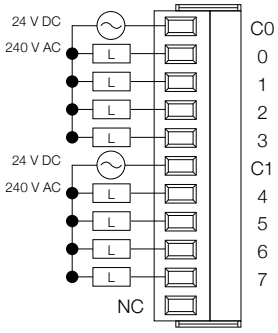
| Load Conditions | Life |
|---|---|
| 30 V DC, 1 A Resistance Load | 300,000 cycles or more |
| 30 V DC, 1 A Inductive Load | 50,000 cycles or more |
| 250 V AC, 1 A Resistance Load | 300,000 cycles or more |
| 250 V AC, 1 A Inductive Load | 20,000 cycles or more |

### Derating Chart

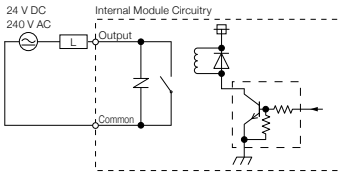



* Every other point should be turned on.

### Wiring Diagram




### Equivalent Circuit



# SJ-ETHER/SJ Series
## Input/Output Module



## ■Output Module《Relay 4 Points》

**J-04TRS**

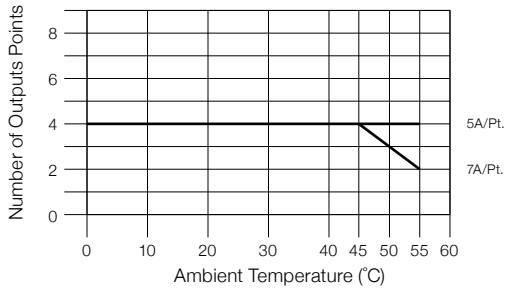
### Output Specifications

| Items | | Specifications |
|---|---|---|
| Number of Outputs Points | | 4 points |
| Number of Occupied Outputs | | 8 points |
| Common | | 4 (1 point/common) |
| Rated Output Voltage | | 24 V DC/240 V AC |
| Operating Voltage | | Up to 30 V DC Up to 264 V AC |
| Output Type | | Relay format C (SPDT) |
| AC Frequency | | 47 to 63 Hz |
| Maximum Output Current | | 7 A (Points)/7 A (Common) |
| Maximum Leakage Current | | 0.1 mA (264 V AC) |
| Maximum Inrush Current | | 12 A |
| Minimum Load Current | | 100 mA (5 V DC) |
| Required Current on the Main Power Supply Side | | Up to 100 mA |
| Response Time | OFF→ON | Up to 15 ms |
| | ON→OFF | Up to 15 ms |
| Fuse | | None |

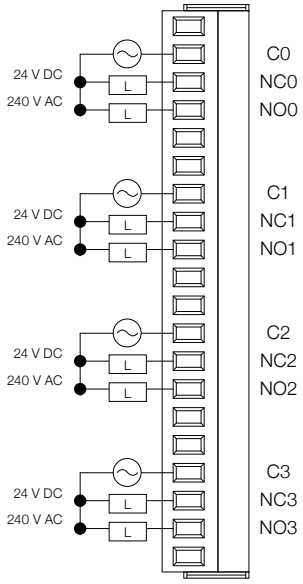
### Relay life (ON → OFF 1cycle)

| Load Conditions | Life |
|---|---|
| 30 V DC, 7 A Resistance Load | 100,000 cycles or more |
| 25 V DC, 7 A Resistance Load | 100,000 cycles or more |
| 250 V AC, 4.9 A Resistance Load | 90,000 cycles or more |
| 250 V AC, 2.9 A Inductive Load | 100,000 cycles or more |

