CS1 Series, C200HX/HG/HE, C200HS
# DeviceNet (CompoBus/D)

CompoBus/D Master Unit: **C200HW-DRM21-V1**
CompoBus/D Slaves: **DRT1 Series**
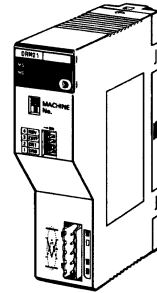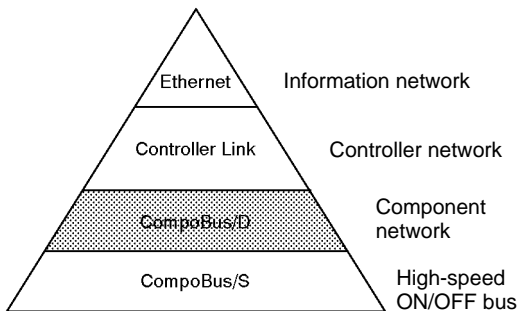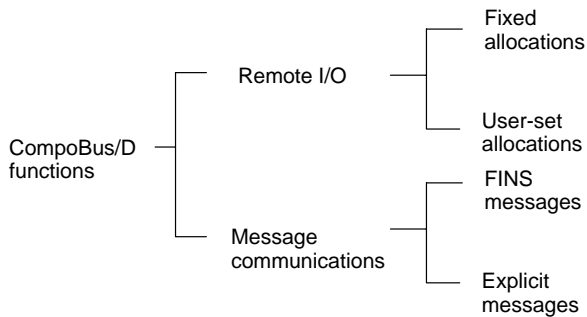CompoBus/D Configurators: **3G8F5-DRM21, 3G8E2-DRM21**

## Multivendor, Multibit Network

■ CompoBus/D is a multibit, multivendor network that combines controls and data on a machine/line-control level and that conforms to the DeviceNet open field network specifications. CompoBus/D has the following features.
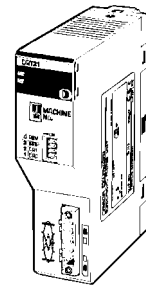
1. Remote I/O communications to automatically exchange I/O data between the Slaves and CPU Unit without requiring a program in the CPU Unit.

2. Message communications to read messages and control operations of Slaves or other CPU Units under which a Master Unit is mounted using IOWR instructions in the program of the CPU Unit under which the Master Unit is mounted.

**Note:** A CompoBus/D network cannot communicate across other networks such as a Controller Link network or Ethernet. The following functions are possible using the Configurator software. (The Configurator operates on an IBM PC/AT or compatible as a CompoBus/D node.)

1. Enables flexible allocation of remote I/O.
2. Enables multiple Master Units on a single CPU Unit.
3. Enables multiple Master Units in a single network.



**C200HW-DRM21-V1**    **C200HW-DRT21**



**CompoBus/D functions**

- Remote I/O
  - Fixed allocations
  - User-set allocations
- Message communications
  - FINS messages
  - Explicit messages



- Ethernet — Information network
- Controller Link — Controller network
- CompoBus/D — Component network
- CompoBus/S — High-speed ON/OFF bus

## ■ System Configuration Example
### I/O Terminals Connected as Slaves



CompoBus/D Master Unit

CompoBus/D

500 kbps: 100 m
125 kbps: 500 m

Slaves

63 Units
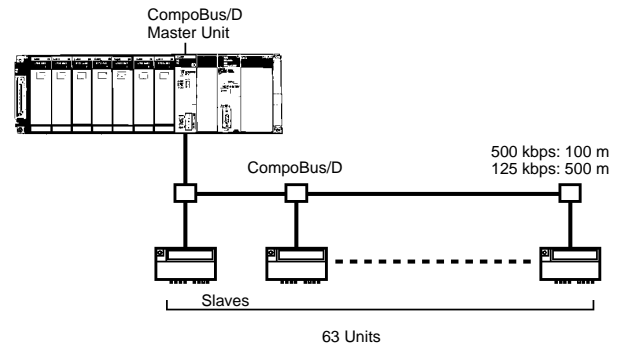
### I/O Link Units Connected with other PCs as Slaves



CompoBus/D Master Unit

CompoBus/D

C200HX/HG/HE or CS1 Series

CQM1

C200H I/O Link Unit

CQM1 I/O Link Unit
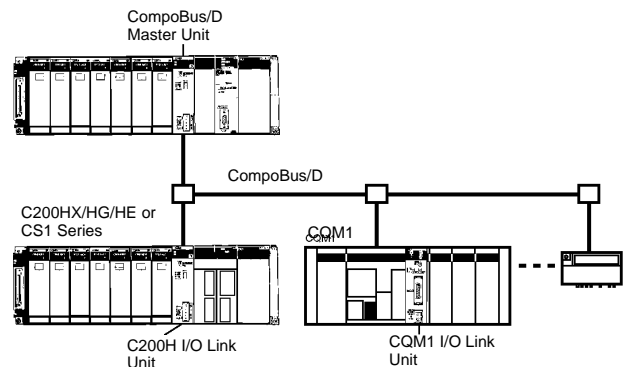
"Programmable Controller" is abbreviated as "PC" in these *Specification Sheets*.

## ■ Features

### Multi-vendor Network

The CompoBus/D conforms to the DeviceNet open field network specification, which means that devices (Masters and Slaves) produced by other manufacturers can also be connected to the Network. A wide range of field-level applications can thus be supported by combining valve devices, sensors, and other devices.

### Simultaneous Remote I/O and Message Services

Remote I/O communications to constantly exchange I/O data between the PC and Slaves can be executed simultaneously with message communications, to send/receive Master Unit data as required by the application. A CompoBus/D Network can thus be installed to flexibly handle applications that require both bit data and message data. Message communications can be achieved either by using OMRON's FINS commands or by using explicit DeviceNet messages.
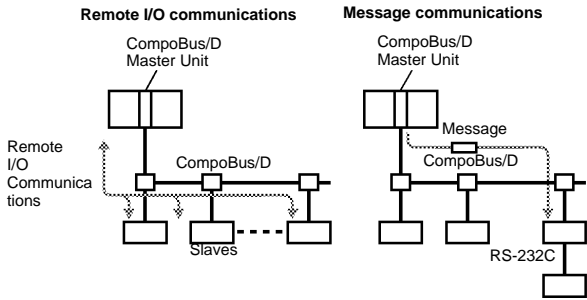


### Easily Expand or Change Lines with Various Connection Methods

Use a multi-drop trunk line, T-branch multi-drop lines, or daisy-chain drop lines. All three connection methods can be combined to flexibly construct a network that meets the needs of the application.

### Maximum Network Length of 500 m

Baud rate of 125 kbps using Thick Cables.

### Remote I/O Communications between a Maximum of 63 Slaves and 1600 I/O Points per Master Unit (Without a Configurator)

### Maximum baud rate of 500 kbps

When the main line is 100 m.

### Connect Multiple PCs to the Same Network

A Configurator (sold separately) can be used to connect more than one Master to the Network, allowing message communications between PCs and between multiple groups of PCs and Slaves. This allows the CompoBus/D Network to be used as a common bus to unify controls while reducing wiring.

