# **OMRON Industrial Automation**

# V680 RFID Controller Series

Supported version

TOP Design Studio



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We want to thank our customers who use the Touch Operation Panel.

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Describes the cable specifications required for connection.



# 1. System configuration

The system configuration of TOP and "OMRON V680 RFID" is as follows.

Series	СРИ	Link I/F	Communication method	System setting	Cable
		RS-232C Port		3.1 Settings	
RFID		on CPU unit	K3-232C	example 1	
	V680-CA5D01-V2/-CA5D02-V2	RS-422,485 Port	RS-422/485	<u>(Page 4)</u>	E 1 Cabla tabla 1
		on CPU unit		4. External device	
				setting	
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### Connection configuration

• 1:1 connection





• 1 : N connection - Available in RS422 communication.





Out Device



.....



# 2. External device selection

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

PLC select [CO	M1]						
Filter : [All]			$\sim$		Search :		
					۲	Model	○ Vendor
Vendor W3I Corporation		Model					
			SYSMAC	CS/CJ/CP Series	1		
MITSUBISHI Electric Corp	oration		SYSMAC	C/CV Series			
OMRON Industrial Autom	ation	8	V680 RF	ID Series			
S Industrial Systems			COMPO	VAY/F			
MODBUS Organization							
SIEMENS AG.							
Rockwell Automation							
GE Fanuc Automation							
ANASONIC Electric Wor	ks						
YASKAWA Electric Corpo	ration						
OKOGAWA Electric Corp	oration						
Schneider Electric Indust	ries						
KDT Systems							
RS Automation		~					
lect Device	RFID Serie	es ]					
elect Device PLC Setting[ V680 Alias Name :	RFID Serie	es ]					
elect Device PLC Setting[ V680 Alias Name : Interface :	RFID Serie PLC1 Serial	25]	~				
lect Device PLC Setting[ V680 Alias Name : Interface : Protocol :	RFID Serie PLC1 Serial V680	25 ]	~			Com	m Manual
lect Device PLC Setting[ V680 Alias Name : Interface : Protocol :	RFID Serie PLC1 Serial V680	es ]	>		(	Com	m Manual
PLC Setting[ V680 Alias Name : Interface : Protocol :	RFID Serie PLC1 Serial V680	25 ]	>		(	Com	m Manual
PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition :	RFID Serie PLC1 Serial V680 / D ~ TimeOut	25]	V V	đ	(	Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance perate Condition : Annge Condition :	RFID Serie PLC1 Serial V680 / D V TimeOut Condition	es ]	✓ ✓ ♦ (Secon	a)		Com	m Manual
Hect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Derate Condition : Change Condition :	RFID Serie PLC1 Serial V680 V D V TimeOut Condition	<b>25</b> ]	✓ ✓	J)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Primary Option Tensout	RFID Seriel PLC1 Serial V680 D TimeOut Condition	25 ]	↓ ↓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Cond Motit	RFID Seriel PLC1 Serial V680  TimeOut Condition	es ]	↓ ✓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Conduct Send Wait Conduct Send Wait	RFID Seriel PLC1 Serial V680 V TimeOut Condition 300 2 0 3 3 3 3 3 3 3 3 3 3 3 3 3	es]	↓ ✓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry	RFID Serie           PLC1           Serial           V680           ImeOut           Condition           300           5	es]	↓ ↓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Primary Option Timeout Send Wait Retry Controller (Station) No.	Serial           V680           D           TimeOut           Condition           300           5           5           6	es]	↓ ↓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Primary Option Timeout Send Wait Retry Controller (Station) No. CH Total No.	Serial           PLC1           Serial           V680           D           TimeOut           Condition           300           5           5           6           2	s ]	C (Secon			Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Controller (Station) No. CH Total No.	Serial           Vc1           Serial           V680           D           TimeOut           Condition           300           5           5           2	es ]	(Secon	ð)		Com	m Manual
PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Controller (Station) No. CH Total No.	Serial           PLC1           Serial           V680           D           TimeOut           Condition           300           5           6           2           1	ss]	↓ (Secon	d)		Com	m Manual
elect Device PLC Setting[ V680 Alias Name : Interface : Protocol : Use Redundance Operate Condition : Primary Option Timeout Send Wait Retry Controller(Station) No. CH Total No. CH No.	Serial           PLC1           Serial           V680           D           TimeOut           Condition           300           5           6           2           1	es ]	↓ (Secon	d)		Com	m Manual