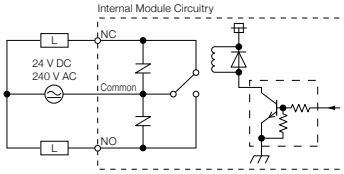
### Derating Chart




### Wiring Diagram




### Equivalent Circuit



# SJ-ETHER/SJ Series

## Analog Module

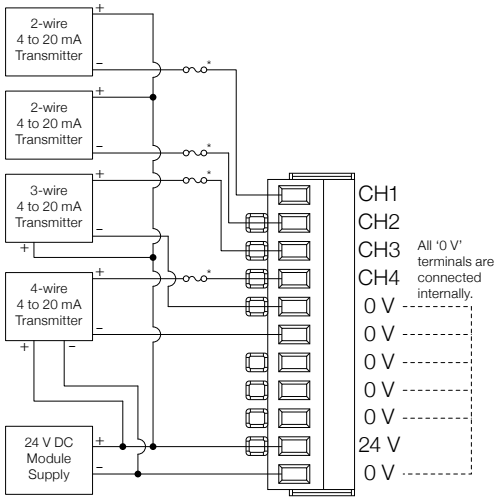
## ■Analog Input Module《4 Channels》

**C0-04AD-1**

### Input Specifications

| Items | Specifications |
|---|---|
| Inputs per Module | 4 |
| Input Range | 0 to 20 mA (Sink) |
| Resolution | 13-bit, 2.44 uA/count |
| Input Type | Single ended (One common) |
| Maximum Continuous Overload | ±44 mA |
| Input Impedance | 124 Ω, 0.5 W current input |
| Filter Charactistics | Low pass, -3 dB at 120 Hz |
| Sample Durtion Time | 2 ms |
| All Channel Update Rate | 25 ms |
| Accuracy Against Temperature | Maximum ±75 ppm/°C |
| Maximum Inaccuracy | 0.5% of range (Including temperature changes) |
| Linearity Error (End-to-end) | ±3 count maximum, monotonic with no missing codes |
| Input Stability and Repeatability | Maximum ±2 count |
| Full Scale Error (Including Offset) | Maximum ±8 count |
| Offset Error | Maximum ±8 count |
| Maximum Crosstalk at DC, 50/60 Hz | Maximum ±2 count |
| Field to Logic Side Isolation | 1,800 V AC for 1 sec. |
| Recommended Fuse (External) | ADC p/n S500-32-R (0.032 A fuse) |
| External 24 V DC Power Required | 65 mA |
| Bus Power Required (24 VDC) | 20 mA |
| Terminal Block Replacement | ADC p/n C0-8TB |
| Weight | 82 g |

### Wiring Diagram




* 0.032 A fast-acting fuse (ADC p/n S500-32-R) is recommended.

