FSA-11O
COMMUNICATION SPECIFICATION

(CC-Link communication protocol)

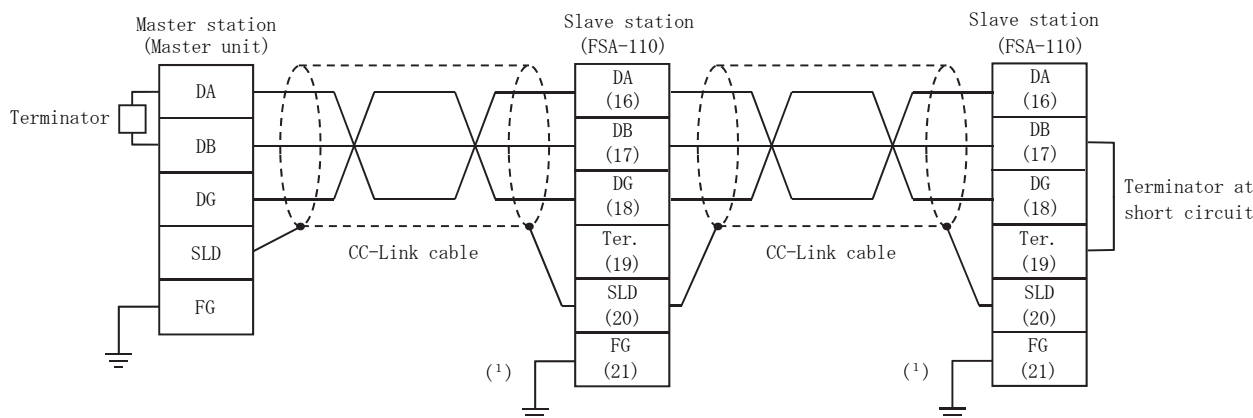**⊖ DAIICHI ELECTRONICS CO., LTD.**

Content

1. Communication specification

Item	Specification
Protocol	CC-Link Ver.1.10
Transmission system	Broadcasting polling system
Synchronous system	Frame synchronization system
Transmission rate	10Mbps ／ 5Mbps ／ 2.5Mbps ／ 625kbps ／ 156kbps
Coding system	NRZI
Transmission path form	Bus form (Compliance for EIA RS485)
Transmission format	HDLC compliant
Error control system	CRC $(X^{16}+X^{12}+X^5+1)$
Occupation station number	Remote device station.　One station occupation.
Remote input and output	RX : 32 points , RY : 32 points
Remote register	RWr : 4 points , RWw : 4 points
Maximum transmission distance	100m (10Mbps) ／ 160m (5Mbps) ／ 400m (2.5Mbps) ／ 900m (625kbps) ／ 1200m (156kbps)
Number of connection	① $(1×a)+(2×b)+(3×c)+(4×d) ≦ 64$ station 　　a : Number of one station occupation unit 　　b : Number of two station occupation unit 　　c : Number of three station occupation unit 　　d : Number of four station occupation unit ② $(16×A)+(54×B)+(88×C) ≦ 2304$ 　　A : Number of remote I/O station ･･････････････････････ MAX. 64 　　B : Number of remote device station ･･･････････････････ MAX. 42 　　C : Number of local station and intelligent device station ･･･ MAX. 26
Station address	1 to 64
Interconnection cable	Ver.1.10 compatible CC-Link cable (Triplex twisted-pair cable with a shield)
Terminating resistance	110Ω ±5% When the 17th terminal (DB) and 19th terminal (Ter.) are short-circuited, a terminating resistor is connected inside.