### Multiple Master Units Handle Multi-point Control and Line Expansions

A Configurator (sold separately) can be used to mount more than one Master Unit to a single PC, allowing control of many more points. This feature can easily handle line expansions and other applications.

### Free Remote I/O Allocation

A Configurator (sold separately) can be used to enable flexible allocation of I/O, i.e., in any area and in any order. This allows I/O allocations that suit the application to simplify programming and enable effective usage of PC memory areas.

### Handle Slaves with Different Response Speeds

A Configurator (sold separately) can be used to set the communications cycle time, enabling usage of Slaves with slow response times.

### Wide Variety of Slaves

A wide variety of I/O devices can be used as Slaves, such as Remote I/O Terminals, Environment-resistant Terminals, Remote Adapters, Sensor Terminals, Temperature Input Terminals, CQM1 I/O Link Units, Analog I/O Terminals, C200H I/O Link Units, RS-232C Units, MULTIPLE I/O TERMINALs, Temperature Controllers, Inverters, and Intelligent Flags.

### Constant Data Exchange between Slave CPU Units and I/O Memory

A C200H I/O Link Unit can be used as a Slave to exchange data constantly from the set area in the Slave CPU Unit's I/O Memory (can be set by area type) to a maximum I/O of 32 words each. This allows the Master's CPU Unit to control the CPU Unit or Special I/O Units of the PC to which the C200H I/O Link Unit is mounted.

### Construct Slave Interfaces canned MULTIPLE I/O TERMI-NALs Using Multipoint Building-block Units

Different types of I/O Units can be connected to create I/O interfaces using Communications Units on the CompoBus/D network. Any I/O Unit, such as Transistor I/O Units, Relay I/O Units, Analog Input Units, Analog Output Units, and High-Speed Counter Units, may be used. I/O Unit interfaces do not require allocation or address settings, thus making flexible distributed I/O control easy.

## Overall System Configuration



**Note** A CompoBus/D Configurator is required if multiple Master Units are to be connected to one network.

□ : T-branch Taps or multi-drop connections
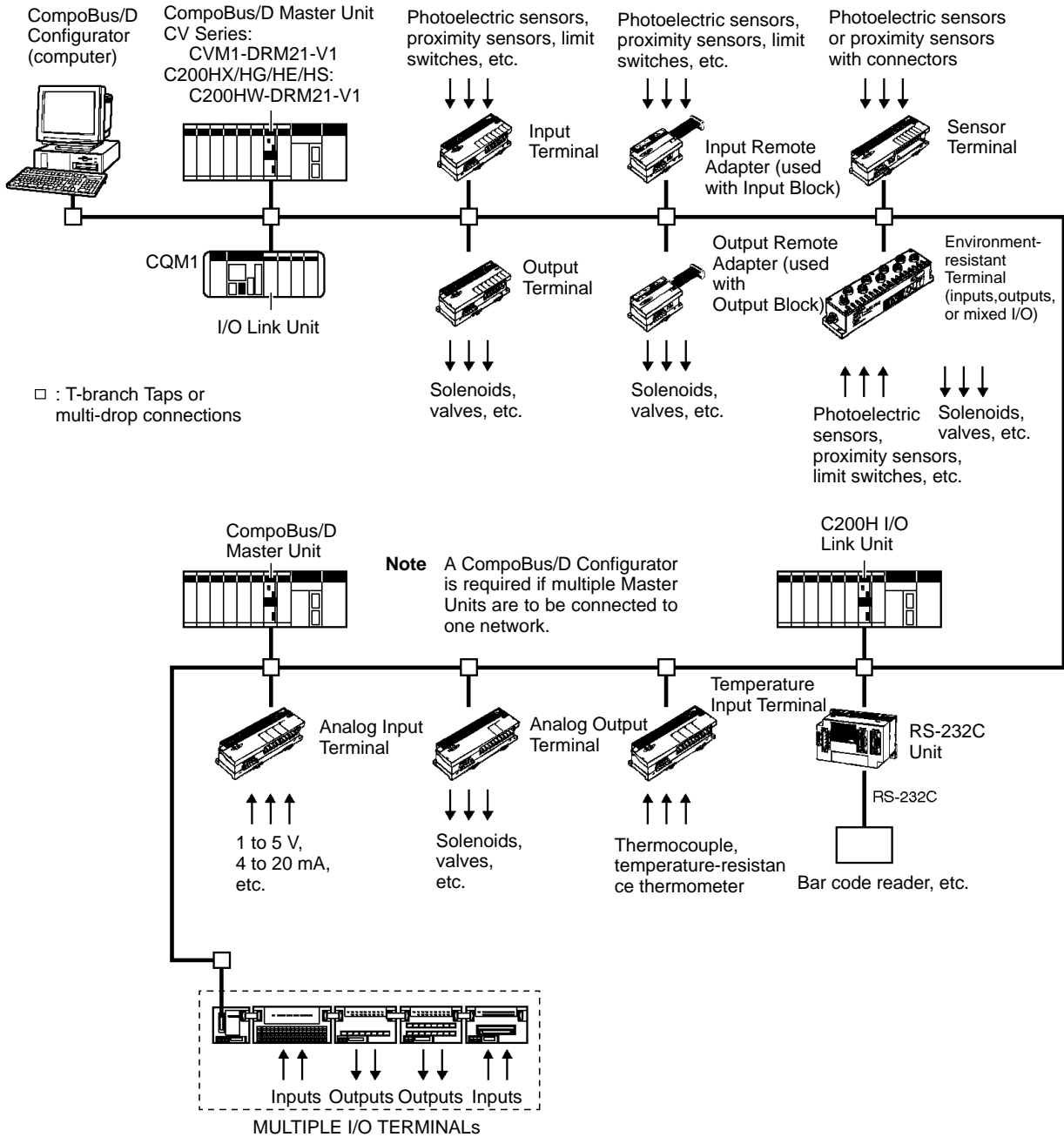
## Slave Features

### I/O Terminals

- Provide general-purpose I/O via terminal blocks (M3).
- Available in 8-point and 16-point models with transistor inputs or outputs.

### Environment-resistant Terminals

- Improved I/O Terminals that conform to IP66 for spatter-, water-, and oil-resistance.
- Available in 8-point models with transistor inputs or outputs, and 16-point models with transistor I/O (8 inputs and outputs).

### Remote Adapters

- Used in combination with G70D and other I/O Blocks to handle relay outputs, power MOS FET Relay outputs, etc.
- Available in 16-point models with transistor inputs or outputs.

### C200H I/O Link Units

- Special I/O Slaves that mount to C200HX/HG/HE PCs and read/write data from the Master Unit to the specified words in the CPU Unit.

- Read and write areas specified for up to 512 bits each (32 words each).
- Any memory area words can be read or written using DeviceNet explicit messages.

### CQM1 I/O Link Units

- More than one I/O Link Unit can be mounted to a CQM1 PC.
- Link 16 inputs and 16 outputs between the PC and the Master Unit.

### Sensor Terminals

- Accept inputs from photoelectric and proximity sensors with connectors.
- Available in 16-point input and 8-point input/8-point output models.
- Output signals can be used for sensor teaching and external diagnosis.

### Analog Input Terminals

- Convert analog inputs to binary.
- Switchable between 2 and 4 input points using the DIP switch.

