KEYENCE.
KV 10/16/24/40 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".

1. System configuration

The system configuration of TOP and "Keyence KV 10/16/24/40 Loader" is as follows:

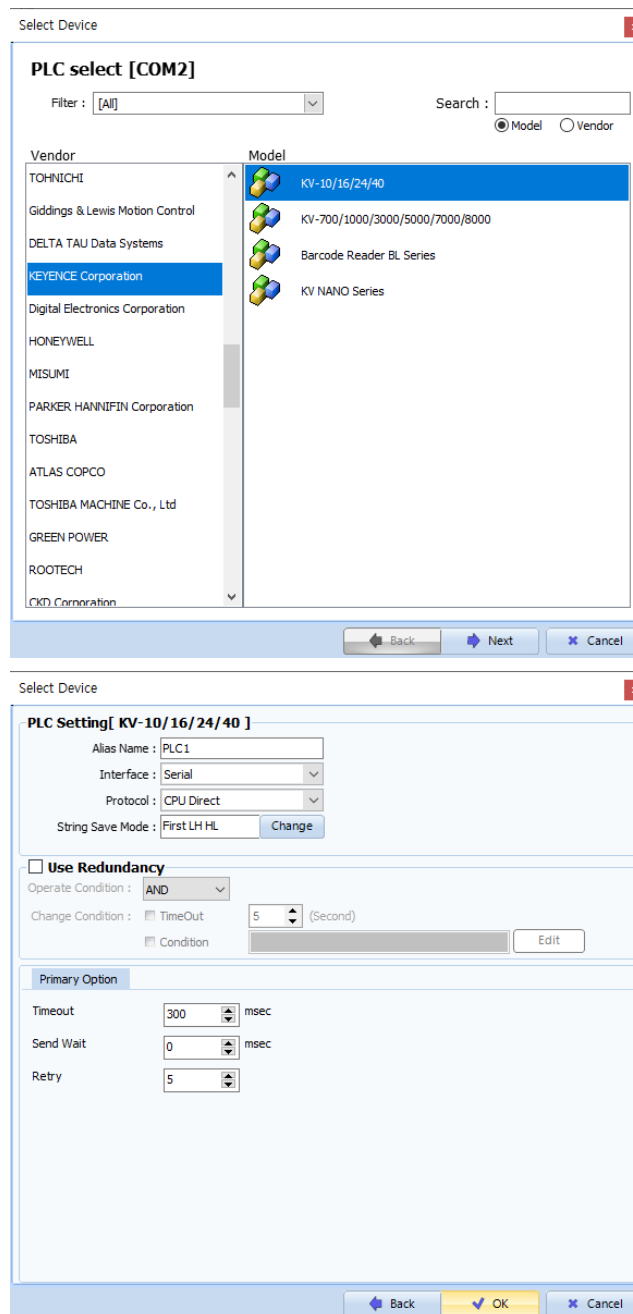| Series	CPU	Link I/F	Communication method	Communication setting	Cable
KV 10/16/24/40 Loader	KV-10 KV-16 KV-24 KV-40	Built-in RS-232C port	RS-232C	3. TOP communication setting 4. External device setting	5.1. Cable table 1

■ 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 10/16/24/40 Loader"
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
KEYENCE KV 10/16/24/40 Loader	Serial	CPU Direct

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.

