

KEYENCE.

KV Series Loader

Serial Driver

Supported version TOP Design Studio

V1.0 or higher



CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

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Describes the devices required for connection, the setting of each device, cables, and configurable systems.
- 2. External device selection** [Page 3](#)

Select a TOP model and an external device.
- 3. TOP communication setting** [Page 4](#)

Describes how to set the TOP communication.
- 4. External device setting** [Page 9](#)

Describes how to set up communication for external devices.
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Describes the cable specifications required for connection.
- 6. Supported addresses** [Page 11](#)

Refer to this section to check the addresses which can communicate with an external device.

1. System configuration

The system configuration of TOP and "Keyence KV Series Loader" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
KV Series Loader	KV-700 KV-1000 series KV-3000 series KV-5000 series KV-7000 series	Built-in RS-232C port	RS-232C	3. TOP communication setting 4. External device setting	5.1. Cable table 1

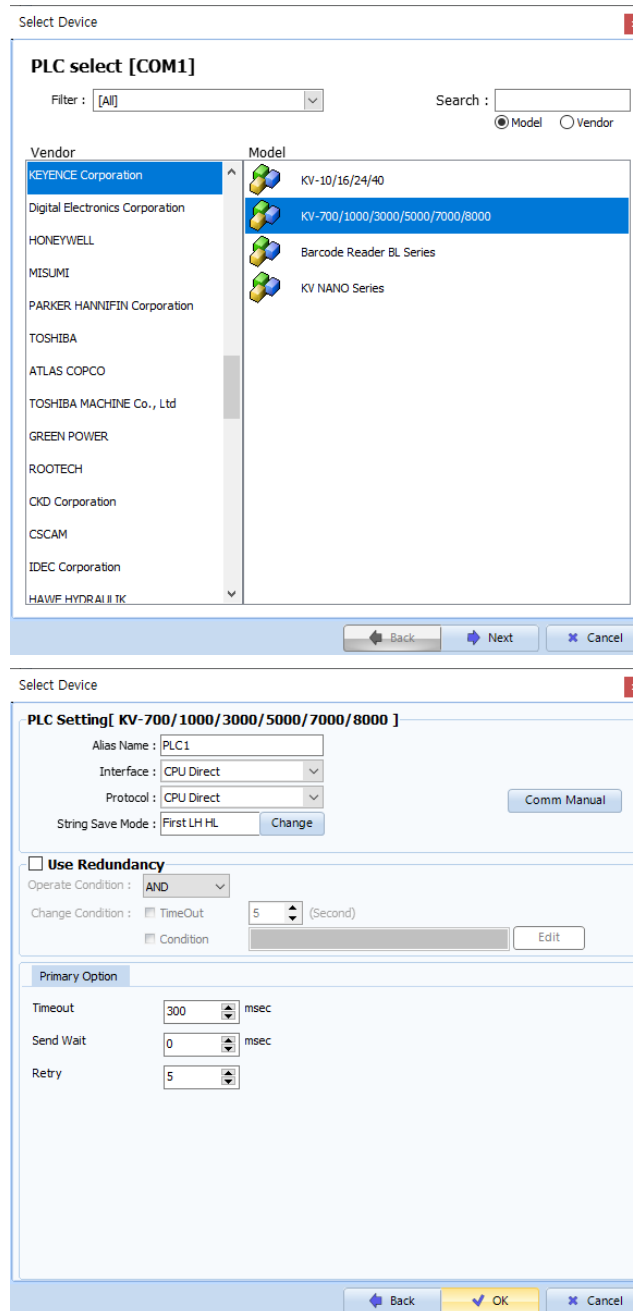
■ Connection configuration

- 1:1 (one TOP and one external device) connection



2. External device selection

- Select a TOP model and a port, and then select an external device.



