

Communication Interface Manual

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1. Abstract

1.1. Touch Screen Communication Interface Feature

Touch Screen has data indication function and operating function replacing operation panel including complex switch buttons and indication lamps, and also have many kinds of communication interface to external controllers for CIM configuration.

Communication interface features of Touch Screen are as follows.

Support standard serial interface RS-232C/422/485.

Support communication master function to read and write external controller's memory data by using controller's fixed communication protocol through standard serial interface.

And also provide **Slave Protocol** for serial interface to embedded system and Personal computer.

1.2. Communication Interface Protocol

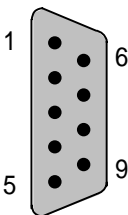
1.2.1. Serial Interface(RS-232C)

(1) Use it in all Touch Screen model.

(2) Protocol

No.	Item	Contents	
1	Communication Type	Half Duplex	
2	Transmission Control Mode	Asynchronous	
3	Transmission Length	About 15m	
4	Connection Type	1:1	
5	Transmission Code	HEX(ASCII)	
6	Baud Rate	9600, 19200, 38400 bps	
7	Data Type	Data	7, 8 bit
		Parity	None, Odd, Even
		Stop Bit	1, 2

(3) Connector pin arrangement and signal

Figure	Pin No.	Signal	Direction	Contents
	1	NU		
	2	RD(RxD)	Input	Receive Data
	3	SD(TxD)	Output	Send Data
	4	DTR	Output	Data Terminal Ready
	5	SG		Signal Ground
	6	DSR	Input	Data Set Ready
	7	RTS	output	Send Request Signal
	8	CTS	Input	Send Enable Signal
	9	NU		

NU: Not Used

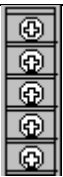
1.2.2. Serial Interface(RS-422/485)

(1) Use it in all Touch Screen model.

(2) Protocol

No.	Item	Contents	
1	Communication Type	Half Duplex, 5line	
2	Transmission Control Mode	Asynchronous	
3	Transmission Length	About 500m	
4	Connection Type	1:1	
5	Transmission Code	HEX(ASCII)	
6	Baud Rate	9600, 19200, 38400, 57600, 115200 bps	
7	Data Type	Data	7, 8 bit
		Parity	None, Odd, Even
		Stop Bit	1, 2

(3) Connector pin arrangement and signal

Figure	Pin No.	Signal	Direction	Contents
	1	RDA(RD+)	Input	Receive Data(+)
	2	RDB(RD-)	Input	Receive Data(-)
	3	SDA(SD+)	Output	Send Data(+)
	4	SDB(SD-)	Output	Send Data(-)
	5	SG		Signal Ground

1.3. Touch Screen Communication Setup

Describe serial interface setup items in Touch Screen.

Push [Comm. Setup]Menu.

Setup parameters of [Serial Baud Rate], [Serial Data Bit] and etc.

Comm. Setup			
1. Serial Baud Rate : <u>38400</u> [BPS]			
2. Serial Data Bit : <u>8</u> [BIT]			
3. Serial Stop Bit : <u>1</u> [BIT]			
4. Serial Parity Bit : <u>NONE</u> [BIT]			
5. Serial Signal Level : <u>RS-232C</u>			
6. Station Number(0~31) : <u>00</u>			
7. Time Out : <u>10</u> * 100 [mSec]			
8. Send Wait : <u>00</u> * 10 [mSec]			
Comm.Setup	Setup	Diagnosis	Info.
V2.20 A 2002/04/02 11:23:12			

Parameters for serial interface are as follows.

Item	Selectable Contents	Ref.
Baud Rate	9600, 19200, 38400, 57600, 115200 bps	
Data Bit	7 bit, 8 bit	
Stop Bit	1 bit, 2 bit	
Parity Bit	NONE, EVEN, ODD	
Signal Level	RS-232C, RS-422	
Controller Station No. at Communication	00 ~ 31	Setup station no. of controller
Diagnosis		
Timeout	1~99	

Please refer transmission part of manual for how to connect and download between PC and Touch Screen.

2. Serial Master Communication Type

Following controllers are connectable to Touch Screen by serial interface now.
Even though controllers are not listed, and if they can support serial interface, it is possible to connect to Touch Screen by our open slave protocol.

Controller	Type	Connection Module	Ref.
Master-K	K10/30/60/100S	Option Module	Serial(RS-485)
	K10/30/60/100S	CPU Direct	Serial
	K10S1	CPU Direct	Serial
	K60H,K200H	CPU Direct	Serial
MELSEC (Melsec)	A0J2, AOJ2H	A0J2C214	Serial
		CPU Direct	Serial
	AnN	AJ71C24-S8	Serial
		CPU Direct	Serial
	A1SH/A2SH	A1SJ71C24-R2	Serial
		CPU Direct	Serial
	A2USH/A2USH-S1	A1SJ71UC24-R2	Serial
		CPU Direct	Serial
	AnA	AJ71UC24	Serial
		CPU Direct	Serial
	AnU	AJ71UC24	Serial
		CPU Direct	Serial
	QnA	AJ71UC24	Serial
		AJ71QC24	Serial
		CPU Direct	Serial
	FX	FX2N-232-BD	Serial
		FX2N-422-BD	Serial
		CPU Direct	Serial
	Q	QJ71C24	Serial
		QJ71C24-R2	Serial
CPU Direct		Serial	

GLOFA-GM	GM1~GM3	G3L-CUEA	Serial
		CPU Direct	Serial
	GM6, GM7	G7L-CUEB	Serial
		CPU Direct	Serial
NEW MASTER-K	1000S	K7F-CUEA	Serial
		CPU Direct	Serial
	300S	K4F-CUEA	Serial
		CPU Direct	Serial
	200S	K3F-CU2A	Serial
		CPU Direct	Serial
	80S	G7LCUEB G7LCUEC	Serial
		CPU Direct	Serial
Micrex-F	F80H,F120H, F120S,F140S, F150S	FFU120B, FFK120A	Serial
OMRON	C200H/C200HS	C200H-LK202-V1	Serial (RS-422)
		C200H-LK201-V1	Serial (RS-232C)
	C500/C1000H/ C2000H/C500F	C500-LK201-V1/ C500-LK203	Serial (RS-232C/ RS-422)
		C50/C120/C500/C20 0H/C1000H/C2000H/ C120F/C500F/CS1	C120-LK201-V1
FARA	FARA-N70/700	CCU	Serial
		CPU Direct	Serial
	FARA-N70/700PLUS	CPU Direct	Serial
AB	SLC500[5/03,04]	CPU Direct	Serial
	PLC-5	CPU Direct	Serial
Modicon	884/984	Modbus	Serial
SPC	SPC-10 SPC-24S SPC-100 SPC-120S SPC-300	CPU Direct	Serial

Siemens	S7-200PPI (CPU212/214)	CPU Direct	Serial (RS-422)
	S7-MPI	CPU Direct	Serial (RS-232C)
	S7-300	CP340	Serial
	S7-400	CP441-2	Serial
GE FANUC 90-30	CPU311/CPU331	CPU Direct	Serial (RS-422)
GE FANUC 90-70	CPU731/732/771/ 772/781/782	IC697CMM711	Serial
YASKAWA	PROGIC-8 MP-920 CP-9200SH (CP-217)	CPU Direct	Serial (RS-232C)
Toshiba	Prosec-T (T3,T3H,T2N, T2E)	CPU LINK	Serial (RS-232C)
		CPU Direct	Serial (RS-232C)
Comfile Technology	Tiny PLC (TCP32/37)	CPU Direct	Serial (RS-232C)
Koyo	DL-205 DL-305 DL-405	Direct Net	Serial (RS-232C)
POSCON	POSFA phld-1a/2a	PHLD-1A PHLD-2A	Serial
		CPU Direct	Serial
SAIA	PCD2	F110 F120	Serial
		CPU Direct	Serial



Note

'CPU Direct' means serial communication through loader port of controller's CPU module.



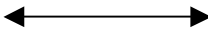
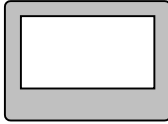
2.1. LG Master-K Series

2.1.1. Master-K Serial Interface

The following section describes the system configuration and interface between LG Master-K PLC and Touch Screen by serial RS-232C/485.

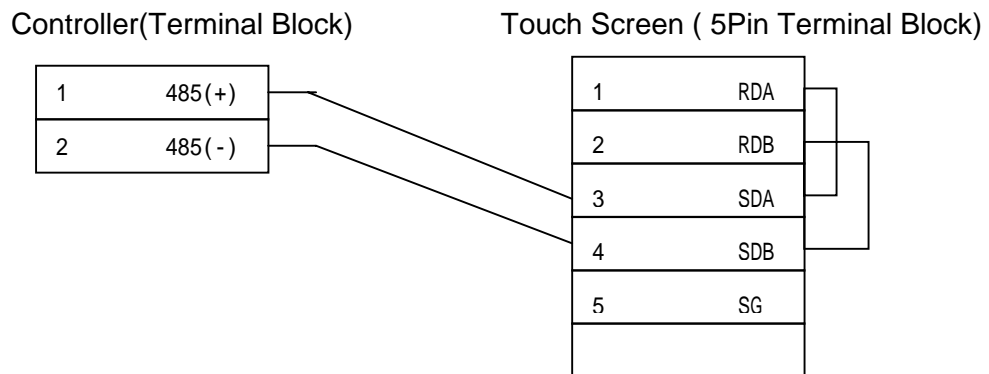
< System Configuration >

This figure shows system configuration to connect LG Master-K PLC to Touch Screen.

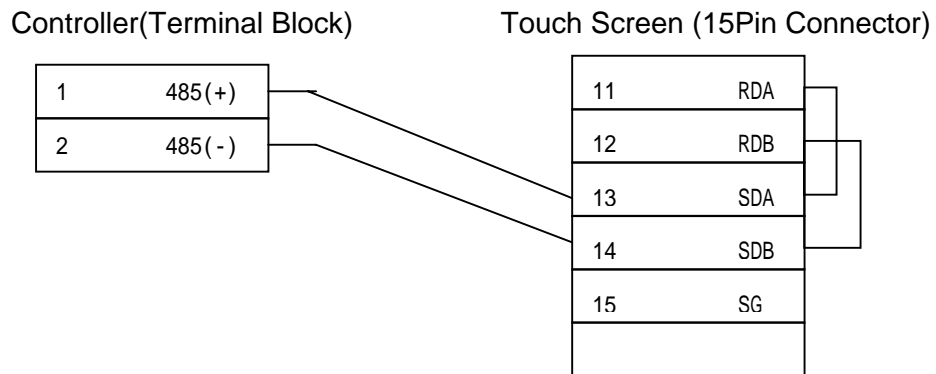
Controller	Comm. Module	Cable	Touch Screen
			
K10S1, K10S, K100S	None	Refer to Connection Diagram(RS-485)	All
K30S, K60S	Option Module	Refer to Connection Diagram(RS-485)	Touch Screen

< Cable Diagram >

(1) RS-485 Connection Diagram(K10S1, K10S, K30S, K60S, K100S Touch Screen (for 5Pin Terminal Block))

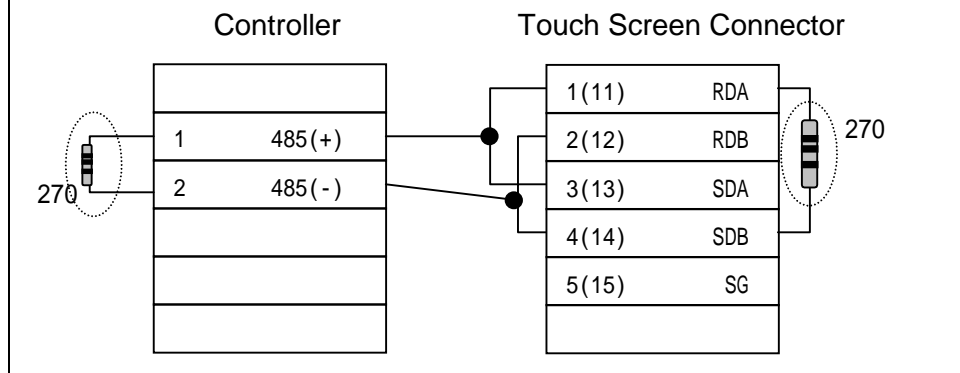


(2) RS-485 Connection Diagram(K10S1,K10S,K30S,K60S,K100S Touch Screen(for 15 Pin Connector))



Caution

In case of RS-485 connection, you have to connect resistor at each terminal as follows for noise reduction.



< Master-K PLC Setup >

(1) K10S1,K10S,K30S,K60S,K100S Setup

Above PLCs are setup by special Loader or KGLWIN program.

Setup items are as follows.

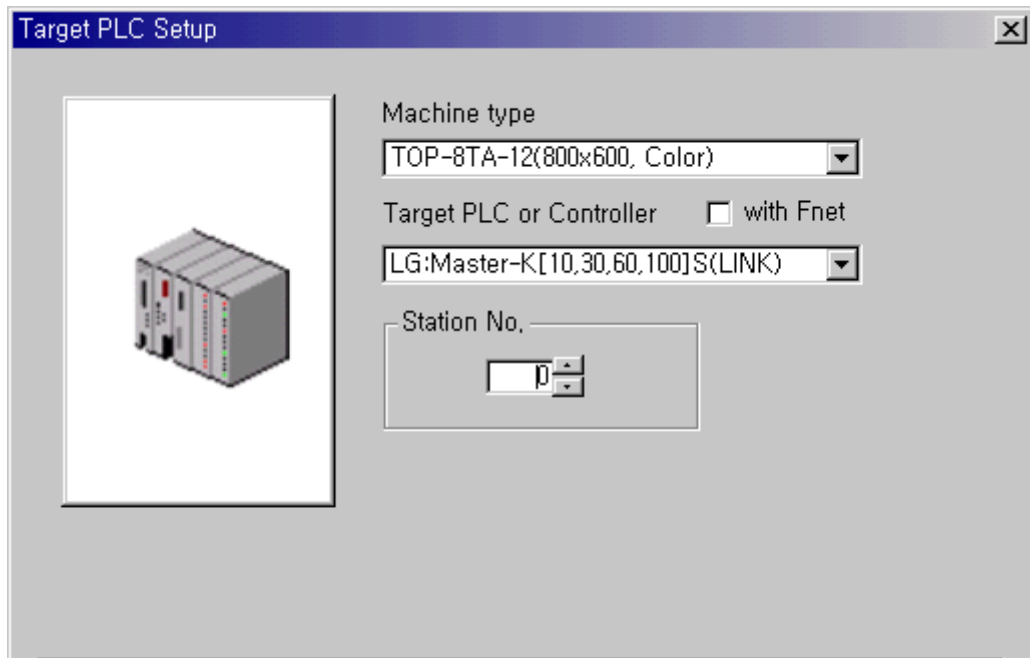
- Station No. : 0 ~ 31
- Baud Rate : 300 ~ 19200bps

In case of RS-485, do not setup 1FH(31) as PLC station no.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Setup Controller type as K[10,30,60,100]S (LINK) in "Master-K Series"



(2) Serial setup in Touch Screen

Communication setup in 'Comm. Setup' Menu are as follows :


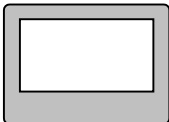
- Serial Baud Rate : Same as controller's setup
- Serial Data Bit : 8bit(Fixed)
- Serial Stop Bit : 1bit(Fixed)
- Serial Parity Bit : None(Fixed)
- Serial Signal Level: Same as controller's setup
- Station No. at Communication Diagnosis(0~31) : Same as controller's setup

2.1.2. Master-K CPU Direct Interface

The following section describes the system configuration and interface between Master-K PLC (K10S, K30S, K60S, K100S, K10S1, K60H, K200H) and Touch Screen using Loader port of CPU module.

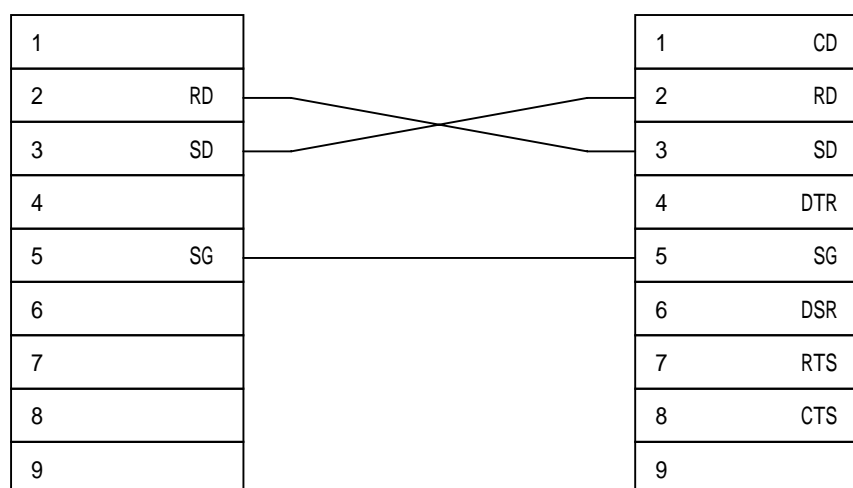
< System Configuration >

The above figure shows system configuration to connect LG Master-K PLC to Touch Screen.

Controller	Comm. Module	Cable	Touch Screen
	← →		
K10S, K30S, K60S, K100S	None	Refer to connection Diagram.(RS-232C)	All Touch Screen
K10S1			
K60H,K200H			

< Cable Diagram >

(1) RS-232C (Master-K Touch Screen(for 9/15 Pin Connector))



Warning

In case of Using Loader Port, Only above 3 wires have to be connected. Other wire connection except above 3 can cause controller's Mal-function or abnormal state.

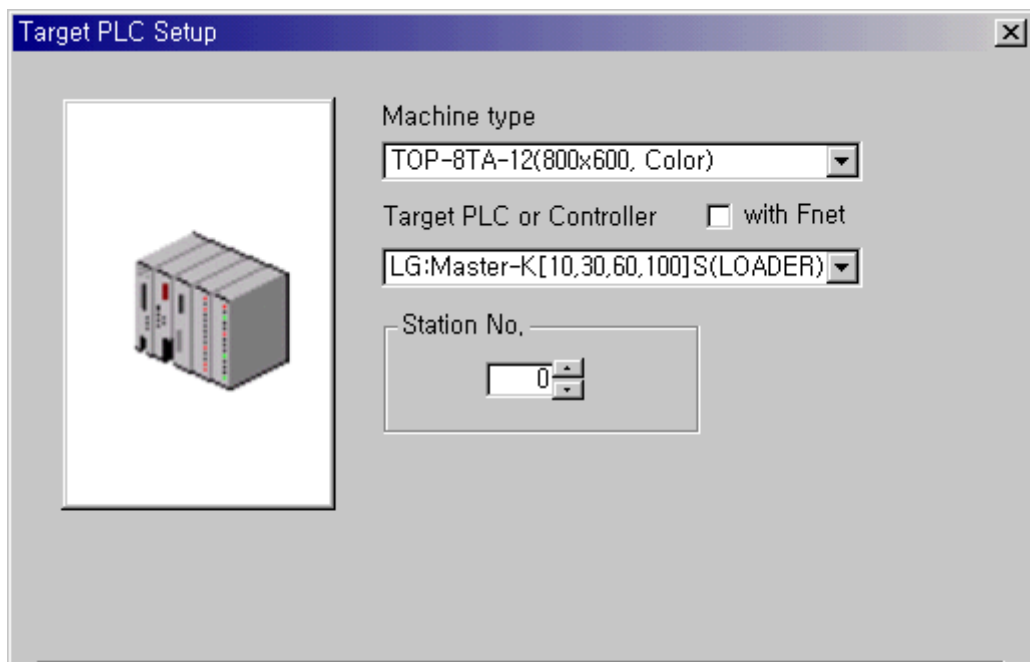
< Master-K PLC Setup >

In case of Master-K, special setup is not needed.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select your controller, “K10S,K30S,K60S,K100S(LOADER)” or “K10S1 (LOADER)” or “K60H,K200H (LOADER)” in “Master-K Series” of controller type



(2) Serial Setup

Special setup is not needed.

Default communication setup of Touch Screen are as follows :

- Serial Baud Rate : 9600bps
- Serial Data Bit : 8bit
- Serial Stop Bit: 1bit
- Serial Parity Bit : None
- Serial Signal Level : RS-232C
- Station No. at Communication Diagnosis(0~31): Not used.

2.1.3. Available Address List

Controller's address to read/write from/to Touch Screen is as following list.

K10S1,K10S,K30S,K60S,K100S

Address			K10S1	K10S,K30S,K60S,K100S
Device	Dev.No	Ref.	Address Area	Address Area
Input/Output (P)	0	Bit	P0000 – P0001	P0000 – P0005
Aux. Relay (M)	1	Bit	M0000 – M0015	M0000 – M0031
LINK Relay (L)	2	Bit	L0000 – L0007	L0000 – L0015
KEEP Relay (K)	3	Bit	K0000 – K0007	K0000 – K0015
Special Relay (F)	4	Bit	F0000 – F0015	F0000 – F0015
Timer-CV (T)	5	Word	T0000 – T0047	T0000 – T0127
Counter-CV (C)	6	Word	C0000 – C0015	C0000 – C0127
Data Register (D)	7	Word	D0000 – D0063	D0000 – D0255
Special Register (S)	8	Word	S0000 – S0099	S0000 – S0099

- CV=Current Value

K60H/200H

Address			K60H	K200H
Device	Dev. No	Ref.	Address Area	Address Area
Input/Output (P)	0	Bit	P0000 - P0005	P0000 - P0011
Aux. Relay (M)	1	Bit	M0000 - M0031	M0000 - M0063
LINK Relay (L)	2	Bit	L0000 - L0015	L0000 - L0011
KEEP Relay (K)	3	Bit	K0000 - K0015	K0000 - K0031
Special Relay (F)	4	Bit	F0000 - F0015	F0000 - F0015
Timer-CV (T)	5	Word	T0000 - T0127	T0000 - T0255
Counter-CV (C)	6	Word	C0000 - C0127	C0000 - C0255
Data Register (D)	7	Word	D0000 – D0255	D0000 – D1023
Special Register (S)	8	Word	S0000 – S0031	S0000 – S0099


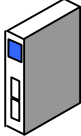
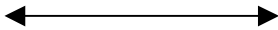

2.2. LG GLOFA-GM/New Master-K

2.2.1. GLOFA-GM/New Master-K Cnet Serial Interface

The following section describes the system configuration and interface between LG GLOFA-GM and NEW MASTER-K PLC's C-net and Touch Screen using RS-232C and RS-422.

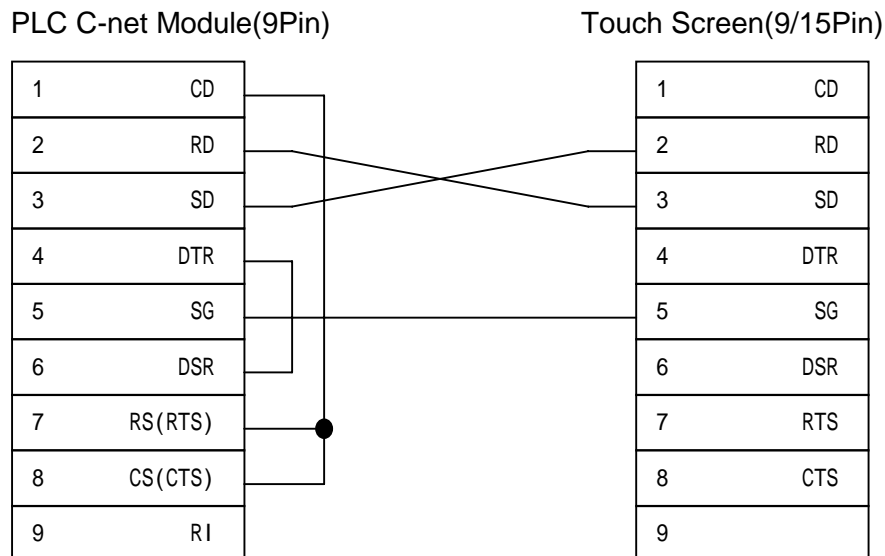
< System Configuration >

The above figure shows system configuration to connect GLOFA-GM and NEW Master-K PLC to Touch Screen using C-net.

PLC	Comm. Unit	Cable	Touch Screen
			
GLOFA-GM1/2/3/4 NEW MASTER-K 1000S	G3L-CUEA K7F-CUEA	Refer Connection diagram (RS-232C, RS-422)	All Touch Screen
GLOFA-GM6, GLOFA-GM7, NEW MASTER-K 300S, 200S, 80S	G6L-CUEA K3F-CU2A G7LCUEB G7LCUEC		

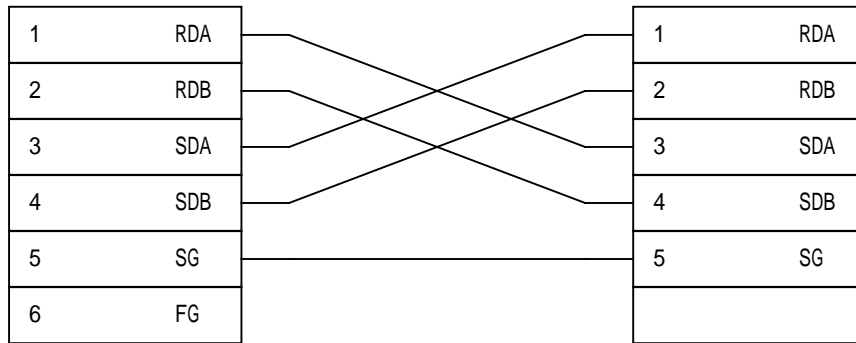
< Cable Diagram >

(1) RS-232C (GLOFA-GM/New Master-K Touch Screen (for 9/15 Pin Connector))



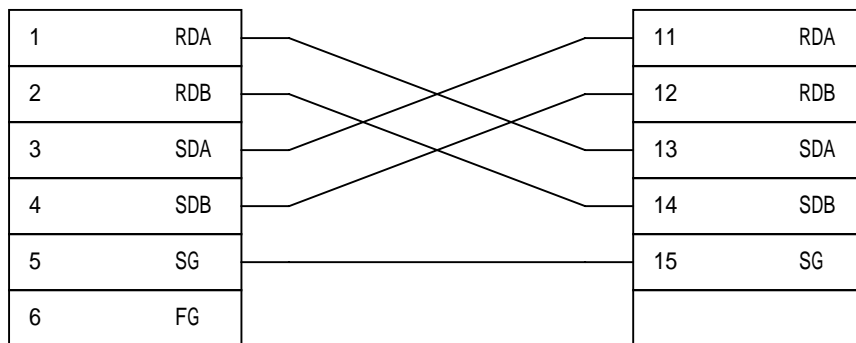
(2) RS-422 (GLOFA-GM/New Master-K Touch Screen(for 5Pin Terminal Block))

PLC C-net(6Pin Terminal Block) Touch Screen(5Pin Terminal Block)



(3) RS-422 (GLOFA-GM/New Master-K Touch Screen (for 15Pin Connector))

PLC C-net(6Pin Terminal Block) Touch Screen(15Pin Connector)



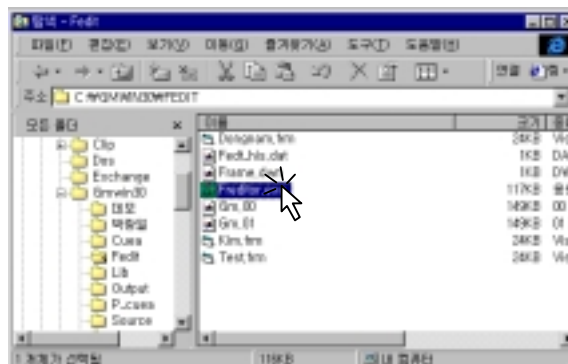
< C-net Module Setup >

(1) Parameter Setup by Software

In case of C-net module of GLOFA/New Master-K PLC, you have to setup parameters by using software 'Frame Editor'

The method of setup is as follows

Execute software 'FREDITOR.EXE'



Setup Comm. Net., Baud Rate, Data Bit, Parity Bit, Stop Bit, and Number of Monitor Reg.

Select [On Line]-[Connection].

Following dialog box means 'connection complete'.

Select [On Line]-[Write] Menu for writing parameter. If following dialog box appears, setup "Slot No." of C-net module accurately and push [write] button

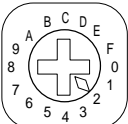
Following dialog box means 'Parameter Writing Complete'.

If writing is complete, C-net module is not active, therefore restart by selecting [On Line]-[Action Toggle] Menu.

If Action "Toggle" is completed, select [On Line]-[Disconnect] Menu and disconnect.

(2) Hardware Mode Setup

Setup mode of C-net module by rotary switch. C-net module support as following modes.

S/W Figure	Mode S/W Value	Mode		Ref.
		RS-232C	RS-422	
	0	User Define Comm.	User Define Comm.	Linked Mode
	1	Exclusive Comm.	Exclusive Comm.	
	2	User Define Comm.	User Define Comm.	Independent Mode
	3	Exclusive Comm.	Exclusive Comm.	
	4	User Define Comm.	Exclusive Comm.	Independent Mode
	5	Exclusive Comm.	User Define Comm.	
	6	GMWIN	User Define Comm.	
	7	GMWIN	Exclusive Comm.	
	8	LOOP-BACK	LOOP-BACK	Diagnosis
	9 ~ F	Reserved		Not Used

Modes to enable to communicate to Touch Screen are as follows.

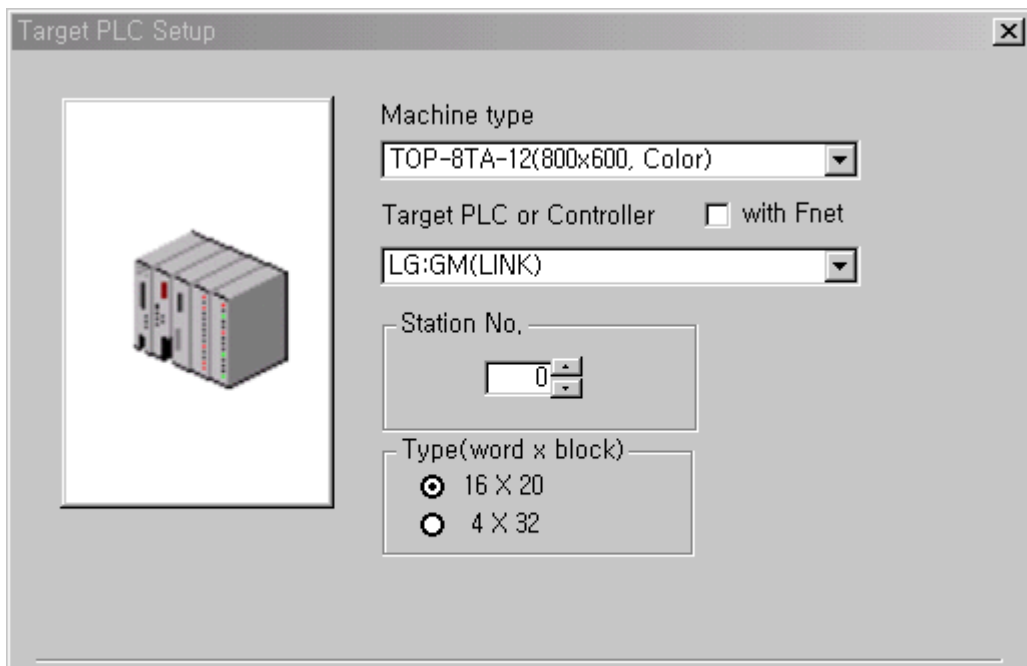
Mode S/W Value	Description
1	Linked Mode of Exclusive Comm.(RS-232C Enable)
3	RS-232C, RS-422 Exclusive Comm. Mode(RS232c/422 Enable)
4	RS-422 Exclusive Comm. Mode
5	RS-232C Exclusive Comm. Mode
7	RS-422 Exclusive Comm. Mode

Recommend Mode 3. for RS-232C and RS-422 communication.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select “GM(LINK)” or “Master-K(80,200,300,1000)S(LINK)” of “GLOFA-GM/New Master-K Series” up to PLC .