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.
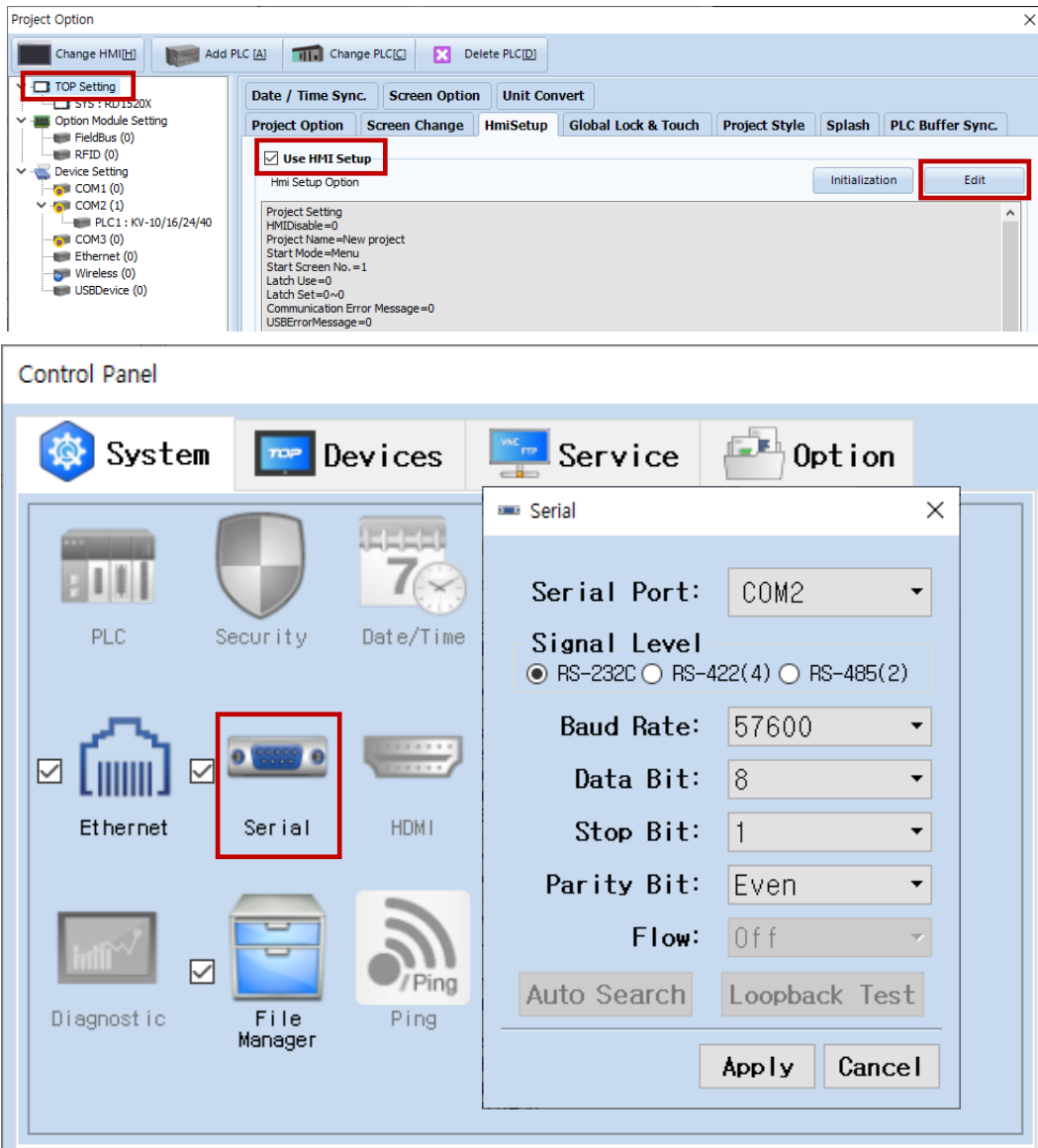
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	57600		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

* 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 10/16/24/40 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]
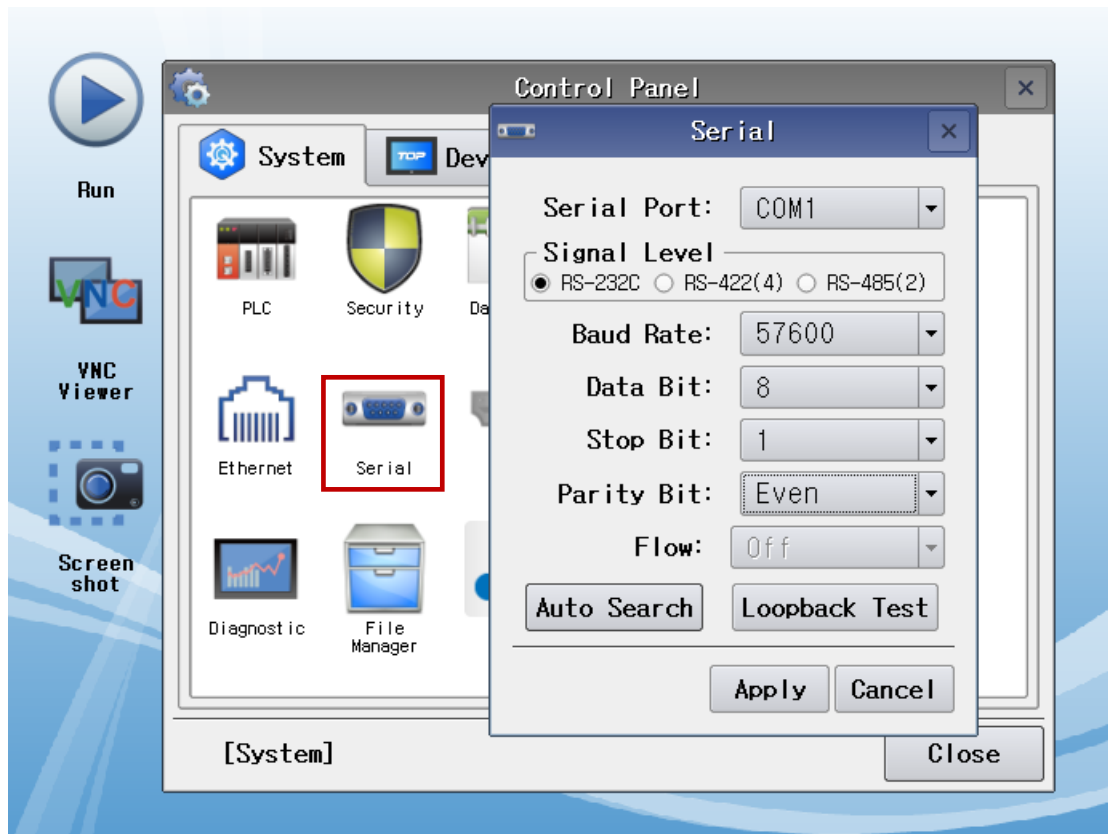
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	57600		
Data Bit	8		
Stop Bit	1		
Parity Bit	Even		

* 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.
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.