- Handle inputs of 0 to 5 V, 1 to 5 V, 0 to 10 V, –10 to 10 V, 0 to 20 mA, or 4 to 20 mA.

- Available in models with a resolution of either 1/6,000 or 1/30,000.

**Analog Output Terminals**

- Convert binary data to analog outputs.

- Provides outputs of 1 to 5 V, 0 to 10 V, –10 to 10 V, 0 to 20 mA, or 4 to 20 mA.

**Temperature Input Terminals**

- Temperature data is input as binary data for 4 inputs.

- Thermocouple and temperature-resistance thermometer inputs are available.

**RS-232C Units**

- Special I/O Slaves that provide two RS-232C ports and control I/O from the Master Units.

**MULTIPLE I/O TERMINALs**

- Multiple I/O Units can be combined under a Communications Unit and treated as a single Slave.

- Special I/O Units, such as Analog I/O Units, and High-speed Counter Units are also available.

## ■ Communications Specifications

| Item | | Specification |
|---|---|---|
| Communications protocol | | DeviceNet |
| Connection forms (see note 1) | | Combination of multi-drop and T-branch connections (for trunk or drop lines) |
| Baud rate | | 500 kbps, 250 kbps, or 125 kbps (switchable) |
| Communications media | | Special 5-wire cables (2 signal lines, 2 power lines, 1 shield line) |
| Communications distances | 500 kbps | Network length: 100 m max. (see note 2) Drop line length: 6 m max. Total drop line length: 39 m max. |
| | 250 kbps | Network length: 250 m max. (see note 2) Drop line length: 6 m max. Total drop line length: 78 m max. |
| | 125 kbps | Network length: 500 m max. (see note 2) Drop line length: 6 m max. Total drop line length: 156 m max. |
| | Parentheses indicate the length when Thin Cables are used. | |
| Communications power supply | | Supply 24 VDC±10% |
| Max. number of nodes | | 64 nodes (including Configurator when used) |
| Max. number of Masters | | Without Configurator: 1 |
| | | With Configurator:     63 |
| Max. number of Slaves | | 63 Slaves |
| Error control checks | | CRC error check |

**Note:**   1. Use a terminating resistor at both ends of the main line.

2. Value when using a Thick Cable on the main line. The communications distance is reduced to 100 m maximum when using a Thin Cable.

3. Maximum time from remote I/O communications with a Slave that has a Master to remote I/O communications with the same Slave once again.

### ■ Master Units

**Model**

| Applicable PC | Master Unit model number | Type of communications | Model |
|---|---|---|---|
| CS1, C200HX/HG/HE, C200HS | C200H Special I/O Unit | Remote I/O communications (fixed or user-set allocations), and messages | C200HW-DRM21-V1 |

**Specifications**

| Item | | C200HW-DRM21-V1 | | |
|---|---|---|---|---|
| **Applicable PC** | | **CS1 Series** | **C200HX/HG/HE** | **C200HS** |
| **Unit classification** | | C200H Special I/O Unit | | |
| **Unit number settings** | | 0 to F or 0 to 9 (depending on PC model: Refer to documentation for applicable CPU Unit.) | | 0 to 9 |
| **Mounting position** | | CPU Rack, C200H Expansion I/O Rack, or CS1 Expansion Rack (Cannot be mounted to a SYSMAC BUS Slave Rack.) (see note 1) | | |
| **Maximum number of Units** | **Without Configurator** | 1 Unit | | |
| | **With Configurator** | 16 Units | CPU Units with more than 880 I/O points: 16 Units | 10 Units |
| | | | CPU Units with 880 or fewer I/O points: 10 Units | |
| **Data exchange with CPU Units** | **CompoBus/D I/O Area** | Outputs: Words CIO 0050 to CIO 0099 | Outputs: Words CIO 050 to CIO 099 | Outputs: Words CIO 050 to CIO 081 |
| | | Inputs: Words CIO 0350 to CIO 0399 | Inputs: Words CIO 350 to CIO 399 | Inputs: Words CIO 350 to CIO 381 |
| | **Special I/O Unit words in CIO Area** | 10 words/Unit | | |
| | | CPU Unit to DeviceNet Master Unit: Software switches: 1 word | | |
| | | DeviceNet Master Unit to CPU Unit: Status area: 9 words | | |
| | **Special I/O Unit words in DM Area** | Not used | | |
| | **Other DM Area words** | 2 words/Unit in DM 6032 to DM 6062: 2-word status area | | |
| **Connections supported** | | Master/Slave connection: Remote I/O and explicit messages | | |
| | | Peer-to-peer connection: FINS messages communications | | |
| | | Both conform to DeviceNet communications protocol | | |
| **Communications cycle time (see note 3)** | | Without Configurator: Depends on conditions | | |
| | | Example: Input Slave (16 points) 16 Units, Output Slave (16 points) 16 Units, baud rate 500 kbps: 9.3 ms | | |
| | | With Configurator: Set from 2 to 500 ms (Calculated value enabled when calculated value due to conditional expression > setting value | | |
| **Supported communications** | **Remote I/O communications** | Possible | | |
| | **Message communications** | Possible | | Not possible (can receive commands addressed to Master Unit) |
| **Remote I/O communications** | **Maximum No. of Slaves/ Master Unit** | **Without Configurator (fixed allocation)** | 50 nodes | 32 nodes |
| | | **With Configurator (user-set allocation)** | 63 nodes | 63 nodes |
| | **Maximum No. I/O points/ Master Unit** | **Without Configurator** | 1600 points (50 words Input, 50 words Output) | 1024 points (32 words Input, 32 words Output) |
| | | **With Configurator** | 300 words (with no message communications) | 80 words (4 block total) |
| | | | 100 words (with message communications) | |
| | **Maximum No. of I/O points/Slaves for I/O communications with Master Unit** | | 32 words input, 32 words output | |

| Item | | | C200HW-DRM21-V1 | | |
|---|---|---|---|---|---|
| **Applicable PC** | | | **CS1 Series** | **C200HX/HG/HE** | **C200HS** |
| **Message communications** | **Maximum No. of messages/ Master Unit** | **FINS messages** | 8 nodes | | Not possible |
| | | **Sending explicit messages** | 63 nodes | | Not possible |
| | **Execution commands** | **Sending and receiving data** | None | None | --- |
| | | **FINS commands** | IOWR instruction | IOWR instruction | --- |
| **Software switches** | | | 1 word (Scan list registration/clear, remote I/O communications start/stop, etc.) | | |
| **Status** | | | 11 words (Master status area, registered Slave information, normal Slave information, communications cycle time current value) | | |
| **Setting switches** | | | Rotary switches: Unit No. | | |
| | | | Rear-panel DIP switch: Node address | | |
| | | | Front-panel DIP switch: Baud rate, communications continue/stop on error | | |
| **Indicators** | | | LED (2 colors) x 2: Display Module status and network status | | |
| | | | 7-segment LED x 1: Displays Master Unit's node address, error code, error node's address | | |
| **Front-panel connections** | | | Communications connector x 1 (communications data: CAN H, CAN L, communications power: V+, V–, shield) | | |
| | | | Connect the communications cable using the applicable connector (XW4B-05C1-H1-D) | | |
| | | | Note: Use a XW4B-05C4-T-D connector (sold separately) when using a multidrop connection. | | |
| **Communications power supply voltage** | | | 24 VDC ±10% (supplied using a special cable) | | |
| **Effect on CPU Unit cycle time** | | | 1.72 ms + 0.0022 x No. of words allocated | | |
| **Current consumption** | | | Communications power: 45 mA max. (supplied using a communications connector) | | |
| | | | Internal circuit power: 250 mA max. (5 VDC) (supplied from Power Supply Unit) | | |
| **Dimensions** | | | 35 x 130 x 100 mm (W x H x D) | | |
| **Weight** | | | 250 g | | |
| **Standard accessories** | | | Connector (XW4B-05C1-H1-D) x 1 (for node connections from a T-branch Tap) | | |
| **Cat. No.** | | | W267 (Slave manual: W347) | | |