Settings			Contents			
ТОР	Model	Check the display and process of TOP to select the touch model.				
External device	Vendor	Select the vendor of the external device to be connected to TOP. Please select "OMRON Industrial Automation".				
	PLC	Select an external device to co	onnect to TOP.			
Model		Model	Interface	Protocol		
		V680 RFID Series	Serial	V680		
		Please check the system conf connect is a model whose syst	guration in Chapter 1 to see if em 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 properties > TOP settings] → [HMI settings > Check "Use HMI settings" > Edit > Serial ]

Change HMI[ <u>H]</u>	PLC [A] TTT Change PLC[C]	] Delete PLC[D]			
	Date / Time Sync.         Sca           Project Option         Screen           ✓ Use HMI Setup Option         Project Setting           Hmi Setup Option         Project Name=New project           Start Kode=Menu         Start Kode=Menu           Start Screen No.=1         Latch Use=0           Latch Use=0         Latch Use=0           Latch Use=0         Start Screen ToMessage=10           Startage=rorMessage=1         DatabaseMessage=1	reen Option Unit Cor n Change HmiSetup t	Global Lock & Touch	Project Style Splash	PLC Buffer Sy
Control Panel					
🔯 System	🔤 Devic	ces 📮	Service	💾 Option	
-		💻 📼 Seri	al		×
PLC S	ecurity Date	Se s/Time Si	rial Port: gnal Level RS-232C O RS-4	COM1 422(4) 〇 RS-485(	•
			Baud Rate:	9600	-
	•		Data Bit:	7	•
Ethernet	Serial H	IDM I	Stop Bit:	2	-
		Р	arity Bit:	Even	-
infi 🗸		Ping	Flow:	Off	-
Diagnost ic	File P	ing Au	to Search	Loopback Te	st
	Manager				

Items	ТОР	External device	Remarks	
Signal Level (port)	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485		
Baud Rate	9600			
Data Bit	7			
Stop Bit	2			
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 properties > Device setting > COM > "PLC1 : V680 RFID Series"]
  - Set the options of the communication driver of V680 RFID Series in TOP Design Studio.

Project Option			$\times$
Change HMI[H] Add PL	C 🔝 👬 Change PL	PLC[C] Delete PLC[D]	
	PLC Setting[ V680 I Alias Name : Interface : Protocol :	RFID Series ]           : PLC1           : Serial           : V680           : V680	nual
	Operate Condition : ANI Change Condition : I I	Y       ND       1 TimeOut       5       (Second)       1 Condition   Edit	
	Timeout Send Wait Retry Controller(Station) No. CH Total No.	300 💌 msec 0 💌 msec 5 💽 0 📡	^
	CH No. Trigger	CH 1 1	
	OK NG Data • Error Message	SYS       ∨       00000.01       □       □       □         SYS       ∨       00000.02       □       □       □       □         SYS       ∨       00100       □       □       □       □       Words	
	✓ No Tao : Input the sp	snerified message	~
		Apply	ose

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "V680".	device selection".
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	it (ms) Set the waiting time between TOP's receiving a response from an external device and	
	sending the next command request.	
Retry	Configure the amount of redelivery attempts from TOP to external device.	
Controller No.	Set the station number of the controller that communicates with TOP.	Station No.
CH Total No.	Set total number of channels.	

	70				
	CH 1				
CH No.					
Trigger	II SYS ✓ 00000.00				
ОК	∎ SYS ✓ 00000.01				
NG	II SYS → 00000.02				
Data	SYS V 00100 25 Words				
Error Message					
✓ No Tag : Input the :	specified message				
- Message	No Tag				
- Destination	Data Address				
🗏 No Tag : Input a me	essage from address				
- Message	SYS V 00200				
- Destination	II SYS → 00300				
- Size	0 Words				
🗸 Read Error : Input t	the specified message				
- Message	Read Error				
- Destination	Data Address				
Read Error : Input a message from address					
- Message	II SYS ∨ 00400				
- Destination	II SYS ✓ 00500				
- Size	0 Words				

### ■ Communication interface setting

Items		Details	Contents
CH No.			RFID antenna number
Trigger			Conditional bit configuration required to execute RFID reading.
OK			Corresponding address turns on when RFID reading is normal User must manually turn off, since off operation does not occur
NG			Corresponding address turns on when an error occurs User must manually turn off, since off operation does not occur
Data			Address for storing loaded RFID data (Other PLC address can be used) Designate maximum words for loaded RFID data
Error message processing method		Direct Input (Input the specified message )	Method used to make an entered message appear by default on the drawing screen when an error occurs.
		Address variable (Input a message from address)	Method that allows users to designate a set amount of words as a variable for the designated address when an error occurs.
	Direct	Message	Enter the tag error message to be used as default.
	Input	Destination	Stores the data address.
No Tag		Message	Message content to be stored when tag error occurs
	Address	Destination	Address for storing message when tag error occurs.
	variable	Size	Maximum words of a message to be stored when tag error occurs
	Direct	Message	Enter the communication error message to be used as default.
	Input	Destination	Stores the data address.
Deed Free		Message	Message content to be stored when communication error occurs
Read Error	Address	Destination	Address for storing message when communication error occurs.
	variable	Size	Maximum words of a message to be stored when communication error occurs

