SanRex

Thyristor Type Power Adjusting Unit

CALPOTE

UF series

CC-Link communication unit

UF－CL

USER MANUAL

TABLE OF CONTENTS

1. COMMUNICATION

1.1 Summary

To the communication between the UF-unit and the external unit, there are RS485, Device Net, CC-Link, Prof-Bus communications.

In this USER MANUAL, explains the correspondence procedure in the UF-unit and the CC-Link communication.

In this USER MANUAL, CC-Link spec is explained roughly and so that if you want to know in detail about it, please make reference to "CC-Link Specification" issued by CLPA(CC-Link Partner Association).

2 SPECIFICATION

2.1 System configuration

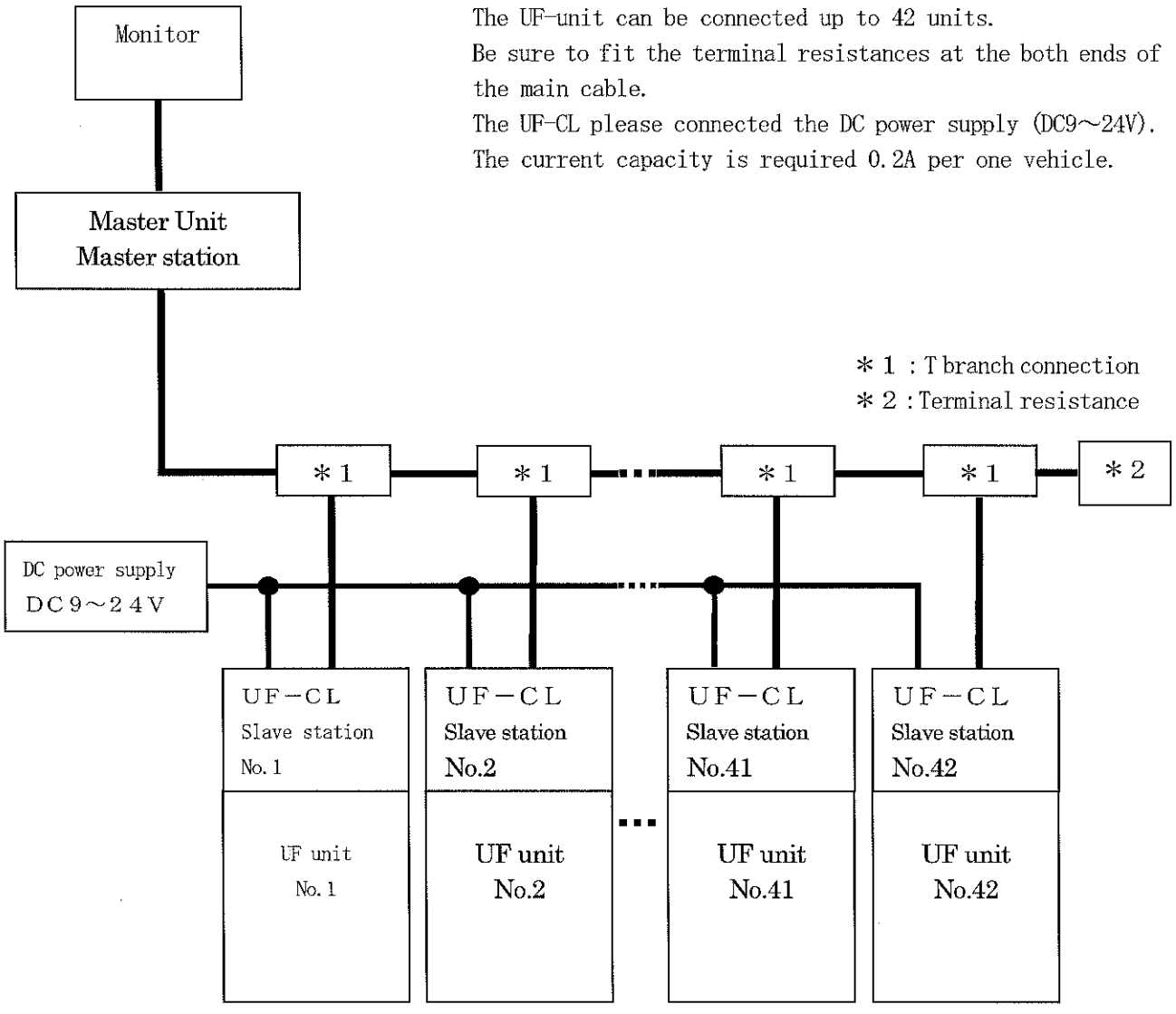
The UF-unit perform as a remote device station of CC-Link.

The order of the cable connection on CC-Link is Daisy chain formula.

In the event of any communication error cause by reflection on transmission lines etc, use a special cable which is exclusive to CC-Link and connect terminal resistances to the both ends of main line.

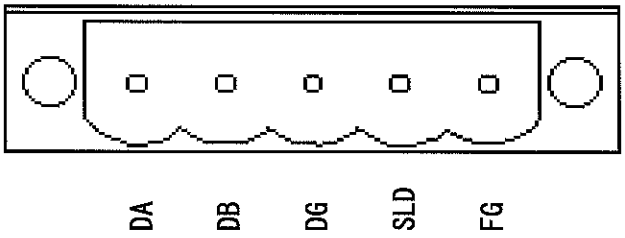
With regard to detail of laying, please refer to "CC-Link Cable Wiring Manual" issued by CLPA.

The UF-unit can be connected up to 42 units.
Be sure to fit the terminal resistances at the both ends of the main cable.
The UF-CL please connected the DC power supply (DC9～24V).
The current capacity is required 0.2A per one vehicle.

