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You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON CP1E-N40DR-A. You'll find the answers to all your questions on the OMRON CP1E-N40DR-A in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual OMRON CP1E-N40DR-A
User guide OMRON CP1E-N40DR-A
Operating instructions OMRON CP1E-N40DR-A
Instructions for use OMRON CP1E-N40DR-A
Instruction manual OMRON CP1E-N40DR-A

New Product

OMRON

SYSMAC CP-series CP1E CPU Units
CP1E-E□□□□□□□
CP1E-N□□□□□□□/NA20□□□□

The CP1E Package PLCs: Economical, Easy to use, and Efficient

- The E-type Basic CPU Units provide cost performance and easy application with only basic functionality.
- The N and NA-types Application CPU Units support Programmable Terminal connection, position control, and inverter connection



CP1E-E200R-A CP1E-N40DR-A

Features

- Programming, setting, and monitoring with CX-Programmer.
- Easy connection with computers using commercially available USB cables.
- With E30/40, N30/40/60 or NA20 CPU Units, Add I/O by Connecting Expansion I/O Units.
- With E30/40, N30/40/60 or NA20 CPU Units, Add Analog I/O or Temperature Inputs by Connecting Expansion Units.
- Quick-response inputs
- Input interrupts
- Complete High-speed Counter Functionality.
- Versatile pulse control for Transistor Output for N14/20/30/40/60 or NA20 CPU Units.
- PWM Outputs for Transistor Output for N14/20/30/40/60 or NA20 CPU Units.
- Built-in RS-232C Port for N/NA-type CPU Units.
- Mounting Serial Option Boards to N30/40/60 or NA20 CPU Units.
- Built-in analog I/O, two inputs and one output, for NA-type CPU Units.

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Manual abstract:

· Versatile pulse control for Transistor Output for N14/20/30/40/60 or NA20 CPU Units. · PWM Outputs for Transistor Output for N14/20/30/40/60 or NA20 CPU Units. · Built-in RS-232C Port for N/NA-type CPU Units. · Mounting Serial Option Boards to N30/40/60 or NA20 CPU Units. · Built-in analog I/O, two inputs and one output, for NA-type CPU Units. 1 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ System Configuration Basic System Configuration Using an E-type CPU Unit CP1E CPU Unit Expansion I/O Units Expansion Units DIN Track Support Software CX-Programmer Personal computer IBM PC/AT or equivalent CP1E-E30DR-A CP1E-E40DR-A 20 or 40 I/O Points 8 inputs 8 outputs 16 outputs 32 outputs Analog I/O Analog inputs Analog outputs Temperature sensors CompoBus/S I/O Link Unit Up to 3 Units can be connected When a two level layout is created by expansion and distance is required CP1E-E10D@-@ CP1E-E14DR-A CP1E-E20DR-A Expansion Units and Expansion I/O Units I/O Connecting Cable CP1E CPU Unit CP1W-CN811 Basic System Configuration Using an N/NA-type CPU Unit Battery CP1W-BAT01 CP1E CPU Unit Expansion I/O Units Expansion Units DIN Track Support Software CX-Programmer Personal computer IBM PC/AT or equivalent CP1E-N30D CP1E-N40D CP1E-N60D CP1E-NA20D - 20 or 40 I/O Points 8 inputs 8 outputs Analog I/O Analog inputs Analog outputs Temperature sensors CompoBus/S I/O Link Unit Built in RS-232C 16 outputs Programmable Terminal (PT) 32 outputs (NT Link/HOST Link) Up to 3 Units can be connected General component Inverter *Neither the CP1W-DAM01 LCD Option Board nor the CP1W-CIF41 Ethernet Option Board can be used. CP1E-N14D CP1E-N20D (No-protocol mode) (Modbus-RTU) RS-232C Option Board CP1W-CIF01 Or RS-422A/485 Option Board CP1W-CIF11 CP1W-CIF12 COMM COMM CP-series PLC or CJ1M PLC Host computer When a two level layout is created by expansion and distance is required CP1E CPU Unit (Host Link) Expansion Units and Expansion I/O Units I/O Connecting Cable (Serial PLC Link) CP1W-CN811 2 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Ordering Information International Standards · The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UCI: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives. · Contact your OMRON representative for further details and applicable conditions for these standards. E-type CP1E CPU Units (Basic Models) Specifications Product name Power Supply Inputs Outputs Output type Relay 100 to 240 VAC Transistor (sinking) Transistor (sourcing) 6 4 Relay 24 VDC Transistor (sinking) Transistor (sourcing) E-type CPU Units with 14 I/O Points 100 to 240 VAC 8 6 Relay 2K steps 2K words -0.16 0.

07 Available soon Program capacity Data memory capacity External power supply (24 VDC) (A) ---- Current consumption (A) Model 5V 24 V Available soon Standards E-type CPU Units with 10 I/O Points 0.08 0.11 0.11 0.08 0.

11 0.11 0.04 --0.04 --- ----- CP1E-E10DR-A Available soon CP1E-E10DT-A Available soon 2K steps 2K words ---- CP1E-E10DT1-A Available soon CP1E-E10DR-D Available soon CP1E-E10DT-D Available soon CP1E-E10DT1-D CP1E-E14DR-A -- E-type CPU Units with 20 I/O Points 100 to 240 VAC 12 8 Relay 2K steps 2K words -- 0.17 0.

08 CP1E-E20DR-A E-type CPU Units with 30 I/O Points 100 to 240 VAC 18 12 Relay 2K steps 2K words 0.30 0.17 0.07 CP1E-E30DR-A N, L, CE E-type CPU Units with 40 I/O Points 100 to 240 VAC 24 16 Relay 2K steps 2K words 0.30 0.17 0.09 CP1E-E40DR-A Note: There are no accessories included with E-type CP1E CPU Units. A Battery (CP1W-BAT01) cannot be used. 3 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ N/NA-type CP1E CPU Units (Application Models) Specifications Product name Power Supply Inputs Outputs Output type Relay 100 to 240 VAC Transistor (sinking) Transistor (sourcing) 8 6 Relay 24 VDC Transistor (sinking) Transistor (sourcing) N-type CPU Units with 20 I/O Points Relay 100 to 240 VAC Transistor (sinking) Transistor (sourcing) 12 8 Relay Transistor (sinking) Transistor (sourcing) N-type CPU Units with 30 I/O Points Relay 100 to 240 VAC Transistor (sinking) Transistor (sourcing) 18 12 Relay 24 VDC Transistor (sinking) Transistor (sourcing) N-type CPU Units with 40 I/O Points Relay 100 to 240 VAC Transistor (sinking) Transistor (sourcing) Relay 24 VDC Transistor (sinking) Transistor (sourcing) 8K steps 8K words ---0.30 0.

30 0.30 8K steps 8K words ---0.21 0.31 0.31 0.09 0.02 0.02 CP1E-N40DR-D CP1E-N40DT-D CP1E-N40DT1-D 0.21 0.27 0.27 0.21 0.31 0.31 0.07 0.

02 0.02 0.09 0.02 0.02 CP1E-N30DR-D CP1E-N30DT-D CP1E-N30DT1-D CP1E-N40DR-A CP1E-N40DT-A CP1E-N40DT1-A 8K steps 8K words -0.18 0.08 CP1E-N20DR-D Program capacity Data memory capacity External power supply (24 VDC) (A) ---8K steps 8K words ---0.17 0.22 0.22 0.18 0.07 0.02 0.02 0.08 Current consumption (A) Model 5V 24 V Available soon Standards N-type CPU Units with 14 I/O Points 0.

17 0.22 0.22 0.07 0.02 0.02 CP1E-N14DR-A Available soon ----- CP1E-N14DT-A Available soon CP1E-N14DT1-A Available soon CP1E-N14DR-D Available soon CP1E-N14DT-D Available soon CP1E-N14DT1-D CP1E-N20DR-A -- 0.23 0.02 CP1E-N20DT-A -- 0.23 0.02 CP1E-N20DT1-A 24 VDC -- 0.23 0.02 CP1E-N20DT-D -- 0.23 0.02 CP1E-N20DT1-D 0.30 0.30 0.30 0.21 0.27 0.27 0.

