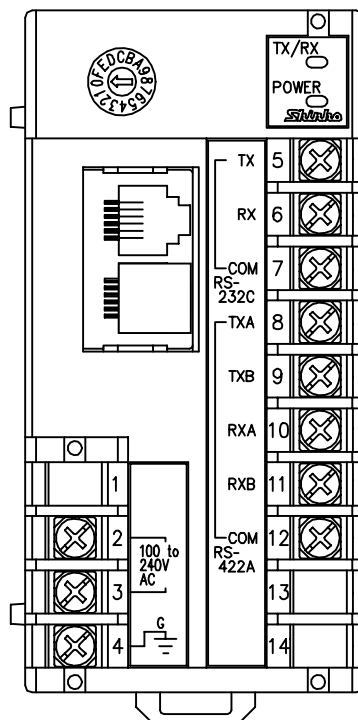# PLC INTERFACE UNIT

CIT-200

INSTRUCTION MANUAL

Shinko

PREFACE

Thank you for the purchase of our PLC Interface Unit **CIT-200**.

This manual contains instructions for the mounting, functions, operations and notes when operating the **CIT-200**.

For confirmation of the model and specifications, please read this manual carefully before starting operation.

To prevent accidents arising from the misuse of this unit, please ensure the operator using it receives this manual.

Notes

• This instrument should be used according to the specifications described in the manual.
  If it is not used according to the specifications, it may malfunction or cause fire.
• Be sure to follow the warnings, cautions and notices. If they are not followed, serious injury or malfunction may occur.
• Do not apply a commercial power source to the sensor which is connected to the input terminal nor allow the power source to come into contact with the sensor.
• Specifications of the CIT-200 and the contents of this instruction manual are subject to change without notice.
• Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform us or the shop you purchased the unit.
• Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
• Shinko Technos Co., Ltd. is not liable for any damages or secondary damages incurred as a result of using this manual, including any indirect damages.

Safety precautions

(**Be sure to read these precautions before using our products**.)

The safety precautions are classified into two categories: "Warning" and "Caution".

Depending on circumstances, procedures indicated by ⚠ Caution may be linked to serious results and so be sure to follow the directions for usage.

⚠ **Warning**

Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠ **Caution**

Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

1. Installation precautions

⚠ **Warning**

Turn the power supplied to the instrument OFF before mounting.

Working or touching the terminal with the power switched ON may result in severe injury or death due to Electric Shock.

⚠ **Caution**

This instrument is intended to be used under the following environmental conditions (IEC61010-1):
Overvoltage category Ⅱ, Pollution degree 2

Mount the unit in a place with:
(1) A minimum of dust, and an absence of corrosive gases
(2) No flammable, explosive gases
(3) No mechanical vibrations or shocks
(4) No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to122℉) that does not change rapidly
(5) An ambient non-condensing humidity of 35 to 85%RH
(6) No large capacity electromagnetic switches or cables through which large current is flowing
(7) No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit

Note: Although the case of this instrument is made of flame resisting resin, do not install this instrument near flammable material.
Avoid setting this instrument directly on flammable material.

2. Wiring precautions

> ⚠ **Warning**
>
> **Turn the power supplied to the instrument OFF before wiring or checking.**
>
> **Working or touching the terminal with the power switched ON may result in severe injury or death due to Electric Shock.**

> ⚠ **Caution**
>
> • Do not leave wire chips in the instrument, because they could cause fire, malfunction or trouble.
> • Use the solderless terminal with an insulation sleeve that fits to the M3 screw when wiring the CIT-200.
> • The terminal block of the CIT-200 is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw.
> • Tighten the terminal screw with the specified torque.
>   If excessive force is applied to the screw when tightening, the screw or case may be damaged.

3. Running and maintenance precautions

> ⚠ **Warning**
>
> • Do not touch live terminals. It may cause electric shock or problems in operation.
> • Turn the power supply to the instrument OFF before cleaning the module or retightening the screws.
>   Doing this work while the power is ON may result in severe injury or death due to electric shock.

CONTENTS

1. Overview

1.1 Overview of the CIT-200

Communication between maximum 16 blocks of C series and PLC can be carried out via PLC interface unit CIT-200.

The CIT-200 reads and writes the PV, SV or other data from/to the memory in the PLC via a host link unit.

Therefore PLC only needs the program for reading and writing the data in the memory, and this will reduce the communication processing of the PLC.

1.2 Units and structure when applying the CIT-200 to the C series

(1) **PLC interface unit: CIT-200**

The CIT-200 makes it possible to communicate between multiple blocks (maximum 16 blocks) of C series and the PLC.

(2) **2-Ch temperature control unit: CCT-235-2□/□**

2-Ch temperature control unit

Two channels should have the same input and same output.

(3) **Heating/Cooling temperature control unit: CCT-235-□/□, D□**

Temperature control unit

Heating/Cooling control is possible with 1-Ch input.

(4) **Power source host link unit: CPT-20A**

Link unit to supply the power to the CCT-235 and to communicate with the host unit.

(5) **Base unit**

CBT-210: Base unit for mounting the CPT-20A and CCT-235 unit.
   One CPT-20A is required to 1 base unit.
   Maximum 10 units of CCT-235 can be mounted.

CBT-205: Base unit for mounting the CPT-20A and CCT-235 unit.
   One CPT-20A is required to 1 base unit.
   Maximum 5 units of CCT-235 can be mounted.

(6) **Communication cable: CPP**

Exclusive communication cable to connect between the CIT-200 and CPT-20A or between CPT-20A units (for block extension)

1.3 System configuration
● When using the CBT-210
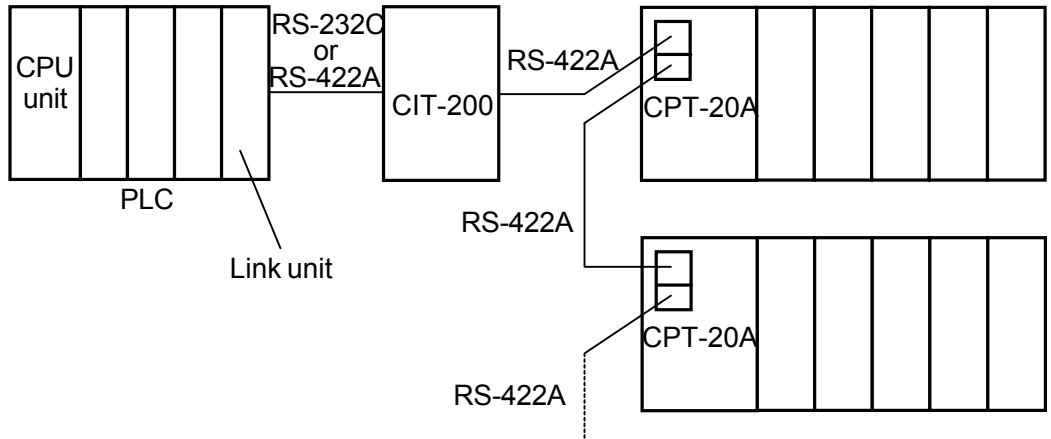
(Fig. 1.3-1)

● When using the CBT-205
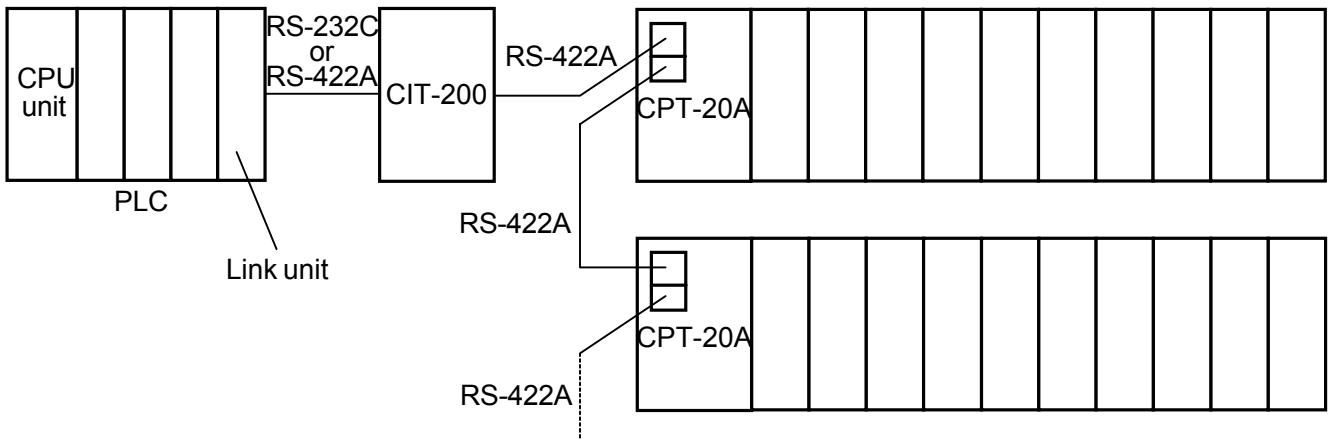
(Fig. 1.3-2)

1.4 Parameter exchange

Parameter exchange is shown below.
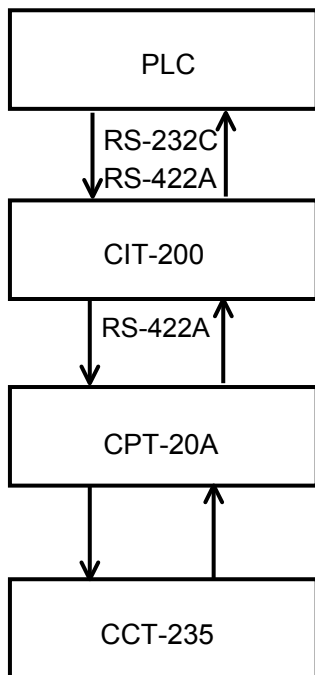
The PLC sets and monitors the C series.

The CIT-200 receives the data from the data memory in the PLC, and sends the command data to the CPT-20A.
The CIT-200 receives the response data from the CPT-20A, and sends it to the data memory in the PLC.

The CPT-20A receives the sending data from the CIT-200 and sends the data to the CCT-235.
The CPT-20A receives the response data from the CCT-235 and sends it to the CIT-200.

The CCT-235 receives the sending data from the CPT-20A, and performs the control. The CCT-235 sends the control data to the CPT-20A.

2. Model name

2.1 Model name

CIT-200: PLC interface unit

2.2 How to read the model name label

> ⚠️ **Warning**
>
> **Turn the power supplied to the instrument OFF before confirming the model name label.**
> **Working or touching the terminal with the power switched ON may result in severe injury or death due to Electric Shock.**

Model name labels are attached to the case and inner assembly.

[Example]

CIT-200	Model name: CIT-200
TC	Option: Terminal cover
No. x x x x x x	Instrument number (indicated only on the inner assembly.)

3. Name and functions of the sections

Terminal block for power source
Terminal block for communication
Internal assembly
(Fig. 3-1)
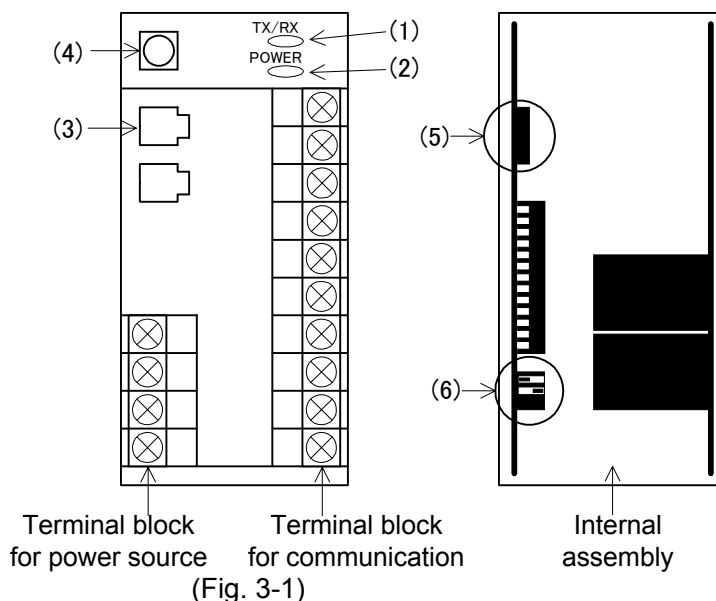
(1) TX/RX: Communication indicator
 When communicating between the CIT-200 and PLC, a yellow LED blinks.
(2) POWER: Instrument power indicator
 When the power supply to the instrument is turned ON, a green LED lights.
(3) Modular jack
 Connects the CIT-200 to CPT-20A.
(4) Rotary switch for selecting a PLC type
 Selects a PLC type to communicate with the CIT-200.
(5) DIP switch for communication setup
 Selects the communication setup between the CIT-200 and PLC.
(6) DIP switch for selecting communication line
 Selects the communication line (RS-422A or RS-232C) between the CIT-200 and PLC.

4. Setup

> ⚠ **Warning**
>
> **Turn the power supplied to the instrument OFF before setup.**
> **Working or touching the terminal with the power switched ON may result in severe injury or death due to Electric Shock.**

> ⚠ **Notice**
>
> Set up each switch of CIT-200 before the power supply to the unit is turned ON.
> Set the same communication speed to both CIT-200 and the PLC, otherwise communication is impossible.
> Set the communication speed of the CPT-20A to 19200bps.

● **Switch setting**

Using a small screwdriver (flat bladed or Phillips) or tweezers, set up the Rotary switch and DIP switch of the CIT-200. See (Fig. 4-1).

Terminal block for Power source   Terminal block for communication (Fig. 4-1)   Internal assembly
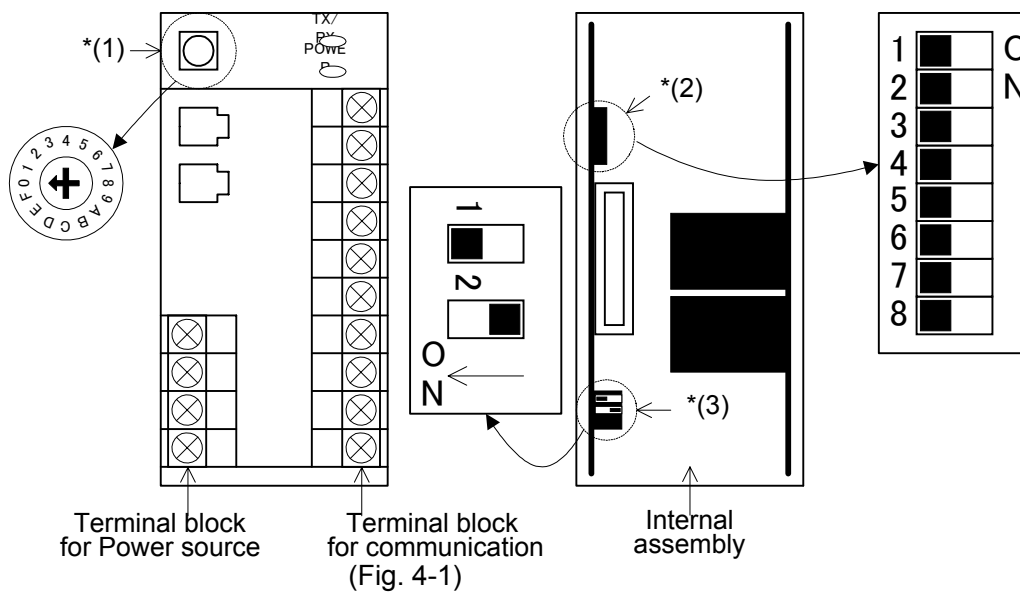
*(1) Rotary switch for selecting a PLC type

(Rotary switch number is represented by the hexadecimal figures.)

Do not set the Rotary switch number [6 to F] even if its setting range is from 0 to F.