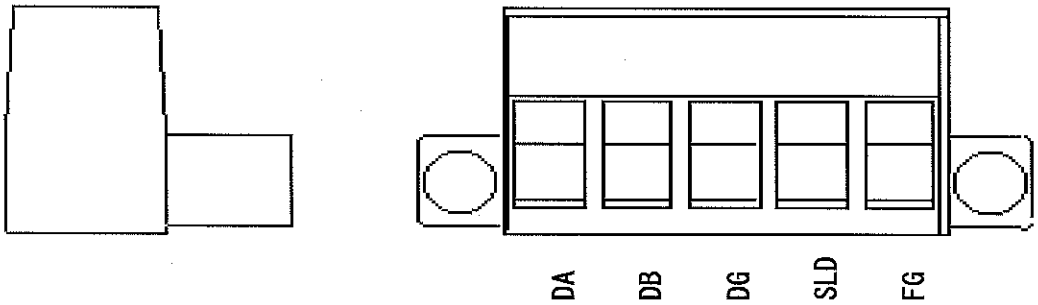


2．2 Connector

(1) Socket — ＭＳＴＢ２．５／５－ＧＦ－５．０８ＡＵ
Made by PHOENIX CONTACT



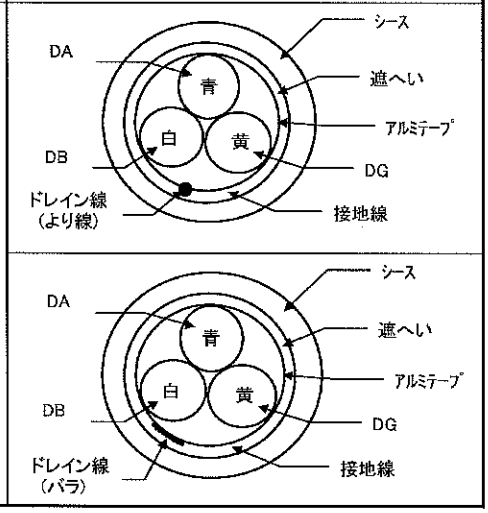
(2) Plug — ＭＳＴＢ２．５／５－ＳＴＦ－５．０８－ＡＵ
Made by PHOENIX CONTACT



2．3 Communication cable

CC-Link uses the special cable settled by the specifications and constructs main line.
The description of each cable is shown as below.

表3．1　CC-Link専用ケーブル仕様（Ver.1.10）

項　目			仕　様
ケーブル種類			シールド付3芯ツイストケーブル
仕上外径			8．0 mm以下
ドレイン線			20本/0.18mm または24本/0.18mm 接地線編組とアルミテープ間に より線またはバラで挿入
電気特性	導体抵抗（20℃）		37．8Ω/km
	絶縁抵抗		10000 MΩ・km 以上
	耐電圧		DC500V1分
	静電容量（1kHz）		60 nF/km以下
	特性インピーダンス	1MHz	110±15Ω
		5MHz	110±6Ω
	減衰量（20℃）	1MHz	1．6 dB/100m以下
		5MHz	3．5 dB/100m以下
断　面			

機器との接続

表3．2　絶縁体の色と接続端子の対応

絶縁体の色	機器側
青	DA
白	DB
黄	DG
接地線(シールド)	SLD

2．4 Connection resistance

CC-Link needs to fit terminal resistances at the both ends of main line.

2．4．1 Specification

The specifications of the terminal resistances are shown as below.

- resistance　　110Ω　±5%
- acceptable loss　　1／2W

2．4．2 Notice on the installation

(1) The terminal resistances should be fit at dead ends of main line.
If they are fit at station, problems may happen at network dead end and it leads to break down.
(Impedance might be too high or too low.)
(2) The terminal resistances should not be fit at branch line's ends.

3. COMMUNICATION METHOD

3.1 Communication text

Communications is set at extended cyclic 2 times setting(Ver.2) 1 stations occupied.
This chapter points out mapping content of each data concerning the UF-unit in the following.

3.1.1 Case of UF1

※ "n" used in the below tables is the value set by station setting.

(1) RX data (UF1 → PLC)

Device No.	Name of signal	Complement
RXn00	State display・Start/Stop	1: operation ／ 0: Stop
RXn01	Reservation	
RXn02		
RXn03	Monitor value switch state flag	1: Set value ／ 0: Usually
RXn04	Reservation	
RXn05	EEPROM abnormal	1: EEPROM abnormal ／ 0: Normal
RXn06	Gate block	1: Gate block ／ 0: Normal
RXn07	Heater disconnection	1: Heater disconnection ／ 0: Normal
RXn08	Abnormal frequency	1: Abnormal frequency ／ 0: Normal
RXn09	Power supply undervoltage	1: Power supply undervoltage ／ 0: Normal
RXn0A	Load abnormality	1: Load abnormality ／ 0: Normal
RXn0B	Thyristor abnormality	1: Thyristor abnormality ／ 0: Normal
RXn0C	Temperature rise abnormality	1: Temperature rise abnormality ／ 0: Normal
RXn0D	Fuse disconnection	1: Fuse disconnection ／ 0: Normal
RXn0E	Over current abnormality	1: Over current ／ 0: Normal
RXn0F	Abnormal collective	1: Abnormal collective(Including communicat-ion error) ／ 0: Normal
RXn10		
RXn11		
RXn12		
RXn13		
RXn14		
RXn15		
RXn16		
RXn17		
RXn18		
RXn19		
RXn1A		
RXn1B		
RXn1C		
RXn1D		
RXn1E		
RXn1F		

Device No.	Name of signal	Complement
RXn20		
RXn21		
RXn22		
RXn23		
RXn24		
RXn25		
RXn26		
RXn27		
RXn28		
RXn29		
RXn2A		
RXn2B		
RXn2C		
RXn2D		
RXn2E		
RXn2F		
RXn30	Reservation	
RXn31		
RXn32		
RXn33		
RXn34		
RXn35		
RXn36		
RXn37		
RXn38	Initial data processing request	1: Initial data processing request(Unused)
RXn39	Initial data processing finish	1: Initial data processing finish(Unused)
RXn3A	Error state	1: Remote error(Communication error with the UF1)
RXn3B	Remote READY	1: Remote READY(Communication Normal with the UF1)
RXn3C	Reservation	
RXn3D		
RXn3E		
RXn3F		

(2) RY data (PLC → UF1)

Device No.	Name of signal	Complement
RYn00	Start/Stop setting	1: start ／ 0: stop
RYn01	Reservation	
RYn02		
RYn03		
RYn04		
RYn05		
RYn06		
RYn07		
RYn08		
RYn09		
RYn0A		
RYn0B		
RYn0C		
RYn0D		
RYn0E	1～16 Set value enable or disable	1: Enable ／ 0: Disable
RYn0F	Monitor value switch state flag	1: Set value ／ 0: Usually
RYn10		
RYn11		
RYn12		
RYn13		
RYn14		
RYn15		
RYn16		
RYn17		
RYn18		
RYn19		
RYn1A		
RYn1B		
RYn1C		
RYn1D		
RYn1E		
RYn1F		