**Note:** **Mounting and Allocation Limitations**

- When mounting to CS1-series PC: CompoBus/D CIO Area (Output words CIO 0050 to CIO 0099, Input words CIO 0350 to CIO 0399) overlap with the general–purpose I/O words in the CIO Area (CIO 0000 to CIO 0319). Consequently, be sure to allocate fixed remote I/O so that it does not overlap with CompoBus/D CIO allocations. (You can use a Configurator to allocate remote I/O, and use remote I/O communications so that the remote I/O Area does not overlap with the CompoBus/D words.)

- When mounting to SYSMAC C200HX/HG/HE: CompoBus/D CIO Area (Output words CIO 050 to CIO 099) overlap with the SYSMAC BUS words in the CIO Area. Consequently, be sure to allocate fixed remote I/O so that it does not overlap with CompoBus/D CIO allocations. (You can use a Configurator to allocate remote I/O, and use remote I/O communications so that the SYSMAC BUS words in the CIO Area do not overlap with the CompoBus/D words.)

## ■ Accessories (Sold Separately)

| Name | Specifications | Model |
|---|---|---|
| Special Cables | 5-wire Thin Cable 100 m | DCA1-5C10 |
| | 5-wire Thick Cable 100 m | DCA-5C10 |
| T-branch Tap | 1-branch tap (with connector) | DCN1-1C |
| | 3-branch tap (with connector) | DCN1-3C |
| | Shielded 1-branch tap | DCN2-1 |
| Terminal Block with Terminating Resistor | --- | DRS1-T |
| Connector with Terminating Resistor | Plug | DRS2-1 |
| | Socket | DRS2-2 |
| Special Node Connectors | For T-branch tap connection (1 connector supplied with Unit as standard) | XW4B-05C1-H1-D |
| | For multidrop connection | XW4B-05C4-T-D |
| Special Driver Connector (special CompoBus/D connector tool) | Manufactured by OMRON | XW4Z-00C |
| | Manufactured by OMRON 2-4 Service | SZF-1 |
| Power Supply Tap | Required when connecting multiple communications power supply units. (Manufactured by Allen-Bradley.) | 1485T-P2T5-T5 |
| | Equipped with power supply reverse current prevention function and ground terminal. | |

## ■ Applicable CPU Units

| PC | CPU Unit | Max. No. of Units that can be mounted on CPU Rack and Expansion Racks | Mounting position limitations |
|---|---|---|---|
| CS1 Series | CS1H-CPU□□ | 16 (Unit Nos. 0 to F) | None |
| | CS1G-CPU□□ | | |
| C200HX/HG/HE | C200HE-CPU11/32/42 (-Z) | 10 (Unit Nos. 0 to 9) | None |
| | C200HG-CPU33/43 (-Z) | | |
| | C200HX-CPU34/44 (-Z) | | |
| | C200HG-CPU53/63 (-Z) | 16 (Unit Nos. 0 to F) | None |
| | C200HX-CPU54/64 (-Z) | | |
| | C200HX-CPU65-Z/85-Z | | |
| C200HS | C200HS-CPU01(-□)/21(-□)/31 /03/23/33 | 10 (Unit Nos. 0 to 9) | None |
| C200H | C200H-CPU01/02/03/11/21/22/ 23/31 | cannot use | --- |

## ■ Slave Units

### Models

| Classifications | Name | I/O points | Model number | Installation | Remarks |
|---|---|---|---|---|---|
| Basic Units | Remote I/O Terminals (transistor inputs) | 8 input points | DRT1-ID08 | DIN track or screws | --- |
| | | 16 input points | DRT1-ID16 | | --- |
| | Remote I/O Terminals (transistor outputs) | 8 output points | DRT1-OD08 | | --- |
| | | 16 output points | DRT1-OD16 | | --- |
| | Environment-resistant Terminals (see note 1) (transistor I/O) | 8 input points | DRT1-ID08C | Screws | Water-resistant. Uses XS2 Sensor I/O Connector to connect I/O and CompoBus/D. |
| | | 8 output points | DRT1-OD08C | | |
| | | 8 input/8 output points | DRT1-MD16C | | |
| | Remote Adapters | 16 input points | DRT1-ID16X | DIN track or screws | --- |
| | | 16 output points | DRT1-OD16X | | --- |
| | Sensor Terminals (see note 2) | 16 input points | DRT1-HD16S | | Connected to photoelectric and proximity sensors with connectors |
| | | 8 input/8 output points | DRT1-ND16S | | |
| | CQM1 I/O Link Units (see note 3) | 16 input/16 output points | CQM1-DRT21 | Assembled with CQM1 | Up to 3 or 7 Units mountable to CQM1 (depending on model of CQM1) |
| Analog I/O Units | Analog Input Terminals | 4 input points (4 words) or 2 input points (2 words) (voltage or current) | DRT1-AD04 | DIN track or screws | Applicable range: 1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to +10 V, 0 to 20 mA, or 4 to 20 mA input (switchable) Resolution: 1/6,000 |
| | | 4 input points (4 words) (voltage or current) | DRT1-AD04H | | Applicable range: 1 to 5 V, 0 to 5 V, 0 to 10 V, 0 to 20 mA, or 4 to 20 mA input (switchable) Resolution: 1/30,000 |
| | Analog Output Terminals | 2 output points (2 words) | DRT1-DA02 | | Applicable range: 1 to 5 V, 0 to 10 V, −10 to +10 V, 0 to 20 mA, or 4 to 20 mA output (switchable) Resolution: 1/6,000 |
| | Temperature Input Terminals | 4 input points (4 words) | DRT1-TS04T | | Thermocouple |
| | | 4 input points (4 words) | DRT1-TS04P | | Temperature-resistant input |
| Special I/O Units | C200H I/O Link Units (see note 3) | 512 input points max. (32 words) 512 output points max. (32 words) | C200HW-DRT21 | Mounted to C200HX/HG/ HE PC | The specified I/O Memory words in the CPU Unit mounted on the C200H I/O Link Unit can be constantly transferred (i.e., read and written to) from the CompoBus/D Master. Up to 16 Units mountable to C200HX/HG/HE PC. |
| | RS-232C Units | 16 input points (1 word) | DRT1-232C2 | DIN track or screws | Two RS-232C ports Explicit messages used for settings and control. RS-232C port status reflected in inputs. |
| Slave Cat. No. | | W347 | | | |

**Note:**   1. Use the following I/O connectors, external power supply connectors, and CompoBus/D communications connectors when using DRT1-☐D☐☐C Environment-resistant Terminals.