# SJ-ETHER/SJ Series
## Analog Module



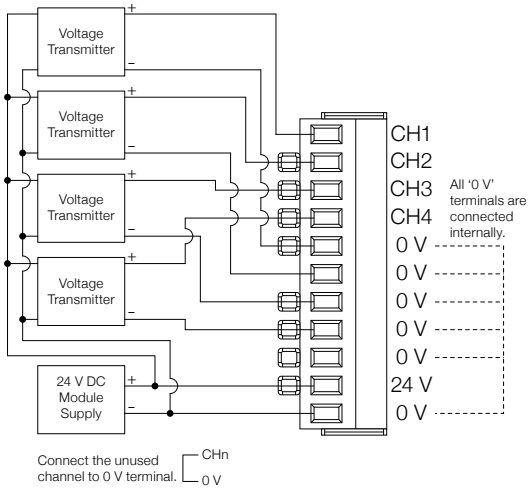
## ■Analog Input Module《4 Channels》

**C0-04AD-2**

### Input Specifications

| Items | Specifications |
|---|---|
| Inputs per Module | 4 |
| Input Range | 0 to 10 V |
| Resolution | 13-bit, 1.22 mV/count |
| Input Type | Single ended (One common) |
| Maximum Continuous Overload | ±100 V DC |
| Input Impedance | >150 kΩ |
| Filter Charactistics | Low pass, -3 dB at 500 Hz |
| Sample Durtion Time | 6.25 ms |
| All Channel Update Rate | 25 ms |
| Open Circuit Detection Time | Zero reading within 100 ms |
| Accuracy Against Temperature | Maximum ±75 ppm/°C |
| Maximum Inaccuracy | 0.5% of range (Including temperature changes) |
| Linearity Error (End-to-end) | ±3 count maximum, monotonic with no missing codes |
| Input Stability and Repeatability | Maximum ±2 count |
| Full Scale Error (Including Offset) | Maximum ±8 count |
| Offset Error | Maximum ±8 count |
| Maximum Crosstalk at DC, 50/60 Hz | Maximum ±2 count |
| Field to Logic Side Isolation | 1,800 V AC for 1 sec. |
| External 24 V DC Power Required | 65 mA |
| Bus Power Required (24 VDC) | 23 mA |
| Terminal Block Replacement | ADC p/n C0-8TB |
| Weight | 82 g |

### Wiring Diagram



# SJ-ETHER/SJ Series

## Analog Module

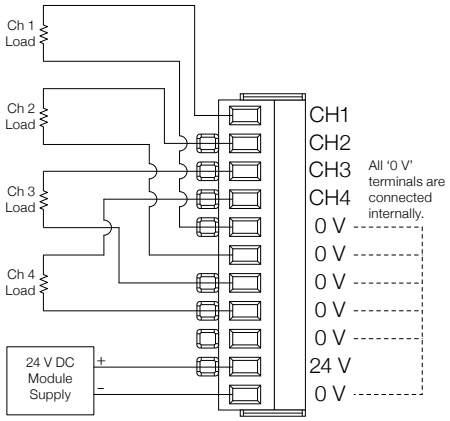
## ■Analog Output Module《4 Channels》

**C0-04DA-1**

### Output Specifications

| Items | Specifications |
|---|---|
| Outputs per Module | 4 |
| Output Range | 4 to 20 mA (Source) |
| Resolution | 12-bit, 3.9 uA/count |
| Output Type | Current sourcing at 20 mA maximum (One common) |
| Output Value in Fault Mode | Less than 4 mA |
| Load Impedance | 0 to 600 Ω at 24 VDC; minimum load: 0 Ω 32˚F to 131˚F (0˚C to 55˚C) ambient temp. |
| Maximum Inductive Load | 1 mH |
| Allowed Load Type | Grounded |
| Maximum Inaccuracy | ±1% of range |
| Maximum Full Scale Error (Including Offset) | ±0.2% of range maximum |
| Maximum Offset Error | ±0.2% of range maximum |
| Accuracy Against Temperature | ±75 ppm/˚C maximum full scale calibration change (±0.005% of range/˚C) |
| Maximum Crosstalk at DC, 50/60 Hz | -72 dB, 1 LSB |
| Linearity Error (End-to-end) | ±4 LSB maximum (±0.1% of full scale) |
| Output Stability and Repeatability | ±2% LSB after 10 minute warmup period typical |
| Output Ripple | ±0.1% of full scale |
| Output Settling Time | 0.3 ms maximum, 5 µs minimum (Full scale range) |
| All Channel Update Rate | 10 ms |
| Maximum Continuous Overload | Outputs open circuit protected |
| Field to Logic Side Isolation | 1,800 V AC applied for 1 second (100% tested) |
| Type of Output Protection | Electronically limited to 20 mA or less |
| Output Signal at Power Up and Power Down | 4 mA |
| External VDC Power Required | 145 mA |
| Bus Power Required (24 VDC) | 20 mA |
| Terminal Block Replacement | ADC p/n C0-8TB |
| Weight | 82 g |