Rotary SW No.	PLC and its manufacturer	Communication command	Communication protocol	Using memory
0	Mitsubishi MELSEC	ACPU common command "WR, WW" compatible	Host link unit protocol (Protocol 4)	R register
1	Mitsubishi MELSEC	ACPU common command "WR, WW" compatible	Host link unit protocol (Protocol 4)	D register
2	Omron C200H	RD/WR command	Host link unit protocol	DM
3	Fuji MICREX-F70.		Host link unit protocol	SI, W30
4	Mitsubishi MELSEC	ACPU common command "QR, QW" compatible	Host link unit protocol (Protocol 4)	R register
5	Mitsubishi MELSEC	ACPU common command "QR, QW" compatible	Host link unit protocol (Protocol 4)	D register
6 to F	———	———	———	———

PLC manufacturer	Model name
Mitsubishi Electric Corp.	AJ71UC24, A1SJ71UC24-R2/R4, QJ71C24
Omron Corp.	LK201-V1, LK202-V1
Fuji Electric Co., Ltd.	NC1L-RS2, NC1L-RS4

*(2) DIP switch for communication setup (Default value: OFF for all switches)

Select a switch to match with the specification of the PLC to be used.

Turn the DIP switch number [6 to 8] to OFF.

DIP SW No.	Contents	ON	OFF
1	Communication speed	19200bps	9600bps
2	Data length	7 bits	8 bits
3	Parity	Used	Not used
4	Parity	Odd	Even
5	Stop bit	2 bits	1 bit
6 to 8	———	———	———

*(3) DIP switch for selecting communication line (Default value: RS-422A)

(Do not use the switch combination other than the below)

DIP switch No.1	DIP switch No.2	Communication line
ON	OFF	RS-422A
OFF	ON	RS-232C

The above switch setup items (1), (2) and (3) will be effective when the power supply is turned on
(If any items are changed after the power is turned on, they will not be effective)

● **Setup of the CPT-20A**

Set the DIP switch to ▢ as shown below except for No.2.

DIP SW No.	Contents	ON	OFF
1	Communication speed	19,200bps	9,600bps
2	Terminator *	Terminator Connected	Terminator Not connected
3 to 6	Communication protocol		Shinko protocol

 Note

* When multiple CPT-20A units are connected, the last CPT-20A should be set to "Terminator
Connected", and set other CPT-20A units to "Terminator Not connected".
For more details, refer to Chapter "4. Setup" in the instruction manual for C series (pages 10 to 12).

● **Setup of each PLC**

As to the PLC setup, refer to the Instruction manual for each PLC or the following.
• For setup of Mitsubishi PLC, see "7.1 Setup" (pp.17-19).
• For setup of Omron PLC, see "8.1 Setup" (p.34).
• For setup of Fuji PLC, see "9.1 Setup" (p.41).

5. Mounting

5.1 Site selection

This instrument is intended to be used under the following environmental conditions (IEC61010-1):
Overvoltage category Ⅱ, Pollution degree 2

Mount the unit in a place with:
 (1) A minimum of dust, and an absence of corrosive gases
 (2) No flammable, explosive gases
 (3) No mechanical vibrations or shocks
 (4) No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to122℉) that does not
     change rapidly
 (5) An ambient non-condensing humidity of 35 to 85%RH
 (6) No large capacity electromagnetic switches or cables through which large current is flowing
 (7) No water, oil or chemicals or where the vapors of these substances can come into direct contact
     with the unit

5.2 External dimensions
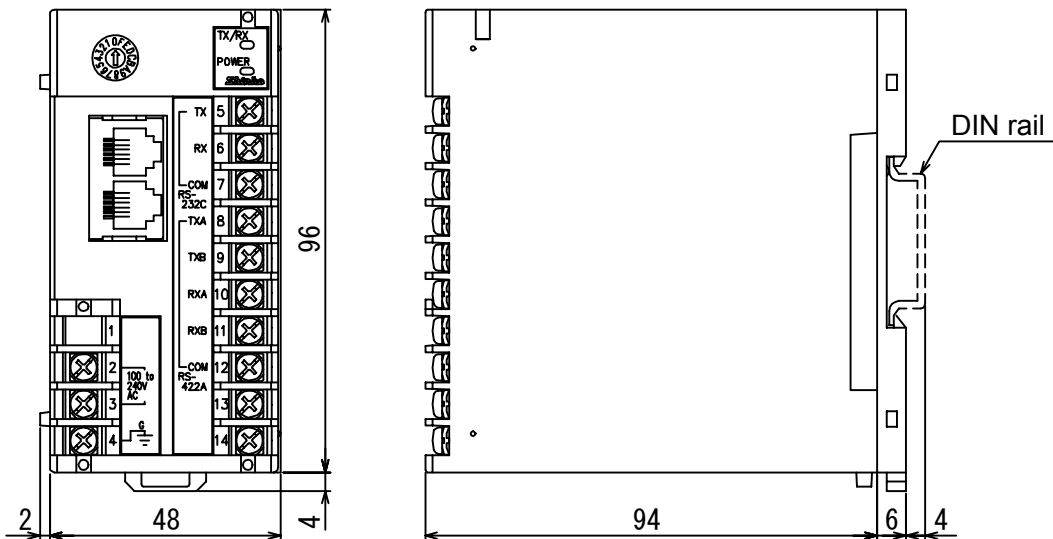
(Fig. 5.2-1)

5.3 DIN rail mounting and removal.

For the DIN rail mounting and removal, refer to "5.3 Mounting" in the Instruction manual for C series.

6. Wiring connection

6.1 Terminal arrangement

> ⚠️ **Warning**
>
> **Turn the power supply to the instrument OFF before wiring.**
> **Working with the power switched ON may result in severe injury or death due to Electric Shock.**
> **Moreover, the instrument must be grounded before the power supply to the instrument**
> **is turned on.**
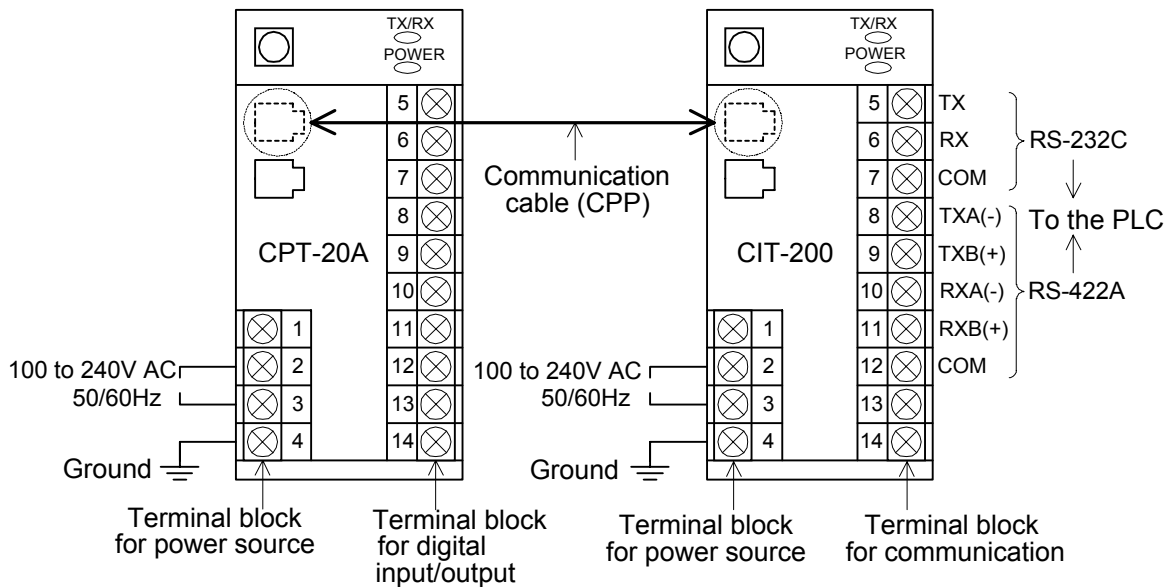
(Fig. 6.1-1)

6.2 Communication interface

(1) RS-232C

Signal name	Code	Signal direction	Terminal No.
Sending data	TX	Output	5
Receiving data	RX	Input	6
Ground for the signal, or common return cable	COM		7

Cable length: Maximum 10m

(2) RS-422A

Signal name	Code	Signal direction	Terminal No.	Terminator
Sending data	TXA (-)	Output	8	
	TXB (+)		9	
Receiving data	RXA (-)	Input	10	Built-in
	RXB (+)		11	
Ground for the signal, or common return cable	COM		12	

Cable length: Maximum 1km

6.3 Wiring connection example

> ⚠️ **Notices**
>
> Use the recommended cable to connect the PLC and CIT-200.
> Use the recommended D sub connector to connect the PLC and CIT-200.
> Use a thick wire (1.25 to 2.0mm^2) as a grounding cable.
> When the communication line is RS-422A, mount a terminator referring to the Instruction manual for each PLC.

● **Solderless terminal**

Use a solderless terminal with an isolation sleeve that fits to the M3 screw as shown below.
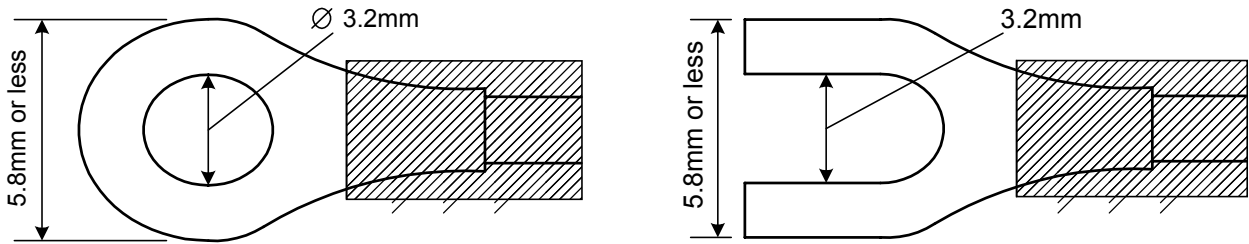
(Fig. 6.3-1)

Solderless terminal	Manufacturer	Model name	Fastening torque
Y type	Nichifu Terminal Industries CO., LTD.	1.25-Y3	0.6N·m Max. 1.0N·m
Y type	Japan Solderless Terminal MFG CO., LTD.	VD1.25-B3A	0.6N·m Max. 1.0N·m
Round type	Nichifu Terminal Industries CO., LTD.	1.25-3	0.6N·m Max. 1.0N·m
Round type	Japan Solderless Terminal MFG CO., LTD.	V1.25-3	0.6N·m Max. 1.0N·m

● Recommended cable

Name	Manufacturer	Communication line
OTSC-2PVB-7/0.32TA	ONAMBA CO., LTD.	RS-232C
OTSC-3PVB-7/0.32TA	ONAMBA CO., LTD.	RS-422A

● Recommended D sub connector

Model	Manufacturer	Name
DE-9SF-N	Japan Aviation Electronics Ind., Ltd.	D sub 9-pin (⊔) connector
DE-C1-J6	Japan Aviation Electronics Ind., Ltd.	D sub 9-pin connector cover
DB-25PFT-N	Japan Aviation Electronics Ind., Ltd.	D sub 25-pin (⊔) connector
DB-C2-J9	Japan Aviation Electronics Ind., Ltd.	D sub 25-pin connector cover

6.3.1 Wiring between the CIT-200 and Mitsubishi Calculator link unit, Serial communication unit

• RS-232C (AJ71UC24, A1SJ71UC24-R2, QJ71C24))
Cable length: Maximum 10m
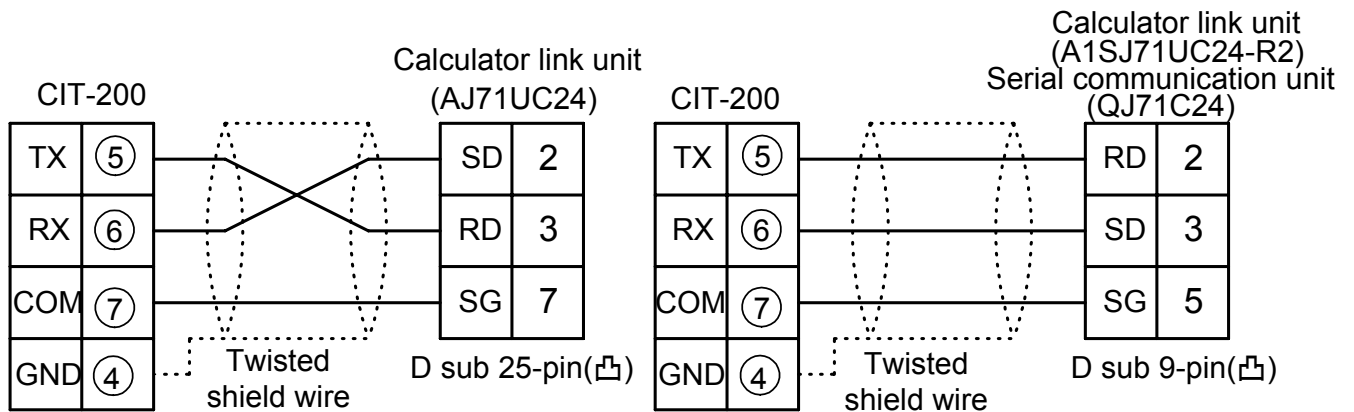
(Fig. 6.3.1-1)

• RS-422A (AJ71UC24, A1SJ71UC24-R4, QJ71C24)
Cable length: Maximum 1km
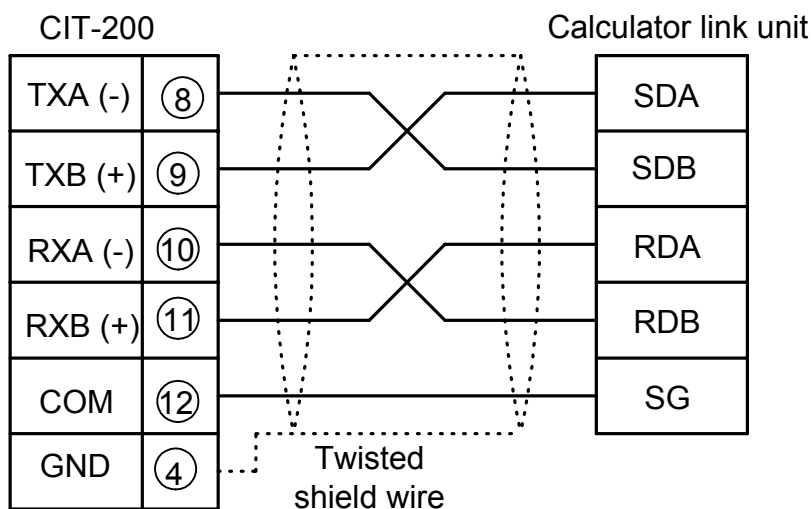
(Fig. 6.3.1-2)

6.3.2 Wiring between the CIT-200 and Mitsubishi Micro PLC

• RS-232C (FX2N-XXMR)
Cable length: Maximum 10m

(Fig. 6.3.2-1)

14
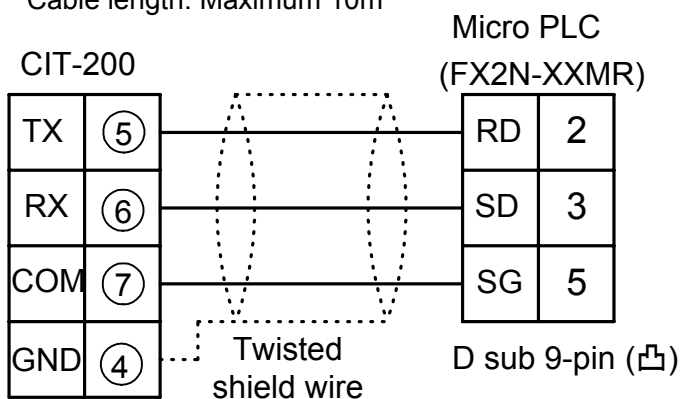
• RS-422A (FX2N-XXMR)
Cable length: Maximum 1km