Device No.	Name of signal	Complement
RYn20		
RYn21		
RYn22		
RYn23		
RYn24		
RYn25		
RYn26		
RYn27		
RYn28		
RYn29		
RYn2A		
RYn2B		
RYn2C		
RYn2D		
RYn2E		
RYn2F		
RYn30	Reservation	
RYn31		
RYn32		
RYn33		
RYn34		
RYn35		
RYn36		
RYn37		
RYn38	Initial data processing finish	1: Initial data processing finish(Unused)
RYn39	Initial data setting request	1: Initial data setting request(Unused)
RYn3A	Error reset request flag	1: Error reset(Communication error clear with the UF1)
RYn3B	Reservation	
RYn3C		
RYn3D		
RYn3E		
RYn3F		

(3) RWr data (UF1 → PLC)

Device No.	Name of signal	Complement
RWr n0	Monitor value 1	Usually : Out current Set value: Control signal
RWr n1	Monitor value 2	Usually : Out voltage Set value: Manual(upper limit) signal
RWr n2	Monitor value 3	Usually : Out power Set value: Lower point(lower limit) signal
RWr n3	Monitor value 4	Usually : Soft start time Set value: Grade signal
RWr n4	Monitor value 5	Usually : 08~0F: Delay time 00~07: Period time Set value: Soft start time
RWr n5	Monitor value 6	Usually : 09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change Set value: 08~0F: Delay time 00~07: Period time
RWr n6	Monitor value 7	Usually : 08~0F: Current limit 00~07: Heater disconnecting amount Set value: 09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change
RWr n7	Monitor value 8	Usually : Reservation Set value: 08~0F: Current limit 00~07: Heater disconnecting amount
RWr n8	Monitor value 9	Reservation
RWr n9	Monitor value 10	Reservation
RWr n10	Monitor value 11	Reservation
RWr n11	Monitor value 12	Reservation
RWr n12	Monitor value 13	Reservation
RWr n13	Monitor value 14	Reservation
RWr n14	Monitor value 15	Reservation
RWr n15	Monitor value 16	Reservation

(4) RWw data (PLC → UF1)

Device No.	Name of signal	Complement
RWwn0	Set value 1	Control signal
RWwn1	Set value 2	Manual(upper limit) signal
RWwn2	Set value 3	Lower point(lower limit) signal
RWwn3	Set value 4	Grade signal
RWwn4	Set value 5	Soft start time
RWwn5	Set value 6	08~0F: Delay time 00~07: Period time
RWwn6	Set value 7	08~0F: Reservation 00~07: I/O characteristic change
RWwn7	Set value 8	08~0F: Current limit 00~07: Heater disconnecting amount
RWwn8	Set value 9	Reservation
RWwn9	Set value 10	Reservation
RWwn10	Set value 11	Reservation
RWwn11	Set value 12	Reservation
RWwn12	Set value 13	Reservation
RWwn13	Set value 14	Reservation
RWwn14	Set value 15	Reservation
RWwn15	Set value 16	Reservation

3.1.2 Case of UF3

※ " n" used in the below tables is the value set by station setting.

(1) RX data (UF3 → PLC)

Device No.	Name of signal	Complement
RXn00	State display・Start/Stop	1: operation ／ 0: Stop
RXn01	Reservation	
RXn02		
RXn03	Monitor value switch state flag	1: Set value ／ 0: Usually
RXn04	Reservation	
RXn05	EEPROM abnormal	1: EEPROM abnormal ／ 0: Normal
RXn06	Gate block	1: Gate block ／ 0: Normal
RXn07	Heater disconnection	1: Heater disconnection ／ 0: Normal
RXn08	Abnormal frequency	1: Abnormal frequency ／ 0: Normal
RXn09	Power supply undervoltage	1: Power supply undervoltage ／ 0: Normal
RXn0A	Load abnormality	1: Load abnormality ／ 0: Normal
RXn0B	Thyristor abnormality	1: Thyristor abnormality ／ 0: Normal
RXn0C	Temperature rise abnormality	1: Temperature rise abnormality ／ 0: Normal
RXn0D	Fuse disconnection	1: Fuse disconnection ／ 0: Normal
RXn0E	Over current abnormality	1: Over current ／ 0: Normal
RXn0F	Abnormal collective	1: Abnormal collective(Including communicat -ion error) ／ 0: Normal
RXn10		
RXn11		
RXn12		
RXn13		
RXn14		
RXn15		
RXn16		
RXn17		
RXn18		
RXn19		
RXn1A		
RXn1B		
RXn1C		
RXn1D		
RXn1E		
RXn1F		

Device No.	Name of signal	Complement
RXn20		
RXn21		
RXn22		
RXn23		
RXn24		
RXn25		
RXn26		
RXn27		
RXn28		
RXn29		
RXn2A		
RXn2B		
RXn2C		
RXn2D		
RXn2E		
RXn2F		
RXn30	Reservation	
RXn31		
RXn32		
RXn33		
RXn34		
RXn35		
RXn36		
RXn37		
RXn38	Initial data processing request	1: Initial data processing request(Unused)
RXn39	Initial data processing finish	1: Initial data processing finish(Unused)
RXn3A	Error state	1: Remote error(Communication error with the UF3)
RXn3B	Remote READY	1: Remote READY(Communication Normal with the UF3)
RXn3C	Reservation	
RXn3D		
RXn3E		
RXn3F		

(2) RY data (PLC → UF3)

Device No.	Name of signal	Complement
RYn00	Start/Stop setting	1: start ／ 0: stop
RYn01	Reservation	
RYn02		
RYn03		
RYn04		
RYn05		
RYn06		
RYn07		
RYn08		
RYn09		
RYn0A		
RYn0B		
RYn0C		
RYn0D		
RYn0E	1～16 Set value enable or disable	1: Enable ／ 0: Disable
RYn0F	Monitor value switch state flag	1: Set value ／ 0: Usually
RYn10		
RYn11		
RYn12		
RYn13		
RYn14		
RYn15		
RYn16		
RYn17		
RYn18		
RYn19		
RYn1A		
RYn1B		
RYn1C		
RYn1D		
RYn1E		
RYn1F		