2. Communication wiring

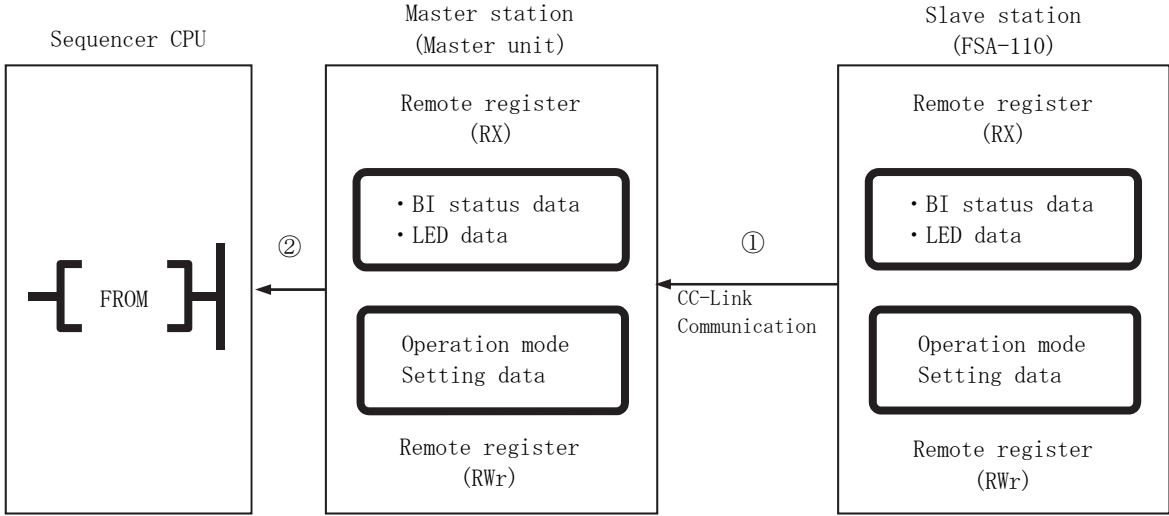Note(¹) FG is equivalent to the function ground, so we recommend a dedicated ground or shared ground.

(1) Please use the connection cable only for Ver.1.10 compatible CC-Link (Triplex twisted-pair cable with a shield).　And, mixture of the cable of a different kind cannot be performed.
In case it is intermingled, a normal data communication is not guaranteed.
Please refer to an about a cable. (CC-Link association, partner product-information, cable connector)

(2) Please be sure to connect a terminating resistance to the unit of the both ends of a CC-Link system.
Master side : Please connect a terminating resistance between DA-DB.　110Ω (1/2W)
Slave side　: When the 17th terminal (DB) and 19th terminal (Ter.) are short-circuited, a terminating resistor (110Ω) is connected inside.

(3) Please shielding wire of CC-Link cable is connected to SLD of each unit.　And, please do D-class grounding (with ground resistance of 100Ω or less) of FG. (SLD and FG connected inside the unit.)

3. Communication outline

3.1 Transmission and reception outline

① By link scan, various data are transmitted from the slave station to the remote input (RX) and remote register (RWr) of the master station.

② Reads various data from the remote input (RX) and remote register (RWr) of the master station.

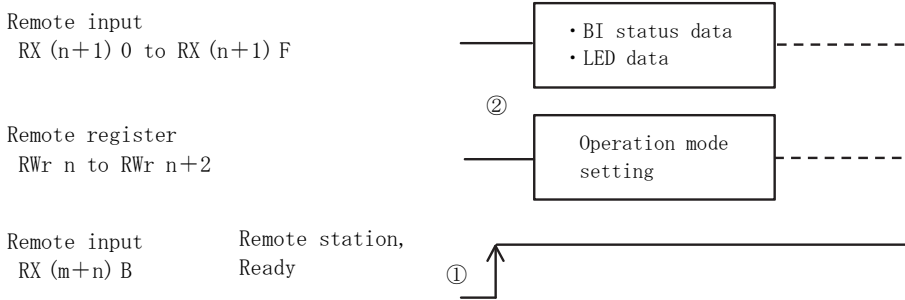Address list (Remote input / Remote output, Remote register)