CIT-200

			Micro PLC (FX2N-XXMR)
TXA (-)	⑧		RDA
TXB (+)	⑨		RDB
RXA (-)	⑩		SDA
RXB (+)	⑪		SDB
COM	⑫		SG
GND	④	Twisted shield wire	
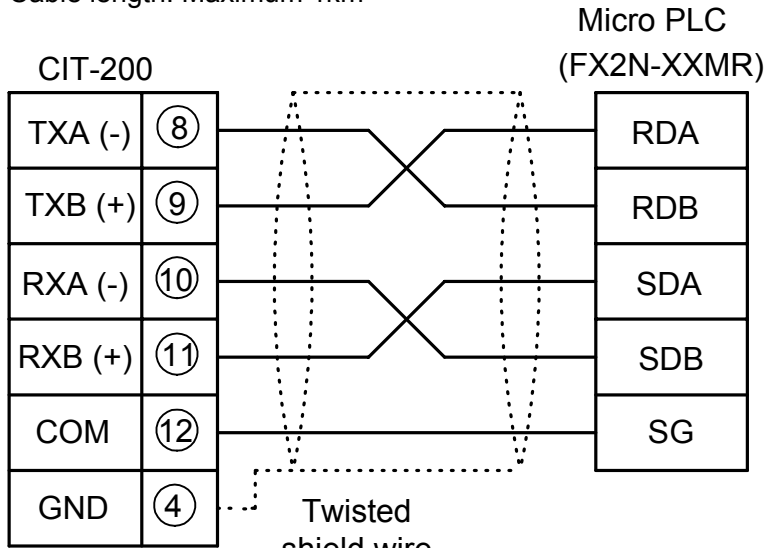
(Fig. 6.3.2-2)

6.3.3 Wiring between the CIT-200 and Omron Host link unit

• RS-232C (C200H-LK201-V1)
Cable length: Maximum 10m

CIT-200

			Host link unit (C200H-LK201-V1)	
TX	⑤		SD	2
RX	⑥		RD	3
COM	⑦		SG	7
GND	④	Twisted shield wire	D sub 25-pin (凸)	
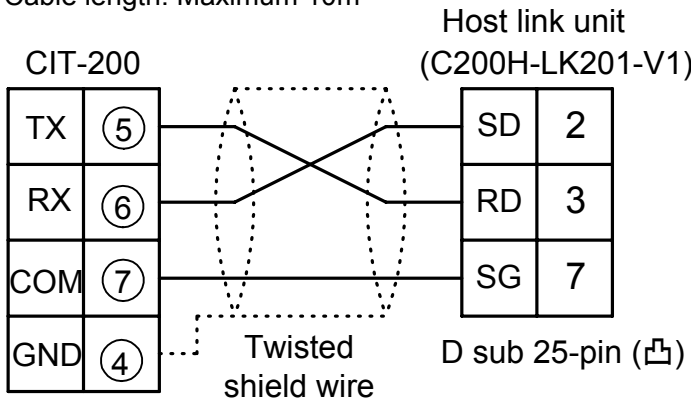
(Fig. 6.3.3-1)

• RS-422A (C200H-LK202-V1)
Cable length: Maximum 1km

CIT-200

			Host link unit (C200H-LK202-V1)	
TXA (-)	⑧		RDB	1
TXB (+)	⑨		RDA	6
RXA (-)	⑩		SDB	5
RXB (+)	⑪		SDA	9
COM	⑫		SG	3
GND	④	Twisted shield wire	D sub 9-pin (凸)	

(Fig. 6.3.3-2)

15
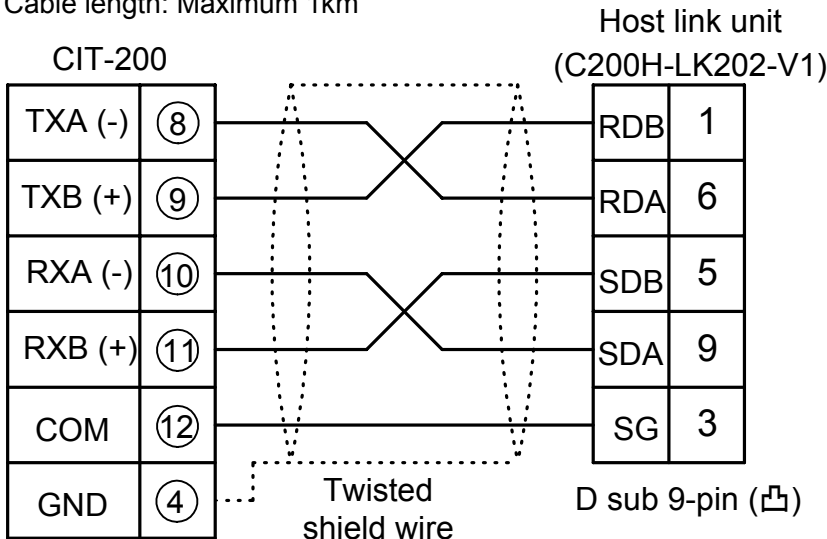
6.3.4 Wiring between the CIT-200 and Fuji Interface module

• RS-232C (NC1L-RS2)
Cable length: Maximum 10m

CIT-200			Interface module (NC1L-RS2)	
TX	⑤		SD	2
RX	⑥		RD	3
COM	⑦		SG	7
GND	④	Twisted shield wire	D sub 25-pin (凸)	
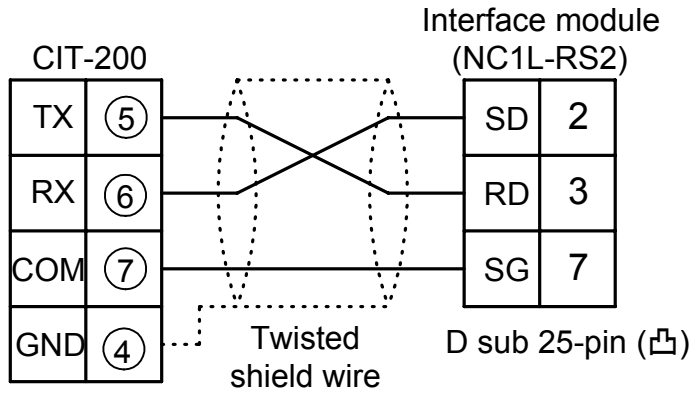
(Fig. 6.3.4-1)

• RS-422A (NC1L-RS4)
Cable length: Maximum 1km

CIT-200			Interface module (NC1L-RS4)
TXA (-)	⑧		RDA
TXB (+)	⑨		RDB
RXA (-)	⑩		SDA
RXB (+)	⑪		SDB
COM	⑫		SG
GND	④	Twisted shield wire	

(Fig. 6.3.4-2)

16
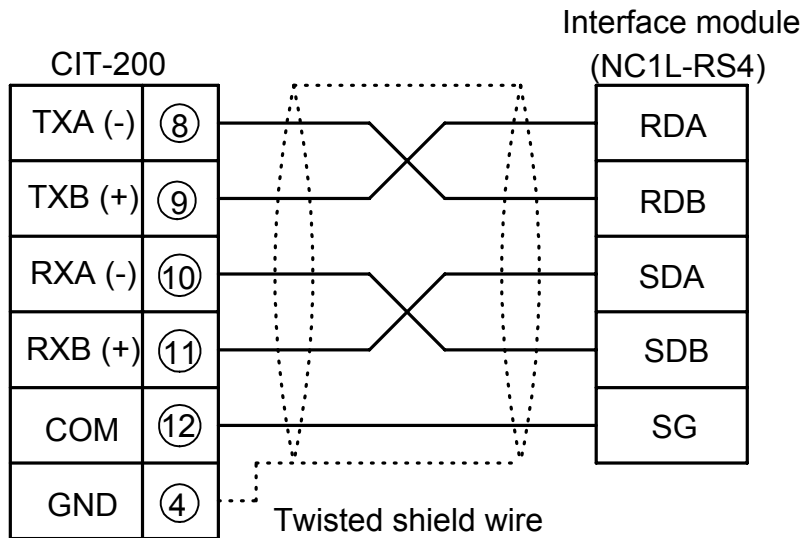
7. Communication between the CIT-200 and Mitsubishi PLC

7.1 Setup

7.1.1 Setup of Calculator link unit (AJ71UC24)

(Fig. 7.1.1-1)

(1) Sets the transmission control procedure (protocol) and control procedure of RS-422A or RS-232C.
Set to 8 (Protocol 4).

(2) Sets the instrument number of the double digit (x10).
Set the number to 0.

(3) Sets the instrument number of the single digit (x1).
Set the number to 0.

(4) Sets the transmission specifications.
See (Table 7.1.1-1).
Set the items except for the baud rate to ▭ .
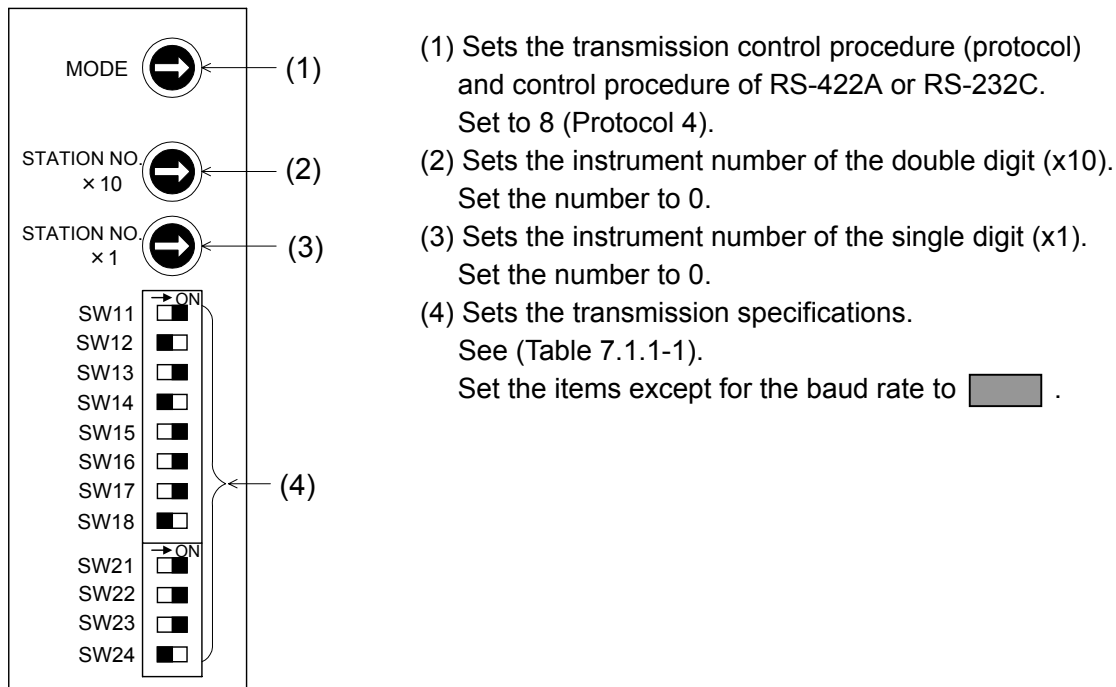
(Table 7.1.1-1)

Setting switch	Setting item		Setting switch ON	Setting switch OFF
SW11	Main channel setting		RS-422A	RS-232C
SW12	Data bit setting		8 bits	7 bits
		Baud rate	9600bps	19200bps
SW13	Transmission speed setting		ON	OFF
SW14			OFF	ON
SW15			ON	ON
SW16	Parity setting		Yes	No
SW17	Even/Odd parity setting		Even	Odd
SW18	Stop bit setting		2 bits	1 bit
SW21	Checksum setting		Yes	No
SW22	Writing during RUN		Possible	Impossible
SW23	Calculator link/multi-drop link selection		Calculator link	Multi-drop link
SW24	Not used		———	———

7.1.2 Setup of Calculator link unit (A1SJ71UC24-R4)
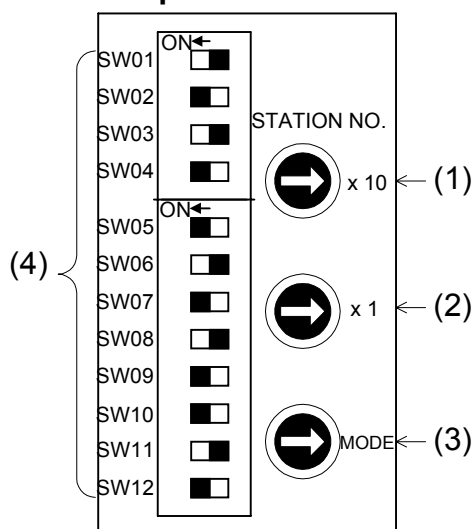
(Fig.7.1.2-1)

(1) Sets the instrument number of the double digit (x10).
    Set the number to 0.
(2) Sets the instrument number of the single digit (x1).
    Set the number to 0.
(3) Sets the transmission control procedure (protocol)
    and control procedure of RS-422A or RS-232C.
    Set to 8 (Protocol 4).
(4) Sets the transmission specifications.
    See (Table 7.1.2-1).
    Set the items except for the baud rate to ▨ .

(Table 7.1.2-1)

Setting switch	Setting item		Setting switch ON	Setting switch OFF
SW01	Not used		——	——
SW02	Calculator link/Multi-drop link selection		Calculator link	Multi-drop link
SW03	Not used		——	——
SW04	Writing during RUN		Possible	Impossible
		Baud rate	9600bps	19200bps
SW05			ON	OFF
SW06	Transmission speed setting		OFF	ON
SW07			ON	ON
SW08	Data bit setting		8 bits	7 bits
SW09	Parity setting		Yes	No
SW10	Even/Odd parity setting		Even	Odd
SW11	Stop bit setting		2 bits	1 bit
SW12	Checksum setting		Yes	No

7.1.3 Setup of Micro PLC (FX2N-XXMR)

In the program, set up communication of no procedure, communication of calculator link
(communication format D8120) which uses designated protocol and the station number (0).

• **Specification of communication format D8120** (Set the items to ▨ except for the baud rate.)

(Table 7.1.3-1)

Bit No.	Name	Contents	
		0 (Bit OFF)	1 (Bit ON)
b0	Data length	7 bits	8 bits
b1 b2	Parity	b2, b1 (1, 1): Even	
b3	Stop bit	1 bit	2 bits
b4 b5 b6 b7	Baud rate (bps)	b7, b6, b5, b4 (1, 0, 0, 0): 9600bps ⎫ (1, 0, 0, 1): 19200bps ⎬ Must be specified	
b8	Header	No	Yes
b9	Terminator	Not connected	Connected
b10 b11	Control cable	b11, b10 (0, 0): RS-485 interface	
b12	Not available		
b13	Checksum	Not applied	Applied
b14	Protocol	Not used	Used
b15	Control procedure	Protocol 1	Protocol 4

Note
 • **Communication format is used to decide the setting of the above (Table 7.1.3-1) and can be set by programming to the special data memory (D8120) of the PLC.**

 • **When the setting is changed, be sure to turn the power supply to the PLC OFF and then ON again, otherwise the changed data will not be effective.**

● **How to set communication format** (D8120)
   When setting the contents of (Table 7.1.3-1), set the program to the special data memory (D8120) of the PLC as follows.

 • **When the baud rate is 9600bps**   • **When the baud rate is 19200bps**

```
        b15                    b0                      b15                    b0
D8120 = [1110   0000   1000   0110 ]      D8120 = [1110   0000   1001   0110 ]
          E      0      8      6                    E      0      9      6
```
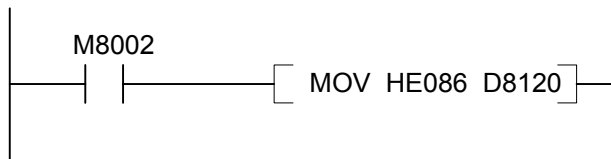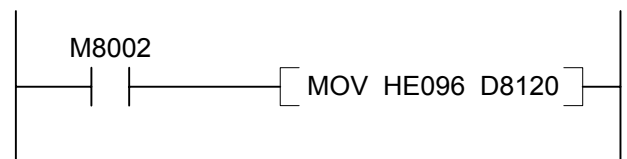

(Fig. 7.1.3-1)   (Fig. 7.1.3-2)

● **How to set the station number (D8121)**
   Be sure to set the station number to "0".
   Set the program to the special data memory (D8121) of the PLC as follows.
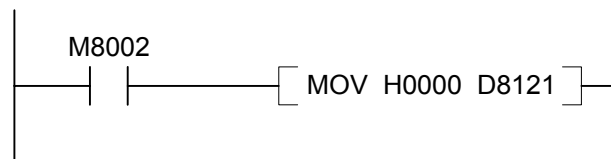
(Fig. 7.1.3-3)

7.1.4 Setup of Serial communication unit (QJ71C24)

Install the GX Developer to a host computer, perform settings such as communication speed, transmission specification and communication protocol, then set up the unit with PC writing function.