Device No.	Name of signal	Complement
RYn20		
RYn21		
RYn22		
RYn23		
RYn24		
RYn25		
RYn26		
RYn27		
RYn28		
RYn29		
RYn2A		
RYn2B		
RYn2C		
RYn2D		
RYn2E		
RYn2F		
RYn30	Reservation	
RYn31		
RYn32		
RYn33		
RYn34		
RYn35		
RYn36		
RYn37		
RYn38	Initial data processing finish	1: Initial data processing finish(Unused)
RYn39	Initial data setting request	1: Initial data setting request(Unused)
RYn3A	Error reset request flag	1: Error reset(Communication error clear with The UF3)
RYn3B	Reservation	
RYn3C		
RYn3D		
RYn3E		
RYn3F		

(3) RWr data (UF3 → PLC)

Device No.	Name of signal	Complement
RWr n 0	Monitor value 1	Usually : U-phase out current Set value: Control signal
RWr n 1	Monitor value 2	Usually : V-phase out current Set value: Manual(upper limit) signal
RWr n 2	Monitor value 3	Usually : W-phase out current Set value: Lower point(lower limit) signal
RWr n 3	Monitor value 4	Usually : U-phase out voltage Set value: Grade signal
RWr n 4	Monitor value 5	Usually : V-phase out voltage Set value: Soft start time
RWr n 5	Monitor value 6	Usually : W-phase out voltage Set value: 08~0F: Delay time 00~07: Period time
RWr n 6	Monitor value 7	Usually : Out power Set value: 09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change
RWr n 7	Monitor value 8	Usually : Soft start time Set value: 08~0F: Current limit 00~07: Heater disconnecting amount
RWr n 8	Monitor value 9	Usually : 08~0F: Delay time 00~07: Period time Set value: Reservation
RWr n 9	Monitor value 10	Usually : 09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change Set value: Reservation
RWr n 1 0	Monitor value 11	Usually : 08~0F: Current limit 00~07: Heater disconnecting amount Set value: Reservation
RWr n 1 1	Monitor value 12	Reservation
RWr n 1 2	Monitor value 13	Reservation
RWr n 1 3	Monitor value 14	Reservation
RWr n 1 4	Monitor value 15	Reservation
RWr n 1 5	Monitor value 16	Reservation

(4) RWw data (PLC → UF3)

Device No.	Name of signal	Complement
RWwn0	Set value 1	Control signal
RWwn1	Set value 2	Manual(upper limit) signal
RWwn2	Set value 3	Lower point(lower limit) signal
RWwn3	Set value 4	Grade signal
RWwn4	Set value 5	Soft start time
RWwn5	Set value 6	08~0F: Delay time 00~07: Period time
RWwn6	Set value 7	08~0F: Reservation 00~07: I/O characteristic change
RWwn7	Set value 8	08~0F: Current limit 00~07: Heater disconnecting amount
RWwn8	Set value 9	Reservation
RWwn9	Set value 10	Reservation
RWwn10	Set value 11	Reservation
RWwn11	Set value 12	Reservation
RWwn12	Set value 13	Reservation
RWwn13	Set value 14	Reservation
RWwn14	Set value 15	Reservation
RWwn15	Set value 16	Reservation

3.2 Communication procedure

3.2.1 Initial data processing request and finish

The initial data processing request flag (RX(n+3)8) and the initial data processing finish flag (RY(n+3)8) are not used.

When power is applied, if normal communication with the UF-unit, the remote station READY flag (RX(n+3)B) is turned ON.

3. 2. 2 Initial data setting request and finish

The initial data setting request flag (RY(n+3)9) and the initial data setting finish flag (RX(n+3)9) are not used.

3. 2. 3 Remote input and output data(RX·RY data)

There is not a sequence about reading and writing of the remote input and output data . An optional data can be read and written.

3. 2. 4 Remote register data(RWr·RWw data)

In regard to reading and writing of the remote register data, read and write page by page. But, in case of Set value 1～16 (RWwn0～RWwn15) can always be read.

3. 2. 5 Reading data of Monitor value 1~16(RWr data)

CC-Link interface board and UF1/UF3-unit may not read correctly by the timing of the data interface unit.

Read data in communication of once, be sure to conduct more than once.

(1) When the Monitor value switch state flag is "Usually"

① The Monitor value switch state flag of Control flag 2 (RYn0FH) set to "0 ".

② The Monitor value switch state flag of Status flag 2 (RXn03H) is set "0".

③ Reads the data of the Monitor value 1~16(RWrn0~RWrn15). The data of the Monitor value switch state flag "Usually" put out to read.

(2) When the Monitor value switch state flag is "Set value"

① The Monitor value switch state flag of Control flag 2 (RYn0FH) set to "1 " .

② The Monitor value switch state flag of Status flag 2 (RXn03H) is set "1".

③ Reads the data of the Monitor value 1~16(RWrn0~RWrn15). The data of the Monitor value switch state flag "Set value" put out to read.

(a) Case of UF1

Device No.	Monitor value switch state flag	
	Usually	Set value
RWr n 0	Out current	Control signal
RWr n 1	Out voltage	Manual(upper limit) signal
RWr n 2	Out power	Lower point(lower limit) signal
RWr n 3	Soft start time	Grade signal
RWr n 4	08~0F: Delay time 00~07: Period time	Soft start time
RWr n 5	09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change	08~0F: Delay time 00~07: Period time
RWr n 6	08~0F: Current limit 00~07: Heater disconnecting amount	09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change
RWr n 7	Reservation	08~0F: Current limit 00~07: Heater disconnecting amount
RWr n 8	Reservation	Reservation
RWr n 9	Reservation	Reservation
RWr n 1 0	Reservation	Reservation
RWr n 1 1	Reservation	Reservation
RWr n 1 2	Reservation	Reservation
RWr n 1 3	Reservation	Reservation
RWr n 1 4	Reservation	Reservation
RWr n 1 5	Reservation	Reservation