(2) Touch Screen Serial Setup

Serial communication settings are as follows :


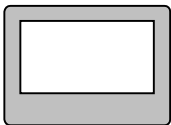
- Serial Baud Rate : Same as controller's setting.
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting.

2.2.2. GLOFA-GM/New Master-K CPU Direct

The following section describes the system configuration and interface between LG GLOFA-GM and NEW MASTER-K PLCs and Touch Screen by RS-232C using CPU direct.

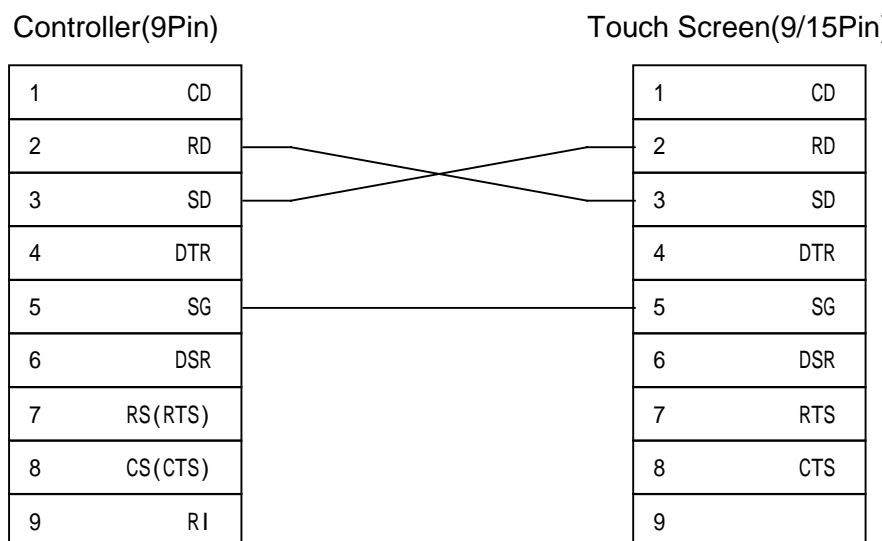
< System Configuration >

The above figure shows system configuration to connect GLOFA-GM and NEW Master-K PLC to Touch Screen using CPU Direct.

Controller	Comm. Module	Cable	Touch Screen
	← →		
GLOFA-GM1/2/3/4 NEW MASTER-K 1000S GLOFA-GM6, GLOFA-GM7, NEW MASTER-K 300S,200S, 80S	None	Refer to Connection Diagram. (RS-232C)	All Touch Screen

< Cable Diagram >

(1) RS-232C (GLOFA-GM/New Master-K Touch Screen(for 9/15 Pin Connector))





Warning

In case of Using Loader Port, Only above 3 wires have to be connected. Other wire connection except above 3 can cause controller's mal-function or abnormal state.

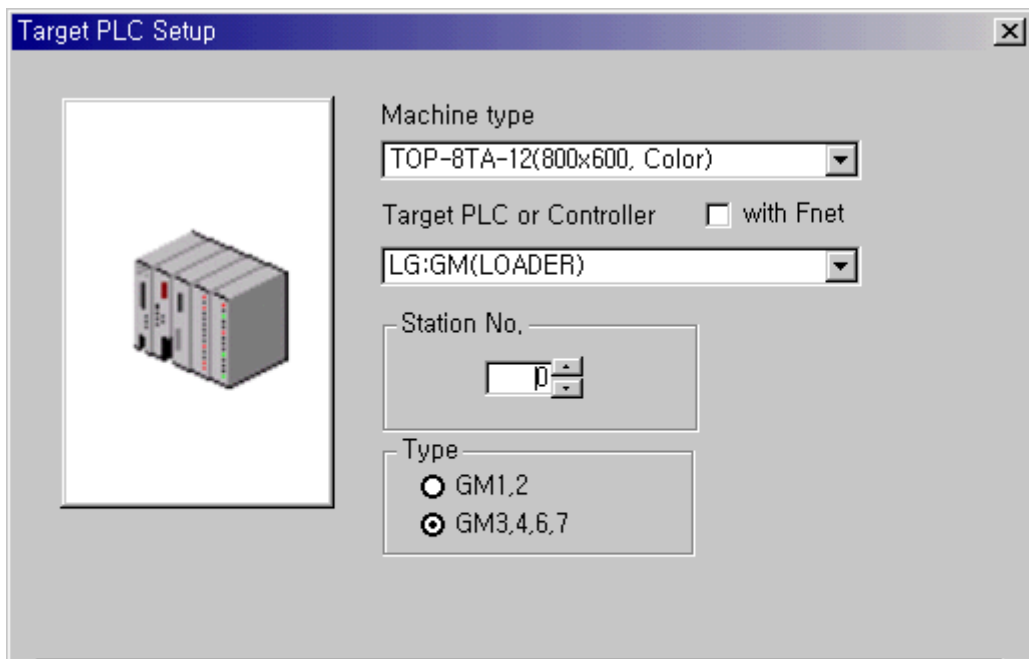
< GLOFA -GM/New Master-K PLC Setup >

In case of GLOFA -GM/New Master-K PLC, Special settings are not needed.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "GM(LOADER)" or "Master-K(80,200,300,1000)S(LOADER)" of "GLOFA-GM / New Master-K Series" up to PLC .



(2) Touch Screen Serial Setup

Special settings are not needed.

Default communication settings of Touch Screen are as follows.

- Serial Baud Rate : 38400 bps
- Serial Data Bit : 8bit
- Serial Stop Bit : 1bit
- Serial Parity Bit : None
- Serial Signal Level : RS-232
- Controller's Station No. at Comm. Diagnosis(0~31) : Not Used

2.2.3. Available Address List

Controller's address to enable to read/write in Touch Screen is as follows.

GLOFA-GM

Item	WORD	Address Area
GM1	%I(Input)	%IW00.0.0 ~ %IW63.7.3
	%Q(Output)	%QW00.0.0 ~ %QW63.7.3
	%M(Inner Memory)	%MW0 ~ %MW65535
GM2	%I(Input)	%IW00.0.0 ~ %IW31.7.3
	%Q(Output)	%QW00.0.0 ~ %QW31.7.3
	%M(Inner Memory)	%MW0 ~ %MW65535
GM3, GM4	%I(Input)	%IW00.0.0 ~ %IW07.7.3
	%Q(Output)	%QW00.0.0 ~ %QW07.7.3
	%M(Inner Memory)	%MW0 ~ %MW32767
GM6, GM7	%I(Input)	%IW00.0.0 ~ %IW07.7.3
	%Q(Output)	%QW00.0.0 ~ %QW07.7.3
	%M(Inner Memory)	%MW0 ~ %MW16383

NEW MASTER-K

Device	Type	1000S	300S	200S	80S
P(I/O Relay)	Bit	P0000~P063F (1024Point)	P0000~P031F (512Point)	P0000~P011F (192Point)	P0000~P015F
M(Inner Relay)	Bit	M0000~M191F(3072Point)			M0000~M191F
K(Keep Relay)	Bit	K0000~K031F(512Point)			K0000~M031F
L(Link Relay)	Bit	L0000~L063F(1024 Point)			L0000~L063F
F(Special Relay)	Bit	F0000~F063F(1024 Point)			F0000~F063F
T(Timer)	Bit	T000~T255(256 Point)			T0000~T1255
C(Counter)	Bit	C000~C255(256 Point)			C000~C255
S(Step Relay)	Bit	S00.00~S99.99			S00.00~S99.99
D(Data Register)	Word	D0000~D9999 (10000 Point)	D0000~D4999 (5000 Point)	D0000~D1999 (2000 Point)	D0000~D4999



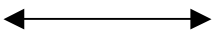

2.3. Mitsubishi MELSEC Series

2.3.1. AnN, AnS, A0J2, AOJ2H, AnA, AnU, FX Interface

The following section describes the system configuration and interface between Mitsubishi MESEC PLC and Touch Screen by RS-232C/RS-422 using Computer Link Unit.

< System Configuration >

The above figure shows system configuration to connect MESEC PLC to Touch Screen using MELSEC Computer Link Unit.

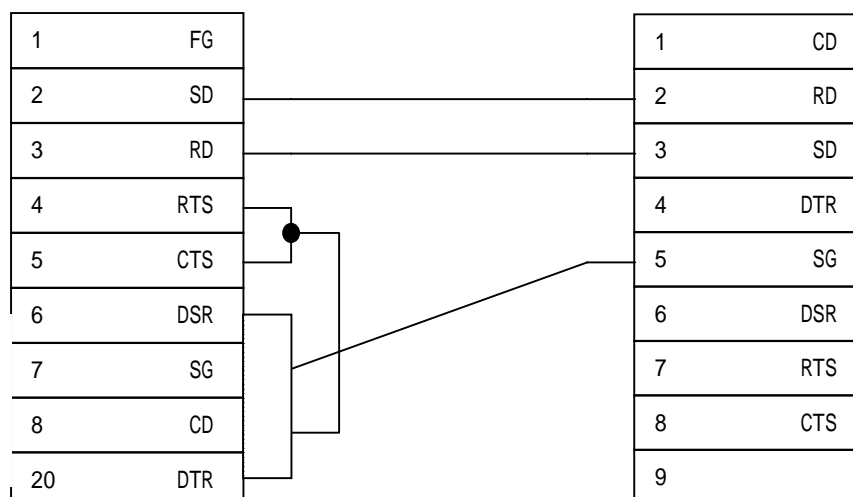
PLC	Comm. Unit	Cable	Touch Screen
			
AnN	AJ71C24-S8	Refer to Connection Diagram (RS-232C,RS-422)	All Touch Screen
AnS	A1SJ71C24-R2 A1SJ71UC24-R2 A1SJ71C24-R4		
A0J2, AOJ2H	A0J2C214-S1		
AnA, AnU	AJ71UC24		
FX	FX2N-232-BD		
	FX2N-422-BD	RS-422	

< Cable Diagram >

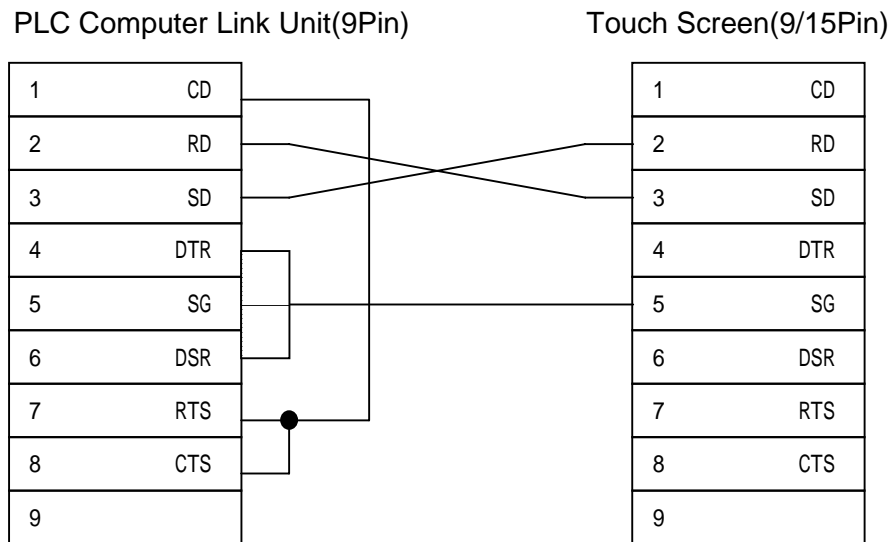
(1) RS-232C (MELSEC (Except A1SJ71C24-R2/FX2N-232-BD) Touch Screen (for 9/15 Pin Connector))

PLC Computer Link Unit(25Pin)

Touch Screen(9/15Pin)



(2) RS-232C (A1SJ71C24-R2/FX2N-232-BD Touch Screen for (9/15 Pin Connector)



(3) RS-422 (MELSEC PLC Touch Screen)

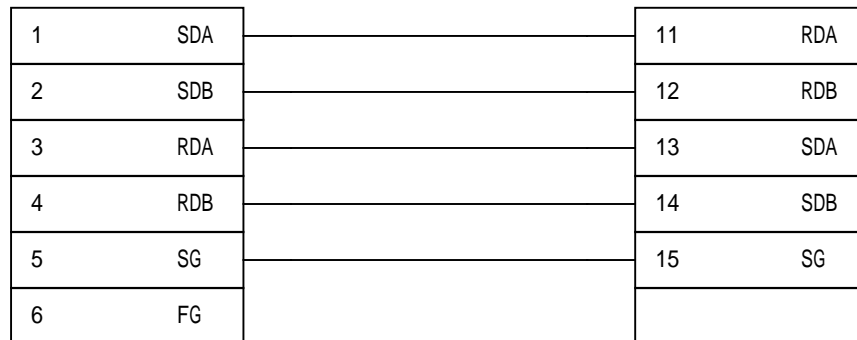
PLC Computer Link Unit (6Pin Terminal Block) Touch Screen(5Pin Terminal Block)



(4) RS-422 (MELSEC PLC(Except FX2N-422-BD) Touch Screen (for 15Pin Connector))

PLC Computer Link Unit
(6Pin Terminal Block)

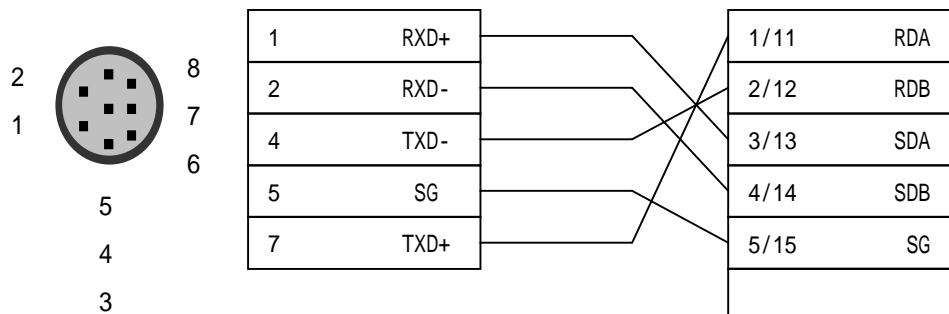
Touch Screen(15Pin)



(5) RS-422 (FX2N-422-BD Touch Screen(for 5Pin Terminal Block or 15Pin Connector))

PLC Computer Link Unit
(8Pin Male Type Connector of Cable)

Touch Screen
(5Pin Terminal Block/15PIN)

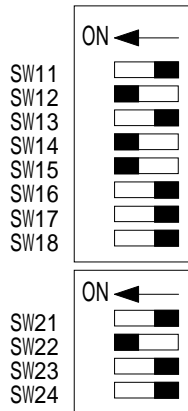


< MELSEC Computer Link Unit Setup >

(1) AJ71C24-S8

Parameter Setup

You can set parameters by Dip Switch in AJ71C24-SB used in AnN, AnA PLC.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
SW11	Main Channel Set	RS-422				RS-232C			
SW12	Data Bit	8 Bit				7 Bit			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	-
SW13	Baud Rate Setting	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW14		OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW15		OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW16	Parity	Exist				None			
SW17	Even/Odd Parity	Even				Odd			
SW18	Stop Bit	2 Bit				1 Bit			
SW21	BCC *1	Exist				None			
SW22	RUNNIG Write	Enable				Disable			
SW23	Transmit Terminal Resistance	Exist				None			
SW24	Receive Terminal Resistance	Exist				None			



Note *1 BCC can be set only 'Exist'.

Station Number Setup

Station No. is set by 2 rotary switch.

Please set 00 station basically.

Communication Mode Setup

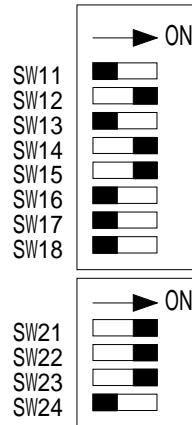
Specify exclusive protocol that Computer Link Unit include, and set by rotary

switch. Touch Screen support protocol type 1, and mode switch is set 5 or A.

(2) AJ71UC24

Parameter Setup

You can set parameters by Dip Switch in AJ71UC24-SB used in AnN, AnA PLC.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
SW11	Main Channel Set	RS-422/485				RS-232C			
SW12	Data Bit	8 Bit				7 Bit			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	-
SW13	Baud Rate Set	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW14		OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW15		OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW16	Parity	Exist				None			
SW17	Even/Odd Parity	Even				Odd			
SW18	Stop Bit	2 Bit				1 Bit			
SW21	BCC *1	Exist *1				None			
SW22	RUNNING Write	Enable				Disable			
SW23	Computer Link	Computer Link *2				Multi Drop Link			
SW24	Not Used								



REF.

*1 BCC can be set only "Exist".

*2 SW23 must be set 'Computer Link'.

Station Number Setup

Station No. is set by 2 rotary switch.

Please set 00 station basically.

Communication Mode Setup

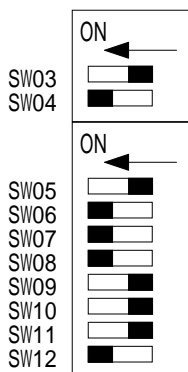
Specify exclusive protocol that Computer Link Unit include, and set by rotary switch. Touch Screen support protocol type 1, and mode switch is set 5 or A.

(3) A1SJ71C24-R2

Parameter Setup

A1SJ71C24-R2 is Communication Unit for RS-232C in A1S PLC.

Parameters are set by Dip Switch in A1SJ71C24-R2.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
SW03	Not Used								
SW04	RUNNING Write	Enable				Disable			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	-
SW05	Baud Rate Setting	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW06		OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW07		OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW08	Data Bit	8 Bit				7 Bit			
SW09	Parity	Exist				None			
SW10	Even/Odd Parity	Even				Odd			
SW11	Stop Bit	2 Bit				1 Bit			
SW12	BCC	Exist				None			

Station Number Setup

Station No. is set by 2 rotary switch.

Please set 00 station basically.

Comm. Mode Setup

Specify exclusive protocol that Computer Link Unit include, and set by rotary switch. Touch Screen support protocol type 1, and mode switch is set 1.

(4) A1SJ71C24-R4

Parameter Setup

A1SJ71C24-R2 is Computer Link Unit for RS-422 in A1S PLC.

Parameters are set by Dip Switch in A1SJ71C24-R2.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
SW01	Master/Local Set	Multi Drop Link/Master				Multi Drop Link/Local			
SW02	Mode Select	Computer Link				Multi Drop Link			
SW03	Unused								
SW04	RUNNING Write ^{*2}	Enable				Disable			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	-
SW05	Baud Rate Set	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW06		OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW07		OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW08	Data Bit	8 Bit				7 Bit			
SW09	Parity	Exist				None			
SW10	Even/Odd Parity	Even				Odd			

SW11	Stop Bit	2 Bit	1 Bit
SW12	BCC	Exist	None



REF.

*1 SW10 must be set to 'Computer Link'.
*2 SW04 must be set to 'Enable'.

Station Number Setup

Station No. is set by 2 rotary switch.

Please set 00 station basically.

Communication Mode Setup

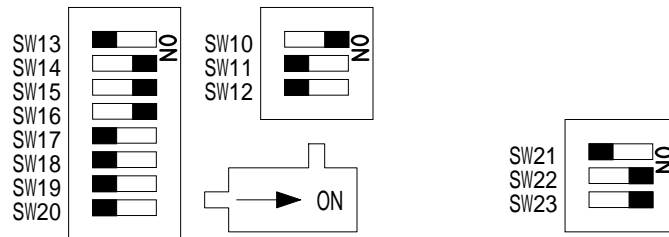
Specify exclusive protocol that Computer Link Unit include, and set by rotary switch. Touch Screen support protocol type 1, and mode switch is set 1.

(5) A0J2-C214-S1

Parameter Setup

A0J2-C214-S1 is Computer Link Unit for RS-232C/RS-422 in A0J2 PLC.

Parameters are set by Dip Switch in front of A0J2-C214-S1 unit.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
SW10	Mode Select	Computer Link ^{*1}				Multi Drop Link			
SW11	Main Channel Set	RS-422				RS-232C			
SW12	RUNNING Write	Enable ^{*2}				Disable			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	-
SW13	Baud Rate Set	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW14		OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW15		OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW16	Data Bit	8 Bit				7 Bit			
SW17	Parity	Exist				None			

SW18	Even/Odd Parity	Even	Odd
SW19	Stop Bit	2 Bit	1 Bit
SW20	Sum Check	Exist	None
SW21	Unused	Must be set to 'OFF'	
SW22	Transmit Terminal Resistance	Exist	None
SW23	Receive Terminal Resistance	Exist	None



*1 SW10 must be set to 'Computer Link'(ON).
 *2 Running Write SW12 must be set to 'Enable'(ON).

Station Number Setup

Station No. is set by 2 rotary switch(SW3, SW4).

Please set 00 station basically.

Communication Mode Setup

Specify exclusive protocol that Computer Link Unit include, and set by rotary switch(SW5). Touch Screen support protocol type 1, and mode switch is set '1' or 'A' for RS-232C and '5' or 'A' for RS-422.

(6) FX2N-232-BD

Special Register(D8120) Setup

After D8120 Registers are set, turn off and restart 'ON' power of PLC.

Bit No.	Setting Item	Description	
		0(OFF)	1(ON)
B0	Data Bit	7 bit	8 bit
B1	Parity	(b2, b1) (0, 0) :None	
B2		(0, 1) :Odd (1, 0) :Even	
B3	Stop Bit	1 Bit	2Bit

B4, B5, B6, B7	Baud Rate(bps)	(B7, B6, B5, B4) (0, 0, 1, 1) 300, (0, 1, 1, 1) 4800 (0, 1, 0, 0) 600, (1, 0, 0, 0) 9600 (0, 1, 0, 1) 1200, (1, 0, 0, 1) 19200 (0, 1, 1, 0) 2400	
B8	Header	Must be set to 'OFF(0)'.	
B9	Terminator		
B10, B11, B12	Control	(B12, B11, B10) (0, 0, 0) : RS485(422) (0, 1, 0) : RS232C	
B13	Sum Check	None	Exist
B14	Protocol	Must be set to 'ON(1)'.	
B15	Protocol Format	Protocol format 1	Protocol format 4



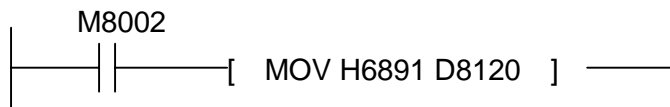
REF.

*1 B13 must be set to 'ON(Exist)'.

*2 B15 must be set to 'OFF(Protocol format 1)'.

(Example)

Data Length	8 bits
Parity	None
Stop bit	1 bits
Baud rate	19200 bps
Protocol	Dedicated Protocol
Header	No used
Terminator	No used
Protocol Format	Protocol format 1



D8120 = [0110 1000 1001 0001]
 6 8 9 1

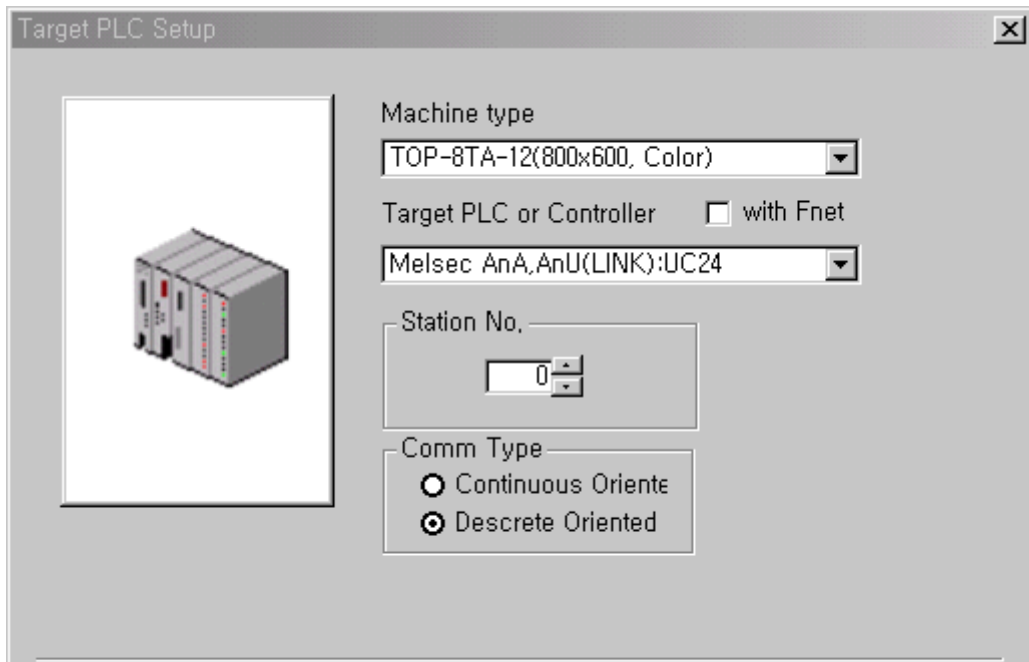
Special Register(D8121) Setup

You can set Station Number.

< Touch Screen Setup >

(1) Touch Screen Designer Setting

Select “AnN, AnS, AoJ2(LINK)” or “AnA, AnU(LINK)” of “MELSEC Series” up to PLC .



(2) Touch Screen Serial Setup

Settings are as follows.



- Serial Baud Rate : Set same as PLC's setting
- Serial Data Bit : Set same as PLC's setting
- Serial Stop Bit : Set same as PLC's setting
- Serial Parity Bit : Set same as PLC's setting
- Serial Signal Level : Set same as PLC's setting
- Controller's Station No. at Comm. Diagnosis(0~31)
: Set same as PLC's setting

2.3.2. MELSEC CPU Direct

The following section describes the system configuration and interface between Mitsubishi MELSEC PLC and Touch Screen by RS-232C using CPU direct.

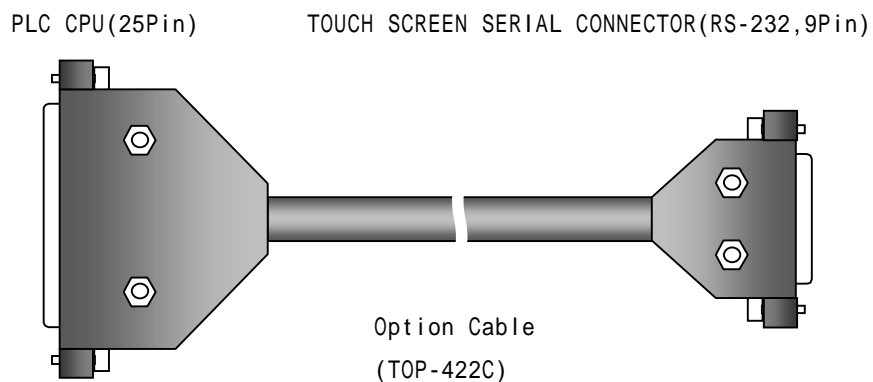
< System Configuration >

The above figure shows system configuration to connect MELSEC PLC to Touch Screen using CPU Direct.

PLC	Comm. Module	Cable	Touch Screen
	←→		
A2N,A3N	None	RS-422C	All Touch Screen
A2A,A3A			
A2U,A3U			
A1SH,A2SH			
A2USH,A2USH-S1			
A0J2,A0J2H			
QnA			
FX			

< Cable Diagram >

(1) RS-232C (MELSEC PLC Touch Screen)



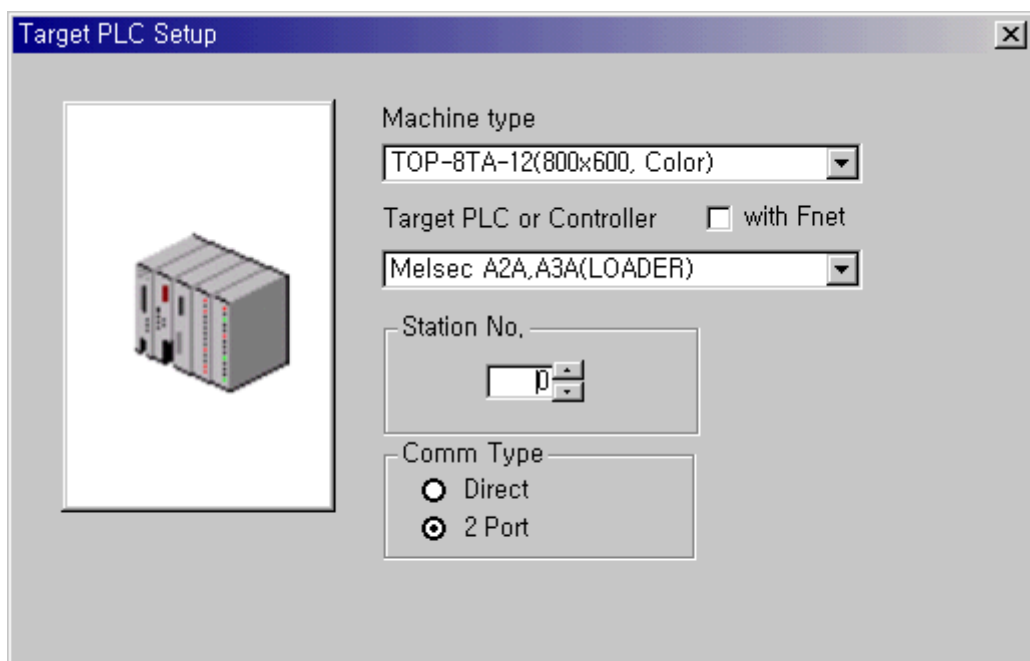
< MELSEC PLC Setting >

You don't need special settings in MELSEC PLCs.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "A2N,A3N(LOADER)" or "A2A,A3A(LOADER)" or "A2U,A3U(LOADER)" or "AnS,AOJ2H(LOADER)" or "AOJ2(LOADER)" or "QnA(LOADER)" or "FX(LOADER)" of "MELSEC Series" up to PLC .



(2) Touch Screen Serial Setup

Special settings are not needed.

Automatic settings are as follows.