 • Setting from the GX Developer:
 (1) I/O allocation setting
       Set the following items.
         • Type: "Intelligent"
         • Model name: QJ71C24
         • Number of points: 32
 (2) Switch setting for I/O unit, Intelligent function unit
       Set the following items.
         • Transmission setting (Action setting: Independent, Data bit: 7, Parity: Yes (Even),
                       Stop bit: 1, Checksum code: Yes, Writing during RUN: Allowed,
                       Setting change: Allowed)
         • Communication speed setting (9600bps or 19200bps)
         • Communication protocol setting (Protocol 4)
   For the setting method, refer to the User's manual for Serial communication unit (Basic).

7.2. Initial setting
7.2.1 Initial setting of Calculator link unit (AJ71UC24, A1SJ71UC24-R4)

When communicating with the C series, set the address from the PLC to store each setting item data of the C series after the power supply to the PLC is turned on. Communication is impossible if the addresses for storing each setting item data of the C series are not set.

Set the program referring to the sample program (Fig. 7.2.1-1) below, and execute the first scan of it.

Note:

Be sure to leave file memory addresses (R0000 to R0002) of the PLC vacant since the addresses (R0000 to R0002) are used to set the top address for the temperature control.

• **Sample program**

```
        M9038
         ┤├─────────────────[MOV K1000  R0000 ]─  (1)
                            [MOV H000A  R1000 ]─  (2)
                            [MOV HAAAA  R1001 ]─┐
                            [MOV HAAAA  R1002 ]─│
                                                │ (3)
                            [MOV H00AA  R1003 ]─│
                            [MOV H0000  R1004 ]─┘
                            [MOV HFFFF  R1005 ]─  (4)
                            [MOV HFFFF  R1006 ]─  (5)
                            [MOV H007F  R1007 ]─  (6)
                            [MOV H1234  R0001 ]─  (7)
                            [MOV H5678  R0002 ]─  (8)


                                    [ END ]─
```
(Fig. 7.2.1-1)

Explanation of the sample program

M9038 is a special relay which turns only 1 scan ON after running.

(1) To the R0000 address, set the top address (R1000) in the memory which is used for the communication with the CIT-200.

(2) To the address R1000, set the number of CPT-20A (10 units) connected to the CIT-200.

(3) To the address R1001 to R1004, set the number of CCT-235 (10 units) connected to the CPT-20A.

(4) To the address R1005, set the communication item Used/Not used selection flag.
    See page 24 for the communication item.

(5) To the address R1006, set the communication item Used/Not used selection flag.
    See page 24 for the communication item.

(6) To the address R1007, set the communication item Used/Not used selection flag.
    See page 25 for the communication item.

(7) To the address R0001, set the fixed value 4660 (decimal).

(8) To the address R0002, set the fixed value 22136 (decimal).

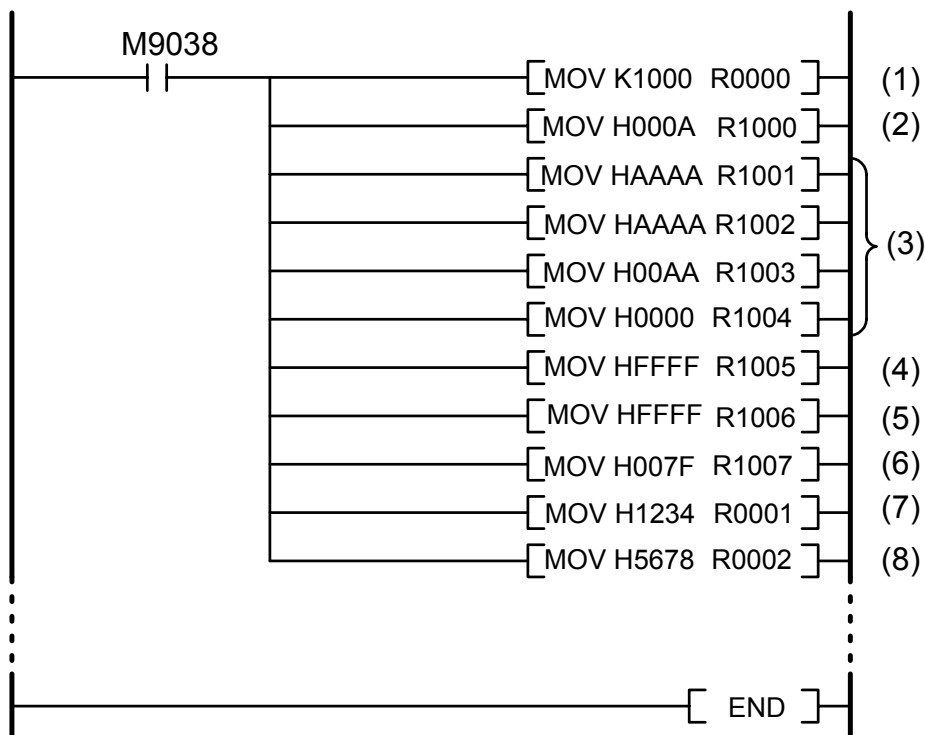### 7.2.2 Initial setting of Micro PLC (FX2N-XXMR)

When communicating with the C series, set the addresses from the PLC to store the setting item data of the C series after the power supply to the PLC is turned on.
Communication is impossible if the addresses for storing the setting item data of the C series are not set. Therefore, set the program referring to the sample program (Fig.7.2.2-1) below, and execute only the first scan of it.

Note

Be sure to leave the file memory addresses (D0000 to D0002) of the PLC vacant when setting a program since the addresses (D0000 to D0002) are used for the top address for the temperature control.

• **Sample program**

```
      M8002
   ─────┤├──────┬──────────────[MOV K1000  D0000]──  (1)
                ├──────────────[MOV H000A  D1000]──  (2)
                ├──────────────[MOV HAAAA  D1001]──┐
                ├──────────────[MOV HAAAA  D1002]──┤
                ├──────────────[MOV H00AA  D1003]──┤  (3)
                ├──────────────[MOV H0000  D1004]──┘
                ├──────────────[MOV HFFFF  D1005]──  (4)
                ├──────────────[MOV HFFFF  D1006]──  (5)
                ├──────────────[MOV H007F  D1007]──  (6)
                ├──────────────[MOV H1234  D0001]──  (7)
                ├──────────────[MOV H5678  D0002]──  (8)
                ├──────────────[MOV HE086  D8120]──  (9)
                └──────────────[MOV H0000  D8121]──  (10)

   ──────────────────────────────────────[ END ]──
```

(Fig. 7.2.2-1)

Explanation of the sample program

M8002 is a special relay which turns only 1 scan ON after running.
(1) To the D0000 address, set the top address (D1000) in the memory area which is used for the communication with the CIT-200.
(2) To the address D1000, set the number of CPT-20A (10 units) connected to the CIT-200.
(3) To the address D1001 to D1004, set the number of CCT-235 (10 units) connected to the CPT-20A.
(4) To the address D1005, set the communication item Used/Not used selection flag.
See page 29 for the communication item.
(5) To the address D1006, set the communication item Used/Not used selection flag.
See page 29 for the communication item.
(6) To the address D1007, set the communication item Used/Not used selection flag.
See page 29 for the communication item.
(7) To the address D0001, set the fixed value 4660 (decimal).
(8) To the address D0002, set the fixed value 22136 (decimal).
(9) To the address D8120, set the communication format.
(10) To the address D8121, set the station number.

For more information, refer to the User's manual (FX communication RS232C, RS485) for Mitsubishi Micro PLC (MELSEC-F).

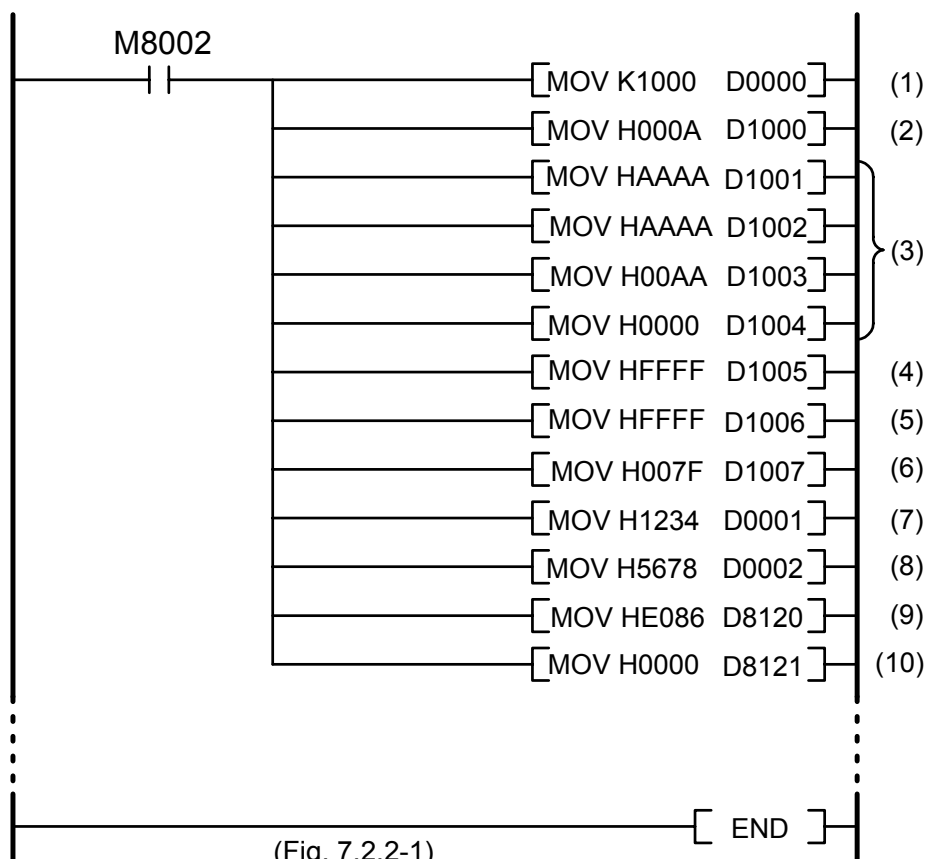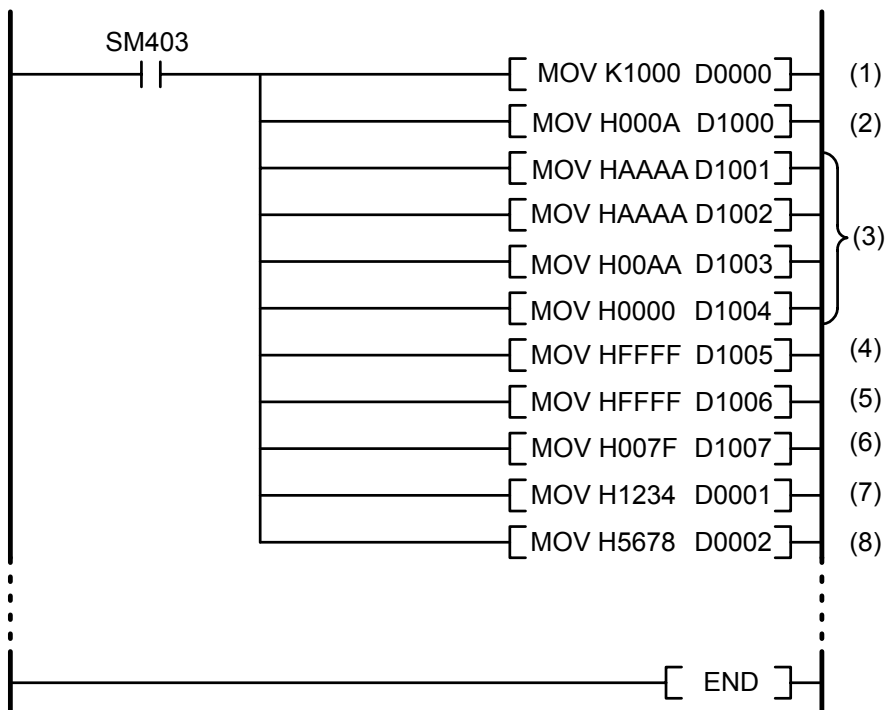### 7.2.3 Initial setting of Serial communication unit (QJ71C24)

When communicating with the C series, set the address from the PLC to store each setting item data of the C series after the power supply to the PLC is turned on. Communication is impossible if the addresses for storing each setting item data of the C series are not set.

Set the program referring to the sample program (Fig. 7.2.3-1) below, and execute the first scan of it.

Note:

Be sure to leave file memory addresses (R0000 to R0002) of the PLC vacant since the addresses (R0000 to R0002) are used to set the top address for the temperature control.

• **Sample program (when using D register)**

```
      SM403
       ┤├                                    ─[ MOV K1000  D0000 ]─   (1)
                                             ─[ MOV H000A  D1000 ]─   (2)
                                             ─[ MOV HAAAA  D1001 ]─┐
                                             ─[ MOV HAAAA  D1002 ]─┤
                                             ─[ MOV H00AA  D1003 ]─├  (3)
                                             ─[ MOV H0000  D1004 ]─┘
                                             ─[ MOV HFFFF  D1005 ]─   (4)
                                             ─[ MOV HFFFF  D1006 ]─   (5)
                                             ─[ MOV H007F  D1007 ]─   (6)
                                             ─[ MOV H1234  D0001 ]─   (7)
                                             ─[ MOV H5678  D0002 ]─   (8)

                                                         ─[ END ]─
```

(7.2.3-1)

Explanation of the sample program

SM403 is a special relay which turns only 1 scan ON after running.

(1) To the D0000 address, set the top address (D1000) in the memory area which is used for the communication with the CIT-200.

(2) To the address D1000, set the number of CPT-20A (10 units) connected to the CIT-200.

(3) To the address D1001 to D1004, set the number of CCT-235 (10 units) connected to the CPT-20A.

(4) To the address D1005, set the communication item Used/Not used selection flag.
　　See page 29 for the communication item.

(5) To the address D1006, set the communication item Used/Not used selection flag.
　　See page 29 for the communication item.

(6) To the address D1007, set the communication item Used/Not used selection flag.
　　See page 29 for the communication item.

(7) To the address D0001, set the fixed value 4660 (decimal).

(8) To the address D0002, set the fixed value 22136 (decimal).

7.3 Communication details

● **How to communicate between the CIT-200 and PLC**

After the power to the PLC is turned on, the PLC sets address 0 in the memory to top address to communicate with the CIT, and sets the number of CPT-20A connected to the CIT-200, the number of the CCT-235 connected to the CPT-20A and communication items to the preset addresses (top address to top address+19).

After that, The PLC sets address 1 to 4660 (decimal), and address 2 to 22136 (decimal).

After the power to the CIT-200 is turned on, the CIT-200 continues to read the PLC addresses (0 to 2).

After confirming that address 1 is 4660 (decimal) and address 2 is 22136 (decimal), the CIT-200 reads the data of the addresses (top address to top address+19) in address 0.