(b) Case of UF3

Device No.	Monitor value switch state flag	
	Usually	Set value
RWr n 0	U-phase out current	Control signal
RWr n 1	V-phase out current	Manual(upper limit) signal
RWr n 2	W-phase out current	Lower point(lower limit) signal
RWr n 3	U-phase out voltage	Grade signal
RWr n 4	V-phase out voltage	Soft start time
RWr n 5	W-phase out voltage	08~0F: Delay time 00~07: Period time
RWr n 6	Out power	09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change
RWr n 7	Soft start time	08~0F: Current limit 00~07: Heater disconnecting amount
RWr n 8	08~0F: Delay time 00~07: Period time	Reservation
RWr n 9	09~0F: Reservation 08: Self-diagnostic function setting 00~07: I/O characteristic change	Reservation
RWr n 1 0	08~0F: Current limit 00~07: Heater disconnecting amount	Reservation
RWr n 1 1	Reservation	Reservation
RWr n 1 2	Reservation	Reservation
RWr n 1 3	Reservation	Reservation
RWr n 1 4	Reservation	Reservation
RWr n 1 5	Reservation	Reservation

3.2.6 Writing data of Set value 1~16(RWw data)

① The Set value 1~16 enable or disable flag of control Flag 2 (RYn0EH) set to disable "0".
② Writes the data of the Set value 1~16(RWwn0~RWwn15).
③ The Set value 1~16 enable or disable flag of control Flag 2 (RYn0EH) set to enable "1".
④ Writes the data of the Set value 1~16(RWwn0~RWwn15).
⑤ The Set value 1~16 enable or disable flag of control Flag 2 (RYn0EH) set to disable "0".

When writes always the data of the Set value, the Set value 1~16 enable or disable flag (RYn0EH) set to enable "1".

3. 3 Communication data term

3. 3. 1 Case of the UF1

※ " n" used in the below Items is the value set by station setting.

(1) RX data(Viewed from the PLC input)

① Status flag 1(RXn00－07H)

07	06	05	04	03	02	01	00

07 : Heater disconnection (1: Heater disconnection ／ 0: Normal)
06 : Gate block (1: Gate block ／ 0: Normal)
05 : EEPROM abnormal (1: EEPROM abnormal ／ 0: Normal)
04 : Reservation
03 : Monitor value switch state flag (1: Set value ／ 0: Usually)
02 : Reservation
01 : Reservation
00 : State display・Start/Stop (1: Operation ／ 0: Stop)

② Status flag 2(RXn08－0FH)

0F	0E	0D	0C	0B	0A	09	08

0F : Abnormal collective
(1: Abnormal collective(Including communication error) ／ 0: Normal)
0E : Over current abnormality (1: Over current ／ 0: Normal)
0D : Fuse disconnection (1: Fuse disconnection ／ 0: Normal)
0C : Temperature rise abnormality (1: Temperature rise abnormality ／ 0: Normal)
0B : Thyristor abnormality (1: Thyristor abnormality ／ 0: Normal)
0A : Load abnormality (1: Load abnormality ／ 0: Normal)
09 : Power supply undervoltage (1: Power supply undervoltage ／ 0: Normal)
08 : Abnormal frequency (1: Abnormal frequency ／ 0: Normal)

③ System status flag 1(RXn30－37H)

37	36	35	34	33	32	31	30

30～37 : Reservation

④ System status flag 2(RXn38－3FH)

3F	3E	3D	3C	3B	3A	39	38

3C～3F : Reservation
3B : Remote READY (1: Remote READY(Communication Normal with the UF1))
3A : Error state (1: Remote error(Communication error with the UF1))
39 : Initial data processing finish (1: Initial data processing finish) (Unused)
38 : Initial data processing request (1: Initial data processing request (Unused))

(2) RY data(Viewed from the PLC output)

① Control flag 1(RYn00－07H)

07	06	05	04	03	02	01	00

01～07 : Reservation
00 : Start/Stop setting (1: Start ／ 0: Stop)

② Control flag 2(RYn08－0FH)

0F	0E	0D	0C	0B	0A	09	08

0F : Monitor value switch state flag (1: Set value ／ 0: Usually)
0E : 1～16 Set value enable or disable (1: Enable ／ 0: Disable)
08～0D : Reservation

③ System control flag 1(RYn30－37H)

37	36	35	34	33	32	31	30

30～37 : Reservation

④ System control flag 2(RYn38－3FH)

3F	3E	3D	3C	3B	3A	39	38

3B～3F : Reservation
3A : Error reset request flag
(1: Error reset(Communication error clear with the UF1))
39 : Initial data setting request (1: Initial data setting request) (Unused)
38 : Initial data processing finish (1: Initial data processing finish) (Unused)

(3) RWr data(Viewed from the PLC input)

① Monitor value 1(RWrn0)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"
00～0F : Out current 0～1250(0.1% unit)

When the Monitor value switch state flag is "Set value"
00～0F : Control signal 0～1000(0.1% unit)

② Monitor value 2(RWr n 1)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : Out voltage 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"

00~0F : Manual(upper limit) signal 0~1000(0.1% unit)

③ Monitor value 3(RWr n 2)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : Out power 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"

00~0F : Lower point(lower limit) signal 0~1000(0.1% unit)

④ Monitor value 4(RWr n 3)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : Soft start time 0~3000(0.1s unit)

When the Monitor value switch state flag is "Set value"

00~0F : Grade signal 0~1000(0.1% unit)

⑤ Monitor value 5(RWr n 4)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

08~0F : Delay time 0~30(0.1s unit)

00~07 : Period time 10~30(0.1s unit)

When the Monitor value switch state flag is "Set value"

00~0F : Soft start time 0~3000(0.1s unit)

⑥ Monitor value 6(RWr n 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

09～0F : Reservation

08 : Self-diagnostic function setting (1: Yes ／ 0: Release)

00～07 : I/O characteristic change(Function No.) 0～7 (Function No.)

When the Monitor value switch state flag is "Set value"

08～0F : Delay time 0～30(0.1s unit)

00～07 : Period time 10～30(0.1s unit)

⑦ Monitor value 7(RWr n 6)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

08～0F : Current limit 50～110(1% unit)

00～07 : Heater disconnecting amount 5～50(1% unit)

When the Monitor value switch state flag is "Set value"

09～0F : Reservation

08 : Self-diagnostic function setting (1: Yes ／ 0: Release)

00～07 : I/O characteristic change(Function No.) 0～7(Function No.)