### Wiring Diagram



# SJ-ETHER/SJ Series
## Analog Module

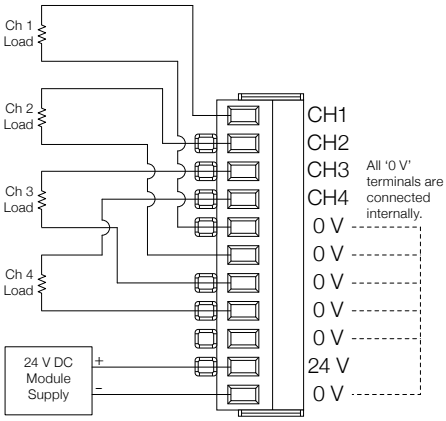
## ■Analog Output Module《4 Channels》

**C0-04DA-2**

### Output Specifications

| Items | Specifications |
|---|---|
| Outputs per Module | 4 |
| Output Range | 0 to 10 V |
| Resolution | 12-bit, 2.44 mV/count |
| Output Type | Voltage sourcing at 10mA maximum (One common) |
| Output Value in Program Mode | Determined by CPU |
| Output Value in Fault Mode | 0 V |
| Output Impedance | 0.2 Ω typical |
| Load Impedance | > 1,000 Ω |
| Maximum Capacitive Load | 0.01 uF maximum |
| Allowed Load Type | Grounded |
| Maximum Inaccuracy | 0.5% of range |
| Maximum Full Scale Error (Not including Offset) | ±0.2% of range maximum voltage |
| Maximum Offset Error | ±0.2% of range maximum |
| Accuracy Against Temperature | ±75 PPM/°C maximum full scale calibration change (±0.0025% of range/°C) |
| Maximum Crosstalk at DC, 50/60 Hz | -72 dB, 1 LSB |
| Linearity Error (End-to-end) | ±4 LSB maximum (±0.1% of full scale); monotonic with no missing codes |
| Output Stability and Repeatability | ±2% LSB after 10 minute warmup period typical |
| Output Ripple | ±0.1% of full scale |
| Output Settling Time | 0.3 ms maximum, 5 µs minimum (Full scale range) |
| All Channel Update Rate | 10 ms |
| Maximum Continuous Overload | Outputs current limited to 40 mA typical; continuous overloads on multiple outputs can damage module. |
| Field to Logic Side Isolation | 1,800 V AC applied for 1 second (100% tested) |
| Type of Output Protection | 0.1 µF transient suppressor |
| Output Signal at Power Up and Power Down | 0 V |
| External 24 V DC Power Required | 85 mA |
| Bus Power Required (24 VDC) | 20 mA |
| Terminal Block Replacement | ADC p/n C0-8TB |
| Weight | 82 g |

### Wiring Diagram



# SJ-ETHER/SJ Series

## Analog Module

## Analog Input/Output Module《Input 4 Channels･Output 2 Channels》

**C0-4AD2DA-1**

### General Specifications

| Items | Specifications |
|---|---|
| Field to Logic Side Isolation | 1,800 V AC for 1 sec. |
| External 24 VDC Power Required | 75 mA |
| Bus Power Required (24 V DC) | 25 mA |
| Recommended Fuse (External) | ADC p/n S500-32-R (0.032A fuse) |
| Terminal Block Replacement | ADC p/n C0-16TB |
| Weight | 86 g |