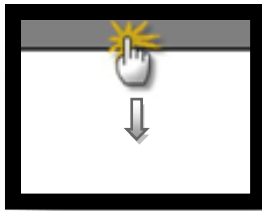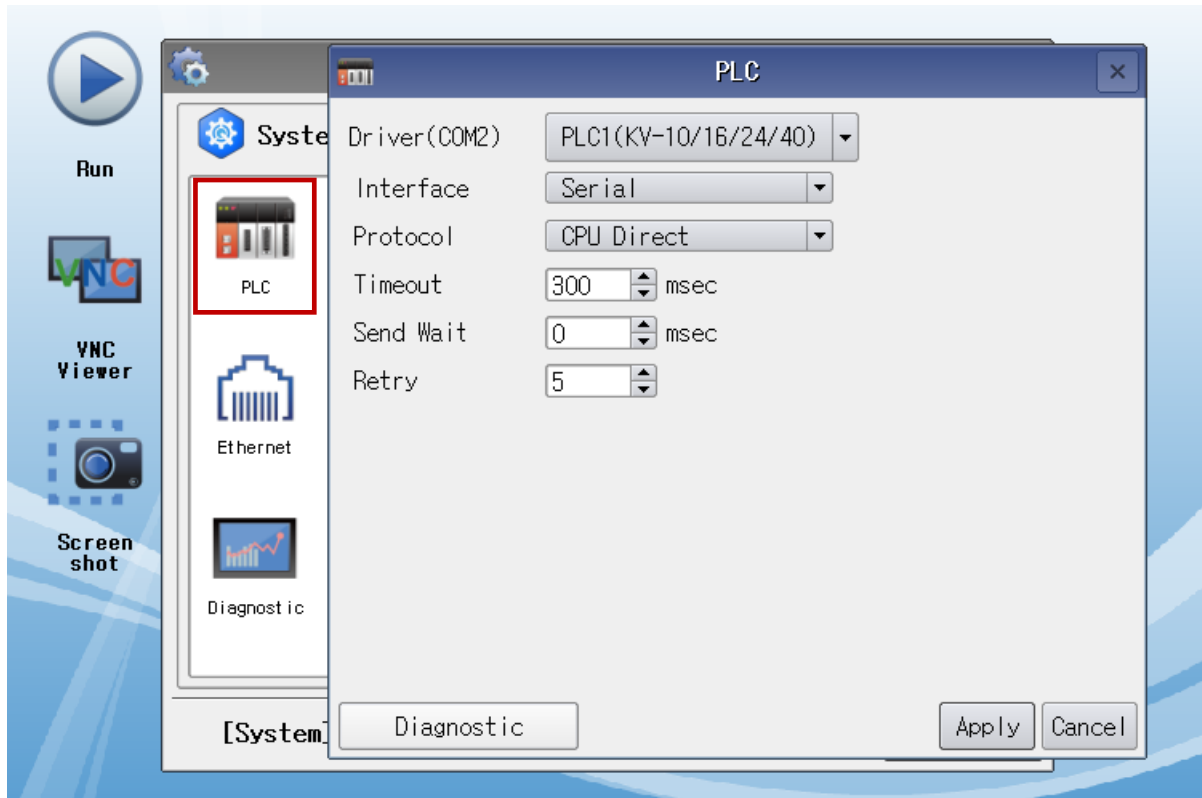**(2) Communication option setting**

■ [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 COM port 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.

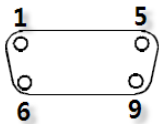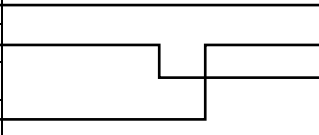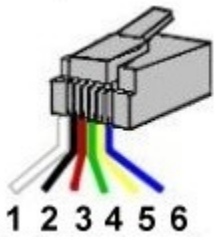| Items	Contents		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	2. External device selection 3. Communication setting
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	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

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

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)
	RS422	1		1		
	RXD	2		2	TXD	
	TXD	3		3	SG	
	RS422	4		4	RXD	
Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	SG	5		5		RJ-12 6-pin connector
	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 – DM1999.15	DM0000 – DM1999	
Temporary Data Memory		TM00.00 – TM31.15	TM00 – TM31	
Relay		R00000 – R17915	R000 – R179	
Timer	contact	T000 – T249	——	
	current	——	TC000 – TC249	
	setting	——	TS000 – TS249	
Counter	contact	C000 – C249	——	
	current	——	CC000 – CC249	
	setting	——	CS000 – CS249	