⑧ Monitor value 8(RWr n 7)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00～0F : Reservation

When the Monitor value switch state flag is "Set value"

08～0F : Current limit 50～110(1% unit)

00～07 : Heater disconnecting amount 5～50(1% unit)

⑨ Monitor value 9～16(RWr n 8～RWr n 1 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Reservation

※ The Set value is reading data from the UF1.
The Set value may be different from the PLC.

(4) RWw data(Viewed from the PLC output)

① Set value 1(RWw 0)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Control signal 0～1000(0.1% unit)

② Set value 2(RWw 1)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Manual(upper limit) signal 0～1000(0.1% unit)

③ Set value 3(RWw 2)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Lower point(lower limit) signal 0～1000(0.1% unit)

④ Set value 4(RWw 3)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Grade signal 0～1000(0.1% unit)

⑤ Set value 5(RWw 4)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Soft start time 0～3000(0.1s unit)

⑥ Set value 6(RWw 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Delay time 0～30(0.1s unit)
00～07 : Period time 10～30(0.1s unit)

⑦ Set value 7(RWw 6)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Reservation
00～07 : I/O characteristic change(Function No.) 0～7 (Function No.)

⑧ Set value 8(RWw 7)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Current limit 50～110(1% unit)
00～07 : Heater disconnecting amount 5～50(1% unit)

⑨ Set value 9～16(RWw 8～RWw 1 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Reservation

3. 3. 2 Case of the UF3

※ " n" used in the below Items is the value set by station setting.

(1) RX data(Viewed from the PLC input)

① Status flag 1(RXn 0 0－0 7H)

07	06	05	04	03	02	01	00

07 : Heater disconnection (1: Heater disconnection ／ 0: Normal)
06 : Gate block (1: Gate block ／ 0: Normal)
05 : EEPROM abnormal (1: EEPROM abnormal ／ 0: Normal)
04 : Reservation
03 : Monitor value switch state flag (1: Set value ／ 0: Usually)
02 : Reservation
01 : Reservation
00 : State display・Start/Stop (1: Operation ／ 0: Stop)

② Status flag 2(RXn 0 8－0 FH)

0F	0E	0D	0C	0B	0A	09	08

0F : Abnormal collective
(1: Abnormal collective(Including communication error) ／ 0: Normal)
0E : Over current abnormality (1: Over current ／ 0: Normal)
0D : Fuse disconnection (1: Fuse disconnection ／ 0: Normal)
0C : Temperature rise abnormality (1: Temperature rise abnormality ／ 0: Normal)
0B : Thyristor abnormality (1: Thyristor abnormality ／ 0: Normal)
0A : Load abnormality (1: Load abnormality ／ 0: Normal)
09 : Power supply undervoltage (1: Power supply undervoltage ／ 0: Normal)
08 : Abnormal frequency (1: Abnormal frequency ／ 0: Normal)

③ System status flag 1(RXn30－37H)

37	36	35	34	33	32	31	30

30～37 : Reservation

④ System status flag 2(RXn38－3FH)

3F	3E	3D	3C	3B	3A	39	38

3C～3F : Reservation
3B : Remote READY (1: Remote READY(Communication Normal with the UF3))
3A : Error state (1: Remote error(Communication error with the UF3))
39 : Initial data processing finish (1: Initial data processing finish) (Unused)
38 : Initial data processing request (1: Initial data processing request(Unused))

(2) RY data(Viewed from the PLC output)

① Control flag 1(RYn00－07H)

07	06	05	04	03	02	01	00

01～07 : Reservation
00 : Start/Stop setting (1: Start ／ 0: Stop)

② Control flag 2(RYn08－0FH)

0F	0E	0D	0C	0B	0A	09	08

0F : Monitor value switch state flag (1: Set value ／ 0: Usually)
0E : 1～16 Set value enable or disable (1: Enable ／ 0: Disable)
08～0D : Reservation

③ System control flag 1(RYn30－37H)

37	36	35	34	33	32	31	30

30～37 : Reservation

④ System control flag 2(RYn38－3FH)

3F	3E	3D	3C	3B	3A	39	38

3B～3F : Reservation
3A : Error reset request flag
(1: Error reset(Communication error clear with the UF3))
39 : Initial data setting request (1: Initial data setting request) (Unused)
38 : Initial data processing finish (1: Initial data processing finish) (Unused)

(3) RWr data(Viewed from the PLC input)

① Monitor value 1(RWr n 0)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"
00~0F : U-phase out current 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"
00~0F : Control signal 0~1000(0.1% unit)

② Monitor value 2(RWr n 1)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"
00~0F : V-phase out current 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"
00~0F : Manual(upper limit) signal 0~1000(0.1% unit)

③ Monitor value 3(RWr n 2)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"
00~0F : W-phase out current 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"
00~0F : Lower point(lower limit) signal 0~1000(0.1% unit)

④ Monitor value 4(RWr n 3)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"
00~0F : U-phase out voltage 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"
00~0F : Grade signal 0~1000(0.1% unit)

⑤ Monitor value 5(RWr n 4)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : V-phase out voltage 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"

00~0F : Soft start time 0~3000(0.1s unit)

⑥ Monitor value 6(RWr n 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : W-phase out voltage 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"

08~0F : Delay time 0~30(0.1s unit)

00~07 : Period time 10~30(0.1s unit)

⑦ Monitor value 7(RWr n 6)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

00~0F : Out power 0~1250(0.1% unit)

When the Monitor value switch state flag is "Set value"

09~0F : Reservation

08 : Self-diagnostic function setting (1: Yes / 0: Release)

00~07 : I/O characteristic change(Function No.) 0~7(Function No.)

⑧ Monitor value 8(RWr n 7)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00~0F : Soft start time 0~3000(0.1s unit)

When the Monitor value switch state flag is "Set value"

08~0F : Current limit 50~110(1% unit)

00~07 : Heater disconnecting amount 8~50(1% unit)

⑨ Monitor value 9(RWr n 8)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

08～0F : Delay time 0～30(0.1s unit)

00～07 : Period time 10～30(0.1s unit)

When the Monitor value switch state flag is "Set value"

00～0F : Reservation

⑩ Monitor value 10(RWr n 9)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

09～0F : Reservation

08 : Self-diagnostic function setting (1: Yes ／ 0: Release)

00～07 : I/O characteristic change(Function No.) 0～7(Function No.)