07 0.02 0.02 CP1E-N30DR-A CP1E-N30DT-A CP1E-N30DT1-A N, L, CE 24 16 4 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Specifications Product name Power Supply Inputs Outputs Output type Relay N-type CPU Units with 60 I/O Points 100 to 240 VAC Transistor (sinking) Transistor (sourcing) 36 24 Relay 24 VDC Transistor (sinking) Transistor (sourcing) NA-type CPU Units with 20 I/O Points (Built-in analog) 100 to 240 VAC 12 8 8K steps 8K words Relay Program capacity Data memory capacity External power supply (24 VDC) (A) 0.30 0.30 0.30 Current consumption (A) Model 5V 24 V Available soon Standards 0.21 0.31 0.31 0.21 0.

31 0.31 0.13 0.02 0.02 0.13 0.02 0.02 CP1E-N60DR-A Available soon ----- CP1E-N60DT-A Available soon 8K steps 8K words ---- CP1E-N60DT1-A Available soon CP1E-N60DR-D Available soon CP1E-N60DT-D Available soon CP1E-N60DT1-D CP1E-NA20DR-A 0.30 0.18 0.11 24 VDC Transistor (Built-in (Built-in (sinking) analog analog inputs: 2) outputs: 1) Transistor (sourcing) -- 0.23 0.09 CP1E-NA20DT-D CE -- 0.23 0.09 CP1E-NA20DT1-D Battery Set For N/NA-type CP1E CPU Units Note: Mount a Battery to an N/NA-type CPU Unit if the data in the following areas must be backed up for power interruptions.

· DM Area (D) (except backed up words in the DM Area), Holding Area (H), Counter Completion Flags (C), Counter Present Values (C), Auxiliary Area (A), and Clock Function (Use batteries within two years of manufacture).



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) CP1W-BAT01 CE Note: There are no accessories included with N/NA-type CP1E CPU Units. RS-232C connectors for the built-in RS-232C port and the Battery (CP1W-BAT01) are not included. 5 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Options (for CP1E N30/40/60 or NA20 CPU Units) The Options cannot be used for CP1E N14/20 CPU Units and all E-type CPU Units. Product name RS-232C Option Board Specifications One RS-232C Option Board can be mounted to the Option Board slot.

For CP1E N30/40/60 or NA20 CPU Units only. One RS-232C connector is included. Model Standards CP1W-CIF01 UC1, N, L, CE CP1W-CIF11 RS-422A/485 Option Board One RS-422A/485 Option Board can be mounted to the Option Board slot. For CP1E N30/40/60 or NA20 CPU Units only. CP1W-CIF12 N, L, CE RS-422A/485 Isolated-type Option Board Note: It is not possible to use a CP-series Ethernet Option Board (CP1W-CIF41), LCD Option Board (CP1W-DAM01), or Memory Card (CP1WME05M) with a CP1E CPU Unit. Programming Devices Specifications Product name CX-One Lite is a subset of the complete CX-One package that provides only the Support Software required for micro PLC applications. CX-One Lite runs on the following OS. Windows 2000 (Service Pack 4 or higher), XP, Vista, or 7 (except 64-bit edition) CX-One Lite Ver. 4.@ includes Micro PLC Edition CXProgrammer Ver.

9.@. CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. OS: Windows 2000 (Service Pack 4 or higher), XP, Vista, or 7 (except 64-bit edition) CX-One Ver. 4.@ includes CX-Programmer Ver. 9.@. Number of licenses Media Model Standards FA Integrated Tool Package CX-One Lite Ver.

4.@ 1 license CD CXONE-LT01C-V4 -- CD 1 license * DVD CXONE-AL01C-V4 -CXONE-AL01D-V4 CX-One FA Integrated Tool Package Ver. 4.@ Note: The E20, E30, E40, N20, N30 and N40 CPU Units are supported by CX-Programmer version 8.2 or higher. The E10, E14, N14, N60, and NA20 CPU Units are supported by CX-Programmer version 9.03 or higher. When Micro PLC Edition CX-Programmer is used, you need version 9.03 or higher. * Site licenses are available for the CX-One (3, 10, 30 or 50 licenses).

The following tables lists the Support Software that can be installed from CX-One Support Software in CX-One Micro PLC Edition CX-Programmer CX-Programmer CX-Integrator Switch Box Utility CX-Protocol CX-Simulator CX-Position CX-Motion-NCF CX-Motion-MCH CX-Motion Ver.9.@ Ver.9.@ Ver.2.@ Ver.1.@ Ver.1.

@ Ver.1.@ Ver.2.@ Ver.1.@ Ver.2.@ Ver.2.

@ CX-One Lite Ver.4.@ Yes No Yes Yes No Yes No No No No CX-One Ver.4.@ No Yes Yes Yes Yes Yes Yes Yes Yes CX-Drive CX-Process Tool Faceplate Auto-Builder for NS CX-Designer NV-Designer CX-Thermo CX-ConfiguratorFDT CX-FLnet Network Configurator CX-Server Support Software in CX-One Ver.

1.@ Ver.5.@ Ver.3.

@ Ver.3.@ Ver.1.@ Ver.4.@ Ver.1.@ Ver.1.

@ Ver.3.@ Ver.4.@ CX-One Lite Ver.4.@ Yes No No Yes Yes Yes No Yes Yes CX-One Ver.4.@ Yes Yes Yes Yes Yes Yes Yes Yes Note: For details, refer to the CX-One Catalog (Cat. No.

R134). 6 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Expansion I/O Units and Expansion Units (for CP1E E30/40, N30/40/60, or NA20 CPU Units) CP1E E10/14/20 or N14/20 CPU Units do not support Expansion I/O Units and Expansion Units. Specifications Unit type Product name Inputs Input Unit 8 --0.018 -CP1W-8ED Outputs Output type Current consumption (A) 5V 24 V Model Standards Output Units -8 Relay Transistor (sinking) Transistor (sourcing) Relay -16 Transistor (sinking) Transistor (sourcing) Relay -32 Transistor (sinking) Transistor (sourcing) 0.026 0.

075 0.075 0.042 0.076 0.076 0.

049 0.113 0.113 0.103 0.130 0.130 0.080 0.160 0.160 0.044 --0.

090 --0.131 --0.044 --0.090 --- CP1W-8ER CP1W-8ET CP1W-8ET1 CP1W-16ER CP1W-16ET CP1W-16ET1 CP1W-32ER CP1W-32ET CP1W-32ET1 CP1W-20EDR1 CP1W-20EDT CP1W-20EDT1 CP1W-40EDR CP1W-40EDT CP1W-40EDT1 U, C, N, L, CE N, L, CE CP1W Expansion I/O Units N, L, CE I/O Units 12 8 Relay Transistor (sinking) Transistor (sourcing) Relay 24 16 Transistor (sinking) Transistor (sourcing) U, C, N, L, CE N, L, CE Analog Input Unit 4 analog inputs Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000 4 analog outputs Output range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000 2 analog inputs and 1 analog output I/O range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000 2 temperature sensor inputs Sensor type: Thermocouple (J or K) 4 temperature sensor inputs Sensor type: Thermocouple (J or K) 2 temperature sensor inputs Sensor type: Platinum resistance thermometer (Pt100 or JPt100) 4 temperature sensor inputs Sensor type: Platinum resistance thermometer (Pt100 or JPt100) 0.100 0.090 CPables. Use the external power supply to power input devices.

Do not use it to drive output devices. This is the rated value for the maximum system configuration. Use the following formula to calculate power consumption for CPU Units with DC power. Formula: DC power consumption = (5V current consumption 5 V/70% (internal power efficiency) + 24V current consumption) 1.1(current fluctuation factor) The above calculation results show that a DC power supply with a greater capacity is required.

8 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Performance Specifications Item Program capacity Control method I/O control method Program language Instructions Processing speed Overhead processing time Instruction execution times CP1E-@@D@-@ 2 K steps (8 Kbytes) including the symbol table, comments, and program indices of the CX-Programmer Stored program method Cyclic scan with immediate refreshing Ladder diagram Approximately 200 0.4 ms Basic instructions (LD): 1.19 µs min. Special instructions (MOV): 7.9 µs min.