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## 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	RS-232C / RS-422 / RS-485	RS-232C / RS-422 / RS-485		
Baud Rate	960	0		
Data Bit	7			
Stop Bit	2			
Parity Bit	Eve			

 $\,^{\star}$  The above settings are setting  $\underline{examples}$  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 ]

Run   WIC   VNC   Viewer   Screen   Diagnostic   Driver(COM1)    Driver(COM1)    PLC1(V680 RFID Series)   Interface   Screen   Driver(COM1)    Driver(COM1)    PLC1(V680 RFID Series)   Interface   Screen   Driver(COM1)    Driver(COM1)    PLC1(V680 RFID Series)     Protocol   V680   Protocol   V800   Protocol   V800   Protocol   V800   Protocol   Protocol   Protocol   V800   Protocol   V800   Protocol   Protocol </th <th></th> <th>Ö</th> <th>1001</th> <th>PLC</th> <th>×</th>		Ö	1001	PLC	×
Hun   Interface   PLC   PLC   PLC   Fineout   300   msec   Send Wait   O   Ethernet   Diagnost ic     Interface     Interface     Protocol   V680   Protocol   Send Wait   O   Retry   Controlle   O   Controlle   O   CH   No.		🔯 Syste	Driver(COM1)	PLC1(V680 RFID Series) 🔻	
VNC   VNC   Viewer   Ethernet   Screen shot   Diagnostic    Protocol V680 Timeout 300 mec Mec Send Wait 0 mec Retry 5 mec Controlle 0 mec Retry 5 mec Controlle 0 mec Her Controlle 0 mec Metry 5 mec Controlle 0 mec Metry 5 mec Metry Controlle 0 mec Metry Controlle 0 mec Controlle 0 mec Controlle 0 mec Metry Controlle 0 mec Metry Controlle 0 mec Metry Controlle 0 mec Metry Controlle Metry Controlle Metry	Run		Interface	Serial 💌	<u> </u>
VNC PLC Timeout 300 * msec   VNC Send Wait 0 * msec   Viewer Image: Send Wait 0 * msec   Ethernet Retry 5 *   Controlle 0 *   Controlle 0 *   CH Total 2 *   Diagnostic CH No.			Protocol	V680 💌	
YNC   Viewer   Ethernet   Screen   Shot   Diagnostic     Screen     Screen <td< th=""><th>VNC</th><th>PLC</th><th>Timeout</th><th>300 🖨 msec</th><th></th></td<>	VNC	PLC	Timeout	300 🖨 msec	
Viewer   Viewer   Ethernet   Retry   Controlle   O   Ch Total   2   Diagnostic     CH No.     Image: Character of the state of the sta	VNC		Send Wait	0 🖨 msec	
Controlle 0 Ethernet CH Total 2 Diagnostic CH No. 1 ↓	Viewer	I 🏠	Retry	5	
CH Total 2 Screen shot Diagnostic CH Total 2 CH CH No. 1 CH No.		Ethernet	Controlle	0	
Screen shot Diagnostic CH No. 1	0.		CH Total	2 🔻	
Diagnostic CH No.	Screen	South N			сн
	SHOT	Diagnostic	CH No.	1 -	
			•		
[System] Diagnostic Apply Cancel		[System]	Diagnostic		Apply Cancel

Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External
Protocol	Select "V680".	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.	
Retry	Configure the amount of redelivery attempts from TOP to external device.	
Controller No.	Set the station number of the controller that communicates with TOP.	Station No.
CH Total No.	Set total number of channels.	



## **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 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.

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



# 4. External device setting

Configure the RFID switch communication settings as follows. For more detailed setting methods than described in this example, please refer to the PLC user manual.