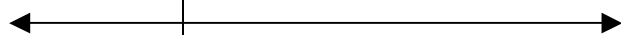
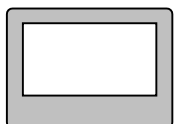
- Serial Baud Rate : 9600 bps
- Serial Data Bit : 8bit
- Serial Stop Bit : 1bit
- Serial Parity Bit : Odd
- Serial Signal Level : RS-232
- Controller's Station No. at Comm. Diagnosis(0~31) : Specified '0'

2.3.3. MELSEC- Q Series CPU Direct

The following section describes the system configuration and interface between MESELC-Q Series and Touch Screen using serial communication through CPU Loader Port.

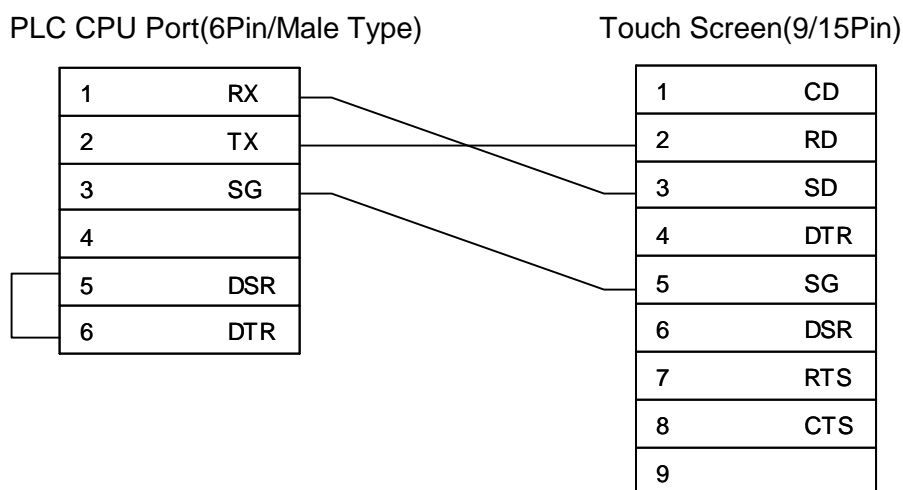
< System Configuration >

This figure shows system configuration to connect MESELC-Q Series to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
Q02CPU Q02HCPUQ06HC PUQ12HCPUQ25 HCPU	None	Refer to Cable Connection. (RS-232)	All Touch Screen

< Cable Diagram >

(1) RS-232 (MESELC-Q Series Touch Screen (for 9/15 Pin Connector))



< MELSEC- Q Series Setup >

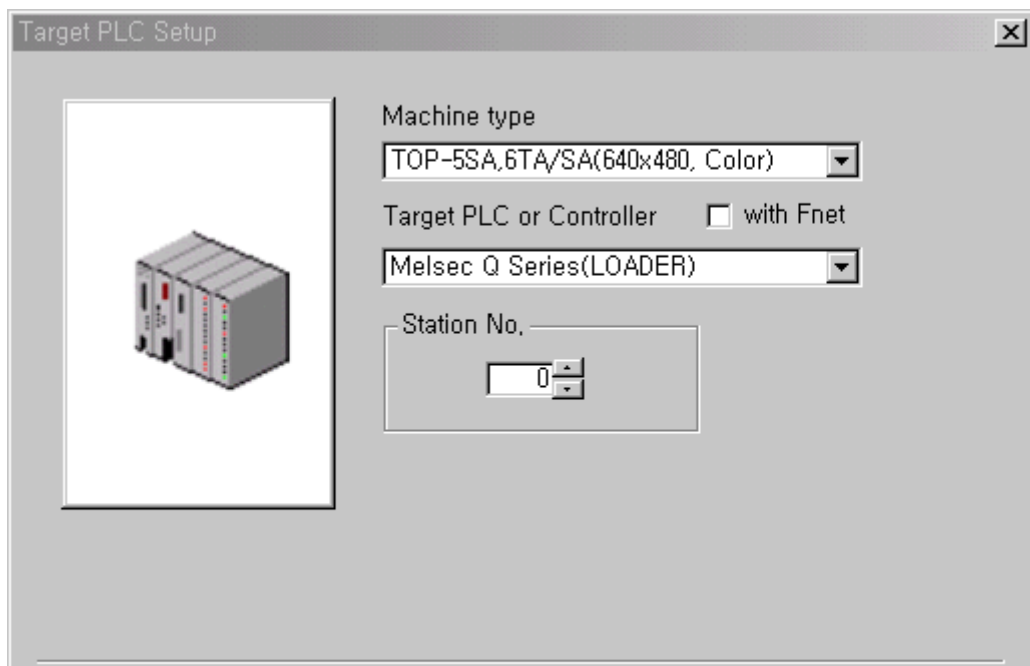
(1) Serial Parameter Setup

When using MELSEC-Q series CPU direct, special serial parameter setup is not needed.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "MELSEC-Q Series(LOADER)" in PLC Type.



(4) Touch Screen Serial Setup

Because default parameters is setup as follows, special serial parameter setup is not needed.

- Serial Baud Rate : 9600 ~ 38400
- Serial Data Bit : 8
- Serial Stop Bit : 1
- Serial Parity Bit : ODD
- Serial Signal Level : RS-232
- Controller's Station No. at Comm. Diagnosis(0~31) : 0

2.3.4. Available Address List

PLC's device address to enable to read/write in Touch Screen are as following list.

(1) AJ71C24-S8, AnN CPU Direct, A1S/AOJ2/A2SH/A1SH CPU Direct

Device	DevNo	Type	Bit Assign Addr.	Word Assign Addr
Input (X)	0	Bit	X0000 - X07FF	X0000 – X07F0
Output (Y)	1	Bit	Y0000 - Y07FF	Y0000 – Y07F0
LINK Relay (B)	2	Bit	B0000 - B03FF	
LINK Register (W)	3	Word		W0000 - W03FF
Special Relay (F)	5	Bit	F0000 - F0255	F0000 - F0240
LATCH Relay (L)	6	Bit	L0000 - L2047	
Inner Relay (M)	7	Bit	M0000 - M2047	M0000 - M2032
Special Relay (M)	7	Bit	M9000 - M9255	M9000 – M9240
Data Register (D)	8	Word		D0000 - D1023
Timer-Coil (TC)	9	Bit	TC000 - TC255	
Timer-CV (TN)	10	Word		TN000 - TN255
Timer-Contact (TS)	11	Bit	TS000 - TS255	
Counter-Coil (CC)	12	Bit	CC000 - CC255	
Counter-CV (CN)	13	Word		CN000 - CN255
Counter-Contact (CS)	14	Bit	CS000 - CS255	

*CV : Current Value

(2) AJ71UC24, AnA/AnU/A2US/A2USH-S1 CPU Direct

Device	DevNo	Type	Bit Assign Addr.	Word Assign Addr
Input (X)	0	Bit	X0000 – X1FFF	X0000 – X1FF0
Output (Y)	1	Bit	Y0000 – Y1FFF	Y0000 – Y1FF0
LINK Relay (B)	2	Bit	B0000 – B1FFF	
LINK Register (W)	3	Word		W0000 – W1FFF
STEP Relay (S)	4	Bit	S0000 - S2047	
Special Relay (F)	5	Bit	F0000 – F2047	F0000 – F2032
LATCH Relay (L)	6	Bit	L0000 – L8191	
Inner Relay (M)	7	Bit	M0000 – M8191	M0000 – M8176

Special Relay (M)	7	Bit	M9000 - M9255	M9000 – M9240
Data Register (D)	8	Word		D0000 – D8191
Special Register (D)	8	Word		D9000 - D9255
Timer-Coil (TC)	9	Bit	TC000 - TC2047	
Timer-CV (TN)	10	Word		TN000 – TN2047
Timer-Contact (TS)	11	Bit	TS0000 – TS2047	
Counter-Coil (CC)	12	Bit	CC000 – CC1023	
Counter-CV (CN)	13	Word		CN000 – CN1023
Counter-Contact (CS)	14	Bit	CS000 – CS1023	

(3) QnA CPU Direct

Device	Dev. No	Type	Bit Assign Addr.	Word Assign Addr
Input (X)	0	Bit	X0000 – X1FFF	
Output (Y)	1	Bit	Y0000 – Y1FFF	
LINK Relay (B)	2	Bit	B0000 – B7FFF	B0000 – B7FF0
LINK Register (W)	3	Word		W0000 – W63FF
Special LINK Reg. (SW)	3	Word		SW000 – SW7FF
STEP Relay (S)	4	Bit	S00000 – S8191	S00000 – S8176
Special Relay (F)	5	Bit	F00000 – F32767	F00000 – F32752
LATCH Relay (L)	6	Bit	L00000 – L32767	L00000 – L32752
Edge Relay (V)	-	Bit	V00000 - V32767	V00000 – V32752
Inner Relay (M)	7	Bit	M00000 – M32767	M00000 – M32752
Special Relay (SM)	7	Bit	SM0000 – SM2047	SM0000 – SM2032
Data Register (D)	8	Word		D00000 – D25599
Special Register (SD)	8	Word		SD0000 – SD2047
Timer- Coil (TC)	9	Bit	TC0000 – TC22527	
Timer-CV (TN)	10	Word		TN0000 – TN22527
Timer-Contact (TS)	11	Bit	TS0000 – TS22527	
Sum Timer-Coil (SC)	-	Bit	SC0000 – SC22527	
Sum Timer-CV (SN)	-	Word		SN0000 – SN22527
Sum Timer-Contact (SS)	-	Bit	SS0000 – SS22527	
Counter-Coil (CC)	12	Bit	CC0000 – CC22527	
Counter-CV (CN)	13	Word		CN0000 – CN22527
Counter-Contact (CS)	14	Bit	CS0000 – CS22527	

(5) MELSEC-FX Series CPU Direct

Device	Dev. No	Type	Bit Assign Addr.	Word Assign Addr
Input (X)	0	Bit	X0000 - X0337	X0000 – X0320
Output (Y)	1	Bit	Y0000 – Y0337	Y0000 – Y0320
STEP Relay (S)	4	Bit	S0000 – S0999	
Inner Relay (M)	7	Bit	M0000 – M3071	
Special Relay (M)	7	Bit	M8000 – M8255	
Data Register (D)	8	Word		D0000 – D7999
Special Register (D)	8	Word		D8000 – D8255
Timer-CV (TN)	10	Word		TN000 - TN255
Timer-Contact (TS)	11	Bit	TS000 – TS255	
Counter-Contact (CS)	12	Bit	CS000 – CS255	
Counter-CV (CN)	13	Word		CN000 - CN255

(6) MELSEC-Q Series CPU Direct

Device	Bit Address(HEX)	Word Address(HEX)
Input Relay	X0000 - X1FFF	X0000 - X1FF0
Output Relay	Y0000 - Y1FFF	Y0000 - Y1FF0
Internal Relay	M0000 – M32767	M0000 - M32752
Special Relay	SM0000 - SM2047	SM0000 - SM2032
Latch Relay	L0000 - L32767	L0000 - L32752
Annunciator	F0000 – F32767	F0000 - F32752
Edge Relay	V0000 – V32767	V0000 - V32752
Step Relay	S0000 - S8191	S0000 - S8176
Link Relay	B0000 - B7FFF	B0000 - B7FF0
Special Link Relay	SB000 - SB7FF	SB000 - SB7F0
Timer (contact)	TS00000 - TS23087	
Timer (coil)	TC00000 - TC23087	
Aggregate Timer (contact)	SS00000 - SS23087	
Aggregate Timer (coil)	SC00000 - SC23087	
Counter (contact)	CS00000 - CS23087	

Device	Bit Address(HEX)	Word Address(HEX)
Counter (coil)	CC00000 - CC23087	
Timer (current value)		TN00000 - TN23087
Aggregate Timer (current value)		SN00000 - SN23087
Counter (current value)		CN00000 - CN23087
Data Register		D00000 - D25983
Special Data Register		SD0000 - SD2047


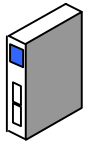
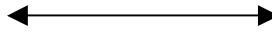
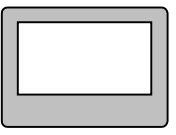
2.4. Fuji Micrex-F Series

2.4.1. Micrex-F Serial Interface

The following section describes the system configuration and interface between Fuji Micrex-F PLC and Touch Screen by RS-232C/RS-422.

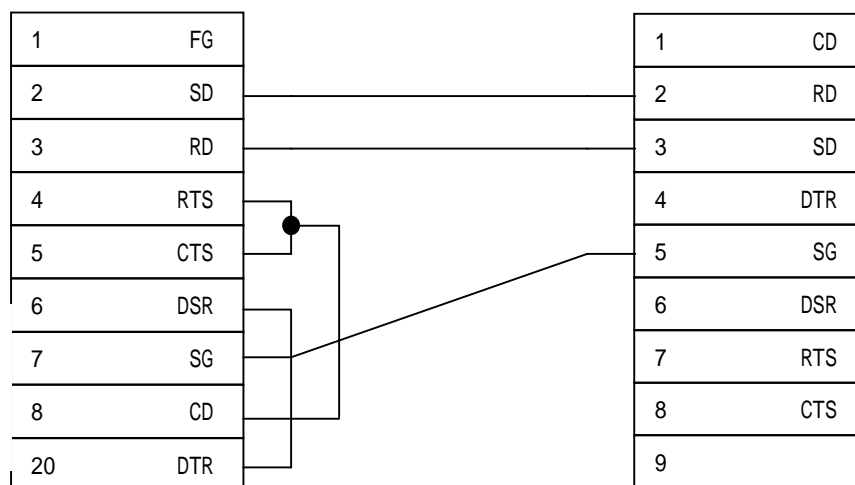
< System Configuration >

The above figure shows system configuration to connect Micrex-F PLC to Touch Screen using serial Interface.

PLC	Comm. Module	Cable	Touch Screen
			
F80H, F120H, F250	FFU120B	Refer to Cable Connection (RS-232C, RS-422)	All Touch Screen
F80H, F120H, F120S, F140S, F150S, F250	FFK120A	Refer to Cable Connection (RS-232C)	

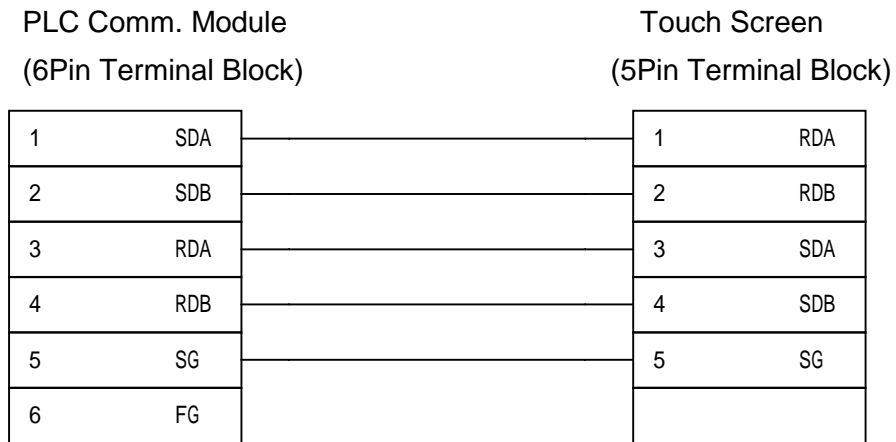
< Cable Diagram >

(1) RS-232C (FFU120B, FFK120A) Touch Screen (for 9/15 Pin Connector)
 PLC Comm. Module(25Pin) Touch Screen(9/15Pin)

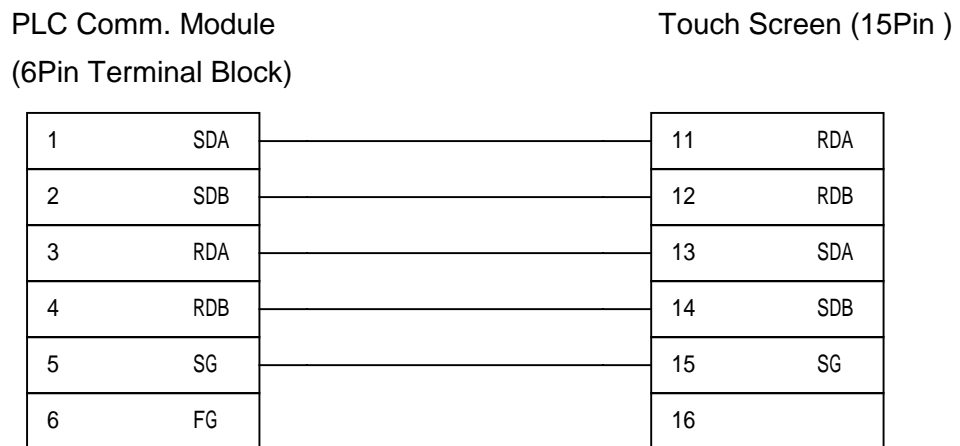


6 & 20 Common

(2) RS-422 (FFU120B Touch Screen (for 5Pin Terminal Block))



(3) RS-422 (FFU120B Touch Screen(for 15 Pin Connector Type))

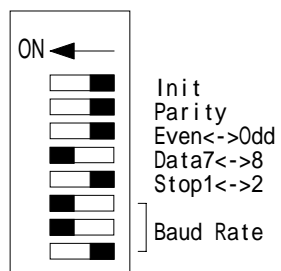


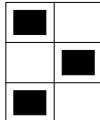
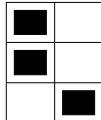
< Micrex-F PLC Setup >

(1) Hardware Setup

Parameter Setup

Parameters are set by Dip Switch in FFU-120B or FFK-120AA0J2-C214-S1 unit.



Switch	Setting Item	Set Switch Status	
		ON	OFF
Init *1	Initialization	Switch Set	File Set
Parity	Parity	Exist	None
Even<->Odd	Even/Odd Parity	Even	Odd
Data7<->8	Data Bit	8 Bit	7 Bit
Stop1<->2	Stop Bit	2 Bit	1 Bit
Baud Rate	Baud Rate	9600 bps 	19200 bps 



REF.

*1 Set Init Dip Switch to 'OFF(File Set)'.
 *2 BCC is set by only software.

Mode Set(FFU-120B)

Switch	Setting Content
1	RS-232C
3	RS-485

In case of RS-485, set Station Number.

(2) Software Set in Monitoring Communication Type

1) Monitoring Communication Type

Monitoring Communication Type is Interface Protocol between Fuji PLC and external equipments(Touch Screen). Through FFU120B(version 2 or above) or FFK120A(Version 2 or above), register Device address of Tag of Touch Screen in Monitoring Area(PK Area) of Micrex-F PLC , Touch Screen read data of PK Area in a communication frame. Therefore communication speed is improved.

2) Restriction of Monitoring Communication

Monitoring Communication Area(PK Area) is also used for Program-Loader, and so MAX. Monitor Point that Touch Screen(External Equipment) can use is 433 points. 6 sets of FFU/FFK is connectable for F120H, and 3 sets for F80H in Monitoring Communication Type.(Refer following list)

PLC	Monitor Point	Num. Of FFU/FFK
F80H	433	3 sets
F120H		6 sets



Caution

1. 1 word or 1 bit is calculated as 1 monitor point.
2. Number of point and connection include Program-Loader.

MAX. Number of Monitor Point in a Loader

Monitor/Loader	D20	D25
Ladder Monitor	Max.96 Point	Max.204 Point
Data Monitor	Max.14 Point	Max. 56 Point

MAX. Reg. Point of a FFU120B or FFK120A is 74 Points.

When using 2 or more sets of FFU120B in a PLC Base Rack, it is possible to use MAX. 71 points for 16bit Word and MAX. 42 points for 32bit Word.

(Calculation --> $X \times 3 + Y \times 5$: X :Number of 16bit Word , Y : Number of 32bit Word)

According to above to , number of system buffer for 'READ' used in a screen of Touch Screen must be smaller than number calculated in in case of using 2 or more sets of FFU120B .

If number of System Buffer for 'READ' on a Base Screen of Touch Screen is over 74, communication speed of the screen is decreased to 1/4 by .

3) FFU/FFK Initial Setting

In order to monitor Communication, 'Init' Dip switch of FFU/FFK must be set to 'File'(Dip SW OFF).

Setup system for FFU/FFK, write initial program and transmit it to Micrex-F PLC. A role of this program is permission of Monitoring Area (PK Area) Access. After then, other communication parameters are transmitted to PLC.

4) System Initial Setting(Based on D20 Graphic Loader)

Input Power

Push 'AUX'

Push 'F1'key : System Definition

Push 'Read' key, and 'Ent' key : P-CPSL LDR

Push 'F4' key : Registering Message Module

Following example shows how to use a FFU and a FFK. In this case, FFU module is established in base board slot #2, T-link No. of FFK is set as 80.

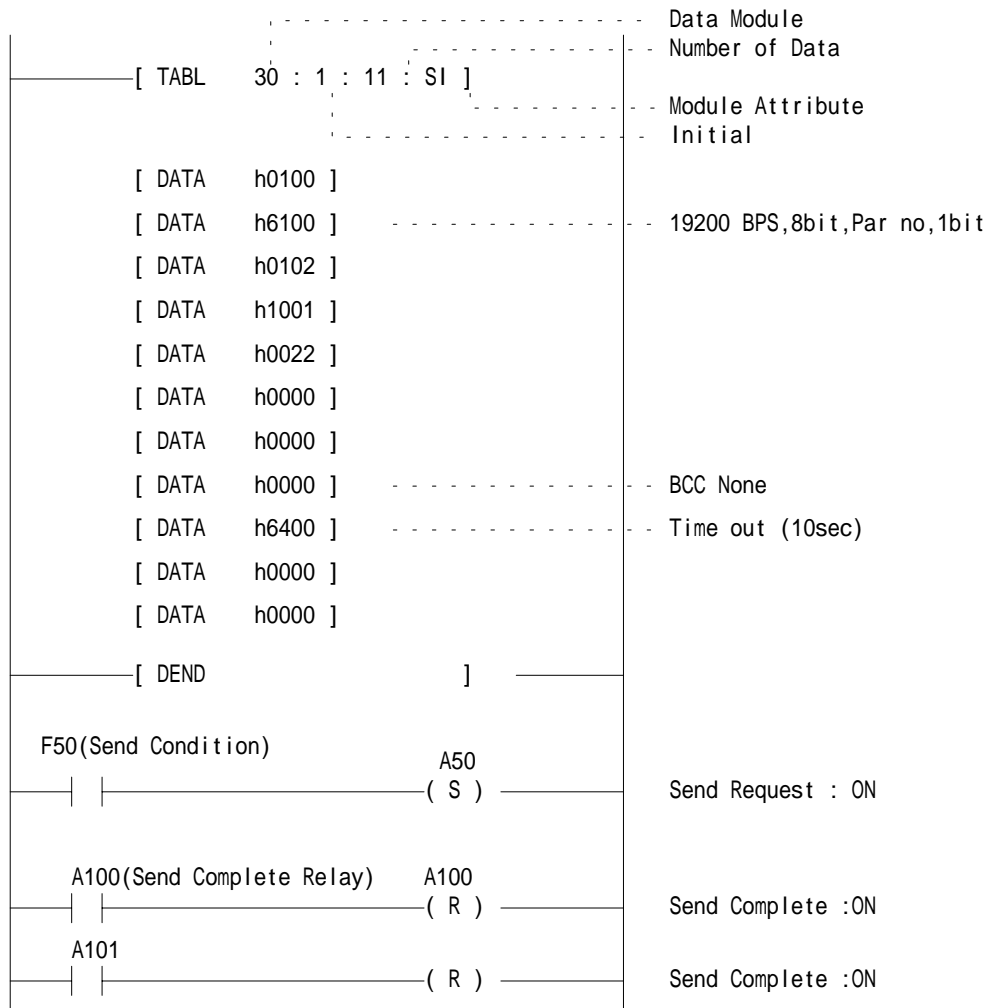
(Please refer manual of FFK120B/FFK120A)

No	Data Module	Service(0:Not Used,1:Init.,2:Send,3:Receive)	Link(0 3:T-Link, 4 5:P-Link, 6:24, 7:SUMINET)	Capsule No.	Channel
00	30	1	0	02	0
01	31	1	0	80	0
02					
.					
.					
.					

Push 'F10' key

Push 'Load' key, and 'Ent' key : Save

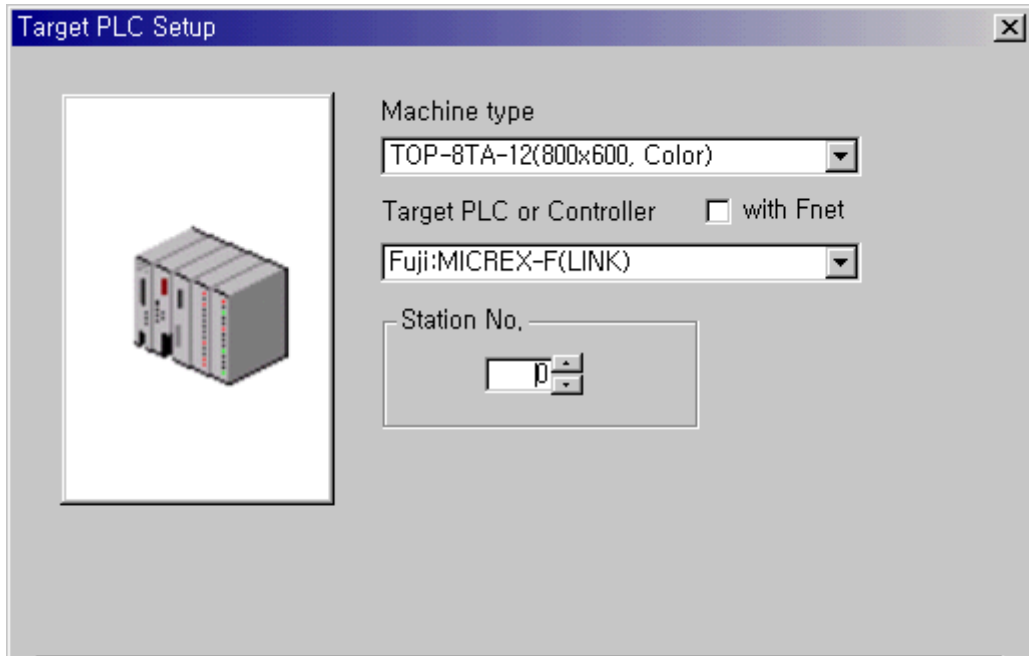
5) Example of Init. Set Program



< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Fuji:MICREX-F(LINK)"in Controller Type.



(2) Touch Screen Serial Setup

Settings are as follows.

- Serial Baud Rate : Set same as PLC's setting
- Serial Data Bit : Set same as PLC's setting
- Serial Stop Bit : Set same as PLC's setting
- Serial Parity Bit : Set same as PLC's setting
- Serial Signal Level : Set same as PLC's setting
- Controller's Station No. at Comm. Diagnosis(0~31)
: In case of RS-485, set same as PLC's setting and '0'for RS-232C

2.4.2. Available Address List

Following list is MICREX-F PLC's Address to enable to read/write in Touch Screen.

(1) Usable address in FFU-120B/FFK-120A

Device	Dev.No	Type	Size	MOLNO	ATTR
In/Out (B)	0	Word	16	00	01
Aux. Relay (M)	1	Word	16	01	01
KEEP Relay (K)	2	Word	16	02	01
Special Relay (F)	3	Word	16	03	01
Announce Relay (A)	4	Word	16	04	01
P-Link Memory (L)	5	Word	16	14	01
Timer-SV (TS)	6	Word	32	0A	02
Timer-CV (TR)	7	Word	32	0B	02
Counter-SV (CS)	8	Word	32	0C	02
Counter-CV (CR)	9	Word	32	0D	02
Data Memory (BD)	10	Word	32	0E	02

CV: Current Value, SV: Set Value

(2) Address Setting Rang up to PLC

Device/PLC	F50/F50H	F60	F80H	F120H	F120S/F140S/ F150S
B	WB0099	WB0099	WB0399	WB0399	WB0511
M	WM0031	WM0127	WM0255	WM0255	WM0511
K	WK0031	WK0063	WK0063	WK0063	WK0063
F	WF0029	WF0029	WF0067	WF0109	WF0125
A	WA0019	WA0019	WA0021	WA0021	WA0045
L	-	-	-	WL0511	WL0511
TS	TS0127	TS0255	TS0255	TS0255	TS0511
TR	TR0127	TR0255	TR0255	TR0255	TR0511
CS	CS0031	CS0127	CS0255	CS0255	CS0511
CR	CR0031	CR0127	CR0255	CR0255	CR0511
BD	BD0127	BD0255	BD0255	BD0255	BD0255

File Memory is based on 16 bit.

All File memory check the range based on Max. assignable size.


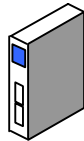
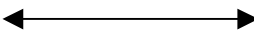
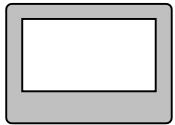
2.5. Samsung FARA / NAI Series

2.5.1. FARA-N70 /700/700 /7000 PLC Serial Interface

The following section describes the system configuration and interface between Samsung FARA-N70 /700 , NAI PLC and Touch Screen by RS-232C/RS-422.

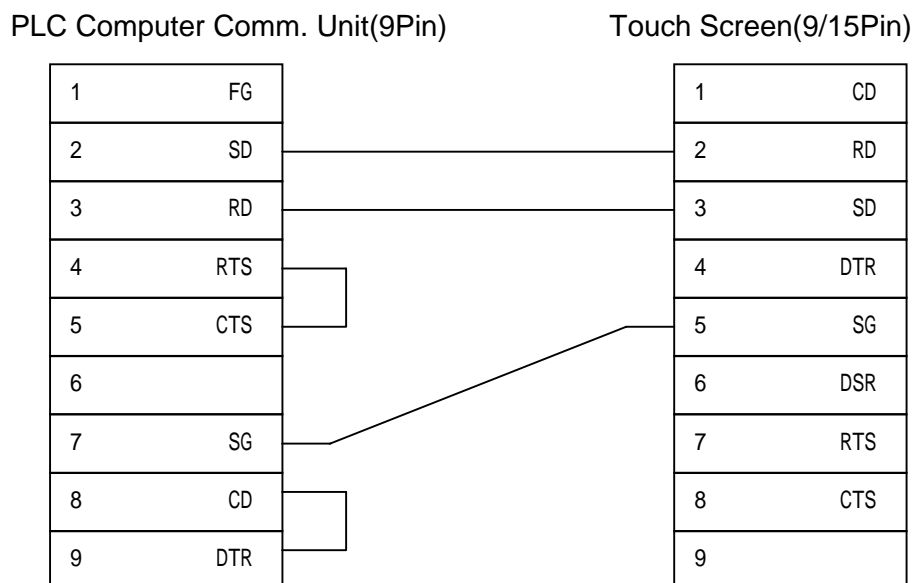
< System Configuration >

The above figure shows system configuration to connect FARA-N PLC to Touch Screen.

PLC	Comm. Module	Cable	Touch Screen
			
FARA-N70 /700/700 /7000, NAIS	N-7000 CCU N-700 CCU	Refer to Cable Connection (RS-232C)	All Touch Screen

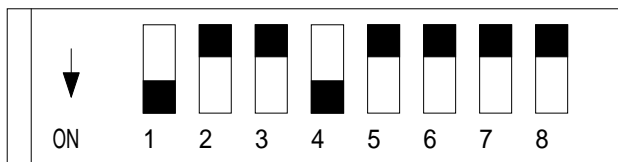
< Cable Diagram >

(1) RS-232C (FARA-N70 /700/700 /7000, NAI Touch Screen(for 9/15 Pin Connector))



< FARA , NAI S PLC Setup >

PLC Communication Setting is set by Dip SW in Computer Communication Unit for RS-232C interfacing to Touch Screen.