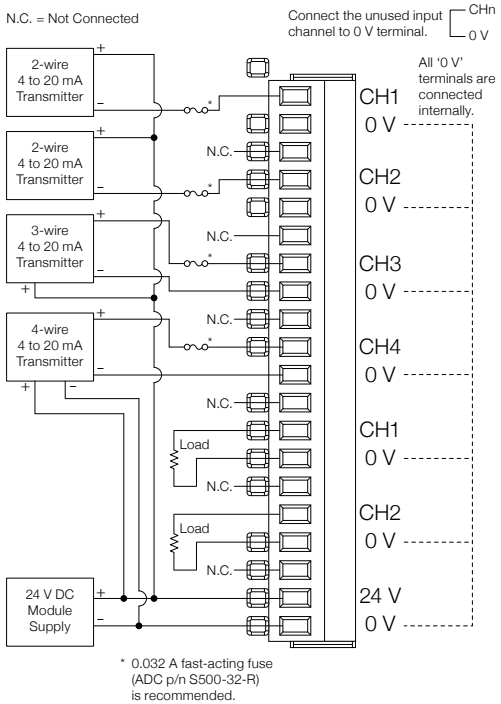
### Input Specifications

| Items | Specifications |
|---|---|
| Inputs per Module | 4 |
| Input Range | 0 to 20 mA (Sink) |
| Resolution | 13-bit, 2.44 uA/count |
| Input Type | Single ended (One common) |
| Maximum Continuous Overload | ±44 mA |
| Input Impedance | 124 Ω, 0.5 W current input |
| Filter Charactistics | Low pass, -3 dB at 400 Hz |
| PLC Data Format | 13-bit unsigned Integer, range is 0-8191 |
| Sample Durtion Time | 5 ms |
| All Channel Update Rate | 20 ms (Input plus output maximum time) |
| Open Circuit Detection Time | Zero reading within 20 ms |
| Conversion Method | Successive approximation |
| Accuracy Against Temperature | Maximum ±75 ppm/˚C |
| Maximum Inaccuracy | 0.5% of range (Including temperature changes) |
| Linearity Error (End-to-end) | ±3 count maximum, monotonic with no missing codes |
| Input Stability and Repeatability | Maximum ±2 count |
| Full Scale Error (Including Offset) | Maximum ±8 count |
| Offset Error | Maximum ±8 count |
| Maximum Crosstalk at DC, 50/60 Hz | Maximum ±2 count |

### Output Specifications

| Items | Specifications |
|---|---|
| Outputs per Module | 2 |
| Output Range | 4 to 20 mA (Source) |
| Resolution | 12-bit, 3.9 uA/count |
| Output Type | Current sourcing at 20 mA maximum (One common) |
| PLC Data Format | 12-bit unsigned integer, 0-4095 counts |
| Output Value in Fault Mode | Less than 4 mA |
| Load Impedance | 0 to 600 Ω at 24 VDC; minimum load: 0 Ω 32˚F to 113˚F (0˚C to 45˚C); 125 Ω 113˚F to 131˚F (45˚C to 55˚C) ambient temp. |
| Maximum Inductive Load | 1 mH |
| Allowed Load Type | Grounded |
| Maximum Inaccuracy | ±1% of range |
| Maximum Full Scale Error (Including Offset) | ±0.2% of range maximum |
| Maximum Offset Error | ±0.2% of range maximum |
| Accuracy Against Temperature | ±75 ppm/˚C maximum full scale calibration change (±0.005% of range/˚C) |
| Maximum Crosstalk at DC, 50/60 Hz | -72 dB, 1 LSB |
| Linearity Error (End-to-end) | ±4 LSB maximum, (±0.1% of full scale), monotonic with no missing codes |
| Output Stability and Repeatability | ±2% LSB after 10 minute warmup period typical |
| Output Ripple | ±0.1% of full scale |
| Output Settling Time | 0.2 ms maximum, 5 µs minimum (Full scale range) |
| All Channel Update Rate | 20 ms |
| Maximum Continuous Overload | Outputs open circuit protected |
| Type of Output Protection | Electronically limited to 20 mA or less |
| Output Signal at Power Up and Power Down | 4 mA |

### Wiring Diagram



# SJ-ETHER/SJ Series
## Analog Module

## ■Analog Input/Output Module《Input 4 Channels･Output 2 Channels》

**C0-4AD2DA-2**

### General Specifications

| Items | Specifications |
|---|---|
| Field to Logic Side Isolation | 1,800 V AC |
| External 24 VDC Power Required | 65 mA |
| Bus Power Required (24 V DC) | 15 mA |
| Terminal Block Replacement | ADC p/n C0-16TB |
| Weight | 86 g |