Address	Remote input			Remote output			Remote register					
							Slave → Master			Master → Slave		
		Master unit			Master unit			Master unit			Master unit	
		Ver.1	Ver.2		Ver.1	Ver.2		Ver.1	Ver.2		Ver.1	Ver.2
1	RX00	0E0H	4000H	RY00	160H	4200H	RWr00	2E0H	4C00H	RWw00	1E0H	4400H
2	RX02	0E2H	·	RY02	162H	·	RWr04	2E4H	·	RWw04	1E4H	·
3	RX04	0E4H	·	RY04	164H	·	RWr08	2E8H	·	RWw08	1E8H	·
·	·	·	·	·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·	·	·	·	·
64	RX7E	15EH	(2)	RY7E	1DEH	(2)	RWrFC	3DCH	(2)	RWwFC	2DCH	(2)

Note(2) In Ver.2 mode, the storage location changes depending on the number of link points per unit and extended cyclic settings.

3.2 Initial communication

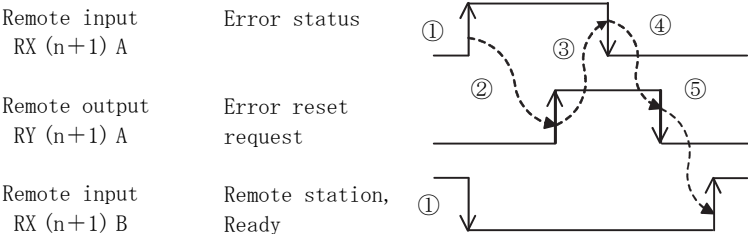No initial processing is required.

3.3 Normal communication

① After the slave station power supply is OFF to ON, the remote station, Ready changes from 0 to 1.

② Various data is updated for each link scan.

<Note> If communication is stopped halfway due to a setting change, reset the power or reset the device (setting mode : CPU reset).
Refer to the instruction manual for how to reset the device.

3.4 Error communication (Error status / Reset request)

Perform this when the slave station notifies / cancels the error occurrence.
An error will occur if data is written to an unused area of the remote output (RY) or remote register (RWw).

Remote input   Error status
RX (n+1) A

Remote output   Error reset
RY (n+1) A   request

Remote input   Remote station,
RX (n+1) B   Ready

① If an error occurs in a slave station, an error status flag is 0 to 1. And, the remote station, Ready is set to 1 to 0.

② If the error status flag changes from 0 to 1, plaese check the data in the unused area and clear. Then, please give an error reset request flag as 0 to 1 at the case of a slave station and resumption of communication.

③ After an error reset request flag's changing into 0 to 1, an error status flag is 1 to 0.

④ After an error status flag's changing into 1 to 0, please set an error reset request flag to 1 to 0.

⑤ After an error reset request flag's changing into 1 to 0, the remote station, Ready is 0 to 1.

4. Remote input and output (RX, RY)

Used to communication bit-wise data between master station and slave station (FSA-110).

4.1 Remote input (RX) : Slave station (FSA-110) → Master station

Device No.	Address (3)	Signal name	Contents		Note
			0	1	
RXn0	0E0H	BI1 status	OFF	ON	
RXn1		BI2 status			
RXn2		BI3 status			
RXn3		BI4 status			
RXn4		BI5 status			
RXn5		BI6 status			
RXn6		BI7 status			
RXn7		BI8 status			
RXn8		BI1 LED	LED off	LED blinking or lighting	
RXn9		BI2 LED			
RXnA		BI3 LED			
RXnB		BI4 LED			
RXnC		BI5 LED			
RXnD		BI6 LED			
RXnE		BI7 LED			
RXnF		BI8 LED			
RX (n+1) 0	0E1H	Non-usable	—	—	
RX (n+1) 1		Non-usable	—	—	
RX (n+1) 2		Non-usable	—	—	
RX (n+1) 3		Non-usable	—	—	
RX (n+1) 4		Non-usable	—	—	
RX (n+1) 5		Non-usable	—	—	
RX (n+1) 6		Non-usable	—	—	
RX (n+1) 7		Non-usable	—	—	
RX (n+1) 8		Initial data processing request flag	—	—	Unused
RX (n+1) 9		Initial data setting completion flag	—	—	Unused
RX (n+1) A		Error status flag	With no error	With error	
RX (n+1) B		Remote station, Ready	Transmission impossible	At normal communication	
RX (n+1) C		Non-usable	—	—	
RX (n+1) D		Non-usable	—	—	
RX (n+1) E		Non-usable	—	—	
RX (n+1) F		Non-usable	—	—	