Switch	Setting Item	Set Switch Status							
		ON				OFF			
	Baud Rate(bps)	300	600	1200	2400	4800	9600	19200	Modem
SW1	Baud Rate Set	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW2		ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW3		ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW4	Data Bit	8 Bit				7 Bit			
SW5	Parity	Exist				None			
SW6	Even/Odd Parity	Even				Odd			
SW7	Stop Bit	2 Bit				1 Bit			
SW8	Control Signal	CTS,CD Available				CTS,CD Not Available			



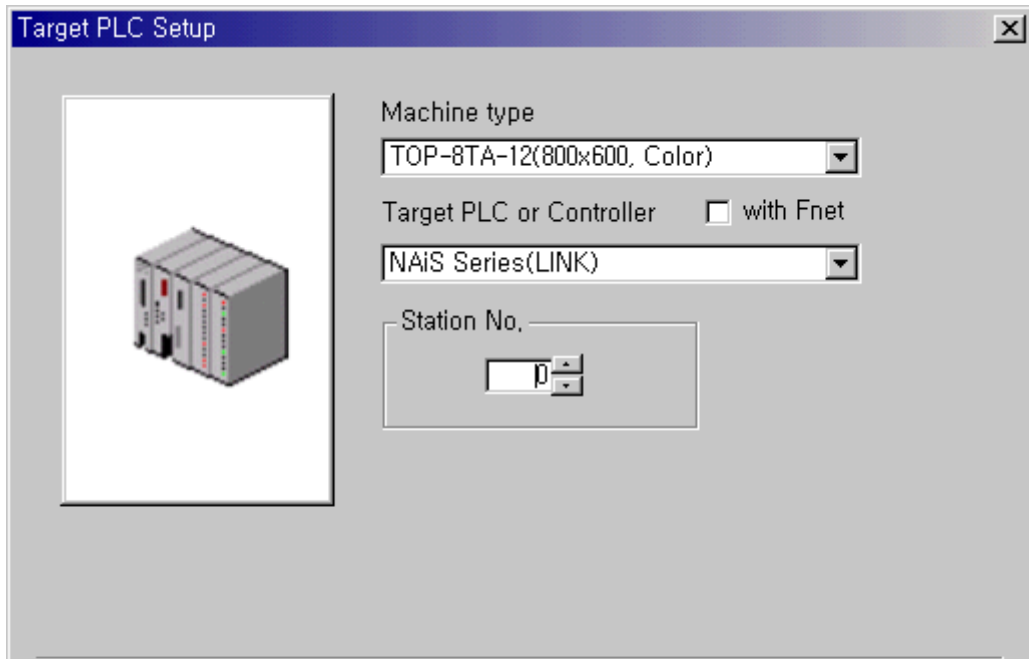
Caution

SW8(Control Signal) is set to 'OFF(CTS,CD Not Available)'.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "NAiS(LINK)" of "FARA Series" in PLC type.



(2) Touch Screen Serial Setup

Serial settings are as follows



- Serial Baud Rate : Same as controller's setting.
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting in case of RS-422, and '0' for RS-232C.

2.5.2.FARA-N70 /700/700 /7000, NAiS PLC CPU Direct

The following section describes the system configuration and interface between Samsung FARA-N70 /700/700 /7000, NAiS PLC and Touch Screen by CPU direct.

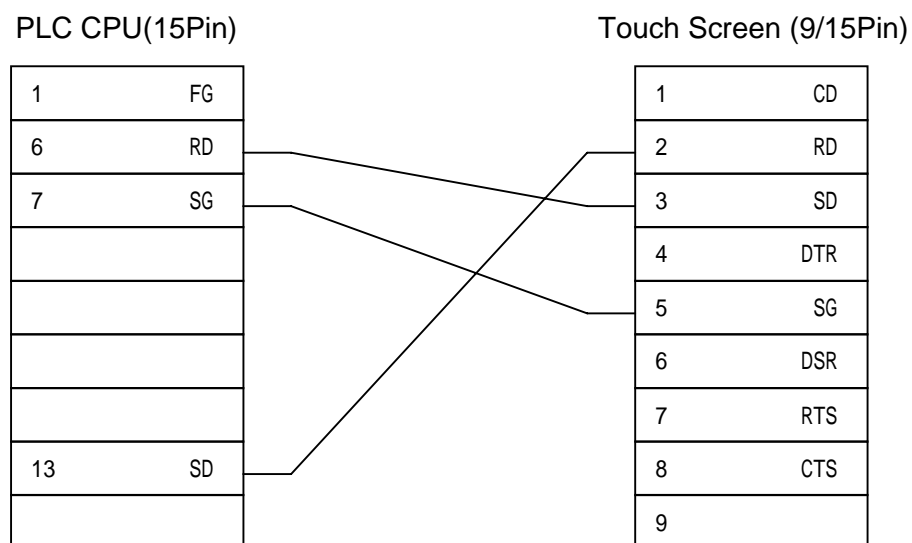
< System Configuration >

The above figure shows system configuration to connect FARA-N70 /700/700 /7000 PLC to Touch Screen.

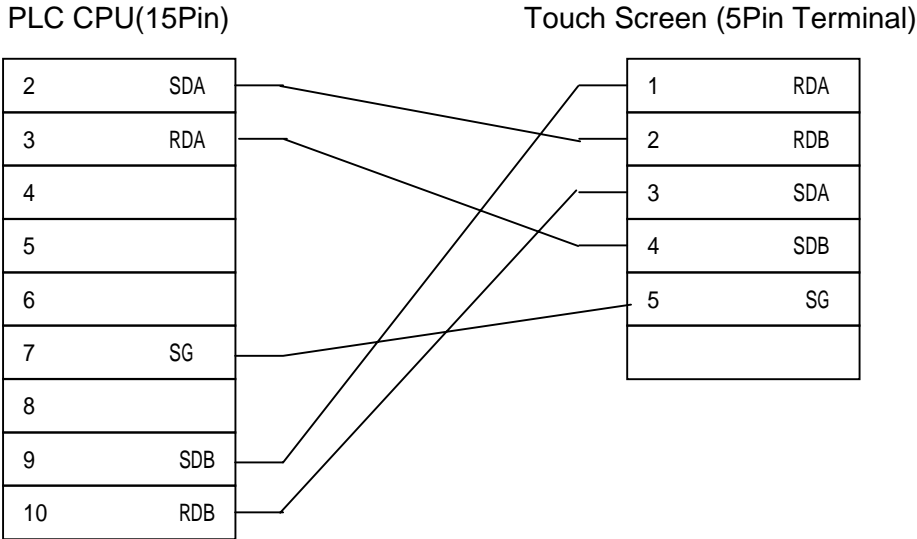
PLC	Comm. Unit	Cable	Touch Screen
	← →		
FARA-N70 /700/700 /7000, NAiS	None	Refer to Cable Connection. (RS-232C)	All Touch Screen

< Cable Diagram >

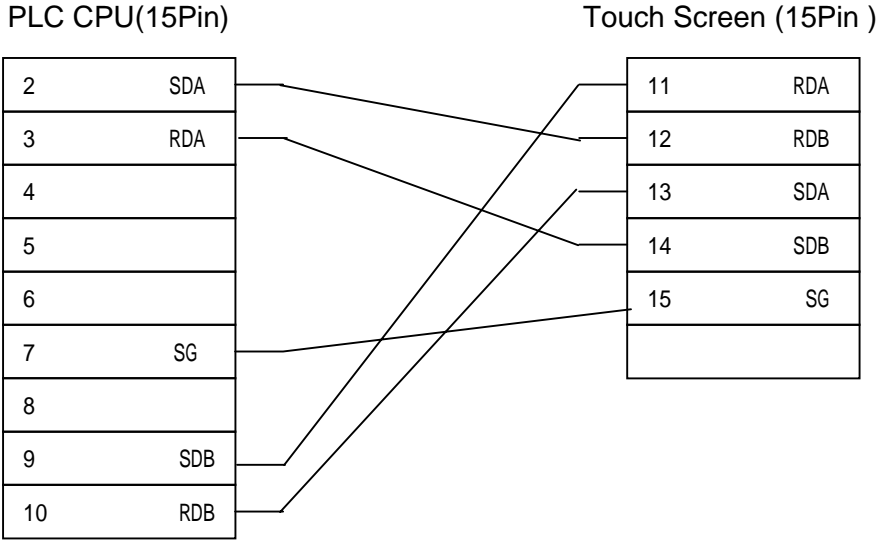
(1) RS-232C (FARA-N700/7000, NAiS Touch Screen(for 9/15 Pin Connector))



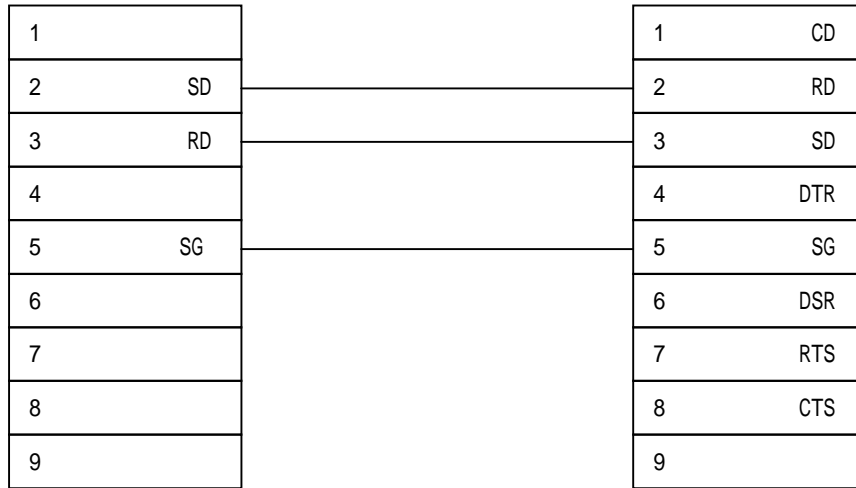
(2) RS-422 (FARA-N700/7000, NAiS Series Touch Screen (for 5Pin Terminal Block))



(3) RS-422 (FARA-N700 Touch Screen(for 15 Pin Connector))



(4) RS-232C (FARA-N70 Touch Screen(for 9/15 Pin Connector)
 PLC CPU(CPL5526)(9Pin) Touch Screen (9/15Pin)



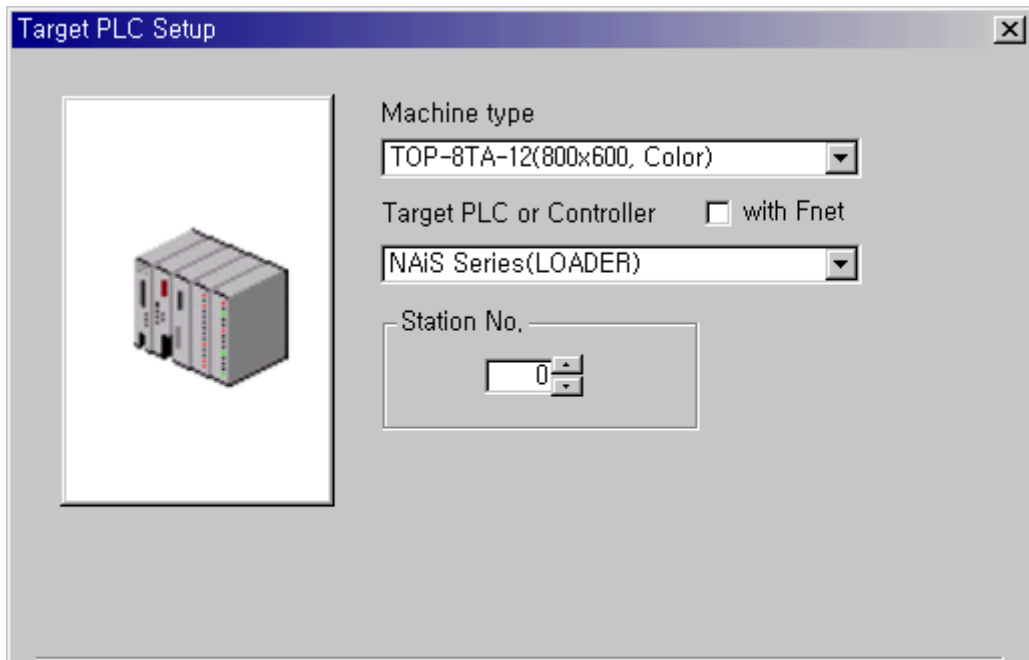
< FARA-N PLC Setup >

You don't need special settings in FARA-N70 /700/700 /7000 PLC.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Samsung Fara-N(LOADER)" of "FARA Series" in PLC Type.



(2) Touch Screen Serial Setup

Special Settings are not needed. Automatic Settings are as follows.


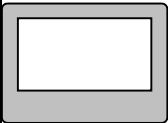
- Serial Baud Rate : 9600/19200bps
- Serial Data Bit : 8bit.
- Serial Stop Bit : 1bit
- Serial Parity Bit : Odd
- Serial Signal Level : RS-232C
- Controller's Station No. at Comm. Diagnosis(0~31) : assigned to'0'.

2.5.3. FARA-N70Plus/700Plus PLC CPU Direct

The following section describes the system configuration and interface between Samsung FARA-N70Plus/700Plus PLC and Touch Screen by CPU direct.

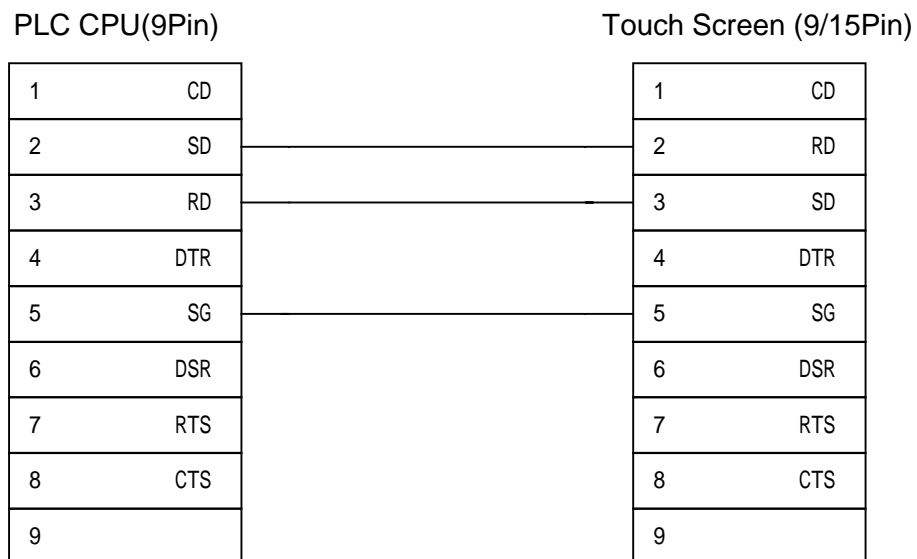
< System Configuration >

The above figure shows system configuration to connect FARA-N70PLUS/700PLUS PLC to Touch Screen

PLC	Comm. Unit	Cable	Touch Screen
			
FARA-N70PLUS/700PLUS	None	Refer to Cable Connection.	All Touch Screen

< Cable Diagram >

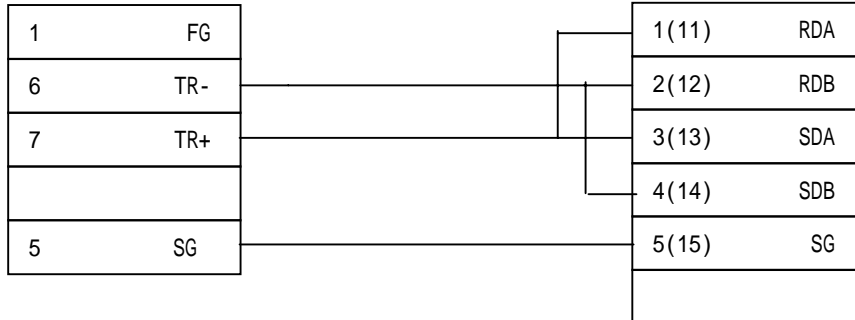
(1) RS-232C (FARA-N70PLUS/700PLUS Touch Screen(for 9/15 Pin Connector))



(2) RS-422 (FARA-N70PLUS/700PLUS Touch Screen(for 5Pin Terminal Block or 15Pin Connector))

PLC CPU (9Pin)

Touch Screen
(5Pin Terminal Block/15Pin)



< FARA-N70PLUS/700PLUS PLC Setup >

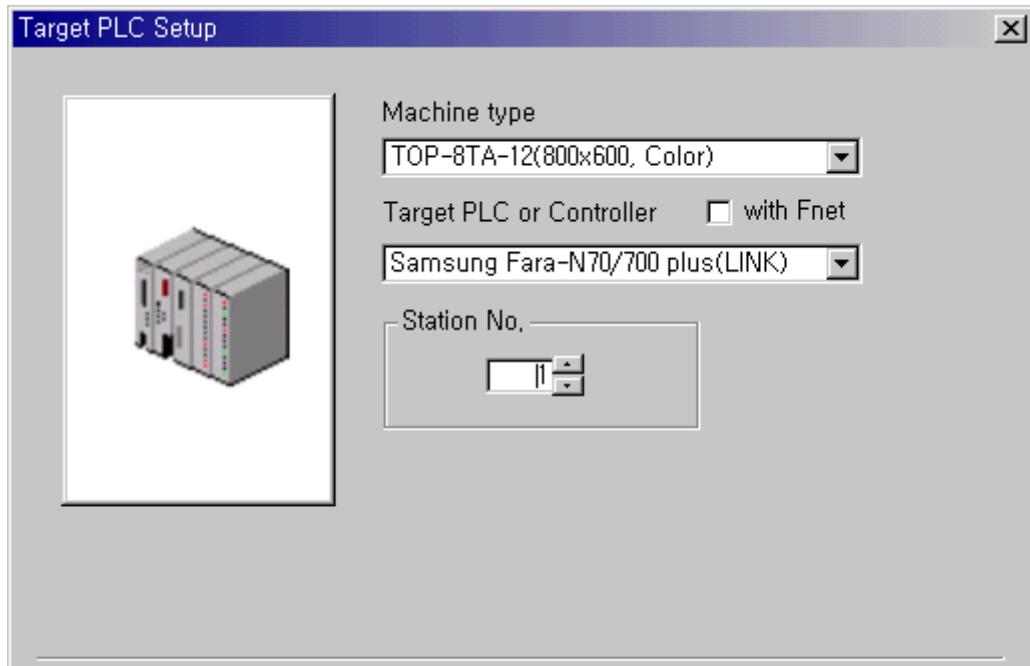
PLC Setting	
Baud Rate	9600 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	NONE
Error Detection	CRC

Station Address is set by Rotary Switch of the rear of CPU module.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Samsung FARA-N70/700PLUS(Link)" in PLC Type.



(2) Touch Screen Serial Setup

Special Settings are not needed. Automatic Settings are as follows.

- Serial Baud Rate : 9600bps
- Serial Data Bit : 8bit.
- Serial Stop Bit : 1bit
- Serial Parity Bit : None
- Serial Signal Level : RS-232C
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as Station Address .

2.5.4. Available Address List

(1) Fara-N70 /700/700 /7000

Operand	Name	Data Type	Num. Of Point	Number
X	External Input Relay	Bit	4096	0 ~ 255F *1
Y	External Output Relay	Bit	4096	0 ~ 255F *1
R	Inner Relay	Bit	14016	0 ~ 875F *1
L	Link Relay	Bit	10240	0 ~ 639F *1
R	Special Relay	Bit	176	9000 ~ 910F *1
T/C	Timer/Counter Contact	Bit	2048	0~2047
DT	Data Register	Word	10000	0 ~9999
FL	File Register	Word	32765	0 ~ 32764
Ld	Link Register	Word	8478	0 ~ 8477
DT	Special Register	Word	256	9000 ~ 9255
SV	Timer/Counter SV	Word	2048	0 ~ 2047
EV	Timer/Counter EV	Word	2048	0 ~ 2047
IX/IY	Index Register	Word	2	IX/IY

*SV: Set Value, EV : Elapse Value



REF.

*1 : X,Y,R,L are available Bit/Word process.

In case of bit process, 1 unit is 'HEXA', from 10unit is Decimal. (Ex : X12C)

In case of Word process, express Word by attaching 'W' in front of device.

(Ex : WX12 = 16bit data of X120~X12F)

(2) Fara-N70PLUS/700PLUS

Device	Address
External Input/Output	R0000 ~ R0127
LINK Relay	L0000 ~ L0063
Aux. Relay	M0000 ~ M0127
KEEP Relay	K0000 ~ K0127
Special Relay	F0000 ~ F0015
Link Data	W0000 ~ W2047
T/C SV	SV000 ~ SV255
T/C CV	PV000 ~ PV255

* SV : Set Value, CV : Current Value



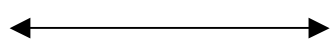
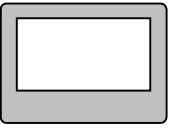
2.6. OMRON SYSMAC Series

2.6.1. OMRON SYSMAC-C Serial Interface

The following section describes the system configuration and interface between Samsung OMRON SYSMAC-C PLC and Touch Screen using RS-232C/422 Serial Communication.

< System Configuration >

The above figure shows system configuration to connect SYSMAC-C PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
C200H/C200HS	C200H-LK202-V1	Refer to Cable Connection. (RS-422)	All Touch Screen
	C200H-LK201-V1	Refer to Cable Connection. (RS-232C)	
C500/C1000H/ C2000H/C500	C500-LK201-V1 C500-LK203	Refer to Cable Connection. (RS-232C/422)	
C50/C120/C500/C1000H/C2000H/C120F/C500F	C120-LK201-V1	Refer to Cable Connection. (RS-232C)	
	C120-LK202-V1	Refer to Cable Connection. (RS-422)	



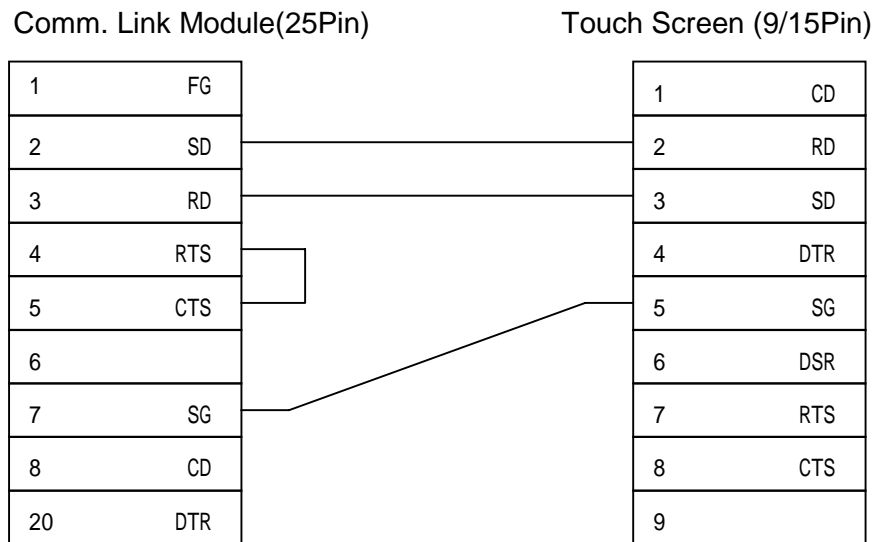
Caution

Be cautious that Communication Unit of C200H/C200HS differs from other in connector pin spec.
(Refer connection diagram (2),(4))

< Cable Diagram >

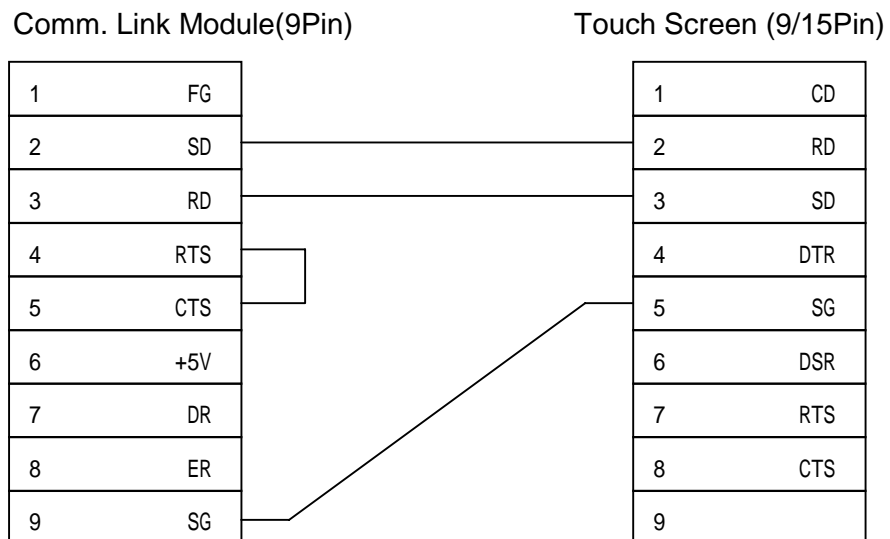
(1) RS-232C (SYSMAC-C Touch Screen (for 9/15 Pin Connector)

This is connection diagram for SYSMAC-C PLCs except C200.



(2) RS-232C (SYSMAC-C200 Touch Screen (for 9/15 Pin Connector)

This is connection diagram for SYSMAC-C C200.

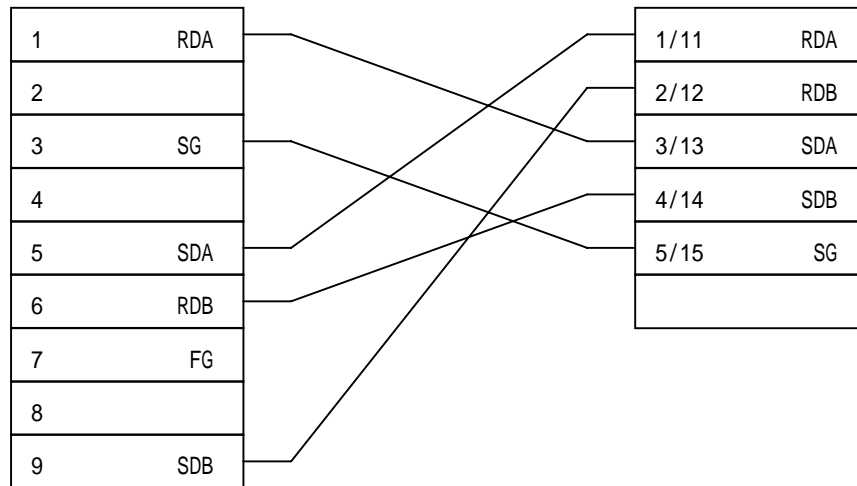


(3) RS-422 (SYSMAC-C Touch Screen (for 5Pin Terminal Block or 15Pin Connector)

This is connection diagram for SYSMAC-C PLCs except C200.

Comm. Link Module(9Pin)

Touch Screen
(5Pin Terminal Block/15pin)

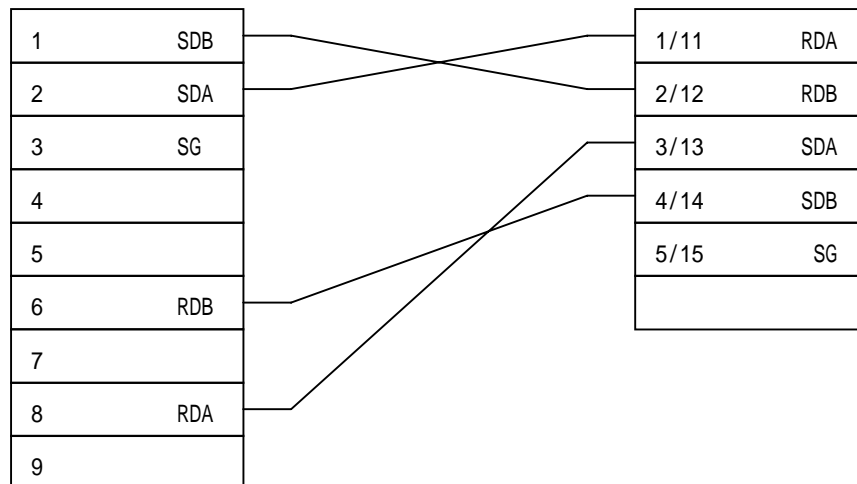


(4) RS-422 (SYSMAC-C200 Touch Screen (for 5Pin Terminal Block or 15Pin Connector))

This is connection diagram for SYSMAC-C PLC C200.

Comm. Link Module(9Pin)

Touch Screen
(5Pin Terminal Block/15Pin)



< SYSMAC-C PLC Setup >

(1) C200H-LK201-V1/LK-202-V1 Setup

1) Set station number.

Station Number is set by SW1 and SW2. SW1 is X10, SW2 is X1.

2) Baud Rate Setting

Set by SW3. Setting values according to SW Set are as follows.

Switch	Baud Rate(bps)
0	300
1	600
2	1200
3	2400
4	4800
5	9600
6	19200

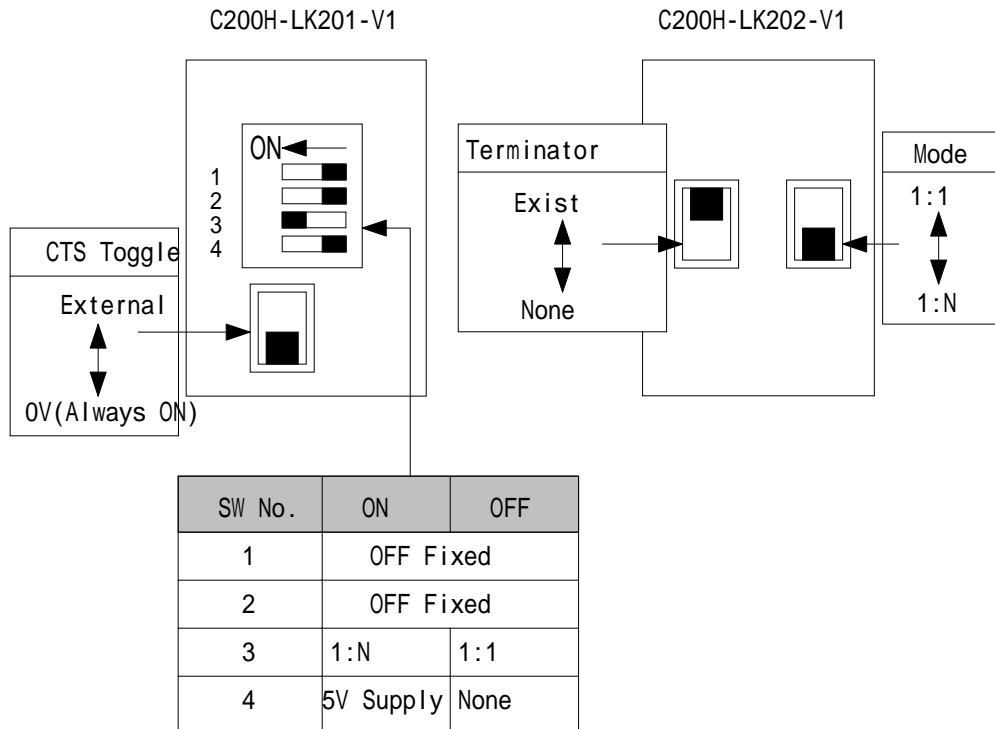
3) Command Level Setting

Set by SW4. Recommend 2.