Settings		Contents					
TOP	Model	Check the TOP display and process to select the touch model.					
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "KEYENCE > KV Series Loader".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>KEYENCE KV Series Loader</td> <td>Serial</td> <td>CPU Direct</td> </tr> </tbody> </table> <p>Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.</p>	Model	Interface	Protocol	KEYENCE KV Series Loader	Serial
Model	Interface	Protocol					
KEYENCE KV Series Loader	Serial	CPU Direct					

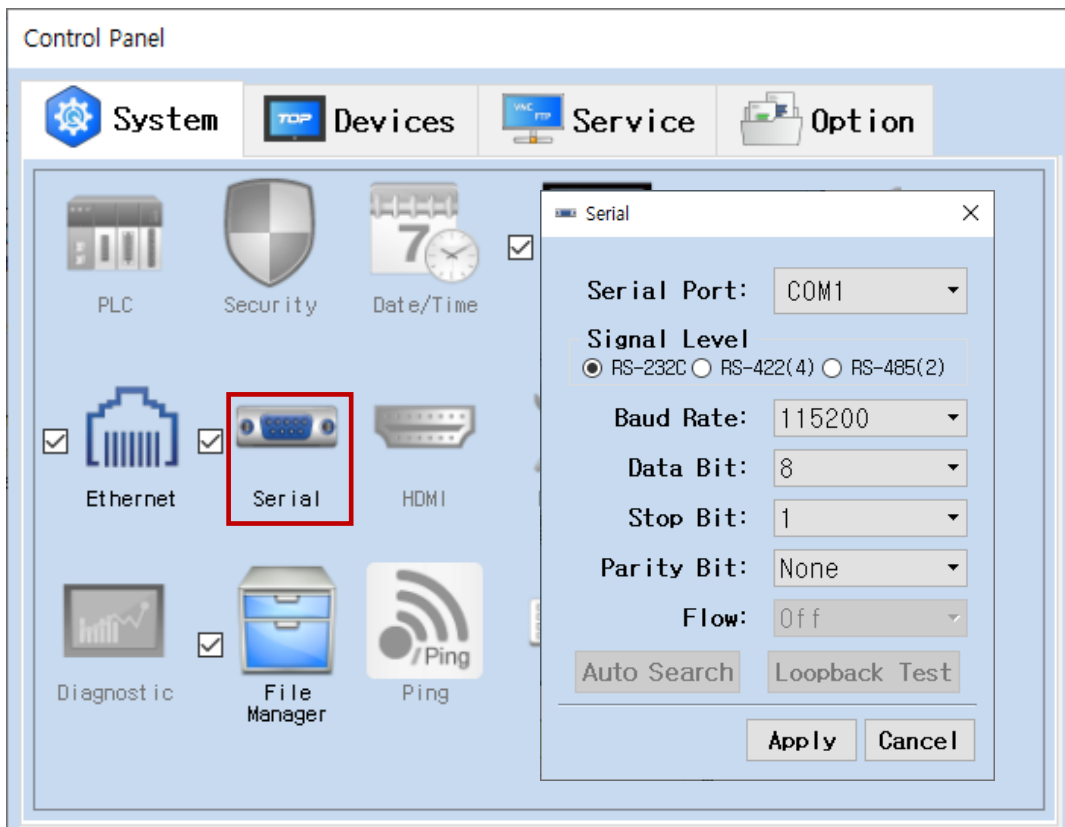
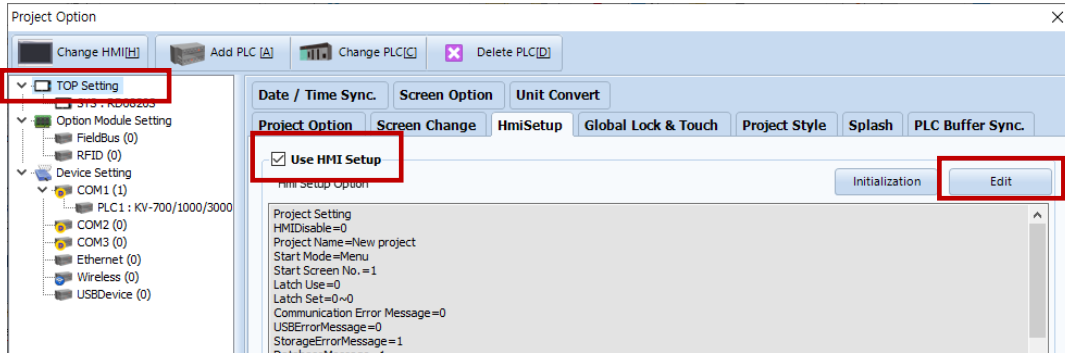
3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

- [Project > Project Property > TOP Setting] → [Project Option > "Use HMI Setup" Check > Edit > Serial]
- Set the TOP communication interface in TOP Design Studio.



Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

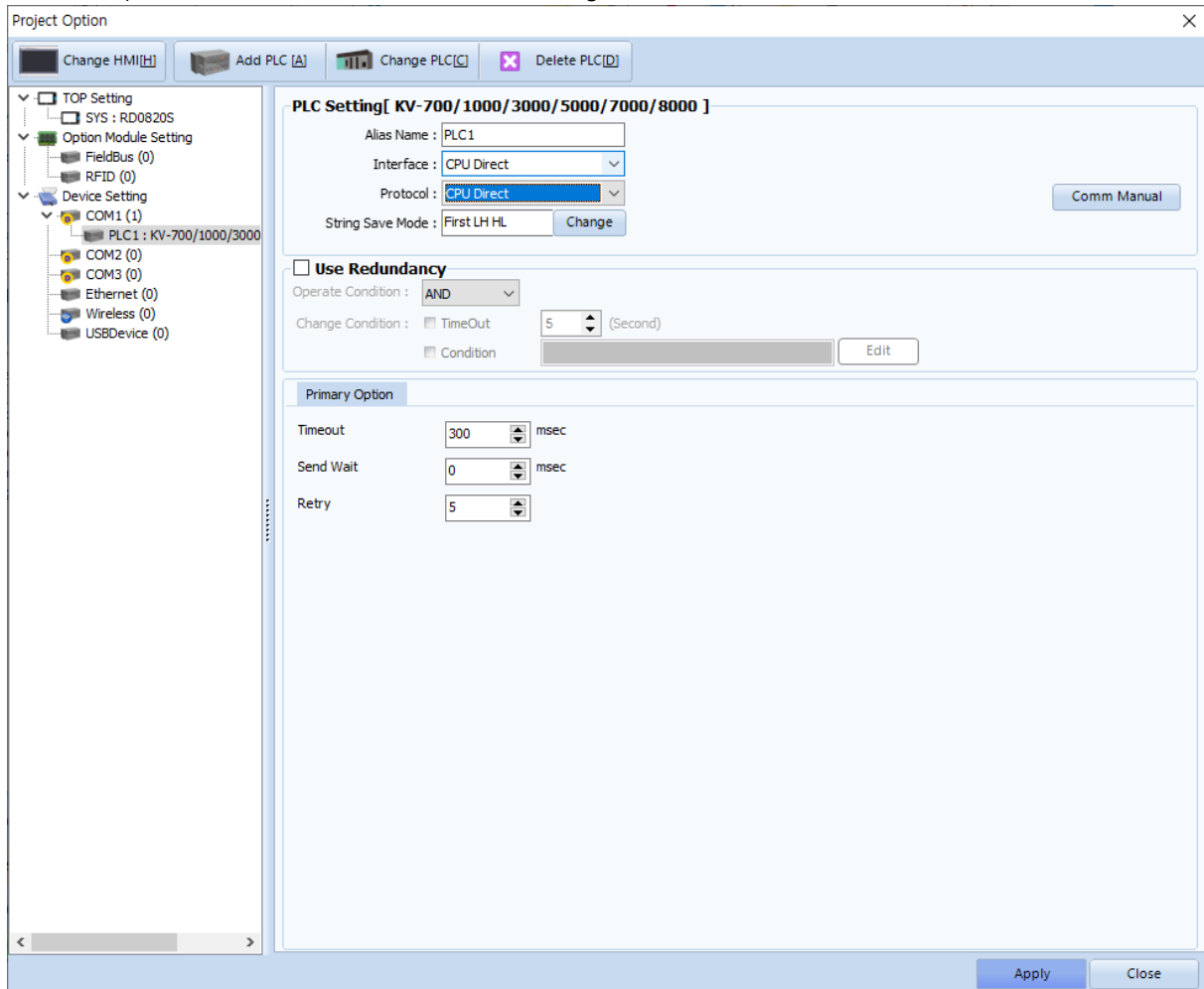
* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Project > Project Property > Device Setting > COM > PLC1: KV Series Loader]

Set the options of the communication driver in TOP Design Studio.



Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External device selection".
Protocol	Configure the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	

3.2. Communication setting in TOP

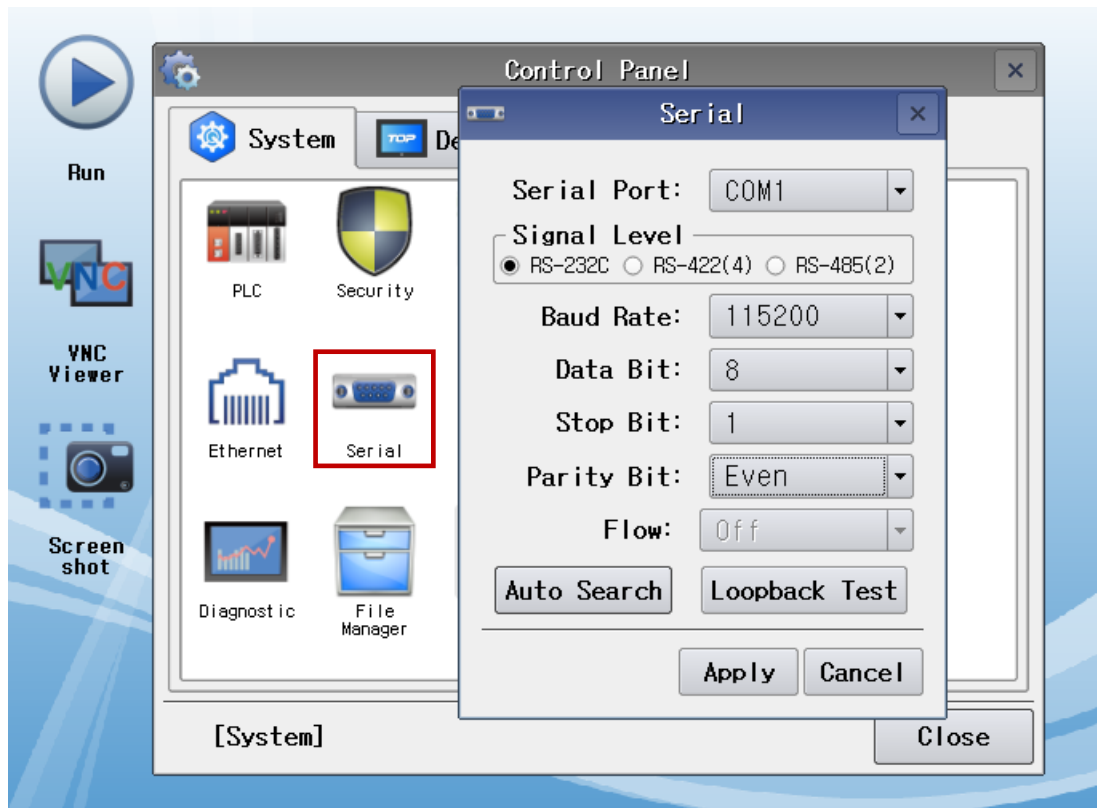
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

- [Main Screen > Control Panel > Serial]