When the Monitor value switch state flag is "Set value"

00～0F : Reservation

⑪ Monitor value 11(RWr n 1 0)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

When the Monitor value switch state flag is "Usually"

08～0F : Current limit 50～110(1% unit)

00～07 : Heater disconnecting amount 8～50(1% unit)

When the Monitor value switch state flag is "Set value"

00～0F : Reservation

⑫ Monitor value 12～16(RWr n 1 1～RWr n 1 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Reservation

※ The Set value is reading data from the UF3.
The Set value may be different from the PLC.

(4) RWw data(Viewed from the PLC output)

① Set value 1(RWw 0)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Control signal 0～1000(0.1% unit)

② Set value 2(RWw 1)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Manual(upper limit) signal 0～1000(0.1% unit)

③ Set value 3(RWw 2)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Lower point(lower limit) signal 0～1000(0.1% unit)

④ Set value 4(RWw 3)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Grade signal 0～1000(0.1% unit)

⑤ Set value 5(RWw 4)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Soft start time 0～3000(0.1s unit)

⑥ Set value 6(RWw 5)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Delay time 0～30(0.1s unit)
00～07 : Period time 10～30(0.1s unit)

⑦ Set value 7(RWw 6)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Reservation
00～07 : I/O characteristic change(Function No.) 0～7 (Function No.)

⑧ Set value 8(RWw 7)

0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

08～0F : Current limit 50～110(1% unit)
00～07 : Heater disconnecting amount 8～50(1% unit)

⑨ Set value 9～16(RWw8～RWw15)

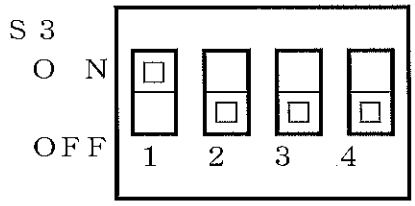
0F	0E	0D	0C	0B	0A	09	08	07	06	05	04	03	02	01	00

00～0F : Reservation

4. HOW TO SET S3 OF THE UF-UNIT

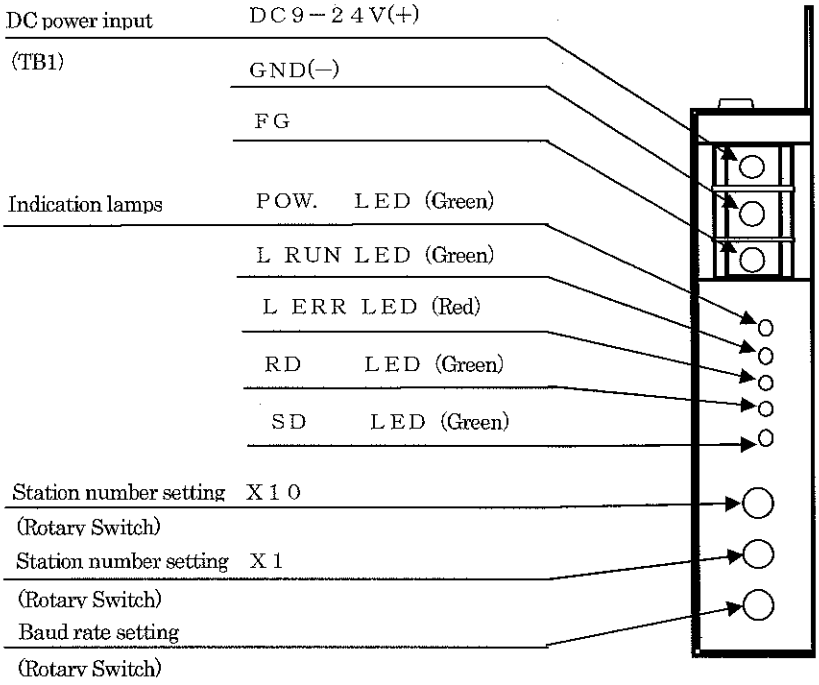
The UF-unit take the front cover, inside it has S3. If use the UF-CL, the unit number setting S3 is must be in "No.1".

S3 default setting is set "No.0".
As follows, the unit number setting S3 of the UF-unit Please set "No.1".



	S3－1	S3－2	S3－3	S3－4
No.1	ON	OFF	OFF	OFF

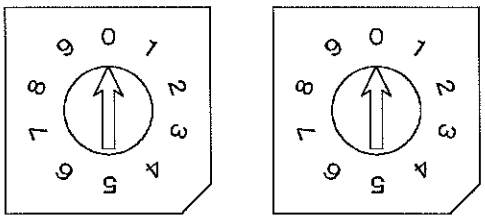
5. HOW TO SET THE UF-CL



5.1 Station number setting

Station number setting sets station number used on the network and the number can set the range of 1～42.

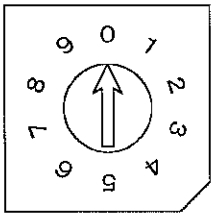
The UF-CL uses one in the station number.



↑Set the tens digit (DSW3)　　↑Set the ones digit (DSW2)

5.2 Baud rate setting

Baud rate setting sets transmission speed on network.



(DSW1)

(Baud rate setting value)
0：156Kbps
1：625Kbps
2：2.5Mbps
3：5Mbps
4：10Mbps
Other than those above: ERROR

6. HOW TO SETTING THE SET VALUES FROM UF-CL

If set the communication, the signal display panel priority settings "2" should be set to change.
If set the UF-CL, the signal display panel priority settings "2" should be set to change.

6.1 How to set the UF-CL

Example

At the UF-CL, L (Lower point(lower limit)signal) to be able to change settings.

(1) Change display-mode

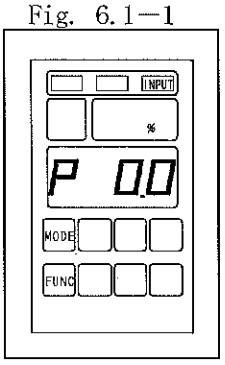
If the [MODE] key is pressed while the [FUNC] key is being pressed down, the display mode is switched.

Press several times, the display-mode of display panels show "INPUT". (Fig. 6.1—1)

"MONI" mode if you are viewing, press twice.

"STATE" mode if you are viewing, press once.