Switch	Command Level	Parity	Etc.
0	Level 1 available	even	ASCII 7bit 2 Stop bit
1	Level 1,2 available		
2	Level 1,2,3 available		
3	Disable setting		
4	Level 1 available	odd	JIS 8bit 1 Stop bit
5	Level 1,2 available		
6	Level 1,2,3 available		
7	Disable setting		
8	Level 1 available	even	JIS 8bit 1 Stop bit
9	Level 1,2 available		
A	Level 1,2,3 available		
B	Disable setting		
C	Level 1 available	odd	

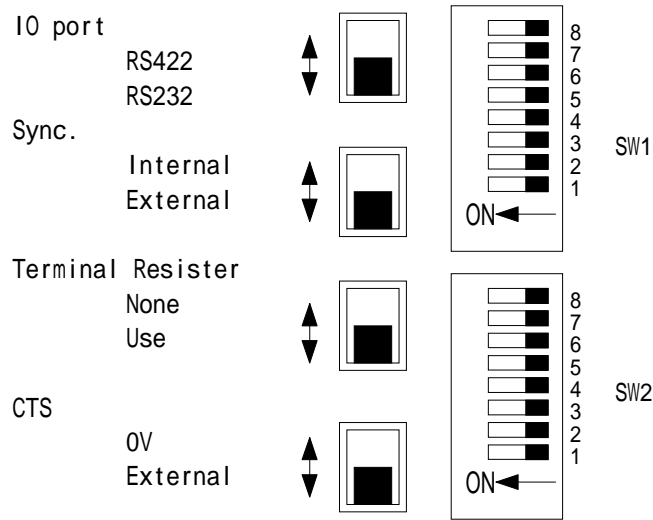
D	Level 1,2 available		
E	Level 1,2,3 available		
F	Disable setting		

4) DIP Switch Setting



Recommended Setting is CTS 0V(On), 1:N, Terminator Exist.

(2) C500-LK201-V1 Dip Switch Setup



	Switch	Setting Item	Setting Switch Status						
			ON			OFF			
SW1	1~5	Assign Station Num.	0	1	2	...	30	31	
	1	Station Num. Setting	OFF	ON	OFF	...	OFF	ON	
	2		OFF	OFF	ON	...	ON	ON	
	3		OFF	OFF	OFF	...	ON	ON	
	4		OFF	OFF	OFF	...	ON	ON	
	5		OFF	OFF	OFF	...	ON	ON	
	6	Not Used							
	7	Not Used							
	8	Power On PLC Mode	Run			Stop			
SW2	1~4	Baud Rate	300	600	1200	2400	4800	9600	19200
	1	Baud Rate Setting	OFF	ON	OFF	ON	OFF	ON	OFF
	2		ON	OFF	OFF	ON	ON	OFF	OFF
	3		OFF	OFF	OFF	ON	ON	ON	ON
	4		ON	ON	ON	OFF	OFF	OFF	OFF
	5	Not Used							
	6	Mode	1:1			1:N			
	7~8	Command Level	1		1	1,2	1,2,3		
	7	CMD Level setting	OFF		ON	OFF	ON		
	8		OFF		OFF	ON	ON		

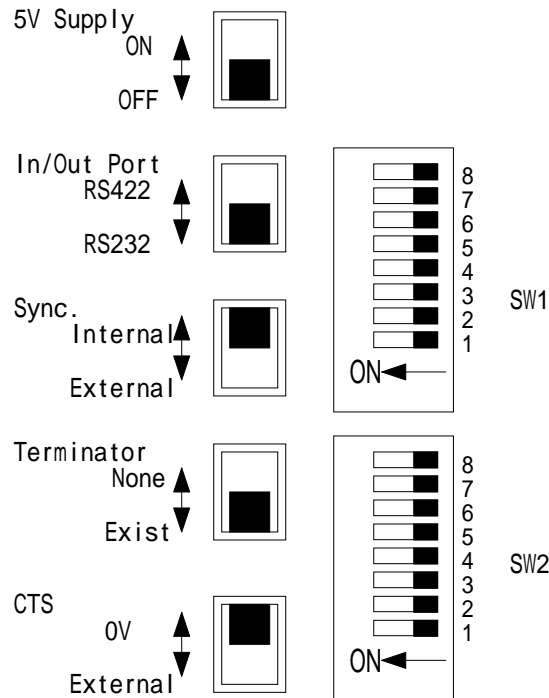


Other recommended settings are Internal Sync., Terminator, CTS OV.



Fixed to Parity Even, Data Bit 7, Stop Bit 2.

(3) C500-LK203 Dip Switch Setting



	Switch	Setting Item	Set Switch Status					
			ON			OFF		
SW1	1~5	Assign Station Num.	0	1	2	...	30	31
	1	Station Num. Setting	OFF	ON	OFF	...	OFF	ON
	2		OFF	OFF	ON	...	ON	ON
	3		OFF	OFF	OFF	...	ON	ON
	4		OFF	OFF	OFF	...	ON	ON
	5		OFF	OFF	OFF	...	ON	ON
	6~7	Parity & Code						
	6	Transmission Code	ASCII 7bt, 2 Stop bit			JIS 8bit, 1 Stop bit		
	7	Parity	Even			Odd		
	8	Power On PLC Mode	Monitor			Normal		

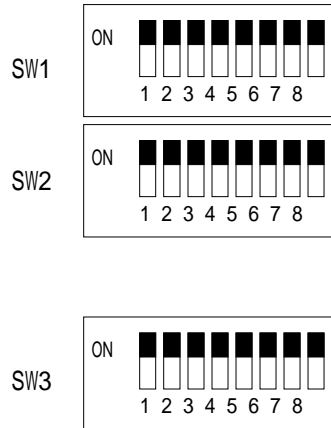
	Switch	Setting Item	Set Switch Status						
			ON			OFF			
SW2	1~4	Assign Baud Rate	300	600	1200	2400	4800	9600	19200
	1	Baud Rate Setting	OFF	ON	OFF	ON	OFF	ON	OFF
	2		ON	OFF	OFF	ON	ON	OFF	OFF
	3		OFF	OFF	OFF	ON	ON	ON	ON
	4		ON	ON	ON	OFF	OFF	OFF	OFF
	5	Select System	System#0			System#1			
	6	Mode	1:1			1:N			
	7~8	Command Level	1		1	1,2		1,2,3	
	7	Command Level	OFF		ON	OFF		ON	
	8	Setting	OFF		OFF	ON		ON	



REF.

Other recommended settings are Internal Sync., Terminator, CTS OV.

(4) C120-LK201-V1/LK-202-V1 Setting



	Switch	Setting Item	Set Switch Status						
			ON			OFF			
SW1	1~5	Assign Station Num.	0	1	2	...	30	31	
	1	Station Num. Setting	OFF	ON	OFF	...	OFF	ON	
	2		OFF	OFF	ON	...	ON	ON	
	3		OFF	OFF	OFF	...	ON	ON	
	4		OFF	OFF	OFF	...	ON	ON	
	5		OFF	OFF	OFF	...	ON	ON	
	6	Not Used							
	7	Not Used							
	8	Power On PLC Mode	Run			Stop			
SW2	1~4	Assign Baud Rate	300	600	1200	2400	4800	9600	19200
	1	Baud Rate Setting	OFF	ON	OFF	ON	OFF	ON	OFF
	2		ON	OFF	OFF	ON	ON	OFF	OFF
	3		OFF	OFF	OFF	ON	ON	ON	ON
	4		ON	ON	ON	OFF	OFF	OFF	OFF
	5	Not Used							
	6	Mode	1:1			1:N			
	7~8	Command Level	1		1	1,2	1,2,3		
	7	Command Level	OFF		ON	OFF	ON		
	8	Setting	OFF		OFF	ON	ON		

C120-LK201-V1 differs from C120-LK202-V1 in SW3.

C120-LK201-V1

	Switch	Setting Item	Set Switch Status	
	1~2	CTS Setting	CTS Always ON	External CTS
	1		ON	OFF
	2		OFF	ON
	3~6	Sync. Type	Internal Sync.	External Sync.
	3		ON	OFF
	4		OFF	ON
	5		ON	OFF
	6		OFF	ON
	7	Not Used		
	8	Not Used		

C120-LK202-V1

	Switch	Setting Item	Set Switch Status	
	1~2	Terminator	Exist	None
	1		ON	ON
	2		OFF	OFF
	3		ON	OFF
	4		OFF	OFF
	5		ON	OFF
	6		OFF	OFF
	7	Not Used		
	8	Not Used		



REF.

Recommended Settings are Internal Sync., Terminator, CTS OV .



Caution

During communication, Mode of PLC must be 'MONITOR'. Otherwise, 'Write' to PLC is not available.

If Data Memory(DM6600) is set to 0101h, PLC Mode is 'MONITOR'. DM6600 is available to be changed in only 'PROGRAM' mode.

(5) C200HW-COM06 Setup

This is setting for OMRON C200 PLC.

Settings use internal DM area. (Refer PLC manual in detail.)

Default Settings are RS232C, 9600, 7bit, 2bit, even.

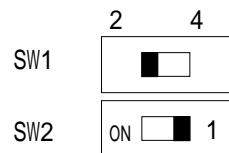


Caution

During communication, Mode of PLC must be 'MONITOR'. Otherwise, 'Write' to PLC is not available.

This is how to use communication unit for RS-422.

Following dip switch is located inner of C200HW-COM06.



RS422/RS485 in case of 2-wire type

SW1 : Set 2 SW2 : Set 1

RS422/RS485 in case of 4-wire type

SW1 : Set 4 SW2 : Set 'ON'

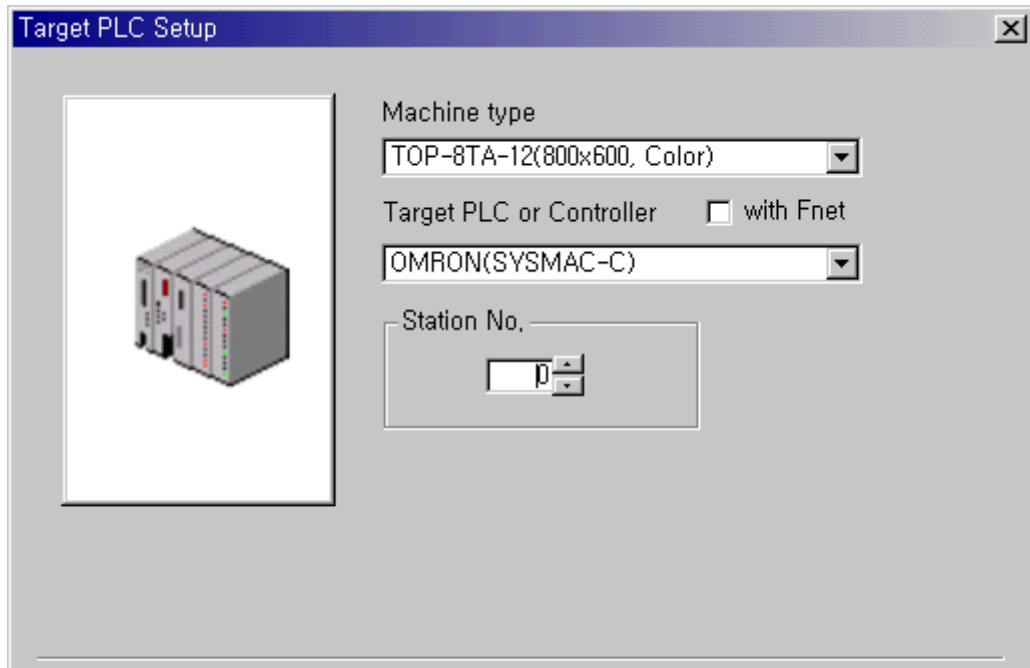
In case interfacing to Touch Screen by RS-422, set 4-wire type.

(Refer PLC manual for RS-422 settings.)

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "OMRON(SYSMAC-C)" of "OMRON Series" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : Same as controller's setting.
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting

2.6.2. Available Address List

(1) SYSMAC C Series(Common)

Dev	Input	50,120(F),500(F)	2000H, 200H(S), 1000H(F)
Data Link	LR	0~31	0~63
Latch Relay	HR	0~31	0~99
Timer	TIM	0~127	0~511
Counter	CNT	0~127	0~511
Data Memory	DM	Refer following List.	
Aux. Memory	AR	None	0~27
I/O Relay	CH	0~63	0~255 (0~511:200HS)

(DM Area)

C50,120,500	0~511
C200H	0~1999
C200HS	0~9999
1000H	0~4096
2000H	0~6655
120F	0~511
500F	0~4095
1000HF	0~4095

* Bit ON/OFF control is available in LR,HR,AR,CH.

(2) SYSMAC CV Series

Dev	Input	CV
Data Link Relay		1000~1199
Special Hold Relay	A	000~511
Timer(Current Value)	T	0~1023
Counter(Current Value)	C	0~1023
Data Memory	D	0~9999
Internal Aux. Relay		1900~2299
I/O Relay		000~199

(3) SYSMAC CS1 Series

Dev	Addr	CS1
Index Register	IR	0~15
Task Flag(TK)	TK	0~30
Data Register	DR	0~15
Timer(CV)	T	0~4095
Counter(CV)	C	0~4095
Data Memory	D	00000~32767
Internal AUX. Relay	W	0~511
Channel I/O	CIO	0~6143
Hold Relay	H	0~511
Special Auxiliary Relay	A	0~959
Exp. Data Memory(E0~EC)	E0~EC	0~32767
Exp. Data Memory(Current Bank)	EM	0~32767

CV : Current Value

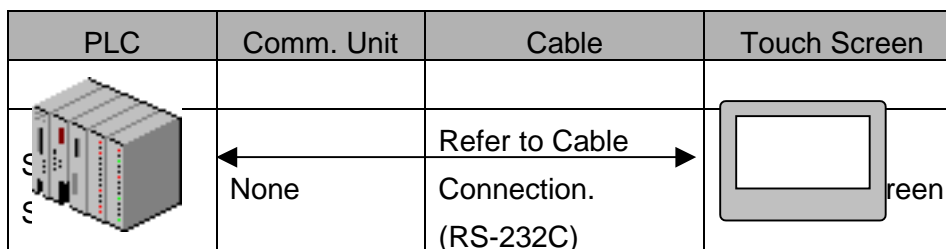
2.7. Allen-Bradley PLC

2.7.1. SLC500 PLC CPU Direct

The following section describes the system configuration and interface between Allen-Bradley(AB) SLC500 PLC and Touch Screen using RS-232C through PLC's Loader port.

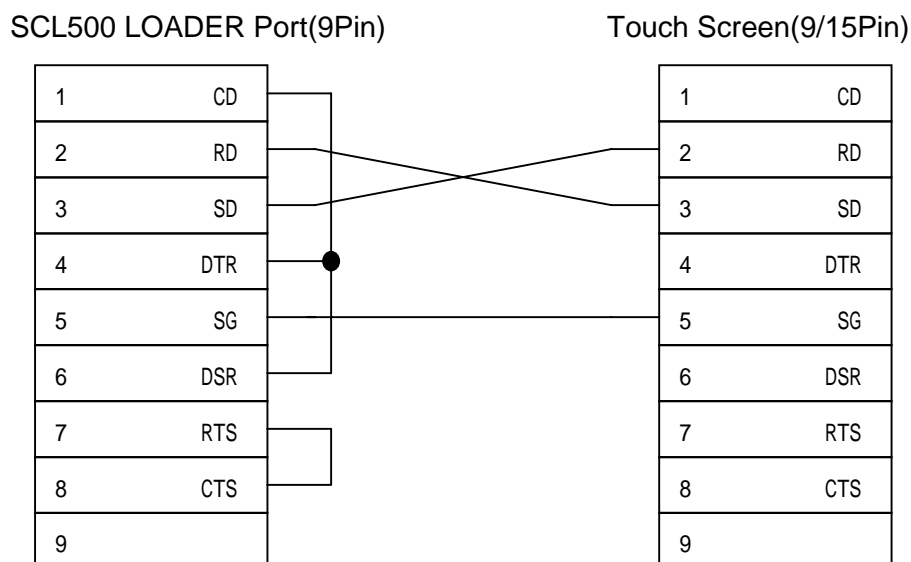
< System Configuration >

The above figure shows system configuration to connect AB SLC500 PLC to Touch Screen.



< Cable Diagram >

(1) RS-232C (SLC500 Touch Screen (for 9/15 Pin Connector)



< SLC500 PLC Setup >

Recommended settings are 19200 bps, data 8 bit, stop bit 1, Parity Even.

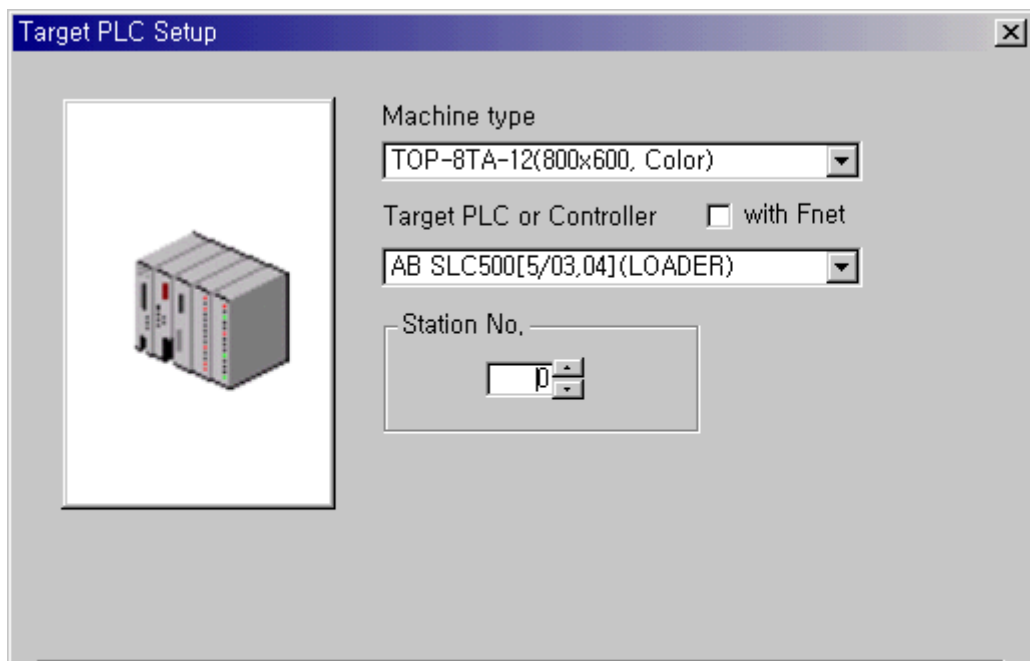
PLC settings	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	EVEN
Communication Driver	DF1 Half Duplex Slave
Duplicate Packet Detection	Disable
Error Detection	BCC
Control Line	No Handshaking
Station Address	0

PLC's Station Address and Touch Screen's station num. must be same.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "SLC500[5/03,04](LOADER)" of "AB Series" in PLC type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : Same as controller's setting.


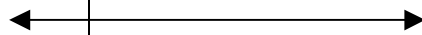
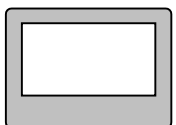
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting

2.7.2. PLC-5 PLC CPU Direct

The following section describes the system configuration and interface between Allen-Bradley(AB) PLC-5 PLC and Touch Screen using RS-232C through PLC's Loader port.

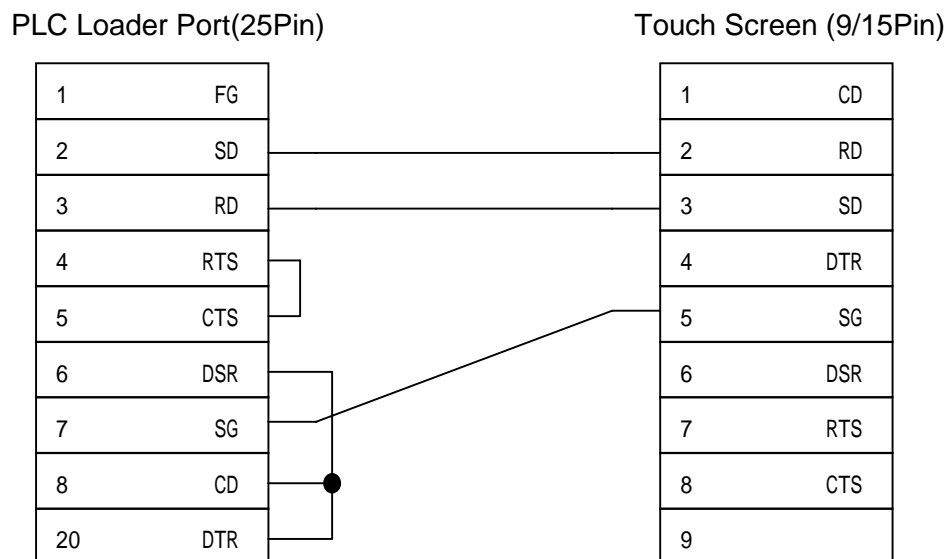
< System Configuration >

The above figure shows system configuration to connect PLC-5 PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
PLC-5/11 PLC-5/20 PLC-5/30 PLC-5/40 PLC-5/40L PLC-5/60 PLC-5/60L	None	Refer to Cable Connection. (RS-232C, RS-422)	All Touch Screen

< Cable Diagram >

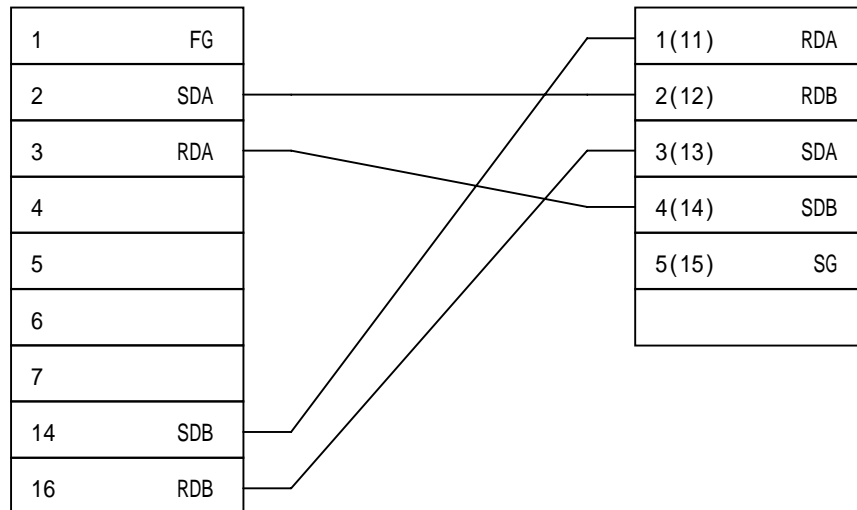
(1) RS-232C (PLC-5 Touch Screen (for 9/15Pin Connector)



(2) RS-422 (PLC-5 Touch Screen (for 5Pin Terminal Block or 15Pin Connector)

PLC Loader Port(25Pin)

Touch Screen
(5Pin Terminal Block/15Pin)



< PLC-5 PLC Setup >

Recommended settings are 19200 bps, data 8 bit, stop bit 1, parity Even.

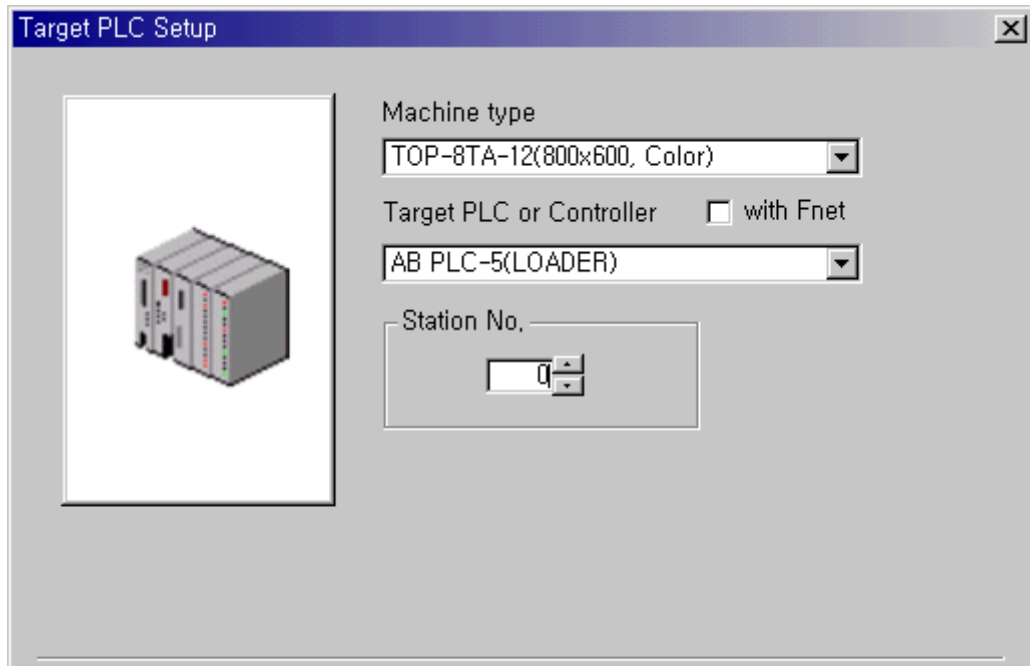
PLC Settings	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	EVEN
Communication Driver	DF1 Half Duplex Slave
Duplicate Packet Detection	Disable
Error Detection	BCC
Control Line	No Handshaking
Station Address	0

PLC Station Address and Touch Screen Station number must be same.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "PLC-5(LOADER)" of "AB Series" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : Same as controller's setting.
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting

2.7.3. Available Address List

(1) SLC500 Series

Device	
Bit	B0003000 ~ B0003255 , B0010000 ~ B0255255
Timer(Timing Bit) *1	TC004000 ~ TC004255 , TC010000 ~ TC255255
Timer(End Bit) *1	TC004000 ~ TC004255 , TC010000 ~ TC255255
Timer(SV)	TP004000 ~ TP004255 , TP010000 ~ TP255255
Timer(CV)	TA004000 ~ TA004255 , TA010000 ~ TA255255
Counter(Up Counter) *2	CC005000 ~ CC005255 , CC010000 ~ CC255255
Counter(Down Counter) *2	CC005000 ~ CC005255 , CC010000 ~ CC255255
Counter(End Bit) *2	CC005000 ~ CC005255 , CC010000 ~ CC255255
Counter(SV)	CP005000 ~ CP005255 , CP010000 ~ CP255255
Counter(CV)	CA005000 ~ CA005255 , CA010000 ~ CA255255
Integer	N0007000 ~ N0007255 , N0010000 ~ N0255255

SV : Set Value, CV : Current Value



REF.

<p>*1 : Timing Bit : 14 End Bit : 13</p> <p>*2 : Un Counter Enable Bit : 15 Down Count Timing Bit : 14 End Bit : 13</p>
--

(2) PLC-5 Series

Device	Address
Input Relay	I0001000 ~ I0001999
Output Relay	O0000000 ~ O0000999
Internal Relay	B0003000 ~ B0099999
Timer(Timing Bit) *1	TC003000 ~ TC099999
Timer(End Bit) *1	TC003000 ~ TC099999
Timer(SV)	TP003000 ~ TP099999
Timer(CV)	TA003000 ~ TA099999
Counter(Up Counter) *2	CC003000 ~ CC099999
Counter(Down Counter) *2	CC003000 ~ CC099999
Counter(End Bit) *2	CC003000 ~ CC099999
Counter(SV)	CP003000 ~ CP099999
Counter(CV)	CA003000 ~ CA099999
Integer	N0003000 ~ N0099999



REF.

*1 : Timing Bit : 14
 End Bit : 13
 *2 : Up Count Enable Bit : 15
 End Bit : 13

Ex) B0003255

Element number(255) : 3 digits from backwards

File number(3) : others digits except device name('B')


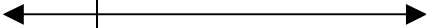
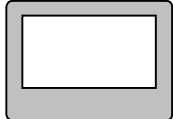
2.8. Modicon Series

2.8.1. Modicon Modbus Serial Interface

The following section describes the system configuration and interface between Modicon Modbus PLC and Touch Screen using RS-232C.

< System Configuration >

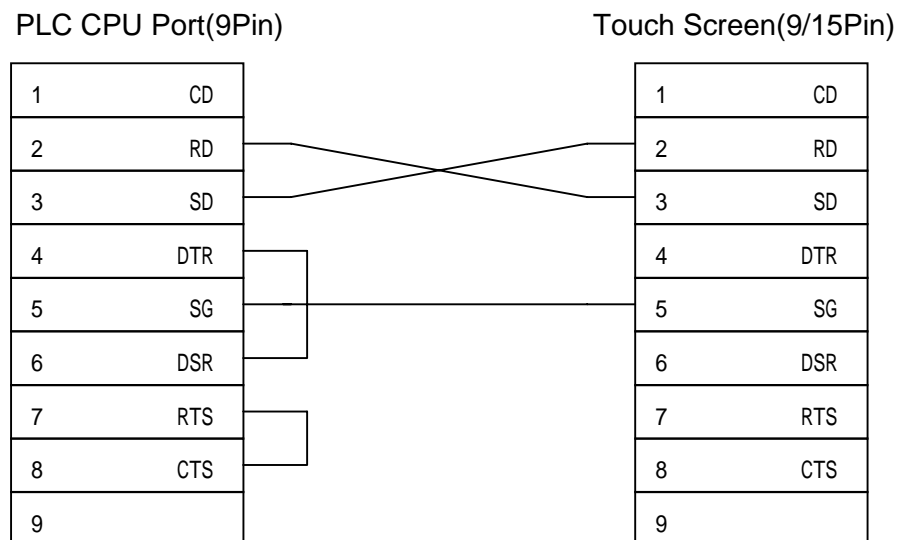
The above figure shows system configuration to connect Modicon Modbus PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
884, 984A, 984B 984X, Slot Mount- 984	None	Refer to Cable Connection. (RS-232C)	All Touch Screen

In case of Modbus, Link I/F Port of CPU Module is used.

< Cable Diagram >

(1) RS-232C (Modicon Touch Screen (for 9/15Pin Connector))



< Modicon PLC Setup >

Comm. Mode of PLC is set to RTU Mode.

PLC Settings	
Baud Rate	9600 bps
Data Length	8 bit
Stop Bit	1 bit
Parity	EVEN
Error Detection	CRC

Comm. Mode of PLC is set to ASCII Mode.

