# KEYENCE. KV KV-700/1000/3000/5000/7000 Series

# **Computer Link Serial Driver**

Supported version

TOP Design Studio



# 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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## Page 2

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.

### 5. Cable table

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Describes the cable specifications required for connection.

## 6. Supported addresses

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 Computer Link" 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	NC10L NC20L	RS-422	<u>3. TOP communication</u> <u>setting</u> 4. External device setting	<u>5.1. Cable table 1</u>

■ Connection configuration

 $\cdot$  1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422 communication.

|--|--|--|--|--|



# 2. External device selection

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

	0401				
PLC select [C	OM2]				
Filter : [All]			$\sim$	Search :	
Vendor		Model			
SAMWONTECH	^		KV-10/16/24/40		
SICK AG.			KV-700/1000/3000/50	00/7000/8000	
FUJI Electric Co., Ltd.		1			
SANGJI Precision Co., L	.td.		barcode Reader bi Sel	les	
DEVA		<b>P</b>	KV NANO Series		
OPTICON					
TOHNICHI					
Giddings & Lewis Motior	Control				
DELTA TAU Data Syster	ms				
KEYENCE Corporation					
Digital Electronics Corpo	oration				
HONEYWELL					
MISUMI					
PARKER HANNIEIN Con	noration				
elect Device					
elect Device PLC Setting[ KV-7	700/1000/30	000/500	00/7000/8000 ]		
elect Device PLC Setting[ KV-7 Alias Name Interface	700/1000/30 : PLC1 : Computer Link	000/500	00/7000/8000 ]		I
elect Device PLC Setting[ KV-7 Alias Name Interface Protocol	700/1000/30 : PLC1 : Computer Link : KV Mode (Hos	000/500	00/7000/8000 ] ~ ~		Comm Manual
elect Device PLC Setting[ KV-7 Alias Name Interface Protocol String Save Mode	700/1000/30 : PLC1 : Computer Link : KV Mode (Hos : First LH HL	000/500 ( t Link) Cha	00/7000/8000 ]	(	Comm Manual
elect Device PLC Setting[ KV-7 Alias Name Interface Protocol String Save Mode Use Redundam	700/1000/30 : PLC1 : Computer Link : KV Mode (Hos : First LH HL	000/500 « :t Link) Cha	00/7000/8000 ]	(	Comm Manual
elect Device PLC Setting[ KV-7 Alias Name Interface Protocol String Save Mode Use Redundan Operate Conditon :	YOO/1000/30 : PLC1 : Computer Link : KV Mode (Hos : First LH HL CY ND ~	000/500 ( it Link) Cha	00/7000/8000 ]	(	Comm Manual
elect Device PLC Setting[ KV-7 Alias Name Interface Protocol String Save Mode Use Redundann Operate Condition : Change Condition :	POO/ 1000/30 PLC1 Computer Link KV Mode (Hos First LH HL CY ND TimeOut	c t Link) 5	00/7000/8000 ]	(	Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redunctann Operate Condition : Change Condition :	POO/1000/30 PLC1 Computer Lini KV Mode (Hos First LH HL Cy ND TimeOut Condition	5	00/7000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : Change Condition : Primary Option	VOO/1000/38  PLC1 Computer Lini KV Mode (Hos First LH HL Cy ND Condition	5	D0/7000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout	VOO/1000/30 : PLC1 : Computer Link : KV Mode (Hos : First LH HL CY ND Condition 300	c t Link) Cha	00/7000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout Send Wait	Y00/1000/30           :         PLC1           :         Computer Link           :         KV Mode (Hos           :         First LH HL           CV         ND           TimeOut         Condition           300         Image: Description of the second s	c t Link) ( Chi 5 msec msec	00/7000/8000 ] v v v v v v v v v v v v v		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry	YOO/ 1000/30           :         PLC1           :         Computer Lini           :         KV Mode (Hos           :         First LH HL           Cy           NND         ImeOut           Condition           300         \$           5         \$	5 ] msec	00/7000/8000 ] ∨ ∨ × (Second)		Comm Manual Edit
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode USe Redunctann Operate Condition : Primary Option Timeout Send Wait Retry Network	Y00/1000/30           :         PLC1           :         Computer Link           :         KV Mode (Hos           :         First LH HL           Cy           NND           TimeOut           Condition           300           5           1:1	000/500	200/70000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Primary Option Timeout Send Wait Retry Network	200/1000/30     PLC1     Computer Link     KV Mode (Hos     First LH HL     Cy     TimeOut     Condition     300 €     5 €     1:1 ✓	Children Chi	00/7000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : Primary Option Timeout Send Wait Retry Network	200/1000/30 : [PLC1 : Computer Lini : KV Mode (Hos : First LH HL CY TimeOut Condition 300 € 5 € 1:1 ✓	c c t Link) Chi Chi Chi Chi Chi Chi Chi Chi Chi Chi	00/7000/8000 ]		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Network	200/1000/30         :       PLC1         :       Computer Lini         :       KV Mode (Hos         :       First LH HL         Cy         NND         TimeOut         Condition         300         5         111	Children Chi	00/7000/8000 ] ∨ ∨ v v v v v v v v v v v v v		Comm Manual
elect Device PLC Setting[KV-7 Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Network	200/1000/30 : [PLC1 : Computer Lini : KV Mode (Hos : First LH HL CY NND ✓ TimeOut Condition 300 € 5 € 1:1 ✓	Children Chi	200/70000/8000 ] v v v v v v v v v v v v v		Comm Manual Edit