| Name | Description | Model |
|---|---|---|
| I/O connectors | Assembled male connector plug (Crimped or soldered) | XS2G-D4☐☐ |
| | Cable with connector plug (one end) (Male plug – cable core wires) | XS2H-D421-☐☐☐ |
| | Cable with connector plug (both ends) (Male plug – female plug) | XS2W-D42☐-☐☐☐ |
| External power supply connectors | Assembled female connector plug Crimped or soldered) | XS2C-D4☐☐ |
| | Cables with connector plug (one end) (Male plug – cable core wires) | XS2F-D42☐-☐80-A |
| CompoBus/D communications cable with connector | Cable with connectors (both ends) | DCA1-5CN☐☐W1 |
| | Cable with connector (one end; socket type) | DCA1-5CN☐☐F1 |
| | Cable with connector (one end; plug type) | DCA1-5CN☐☐H1 |

    2. Use the following I/O connectors when using DRT1-☐D16S Sensor Terminals.

| Name | Description | Model |
|---|---|---|
| Cable connector (sensor or external device end) | Marking XS8-1, conforming cable core wire size: 0.3 to 0.5 mm$^2$ | XS8A-0441 |
| | Marking XS8-2, conforming cable core wire size: 0.14 to 0.2 mm$^2$ | XS8A-0442 |

    3. The number of I/O points given for the CQM1 I/O Link Unit is not the number of external I/O points, but the number of internal I/O points in the CQM1 Unit. Similarly, the number of I/O points given for the C200H I/O Link Unit is not the number of external I/O points, but the number of internal I/O points in the CPU Unit mounted to the C200H Link Unit.

## MULTIPLE I/O TERMINALs
**System Configuration Example**
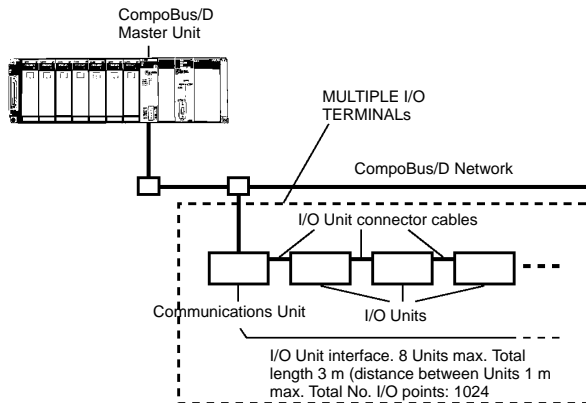
**MULTIPLE I/O TERMINAL Units**

| Unit | | I/O points | Words allocated in PC memory | | I/O connec-tions | Unit power supply voltage | Installa-tion | Model number | Remarks |
|------|--|-----------|------|--------|---------|-------|------|------|------|
| | | | **Input** | **Output** | | | | | |
| Communications Unit | | None | Status two words | 0 words | None | 24 VDC (supplied from outside) | DIN track | DRT1-COM | --- |
| Base I/O Unit | Transistor Input Units | 16 input points | 1 word | 0 words | M3 terminal block | | | GT1-ID16 | --- |
| | | 16 input points | 1 word | 0 words | Connector (made by MOLEX) | | | GT1-ID16MX | --- |
| | | | | | Connector (made by FUJITSU) | | | GT1-ID16ML | --- |
| | | | | | D-Sub connector | | | GT1-ID16DS | --- |
| | | 32 input points | 2 words | 0 words | Multipoint connector (made by FUJITSU) | | | GT1-ID32ML | --- |
| | Transistor Output Units | 16 output points | 0 words | 1 word | M3 terminal block | | | GT1-OD16 | --- |
| | | 16 output points | 0 words | 1 word | Connector (made by MOLEX) | | | GT1-OD16MX | --- |
| | | | | | Connector (made by FUJITSU) | | | GT1-OD16ML | --- |
| | | | | | D-Sub connector | | | GT1-OD16DS | --- |
| | | 32 output points | 0 words | 2 words | Multipoint connector (made by FUJITSU) | | | GT1-OD32ML | --- |
| | Relay Output Units | 16 output points | 0 words | 1 word | M3 terminal block | | | GT1-ROS16 | --- |
| | | 8 output points | 0 words | 1 word | M3 terminal block | | | GT1-ROP08 | --- |

| Unit | | I/O points | Words allocated in PC memory | | I/O connections | Unit power supply voltage | Installation | Model number | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | Input | Output | | | | | |
| Special I/O Units (See note.) | Analog Input Units | 8 input points | 8 words | 0 words | Connector (made by MOLEX) | 24 VDC (supplied from outside) | DIN track | GT1-AD08MX | Applicable range: 4 to 20 mA, 0 to 20 mA, 0 to 5 V, 1 to 5 V, 0 to 10 V, or −10 to 10 V Resolution: 1/6,000 |
| | | 4 input points | 4 words | 0 words | M3 terminal block | | | GT1-AD04 | |
| | Analog Output Units | 4 output points | 0 words | 4 words | Connector (made by MOLEX) | | | GT1-DA04MX | Applicable range: 0 to 5 V, 1 to 5 V, 0 to 10 V, or −10 to 10 V Resolution: 1/6,000 |
| | | | | | M3 terminal block | | | GT1-DA04 | Applicable range: 4 to 20 mA, 0 to 5 V, 1 to 5 V, 0 to 10 V, or −10 to 10 V Resolution: 1/6,000 |
| | High-speed Counter Units | 1 encoder input, 1 input, 2 outputs | 5 words | 3 words | M3 terminal block | | | GT1-CT01 | A and B encoder inputs (differential phase inputs) 1 external control input 2-point external outputs according to counter value |
| MULTIPLE I/O TERMINAL Cat. No. | | | W348 | | | | | | |

**Note:** The front-panel indicators and other parts of Analog Input Units, Analog Output Units, and High-speed Counter Units differ from those of other I/O Units. These Units belong to a group called Special I/O Units.

**MULTIPLE I/O TERMINAL Accessories (Attachments/Sold Separately/Recommended Products)**

| Name | Description | Model |
|---|---|---|
| I/O Unit connector cable | Length: 40 mm | (One included with each I/O Unit) |
| | Length: 1 m | GCN1-100 |
| End connector | Connects to end unit. | (One included with each Communications Unit) |

| Name | I/O points | Model | Installation | Remarks |
|---|---|---|---|---|
| Intelligent Flags | 2 words input, 2 words output | V600-HAM42-DRT | DIN track | --- |
| Multipoint Temperature Controller | 14 words input, 9 words output | E5ZE-8□D1□B | Screws | --- |
| Digital Regulator | 3 words input. 4 words output | E5EK-AA2-DRT | Panels | --- |
| Compact Signal Switcher | 16 words input, 16 words output | K3FM-BIX K3FM-BOX | Screws | --- |
| Special Inverter Option Car | 2 words input, 2 words output | 3GFV-PDRT1-SIN | | 3 words input, 3 words output using Special Remote I/O Function. |

## ■ Configurator

A Configurator is required to perform any of the following functions.