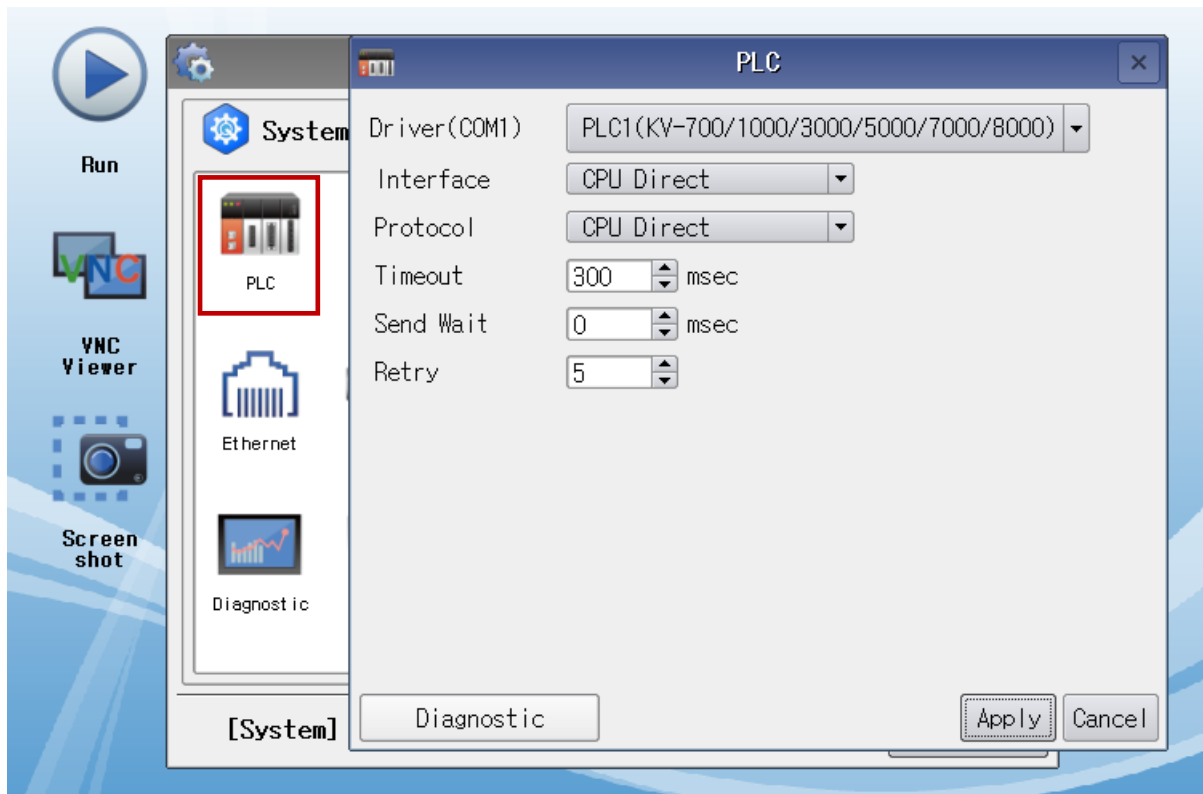
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

* The above settings are setting examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device. (COM3 supports only RS-485.)
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Main Screen > Control Panel > PLC]



Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External device selection".
Protocol	Configure the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	

3.3 Communication diagnostics

- Check the interface setting status between the TOP and external device.
 - Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
 - Check if the port (COM1/COM2/COM3) settings you want to use in [Control Panel > Serial] are the same as those of the external device.

- Diagnosis of whether the port communication is normal or not
 - Touch "Communication diagnostics" in [Control Panel > PLC].
 - The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

OK	Communication setting normal
Time Out Error	Communication setting abnormal - Check the cable, TOP, and external device setting status. (Reference: Communication diagnostics sheet)

- Communication diagnostics sheet
 - If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents	Check		Remarks	
System configuration	How to connect the system	OK	NG	1. System configuration	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	2. External device selection 3. Communication setting	
	Port in use	OK	NG		
	Driver name	OK	NG		
	Other detailed settings	OK	NG		
	Relative prefix	Project setting	OK		NG
		Communication diagnostics	OK		NG
	Serial Parameter	Transmission Speed	OK		NG
		Data Bit	OK		NG
Stop Bit		OK	NG		
Parity Bit		OK	NG		
External device	CPU name	OK	NG	4. External device setting	
	Communication port name (module name)	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG		
	Serial Parameter	Transmission Speed	OK		NG
		Data Bit	OK		NG
		Stop Bit	OK		NG
Parity Bit		OK	NG		
Check address range		OK	NG	6. Supported addresses (For details, please refer to the PLC vendor's manual.)	