Note

• **Memory type is decided beforehand depending on the PLC selected by the Rotary switch. (pp. 9-10) To address 0 of the predetermined memory, set the top address in the memory which is used for communications with the CIT-200.**
• **The CIT-200 directly reads from and writes to the data memory of the PLC, therefore the PLC does not need to manage the communication procedure, and the program can be simplified.**
• **With writing to and reading from the PLC, the amount of data processed at a time is 20 channels per item.**
• **Communication protocol is Format 4, word unit (command W).**

● **PLC data memory configuration**

• **Mitsubishi Calculator link unit (AJ71UC24, A1SJ71UC24-R4), and Serial communication unit (QJ71C24)**

(e.g.) ⎡ Top address in the memory: R1000
The number of CPT-20A units connected to the CIT-200: 5
The number of CCT-235 units connected to the CPT-20A: 10
⎣ All communication items: Used

To the address R1000, 16^0 (lower 4-bit), set the number of CPT-20A units connected to the CIT-200.

To the addresses [R1001 to R1004], set the number of CCT-235 units connected to the CPT-20A.

To the addresses [R1005 to R1007], select the communication item Used or Not used.

To the address R1008, set the signal (setting value change flag) sending the setting value from the PLC to the CCT-235.

The addresses [R1009 to R1019] are used for future extension.

To the address R1020 and those which follow it, set the necessary points of the communication items (from the main setting value in sequence) to the addresses. The communication items have been set at the addresses [R1005 to R1007].

However, the communication items which have not been set at the addresses [R1005 to R1007] will not be assigned to addresses.

Address	Contents	Setting range, information
R0000	Sets top address in the memory used for communication.	1000 (decimal)
R0001	Communication parameter setting completion flag 1	Fixed value 4660 (decimal)
R0002	Communication parameter setting completion flag 2	Fixed value 22136 (decimal)

Address	Contents	Setting range, information
R1000	Sets the number of CPT-20A units connected to the CIT-200 to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 5 CPT-20A units are connected: 0005H	16^0: The number of the CPT-20A 16^1: Ignored 16^2: Ignored 16^3: Ignored Setting range: 1 to 10H
R1001	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to 4 CPT-20A units (instrument No.0 to No.3): AAAAH	16^0: Instrument No. 0 CPT-20A 16^1: Instrument No. 1 CPT-20A 16^2: Instrument No. 2 CPT-20A 16^3: Instrument No. 3 CPT-20A Setting range: 1 to AH
R1002	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to instrument No.4 CPT-20A unit: 000AH	16^0: Instrument No. 4 CPT-20A 16^1: Instrument No. 5 CPT-20A 16^2: Instrument No. 6 CPT-20A 16^3: Instrument No. 7 CPT-20A Setting range: 1 to AH
R1003	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) CPT-20A is not connected: 0000H	16^0: Instrument No. 8 CPT-20A 16^1: Instrument No. 9 CPT-20A 16^2: Instrument No. 10 CPT-20A 16^3: Instrument No. 11 CPT-20A Setting range: 1 to AH
R1004	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) CPT-20A is not connected: 0000H	16^0: Instrument No. 12 CPT-20A 16^1: Instrument No. 13 CPT-20A 16^2: Instrument No. 14 CPT-20A 16^3: Instrument No. 15 CPT-20A Setting range: 1 to AH
R1005	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Main setting value 2^1 : Main proportional band 2^2 : Integral time 2^3 : Derivative time 2^4 : Alarm 1 (high limit) setting 2^5 : Alarm 2 (low limit) setting 2^6 : Main proportional cycle 2^7 : Heater burnout alarm 2^8 : Control action Perform/Stop 2^9 : Auto-tuning Perform/Cancel 2^{10}: Alarm 1 (high limit) hysteresis 2^{11}: Alarm 2 (low limit) hysteresis 2^{12}: Control output ON/OFF action hysteresis 2^{13}: Control output high limit 2^{14}: Control output low limit 2^{15}: PV (input) filter
R1006	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Temperature unit 2^1 : Control action (Heating/Cooling) 2^2 : Alarm 1 action 2^3 : Alarm 2 action 2^4 : Loop break alarm 1 action span 2^5 : Loop break alarm 1 action time 2^6 : Anti-reset windup 2^7 : PD (Manual) reset 2^8 : Sensor correction 2^9 : Loop break alarm 2 action span 2^{10} : Loop break alarm 2 action time 2^{11}: Cooling proportional band 2^{12}: Cooling proportional cycle 2^{13}: Overlap band/Dead band 2^{14}: Cooling action mode 2^{15}: Cooling output ON/OFF action hysteresis

R1007	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : PV (input) reading 2^1 : MV (manipulated variable) reading 2^2 : Heater current (A) value reading 2^3 : Current status 1 reading 2^4 : Current status 2 reading 2^5 : Reading of Software version information 2^6 : Instrument information reading $2^{7 \text{ to } 15}$: Ignored
R1008	Designates the setting value change flag.	0: No change 1: All setting items are changed. 2: Main setting value is changed. 3: Alarm 1, 2 and Heater burnout alarm setting value are changed. 4: Main proportional band, Integral time, Derivative time, Cooling proportional band, Overlap/Dead band setting value are changed. 5: Auto-tuning Perform/Cancel is changed 6: Control action Perform/Stop is changed. 7: Alarm 1, 2 action, Main proportional cycle, Cooling proportional cycle are changed. 8: Control output high limit and low limit are changed.
R1009 to R1019	For future extension	
R1020 to R1119	Main setting value (SV) setting	Main setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
R1120 to R1219	Main proportional band setting	Main proportional band from Ch1 to Ch100 Setting range: 0.0 to 100.0%
R1220 to R1319	Integral time setting	Integral time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
R1320 to R1419	Derivative time setting	Derivative time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
R1420 to R1519	Alarm 1 (high limit) setting	Alarm 1 (high limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
R1520 to R1619	Alarm 2 (low limit) setting	Alarm 2 (low limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
R1620 to R1719	Main proportional cycle setting	Main proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
R1720 to R1819	Heater burnout alarm setting	Heater burnout alarm value from Ch1 to Ch100 Setting range: 0.0 to 20.0A [W(20A)] 0.0 to 50.0A [W(50A)]
R1820 to R1919	Control action Perform/Stop	Control action Perform/Stop from Ch1 to Ch100 0: Control Stop 1: Control Perform
R1920 to R2019	Auto-tuning Perform/Cancel	Auto-tuning Perform/Cancel from Ch1 to Ch100 0: AT Cancel 1: AT Perform

R2020 to R2119	Alarm 1 (high limit) hysteresis setting	Alarm 1 (high limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000　　(DC current, voltage)
R2120 to R2219	Alarm 2 (low limit) hysteresis setting	Alarm 2 (low limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000　　(DC current, voltage)
R2220 to R2319	Control output ON/OFF action hysteresis setting	Control output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000　　(DC current, voltage)
R2320 to R2419	Control output high limit setting	Control output high limit value from Ch1 to Ch100 Setting range: Control output low limit value to 105%
R2420 to R2519	Control output low limit setting	Control output low limit value from Ch1 to Ch100 Setting range: -5% to Control output high limit value
R2520 to R2619	PV (input) filter setting	PV (input) filter value from Ch1 to Ch100 Setting range: 0.0 to 10.0 seconds
R2620 to R2719	Temperature unit setting	Temperature unit from Ch1 to Ch100 0: ℃　　1: ℉
R2720 to R2819	Control action setting	Control action from Ch1 to Ch100 0: Heating action　　1: Cooling action
R2820 to R2919	Alarm 1 action selection	Alarm 1 action from Ch1 to Ch100 0: No alarm action 1: High limit alarm 2: High limit alarm with standby 3: Low limit alarm 4: Low limit alarm with standby 5: H/L limits alarm 6: H/L limits alarm with standby 7: H/L limit range alarm 8: H/L limit range alarm with standby 9: Process high alarm 10: Process high alarm with standby 11: Process low alarm 12: Process low alarm with standby
R2920 to R3019	Alarm 2 action selection	Alarm 2 action from Ch1 to Ch100 The selection items are the same as those of Alarm 1 action
R3020 to R3119	Loop break alarm 1 action span setting	Loop break alarm 1 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000　　(DC current, voltage)
R3120 to R3219	Loop break alarm 1 action time setting	Loop break alarm 1 action time from Ch1 to Ch100 Setting range: 200 minutes
R3220 to R3319	Anti-reset windup setting	Anti-reset windup from Ch1 to Ch100 Setting range: 0 to 100%

R3320 to R3419	PD (Manual) reset setting	PD (Manual) reset value from Ch1 to Ch100 Setting range: ±Proportional band converted value, however, within the range of -199.9 to 999.9℃
R3420 to R3519	Sensor correction setting	Sensor correction value from Ch1 to Ch100 Setting range: -100.0 to 100.0℃ (Thermocouple, RTD) -1000 to 1000 (DC current, voltage)
R3520 to R3619	Loop break alarm 2 action span setting	Loop break alarm 2 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
R3620 to R3719	Loop break alarm 2 action time setting	Loop break alarm 2 action time from Ch1 to Ch100 Setting range: 200 minutes
R3720 to R3819	Cooling proportional band setting	Cooling proportional band from Ch1 to Ch100 Setting range: Multiplying factor to Heating proportional band 0.0 to 10.0 (ON/OFF action when set to 0.0)
R3820 to R3919	Cooling proportional cycle setting	Cooling proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
R3920 to R4019	Overlap/Dead band setting	Overlap/Dead band from Ch1 to Ch100 Setting range: ±(Heating proportional band converted value)℃
R4020 to R4119	Cooling action mode selection	Cooling action mode from Ch1 to Ch100 0: Air cooling (Linear characteristic) 1: Oil cooling (1.5^{th} power of the linear characteristic) 2: Water cooling (2nd power of the linear characteristic)
R4120 to R4219	Cooling output ON/OFF action hysteresis setting	Cooling output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
R4220 to R4319	PV (input) reading	Reading of PV from Ch1 to Ch100
R4320 to R4419	MV (Manipulated variable) reading	Reading of MV from Ch1 to Ch100
R4420 to R4519	Heater current (ampere) value reading	Reading of Heater current value from Ch1 to Ch100
R4520 to R4619	Current status 1 reading	Reading of Current status 1 from Ch1 to Ch100
R4620 to R4719	Current status 2 reading	Reading of Current status 2 from Ch1 to Ch100
R4720 to R4819	Software version information reading	Reading of Software version information from Ch1 to Ch100
R4820 to R4919	Instrument information reading	Reading of Instrument information from Ch1 to Ch100

Example 1: Set Ch1 main proportional band to data memory address R1120.
Example 2: Set Ch100 heater burnout alarm to data memory address R1819.

• Mitsubishi Micro PLC (FX2N-XXMR), Serial communication unit (QJ71C24)

(e.g.) ⌐ Top address in the memory: D1000
The number of CPT-20A units connected to the CIT-200: 5
The number of CCT-235 units connected to the CPT-20A: 10
└ All communication items: Used

To the address D1000, 16^0 (lower 4-bit), set the number of CPT-20A units connected to the CIT-200.

To the addresses [D1001 to D1004], set the number of CCT-235 units connected to the CPT-20A.

To the addresses [D1005 to D1007], select the communication item Used or Not used.

To the address D1008, set the signal (setting value change flag) sending the setting value from the PLC to the CCT-235.

The addresses [D1009 to D1019] are used for the future extension.

To the address D1020 and those which follow it, set the necessary points of the communication items (from the main setting value) to the addresses in sequence. The communication items has been set at the addresses [D1005 to D1007]

However, the communication items which have not been set at the addresses [D1005 to D1007] will not be assigned to addresses.

Address	Contents	Setting range, information
D0000	Top address in the memory used for communications is set.	1000 (decimal)
D0001	Communication parameter setting completion flag 1	Fixed value 4660 (decimal)
D0002	Communication parameter setting completion flag 2	Fixed value 22136 (decimal)

Address	Contents	Setting range, information
D1000	Sets the number of CPT-20A units connected to the CIT-200 to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 5 CPT-20A units are connected: 0005H	16^0: The number of the CPT-20A 16^1: Ignored 16^2: Ignored 16^3: Ignored Setting range: 1 to 10H
D1001	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to 4 CPT-20A units (instrument No.0 to No.3): AAAAH	16^0: Instrument No. 0 CPT-20A 16^1: Instrument No. 1 CPT-20A 16^2: Instrument No. 2 CPT-20A 16^3: Instrument No. 3 CPT-20A Setting range: 1 to AH
D1002	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to instrument No.4 CPT-20A unit: 000AH	16^0: Instrument No. 4 CPT-20A 16^1: Instrument No. 5 CPT-20A 16^2: Instrument No. 6 CPT-20A 16^3: Instrument No. 7 CPT-20A Setting range: 1 to AH
D1003	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) CPT-20A is not connected: 0000H	16^0: Instrument No. 8 CPT-20A 16^1: Instrument No. 9 CPT-20A 16^2: Instrument No. 10 CPT-20A 16^3: Instrument No. 11 CPT-20A Setting range: 1 to AH
D1004	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) CPT-20A is not connected: 0000H	16^0: Instrument No. 12 CPT-20A 16^1: Instrument No. 13 CPT-20A 16^2: Instrument No. 14 CPT-20A 16^3: Instrument No. 15 CPT-20A Setting range: 1 to AH

D1005	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Main setting value 2^1 : Main proportional band 2^2 : Integral time 2^3 : Derivative time 2^4 : Alarm 1 (high limit) setting 2^5 : Alarm 2 (low limit) setting 2^6 : Main proportional cycle 2^7 : Heater burnout alarm 2^8 : Control action Perform/Stop 2^9 : Auto-tuning Perform/Cancel 2^{10}: Alarm 1 (high limit) hysteresis 2^{11}: Alarm 2 (low limit) hysteresis 2^{12}: Control output ON/OFF action hysteresis 2^{13}: Control output high limit 2^{14}: Control output low limit 2^{15}: PV (input) filter
D1006	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Temperature unit 2^1 : Control action (Heating/Cooling) 2^2 : Alarm 1 action 2^3 : Alarm 2 action 2^4 : Loop break alarm 1 action span 2^5 : Loop break alarm 1 action time 2^6 : Anti-reset windup 2^7 : PD (Manual) reset 2^8 : Sensor correction 2^9 : Loop break alarm 2 action span 2^{10} : Loop break alarm 2 action time 2^{11}: Cooling proportional band 2^{12}: Cooling proportional cycle 2^{13}: Overlap band/Dead band 2^{14}: Cooling action mode 2^{15}: Cooling output ON/OFF action hysteresis
D1007	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : PV (input) reading 2^1 : MV reading 2^2 : Heater current (A) value reading 2^3 : Current status 1 reading 2^4 : Current status 2 reading 2^5 : Reading of Software version information 2^6 : Instrument information reading $2^{7 \text{ to } 15}$: Ignored
D1008	Designates the setting value change flag.	0: No change 1: All setting items are changed. 2: Main setting value is changed. 3: Alarm 1, 2 and Heater burnout alarm setting value are changed. 4: Main proportional band, Integral time, Derivative time, Cooling proportional band, Overlap/Dead band setting value are changed. 5: Auto-tuning Perform/Cancel is changed 6: Control action Perform/Stop is changed. 7: Alarm 1, 2 action, Main proportion-al cycle, Cooling proportional cycle are changed. 8: Control output high limit and low limit are changed.