CP1E-E10D@-@/@14D@-@/@20D@-@: None CP1E-@30D@-@/@40D@-@/N60D@-@/NA20D@-@: 3 units CP1E-E10D@-@ : 10 CP1E-@14D@-@ : 14 CP1E-@20D@-@ : 20 CP1E-@30D@-@ : 150 (30 built in, 40 × 3 expansion) CP1E-@40D@-@ : 160 (40 built in, 40 × 3 expansion) CP1E-N60D@-@ : 180 (60 built in, 40 × 3 expansion) CP1E-NA20D@-@: 140 (20 built in, 40 × 3 expansion) CP1E-E10D@-@ : 10 (6 inputs, 4 outputs) CP1E-@14D@-@ : 14 (8 inputs, 6 outputs) CP1E-@20D@-@ : 20 (12 inputs, 8 outputs) CP1E-@30D@-@ : 30 (18 inputs, 12 outputs) CP1E-@40D@-@ : 40 (24 inputs, 16 outputs) CP1E-N60D@-@ : 60 (36 inputs, 24 outputs) CP1E-NA20D@-@: 20 (12 inputs, 8 outputs) Incremental Pulse Inputs 10 kHz: 6 counters 5 counters (only for 10 I/O points) Up/Down Inputs 10 kHz: 2 counters Pulse + Direction Inputs 10 kHz: 2 counters Differential Phase Inputs (4x) 5 kHz: 2 counters Linear mode Ring mode 32 bits Phase Z and software reset (excluding increment pulse input) Software reset Target Matching Range Comparison 6 inputs (4 inputs only for 10 I/O points) Interrupt input pulse width: 50 µs min. 6 inputs (4 inputs only for 10 I/O points) Input pulse width: 50 µs min. Delays can be set in the PLC Setup (0 to 32 ms, default: 8 ms).



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Set values: 0, 1, 2, 4, 8, 16, or 32 ms Pulse + Direction Mode 1 Hz to 100 kHz: 2 outputs Continuous mode (for speed control) Independent mode (for position control) Relative coordinates: 0000 0000 to 7FFF FFFF hex (0 to 2147483647) Absolute coordinates: 8000 0000 to 7FFF FFFF hex (-2147483647 to 2147483647) Trapezoidal acceleration and deceleration (Cannot perform S-curve acceleration and deceleration.) Only target position can be changed. Incremental Pulse Inputs 100 kHz: 2 counters, 10 kHz: 4 counters Up/Down Inputs 100 kHz: 1 counters, 10 kHz: 1 counters Pulse + Direction Inputs 100 kHz: 2 counters Differential Phase Inputs (4x) 50 kHz: 1 counter, 5 kHz: 1 counter CP1E-N@@D@-@ CP1E-NA@@D@-@ 8 K steps (32 Kbytes) including the symbol table, comments, and program indices of the CX-Programmer Number of CP1W-series Expansion Units connected Maximum number of I/O points Built-in I/O High-speed counter mode/ maximum frequency High-speed counters Built-in input functions Counting mode Count value Counter reset modes Control method Input interrupts Quick-response Inputs Normal input Input constants Pulse output method and output frequency Output mode Number of output pulses Pulse outputs (Models with transistor outputs only) Built-in output functions Pulse output function not included Acceleration/ deceleration curves Changing SVs during instruction execution Origin searches Frequency Included 2.0 to 6,553.5 Hz (in increments of 0.1 Hz) with 1 output or 2 Hz to 32,000 Hz (in increments of 1 Hz) with 1 output PWM output function not included 0.0% to 100.

0% (in increments of 0.1%) Accuracy: +1%/-0% at 2 Hz to 10,000 Hz and +5%/-0% at 10,000 Hz to 32,000 kHz Continuous Mode Analog function not included 2 adjusters (Setting range: 0 to 255) Setting range: 0 to 6,000 (2 channels only for NA-type) Setting range: 0 to 6,000 (1 channels only for NA-type)

Pulse outputs (Models with transistor outputs only) Duty factor Output mode Built-in analog Analog adjusters Analog input Analog output 9 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Item CP1E-E@@D@-@ B-type Peripheral USB Port Conforming to USB 2.0 B type connector Transmission 5 m max. distance Built-in RS-232C port Communications method synchronization Baud rate Transmission No built-in RS-232C port distance Supported protocol CP1E-N@@D@-@ CP1E-NA@@D@-@ Interface: Conforms to EIA RS-232C. Half duplex Start-stop 1.2, 2.4, 4.8, 9.6, 19.2, 38.

4, 57.6, or 115.2 kbps 15 m max. · Host Link · 1:N NT Link · No-protocol mode · Serial PLC Links (master, slave) · Modbus-RTU Easy Master 1 port (Option Board can be mounted only to N30/40/ 60 and NA20 CPU Units.) · One RS-232C port: CP1W-CIF01 · One RS-422A/485 port (not isolated): CP1W-CIF11 · One RS-422A/485 port (isolated): CP1W-CIF12 Depends on Option Board.

Depends on Option Board. 1.2, 2.4, 4.8, 9.

6, 19.2, 38.4, 57.6, or 115.2 kbps · Host Link · 1:N NT Link · No-protocol mode · Serial PLC Links (master, slave) · Modbus-RTU Easy Master Communications Serial Option port Mountable Option Boards Communications method Option Board cannot be mounted. synchronization Baud rate Compatible protocols Number of tasks Maximum subroutine number Maximum jump number Scheduled interrupt tasks Clock Built-in EEPROM Memory backup Battery backup With CP1W-BAT01 Battery (Sold separately) CIO Area Work Area (W) Holding Area (H) Input Bits Output Bits Serial PLC Link Words Auxiliary Area (A) Temporary Relay Area (TR) (TR Area) Timer Area (T) Counter Area (C) Data Memory Area (D) Operating modes 17 · One cyclic execution task · One scheduled interrupt task (always interrupt task 1) · Six input interrupt tasks (interrupt tasks 2 to 7) · Sixteen high-speed counter interrupt tasks (interrupt tasks 1 to 16) 128 128 1 interrupt task Included. Clock function not included. Accuracy (monthly deviation): The time of error occurrence displays 01-01-01 -4.5 min to -0.5 min at ambient temperature of 55oC, 01:01:01 Sunday -2.

0 min to +2.0 min at ambient temperature of 25oC, -2.5 min to +1.5 min at ambient temperature of 0oC Ladder programs and parameters are automatically saved to built-in EEPROM A section of the Data Memory Area can be saved to the built-in EEPROM. CP1W-BAT01 can be used. Maximum battery service life: 5 years Backup Time Battery cannot be mounted. Guaranteed value (ambient temperature: 55oC): 13,000 hours (approx. 1.5 years) Effective value (ambient temperature: 25oC): 43,000 hours (approx. 5 years) 1,600 bits (100 words): CIO 0.

00 to CIO 99.15 (CIO 00 to CIO 99) 1,600 bits (100 words): CIO 100.00 to CIO 199.15 (CIO 100 to CIO 199) 1,440 bits (90 words): CIO 200.00 to CIO 289.15 (words CIO 200 to CIO 289) 1,600 bits (100 words): W0.00 to W99.15 (W0 to W99) 800 bits (50 words): H0.00 to H49.15 (H0 to H49) Bits in this area maintain their ON/OFF status when operating mode is changed.

Read-only: 7,168 bits (448 words) A0 to A447 Read/write: 4,896 bits (306 words) in words A448 to A753 16 bits: TR0 to TR15 256 timer numbers (T0 to T255 (separate from counters)) 256 counter numbers (C0 to C255 (separate from timers)) 2 Kwords: D0 to D2047 8 Kwords: D0 to D8191 Of these, 1,500 words can be saved to the backup Of these, 7,000 words can be saved to the backup memory (built-in EEPROM) using settings in the memory (built-in EEPROM) using settings in the Auxiliary Area. Auxiliary Area PROGRAM mode: Program execution is stopped. Preparations can be executed prior to program execution in this mode. MONITOR mode: Programs are executed. Some operations, such as online editing, and changes to present values in I/O memory, are enabled in this mode. RUN mode: Programs are executed. This is the normal operating mode. 10 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Function Specifications Function Cycle time management Making the cycle time High-speed counter inputs High-speed pulse inputs Input pulse frequency measurement Minimum cycle time Function description Makes the cycle time consistent. Monitors the cycle time. High-speed pulses from devices such as a rotary encoder are counted.

The counted values are stored in the Auxiliary Area. Interrupt tasks can be executed when target is reached or by range comparison. The frequency of pulses input by the PRV instruction is measured. Relevant interrupt tasks are executed during the cycle when the CPU Unit built-in inputs turn ON or turn OFF.

Inputs can be read without being affected by cycle time. Use the quick-response inputs to read signals shorter than the cycle time. Cyclic refreshing Immediate refreshing The CPU Unit's built-in I/O are cyclically refreshed. I/O refreshing by immediate refreshing instructions Input constants can be set for Basic I/O Units. The response time can be increased to reduce the effects of chattering and noise at input contacts. The response time can be decreased to enable detecting shorter input pulses.