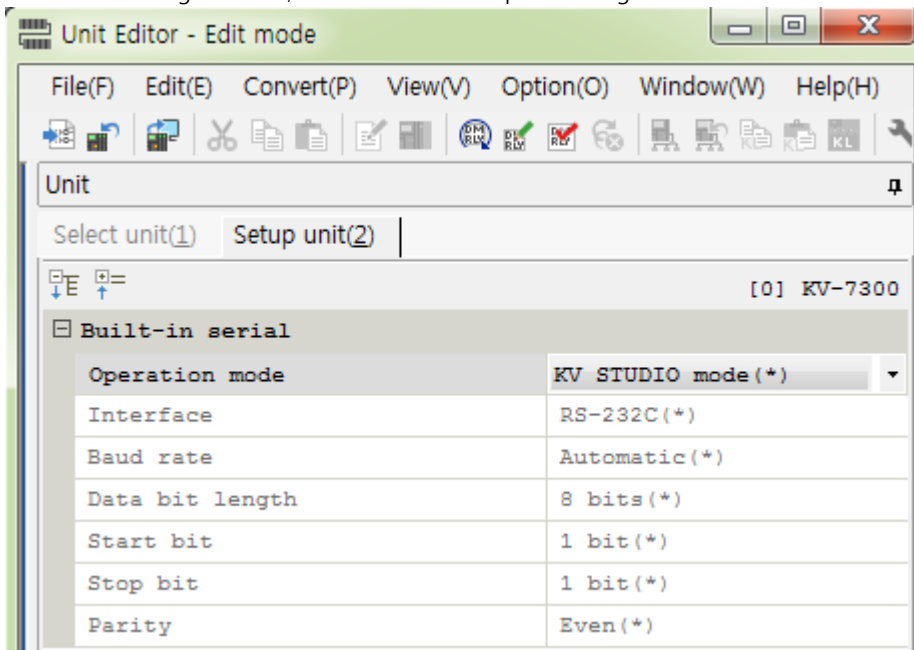
4. External device setting

4.1 KV 1000/3000/5000 series

No additional settings need to be configured for the external device.

4.2 KV-7000 series

As shown in the figure below, the Unit Editor's setup unit configures the KV Studio mode.

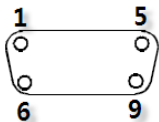
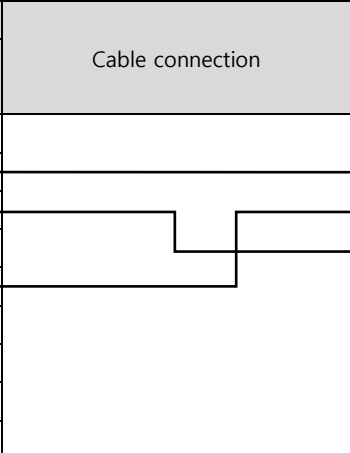
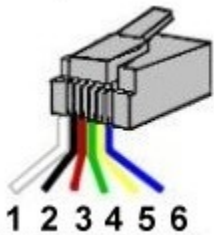


5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.

5.1. Cable table 1

■ RS-232C (1:1 connection)

COM			Cable connection	Main Controller		
Pin arrangement* Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement* Note 1)
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RS422	1		1		 <p>RJ-12 6-pin connector</p>
	RXD	2		2	TXD	
	TXD	3		3	SG	
	RS422	4		4	RXD	
	SG	5		5		
	RS422	6		6		
	5V	7				
	GND	8				
	RS422	9				

***Note 1)** Pin arrangement is depicted as facing the interface of the cable connector in this figure. Unused pins are not connected.

6. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

Device	Bit Address	Word Address	Remarks
Data Memory	DM0000.00 – DM65534.15	DM0000 – DM65534	
Control Memory	CM0000.00 – CM5999.15	CM0000 – CM5999	
Temporary Memory	TM000.00 – TM511.15	TM000 – TM511	
Expansion Data Memory	EM00000.00 – EM65534.15	EM00000 – EM65534	
File Register – Current Bank	FM00000.00 – FM32767.15	FM00000 – FM32767	
Work Memory	VM00000.00 – VM59999.15	VM00000 – VM59999	
Link Register	W000.00 – W999.15	W000 – W999	
Digital Timer	TRM0.00 – TRM7.15	TRM0 – TRM7	
Index Register		Z000 – Z12	32bit
Link Register		W0000 – WFFFF	
High-Speed Counter Current Value		CTH0 – CTH1	32bit
High-Speed Counter Comparator		CTC0 – CTC3	32bit
File Register – Consecutive Number mode		ZF000000 – ZF131071	
Input/Output	R00000 – R99915	R000 – R999	
Control Relay	CR0000 – CR3915	CR00 – CR39	
Internal Auxiliary Relay	MR00000 – MR99915	MR000 – MR999	
Latch Relay	LR00000 – LR99915	LR000 – LR999	
Link Relay	B0000 – BFFFF		
Timer	contact	T000 – T511	—
	current	—	TC000 – TC511 32bit
	setting	—	TS000 – TS511 32bit
Counter	contact	C000 – C511	—
	current	—	CC000 – CC511 32bit
	setting	—	CS000 – CS511 32bit