● User-set remote I/O allocations

● Mounting multiple Master Units under a single CPU Unit

● Connecting multiple Master Units to a single network

● Setting communications parameters

● Setting Slave parameters

Use any of the following methods to connect the Configurator to CompoBus/D. The Configurator is handled as a CompoBus/D node.

● ISA Board + IBM PC/AT or Compatible                    ● PCMCIA Card + IBM PC/AT or Compatible
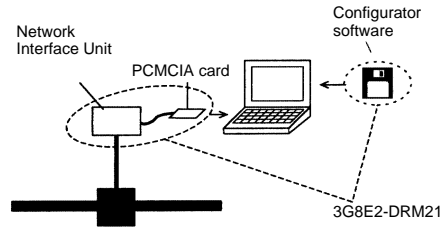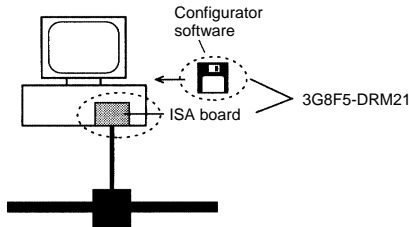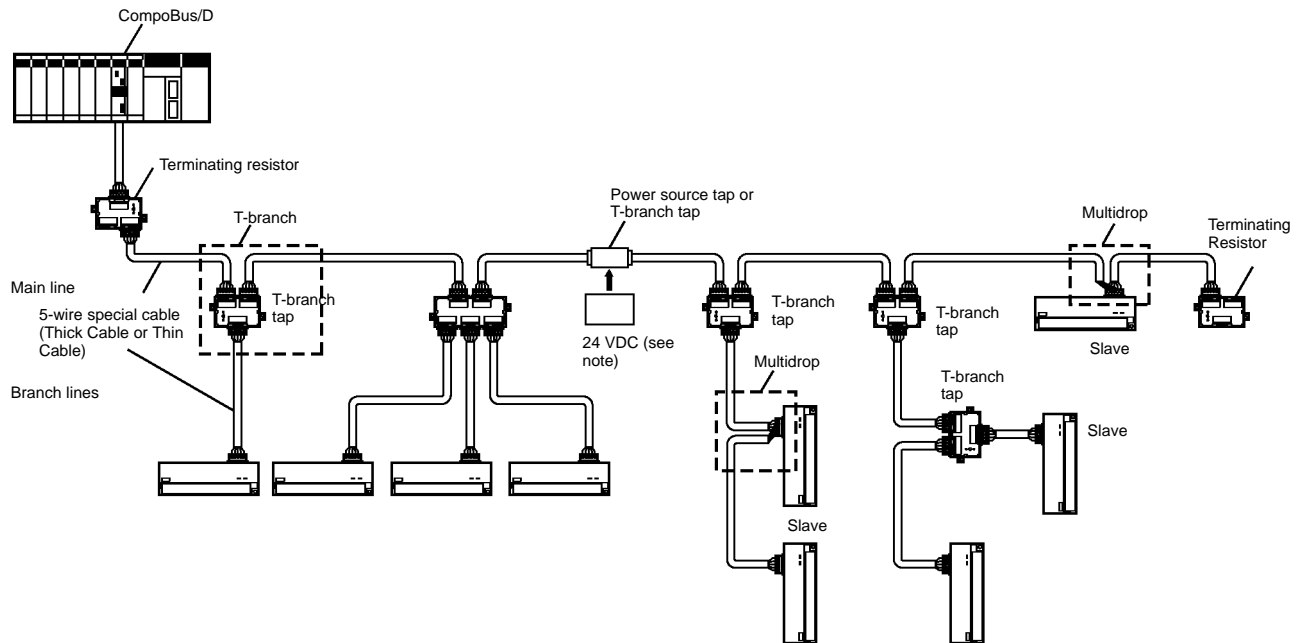


### Configurator Models

| Configurator connection to IBM PC/AT or compatible | Compatible computer | OS | Configuration | Model |
|---|---|---|---|---|
| Special ISA board | IBM PC/AT or compatible | Windows 95 or Windows NT 3.5/4.0 | Special ISA board + installation disk | 3G8F5-DRM21 |
| Special PCMCIA card | | Windows 95 | Special PCMCIA card + installation disk | 3G8E2-DRM21 |

**Note:** Connect a maximum of 1 configurator to 1 network.

## Configurator Specifications

| Item | | Specifications |
|---|---|---|
| Operating environment | Hardware | Computer: IBM PC/AT or compatible |
| | | CPU: i486DX2 66 MHz or later (using Windows 95) |
| | | Pentium 90 MHz or later (using Windows NT) |
| | | Memory: 12 MB min. (16 MB min. recommended) (using Windows 95) |
| | | 16 MB min. (24 MB min. recommended) (using Windows NT) |
| | | Hard disk: 5 MB min. of available space |
| | OS | Windows 95 or Windows NT 3.51/4.0 |
| | | Note: PCMCIA card cannot be used with Windows NT. |
| | CompoBus/D Interface Unit | ISA board (3G8F5-DRM21) |
| | | PCMCIA card (3G8E2-DRM21) |
| Position on network | | Occupies 1 node address |
| No. of Configurators that can be connected to network | | 1 per network |
| CompoBus/D functions possible using a Configurator | | • User-set remote I/O allocations (when scan list is enabled)<br>• Mount multiple Master Units under a single CPU Unit<br>• Connect multiple Master Units to a single network |
| Main functions | Monitor function | • Display information tables (node address order, remote I/O configuration order, etc.) for devices connected to the network<br>• Master status monitor (remote I/O operating, error generation, etc.)<br>• Master error log monitor (time of error, error code, type of error, etc., to a maximum of 20 records)<br>• Communications cycle time monitor |
| | Setting function | OMRON Master Unit parameter (Master parameters) settings<br>• User–set remote I/O allocations (creating scan list) (see note)<br>• Set initial remote I/O status (start/stop) at startup<br>• Set communications cycle time<br>**Note:** Use the Master parameter creation wizard for easy settings.<br>  • Use user-set allocations to make sure that the allocated areas do not overlap, even with multiple Master Units mounted on a single CPU Unit. |
| | | Set parameters for Slaves manufactured by other companies |
| | | Set node addresses and baud rate |
| | Operation function | Remote I/O communications start/stop |
| | Storage function | You can store the information for devices connected to the network (when online), or device information created using the Master parameters (when offline) as a network configuration file. |
| | Other | • Read and create EDS files<br>• Check I/O allocation overlap in the Master parameters<br>• Print the device (Master/Slave) parameters |
| Files that can be created | | • Master parameters files (OMRON Master Unit parameters, 1 node/1 file)<br>• Slave parameters files (Parameters for each Slave, 1 node/1 file)<br>• Network files (All parameters for Masters and Slaves displayed in the device table, 1 network/1 file)<br>• EDS files (Device-defined files shared in the DeviceNet, 1 type/1 file) |
| Cat. No. | | W328 |

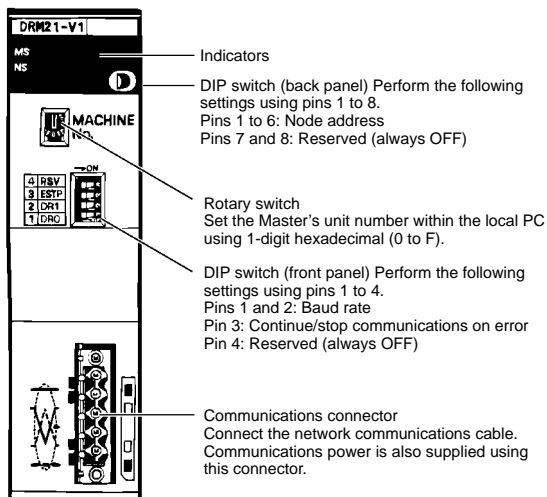## ■ CompoBus/D Network Configuration (Example)



**Note:** You must supply a 24-VDC communications power supply to the communications connectors to each node via a 5-wire cable to use CompoBus/D. Provide a separate power supply for the communications power supply, internal circuit power supply, and I/O power supply.