A pulse signal is output and positioning or speed control is performed with a servo driver that accepts a pulse input.



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Continuous mode for speed control or independent mode for position control can be used. There are functions for changing to positioning during speed control and for changing the target value during positioning. Origin searches and origin returns Pulses for which the duty ratio (ratio between ON time and OFF time during one pulse cycle) can be set are output. All of the outputs on the CPU Unit's I/O can be turned OFF when an error occurs in RUN or MONITOR mode.

Convert analog signal into digital value range from 0 to 6,000. Convert digital value range from 0 to 6,000 into analog signal. The Expansion I/O Units and Expansion Units are cyclically refreshed. I/O refreshing by IORF instruction All of the outputs on Expansion I/O Units and Expansion Units are turned OFF (0000 hex) when an error occurs in RUN or MONITOR mode. The response time can be increased to reduce the effects of chattering and noise at input contacts.

The response time can be decreased to enable detecting shorter input pulses. Errors in Expansion Units are detected. The CPU Unit is notified that the Expansion Unit stopped due to an error. Cyclic refreshing Refreshing by IORF Interrupt inputs Inputs Quick-response inputs CPU Unit built-in functions Normal inputs I/O refreshing Input response times Pulse outputs (Models with transistor outputs only) Pulse control Outputs Origin positioning PWM outputs (Models with transistor outputs only) Normal outputs Built-in analog Functions supported by both Expansion I/O Unit and Expansion Unit Expansion I/O Units Expansion Units Analog input Analog output I/O refreshing Load OFF function Expansion I/O Units and Expansion Units Load OFF function Input response times Unit error detection The status of I/O memory can be held when the operating mode is changed. Holding I/O memory when changing operating modes Memory The forced-set/reset status can be held when the operating mode is changed. management Automatic backup to the backup memory Automatic backup of ladder programs and parameter area to the backup memory functions (built-in EEPROM) (built-in EEPROM) Peripheral USB port Peripheral bus (toolbus) For communications with programming device (CX-Programmer). -Host Link commands can be sent from a PT or a computer to read/write I/O memory, and perform other operations for PLC. I/O instructions for communications ports (TXD/RXD instructions) can be used for data transfer with peripheral devices such as bar code readers. I/O memory in the PLC can be allocated and directly linked to various PT functions, including status control areas, status notification areas, touch switches, lamps, memory tables, and other objects. Up to ten words per Unit can be shared by up to nine CPU Units, including one Polling Unit and eight Polled Units.

Note: Programmable Terminal (PT) cannot be connected. Modbus-RTU commands are sent by the Modbus-RTU Master function. Modbus slaves, such as inverters, can be easily controlled with serial communications. Tasks can be executed at a specified interval (1.0 ms min., Unit: 0.1 ms). Interrupt tasks are processed when the built-in input turns ON or OFF. This function counts input pulses with the CPU Unit's built-in high-speed counter and executes an interrupt task when the count reaches the preset value or falls within a preset range (target value or zone comparison). Serial port (N/NA-type only) Host Link (SYSWAY) communications No-protocol communications Communications NT Link communications Serial PLC Links Modbus-RTU Easy Master function Scheduled interrupts Interrupt inputs Interrupt High-speed counter interrupts 11 CP1E-E@D@-@ CP1E-N@D@-@/NA20D@-@ Function Power supply management Memory protection Number of power interruptions counter Online editing Force-set/reset Debugging Differentiate monitoring Storing the stop position at errors Program check Error Log CPU error detection User-defined failure diagnosis Load OFF function System FAL error detection (User-defined non-fatal error) Backup memory error detection Non-fatal error detection PLC Setup error detection Option Board errors Battery error detection (N/NA-type CPU Units only) Built-in analog error Memory error detection I/O bus error detection Self-diagnosis and restoration Too Many I/O Points Error Detection Program error detection Instruction processing error detection Indirect DM addressing BCD error Fatal Error Detection Illegal area access error detection No END error detection Task error detection overflow error detection Invalid instruction error detection User program area overflow error detection Cycle time exceeded error detection System FALS error detection (user-defined fatal error) Maintenance Automatic online connection via network Read protection using password Write protection from FINS commands Function description Holding Area data, DM Area data, Counter Completion Flags, and counter present values are held even when power is turned OFF.

This function can be used only with an N/NA-type CPU Unit and only when the Battery Set (sold separately) is mounted. The number of times power has been interrupted is counted. The program can be changed during operation in MONITOR mode or PROGRAM mode. Specified bits can be set or reset. ON/OFF changes in specified bits can be monitored.

The location and task number where execution stopped for a program error is recorded. The programs can be checked for items such as no END instruction and FALS/FAL errors at startup. Details and the time of occurrence of error codes predefined by the CPU Unit are stored. CPU Unit WDT errors are detected. Errors can be generated for user-specified conditions: Non-fatal errors (FAL) and fatal errors (FALS).

The built-in outputs, Expansion I/O Unit outputs, and Expansion Unit outputs are turned OFF. This function generates a non-fatal (FAL) error when the user-defined conditions are met in program. This function detects when data in the backup memory (built-in EEPROM) that stores the ladder program is corrupted. This function detects setting errors in the PLC Setup. This function detects when the Option Board is malfunctioning or disconnected. This function detects when the battery voltage is low or the battery is disconnected. Note: This function is valid only when a battery is mounted and the Do not detect battery error Check Box is cleared in the PLC Setup. This function detects when a built-in analog I/O error occurs and stops the operation of builtin analog I/O. This function detects errors that occur in memory of the CPU Unit. This function detects errors that occur during data transfer between the CPU Unit and another Unit.

This function detects when more than the maximum number of CP1W Expansion I/O Units and Expansion Units are connected to the PLC. This function detects when there is an error in the program. See the following for details. This function detects an error when the given data value is invalid when executing an instruction, or execution of instruction between tasks was attempted.



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6 VDC 50% Power voltage 20.4 VDC 50% 0% 50 55°C Ambient temperature 0% 0% 50 55°C Ambient temperature 40 45 55°C Ambient temperature Note: The above restrictions apply to the relay output load current from the CPU Unit even if Expansion I/O Units are not connected. 22 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Output Specifications for Transistor Outputs (Sinking or Sourcing) Normal Outputs Item CIO 100.00 and CIO 100.01 Specification CIO 100.02 to CIO 100.07, CIO 101.00 to CIO 101.07 and CIO 102.00 to CIO 102.07 *2 Maximum switching capacity Minimum switching capacity Leakage current Residual voltage ON response time OFF response time Fuse 0.3 A/output, 0.9 A/common *1 4.5 to 30 VDC CP1E-E10D@-@: 0.9 A/Unit CP1E-N14D@-@: 1.5 A/Unit CP1E-N40D@-@: 3.6 A/Unit CP1E-N60D@-@: 5.4 A/Unit 1 mA 4.5 to 30 VDC 0.

1mA max. E-type CPU Unit: 1.5 V max. N/NA-type CPU Unit: 0.6 V max. 0.1 ms max. E-type CPU Unit: 1 ms max. N/NA-type CPU Unit: 0.1 ms max. Not provided. N/NA-type CPU Unit: Normal outputs CIO 100.00 to CIO 100.01 (sinking) CP1E-N20D@-@: 1.8 A/Unit CP1E-NA20D@-@: 1.8 A/Unit CP1E-N30D@-@: 2.7 A/Unit 1.5V max. 0.1 ms max.

1 ms max. E-type CPU Unit: Normal outputs CIO 100.00 to CIO 100.03 (sinking) N/NA-type CPU Unit: Normal outputs CIO 100.02 to CIO 102.07 (sinking) OUT OUT L ~ L 24 VDC, 4.5 to 30 VDC COM() L ~ L 24 VDC, 4.5 to 30 VDC OUT OUT Internal circuits Internal circuits L ~ L 24 VDC, 4.5 to 30 VDC Internal circuits COM() Circuit configuration N/NA-type CPU Unit: Normal outputs CIO 100.00 to CIO 100.01 (sourcing) E-type CPU Unit: Normal outputs CIO 100.01 to CIO 100.03 (sourcing) N/NA-type CPU Unit: Normal outputs CIO 100.02 to CIO 102.07 (sourcing) COM(+) Internal circuits Internal circuits OUT OUT L ~ L 24 VDC, 4.5 to 30 VDC COM(+) Internal circuits OUT OUT Note: Do not connect a load to an output terminal or apply a voltage in excess of the maximum switching capacity. * 1 Also do not exceed 0.9 A for the total for CIO 100.00 to CIO 100.03.