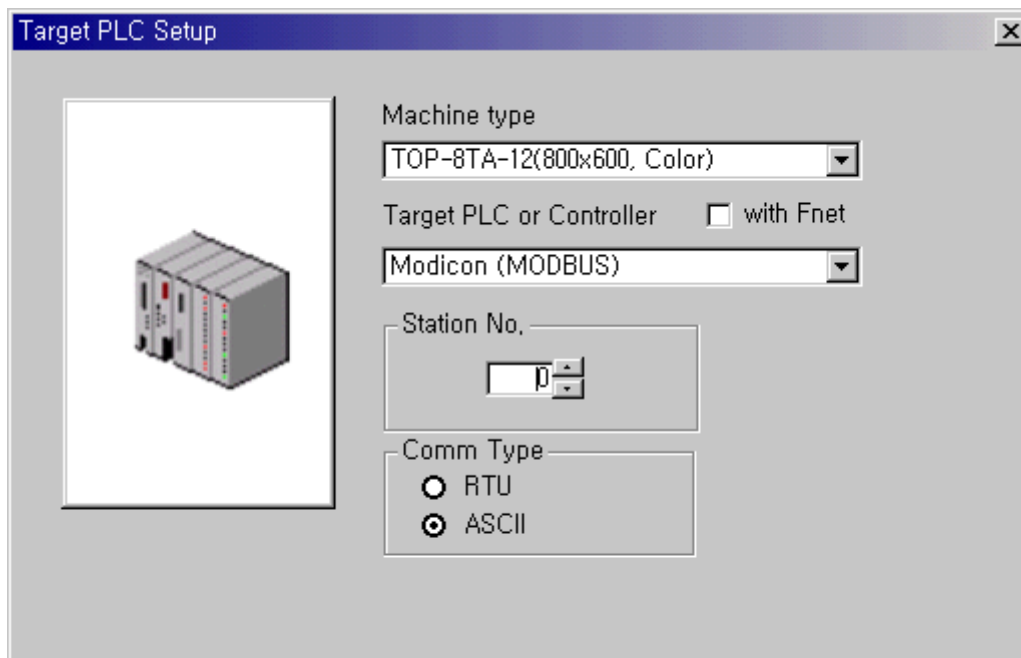
PLC Settings	
Baud Rate	2400 bps
Data Length	7 bit
Stop Bit	1 bit
Parity Bit	EVEN
Error Detection	LRC

Station Address is set by rotary switch of CPU Unit. It must be same to Touch Screen's Station Num.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Modicon(Modbus)" of "Modicon Series" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : Same as controller's setting.
- Serial Data Bit : Same as controller's setting.
- Serial Stop Bit : Same as controller's setting.
- Serial Parity Bit : Same as controller's setting.
- Serial Signal Level : Same as controller's setting.
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's setting

2.8.2. Available Address List

Device	Address
Input Bit	10001 ~ 18192
Output Bit	00001 ~ 08192
Input Register(Word)	30001 ~ 39999
Output Register(Word)	40001 ~ 49999



Data "Write" is not available in case of Input Bit and Input Register.


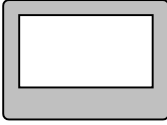
2.9. Samsung SPC Series

2.9.1. SPC Series PLC CPU Direct

The following section describes the system configuration and interface between Samsung SPC PLC and Touch Screen using RS-232C through CPU direct port.

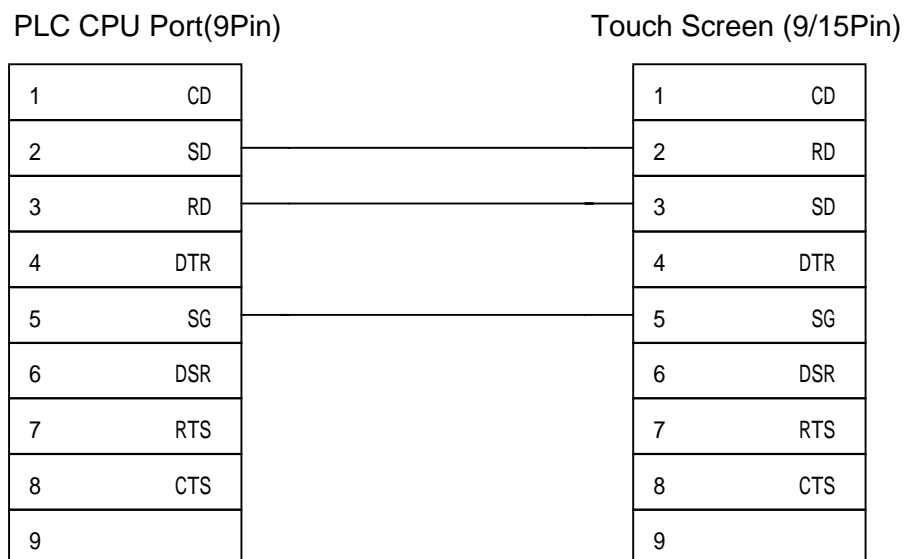
< System Configuration >

The above figure shows system configuration to connect SPC PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
SPC-10 SPC-24S SPC-100 SPC-120S SPC-300	None	Refer Cable Connection. (RS-232C)	All Touch Screen

< Cable Diagram >

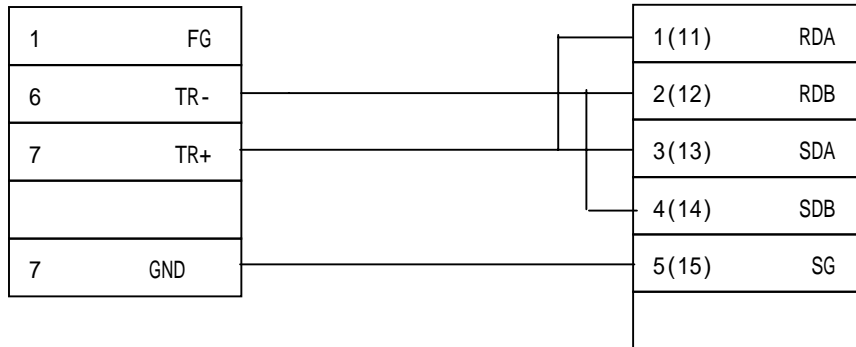
(1) RS-232C (SPC Touch Screen (for 9/15Pin Connector)



(2) RS-485 (SPC Touch Screen (for 5Pin Terminal Block or 15Pin Connector))

PLC CPU Port(9Pin)

Touch Screen
(5Pin Terminal Block/15Pin)



< SPC PLC Setup >

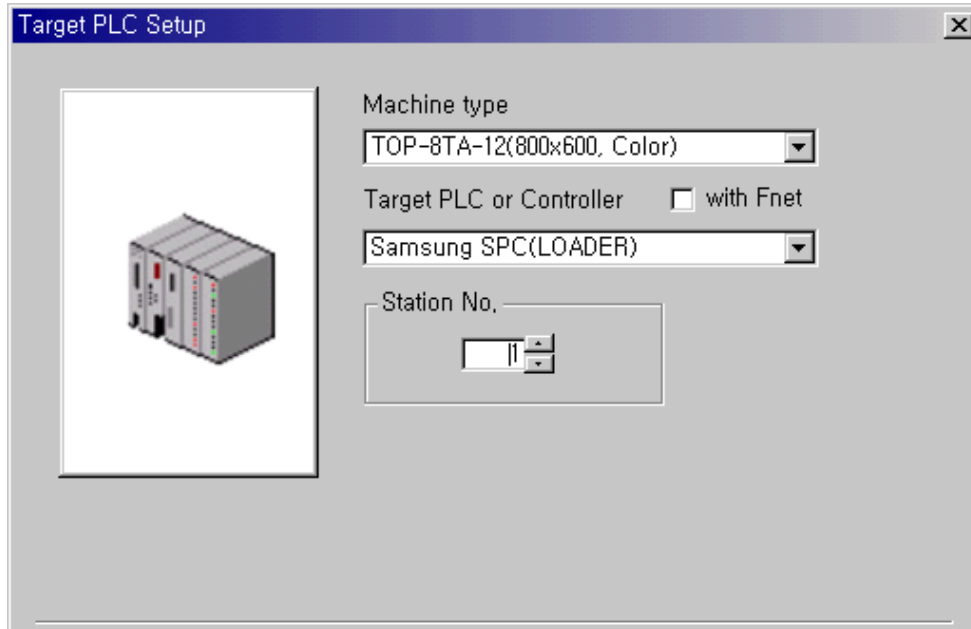
PLC Setting	
Baud Rate	9600 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	NONE
Error Detection	CRC

Station address is set by Rotary Switch of CPU Unit.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Samsung SPC(Loader)" in PLC Type.



(2) Touch Screen Serial Setup

Special settings are not needed.

Automatic settings are as follows.

- Serial Baud Rate : 9600bps
- Serial Data Bit : 8bit
- Serial Stop Bit : 1bit
- Serial Parity Bit : None
- Serial Signal Level : RS-232C
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address

2.9.2. Available Address List

Device	Address
External Input/Output	R0000 ~ R0127
LINK Relay	L0000 ~ L0063
AUX. Relay	M0000 ~ M0127
KEEP Relay	K0000 ~ K0127
Special Relay	F0000 ~ F0015
Link Data	W0000 ~ W2047
T/C SV	SV000 ~ SV255
T/C CV	PV000 ~ PV255

SV : Set Value, CV : Current Vale


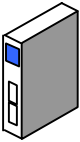
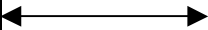
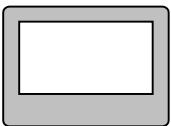
2.10. Siemens S5/S7 Series

2.10.1. S5/ S7 Serial Interface

The following section describes the system configuration and interface between Siemens S5/S7 series PLC and Touch Screen using serial communication through link unit.

< System Configuration >

The above figure shows system configuration to connect S5/S7 PLC to Touch Screen. (Use 3964R protocol)

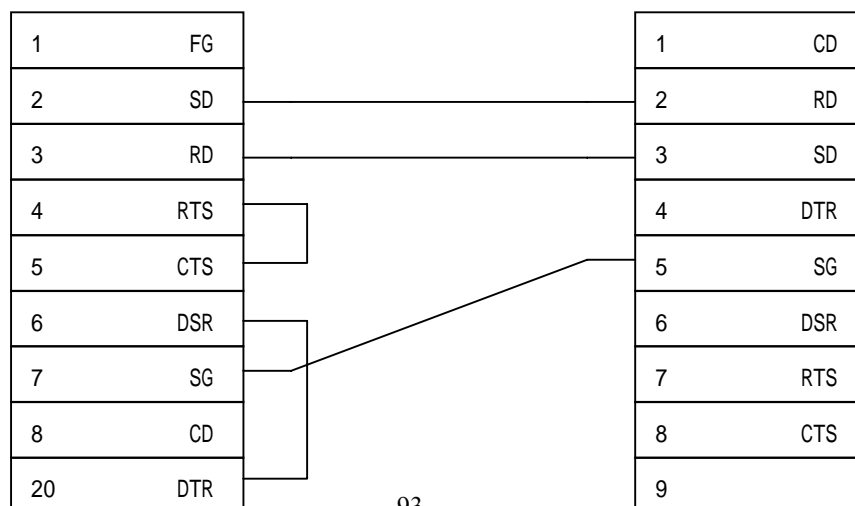
PLC	Comm. Unit	Cable	Touch Screen
			
S5 90U S5 95U S5 100U S5 115U S5 135U S5 155U S7-300 S7-400	CP525 CP340 CP441-2	Refer Cable Connection. (RS-232C)	All Touch Screen

< Cable Diagram >

(1) RS-232C (CP525 Touch Screen (for 9/15 Pin Connector))

PLC Comm. Link Module(25Pin)

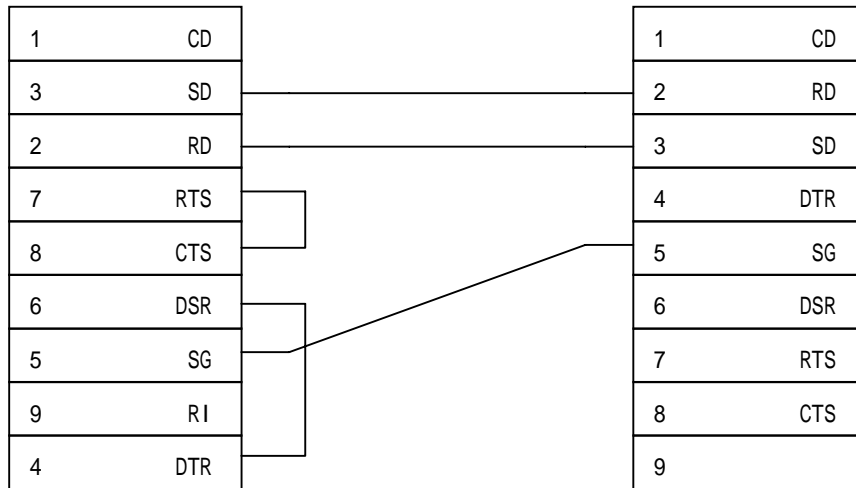
Touch Screen (9/15Pin)



(2) RS-232C (CP340, CP441-2 Touch Screen (for 9/15 Pin Connector))

PLC Comm. Link Module (9Pin)

Touch Screen (9/15Pin)



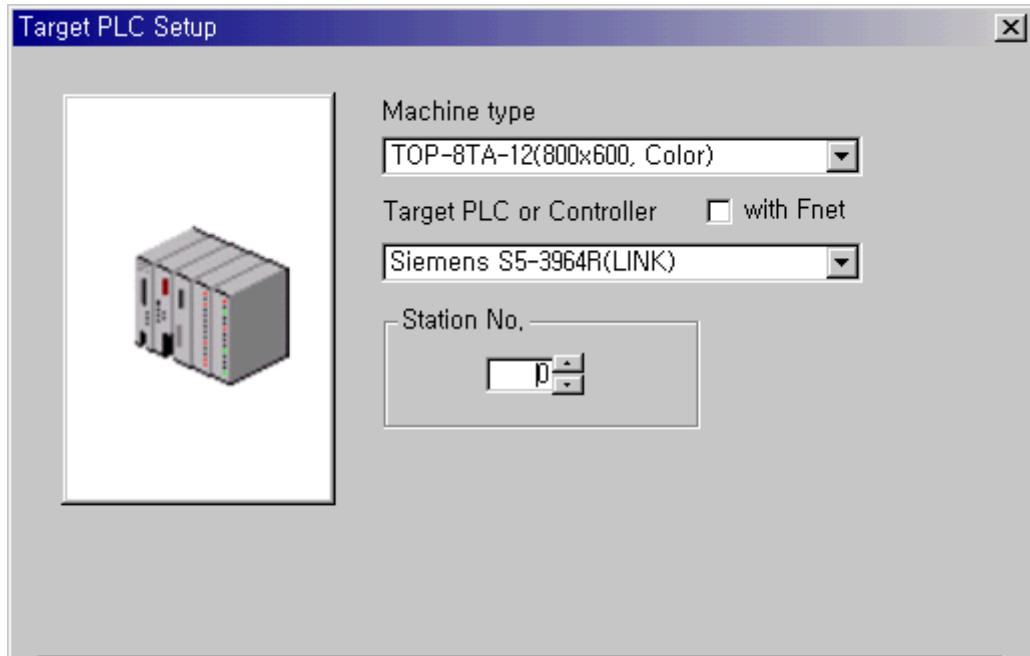
< CP525/CP340/ CP441-2 Setup >

PLC Setting	
Baud Rate	110 bps ~ 19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	EVEN
Error Detection	BCC(SUM)

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Siemens S5-3964R(Link)" in PLC Type.



(2) Touch Screen Serial Setup

Recommended settings are as follows.

- Serial Baud Rate : 19200 bps
- Serial Data Bit : 8bit
- Serial Stop Bit: 1bit
- Serial Parity Bit : EVEN
- Serial Signal Level : RS-232C
- Controller's Station No. at Comm. Diagnosis(0~31)
: Setting is no meaning.

< Available Address List >

Device	Word Address
Data Register *1	D002:000 ~ D255:255
Expansive Data Register *1	X002:000 ~ X255:255



REF.

*1 : Data Register and Expansive Data Register are as follows.

D002:000

└─── Data Word(DW) : 000~255

└─── Data Block(DB) : 000~255


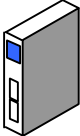
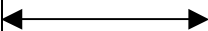

Expansive Data Register is available in only S5 135U/155U.

2.10.2. S7-300/400 (CPU Direct Using MPI Port)

The following section describes the system configuration and interface between Siemens S7-300/400 series PLC and Touch Screen using serial communication through PC adapter.

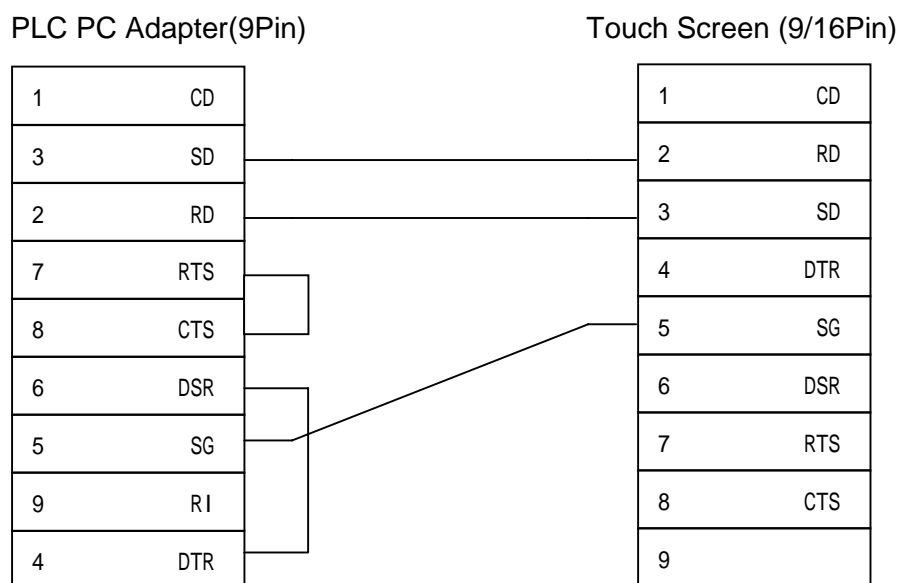
< System Configuration >

This figure shows system configuration to connect S7 PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
CPU312IFM CPU313 CPU314 CPU315 CPU315-2DP	PC Adapter	Refer Cable Connection (RS-232C)	All Touch Screen

< Cable Diagram >

(1) RS-232C (PC Adapter Touch Screen(for 9/15Pin Connector))



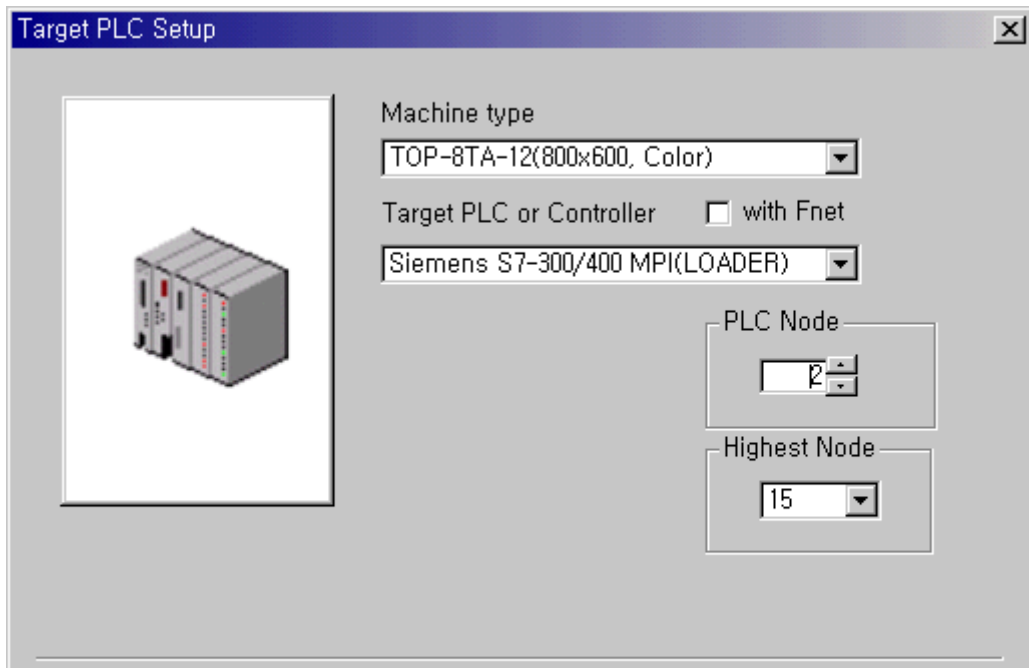
< S7-300/400 CPU Setup >

PLC Setting	
Baud Rate	19200 ~ 38400 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	ODD
Error Detection	BCC(SUM)

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "S7-300/400 MPI(LOADER)" of "Siemens Series" in PLC type.



(2) Touch Screen Serial Setup

Recommended settings are as follows.


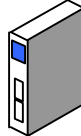
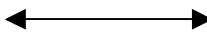

- Serial Baud Rate : 19200 bps
- Serial Data Bit : 8bit
- Serial Stop Bit: 1bit
- Serial Parity Bit : ODD
- Serial Signal Level : RS-232
- Controller's Station No. at Comm. Diagnosis(0~31) : 1

2.10.3. S7-200 (CPU Direct Using PPI Port)

The following section describes the system configuration and interface between Siemens S7-200 and Touch Screen using serial communication.

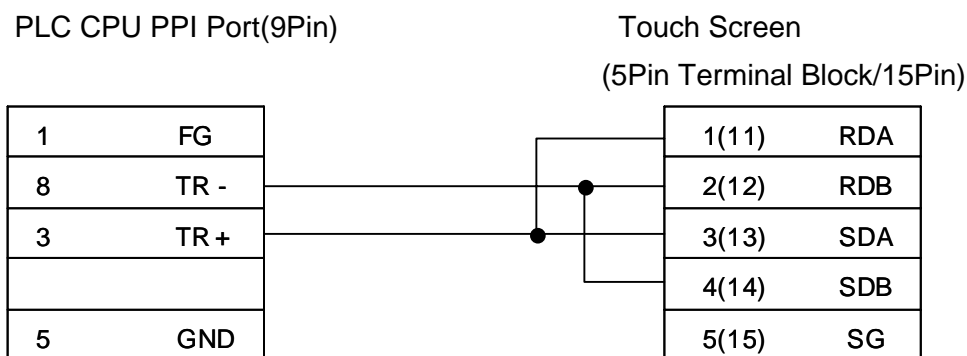
< System Configuration >

This figure shows system configuration to connect S7 PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
S7-200 (CPU212/214 / 222/224/226)	None	Refer to Cable Connection (RS-485)	All Touch Screen

< Cable Diagram >

(1) RS-422 (S7-200 Touch Screen (for 5Pin Terminal Block or 15Pin Connector))



< S7-200CPU Setup >

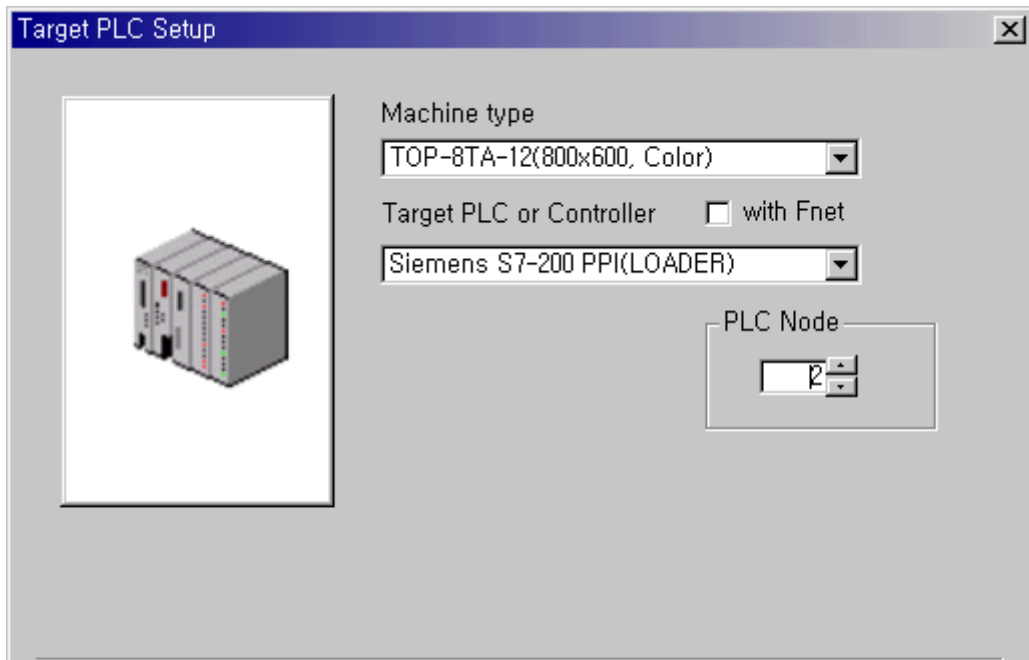
PLC Setting	
Baud Rate	9600 bps
Data Length	8 bit
Stop Bit	1 bit
Parity	EVEN
Error Detection	BCC(SUM)

Setting of Station Num. is default(2).

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Siemens S7-200 PPI(Loader)" in PLC type.



(2) Touch Screen Serial Setup

Recommended settings are as follows.

- Serial Baud Rate : 9600bps
- Serial Data Bit : 8bit
- Serial Stop Bit: 1bit
- Serial Parity Bit : EVEN
- Serial Signal Level : RS-485
- Controller's Station No. at Comm. Diagnosis(0~31) : 1

< Available Address List >

(1) S7-300 CPU Direct(Using MPI Port)

Device	Bit Address	Word Address
Input Relay	E0000 ~ E1277	EW000 ~ EW126
Output Relay	A0000 ~ A1277	AW000 ~ AW126
Timer		T000 ~ T127
Counter		Z00 ~ Z63
Data Block	DB01000000 ~ DB60655357	DB0100000 ~ DB6065534
Memory	M0000 ~ M2557	MW000 ~MW254

(2) S7-200

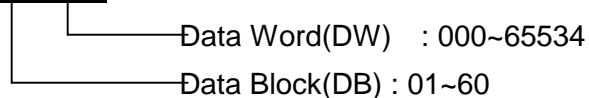
Device	Bit Address	Word Address
Input Relay	I00 ~ I77	IWO ~ IW6
Output Relay	Q00 ~ Q77	QW0 ~ QW6
Timer	T000 ~ T127	TW000 ~ TW127
Counter	C00 ~ C63	CW000 ~ CW127
Variable Memory	V000 ~ V4095	VW0000 ~ VW4094
Memory	M000 ~ M317	MW00 ~MW30
Special Memory	SM000 ~ SM857	SMWO ~ SMW84
Analog Input		AIWO ~ AIW30
Analog Output		AQWO ~ AQW30
High Speed Counting		HCO ~ HC2



REF.

*1:Data Register and Expansive Data Register are described as follows.

DB02 00000




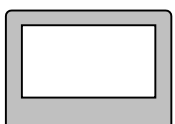
2.11. GE Fanuc 90-30/90-70 Series

2.11.1. GE Fanuc 90-30(SNP/SNP-X) PLC CPU Direct

The following section describes the system configuration and interface between GE Fanuc 90-30 PLC and Touch Screen using RS-422 communication through CPU Loader Port.

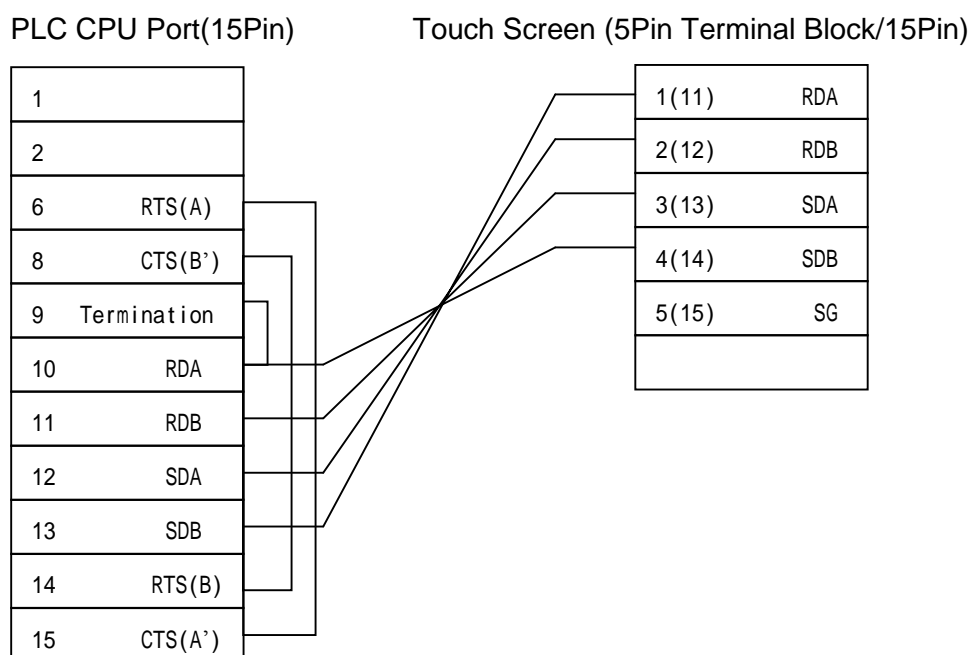
< System Configuration >

This figure shows system configuration to connect GE Fanuc 90-30 PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
	←————→		
Fanuc 90-30 (CPU311/CPU331)	None	Refer to Cable Connection. (RS-422)	All Touch Screen

< Cable Diagram >

(1) RS-422 (GE Fanuc 90-30 Touch Screen (for 5Pin Terminal Block or 15Pin Connector))



Pin No. 6-15, 8-14, 9-10 has to be commonly connected.

< GE Fanuc 90-30[SNP/SNP-X] PLC Setup >

(1) Serial Parameter Setup

Recommended settings are 19200 bps, Data 8 bit, Stop 1 bit, Parity ODD.