## ■ Data Exchange Format
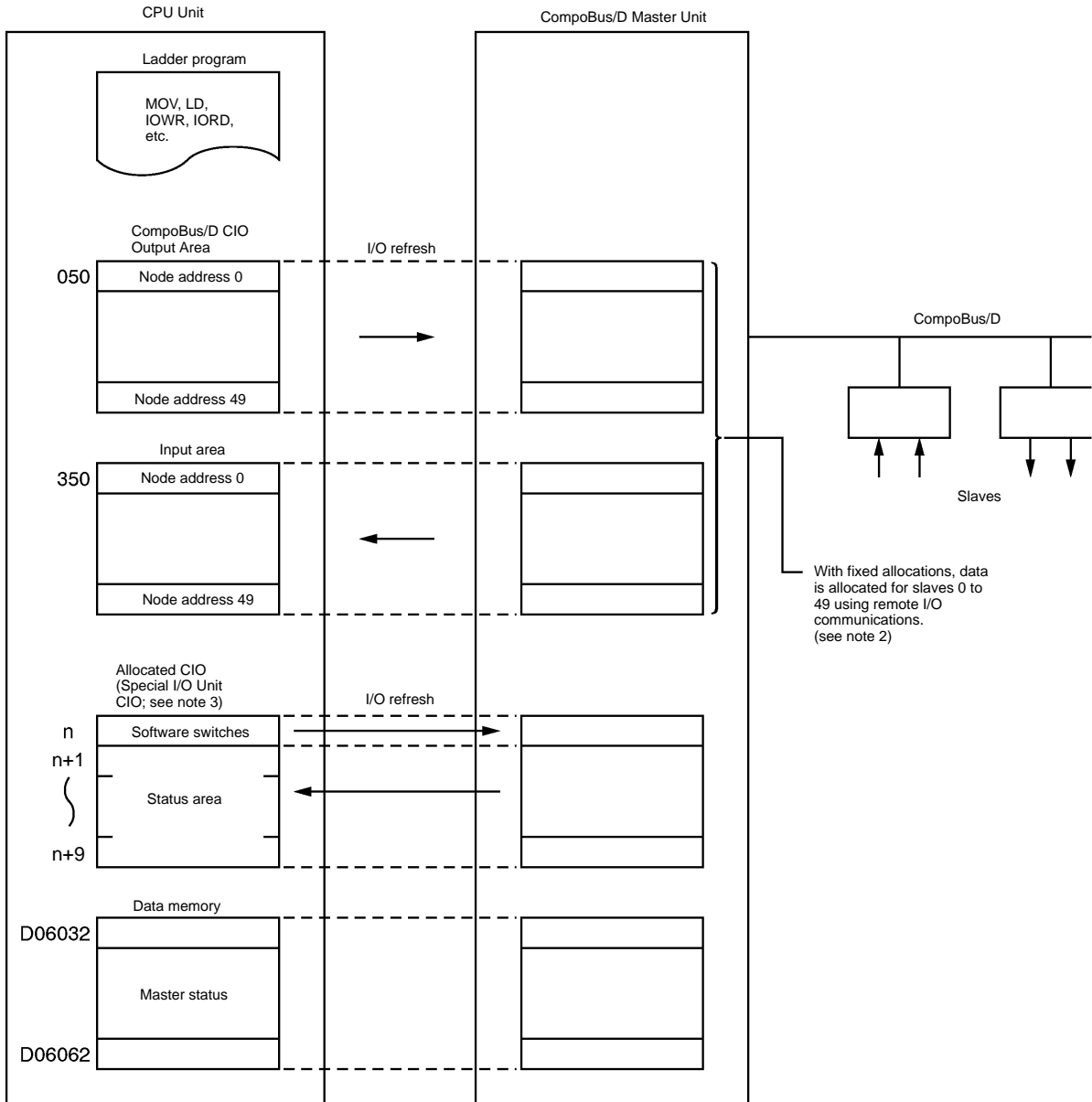


**Note:** 1. A Slave with more than 16 inputs or outputs will be allocated multiple node addresses (words). A Slave with less than 16 input or outputs will be allocated the rightmost byte of one word.

