KEYENCE. KV Series Loader

Serial Driver

Supported version TOP Design Studio

V1.0 or higher



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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 how to set up communication for external devices.

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Describes the cable specifications required for connection.

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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.

Select Device					
PLC select [CC	DM11				
Filter : [All]	-		\sim	Search :	
0.03				() Mo	del 🔾 Vendor
Vendor		Model			
KEYENCE Corporation		^ 🌮	KV-10/16/24/40		
Digital Electronics Corpo	ration	80	KV-700/1000/3000/5	000/7000/8000	
HONEYWELL		8	Barcode Reader BL Se	eries	
MISUMI		8	KV NANO Series		
PARKER HANNIFIN Corp	oration				
TOSHIBA					
ATLAS COPCO					
TOSHIBA MACHINE Co.,	Ltd				
GREEN POWER					
ROOTECH					
CKD Corporation					
CSCAM					
IDEC Corporation					
HAWF HYDRALII TK		×			
elect Device					
PLC Setting[KV-7	DO/1000/ 3	000/500	0/7000/8000]		
Alias Name :	PLC1	:000/500			
Alias Name : Interface :	PLC1 CPU Direct	:000/500	~		•
Alias Name : Interface :	PLC1 CPU Direct CPU Direct				Comm Manual
Alias Name : Interface : Protocol : String Save Mode :	PLC1 CPU Direct CPU Direct First LH HL		~		Comm Manual
Alias Name : Interface : Protocol :	PLC1 CPU Direct CPU Direct First LH HL		~		Comm Manual
Alias Name : Interface : Protocol : String Save Mode :	PLC1 CPU Direct CPU Direct First LH HL Y	Cha	~		
Alas Name : Interface : Protocol : String Save Mode : Operate Condition : A Change Condition :	PLC1 CPU Direct CPU Direct First LH HL Y	Cha	∨ ∨ inge		Comm Manual
Alas Name : Interface : Protocol : String Save Mode : Operate Condition : A Change Condition :	PLC1 CPU Direct CPU Direct First LH HL Y ND ~ TimeOut	Cha	∨ ∨ inge		
Alias Name : Interface : Protocol : String Save Mode : Operate Condition : Al Change Condition : C	PLC1 CPU Direct First LH HL Y VD ~ TimeOut Condition	Cha	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Al Change Condition : Change Condition :	PLC1 CPU Direct First LH HL Y ND TimeOut Condition	5	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Al Change Condition : Change Condition : Primary Option Timeout	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Alange Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Ange Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Ange Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Alange Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		
Alas Name : Interface : Protocol : String Save Mode : Operate Condition : Change Condition : Primary Option Timeout Send Wait	PLC1 CPU Direct CPU Direct First LH HL Y VD Condition 300 300 300 300 300 300 300 30	Cha 5 msec msec	∨ ∨ inge		

Settings			Contents	
ТОР	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.		
		Model	Interface	Protocol
	KEYENCE KV Series Loader Serial CPU Dire			CPU Direct
Please check the system configuration in Chapter 1 t connect is a model whose system can be configured.				the external device you want to



3. TOP communication setting

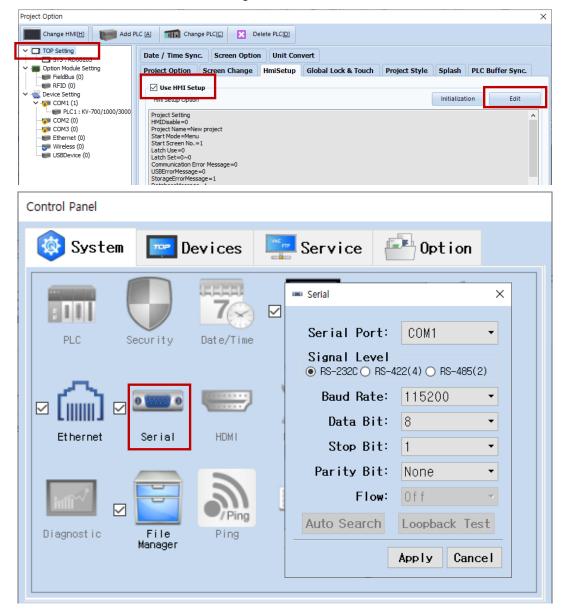
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

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	ТОР	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	Eve	n	

* 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.