Fig. 6.1—1



(2) Chang the display item

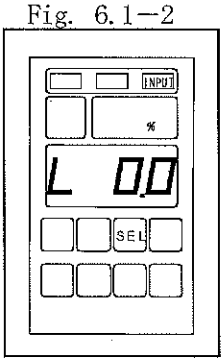
If the [SEL] key is pressed down, the display content is switched.

Press the [SEL] key twice, 4-digit display on the left is the display to "L" . (Fig. 6.1—2)

When the "L" does not show, press "SEL" key a few times.

The set values display the set values in the set-mode is currently set.

Fig. 6.1—2



(3) Check set-mode of Lower point(lower limit)signal priority setting

Fig. 6.1—3

If the [SEL] key is pressed while the [FUNC] key is being pressed down, the display switches the lower point (lower limit)signal priority setting of set-mode.

4 digit display on the left is the display to "LS".

Please check with that. (Fig. 6.1—3)

At this time, the right 1 digit display represents the set-mode. (Table 6.1—1)

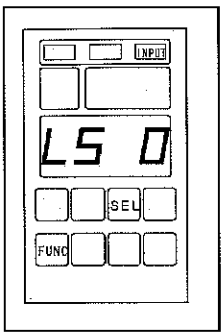
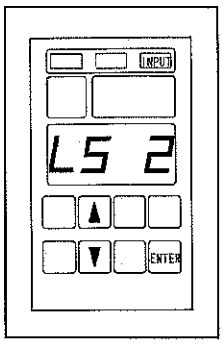


Table 6.1—1

Display	set-mode
L S 0	Setting the set-values from Lower point (lower limit)signal of input (terminal VL2)
L S 1	Setting the set-values from the display panel
L S 2	Setting the set-values from UF-CL

(4) Change in set-mode of Lower point(lower limit)signal priority setting

Fig. 6.1—4



When set in the UF-CL, the left one digit display 4 digit [2], please check to see.

When the set values do not display to "2", "2" settings are set using the [▲] or [▼] key.

Then, [ENTER] please press. (Fig. 6.1—4)

Change lights from blink, the setting is completed.

Once configure the set-mode. Also remembers the set-mode turned off power.

Priority settings changed by manipulating the signal display panel as an example, UF-CL signals can change the settings.

Table 6.1—2, by changing the settings on the display panel signal priority, UF-CL can change the signal settings.

Table 6.1—2

Display item	Function
P	Control signal
H	Manual(upper limit) signal
L	Lower point(lower limit)signal
F	Grade signal
E	Soft start time
C	Current limit
U	Heater disconnecting amount
d	Delay time
—	Period time

7. Indicator

Indicator has 4 types; RUN, ERR, RD and SD, and they express operating state with lighting, not lighting or Blinking.

LED Name	Lighting	Not Lighting	Blinking
L RUN	Normal receive after becoming a member of network	1. Before becoming a member of network 2. Carrier detection N.G. 3. Time over 4. Hardware resetting	————
L ERR	1. CRC error 2. Station number SW setting abnormal. 3. Baud rate SW setting abnormal	1. Normal communication 2. Resetting hardware	After turing on power, SW setting is changed. (0.4s blink)
RD	Receiving	1. Receive N.G. 2. Resetting hardware	————
SD	Sending	Resetting hardware	————

○:Lighting ●:Not Lighting ◎:Blinking

L RUN	L ERR	RD	SD	Operation
○	◎	○	◎	Communicating properly. But the noise have sometimes happens CRC error.
○	0.4 s◎	○	◎	When Reset was released, to change from baud rate and station setting.
○	◎	○	●	Receive data is recognized CRC error, and cannot be acknowledged.
○	●	○	◎	Normal communication.
○	●	○	●	Data for a local station doesn't come.
●	◎	○	◎	A polling reply is being done, refreshment receive is a CRC error.
●	◎	○	●	Data for a local station is a CRC error.
●	●	○	◎	A link has not been activated.
●	●	○	●	Whether there isn't data for a local station or can't receive one for a local station by noise.
●	●	●	●	Data can't be received for breaking. Power cutoff or during a hardware reset.
●	○	○, ●	●	Baud rate or station number setting is injustice.

8. Others

8. 1 Grounding on network

With regard to CC-Link, grounding should carry out one point grounding to prevent ground loop.
Make sure to ground the network using D type grounding.
Grounding should perform the special grounding which is divided from activate inverter etc.

8. 2 Important notice on the noise countermeasure

To prevent inductive noise, a communication line should be wired separating from other power supply lines and power lines.
Avoid installation in the board in which high-pressure equipment is installed.
Do a noise countermeasure for a surge killer in the equipment which tends to generate noise (motors, solenoids and magnets, etc.).

SANSHA ELECTRIC MFG. CO.,LTD.

Head Office
3-1-56 Nishiawaji,Higashiyodogawa-ku,Osaka
533-0031,Japan
Tel: 06-6325-0500 Fax: 06-6321-0355
http://www.sansha.co.jp/

SANREX CORPORATION (U.S.A)
50Seaview Boulevard Port Washington,NY 11050-4618,
U.S.A
Tel: +1-516-625-1313 Fax: +1-516-625-8845

SANREX EUROPE GmbH (Germany)
Knorrstrasse 142, Munich D-80937,Germany.
Tel: +49-89-311-2034 Fax: +49-89-316-1636

SANREX LIMITED (Hong Kong)
Room 307,Kowloon Plaza,485 Castle Peak Rd.,
Kowloon,HongKong
Tel: +852-2744-1310,+852-2785-6313
Fax: +852-2785-6009

SANREX ASIA PACIFIC PTE.LTD. (Singapore)
25,Tagore Lane,#04-02B Singapore Godown, 787602
Singapore
Tel: +65-6457-8867,+65-6459-6426 Fax: +65-6459-6425

FOSHAN CITY SHUNDE SANREX LIMITED (China)
Dazhou Shiliang Road Lunjiao Town, Shunde District,
Foshan City, Guandong Province 528308 P.R.China
Tel: +86-757-2733-3688 Fax: +86-757-2783-3547

SANSHA ELECTRIC MFG. (SHANGHAI) CO.,LTD (China)
Room310,555 Building,555West Nanjing Road,
Shanghai 200041,P.R.China
Tel: +86-21-5868-1058 Fax: +86-21-5868-1056

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