(CIO 100.00 to CIO 100.03 is different common.) * 2 The bits that can be used depend on the model of CPU Unit. Pulse Outputs (CIO 100.00 and CIO 100.01) Item Maximum switching capacity Minimum switching capacity Maximum output frequency Specification 100 mA/4.5 to 26.4 VDC 7 mA/4.5 to 26.

4 VDC 100 kHz OFF 90% Output waveform ON 10% 4s min. 2s min. Note: 1. The load for the above values is assumed to be the resistance load, and does not take into account the impedance for the connecting cable to the load. 2. Due to distortions in pulse waveforms resulting from connecting cable impedance, the pulse widths in actual operation may be smaller than the values shown above. PWM Output (CIO 100.01) Item Maximum switching capacity Maximum output frequency PWM output accuracy Specification 30 mA/4.5 to 26.4 VDC 32 kHz For ON duty +1%, .

0%:10 kHz output For ON duty +5%, .0%: 0 to 32 kHz output OFF Output waveform ON tON T ON duty= tON × 100% T 23 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Built-in Analog I/O (NA-type CPU Units) Analog Input Specifications Item Number of inputs Input signal range Max. rated input External input impedance Resolution Overall accuracy A/D conversion data Averaging function Open-circuit detection function At 25°C 0 to 55°C -10 to +10 V Other ranges Voltage input 2 inputs (Allocated 2 words: CIO 90 to CIO 91.) 0 to 5 V, 1 to 5 V, 0 to 10 V, or -10 to 10 V ±15 V 1 M min. 1/6000 ±0.3% full scale ±0.6% full scale F448 to 0BB8 hex FS 0000 to 1770 hex FS Supported (Set for individual inputs in the PLC Setup.) Supported (Value when disconnected: 8000 hex) ±0.4% full scale ±0.8% full scale 0 to 20 mA or 4 to 20 mA ±30 mA Approx.

250 Current input Analog Output Specifications Item Number of outputs Output signal range Allowable external output load resistance External input impedance Resolution Overall accuracy D/A conversion data At 25°C 0 to 55°C -10 to +10 V Other ranges Voltage output 1 output (Allocated 1 word: CIO 190.) 0 to 5 V, 1 to 5 V, 0 to 10 V, or -10 to 10 V 1 k min. 0.5max. 1/6000 ±0.

4% full scale * ±0.8% full scale * F448 to 0BB8 hex FS 0000 to 1770 hex FS 0 to 20 mA or 4 to 20 mA 600 max. --Current output * In 0 to 20 mA mode, accuracy cannot be ensured at 0.2 mA or less. Shared I/O Specifications Item Conversion time Isolation method Specification 2 ms/point (6 ms total for 2 analog inputs and 1 analog output.

) Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals. 24 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Specifications of Expansion I/O Units and Expansion Units Expandable CPU Units · Expansion I/O Units and Expansion Units cannot be connected to E10/14/20 or N14/20 CPU Units. · A total of up to three Expansion I/O Units and Expansion Units can be connected to an E30/40, N30/40/60 or NA20 CPU Unit. CP1E E10/14/20 or N14/20 CPU Unit CP-series Expansion Units and Expansion I/O Units cannot be connected. CP1E E30/40, N30/40/60 or NA20 CPU Unit A total of up to three CP-series Expansion I/O Units and Expansion Units can be connected. NC NC NC NC COM 00 01 02 CH 03 04 05 06 07 08 09 10 11 NC NC NC NC COM 00 01 02 CH 03 04 05 06 07 08 09 10 11 CH CH 00 01 01 01 01 02 02 02 02 03 03 03 03 04 04 04 04 05 05 05 05 06 06 06 06 07 07 07 07 08 08 09 09 10 10 11 11 CH 00 01 01 01 01 02 02 02 02 03 03 03 03 04 04 04 04 05 05 05 05 06 06 06 06 07 07 07 07 08 08 09 09 10 10 11 11 IN CH CH IN CH CH IN CH CH 00 00 01 01 01 01 02 02 02 02 03 03 03 03 04 04 04 04 05 05 05 05 06 06 06 06 07 07 07 07 08 08 09 09 10 10 11 11 OUT CH 00 00 40EDR OUT CH 00 00 40EDR OUT CH 00 00 40EDR CH NC NC COM 00 COM 01 COM 02 03 04 COM 05 06 07 COM CH 00 02 04 05 07 01 03 COM 06 EXP NC NC COM 00 CH 01 COM COM 02 03 04 COM 05 06 07 COM CH 00 02 04 05 07 01 03 COM 06 EXP Connection

Methods Connection cables for the Expansion I/O Units and Expansion Units are used to connect the Units. The length can be extended by using a CP1WCN811 I/O Connection Cable (length: 800 m). Maximum Number of I/O Points for an Expanded System Built-in I/O on CPU Unit CPU Unit Total CP1E-E10D@-@ CP1E-@14D@-@ CP1E-@20D@-@ CP1E-@30D@-@ CP1E-@40D@-@ CP1E-N60D@-@ 10 14 20 30 40 60 Number of inputs 6 8 12 18 24 36 12 Number of outputs 4 6 8 12 16 24 8 2 1 None None 3 Units maximum Not possible. AD DA Built-in Analog Total number of Expansion I/O Units and Expansion Units that can be connected Number of inputs: 24 Number of outputs: 16 Total number of I/O points when three CP1W-40ED@ Expansion I/O Units are connected Total 10 14 20 150 160 180 140 6 8 12 90 96 108 84 Number of inputs 4 6 8 60 64 72 56 Number of outputs CP1E-NA20D@-@ 20

Restrictions on External Power Supply Capacity The following restrictions apply when using the CPU Unit's external power supply.



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AC-power-supply E30/40, N30/40/60 or NA20 CPU Unit The power supply capacity is restricted for AC-power-supply E30/40, N30/40/60 or NA20 CPU Units. It may not be possible to use the full 300 mA of the external power supply, though a CPU Unit can connect any CP-series Expansion I/O Unit or Expansion Unit. The entire 300 mA from the external power supply can be used if Expansion Units and Expansion I/O Units are not connected. Refer to the CP1E CPU Unit Hardware Manual (Cat. No. W479) for details. AC-power-supply or DC-power-supply E10/14/20, N14/20 CPU Unit There is no external power supply on AC-power-supply or DC-power-supply E10/14/20, N14/20 CPU Units. 25 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Specifications of Expansion I/O Units Input Specifications (CP1W-40EDR/40EDT/40EDT1/20EDR1/20EDT/20EDT1/8ED) Item Input voltage Input impedance Input current ON voltage OFF voltage ON delay OFF delay 24 VDC +10%/-15% 4.7 k 5 mA typical 14.4 VDC min.

5.0 VDC max. 1 ms max. * 1 ms max. * IN Specification Input LED 750 4.

7 k Circuit configuration IN Internal circuits CO M Note: Do not apply voltage in excess of the rated voltage to the input terminal. * The response time is the hardware delay value. The delay set in the PLC Setup (0 to 32 ms, default: 8 ms) must be added to this value. For the CP1W-40EDR/EDT/EDT1, a fixed value of 16 ms must be added. Output Specifications Relay Outputs (CP1W-40EDR/32ER/20EDR1/16ER/8ER) Item Max.

switching capacity Min. switching capacity Service life of relay (See note.) ON delay OFF delay Electrical Mechanical Resistive load Inductive load Specification 2 A, 250 VAC (cos = 1), 2 A, 24 VDC (4 A/common) 5 VDC, 10 mA 150,000 operations (24 VDC) 100,000 operations (240 VAC, cos = 0.4) 20,000,000 operations 15 ms max. 15 ms max. v Output LED OUT Circuit configuration Internal circuits OUT COM Maximum 250 VAC: 2 A 24 VDC: 2 A Note: 1. Estimating the Service Life of Relays The service life of output contacts is as shown in the following diagram. 300 200 100 120 VAC resistive load 24 VDC = 7 ms 120 VAC cos = 0.4 240 VAC cos = 0.4 24 VDC/240 VAC resistive load Life (x 104) 50 30 20 10 5 3 2 Switching rate: 1,800 operations/hour 0.