D1009 to D1019	For future extension	
D1020 to D1119	Main setting value (SV) setting	Main setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
D1120 to D1219	Main proportional band setting	Main proportional band from Ch1 to Ch100 Setting range: 0.0 to 100.0%
D1220 to D1319	Integral time setting	Integral time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
D1320 to D1419	Derivative time setting	Derivative time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
D1420 to D1519	Alarm 1 (high limit) setting	Alarm 1 (high limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
D1520 to D1619	Alarm 2 (low limit) setting	Alarm 2 (low limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
D1620 to D1719	Main proportional cycle setting	Main proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
D1720 to D1819	Heater burnout alarm setting	Heater burnout alarm value from Ch1 to Ch100 Setting range: 0.0 to 20.0A [W(20A)] 0.0 to 50.0A [W(50A)]
D1820 to D1919	Control action Perform/Stop	Control action Perform/stop from Ch1 to Ch100 0: Control stop 1: Control Perform
D1920 to D2019	Auto-tuning Perform/Cancel	Auto-tuning Perform/Cancel from Ch1 to Ch100 0: AT Cancel 1: AT Perform
D2020 to D2119	Alarm 1 (high limit) hysteresis setting	Alarm 1 (high limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D2120 to D2219	Alarm 2 (low limit) hysteresis setting	Alarm 2 (low limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D2220 to D2319	Control output ON/OFF action hysteresis setting	Control output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D2320 to D2419	Control output high limit setting	Control output high limit value from Ch1 to Ch100 Setting range: Control output low limit value to 105%
D2420 to D2519	Control output low limit setting	Control output low limit value from Ch1 to Ch100 Setting range: -5% to Control output high limit value
D2520 to D2619	PV (input) filter setting	PV (input) filter value from Ch1 to Ch100 Setting range: 0.0 to 10.0 seconds

D2620 to D2719	Temperature unit setting	Temperature unit from Ch1 to Ch100 0: ℃ 1: ℉
D2720 to D2819	Control action setting	Control action from Ch1 to Ch100 0: Heating action 1: Cooling action
D2820 to D2919	Alarm 1 action selection	Alarm 1 action from Ch1 to Ch100 0: No alarm action 1: High limit alarm 2: High limit alarm with standby 3: Low limit alarm 4: Low limit alarm with standby 5: H/L limits alarm 6: H/L limits alarm with standby 7: H/L limit range alarm 8: H/L limit range alarm with standby 9: Process high alarm 10: Process high alarm with standby 11: Process low alarm 12: Process low alarm with standby
D2920 to D3019	Alarm 2 action selection	Alarm 2 action from Ch1 to Ch100 The selection items are the same as those of Alarm 1 action
D3020 to D3119	Loop break alarm 1 action span setting	Loop break alarm 1 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D3120 to D3219	Loop break alarm 1 action time setting	Loop break alarm 1 action time from Ch1 to Ch100 Setting range: 200 minutes
D3220 to D3319	Anti-reset windup setting	Anti-reset windup from Ch1 to Ch100 Setting range: 0 to 100%
D3320 to D3419	PD (Manual) reset setting	PD (Manual) reset value from Ch1 to Ch100 Setting range: ±Proportional band converted value, however, within the range of -199.9 to 999.9℃
D3420 to D3519	Sensor correction setting	Sensor correction value from Ch1 to Ch100 Setting range: -100.0 to 100.0℃ (Thermocouple, RTD) -1000 to 1000 (DC current, voltage)
D3520 to D3619	Loop break alarm 2 action span setting	Loop break alarm 2 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D3620 to D3719	Loop break alarm 2 action time setting	Loop break alarm 2 action time from Ch1 to Ch100 Setting range: 200 minutes
D3720 to D3819	Cooling proportional band setting	Cooling proportional band from Ch1 to Ch100 Setting range: Multiplying factor to Heating proportional band 0.0 to 10.0 (ON/OFF action when set to 0.0)
D3820 to D3919	Cooling proportional cycle setting	Cooling proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds

D3920 to D4019	Overlap/Dead band setting	Overlap/Dead band from Ch1 to Ch100 Setting range: ±(Heating proportional band converted value)℃
D4020 to D4119	Cooling action mode selection	Cooling action mode from Ch1 to Ch100 0: Air cooling (Linear characteristic) 1: Oil cooling (1.5th power of the linear characteristic) 2: Water cooling (2nd power of the linear characteristic)
D4120 to D4219	Cooling output ON/OFF action hysteresis setting	Cooling output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
D4220 to D4319	PV (input) reading	Reading of PV from Ch1 to Ch100
D4320 to D4419	MV (Manipulated variable) reading	Reading of MV from Ch1 to Ch100
D4420 to D4519	Heater current (ampere) value reading	Reading of Heater current value from Ch1 to Ch100
D4520 to D4619	Current status 1 reading	Reading of Current status 1 from Ch1 to Ch100
D4620 to D4719	Current status 2 reading	Reading of Current status 2 from Ch1 to Ch100
D4720 to D4819	Software version information reading	Reading of Software version information from Ch1 to Ch100
D4820 to D4919	Instrument information reading	Reading of Instrument information from Ch1 to Ch100

Example 1: Set Ch1 main proportional band to data memory address D1120.

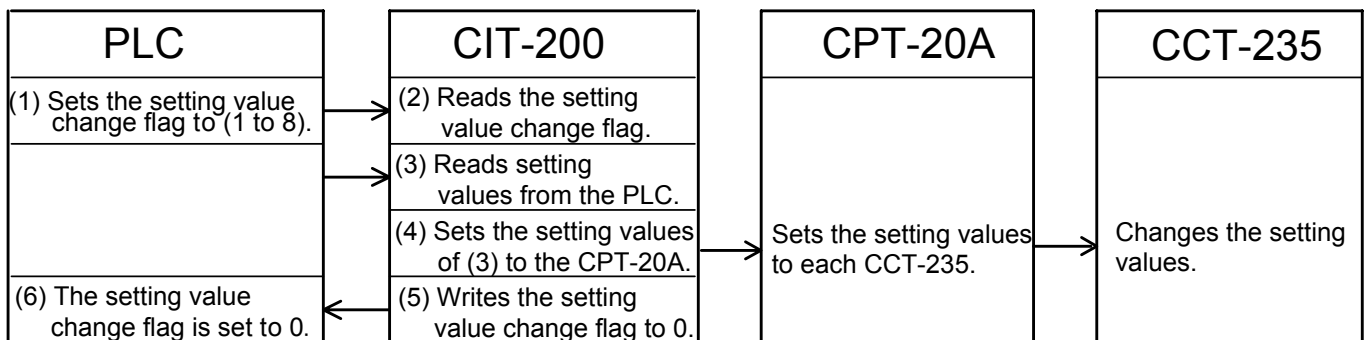Example 2: Set Ch100 heater burnout alarm to data memory address D1819.

● **Processing in the PLC**

• **Setting value change flag setting**

The following procedures show how to change setting values from the PLC. See (Fig.7.3-1).

(1) When changing the CCT-235 setting value, the PLC sets the setting value change flag from the following (1 to 8) items.

    1. All setting values

    2. Main setting value

    3. Alarm 1, Alarm 2, Heater burnout alarm

    4. Main proportional band, Integral time, Derivative time, Cooling proportional band, Overlap/Dead band

    5. Auto-tuning

    6. Control action (Perform/Stop)

    7. Alarm 1 and Alarm 2 action selection, Main proportional cycle, Cooling proportional cycle

    8. Control output high limit, low limit.

(2) After the CIT-200 reads the contents of the setting value change flag (3), the CIT-200 sets them to the CCT-235 via the CPT-20A (4).

(5) After that, the CIT-200 sets the value of the setting value change flag to "0".

The setting data in the data memory should be set within the setting range of CCT-235 since the CIT-200 does not check the allowable setting range of the data.

PLC	CIT-200	CPT-20A	CCT-235
(1) Sets the setting value change flag to (1 to 8).	(2) Reads the setting value change flag.		
	(3) Reads setting values from the PLC.	Sets the setting values to each CCT-235.	Changes the setting values.
	(4) Sets the setting values of (3) to the CPT-20A.		
(6) The setting value change flag is set to 0.	(5) Writes the setting value change flag to 0.		

(Fig. 7.3-1)

• **PV reading**

After the CIT-200 reads PV from the CCT-235, the CIT-200 writes the PV to the PLC memory area where "PV (input) reading" is assigned.

⚠ **Notice**

The CIT-200 can monitor the temperature of up to 16 blocks (320 points). However, if the CIT-200 reads or writes the number of data exceeding the PLC data memory capacity, communication errors occur and it does not work normally.

Therefore, the number of data of the CIT-200 has to be within PLC data memory capacity.

For the PLC data memory capacity, refer to the Instruction manual for each PLC.

8. Communication between the CIT-200 and Omron PLC

8.1 Setup of Host link unit (C200H-LK202-V1)
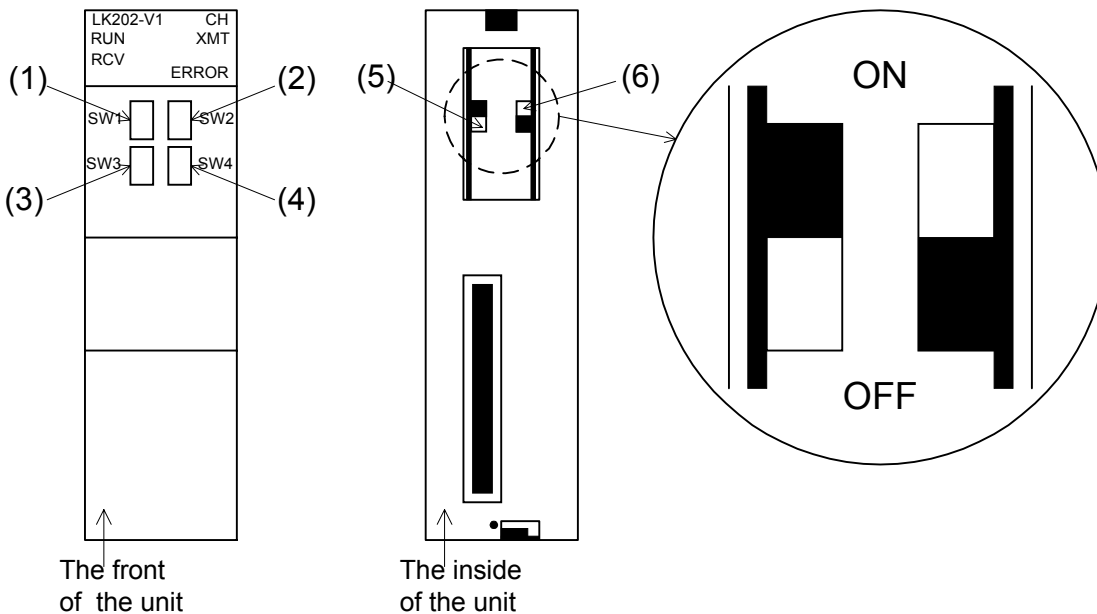
(Fig. 8.1-1)

(1) Sets the instrument number of the double digit (x10).
   Set the number to 0.
(2) Sets the instrument number of the single digit (x1).
   Set the number to 0.
(3) Sets the communication speed.
   Set the communication speed to switch No.5 (9600bps) or No.6 (19200bps).
(4) Sets the command level, parity and transmission code.
   Select the switch No.2 to set them.
(5) Sets the terminator Connected or Not connected.
   Set the terminator to Connected (ON).
(6) Sets the procedure of 1:1 or 1:N.
   Set to 1:N procedure (OFF).

8.2 Initial setting of Host link unit (C200H-LK202-V1)

When communicating with the C series, set the addresses from the PLC to store the setting item data of the C series after the power supply to the PLC is turned on.
Communication is impossible if the addresses for storing the setting item data of the C series are not set.
Set the program referring to the sample program (Fig.8.2-1) as follows.
(Execute only the first scan of the following sample program.)

Note
Leave file memory addresses (DM0000 to DM0002) of the PLC vacant when setting the program since the addresses (DM0000 to DM0002) are used for the top address for the temperature control.
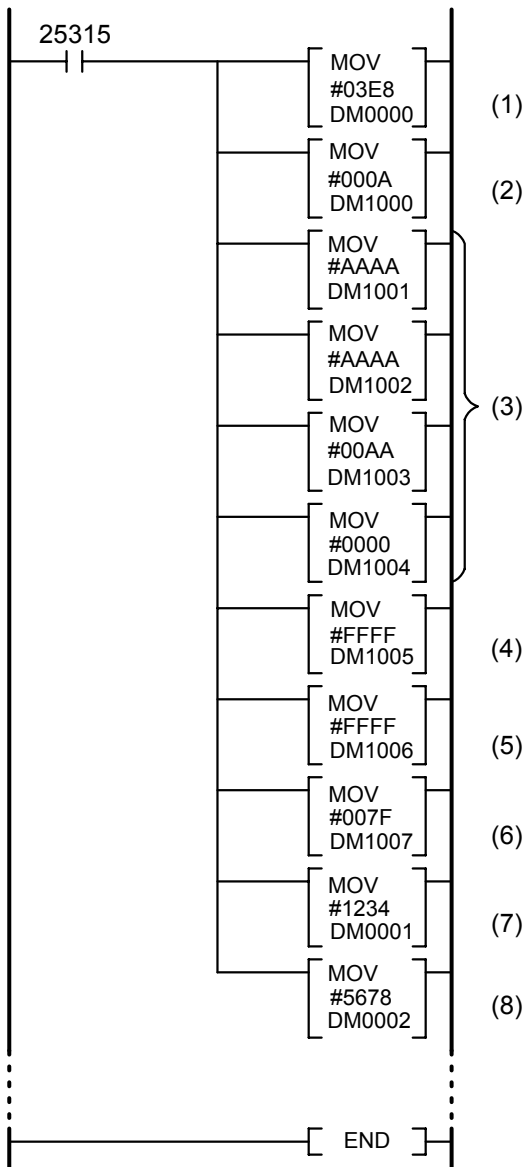
• Sample program

(Fig. 8.2-1)

Explanation of the Sample program

(1) To the DM0000 address, set the top address (DM1000) in the memory area which is used for the communication with the CIT-200.

(2) To the address DM1000, set the number of CCT-235 units (10 units) connected with the CIT-200.

(3) To the addresses DM1001 to DM1004, set the number of CCT-235 units (10 units) connected with the CPT-20A.

(4) To the address DM1005, set the communication item Used/Not used selection flag.
See page 37 for the communication item.

(5) To address DM1006, set the communication item Used/Not used selection flag.
See page 37 for the communication item.

(6) To address DM1007, set the communication item Used/Not used selection flag.
See page 37 for the communication item.

(7) To the address DM0001, set the fixed value 4660 (decimal).

(8) To the address DM0002, set the fixed value 22136 (decimal).

8.3 Communication details

● **How to communicate between the CIT-200 and Host link unit (C200H-LK202-V1)**

After the power to the PLC is turned on, the PLC sets address 0 in the memory area to top address and sets the number of CPT-20A units connected to the CIT-200, the number of the CCT-235 units connected to the CPT-20A and communication items to the preset addresses (top address to top address+19).

After that, The PLC sets address 1 to 4660 (decimal), and address 2 to 22136 (decimal).

After the power to the CIT-200 is turned on, the CIT-200 continues to read the PLC address (0 to 2).

After confirming that address 1 is 4660 (decimal) and address 2 is 22136 (decimal), the CIT-200 reads the data of the addresses (top address to top address+19) in address 0.

Note

• **Memory type is decided beforehand depending on the PLC selected by the Rotary switch.
To the address 0 of the predetermined memory, set the top address in the memory area which is used for communications with the CIT-200.**

• **The CIT-200 directly reads from and writes to the data memory of the PLC, therefore the PLC does not need to manage the communication procedure, and the program can be simplified.**

• **With writing to and reading from the PLC, the amount of data processed at a time is 20 channels per item.**

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● PLC data memory configuration
• Omron Host link unit (C200H-LK202-V1)

(e.g.) ⎧ Top address in the memory area: DM1000
⎪ The number of CPT-20A units connected to the CIT-200: 5
⎪ The number of CCT-235 units connected to the CPT-20A: 10
⎩ All communication items: Used

To the address DM1000, 16^0 (lower 4-bit), set the number of CPT-20A units connected to the CIT-200.

To the addresses [DM1001 to DM1004], set the number of CCT-235 units connected to the CPT-20A.

To the addresses [DM1005 to DM1007], select the communication item Used or Not used.

To the address DM1008, set the signal (setting value change flag) sending the value from the PLC to CCT-235.

The addresses [DM1009 to DM1019] are used for the future extension.