2. You can allocate up to 63 nodes by changing the CIO allocations using a Configurator.

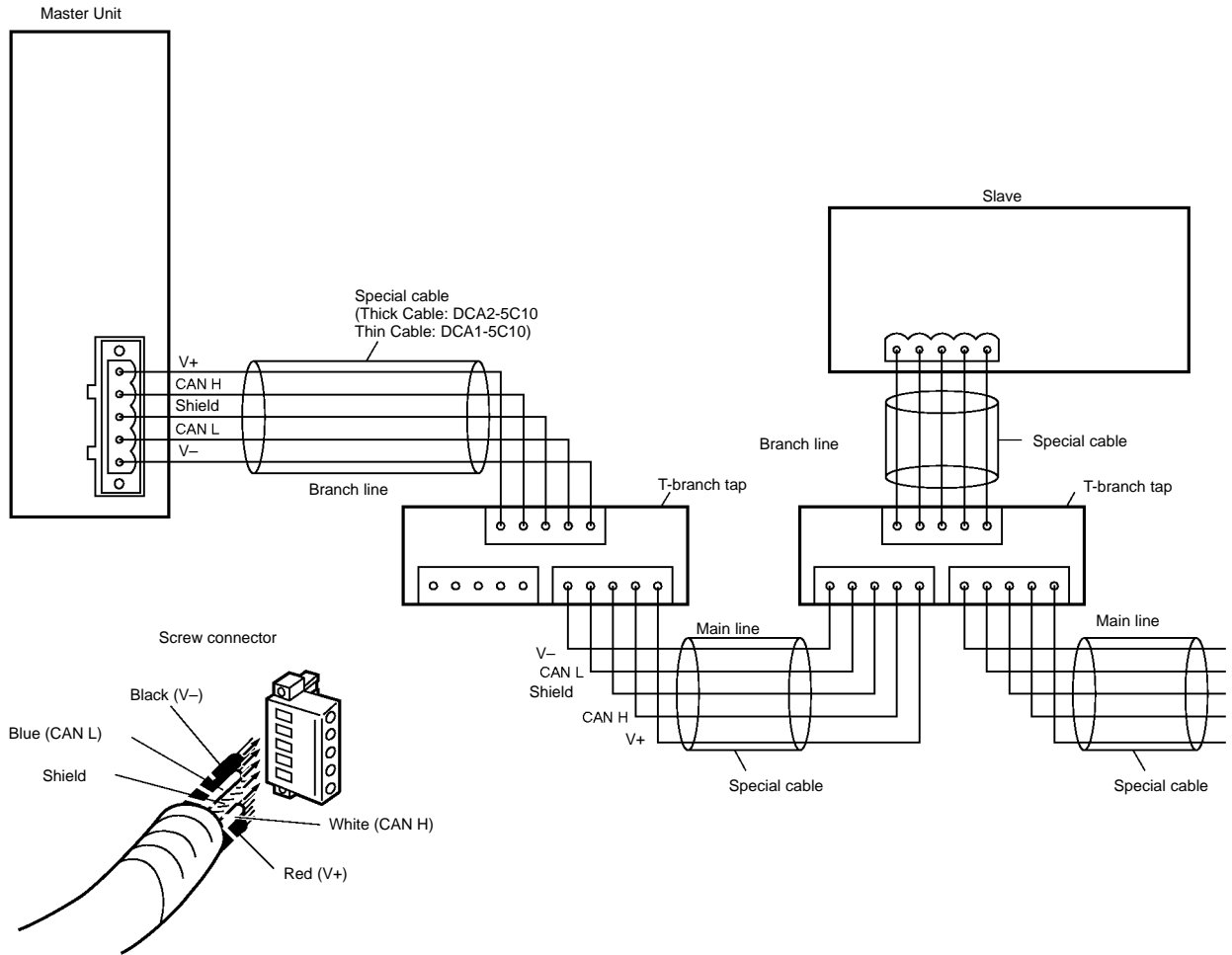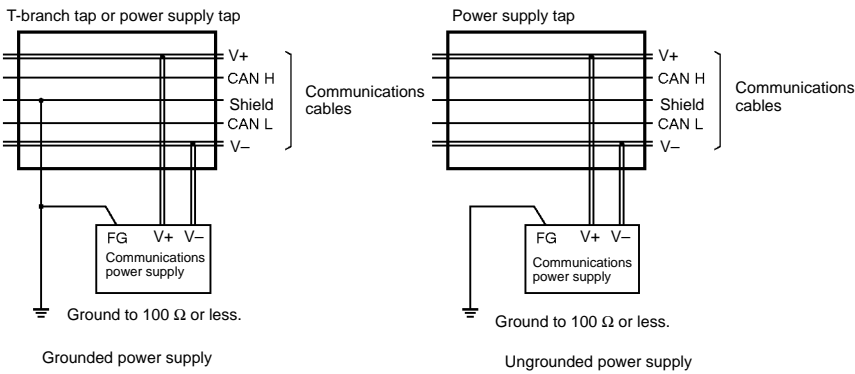3. The Special I/O Unit words in the CIO Area start at word CIO 2000.

## ■ Nomenclature

DRM21-V1

Indicators

DIP switch (back panel) Perform the following settings using pins 1 to 8.
Pins 1 to 6: Node address
Pins 7 and 8: Reserved (always OFF)

Rotary switch
Set the Master's unit number within the local PC using 1-digit hexadecimal (0 to F).

DIP switch (front panel) Perform the following settings using pins 1 to 4.
Pins 1 and 2: Baud rate
Pin 3: Continue/stop communications on error
Pin 4: Reserved (always OFF)

Communications connector
Connect the network communications cable.
Communications power is also supplied using this connector.

### Indicators

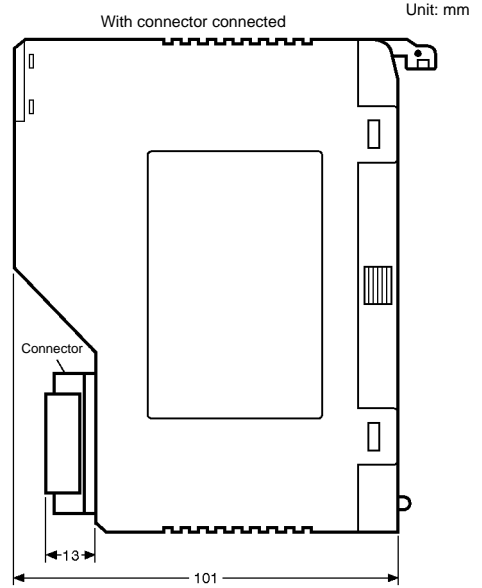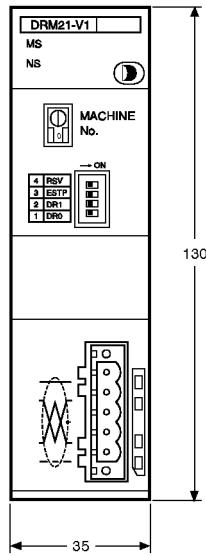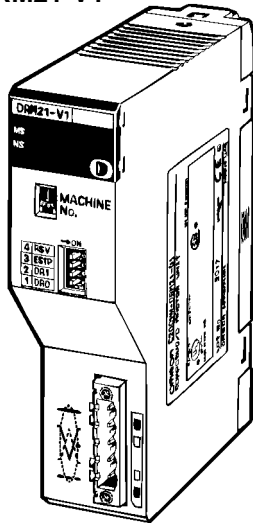| Indicator | Color | Status | Definition | Meaning |
|---|---|---|---|---|
| MS | Green | ON | Device operational | Normal operating status. |
| | | Flashing | Device in Standby | Reading switch settings. |
| | Red | ON | Unrecoverable Fault | Unit hardware error. |
| | | Flashing | Minor Fault | Switch settings incorrect, etc. |
| | --- | OFF | No Power | Unit hardware error, power isn't being supplied, waiting for initial processing to start, or the Unit is being reset. |
| NS | Green | ON | Link OK. On-line, Connected. | Network is operating normally (communications established) |
| | | Flashing | On-line, Not Connected. | Network is operating normally, but communications have not yet been established. |
| | Red | ON | Critical Link Failure | A fatal communications error has occurred. Network communications are not possible. Check for a node address duplication or Bus Off error. |
| | | Flashing | Minor Error | Communications error in one of the Slaves. |
| | --- | OFF | Not Powered/ Not On-Line | No nodes except for the Master, etc. |

## ■ External Connections

Master Unit

Special cable
(Thick Cable: DCA2-5C10
Thin Cable: DCA1-5C10)

V+
CAN H
Shield
CAN L
V–

Branch line

Slave

Branch line

Special cable

T-branch tap

T-branch tap

Screw connector

Black (V–)

Blue (CAN L)

Shield

White (CAN H)

Red (V+)

V–
CAN L
Shield
CAN H
V+

Main line

Main line

Special cable

Special cable

Special cable

Note: Supplies communications power V+ and V–

T-branch tap or power supply tap

V+
CAN H
Shield
CAN L
V–

Communications
cables

FG   V+   V–
Communications
power supply

Ground to 100 Ω or less.

Grounded power supply

Power supply tap

V+
CAN H
Shield
CAN L
V–

Communications
cables

FG   V+   V–
Communications
power supply

Ground to 100 Ω or less.

Ungrounded power supply

17

## ■ Dimensions

**C200HW-DRM21-V1**

Unit: mm

With connector connected

DRM21-V1
MS
NS

MACHINE No.

4 RSV
3 ESTP
2 DR1
1 DR0

130

Connector

35

13

101

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.