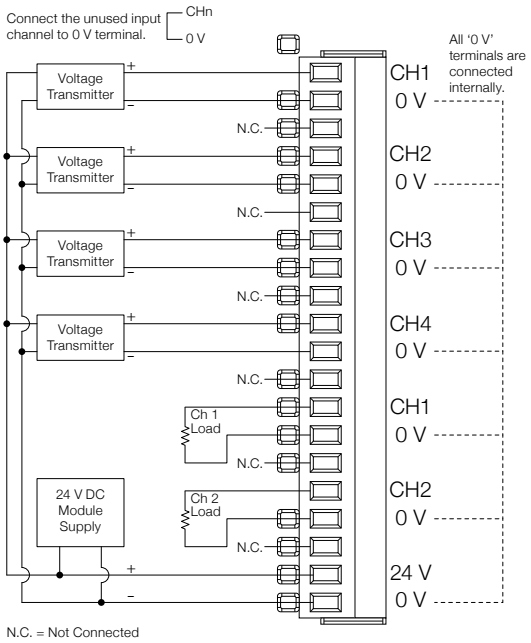
### Input Specifications

| Items | Specifications |
|---|---|
| Inputs per Module | 4 |
| Input Range | 0 to 10 V |
| Resolution | 13-bit, 1.22 mV/count |
| Input Type | Single ended (One common) |
| Maximum Continuous Overload | ±100 V DC |
| Input Impedance | > 150 kΩ |
| Filter Charactistics | Low pass, -3 dB at 500 Hz |
| Sample Durtion Time | 5 ms |
| All Channel Update Rate | 20 ms |
| Open Circuit Detection Time | Zero reading within 100 ms |
| Conversion Method | Successive approximation |
| Accuracy Against Temperature | Maximum ±75 ppm/˚C |
| Maximum Inaccuracy | 0.5% of range (including temperature changes) |
| Linearity Error (End-to-end) | ±3 count maximum, monotonic with no missing codes |
| Input Stability and Repeatability | Maximum ±2 count |
| Full Scale Error (Including Offset) | Maximum ±8 count |
| Offset Error | Maximum ±8 count |
| Maximum Crosstalk at DC, 50/60 Hz | Maximum ±2 count |

### Output Specifications

| Items | Specifications |
|---|---|
| Outputs per Module | 2 |
| Output Range | 0 to 10 V |
| Resolution | 12-bit, 2.44 mV/count |
| Output Type | Voltage sourcing at 10mA maximum (One common) |
| Output Value in Program Mode | Determined by CPU |
| Output Value in Fault Mode | 0 V |
| Output Impedance | 0.2 Ω typical |
| Load Impedance | > 1,000 Ω |
| Maximum Capacitive Load | 0.01 uF maximum |
| Allowed Load Type | Grounded |
| Maximum Inaccuracy | ±1% of range |
| Maximum Full Scale Error (Not including Offset) | ±0.2% of range maximum voltage |
| Maximum Offset Error | ±0.2% of range maximum |
| Accuracy Against Temperature | ±75 ppm/˚C maximum full scale calibration change (±0.0025% of range/˚C) |
| Maximum Crosstalk at DC, 50/60 Hz | -72 dB, 1 LSB |
| Linearity Error (End-to-end) | ±4 LSB maximum, (±0.1% of full scale), monotonic with no missing codes |
| Output Stability and Repeatability | ±2% LSB after 10 minute warmup period typical |
| Output Ripple | 0.5% of full scale |
| Output Settling Time | 0.3 ms maximum, 5 µs minimum (Full scale range) |
| All Channel Update Rate | 20 ms |
| Maximum Continuous Overload | Outputs current limited to 40 mA typical; continuous overloads on multiple outputs can damage module. |
| Type of Output Protection | 0.1 µF transient suppressor |
| Output Signal at Power Up and Power Down | 4 mA |

### Wiring Diagram




N.C. = Not Connected

# SJ-ETHER/SJ Series

## Analog Module

## RTD Input Module《4 Channels》

### C0-04RTD

### General Specifications

| Items | Specifications |
|---|---|
| Field to Logic Side Isolation | No isolation |
| External DC Power Required | None |
| Bus Power Required (24 V DC) | 25 mA |
| Thermal Dissipation | 2.047 BTU/hour |
| Terminal Block Replacement | ADC p/n C0-16TB |
| Weight | 86 g |