To the address DM1020 and those which follow it, set the necessary points of the communication items (from the main setting value) to the addresses in sequence. The communication items have been set at the addresses [DM1005 to DM1007]

However, the communication items which have not been set at the addresses [DM1005 to DM1007] will not be assigned to addresses.

Address	Contents	Setting range, information
DM0000	Top address in the memory used for communications is set.	1000 (decimal)
DM0001	Communication parameter setting completion flag 1	Fixed value 4660 (decimal)
DM0002	Communication parameter setting completion flag 2	Fixed value 22136 (decimal)

Address	Contents	Setting range, information
DM1000	Sets the number of CPT-20A units connected to the CIT-200 to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 5 CPT-20A units are connected: 0005H	16^0: The number of the CPT-20A 16^1: Ignored 16^2: Ignored 16^3: Ignored Setting range: 1 to 10H
DM1001	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to 4 CPT-20A units (instrument No.0 to No.3): AAAAH	16^0: Instrument No. 0 CPT-20A 16^1: Instrument No. 1 CPT-20A 16^2: Instrument No. 2 CPT-20A 16^3: Instrument No. 3 CPT-20A Setting range: 1 to AH
DM1002	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to instrument No.4 CPT-20A unit: 000AH	16^0: Instrument No. 4 CPT-20A 16^1: Instrument No. 5 CPT-20A 16^2: Instrument No. 6 CPT-20A 16^3: Instrument No. 7 CPT-20A Setting range: 1 to AH
DM1003	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) The CPT-20A is not connected: 0000H	16^0: Instrument No. 8 CPT-20A 16^1: Instrument No. 9 CPT-20A 16^2: Instrument No. 10 CPT-20A 16^3: Instrument No. 11 CPT-20A Setting range: 1 to AH
DM1004	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) The CPT-20A is not connected: 0000H	16^0: Instrument No. 12 CPT-20A 16^1: Instrument No. 13 CPT-20A 16^2: Instrument No. 14 CPT-20A 16^3: Instrument No. 15 CPT-20A Setting range: 1 to AH

DM1005	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Main setting value 2^1 : Main proportional band 2^2 : Integral time 2^3 : Derivative time 2^4 : Alarm 1 (high limit) setting 2^5 : Alarm 2 (low limit) setting 2^6 : Main proportional cycle 2^7 : Heater burnout alarm 2^8 : Control action Perform/Stop 2^9 : Auto-tuning Perform/Cancel 2^{10}: Alarm 1 (high limit) hysteresis 2^{11}: Alarm 2 (low limit) hysteresis 2^{12}: Control output ON/OFF action hysteresis 2^{13}: Control output high limit 2^{14}: Control output low limit 2^{15}: PV (input) filter
DM1006	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : Temperature unit 2^1 : Control action (Heating/Cooling) 2^2 : Alarm 1 action 2^3 : Alarm 2 action 2^4 : Loop break alarm 1 action span 2^5 : Loop break alarm 1 action time 2^6 : Anti-reset windup 2^7 : PD (Manual) reset 2^8 : Sensor correction 2^9 : Loop break alarm 2 action span 2^{10} : Loop break alarm 2 action time 2^{11}: Cooling proportional band 2^{12}: Cooling proportional cycle 2^{13}: Overlap band/Dead band 2^{14}: Cooling action mode 2^{15}: Cooling output ON/OFF action hysteresis
DM1007	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0 : PV (input) reading 2^1 : MV reading 2^2 : Heater current (A) value reading 2^3 : Current status 1 reading 2^4 : Current status 2 reading 2^5 : Reading of Software version information 2^6 : Instrument Information reading $2^{7 \text{ to } 15}$: Ignored
DM1008	Designates the setting value change flag.	0: No change 1: All setting items are changed. 2: Main setting value is changed. 3: Alarm 1, 2 and Heater burnout alarm setting value are changed. 4: Main proportional band, Integral time, Derivative time, Cooling proportional band, Overlap/Dead band setting value are changed. 5: Auto-tuning Perform/Cancel is changed 6: Control action Perform/Stop is changed. 7: Alarm 1, 2 action, Main proportional cycle, Cooling proportional cycle are changed. 8: Control output high limit and low limit are changed.

DM1009 to DM1019	For future extension	
DM1020 to DM1119	Main setting value (SV) setting	Main setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
DM1120 to DM1219	Main proportional band setting	Main proportional band from Ch1 to Ch100 Setting range: 0.0 to 100.0%
DM1220 to DM1319	Integral time setting	Integral time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
DM1320 to DM1419	Derivative time setting	Derivative time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
DM1420 to DM1519	Alarm 1 (high limit) setting	Alarm 1 (high limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
DM1520 to DM1619	Alarm 2 (low limit) setting	Alarm 2 (low limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
DM1620 to DM1719	Main proportional cycle setting	Main proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
DM1720 to DM1819	Heater burnout alarm setting	Heater burnout alarm value from Ch1 to Ch100 Setting range: 0.0 to 20.0A [W(20A)] 0.0 to 50.0A [W(50A)]
DM1820 to DM1919	Control action Perform/Stop	Control action Perform/Stop from Ch1 to Ch100 0: Control Stop 1: Control Perform
DM1920 to DM2019	Auto-tuning Perform/Cancel	Auto-tuning Perform/Cancel from Ch1 to Ch100 0: AT Cancel 1: AT Perform
DM2020 to DM2119	Alarm 1 (high limit) hysteresis setting	Alarm 1 (high limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM2120 to DM2219	Alarm 2 (low limit) hysteresis setting	Alarm 2 (low limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM2220 to DM2319	Control output ON/OFF action hysteresis setting	Control output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM2320 to DM2419	Control output high limit setting	Control output high limit value from Ch1 to Ch100 Setting range: Control output low limit value to 105%
DM2420 to DM2519	Control output low limit setting	Control output low limit value from Ch1 to Ch100 Setting range: -5% to Control output high limit value

DM2520 to DM2619	PV (input) filter setting	PV (input) filter value from Ch1 to Ch100 Setting range: 0.0 to 10.0 seconds
DM2620 to DM2719	Temperature unit setting	Temperature unit from Ch1 to Ch100 0: ℃ 1: ℉
DM2720 to DM2819	Control action setting	Control action from Ch1 to Ch100 0: Heating action 1: Cooling action
DM2820 to DM2919	Alarm 1 action selection	Alarm 1 action from Ch1 to Ch100 0: No alarm action 1: High limit alarm 2: High limit alarm with standby 3: Low limit alarm 4: Low limit alarm with standby 5: H/L limits alarm 6: H/L limits alarm with standby 7: H/L limit range alarm 8: H/L limit range alarm with standby 9: Process high alarm 10: Process high alarm with standby 11: Process low alarm 12: Process low alarm with standby
DM2920 to DM3019	Alarm 2 action selection	Alarm 2 action from Ch1 to Ch100 The selection items are the same as those of Alarm 1 action
DM3020 to DM3119	Loop break alarm 1 action span setting	Loop break alarm 1 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM3120 to DM3219	Loop break alarm 1 action time setting	Loop break alarm 1 action time from Ch1 to Ch100 Setting range: 200 minutes
DM3220 to DM3319	Anti-reset windup setting	Anti-reset windup from Ch1 to Ch100 Setting range: 0 to 100%
DM3320 to DM3419	PD (Manual) reset setting	PD (Manual) reset value from Ch1 to Ch100 Setting range: ±Proportional band converted value, however, within the range of -199.9 to 999.9℃
DM3420 to DM3519	Sensor correction setting	Sensor correction value from Ch1 to Ch100 Setting range: -100.0 to 100.0℃ (Thermocouple, RTD) -1000 to 1000 (DC current, voltage)
DM3520 to DM3619	Loop break alarm 2 action span setting	Loop break alarm 2 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM3620 to DM3719	Loop break alarm 2 action time setting	Loop break alarm 2 action time from Ch1 to Ch100 Setting range: 200 minutes
DM3720 to DM3819	Cooling proportional band setting	Cooling proportional band from Ch1 to Ch100 Setting range: Multiplying factor to Heating proportional band 0.0 to 10.0 (ON/OFF action when set to 0.0)

DM3820 to DM3919	Cooling proportional cycle setting	Cooling proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
DM3920 to DM4019	Overlap/Dead band setting	Overlap/Dead band from Ch1 to Ch100 Setting range: ±(Heating proportional band converted value)℃
DM4020 to DM4119	Cooling action mode selection	Cooling action mode from Ch1 to Ch100 0: Air cooling (Linear characteristic) 1: Oil cooling (1.5th power of the linear characteristic) 2: Water cooling (2nd power of the linear characteristic)
DM4120 to DM4219	Cooling output ON/OFF action hysteresis setting	Cooling output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
DM4220 to DM4319	PV (input) reading	Reading of PV from Ch1 to Ch100
DM4320 to DM4419	MV (Manipulated variable) reading	Reading of MV from Ch1 to Ch100
DM4420 to DM4519	Heater current (ampere) value reading	Reading of Heater current value from Ch1 to Ch100
DM4520 to DM4619	Current status 1 reading	Reading of Current status 1 from Ch1 to Ch100
DM4620 to DM4719	Current status 2 reading	Reading of Current status 2 from Ch1 to Ch100
DM4720 to DM4819	Software version information reading	Reading of Software version information from Ch1 to Ch100
DM4820 to DM4919	Instrument information reading	Reading of Instrument information from Ch1 to Ch100

Example 1: Set Ch1 main proportional band to data memory address DM1120.
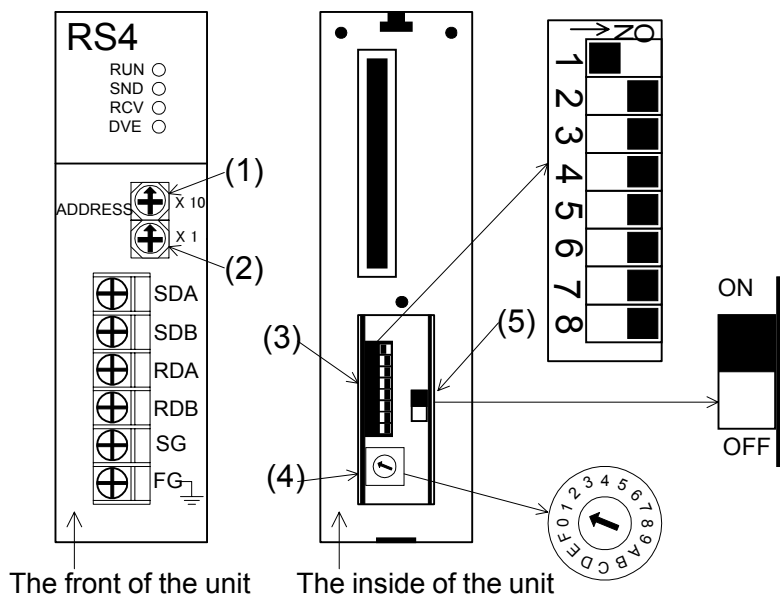Example 2: Set Ch100 heater burnout alarm to data memory address DM1819.

● **Processing in the PLC**

9. Communication between the CIT-200 and Fuji PLC

9.1 Setup of Interface module (NC1L-RS4)

(Fig. 9.1-1)

(1) Sets the instrument number of the double digit (x10).
   Set the number to 0.
(2) Sets the instrument number of the single digit (x1).
   Set the number to 0.
(3) Sets the transmission specifications, referring to (Table 9.1-1).
   Set the baud rate to 9600bps or 19200bps.
   Set the items except for the baud rate to [   ] .
(4) Sets the transmission modes.
   Set the transmission modes to Switch No.3.
(5) Sets the terminator Connected or Not connected.
   Set the terminator to Connected (ON).

(Table 9.1-1)

B. rate / SW No.	300bps	600bps	1,200bps	2,400bps	4,800bps	9,600bps	19,200bps	Not used
1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

SW No.	Setting item	Setting switch ON	Setting switch OFF
4	Stop bit	1 bit	2 bits
5	Data length	7 bits	8 bits
6	Even parity/Odd parity	Even	Odd
7	Parity	Yes	No
8	Initial setting	Switch setting effective	Initial file

9.2 Initial setting of Interface module (NC1L-RS4)

(1) Define the user file area with system definition (File number: W30, File range: Number of data which is required for the communication, Data format: SI).
For more details, refer to Fuji Users' manual [Command] for Program controller (MICREX-F).

(2) When communicating with the C series, set the program to the PLC to perform initial setting (addresses to store the C series setting item data) of one (1) scan after the power supply to the PLC is turned on.
Communication is impossible if the initial setting (addresses to store the C series setting item data) is not performed.

Note

Leave the PLC file memory addresses (W30.0000 to W30.0002) vacant since these will be used for the top address for the temperature control.

9.3 Communication details

● **How to communicate between the CIT-200 and Interface module (NC1L-RS4)**

The CIT-200 sets the CCT-235 to parameters via the CPT-20A after reading the PLC data memory through the Interface module (NC1L-RS4).
The CIT-200 constantly monitors the CCT-235 via the CPT-20A and writes its status to the PLC data memory.
After the power to the PLC is turned on, the PLC sets address 0 in the memory to top address for use of the communication with the CIT-200. The PLC sets the preset addresses (top address to top address +19) to the number of CPT-20A units connected to the CIT-200, the number of CCT-235 units connected to the CPT-20A and communication items.
After that, the PLC sets address 1 to 4660 (decimal) and address 2 to 22136 (decimal).
After the power to the CIT-200 is turned on, the CIT-200 continues to read the PLC addresses (0 to 2).
After confirming that address 1 is 4660 (decimal) and address 2 is 22136 (decimal), the CIT-200 reads data of the addresses (top address to address +19) which has been set in address 0.

File memory "W30 and those which follow it" area is used for writing/reading address of the data.
(It is necessary to set the file memory area from the PLC side)
For more details, refer to Fuji Users' manual [Command] for Program controller (MICREX-F).

Note

• **Memory type is decided beforehand depending on the PLC selected by the Rotary switch.
To the address 0 of the predetermined memory, set the top address in the memory which is used for communications with the CPT-20A.**

• **The CIT-200 directly reads from and writes to the data memory of the PLC, therefore the PLC does not need to manage the communication procedure, and the program can be simplified.**

• **With writing to and reading from the PLC, the amount of data processed at a time is 20 channels per item.**

● PLC data memory configuration
・Fuji interface module (NC1L-RS4)

(e.g.) ⌐ Top address in the memory: W30.1000
The number of CPT-20A units connected to the CIT-200: 5
The number of CCT-235 units connected to the CPT-20A: 10
⌐ All communication items: Used

To the address W30.1000, 16^0 (lower 4-bit), set the number of CPT-20A units connected to the CIT-200.
To the addresses [W30.1001 to W30.1004], set the number of CCT-235 units connected to the CPT-20A.
To the addresses [W30.1005 to W30.1007], select the communication item Used or Not used.
To the address W30.1008, set the signal (setting value change flag) sending the value from the PLC to the CCT-235.
The addresses [W30.1009 to W30.1019] are used for future extension.
To the address W30.1020 and those which follow it, set the necessary points of the communication items (from the main setting value in sequence) to the addresses. The communication items have been set at the addresses [W30.1005 to W30.1007].
However, the communication items which have not been set at the addresses [W30.1005 to W30.1007] will not be assigned to addresses.