External device connection manual for TOP Design Studio



(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.

Project Option		×
Change HMI[<u>H</u>] Change HMI[<u>H</u>]	LC [A] TI Change PLC[C] X Delete PLC[D]	
✓ -□ TOP Setting SYS : RD0820S	PLC Setting[KV-700/1000/3000/5000/7000/8000]	
V III Option Module Setting	Alias Name : PLC1	
FieldBus (0)	Interface : CPU Direct 🗸	
🗸 🛒 Device Setting	Protocol : CPU Direct 🗸 🗸	Comm Manual
 COM1 (1) PLC1 : KV-700/1000/3000 	String Save Mode : First LH HL Change	
	Use Redundancy	
	Operate Condition : AND V	
Wireless (0)	Change Condition : TimeOut 5 (Second)	
	Condition Edit	
	Primary Option	
	Timeout 300 💭 msec	
	Send Wait 0 msec	
:	Retry 5	
	5 •	
< >>		Apply Close
		Close

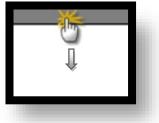
Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External
Protocol	Configure the communication protocol between the TOP and an external device.	device selection".
TimeOut (ms)	Set the time for the TOP to wait for a response from 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	ТОР	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	Eve	n	

* 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]

	õ	1001	PLC ×	
	🔯 System	Driver(COM1)	PLC1(KV-700/1000/3000/5000/7000/8000) -	
Run		Interface	CPU Direct 🔹	
		Protocol	CPU Direct 🔹	
MNC	PLC	Timeout	300 🖨 msec	
VNC Viewer		Send Wait	0 🖨 msec	
	(())	Retry	5	
	Ethernet			
Screen shot	Intliv			
	Diagnostic			
	[System]	Diagnostic	[Apply] Cancel	
		*		

Items	Settings	Remarks
Interface	Configure the communication interface between the TOP and an external device.	Refer to "2. External
Protocol	Configure the communication protocol between the TOP and an external device.	device selection".
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.

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



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.

Unit Editor - Ed	dit mode				• ×			
File(F) Edit(E)	Convert(P) Vi	iew(V)	Option(O)	Window(W)	Help(H)			
📲 🔐 🔒	6 6 6 8	(🖬 🛒 🚭		💼 🖪 🖣			
Unit					д			
Select unit(<u>1</u>)	Setup unit(2)							
₽E ₽=				[0]] KV-7300			
🗆 Built-in s	erial							
Operation	mode		KV SI	UDIO mode(*) -			
Interface	Interface				RS-232C(*)			
Baud rate	Baud rate				Automatic(*)			
Data bit 1	length		8 bi	ts(*)				
Start bit			1 bit	t(*)				
Stop bit			1 bi	t(*)				
Parity			Even	(*)				



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)

СОМ				Main Controller		
Din arrangement*Nets 1)	Signal	Pin	Cable connection	Pin	Signal	Din arrangement*Nets 1)
Pin arrangement*Note 1)	name	number		number	name	Pin arrangement*Note 1)
	RS422	1		1		
1 5	RXD	2		2	TXD	A
	TXD	3.		3	SG	FR
6 9	RS422	4		4	RXD	
Based on communication	SG	5		5		
cable connector front,	RS422	6		6		
D-SUB 9 Pin male (male,	5V	7				123456
convex)	GND	8				RJ-12 6-pin connector
	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 Registe	er – Current Bank	FM00000.00 – FM32767.15	FM00000 – FM32767	
Work Mem	iory	VM00000.00 – VM59999.15	VM00000 – VM59999	
Link Regist	er	W000.00 – W999.15	W000 – W999	
Digital Tim	er	TRM0.00 – TRM7.15	TRM0 – TRM7	
Index Regi	ster		Z000 – Z12	32bit
Link Regist	er		W0000 – WFFFF	
High-Speed Counter Current Value			CTH0 – CTH1	32bit
High-Spee	d 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