n : The value decided by address setting.

Note(3) In case of address 1 and master unit mode is "ver.1". (In case of other than the address 1, remote input / output of the 3-page, refer to the address table of remote register)

4.2 Remote output (RY) : Master station → Slave station (FSA-110)

Device No.	Address (4)	Signal name	Contents		Note
			0	1	
RYn0	160H	Unused	—	—	
RYn1		Unused	—	—	
RYn2		Unused	—	—	
RYn3		Unused	—	—	
RYn4		Unused	—	—	
RYn5		Unused	—	—	
RYn6		Unused	—	—	
RYn7		Unused	—	—	
RYn8		Unused	—	—	
RYn9		Unused	—	—	
RYnA		Unused	—	—	
RYnB		Unused	—	—	
RYnC		Unused	—	—	
RYnD		Unused	—	—	
RYnE		Unused	—	—	
RYnF		Unused	—	—	
RY (n+1) 0	161H	Non-usable	—	—	
RY (n+1) 1		Non-usable	—	—	
RY (n+1) 2		Non-usable	—	—	
RY (n+1) 3		Non-usable	—	—	
RY (n+1) 4		Non-usable	—	—	
RY (n+1) 5		Non-usable	—	—	
RY (n+1) 6		Non-usable	—	—	
RY (n+1) 7		Non-usable	—	—	
RY (n+1) 8		Initial data processing completion flag	—	—	Unused
RY (n+1) 9		Initial data setting request flag	—	—	Unused
RY (n+1) A		Error reset request flag	No reset request	Reset request	
RY (n+1) B		Reserve	—	—	
RY (n+1) C		Non-usable	—	—	
RY (n+1) D		Non-usable	—	—	
RY (n+1) E		Non-usable	—	—	
RY (n+1) F		Non-usable	—	—	

n : The value decided by address setting.

Note(4) In case of address 1 and master unit mode is "ver.1". (In case of other than the address 1, remote input / output of the 3-page, refer to the address table of remote register)

5. Remote register (RWr, RWw)

Remote register (RWr) : Slave station → Master station			Remote register (RWw) : Master station → Slave station		
Address [5]		Contents	Address [5]		Contents
RWr n	2E0H	BI1 operation mode setting	RWw n	1E0H	Unused
		BI2 operation mode setting			
RWr n+1	2E1H	BI3 operation mode setting	RWw n+1	1E1H	Unused
		BI4 operation mode setting			
RWr n+2	2E2H	BI5 operation mode setting	RWw n+2	1E2H	Unused
		BI6 operation mode setting			
RWr n+3	2E3H	BI7 operation mode setting	RWw n+3	1E3H	Unused
		BI8 operation mode setting			

n : The value decided by address setting.

Note[5] In case of address 1 and master unit mode is "ver.1". (In case of other than the address 1, remote input / output of the 3-page, refer to the address table of remote register)

5.1 Remote register (RWr) details

(1) BI1 to BI8 operation mode setting

0 : Warning
1 : Caution
2 : Operation (LED lighting color : White)
3 : Operation (LED lighting color : Green)
4 : Operation (LED lighting color : Blue)
5 : Operation (LED lighting color : Red)

5.2 Remote register (RWw)

Unused

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