### Input Specifications

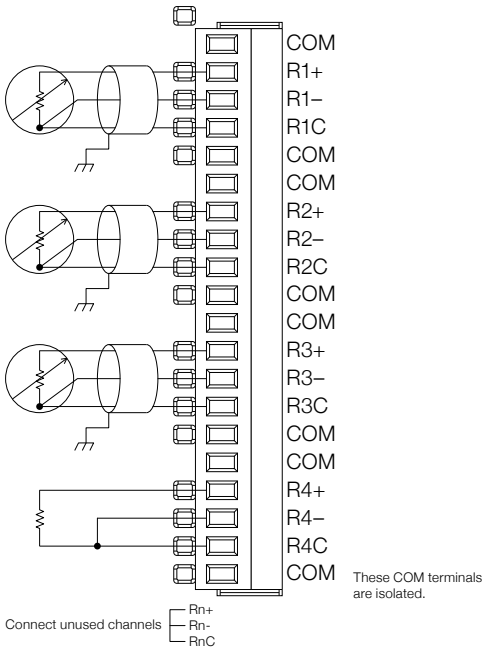
| Items | Specifications |
|---|---|
| Number of Channels | 4 |
| Common Mode Signal Range | ±2.5 V |
| Common Mode Rejection | 100 dB at DC and 100 dB at 50/60 Hz |
| Input Impedance | > 5 MΩ |
| Absolute Maximum Rating | Failure-resistant input to ±50 V DC |
| Display Resolution | ±0.1°C or °F, 0.1Ω or 0.01 Ω |
| Input Range* | Pt100 Type: -200.0°C to 850.0°C, (-328°F to 1,562°F)<br>Pt1000 Type: -200.0°C to 595.0°C, (-328°F to 1,103°F)<br>jPt100 Type: -100°C to 450°C (-148°F to 842°F)<br>10 Ω Cu: -200°C to 260°C (-328°F to 500°F)<br>25 Ω Cu: -200°C to 260°C (-328°F to 500°F)<br>120 Ω Ni: -80°C to 260°C (-112°F to 500°F)<br>0 to 3,125.0 Ω: Resolution 0.1 Ω<br>0 to 1,562.5 Ω: Resolution 0.1 Ω<br>0 to 781.2 Ω: Resolution 0.1 Ω<br>0 to 390.62 Ω: Resolution 0.01 Ω<br>0 to 195.31 Ω: Resolution 0.01 Ω |
| RTD Linearization | Automatic |
| Excitation Current (All Ranges) | 210 µA |
| Accuracy Against Temperature | Maximum ±10 ppm/°C |
| RTD Input Maximum Inaccuracy | ±3°C (Excluding RTD error);<br>±5°C (Ranges Cu10 and Cu25) |
| RTD Linearity Error (End-to-end) | ±2°C maximum, ±0.5°C typical, monotonic with no missing codes |
| Resistance Input Maximum Zero Scale Error | ±0.0015% of full scale range in ohms (Negligible) |
| Resistance Input Maximum Full Scale Error | ±0.02% of full scale range |
| Maximum Linearity Error | ±0.015% of full scale range maximum at 25°C, monotonic with no missing codes |
| Resistance Maximum Input Inaccuracy | 0.1% at 0°C to 60°C (32°F to 140°F), typical 0.04% at 25°C (77°F) |
| Warm Up Time | 30 minutes for ±1°C repeatability |
| Sample Duration Time | 240 ms |
| All Channel Update Rate | Single channel update rate times the number of enabled channels on the module |
| Open Circuit Detection Time | Positive full-scale reading within 2 seconds |
| Conversion Method | Sigma - Delta |

* While it is possible to use different resistive ranges, we recommend using the narrowest range that covers the resistance being measured. For example, if measuring approximately 100 Ω resistance, use the 0 to 195.31 Ω range. While the resolution is the same as the 0 to 390.62 Ω range, output RMS noise will be lower and stability will be improved.