PLC Settings	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	ODD
Station Address	0

(2) Set Control ID – CPU ID (When using SNP protocol)

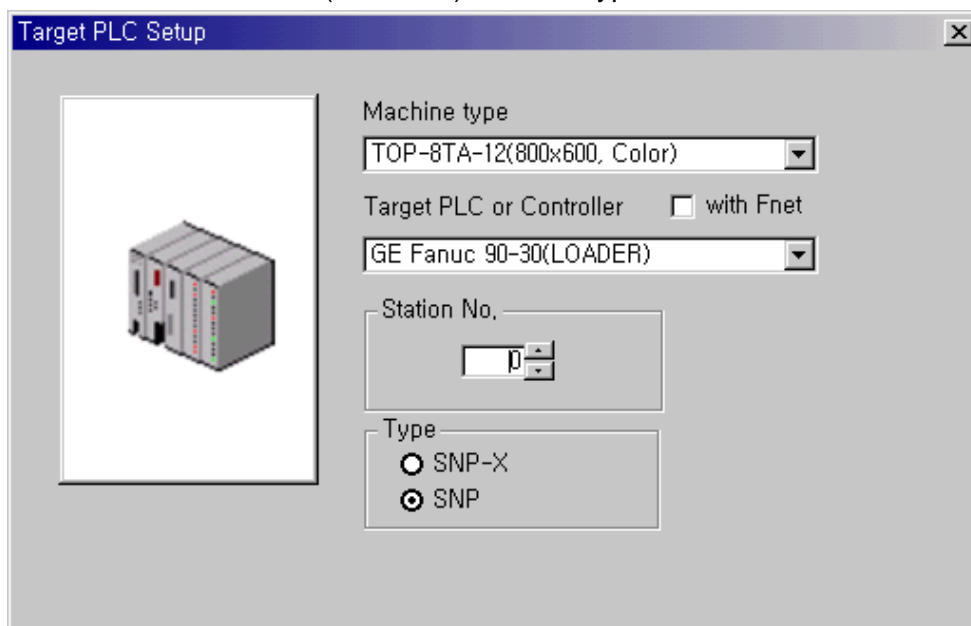
When using SNP protocol, a PLC CPU controller ID for a given PLC CPU has to be specified. Maximum of six ASCII characters can be permitted for GE FANUC 90-30 series. In order to recognize CPU ID from Touch Screen by GE FANUC 90-30, CPU ID has to be set as the following rules.

- CPU ID setup for PLC : '0' ~ '99' DECIMAL CHARACTER

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "GE Fanuc 90-30(LOADER)" in PLC Type.



(2) Selecting Protocol

Select 'SNP' or 'SNP-X' protocol according to protocol to be available.

(3) CPU ID Setup (When using SNP protocol)

If having selected SNP protocol in Target PLC setup window of Touch Screen Designer, CPU ID of Touch Screen Designer has to be set as same as CPU ID of PLC. Because Touch Screen Designer uses station number as PLC CPU ID, PLC CPU ID has to be entered in 'Station Number' column of Touch Screen Designer.

(4) Touch Screen Serial Setup

Serial Settings are as follows.


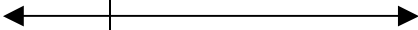
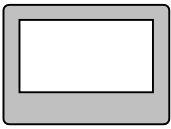
- Serial Baud Rate : 19200
- Serial Data Bit : 8
- Serial Stop Bit : 1
- Serial Parity Bit : ODD
- Serial Signal Level : RS-422
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address (Same as CPU ID for SNP protocol)

2.11.2. GE Fanuc 90-70(SNP-X) PLC Serial Interface

The following section describes the system configuration and interface between GE Fanuc 90-70 PLC and Touch Screen using RS-422 communication through IC697CMM711 Unit.

< System Configuration >

This figure shows system configuration to connect GE Fanuc 90-70 PLC to Touch Screen.

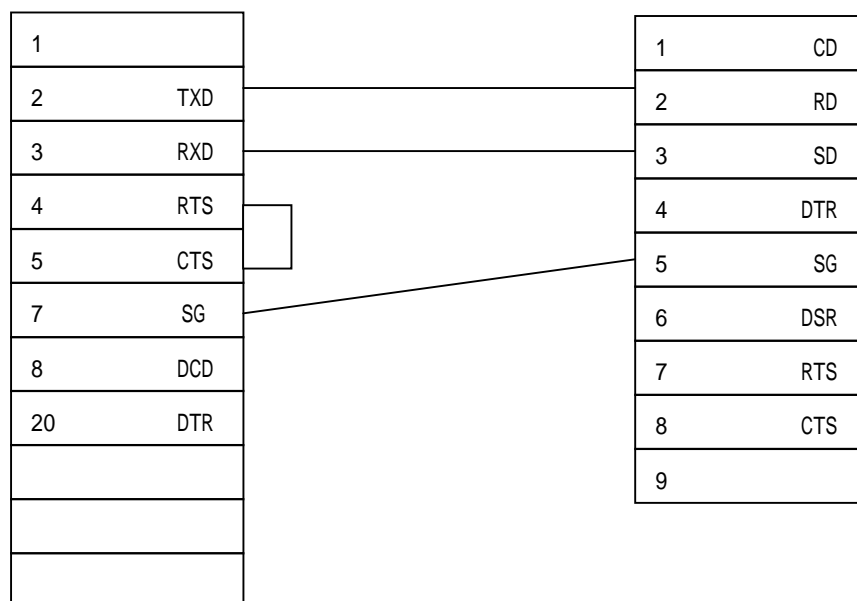
PLC	Comm. Unit	Cable	Touch Screen
			
GE FANUC 90-70 (CPU731/732/771/772/781/782)	IC697CMM711	Refer to Cable Connection.	All Touch Screen

< Cable Diagram >

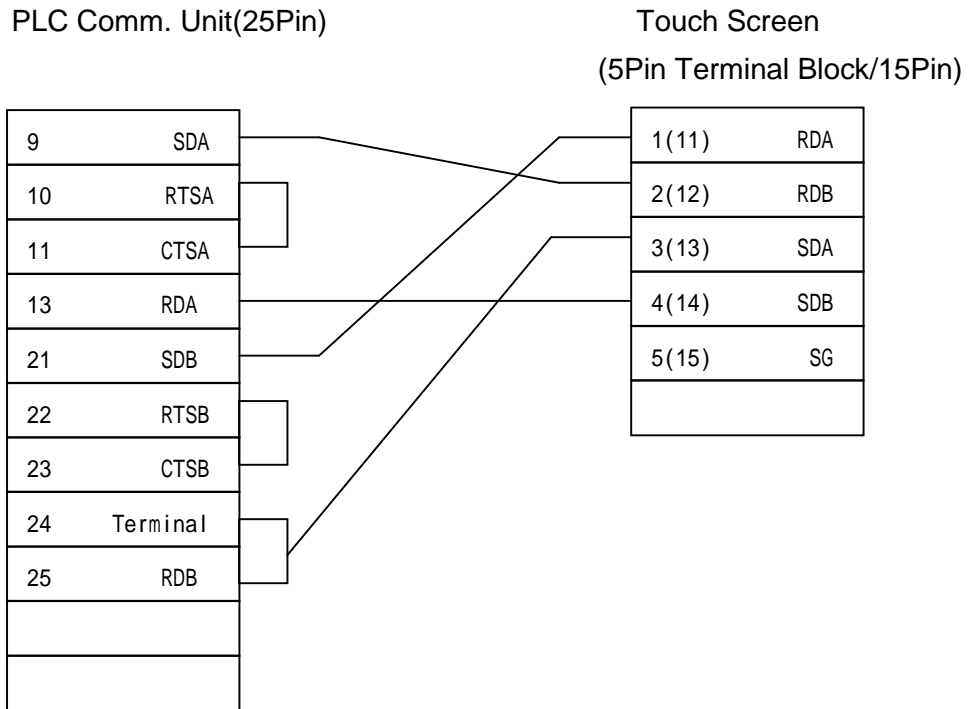
(1) RS-232C (GE Fanuc 90-70 Touch Screen (for 9/15Pin Connector))

PLC Comm. Unit(25Pin)

Touch Screen (9/15Pin)



(1) RS-422 (GE Fanuc 90-70 Touch Screen (for 5Pin Terminal Block or 15Pin Connector))



< GE Fanuc 90-70[SNP-X] PLC Setup >

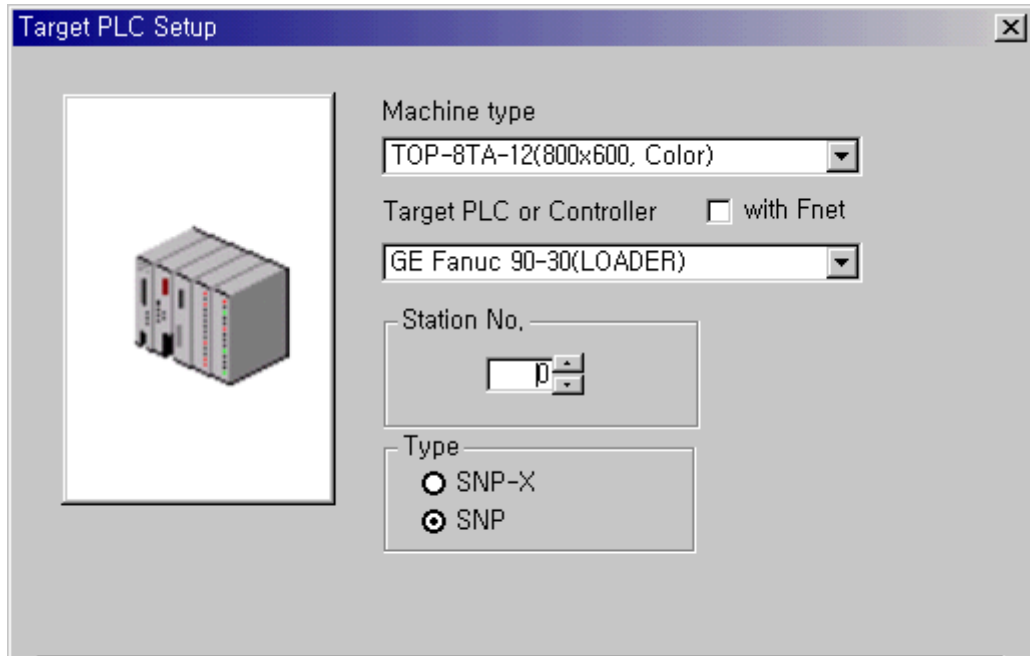
Recommended settings are 19200 bps, Data 8 bit, Stop Bit 1 bit, Parity ODD.

PLC Setting	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	ODD
Station Address	0

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "GE Fanuc 90-70[SNP-X](LOADER)" in PLC type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : 19200
- Serial Data Bit : 8
- Serial Stop Bit : 1
- Serial Parity Bit : ODD
- Serial Signal Level : RS-422
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address

2.11.3. Available Address List

(1) GE Fanuc 90-30/90-70[SNP-X]

Device	Bit Address	Word Address
Input Relay(I)	I0001 ~ I12288	I00001 ~ I12273
Output Relay(Q)	Q00001~ Q12288	Q0001 ~ Q12273
Internal Relay(M)	M00001 ~ M12288	M0001 ~ M12273
Global Relay(G)	G0001 ~ G7680	G0001 ~ G7665
Momentary Relay(T)	T001 ~ T256	T001 ~ T241
System Function Relay(SA)	SA001 ~ SA128	SA001 ~ SA113
System Function Relay(SB)	SB001 ~ SB128	SB001 ~ SB113
System Function Relay(SC)	SC001 ~ SC128	SC001 ~ SC113
System Function Relay(S)	S001 ~ S128	S001 ~ S113
Register(R)		R00001 ~ R16384
Analog Input(AI)		AI0001 ~ AI8192
Analog Output(AQ)		AQ0001 ~ AQ8192



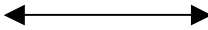
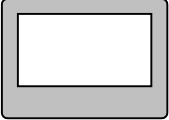
2.12. Comfile Technology Tiny PLC Series

2.12.1. Tiny PLC CPU Direct

The following section describes the system configuration and interface between Comfile Technology Tiny PLC and Touch Screen using serial communication.

< System Configuration >

This figure shows system configuration to connect Tiny PLC to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
TCP32/37	None	Refer to Cable Connection. (RS-232C/485)	All Touch Screen

< Cable Diagram >

(1) RS-232C (TCP32/37 Touch Screen (for 9/15Pin Connector))

PLC CPU Port(9Pin)

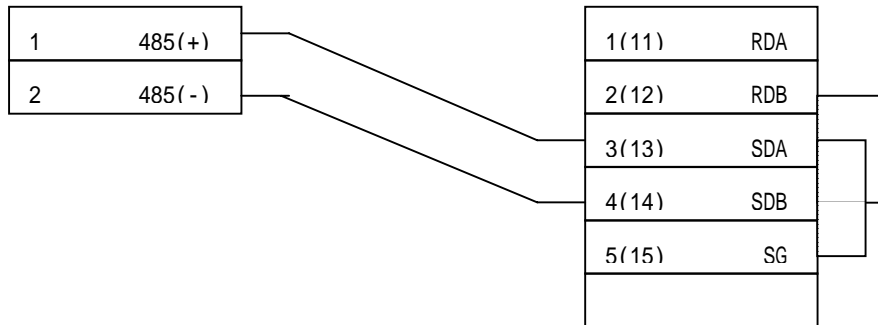
Touch Screen (9/15Pin)

1	CD		1	CD
2	RD	—————	2	RD
3	SD	—————	3	SD
4			4	DTR
5	SG	—————	5	SG
6			6	DSR
7			7	RTS
8			8	CTS
9			9	

(2) RS-485 (TCP32/37 Touch Screen (for 5Pin Terminal Block or 15Pin Connector))

PLC CPU (Terminal Block)

Touch Screen
(5Pin Terminal Block/15Pin)



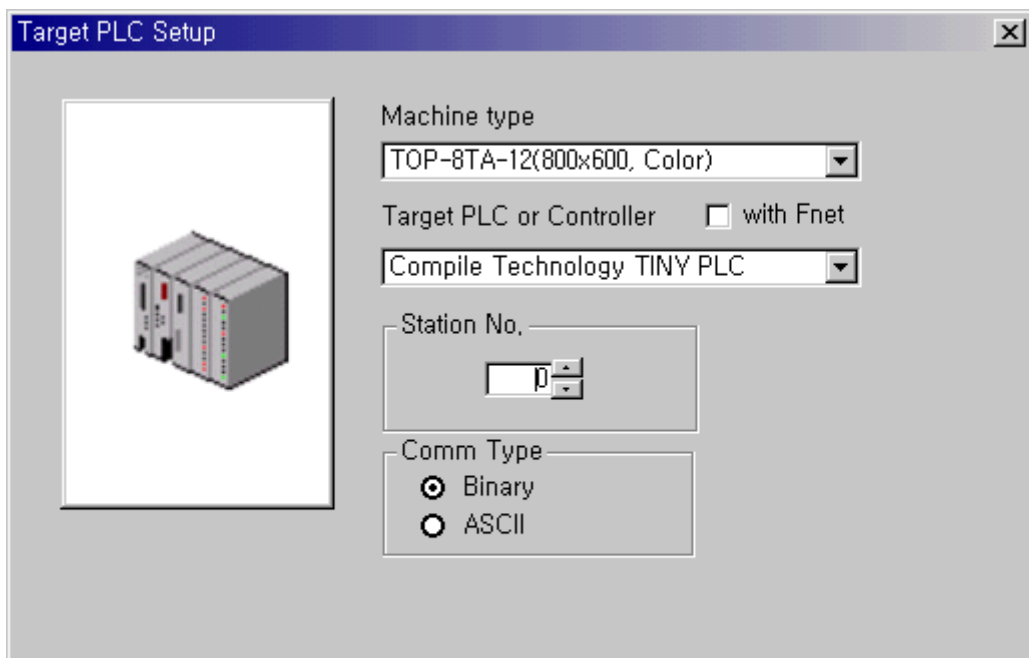
< Tiny PLC Setup>

Do not need set.

< Touch Screen Setup>

(1) Touch Screen Designer Setup

Select "Compile Technology TINY PLC" in PLC type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : 9600
- Serial Data Bit : 8(fixed)
- Serial Stop Bit : 1(fixed)
- Serial Parity Bit : None(fixed)
- Serial Signal Level : Same as controller's Station Address
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address

2.12.2. Available Address List

PLC Address to be available to READ/WRITE in Touch Screen is as follows.

In case of TCP32/37

Device	Bit Address	Word Address
Input/Output Relay (P)	P0000 – P0157	P0000 - P014
AUX. Relay (M)	M0000 – M1277	M0000 – M126
KEEP Relay (K)	K0000 - K0317	K0000 - K030
Special Relay (F)	F0000 - F0157	F0000 - F014
Step Relay (S)	S0000 ~ S0317	S0000 - S030
Timer-CV (T)		T0000 - T0255
Counter-CV (C)		C0000 - C0255
Data Register (D)		D0000 – D1023
AD Area (AD)		A0000 - A0015
High Speed Counter Area (CNT)		N0000 – N0001
LCD Area (CH)		H0000 - H0079
7 Segment (G)		G0000 – G0039


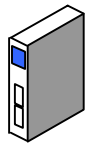
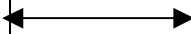

2.13. Toshiba Prosec-T Series

2.13.1. Toshiba Prosec-T Series Serial Interface

The following section describes the system configuration and interface between Toshiba Prosec-T PLC and Touch Screen using serial communication through CPU LINK.

< System Configuration >

This figure shows system configuration to connect Toshiba Prosec-T PLC to Touch Screen.

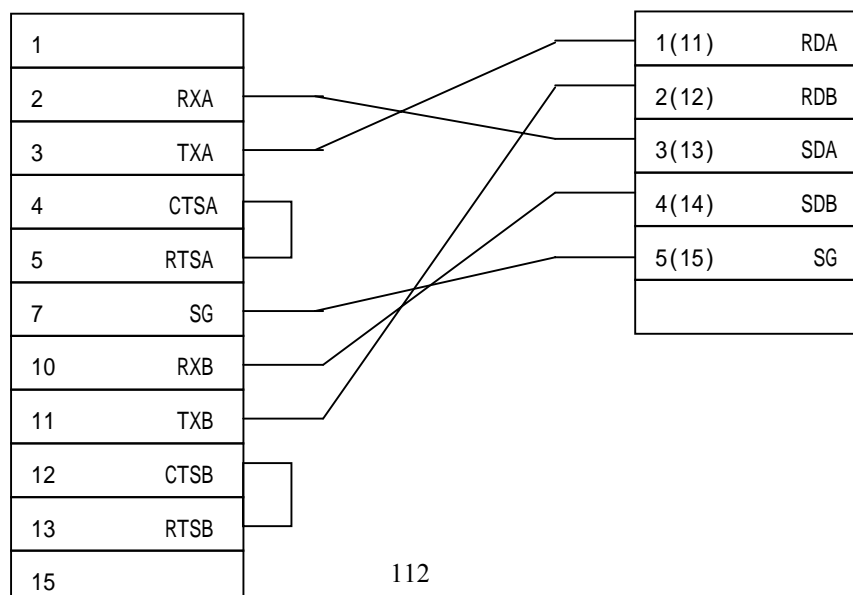
PLC	Comm. Unit	Cable	Touch Screen
			
T3, T3H	CPU LINK	Refer Cable Connection	All Touch Screen
T2E	CPU Port		
T2N	CPU LINK		
T2E	CM231E		

< Cable Connection >

(1) RS-422 (T3/T3H/T2N Touch Screen (for 5Pin Terminal Block or 15Pin Connector))

PLC CPU Link(15Pin)

Touch Screen
(5Pin Terminal Block/15Pin)



(2) RS-232C(T2E Touch Screen (for 9/15Pin Connector))

PLC CPU Port(9Pin)

1	CD
2	RD
3	SD
4	
5	SG
6	
7	RTS
8	CTS
9	

Touch Screen (9/15Pin)

1	CD
2	RD
3	SD
4	DTR
5	SG
6	DSR
7	RTS
8	CTS
9	



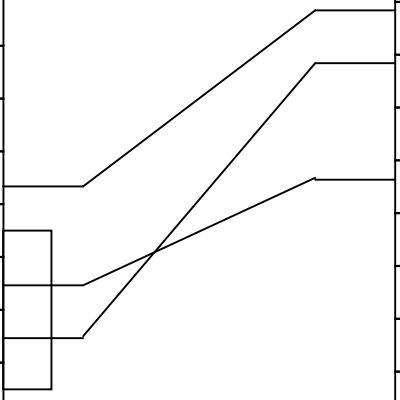
(3) RS-232C (T2N Touch Screen(for 9/15Pin Connector))

PLC CPU Link(15Pin)

1	
2	
3	
4	
5	TXD
6	RTS
7	SG
12	RXD
14	CTS
15	

Touch Screen (9/15Pin)

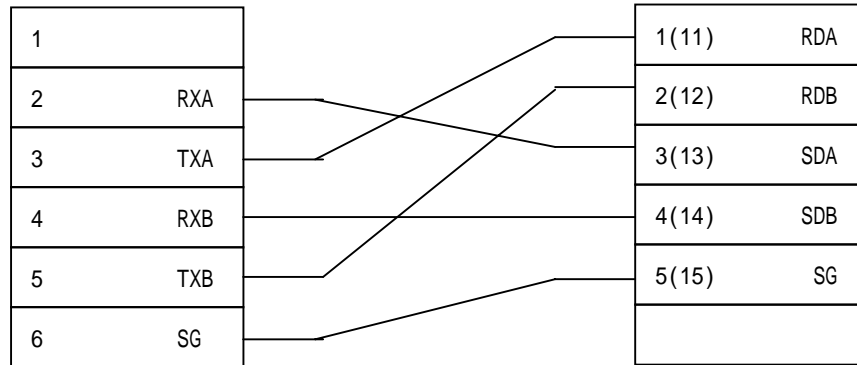
1	CD
2	RD
3	SD
4	DTR
5	SG
6	DSR
7	RTS
8	CTS
9	



(4)RS-422 (T2E Touch Screen (for 5Pin Terminal Block or 15Pin Connector))

PLC CPU Port(Terminal Block)

Touch Screen
(5Pin Terminal Block/15Pin)



< Toshiba Prosec-T PLC Setup >

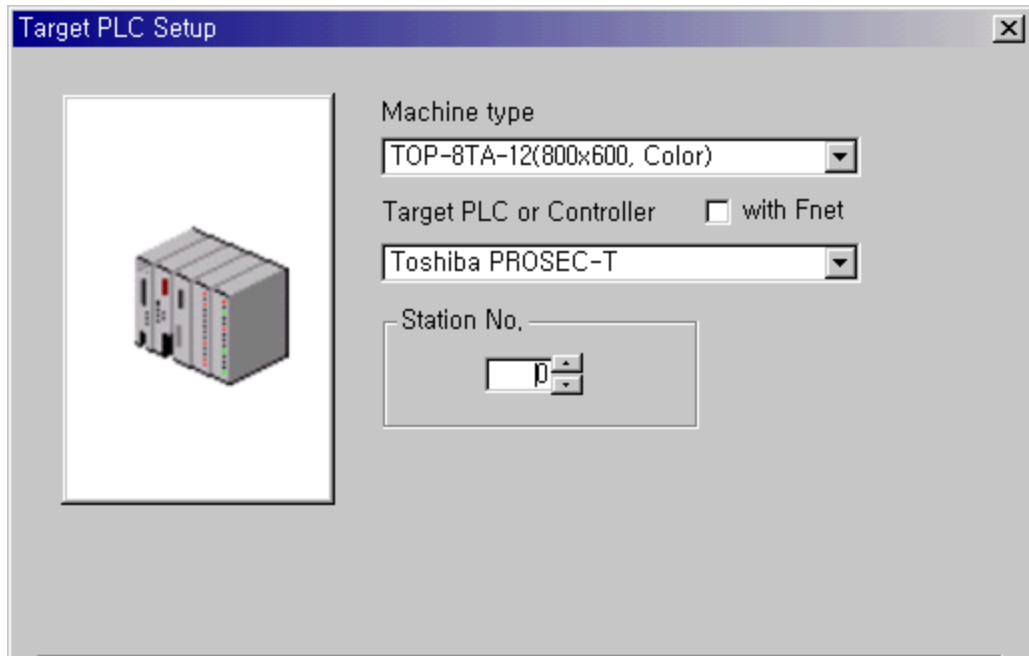
Recommended settings are 19200 bps, Data 8 bit, Stop Bit 2 , Parity ODD .

PLC Setting	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	2 bit
Parity	ODD
Station Address	1

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Toshiba Prosec-T" in PLC type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : 19200
- Serial Data Bit : 8
- Serial Stop Bit : 2
- Serial Parity Bit : ODD
- Serial Signal Level : Same as controller's Station Address
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address

2.13.2. Available Address List

(1) T3/T3H/T2N/T2E

Device	Bit Address	Word Address
External Input	X0000 ~ X511F	XW0000 ~ XW511
External Output	Y0000 ~ Y511F	YW0000 ~ YW511
Internal Relay	R0000 ~ R999F	RW000 ~ RW999
Special Relay	S0000 ~ S255F	SW000 ~ SW255
Link Register Relay	Z0000 ~ Z999F	
Link Relay	L0000 ~ L255F	
Timer(contact)	T000 ~ T999	
Counter(contact)	C000 ~ C511	
Timer(Current Value)		T000 ~ T999
Counter (Current Value)		C000 ~ C511
Data Register		D0000 ~ D8191
Link Register		W0000 ~ W2047
File Register		F0000 ~ F32767


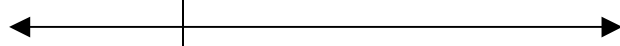
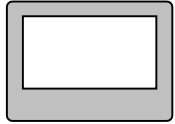
2.14. KOYO PLC Series

2.14.1. KOYO PLC CPU Direct

The following section describes the system configuration and interface between KOYO DL-205 and Touch Screen using RS-232 communication through CPU Loader Port.

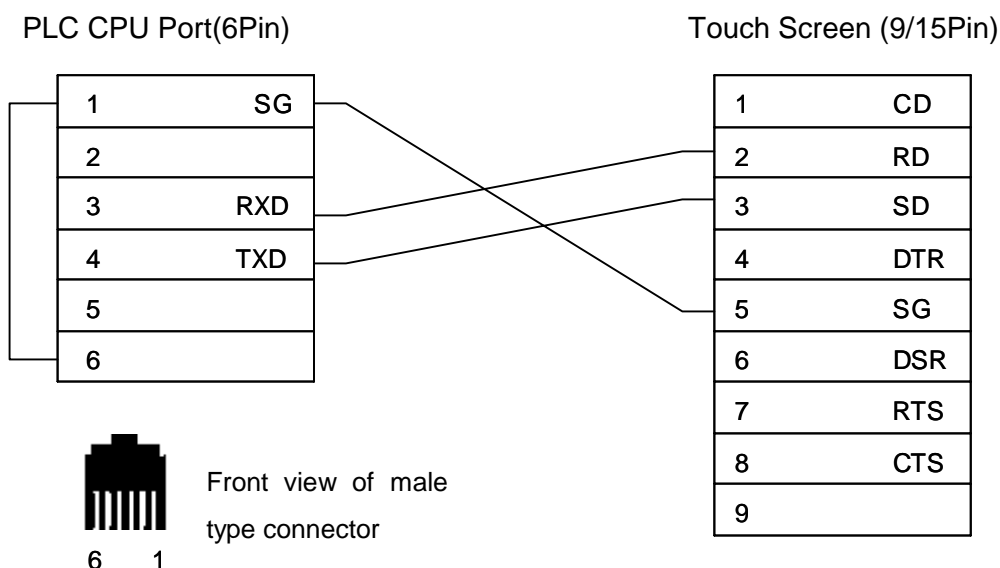
< System Configuration >

This figure shows system configuration to connect KOYO DL-205 to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
DL-205 (D2-240)	None	Refer to Cable Connection. (RS-232)	All Touch Screen

< Cable Diagram >

(1) RS-232 (DL-205 Touch Screen (for 9/15Pin Connector))



In above cable diagram, PLC CPU port (6 Pin) of D2-240 is Port 2.

< DL-205 PLC Setup >

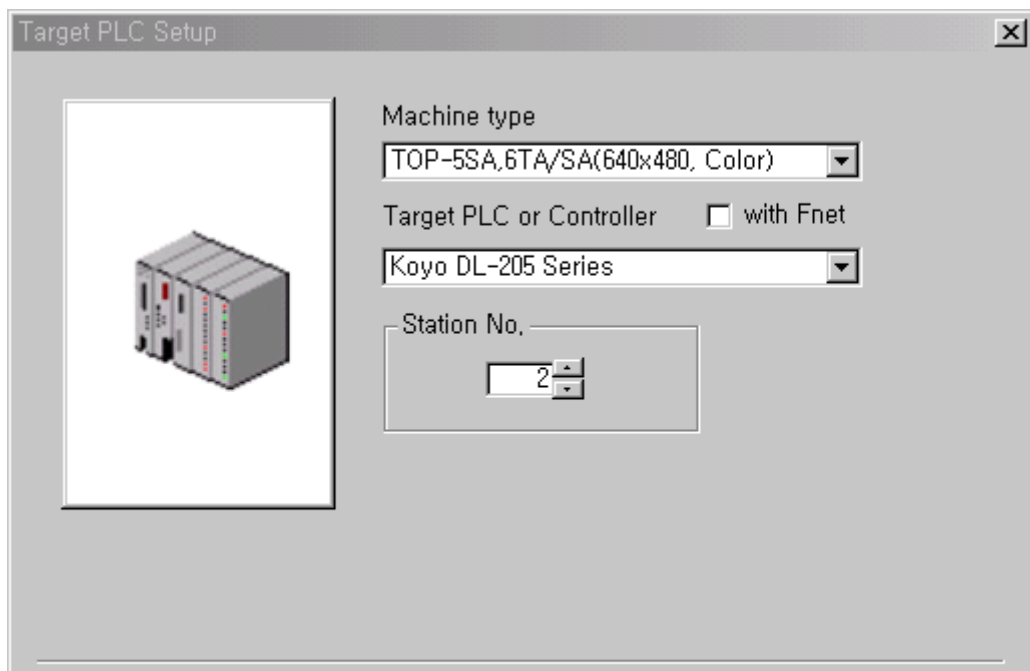
(1) Serial Parameter Setup

Special serial setup is not needed for DL-205 PLC.

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "KOYO DL-205 Series" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : 19200
- Serial Data Bit : 8
- Serial Stop Bit : 1
- Serial Parity Bit : None
- Serial Signal Level : RS-232
- Controller's Station No. at Comm. Diagnosis(0~31) : 2

2.14.2. Available Address List

(2) DL-205

Device	Bit Address	Word Address
Input Relay	X0000 ~ X0477	V40400 ~ V40423
Output Relay	Y0000 ~ Y0477	V40500 ~ V40523
Control Relay	C0000 ~ C0377	V40600 ~ V40617
Stage	-	V41000 ~ V41037
Timer(contact)	T000 ~ T177	V41100 ~ V41107
Counter(contact)	CT000 ~ CT177	V41140 ~ V41147
Timer(elapsed time)	-	V0000 ~ V0177
Counter(elapsed value)	-	V1000 ~ V1177
Variable Memory	-	V2000 ~ V3777


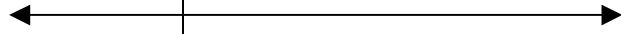
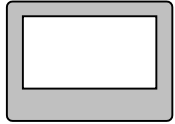
2.15. SAIA PCD Series

2.15.1. SAIA PCD CPU Direct

The following section describes the system configuration and interface between SAIA PCD Series and Touch Screen using RS-232 communication through CPU Loader Port (PGU).