1 0.2 0.3 0.5 0.7 1 2 3 5 Contact current (A) 26 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ 2. Restrictions of CP1W-16ER/32ER Limit the output load current to satisfy the following derating curve. Output load current(%) 100 50 0 43 55 Ambient temperature(°C) 3. CP1W-32ER's maximum number of simultaneously ON output points is 24 (75%). Relation between Number of ON Outputs and Ambient Temperature (CP1W-32ER) Number of inputs ON simultaneously (%) 75 0 Ambient temperature (°C) 55 4. According to the ambient temperature, there are restrictions on power supply voltage and output load current for the CPU Units connected with the Expansion I/O Units (CP1W-8ER/16ER/20EDR1/32ER/40EDR).

Use the PLC in the range of the power supply voltage and output load current as show below. The ambient temperature is restricted for the power-supply CPU Units (CP1E-N/NA@@@-@). Derating curve of the output load current for Expansion I/O Units (CP1W-8ER/16ER/20EDR1/32ER/40EDR).

Connected to CP1E-N30DR-D 100% Power voltage: 21.6 VDC Connected to CP1E-N40DR-D 100% Power voltage: 21.

6 VDC Power voltage: 20.4 VDC Connected to CP1E-N30DT@-D 100% Power voltage: 21.6 VDC Connected to CP1E-N40DT@-D 100% Power voltage: 21.6 VDC 50% Power voltage: 20.4 VDC 50% 50% Power voltage: 20.

4 VDC 50% Power voltage: 20.4 VDC 0% 35 45 55°C Ambient temperature 0% 0% 0% 35 45 55°C Ambient temperature 30 45 50 55°C Ambient temperature 35 45 55°C Ambient temperature Connected to CP1E-N60DR-D/CP1E-N60DT@-D 100% Power voltage: 21.6 VDC Connected to CP1E-NA20DT@-D 100% Power voltage: 21.6 VDC Connected to CP1E-NA20DR-A 100% 80% 50% Power voltage: 20.4 VDC 50% Power voltage: 20.4 VDC 0% 40 45 55°C Ambient temperature 0% 0% 40 45 55°C Ambient temperature 50 55°C Ambient temperature 27 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Transistor Outputs (Sinking or Sourcing) Specification Item CP1W-40EDT CP1W-40EDT1 4.5 to 30 VDC 0.3 A/output 0.9 A/common 3.6 A/Unit 0.

1 mA max. 1.5 V max. 0.1 ms max. 1 ms max. 24 VDC +10%/-5% 5 to 300 mA 16 pts (100%) 1 fuse/common CP1W-32ET CP1W-32ET1 4.5 to 30 VDC 0.3 A/output 0.9 A/common 7.

2 A/Unit 0.1 mA max. 1.5 V max. 0.

1 ms max. 1 ms max. 24 VDC +10%/-5% 5 to 300 mA 24 pts (75%) CP1W-20EDT CP1W-20EDT1 24 VDC +10%/-5% 0.3 A/output 0.9 A/common 1. 8 A/Unit 0.1 mA max. 1.5 V max. 0.1 ms. 1 ms max. 24 VDC +10%/-5% 5 to 300 mA 8 pts (100%) CP1W-16ET CP1W-16ET1 4.5 to 30 VDC 0.3 A/output 0.

9 A/common 3.6 A/Unit 0.1 mA max. 1.5 V max. 0.1 ms max. 1 ms max. 24 VDC +10%/-5% 5 to 300 mA 16 pts (100%) CP1W-8ET CP1W-8ET1 4.5 to 30 VDC 0.

3 A/output 0.9 A/common 1.8 A/Unit 0.1 mA max. 1.

5 V max. 0.1 ms max. 1 ms max. 24 VDC +10%/-5% 5 to 300 mA 8 pts (100%) Max.

switching capacity *1 Leakage current Residual voltage ON delay OFF delay Max. number of Simultaneously ON Points of Output Fuse *2 Sinking Outputs Output LED OUT L Sourcing Outputs Output LED COM (+) Circuit configuration Internal circuits L OUT 24 VDC/4.5 to 30 VDC Internal circuits OUT L L 24 VDC/4.5 to 30 VDC COM (-) OUT *1 If the ambient temperature is maintained below 50°C, up to 0.9 A/common can be used. (A) 0.9 Total current for common 0.8 0 Ambient temperature 50 55 (°C) *2 The fuse cannot be replaced by the user. Replace the Unit if the fuse breaks due to a short-circuit or overcurrent. *3 Do not connect a load to an output terminal or apply a voltage in excess of the maximum switching capacity.

28 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Specifications of Expansion Units Analog Input Units Model Item Number of inputs Input signal range Max. rated input External input impedance Resolution Overall accuracy 25°C 0 to 55°C Voltage Input 4 inputs (4 words allocated) 0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC, or 10 to 10 VDC ±15 V 1 M min. 1/6000 (full scale) 0.3% full scale 0.6% full scale 16-bit binary (4-digit hexadecimal) Full scale for 10 to 10 V: F448 to 0BB8 Hex Full scale for other ranges: 0000 to 1770 Hex Supported (Set in output words n+1 and n+2.) Supported 2 ms/point (8 ms/all points) Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals. 5 VDC: 100 mA max.; 24 VDC: 90 mA max. 0.

4% full scale 0.8% full scale 0 to 20 mA or 4 to 20 mA ±30 mA Approx. 250 CP1W-AD041 Current Input A/D conversion data Averaging function Open-circuit detection function Conversion time Isolation method Current consumption Analog Output Units Model Item Number of outputs Output signal range External output allowable load resistance Analog output section Resolution Overall accuracy 25°C 0 to 55°C Voltage Output 4 outputs (4 words allocated) 1 to 5 VDC, 0 to 10 VDC, or 10 to 10 VDC 2 k min.



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0 to 20 mA or 4 to 20 mA 350 max. --CPIW-DA04I Current Output External output impedance 0.
5 max. 1/6000 (full scale) 0.4% full scale 0.8% full scale 16-bit binary (4-digit hexadecimal) Full scale for 10 to 10 V: F448 to 0BB8 Hex Full scale for other ranges: 0000 to 1770 Hex 2 ms/point (8 ms/all points) D/A conversion data Conversion time Isolation method Current consumption Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals.

5 VDC: 80 mA max.; 24 VDC: 124 mA max. 29 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Analog I/O Units Model Item Number of inputs Input signal range Max. rated input External input impedance Analog Input Section Resolution Overall accuracy 25°C 0 to 55°C Voltage I/O 2 inputs (2 words allocated) 0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC, or -10 to 10 VDC ±15 V 1 M min. 1/6000 (full scale) 0.3% full scale 0.6% full scale 16-bit binary (4-digit hexadecimal) Full scale for -10 to 10 V: F448 to 0BB8 hex Full scale for other ranges: 0000 to 1770 hex Supported (Settable for individual inputs via DIP switch) Supported 1 output (1 word allocated) 1 to 5 VDC, 0 to 10 VDC, or -10 to 10 VDC, 1 k min. 0.5 max. 1/6000 (full scale) 25°C 0 to 55°C 0.

4% full scale 0.8% full scale 16-bit binary (4-digit hexadecimal) Full scale for -10 to 10 V: F448 to 0BB8 hex Full scale for other ranges: 0000 to 1770 hex 2 ms/point (6 ms/all points) Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals. 5 VDC: 83 mA max., 24 VDC: 110 mA max. 0 to 20 mA or 4 to 20 mA 600 max. 0.4% full scale 0.8% full scale 0 to 20 mA or 4 to 20 mA ±30 mA Approx. 250 CP1W-MAD11 Current I/O A/D conversion data Averaging function Open-circuit detection function Number of outputs Output signal range Allowable external output load resistance Analog Output Section External output impedance Resolution Overall accuracy Set data (D/A conversion) Conversion time Isolation method Current consumption Temperature Sensors Units Item Temperature sensors Number of inputs Allocated input words Accuracy Conversion time Converted temperature data Isolation Current consumption CP1W-TS001 Thermocouples Switchable between K and J, but same type must be used for all inputs.