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-700/1000/3000/5000/7000"			
	PLC	Select an external device to connect to TOP.			
		Model	Interface	Protocol	
KEYENCE KV Series Loader Comp		Computer Link	Computer Link(KV LINK MODE		
		Please check the system config connect is a model whose syste	juration in Chapter m can be configure	r 1 to see if the external device you want to ed.	



# 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-422	RS-422	
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.



#### (2) Communication option setting

■ [Project > Project Property > Device Setting > COM > PLC1: Computer Link]

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

Project Option			×
Change HMI[H] Add F	PLC [A] TID Change PLC[C] X Delete PLC[D]		
Change HMI[H] Add F Change HMI[H] Change Add F Change HMI[H] Change Add F Correction Module Setting Correction FieldBus (0) Correction RFID (0) Correction Correction (0) Correction (0	PLC [d] The Change PLC[C] Color Delete PLC[D]  PLC Setting[ KV-700/1000/3000/5000/7000/8000 ]  Alias Name : PLC1 Interface : Computer Link Protocol : KV Mode (Host Link)  String Save Mode : First LH HL Change Condition : ImeOut Change Condition : ImeOut Condition Edit  Primary Option Timeout 300 © msec Send Wait 0 © msec Retry S© Network 1:1 ✓	Co	mm Manual
< >			
		Apply	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.	
Station Num	Enter the Kv mode's Station Num.	
StationNoUse	Determines whether or not the Station Num is going to be used. (0: Disable; 1: Enable)	
	If the Station Num does not match the plc, the plc does not respond.	



#### 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-422	RS-422	
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.
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
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.	
Station Num	Enter the Kv mode's Station Num.	
StationNoUse	Determines whether or not the Station Num is going to be used. (0: Disable; 1: Enable)	
	If the Station Num does not match the plc, the plc does not respond.	



#### **3.3 Communication diagnostics**

■ Check the interface setting status between the TOP and an 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.

ltems	Contents		Check		Remarks	
System	How to connect the sy	stem	OK	NG	1 System configuration	
configuration	Connection cable name	е	OK	NG		
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	ОК	NG	2. External device selection 3. Communication setting	
		diagnostics				
	Serial Parameter	Transmission	OK	NG		
		Speed	ŬK			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	CPU name		OK	NG		
	Communication port n	OK	NG			
	Protocol (mode)	OK	NG			
	Setup Prefix	OK	NG			
	Other detailed settings		OK	NG	1. External device cotting	
	Serial Parameter	Transmission	OK	NG	4. External device setting	
		Speed	ŬK			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
	Check address range				6. Supported addresses	
		ОК	NG	(For details, please refer to the PLC		
				vendor's manual.)		



#### 4.1 KV 5500/5000/3000 series

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

#### 4. 2 KV-7000 series

From Extension cassette, configure the operation mode to KV mode (host link), as shown in the figure below.

Extension cassette (right) (Port 2)						
Extension cassette	KV-N11L(RS-422A/485)					
Operation mode	KV mode (host link) -					
Interface	RS-422A/485 (4-wire type)					
Baud rate	115200bps	_				
Data bit length	8bit(*)					
Start bit	1 bit(*)					
Stop bit	1 bit(*)					
Parity	Even number(*)					
RS/CS flow control	Disable(*)					
KV mode Station No.	0(*)					



# 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-422 (connection)

(A) TOPR COM Port (9 pin)

COM				"HITACHI Series"		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
$ \begin{array}{ccc} 1 & 5 \\ 0 & 0 \end{array} $	RDA	1 ·			SDB	
		2				
		3				
Based on	RDB	4 ·			SDA	
communication	SG	5				
cable connector	SDA	6 ·			RDB	
front,		7				
D-SUB 9 Pin male		8				
(male, convex)	SDB	9 ·			RDA	

\*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.



# 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 I	Vemory	TM000.00 – TM511.15	TM000 – TM511	
Expansion D	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			Z01 – Z12	32bit
Link Register			W0000 – WFFFF	
High-Speed Counter Current Value			CTH0 – CTH1	32bit
High-Speed Counter Comparator			CTC0 – CTC3	32bit
File Register			7500000 75121071	
- Consecutive Number mode			2F000000 - 2F131071	
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