1. SW 1, SW 2 (Controller Number): Set to 0 as follows.

SW1	SW2	Controller No
Upper digit	Lower digit	Controller No.
0	0	0
0	1	1
0	2	2
0	3	3
0	4	4
0	5	5
0	6	6
0	7	7
0	8	8
0	9	9
1	0	10
1	1	11
:	:	:
2	9	29
3	0	30
3	1	31
3	2	Setting prohibited
3	3	Setting prohibited
:	:	:
9	9	Setting prohibited

2. SW3, PIN 1 (SW Enable Switch): Set to OFF.

SW3, pin 1	Description
OFF	DIP switch enabled
ON	Internal settings enabled

3. SW3, Pin 2 (Reserved by System): Set to OFF.

#### 4. SW3, Pins 3 and 4 (Baud Rate): Set both pin 3 and 4 to OFF.

SW3, pin 3	SW3, pin 4	Description
OFF	OFF	9,600 bps
	ON	19,200 bps
ON	OFF	38,400 bps
	ON	115,200 bps

#### 5. SW3, Pin 5 (Data Length): Set to OFF.

SW3, pin 5	Description
OFF	7 bits
ON	8 bits

#### 6. SW3, Pins 6 and 7 (Parity): Set both pin 6 and 7 to OFF.

SW3, pin 6	SW3, pin 7	Description
OFF	OFF	Even
	ON	None
ON -	OFF	Odd
	ON	Even



•

### 7. SW3, Pin 8 (Stop Bit Length): Set to OFF.

SW3, pin 8	Description
OFF	2 bits
ON	1 bit

8. SW3, Pin 9 (Communications Protocol): Set to ON.

SW3, pin 9	Description
OFF	1:1
ON	1:N

9. SW3, Pin 10 (Command System): Set to OFF>

SW3, pin 10	Description
OFF	V680 commands
ON	V600 commands

10. SW4, Pins 1, 2, and 3 (Maintenance Mode Switch Settings): Set all of pin 1, 2, and 3 to OFF.

SW4, pin 1	SW4, pin 2	SW4, pin 3	Description		
	OFF	OFF	Distance Level Measurement Mode		
OFF	011	ON	Tag Communications Test Mode		
	ON	OFF	Speed Level Measurement Mode, Read		
		ON	Speed Level Measurement Mode, Write		
	OFF	OFF	Noise Level Measurement Mode		
ON	ON	OFF	Communications Success Rate Measurement Mode		
		ON	Host Communications Monitor Mode		

11. SW4, Pin 4 (Antenna Specification): Set the antenna number you want to use as follows.

SW4, pin 4	Description
OFF	Antenna 1
ON	Antenna 2

12. SW4, Pin 5 (Write Verification): Set to ON.

SW4, pin 5	Description
OFF	With write verification
ON	Without write verification

13. SW4, Pin 6 (Lower Trigger Execution): Set to OFF.

SW4, pin 6	Description		
OFF	None		
ON	Enabled (on rising edge)		

**14.** SW4, Pin 7 (Write Protection Function): Set to ON.

SW4, pin 7	Description
OFF	Enabled
ON	Disabled

15. SW4, pin 8 (V680-H01 Antenna connection setting): Set the antenna type you want to use as follows.

SW4, pin 8	Description		
OFF	Connection to antennas other than the V680-H01		
ON	Allows connection of the V680-H01 Antenna.		

16. SW4, Pin 9 (Run Mode): Set to OFF.

SW4, pin 9	Description		
OFF	Command Execution Mode		
ON	Self-execution Mode		



### **17.** SW4-10 (High-speed Data Transmission setting): Set to OFF.

SW4, pin 8	Description
OFF	Normal mode
ON	High-speed mode

### **18.** SW 5 (Mode Switch Setting): Set to OFF.

SW5	Description			
OFF	Run Mode			
ON	Maintenance Mode			

### 19. SW 6 (Terminating Resistance): Set to OFF.

SW6	Description		
OFF	Terminating resistance OFF		
ON	Terminating resistance ON		



# 5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device. (The cable diagram described in this chapter may differ from the recommendations of "Omron V680 RFID".)

### ■ 1:1 connection

TOP COM Port (9 pin)

ТОР				RFID		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
1 5	CD	1		1	NC	1 5
$(\circ \circ)$	RD	2		2	SD	$(\circ \circ)$
	SD	3		3	RD	
6 9	DTR	4		4	RS	6 9 Deced on
	SG	5	<b>⊢_</b> •	5	CS	communication
cable connector	DSR	6		6	NC	cable connector
front	RTS	7		7	NC	front
D-SUB 9 Pin male	CTS	8	<b>_</b> •	8	NC	D-SUB 9 Pin male
(male, convex)		9	•	9	SG	(male, convex)

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

#### ■ 1 : N connection

TOP COM Port (9 pin)

TOP				RFID		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
1 5	RDA	1		4	SDB	
00	RDB	4		3	SDA	
	SDA	6		2	RDB	
6 9 Deced on	SDB	9		1	RDA	L
based on						Terminal No. 1 2 3 4 5
communication						Based on
cable connector						communication
front,						cable connector
D-SUB 9 Pin male						front.
(male, convex)						3 <b>y</b>

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