2 2 4 4 CP1W-TS002 CP1W-TS101 Platinum resistance thermometer Switchable between Pt100 and JPt100, but same type must be used for all inputs. 2 2 4 4 CP1W-TS102 (The larger of ±0.5% of converted value or ±2°C) ±1 digit max. * 250 ms for 2 or 4 input points 16-bit binary data (4-digit hexadecimal) Photocouplers between all temperature input signals 5 VDC: 40 mA max., 24 VDC: 59 mA max. (The larger of ±0.5% of converted value or ±1°C) ±1 digit max. 5 VDC: 54 mA max., 24 VDC: 73 mA max. * Accuracy for a K-type sensor at -100°C or less is ±4°C ±1 digit max. The rotary switch is used to set the temperature range. Setting 0 1 2 3 4 to F K J --CP1W-TS001/TS002 Input type Range (°C) -200 to 1,300 0.0 to 500.0 -100 to 850 0.0 to 400.0 Cannot be set. Range (°F) -300 to 2,300 0.0 to 900.0 -100 to 1,500 0.0 to 750.

0 Input type Pt100 JPt100 -----Cannot be set. CP1W-TS101/TS102 Range (°C) -200.0 to 650.0 -200.0 to 650.0 Range (°F) -300.0 to 1,200.0 -300.0 to 1,200.0 CompoBus/S I/O Link Unit Model number Master/slave Number of I/O points Number of words allocated in CPU Unit I/O memory Node number setting CompoBus/S Slave 8 input points, 8 output points 1 input word, 1 output word Set using the DIP switch (Set before turning on the CPU Unit's power supply.) CP1W-SRT21 30 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ External Interfaces The CP1E CPU Units provide the following external interfaces. E10/14/20 or N14/20 CPU Units E-type N-type Power supply input terminals Input terminal block Input indicators Peripheral USB port Analog adjusters Operation indicators Output terminals Ground terminal Input terminals Built-in RS-232C communications status indicator Built-in RS-232C port Output indicators Output terminal block Battery cover Note: Terminal Block (Fixed) E30/40, N30/40/60 or NA20 CPU Units E-type N-type/NA-type Power supply input terminals Input terminal block Input indicators Peripheral USB port Analog adjusters Operation indicators External power supply Input terminals Battery cover Built-in RS-232C communications status indicator Analog input terminal (NA-type only) Ground terminal Expansion I/O Unit connector Output indicators Output terminal block Analog output terminals (NA-type only) Built-in RS-232C port Serial Option Board slot Output terminals Note: Terminal Block (Fixed) Built-in RS-232C Port for N/NA-type CPU Units RS-232C Connector 5 1 Pin 1 2 3 4 5 6 7 8 9 Connector hood FG SD (TXD) Abbr. Signal name Frame ground Send data Receive data Request to send Clear to send Power supply Data set ready Data terminal ready Signal ground Frame Ground -- Signal direction Output Input Output Input -Input Output --- RD (RXD) RS (RTS) CS (CTS) 5V DR (DSR) ER (DTR) SG (0 V) FG 9 6 Note: Do not use the 5-V power from pin 6 of the RS-232C port for anything but CJ1W-CIF11 RS-422A Conversion Adapter, NT-AL001 RS-232C/RS-422A Conversion Adapter and NV3W-M@20L Programmable Terminal. The external device or the CPU Unit may be damaged. 31 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Optional Serial Communications Board for N30/40/60 or NA20 CPU Units CP1E N30/40/60 or NA20 CPU Units Built-in RS-232C port Model number CP1W-CIF01 CP1W-CIF11 CP1W-CIF12 Port One RS-232C port One RS-422A/485 port (not isolated) One RS-422A/485 port (isolated) Maximum transmission distance 15 m 50 m 500 m Connection method Connector (D-sub, 9 pin female) Terminal block (using ferrules) Terminal block (using ferrules) CP1W-CIF01 RS-232C Option Board CP1W-CIF11/12 RS-422A/485 Option Board CP1W-CIF01 RS-232C Option Board Front Back Communications Status Indicator CPU Unit Connector COMM RS-232 Connector RS-232C Connector 5 1 Pin 1 2 3 4 5 6 7 8 9 Connector hood FG SD (TXD) RD (RXD) RS (RTS) CS (CTS) 5V DR (DSR) ER (DTR) SG (0 V) FG Abbr. Signal name Frame ground Send data Receive data Request to send Clear to send Power supply Data set ready Data terminal ready Signal ground Frame Ground Input Output --Output Input Output Input -Signal direction -- 9 6 Note: Do not use the 5-V power from pin 6 of the RS-232C port for anything but CJ1W-CIF11 RS-422A Conversion Adapter, NT-AL001 RS-232C/RS-422A Conversion Adapter and NV3W-M@20L Programmable Terminal. The external device or the CPU Unit may be damaged. CP1W-CIF11/CIF12 RS-422A/485 Option Board Front Back Communications Status Indicator COMM RDA-RDB+ SDA- SDB+ FG CPU Unit Connector DIP Switch for Operation Settings RS-422A/485 Connector RS-422A/485 Terminal Block Tighten the terminal block screws to a torque of 0.



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28 N-m. RDARDB+ SDAFG SDB+ 32 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Connecting to Support Software Operating Environment and System Configuration The following system is required to operate the CX-Programmer.

Make sure your system provides the following conditions and has the necessary components. Item Supported computer CD-ROM or DVD-ROM drive One or more Description IBM PC/AT or equivalent Windows 7, Windows Vista, Windows XP, Supported Operating Systems Windows 2000 (Service Pack 4 or later) (except 64-bit edition) CPU RAM Available hard disk space Display PLC and connection port Pentium II 333 MHz or faster 256 MB min. 512 MB or more recommended 600 MB min. 800 x 600 SVGA min. USB port Connecting Methods Using commercially available USB cable, connect the CX-Programmer to the peripheral USB port on the CPU Unit. CX-Programmer USB port A connector Commercially available USB cable * B connector Peripheral USB port (Conforming to USB 2.0, B connector) Note: The CX-Programmer cannot be used if it is connected to the built-in RS-232C port or serial option port of a CP1E CPU Unit. * Commercially available USB cable: 5 m max., for USB 2.0.

CP1E CPU Unit Connecting Cable Use the following cable to connect the CP1E CPU Unit to the computer running the Support Software. Port at Unit Peripheral USB port (Conforming to USB 2.0, B connector) Port at computer USB port Network type (communications mode) USB 2.0 (or 1.1) Model numbers Commercially available USB cable (A connector - B connector) Length Less than 5 m 33 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Unit Versions Units CP1E CPU Units Model numbers CP1E-E@@D@-@ CP1E-N@@D@-@ CP1E-NA@@D@-@ Unit version Unit version 1.@ Unit Versions and Programming Devices The following tables show the relationship between unit versions and CX-Programmer versions. Unit Versions and Programming Devices Required Programming Device * CPU Unit Functions Ver.8.1 or lower CP1E-E10D@-@ CP1E-@14D@-@ CP1E-N60D@-@ CP1E-NA20D@-@ CP1E-E20/30/40D@-A CP1E-N20/30/40D@-@ Unit version Not support. 1.

@ functions CX-Programmer Ver.8.2 Ver.9.03 or higher Yes Supports Smart Input function.

Yes Supports Smart Input function. Micro PLC Edition CX-Programmer Ver.8.1 or lower Not support. Ver.

8.2 Ver.9.0 Ver.9.03 or higher Yes Supports Smart Input function. Yes Supports Smart Input function. CXProgrammer for CP1E Ver.1.0 Not support.

Yes Does not support Smart Input function. Not support. Yes Does not support Smart Input function. Not support. Not support. Unit version Not support. 1.@ functions Not support. Yes Supports Smart Input function. Yes Supports Smart Input function.