### Initialization Time

| The Number of Channels Used | The same Input Type is selected for all Channels | Mixed Input Types are selected |
|---|---|---|
| 1 | 4 sec | N/A |
| 2 | 5 sec | May take up to 13 sec |
| 3 | 6 sec | May take up to 18 sec |
| 4 | 7 sec | May take up to 24 sec |

### Wiring Diagram



# SJ-ETHER/SJ Series
## Analog Module



## ■Temperature Input Module《4 Channels》

**C0-04THM**

### General Specifications

| Items | Specifications |
|---|---|
| Field to Logic Side Isolation | 1,800 V AC applied for 1 second (100% tested) |
| External DC Power Required | None |
| Bus Power Required (24 V DC) | 25 mA |
| Thermal Dissipation | 0.175 BTU/hour |
| Terminal Block Replacement | ADC p/n C0-8TB |
| Weight | 86 g |

### Input Specifications

| Items | Specifications |
|---|---|
| Number of Channels | 4 |
| Common Mode Signal Range | -1.3 to +3.8 V |
| Common Mode Rejection | 100 dB at DC and 130 dB at 60 Hz |
| Input Impedance | > 5 MΩ |
| Absolute Maximum Rating | Failure-resistant input to ±50 V DC |
| Display Resolution | ±0.1˚C or ˚F, 16 bit |
| Input Range* | Type J: -190˚C to 760˚C (-310˚F to 1,400˚F)<br>Type K: -150˚C to 1,372˚C (-238˚F to 2,502˚F)<br>Type E: -210˚C to 1,000˚C (-346˚F to 1,832˚F)<br>Type R: 65˚C to 1,768˚C (149˚F to 3,214˚F)<br>Type S: 65˚C to 1,768˚C (149˚F to 3,214˚F)<br>Type T: -230˚C to 400˚C (-382˚F to 752˚F)<br>Type B: 529˚C to 1,820˚C (984˚F to 3,308˚F)<br>Type N: -70˚C to 1,300˚C (-94˚F to 2,372˚F)<br>Type C: 65˚C to 2,320˚C (149˚F to 4,208˚F)<br>0 to 39.0625 mV<br>±39.0625 mV<br>±78.125 mV<br>0 to 156.25 mV<br>±156.25 mV<br>0 to 1.25 V |
| Cold Junction Compensation | Automatic |
| Thermocouple Linearization | Automatic |
| Accuracy Against Temperature | Maximum ±25 ppm/˚C |
| Linearity Error | ±2˚C maximum, ±1˚C typical, monotonic with no missing codes |
| Maximum Inaccuracy | ±3˚C maximum (Excluding thermocouple error) |
| Maximum Voltage Input Offset Error | 0.05% at 0˚C to 55˚C (32˚F to 131˚F), typical 0.04% at 25˚C (77˚F) |
| Maximum Voltage Input Gain Error | 0.06% at 25˚C (77˚F) |
| Maximum Voltage Input Linearity Error | 0.05% at 0˚C to 55˚C (32˚F to 131˚F), typical 0.03% at 25˚C (77˚F) |
| Maximum Voltage Input Inaccurracy | 0.1% at 0˚C to 55˚C (32˚F to 131˚F), typical 0.04% at 25˚C (77˚F) |
| Warm Up Time | 30 minutes for ±1˚C repeatability |
| Sample Duration Time | 400 ms |
| All Channel Update Rate | Single channel update rate times the number of enabled channels on the module |
| Open Circuit Detection Time | Open Circuit Detection Time Burn Out flag set and zero scale reading within 3 seconds |
| Conversion Method | Sigma - Delta |

### Initialization Time

| The Number of Channels Used | With any Configuration |
|---|---|
| 1 | 5 sec |
| 2 | 7 sec |
| 3 | 9 sec |
| 4 | 11 sec |

### Wiring Diagram