Address	Contents	Setting range, information
W30.0000	Sets top address in the memory used for communication.	1000 (decimal)
W30.0001	Communication parameter setting completion flag 1	Fixed value 4660 (decimal)
W30.0002	Communication parameter setting complete flag 2	Fixed value 22136 (decimal)

Address	Contents	Setting range, information
W30.1000	Sets the number of CPT-20A units connected to the CIT-200 to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 5 CPT-20A units are connected: 0005H	16^0: The number of the CPT-20A 16^1: Ignored 16^2: Ignored 16^3: Ignored Setting range: 1 to 10H
W30.1001	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to 4 CPT-20A units (instrument No.0 to No.3): AAAAH	16^0: Instrument No. 0 CPT-20A 16^1: Instrument No. 1 CPT-20A 16^2: Instrument No. 2 CPT-20A 16^3: Instrument No. 3 CPT-20A Setting range: 1 to AH
W30.1002	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) 10 CCT-235 units are connected to instrument No.4 CPT-20A unit: 000AH	16^0: Instrument No. 4 CPT-20A 16^1: Instrument No. 5 CPT-20A 16^2: Instrument No. 6 CPT-20A 16^3: Instrument No. 7 CPT-20A Setting range: 1 to AH
W30.1003	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) The CPT-20A is not connected: 0000H	16^0: Instrument No. 8 CPT-20A 16^1: Instrument No. 9 CPT-20A 16^2: Instrument No. 10 CPT-20A 16^3: Instrument No. 11 CPT-20A Setting range: 1 to AH
W30.1004	Sets the number of CCT-235 units connected to the CPT-20A to every 4-bit of word data. (0 is regarded as 1 unit.) (e.g.) The CPT-20A is not connected: 0000H	16^0: Instrument No. 12 CPT-20A 16^1: Instrument No. 13 CPT-20A 16^2: Instrument No. 14 CPT-20A 16^3: Instrument No. 15 CPT-20A Setting range: 1 to AH

W30.1005	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0: Main setting value 2^1: Main proportional band 2^2: Integral time 2^3: Derivative time 2^4: Alarm 1 (high limit) setting 2^5: Alarm 2 (low limit) setting 2^6: Main proportional cycle 2^7: Heater burnout alarm 2^8: Control action Perform/Stop 2^9: Auto-tuning Perform/Cancel 2^{10}: Alarm 1 (high limit) hysteresis 2^{11}: Alarm 2 (low limit) hysteresis 2^{12}: Control output ON/OFF action hysteresis 2^{13}: Control output high limit 2^{14}: Control output low limit 2^{15}: PV (input) filter
W30.1006	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0: Temperature unit 2^1: Control action (Heating/Cooling) 2^2: Alarm 1 action 2^3: Alarm 2 action 2^4: Loop break alarm 1 action span 2^5: Loop break alarm 1 action time 2^6: Anti-reset windup 2^7: PD (Manual) reset 2^8: Sensor correction 2^9: Loop break alarm 2 action span 2^{10}: Loop break alarm 2 action time 2^{11}: Cooling proportional band 2^{12}: Cooling proportional cycle 2^{13}: Overlap band/Dead band 2^{14}: Cooling action mode 2^{15}: Cooling output ON/OFF action hysteresis
W30.1007	Designates Communication item Used/ Not used selection flag for every 1 bit of word data. 1: Used 0: Not used	2^0: PV (input) reading 2^1: MV reading 2^2: Heater current (A) value reading 2^3: Current status 1 reading 2^4: Current status 2 reading 2^5: Reading of Software version information 2^6: Instrument information reading $2^{7\ to\ 15}$: Ignored
W30.1008	Designates the setting value change flag.	0: No change 1: All setting items are changed. 2: Main setting value is changed. 3: Alarm 1, 2 and Heater burnout alarm setting value are changed. 4: Main proportional band, Integral time, Derivative time, Cooling proportional band, Overlap/Dead band setting value are changed. 5: Auto-tuning Perform/Cancel is changed 6: Control action Perform/Stop is changed. 7: Alarm 1, 2 action, Main proportional cycle, Cooling proportional cycle are changed. 8: Control output high limit and low limit are changed.

W30.1009 to W30.1019	For future extension	
W30.1020 to W30.1119	Main setting value (SV) setting	Main setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
W30.1120 to W30.1219	Main proportional band setting	Main proportional band from Ch1 to Ch100 Setting range: 0.0 to 100.0%
W30.1220 to W30.1319	Integral time setting	Integral time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
W30.1320 to W30.1419	Derivative time setting	Derivative time from Ch1 to Ch100 Setting range: 0 to 3600 seconds
W30.1420 to W30.1519	Alarm 1 (high limit) setting	Alarm 1 (high limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
W30.1520 to W30.1619	Alarm 2 (low limit) setting	Alarm 2 (low limit) setting value from Ch1 to Ch100 Setting range: Refer to the Instruction manual for C series "11.2 Temperature control unit (CCT-235)".
W30.1620 to W30.1719	Main proportional cycle setting	Main proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds
W30.1720 to W30.1819	Heater burnout alarm setting	Heater burnout alarm value from Ch1 to Ch100 Setting range: 0.0 to 20.0A [W(20A)] 0.0 to 50.0A [W(50A)]
W30.1820 to W30.1919	Control action Perform/Stop	Control action Perform/Stop from Ch1 to Ch100 0: Control Stop 1: Control Perform
W30.1920 to W30.2019	Auto-tuning Perform/Cancel	Auto-tuning Perform/Cancel from Ch1 to Ch100 0: AT Cancel 1: AT Perform
W30.2020 to W30.2119	Alarm 1 (high limit) hysteresis setting	Alarm 1 (high limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.2120 to W30.2219	Alarm 2 (low limit) hysteresis setting	Alarm 2 (low limit) hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.2220 to W30.2319	Control output ON/OFF action hysteresis setting	Control output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.2320 to W30.2419	Control output high limit setting	Control output high limit value from Ch1 to Ch100 Setting range: Control output low limit value to 105%
W30.2420 to W30.2519	Control output low limit setting	Control output low limit value from Ch1 to Ch100 Setting range: -5% to Control output high limit value
W30.2520 to W30.2619	PV (input) filter setting	PV (input) filter value from Ch1 to Ch100 Setting range: 0.0 to 10.0 seconds

W30.2620 to W30.2719	Temperature unit setting	Temperature unit from Ch1 to Ch100 0: ℃ 1: ℉
W30.2720 to W30.2819	Control action setting	Control action from Ch1 to Ch100 0: Heating action 1: Cooling action
W30.2820 to W30.2919	Alarm 1 action selection	Alarm 1 action from Ch1 to Ch100 0: No alarm action 1: High limit alarm 2: High limit alarm with standby 3: Low limit alarm 4: Low limit alarm with standby 5: H/L limits alarm 6: H/L limits alarm with standby 7: H/L limit range alarm 8: H/L limit range alarm with standby 9: Process high alarm 10: Process high alarm with standby 11: Process low alarm 12: Process low alarm with standby
W30.2920 to W30.3019	Alarm 2 action selection	Alarm 2 action from Ch1 to Ch100 The selection items are the same as those of Alarm 1 action
W30.3020 to W30.3119	Loop break alarm 1 action span setting	Loop break alarm 1 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.3120 to W30.3219	Loop break alarm 1 action time setting	Loop break alarm 1 action time from Ch1 to Ch100 Setting range: 200 minutes
W30.3220 to W30.3319	Anti-reset windup setting	Anti-reset windup from Ch1 to Ch100 Setting range: 0 to 100%
W30.3320 to W30.3419	PD (Manual) reset setting	PD (Manual) reset value from Ch1 to Ch100 Setting range: ±Proportional band converted value, however, within the range of -199.9 to 999.9℃
W30.3420 to W30.3519	Sensor correction setting	Sensor correction value from Ch1 to Ch100 Setting range: -100.0 to 100.0℃ (Thermocouple, RTD) -1000 to 1000 (DC current, voltage)
W30.3520 to W30.3619	Loop break alarm 2 action span setting	Loop break alarm 2 action span from Ch1 to Ch100 Setting range: 0.0 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.3620 to W30.3719	Loop break alarm 2 action time setting	Loop break alarm 2 action time from Ch1 to Ch100 Setting range: 200 minutes
W30.3720 to W30.3819	Cooling proportional band setting	Cooling proportional band from Ch1 to Ch100 Setting range: Multiplying factor to Heating proportional band 0.0 to 10.0 (ON/OFF action when set to 0.0)
W30.3820 to W30.3919	Cooling proportional cycle setting	Cooling proportional cycle from Ch1 to Ch100 Setting range: 1 to 120 seconds

W30.3920 to W30.4019	Overlap/Dead band setting	Overlap/Dead band from Ch1 to Ch100 Setting range: ±(Heating proportional band converted value)℃
W30.4020 to W30.4119	Cooling action mode selection	Cooling action mode from Ch1 to Ch100 0: Air cooling (Linear characteristic) 1: Oil cooling (1.5^{th} power of the linear characteristic) 2: Water cooling (2nd power of the linear characteristic)
W30.4120 to W30.4219	Cooling output ON/OFF action hysteresis setting	Cooling output ON/OFF action hysteresis from Ch1 to Ch100 Setting range: 0.1 to 100.0℃ (Thermocouple, RTD) 1 to 1000 (DC current, voltage)
W30.4220 to W30.4319	PV (input) reading	Reading of PV from Ch1 to Ch100
W30.4320 to W30.4419	MV (Manipulated variable) reading	Reading of MV from Ch1 to Ch100
W30.4420 to W30.4519	Heater current (ampere) value reading	Reading of Heater current value from Ch1 to Ch100
W30.4520 to W30.4619	Current status 1 reading	Reading of Current status 1 from Ch1 to Ch100
W30.4620 to W30.4719	Current status 2 reading	Reading of Current status 2 from Ch1 to Ch100
W30.4720 to W30.4819	Software version information reading	Reading of Software version information from Ch1 to Ch100
W30.4820 to W30.4919	Instrument information reading	Reading of Instrument information from Ch1 to Ch100

Example 1: Set Ch1 main proportional band to data memory address W30.1120.
Example 2: Set Ch100 heater burnout alarm to data memory address W30.1819.

● **Processing in the PLC**

10. Specifications

10.1 Standard specifications

Name	: PLC Interface Unit
Model	: CIT-200
Supply voltage	: 100 to 240V AC, 50/60Hz
Allowable voltage fluctuation	: 85 to 264V AC

Communication line

> Between the CIT-200 and PLC : Based on RS-232C/RS-422A(RS-485) (Selectable by DIP switch)
> Between the CIT-200 and CPT-20A: Based on RS-422A

External dimensions	: 48 (W) x 96 (H) x 100 (D) mm
Mounting method	: DIN rail mounting
Case	: Flame resistant resin, Color: Black

Action indicator

> Instrument power indicator : When the power supply to the instrument is turned on, a green LED (POWER) lights.
> Communication indicator : When communicating between the CIT-200 and PLC, a yellow LED (TX/RX) blinks.

Setting

> PLC type: Set with the Rotary switch. (pp.9, 10)
> Communication between the PLC and CIT-200: Set with the DIP switch. (pp.9, 10)
> Communication line between the PLC and CIT-200: Set with the DIP switch. (pp.9, 10)

Function
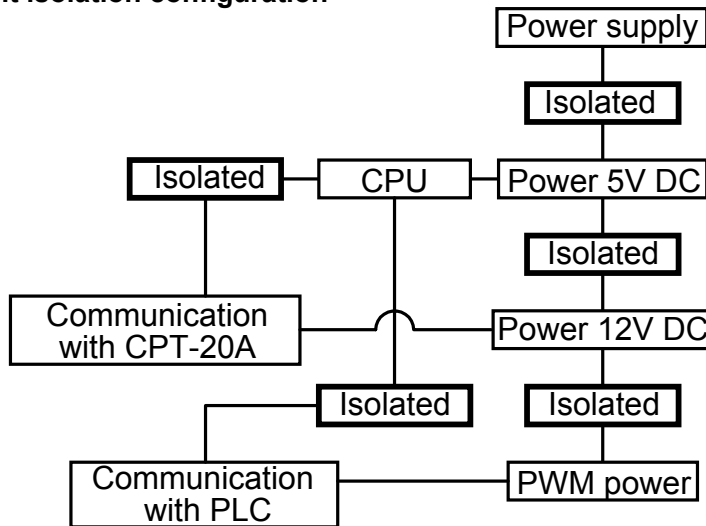
Communication function between the PLC and CIT-200:

> Communication line : Based on RS-232C/RS-422A (RS-485)
> Based on RS-422A [120Ω terminator built-in between RXA(-)and RXB(+)]
> Communication system : Half-duplex communication start-stop synchronous
> Communication speed : 19200bps, 9600bps (Selectable by DIP switch.)
> Data format
>> Start bit : 1
>> Data length : 7, 8 (Selectable by DIP switch.)
>> Parity : None, even, odd (Selectable by DIP switch.)
>> Stop bit : 1, 2

Communication function between the CPT-20A and CIT-200:

> Communication line : Based on RS-422A [120Ω terminator built-in between RXA(-)and RXB(+)]
> Communication speed : 19200bps fixed
> Data format
>> Start bit : 1
>> Data length : 7
>> Parity : Even
>> Stop bit : 1
> Protocol : Shinko protocol for the CPT-20A

Circuit isolation configuration

```
                                    ┌──────────────┐
                                    │ Power supply │
                                    └──────────────┘
                                           │
                                    ┌──────────────┐
                                    │   Isolated   │
                                    └──────────────┘
                                           │
  ┌──────────┐   ┌───────┐   ┌──────────────┐
  │ Isolated │───│  CPU  │───│ Power 5V DC  │
  └──────────┘   └───────┘   └──────────────┘
       │            │               │
       │            │        ┌──────────────┐
       │            │        │   Isolated   │
       │            │        └──────────────┘
       │            │               │
  ┌──────────────┐  │        ┌──────────────┐
  │ Communication│──┴────────│ Power 12V DC │
  │  with CPT-20A│           └──────────────┘
  └──────────────┘                  │
       │      ┌──────────┐   ┌──────────────┐
       │      │ Isolated │   │   Isolated   │
       │      └──────────┘   └──────────────┘
       │           │                │
  ┌──────────────┐ │         ┌──────────────┐
  │ Communication│─┘         │  PWM power   │
  │   with PLC   │───────────└──────────────┘
  └──────────────┘
```

Isolation resistance

Between power terminal and ground terminal: 10MΩ or greater at 500V DC

Dielectric strength

Between power terminal and ground terminal: 1.5kV AC for 1 minute

Others

Power consumption	: Approx. 5VA
Ambient temperature	: 0 to 50℃
Ambient humidity	: 35 to 85%RH (Non-condensing)
Weight	: Approx. 300g
Accessories	: Instruction manual 1 copy
	Terminal cover (when option TC is added) 2 pieces

10.2 Optional specifications

Terminal cover [TC]

Electric shock protection terminal cover

11. Troubleshooting

If any malfunctions occur, check if the power is supplied to the PLC, CIT-200 and C series. If the power is supplied to them, a green power indicator (POWER) lights up.
Check the following and C series "12. Troubleshooting" when they do not work even if the indicator lights up.

⚠ Warning

Turn the power supplied to the instrument OFF before wiring or checking.

Working with the power switched ON may result in severe injury or death due to Electric Shock.

● **Problem: Communication is impossible.**

Presumed cause	Solution
• The disconnection of communication cable or imperfect contact between the cable and terminal	Change the cable, or fasten the screw of the terminal securely.
• Setup of the CIT-200 is mistaken.	Refer to pages 9 and 10.
• Setup of the CPT-20A is mistaken.	Refer to pages 9 and 10.
• The wiring of communication cable is not correct.	Wire it properly. (pp.13 to 17)
• Setup of the PLC is not correct.	Setup of Mitsubishi PLC: pp. 17 to 19 Setup of Omron PLC : pp. 34 Setup of Fuji PLC : pp. 41
• Initial setting of the PLC is not correct.	Initial setting of Mitsubishi PLC: pp. 20 Initial setting of Omron PLC : pp. 34 to 40 Initial setting of Fuji PLC : pp. 42 to 47
• When using the communication line RS-422A, terminators are not connected at the end of the PLC unit.	Connect terminators, referring to the instruction manual for each PLC.

If any unexplained malfunctions occur other than the above mentioned, make inquiries at our agency or the shop where you purchased the unit.

******* Inquiry *******

For any inquiry about this unit, please contact the shop where you purchased or our agency after checking the following.

    • Model name ·························· CIT-200
    • Option ································ TC
    • Instrument number ················ No.XXXXXX

In addition to the above, please let us know the details of malfunction, if any, and the operating conditions.