* A Programming Console cannot be used. 34 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Programming Instructions Sequence Input Instructions Instruction LOAD LOAD NOT AND AND NOT OR OR NOT AND LOAD OR LOAD NOT CONDITION ON CONDITION OFF LD LD NOT AND AND NOT OR OR NOT AND LD OR LD NOT UP DOWN Input Comparison Instructions (double, unsigned) Input Comparison Instructions (unsigned) Mnemonic Comparison Instructions Instruction Mnemonic LD,AND,OR+= LD,AND,OR+<> LD,AND,OR+< LD,AND,OR+<= LD,AND,OR+> LD,AND,OR+>= LD,AND,OR+=+L LD,AND,OR+<>+L LD,AND,OR+<+L LD,AND,OR+<=+L LD,AND,OR+>+L LD,AND,OR+>=+L LD,AND,OR+=+S LD,AND,OR+<>+S Input Comparison Instructions (signed) LD,AND,OR+<+S LD,AND,OR+<=+S LD,AND,OR+>+S LD,AND,OR+>=+S LD,AND,OR+=+SL LD,AND,OR+<>+SL Input Comparison Instructions (double, signed) LD,AND,OR+<+SL LD,AND,OR+<=+SL LD,AND,OR+>+SL LD,AND,OR+>=+SL =DT <>DT Time Comparison Instructions <DT <=DT >DT >=DT COMPARE DOUBLE COMPARE SIGNED BINARY COMPARE DOUBLE SIGNED BINARY COMPARE TABLE COMPARE UNSIGNED BLOCK COMPARE AREA RANGE COMPARE DOUBLE AREA RANGE COMPARE CMP CMPL CPS CPSL TCMP BCMP ZCP ZCPL Sequence Output Instructions Instruction OUTPUT OUTPUT NOT KEEP DIFFERENTIATE UP DIFFERENTIATE DOWN SET RESET MULTIPLE BIT SET MULTIPLE BIT RESET SINGLE BIT SET SINGLE BIT RESET OUT OUT NOT KEEP DIFU DIFD SET RSET SETA RSTA SETB RSTB Mnemonic Sequence Output Instructions Instruction END NO OPERATION INTERLOCK INTERLOCK CLEAR MULTI-INTERLOCK DIFFERENTIATION HOLD MULTI-INTERLOCK DIFFERENTIATION RELEASE MULTI-INTERLOCK CLEAR JUMP JUMP END CONDITIONAL JUMP FOR LOOP BREAK LOOP NEXT LOOP END NOP IL ILC MILH MILR MILC JMP JME CJP FOR BREAK NEXT MOVE DOUBLE MOVE MOVE NOT MOVE BIT MOVE DIGIT MULTIPLE BIT TRANSFER BLOCK TRANSFER BLOCK SET DATA EXCHANGE SINGLE WORD DISTRIBUTE DATA COLLECT Mnemonic Data Movement Instructions Instruction MOV MOVL MVN MOVB MOVD XFRB XFER BSET XCHG DIST COLL Mnemonic Timer and Counter Instructions Instruction TIMER COUNTER HIGH-SPEED TIMER ONE-MS TIMER ACCUMULATIVE TIMER LONG TIMER REVERSIBLE COUNTER RESET TIMER/COUNTER TIM TIMX CNT CNTX TIMH TIMHX TMHH TMHHX TTIM TTIMX TIML TIMLX CNTR CNTRX CNR CNRX Mnemonic 35 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Data Shift Instructions Instruction SHIFT REGISTER REVERSIBLE SHIFT REGISTER WORD SHIFT ARITHMETIC SHIFT LEFT ARITHMETIC SHIFT RIGHT ROTATE LEFT ROTATE RIGHT ONE DIGIT SHIFT LEFT ONE DIGIT SHIFT RIGHT SHIFT N-BITS LEFT DOUBLE SHIFT N-BITS LEFT SHIFT N-BITS RIGHT DOUBLE SHIFT N-BITS RIGHT SFT SFTR WSFT ASL ASR ROR SLD SRD NASL NSLL NASR NSRL Mnemonic Conversion Instructions Instruction BCD-TO-BINARY DOUBLE BCD-TO-DOUBLE BINARY BINARY-TO-BCD 2'S COMPLEMENT DATA DECODER DATA ENCODER ASCII CONVERT ASCII TO HEX BIN BINL BCD NEG MLPX DMPX ASC HEX Mnemonic DOUBLE BINARY-TO-DOUBLE BCD BCDL Logic Instructions Instruction LOGICAL AND DOUBLE LOGICAL AND LOGICAL OR DOUBLE LOGICAL OR EXCLUSIVE OR DOUBLE EXCLUSIVE OR COMPLEMENT DOUBLE COMPLEMENT ANDW ANDL ORW ORWL XORW XORL COM COML Mnemonic Increment/Decrement Instructions Instruction INCREMENT BINARY DOUBLE INCREMENT BINARY DECREMENT BINARY DOUBLE DECREMENT BINARY INCREMENT BCD DOUBLE INCREMENT BCD DECREMENT BCD DOUBLE DECREMENT BCD ++ ++L --L ++B ++BL --B --BL Mnemonic Special Math Instructions Instruction ARITHMETIC PROCESS BIT COUNTER Mnemonic APR BCNT Mnemonic Symbol Math Instructions Instruction SIGNED BINARY ADD WITHOUT CARRY DOUBLE SIGNED BINARY ADD WITHOUT CARRY DOUBLE SIGNED BINARY ADD WITH CARRY BCD ADD WITHOUT CARRY BCD ADD WITH CARRY DOUBLE BCD ADD WITH CARRY SIGNED BINARY SUBTRACT WITHOUT CARRY DOUBLE SIGNED BINARY SUBTRACT WITH CARRY DOUBLE SIGNED BINARY SUBTRACT WITH CARRY DOUBLE BCD SUBTRACT WITHOUT CARRY BCD SUBTRACT WITH CARRY DOUBLE BCD SUBTRACT WITH CARRY SIGNED BINARY MULTIPLY BCD MULTIPLY DOUBLE BCD MULTIPLY SIGNED BINARY DIVIDE DOUBLE SIGNED BINARY DIVIDE BCD DIVIDE DOUBLE BCD DIVIDE + +L Floating-point Math Instructions Instruction FLOATING TO 16-BIT FLOATING TO 32-BIT 16-BIT TO FLOATING 32-BIT TO FLOATING FLOATING-POINT ADD FLOATING-POINT SUBTRACT FLOATING-POINT DIVIDE FLOATING-POINT MULTIPLY FIX FIXL FLT FLTL +F -F /F *F LD, AND, OR+=F LD, AND, OR+<>F Floating Symbol Comparison LD, AND, OR+<F LD, AND, OR+<=F LD, AND, OR+>F LD, AND, OR+>=F FLOATING- POINT TO ASCII ASCII TO FLOATING-POINT FSTR FVAL Mnemonic SIGNED BINARY ADD WITH CARRY +C +CL +B +BC +BCL -L -C -CL DOUBLE BCD ADD WITHOUT CARRY +BL BCD SUBTRACT WITHOUT CARRY -B -BL -BC -BCL * *B *BL /L /B /BL Table Data Processing Instructions Instruction SWAP BYTES FRAME CHECKSUM SWAP FCS Mnemonic DOUBLE SIGNED BINARY MULTIPLY *L Data Control Instructions Instruction PID CONTROL WITH AUTOTUNING PIDAT TIME-PROPORTIONAL OUTPUT SCALING SCALING 2 SCALING 3 AVERAGE TPO SCL SCL2 SCL3 AVG Mnemonic 36 CP1E-E@@D@-@ CP1E-N@@D@-@/NA20D@-@ Subroutine Instructions Instruction SUBROUTINE CALL SUBROUTINE ENTRY SUBROUTINE RETURN SBS SBN RET Mnemonic Interrupt Control Instructions Instruction SET INTERRUPT MASK CLEAR INTERRUPT DISABLE INTERRUPTS ENABLE INTERRUPTS MSKS CLI DI EI Mnemonic High-speed Counter and Pulse Output Instructions Instruction MODE CONTROL HIGH-SPEED COUNTER PV READ COMPARISON TABLE LOAD SPEED OUTPUT SET PULSES PULSE OUTPUT ACCELERATION

*CONTROL ORIGIN SEARCH PULSE WITH VARIABLE DUTY FACTOR INI PRV CTBL SPED PULS PLS2 ACC ORG PWM Mnemonic Step Instructions
Instruction STEP DEFINE STEP START STEP SNXT Mnemonic I/O Unit Instructions Instruction I/O REFRESH 7-SEGMENT DECODER DIGITAL
SWITCH INPUT MATRIX INPUT 7-SEGMENT DISPLAY OUTPUT IORF SDEC DSW MTR 7SEG Mnemonic Serial Communications Instructions
Instruction TRANSMIT RECEIVE TXD RXD Mnemonic Clock Instructions Instruction CALENDAR ADD CALENDAR SUBTRACT CLOCK ADJUSTMENT
CADD CSUB DATE Mnemonic Failure Diagnosis Instructions Instruction FAILURE ALARM SEVERE FAILURE ALARM FAL FALS Mnemonic Other
Instructions Instruction SET CARRY CLEAR CARRY EXTEND MAXIMUM CYCLE TIME STC CLC WDT Mnemonic 37 CP1E-E@@D@-@ CP1E-
N@@D@-@/NA20D@-@ Dimensions CP1E CPU Unit CPU Units with 10 I/O Points 66 56 85 8 (Unit: mm) 110 100 90 Two, 4.*



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