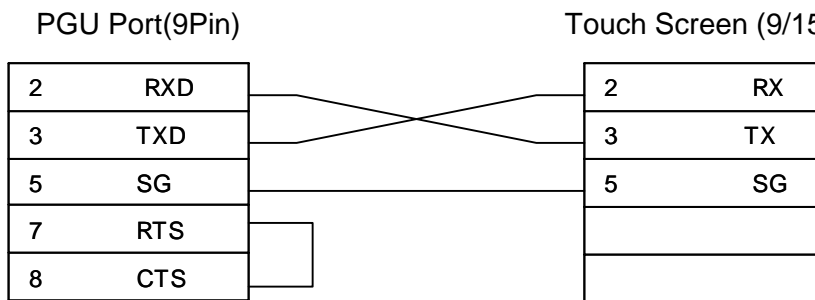
< System Configuration >

This figure shows system configuration to connect SAIA PCD Series to Touch Screen.

PLC	Comm. Unit	Cable	Touch Screen
			
SAIA PCD2 (PGU)	None	Refer to Cable Connection. (RS-232)	All Touch Screen

< Cable Diagram >

(1) RS-232 (SAIA PCD2 PGU Touch Screen (for 9/15Pin Connector))


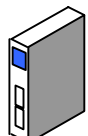
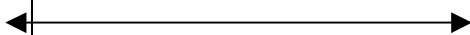
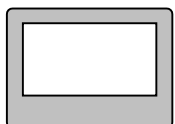


2.15.2. SAIA PCD Serial Interface

The following section describes the system configuration and interface between SAIA PCD Series and Touch Screen using RS-232/485 communication through Serial interface.

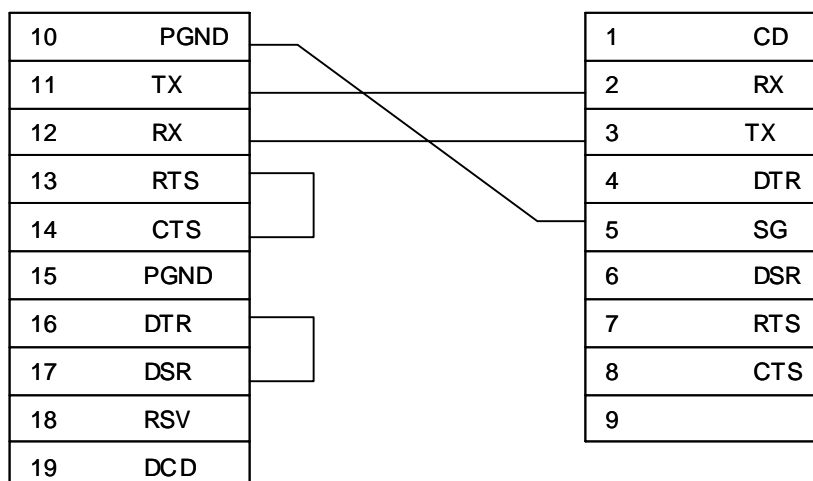
< System Configuration >

This figure shows system configuration to connect SAIA PCD Series to Touch Screen.

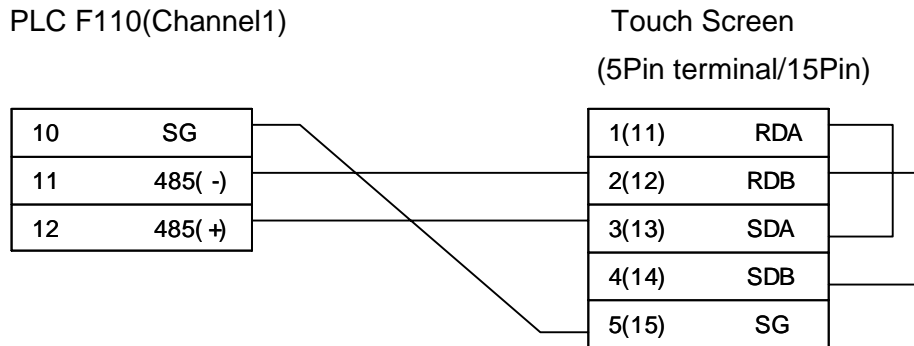
PLC	Comm. Unit	Cable	Touch Screen
			
SAIA PCD2	PCD7 F120 (Option Unit)	Refer to Cable Connection. (RS-232)	All Touch Screen
	PCD7 F110 (Option Unit)	Refer to Cable Connection. (RS-485)	

< Cable Diagram >

(1) RS-232 (PCD7 F120 Touch Screen (for 9/15Pin Connector))
 PLC F120(Channel1) Touch Screen (9/15Pin)



(2) RS-485 (PCD7 F110 Touch Screen (for 5Pin Terminal or 15Pin Connector))



< SAIA PCD PLC Setup >

(1) Serial Parameter Setup

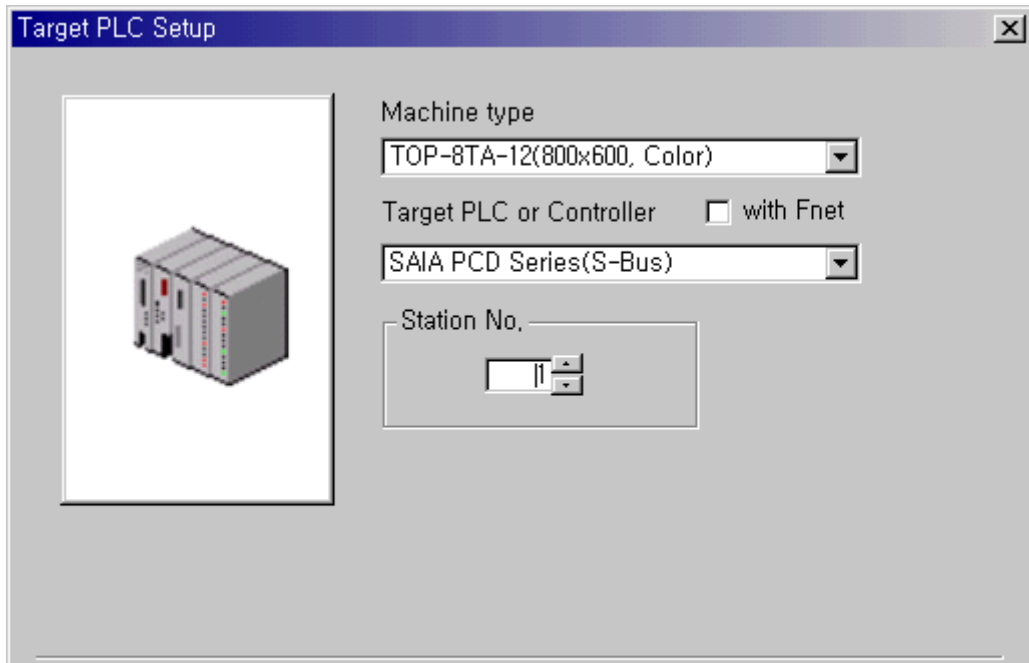
Serial parameter of SAIA PCD series can be setup using SAIA PG4 and recommended setting are as follows :

PLC Settings	
Baud Rate	100 ~ 38400 bps
Data Length	8 bit
Stop Bit	1 bit
Parity Bit	None
Station Address	0 ~ 255
Protocol	DATA Mode
Channel	CH0 (PGU Port)/CH1/CH2

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "SAIA PCD Series (S-BUS)" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : same as PLC setting
- Serial Data Bit : same as PLC setting
- Serial Stop Bit : same as PLC setting
- Serial Parity Bit : same as PLC setting
- Serial Signal Level : same as PLC setting
- Controller's Station No. at Comm. Diagnosis(0~31)
: Same as controller's Station Address

2.15.3. Available Address List

(3) SAIA PCD

Device	Bit Address	Word Address
Input (I)	I0000 ~ I5199	I0000 ~ I5104
Output (O)	O0000 ~ O5119	O0000 ~ O5104
Internal Bit (F)	F0000 ~ F8191	F0000 ~ F8176*
Register Word (RW)	RW000000 ~ RW409515	RW0000 ~ RW4095
Timer Word (T)	-	T0000 ~ T8176
Counter Word (C)	-	C0000 ~ C8176


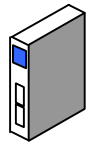

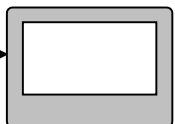
2.16. YOKOGAWA PLC Series

2.16.1. YOKOGAWA PLC CPU Direct

The following section describes the system configuration and interface between YOKOGAWA and Touch Screen using RS-232 / RS-422 communication.

< System Configuration >

This figure shows system configuration to connect YOKOGAWA to Touch Screen.

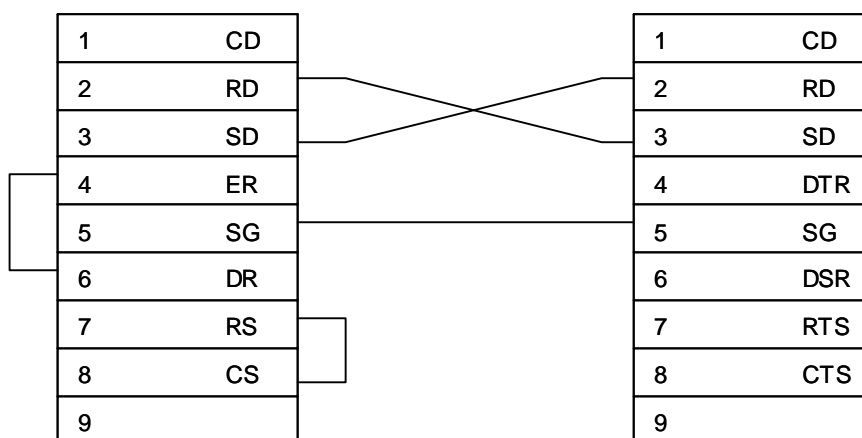
PLC	Comm. Unit	Cable	Touch Screen
			
F3SP10_0N	F3LC01_1N	Refer to Cable Connection. (RS-232)	All Touch Screen
F3SP20_0N, F3SP21_0N F3SP25_2N,F3SP36_3N	F3LC11_1N		
F3SP20_0N,F3SP21_0N F3SP25_2N,F3SP36_3NF 3SP35_5N	F3LC11_2N	Refer to Cable Connection. (RS-422)	

< Cable Diagram >

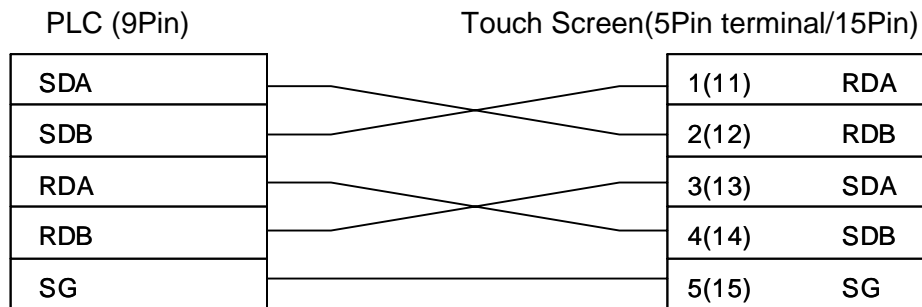
(1) RS-232 (YOKOGAWA PLC (9Pin) Touch Screen (for 9/15Pin Connector))

PLC (9Pin)

Touch Screen (9/15Pin)



(2) RS-485/422 (YOKOGAWA Touch Screen (for 5Pin Terminal or 15Pin Connector))



< YOKOGAWA PLC Setup >

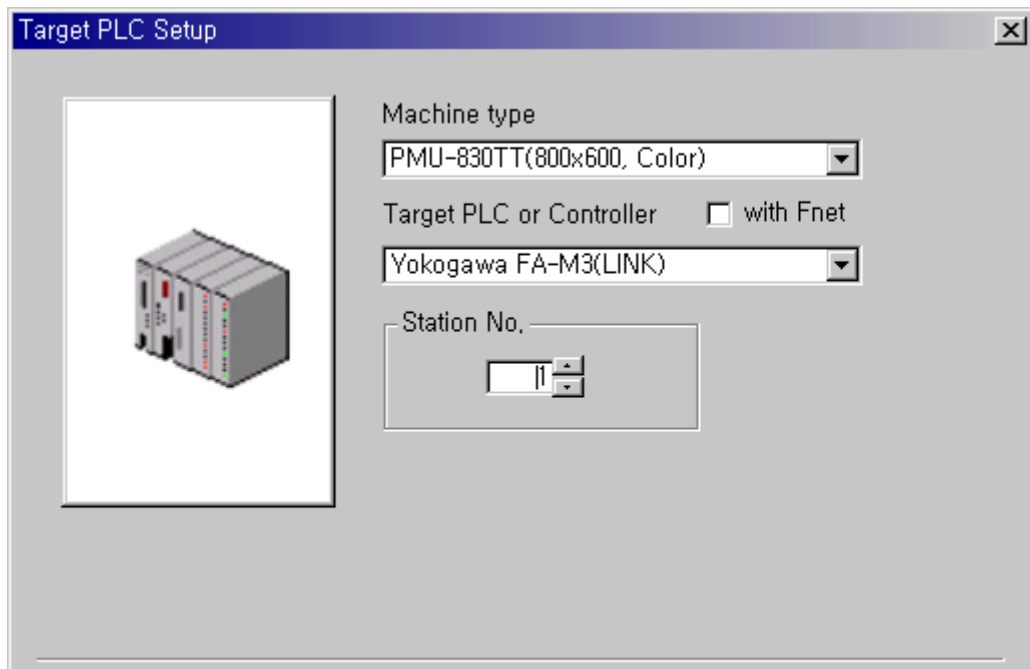
Recommended settings are 19200 bps, Data 8 bit, Stop Bit 1 , Parity None .

PLC Setting	
Baud Rate	19200 bps
Data Length	8 bit
Stop Bit	1 bit
Parity	None
Station Address	1

< Touch Screen Setup >

(1) Touch Screen Designer Setup

Select "Yokogawa FA-M3(Link)" in PLC Type.



(2) Touch Screen Serial Setup

Serial Settings are as follows.

- Serial Baud Rate : 19200
- Serial Data Bit : 8
- Serial Stop Bit : 1
- Serial Parity Bit : None
- Serial Signal Level : same as PLC setting
- Controller's Station No. at Comm. Diagnosis(0~31) : Same as PLC's station number

2.16.2. Available Address List

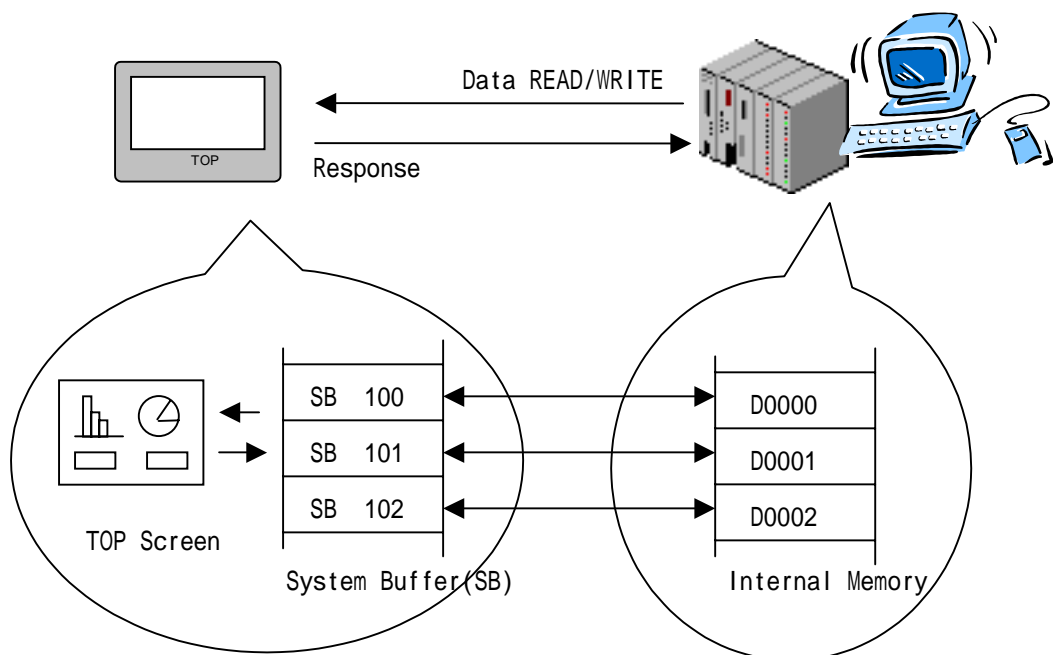
Device	Bit Address	Word Address
Input Relay	X00201~x71364	X00201~x71349
Output Relay	Y00201~y71364	Y00201~y71349
Internal Relay	I00001~I16384	I00001~I16369
Joint Relay	E0001~E4096	E0001~E4081
Special Relay	M0001~M9984	M0001~M9969
Link Relay	L00001~L71024	L00001~L71009
Timer(contact)	T0001~T3072	
Counter(contact)	C0001~C3072	
Timer(Current value)		TP0001~TP3072
Timer(setup value)		TS0001~TS3072
Counter(contact)		CP0001~CP3072
Counter(setup value)		CS0001~CS3072
Data Register		D0001~D8192
File Register		B00001~B32768
Joint Register		R0001~R4096
Special Register		Z001~Z512
Link Register		W00001~W71024

3. Serial Slave Communication Protocol

This section is to describe the protocol for interfacing Touch Screen with host PC or external controllers that Touch Screen do not support specified protocol.

For SLAVE COMMUNICATION, Touch Screen must be set to special protocol mode that Touch Screen support. (In this case, host PC or external controller must provide the program for READ/WRITE data from/to Touch Screen.)

In case of SLAVE setting, Touch Screen responses when host PC or external controller request data from Touch Screen or write to Touch Screen. At that time, host PC or external controllers have to READ/WRITE according to predefined Touch Screen SLAVE protocol.



3.1. SLAVE Protocol Description

This section is to describe protocol that you have to program in host PC or external controller .Protocol consists of 2 kinds and 4 commands.

Kind	Command	Contents	Direction
READ Protocol	READ Command	Read data from Touch Screen System Buffer Area.	Touc h Scree n ← Controller or PC
	READ Response (ACK) Command	Read Command Response in order that Touch Screen send data to Controller or PC.	Touc h Scree n → Controller or PC
Write Protocol	Write Command	Write data to Touch Screen System Buffer.	Touc h Scree n ← Controller or PC
	Write Response (ACK) Command	Write Command Response that Touch Screen send sign of "WRITE Command Complete" to Controller or PC.	Touc h Scree n → Controller or PC

3.1.1. READ Command

Contents of READ command are as follows.

Code	Size (byte)	Example	Hexa	REF.
ENQ	1	ENQ	05H	Start Code
Station Number	2	01	3031H	Station Num. of Touch Screen
Command(R)	1	R	52H	
Start Address In System Buf.	4	0100	3031H 3030H	System Buf. Address of Touch Screen
Number of Word	2	10	3130H	Number of Word(HEX)
EOT	1	EOT	04H	Complete Code
BCC	2	BCC	3438H	SUM Value of Station NUM. to Complete Code

Above Example require Touch Screen to transmit 10 data (word) in Touch Screen system buffer address 100 to system buffer address109.

3.1.2. Response Command(ACK) for READ

This example shows data frame to response enquire from master. Touch Screen send data of system buffer after receive READ command normally and check normal BCC.

Code	Size (byte)	Example	Hexa	REF>
ACK	1	ACK	06H	Start Code
Station Num.	2	01	3031H	Station Num. of Touch Screen
Command(R)	1	R	52H	
Data	64	1234H 4567H : : FFFFH	3132H 3334H 3435H 3637H : : 4646H 4646H	Data of System Buf. Size is variable according to number of data.
EOT	1	EOT	04H	Complete Code
BCC	2	BCC	3735H	SUM Value of Station NUM. to Complete Code

Above example means that SB100 is 1234H,SB101 is 4567H,...,and SB109 is FFFFH.

3.1.3. Write Command

WRITE commands are as follows.

Code	Size (byte)	Example	Hexa	REF.
ENQ	1	ENQ	05H	Start Code
Station Num.	2	01	3031H	Station Num. of Touch Screen
Command(R)	1	W	57H	
Start Address of System Buffer(SB)	4	0100	3031H 3030H	System Buf. Address of Touch Screen
Num. of Word	2	01	3031H	Num. of Word(HEX)
Data	4	1234H	3132H 3334H	Variable according to Num. of Word
EOT	1	EOT	04H	Complete Code
BCC	2	BCC	4138H	SUM Value of Station NUM. to Complete Code

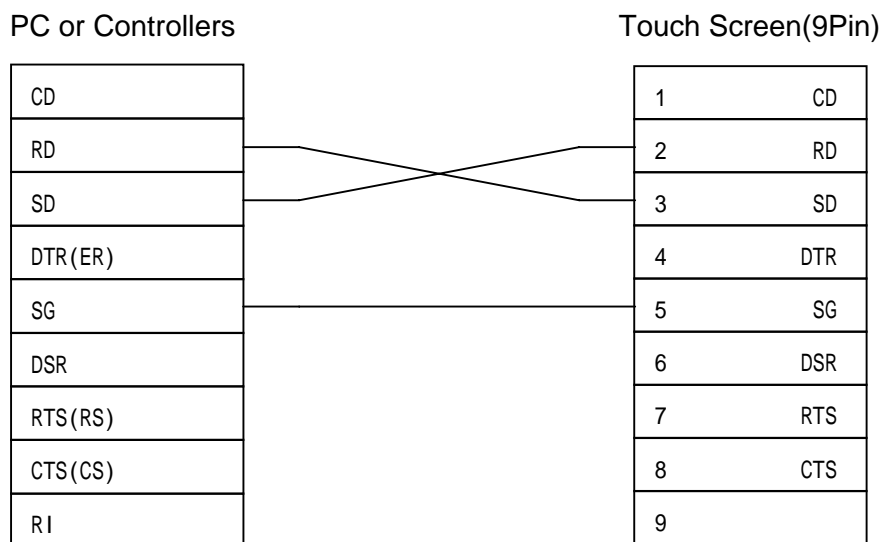
3.1.4. Response Command(ACK) for WRITE

Touch Screen transmits Response Command(ACK) for WRITE to PC or controllers if receive WRITE command normally and write data to System Buffer normally.

Code	Size(byte)	Example	Hexa	REF
ACK	1	ACK	06H	Start Code
Station Num.	2	01	3031H	Station Num. of Touch Screen
Command(R)	1	W	57H	
EOT	1	EOT	04H	Complete Code
BCC	2	BCC	3735H	SUM Value of Station NUM. to Complete Code

3.2. Cable Diagram

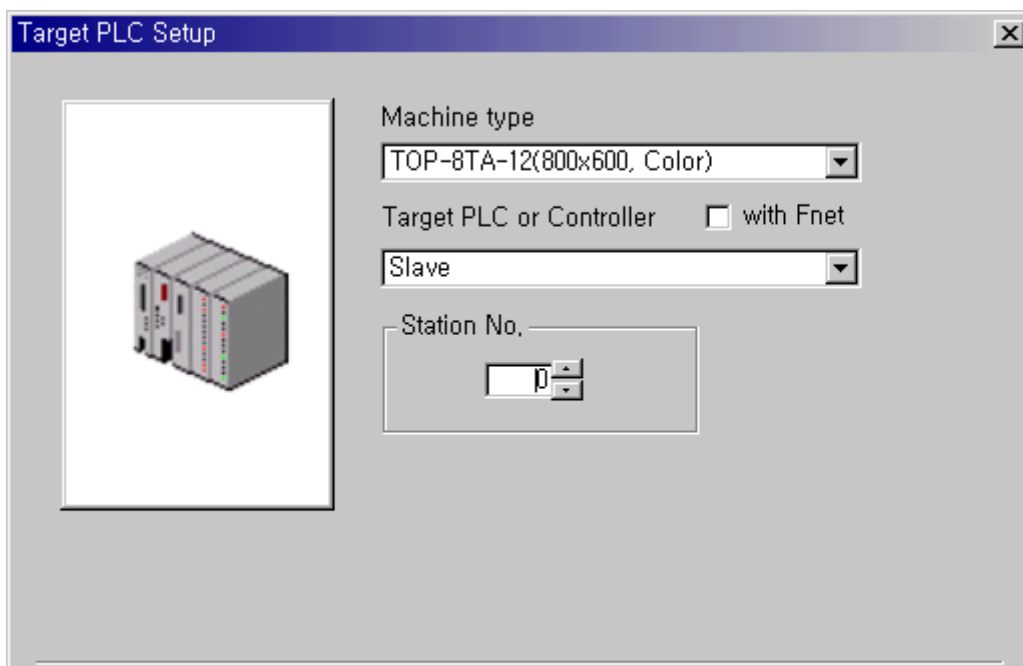
If host computer is IBM compatible, connection diagram of PC's RS-232C Port COM1 and Touch Screen RS-232C Port are as follows. Be cautious there are some differences according to Signal Spec. of PC RS-232C Port.



3.3. Touch Screen Setup

(1) Touch Screen Designer Setup

Select "Slave" or "Slave(extended)" or "Slave(extended-2)" in PC or Controllers according to your application.

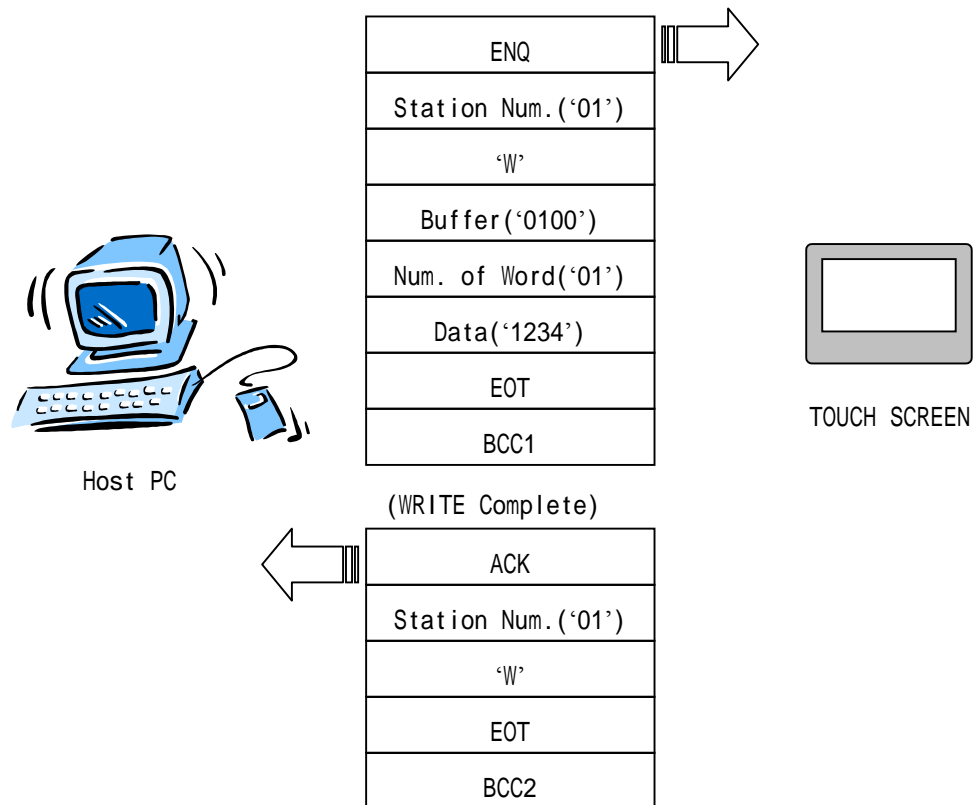


(2) Touch Screen Setup

There is no limit in Touch Screen setting but external controller(including PC)'s program has to be programmed as communication parameter of Touch Screen.

3.4. Communication Programming Example

This is BASIC Program example to write data to Touch Screen assuming external controller is host PC.



$BCC1 = \text{Station Num.('01')} + \text{Command('W')} + \text{Buffer Address('0100')} + \text{Num. of Word('01')} + \text{Data('1234')} + \text{EOT}$

$BCC2 = \text{Station Num.('01')} + \text{Command('W')} + \text{EOT}$

If BCC SUM value is more than 3 digits, convert right 2 digits to ASCII code and transmit or receive .2 digit BCC.

This is EXAMPLE programmed by 'BASIC' in host PC.

(1) EXAMPLE :Program Execution Screen

< WORD WRITE TEST PROGRAM >

< Write Address ? >

< Write Number ? >

< Write Data ? >

< Display Initial (R) / Quit (Q) > Select ?

< WORD WRITE TEST PROGRAM >

< Write Address ? > 0100

< Write Number ? > 01

< Write Data ? > 1234

< Display Initial (R) / Quit (Q) > Select ?

(2) EXAMPLE : Programmed by BASIC

```
DEFINE A-Z
DECLARE SUB BOX()
'=====
' COMMUNICATION TEST PROGRAM (WORD DATA WRITE)
'=====

'RS-232C INITIAL ROUTINE =====
' PORT -> COM1
' BPS -> 19200
' PARITY -> NONE
' DATA -> 8BIT
' STOP -> 1BIT
OPEN "COM1,19200,N,8,1,CS,DS" FOR RANDOM AS #1

'SCREEN DISPLAY ROUTINE =====
START:

BOX

LOCATE 4,10: PRINT "< WORD WRITE TEST PROGRAM >"
LOCATE 23,20: PRINT "< Display Initial (R) / Quit (Q) > Select ? > "
LOCATE 7,15: PRINT "< Write Address ? > "
LOCATE 9,15: PRINT "< Write Number ? > "
LOCATE 11,15: PRINT "< Write Data ? > "

LOCATE 7,37: INPUT "", ADDRESS$
LOCATE 9,37: INPUT "",NUMBER$
LOCATE 11,37: INPUT "",DATA$

'BCC CHECK ROUTINE =====
DT$="01" + "W" + ADDRESS$ + NUMBER$ + DATA$
BCC=0
LE=LEN(DT$)
```

```

FOR I = 1 TO LE
  BC$=MID$(DT$,I,1)
  BC=ASC(BC$)
  BCC=BCC+BC
NEXT I
BCC=BCC + ASC(CHR$(4))
HE$=HEX$(BCC)
BCC1$=RIGHT$(HE$,2)

'COMPUTER TO DATA SEND PROCESS =====
  SEND$ = CHR$(5) + "01" + "W" + ADDRESS$ + NUMBER$ + DATA$ +
CHR$(4) + BCC1$
  PRINT #1,SEND$;
  LOCATE 14,20: PRINT "[PC -> TOUCH SEN DATA] : ";SEND$
'RECEIVED DATA INPUT PROCESS
  REACK$ = INPUT$(7,#1)
  LOCATE 16,20: PRINT "[TOUCH -> PC RCV DATA] : ".REACK$

'ASK PROCESS REPEAT =====
MENU :
  LOCATE 23,64 : INPUT " ", REV$
  SELECT CASE REV$
    CASE "R","r"
      GOTO START1
    CASE "Q","q"
      GOTO PROGEND
    CASE ELSE
  END SELECT

PROGEND:
  CLOSE #1
  CLS
  END

'SUBROUTINE BOX =====
SUB BOX

```

```
CLS
LOCATE 2,1
PRINT SPC(4); CHR$(201) ; STRING$(70,205); CHR$(187)
FOR COUNT%=1 TO 20
    PRINT SPC(4);CHR$(186); STRING$(70); CHR$(186)
NEXT COUNT%
PRINT SPC(4); CHR$(200); STRINT$(70,205); CHR$(188)
END SUB
```