



Industrial Ethernet Connection Manual

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1.0 What is Industrial Ethernet?

Industrial Ethernet is a communication protocol for real-time control using Ethernet in an industrial environment. This function enables cyclic communication with PLCs (programmable logic controllers) compliant with the following standards to control the reader's operation:

- EtherNet/IP *

*EtherNet/IP is a registered trademark of ODVA (Open DeviceNet Vendor Association Inc).

2.0 Supported Models

The following are the supported models:

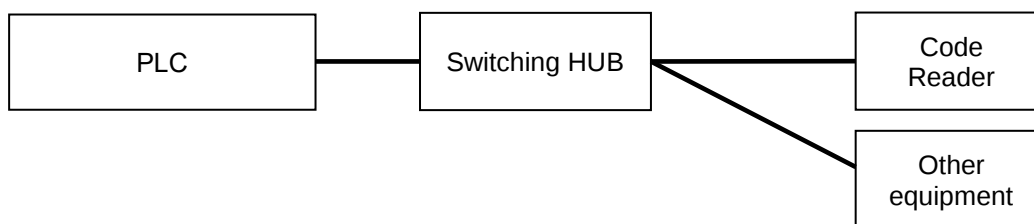
Fixed Barcode Readers:

- V6180 – Firmware v1.6b
- V7000 – Firmware v1.4b

3.0 Supported PLC

Rockwell Automation

Series	Connection type	Models	Note
ControlLogix series *	Controller	ControlLogix series CompactLogix series	



* ControlLogix Series is a registered trademark of Rockwell Automation.

4.0 Industrial Ethernet Configuration

An example configuration for communication via Industrial Ethernet is shown below.

4.1 Important Considerations for Configuration

4.1.1 Communication Range

- Devices must be within the same network address on the Ethernet.
- The range beyond the router cannot be accessed.

4.2 Switching Hub Requirements

4.2.1 Hub specifications:

- Compliant with the IEEE 802.3 (100BASE-TX) standard
- Supports auto-negotiation
- Includes Auto MDI/MDI-X functionality
- Must be a Layer 2 switch (repeater hubs are not supported)

5.0 Set up a V7000 or a V6180 scanner.

Follow the quick start guides and user manuals to connect the scanner to a PC and configure its camera settings.

6.0 Set up communication settings.

6.1 PLC and PC Requirements:

1. Have the **V7000/V6180** IP address ready, if the IP address is unknown, use the default IP address: **192.168.209.10**

NOTE: If the default IP address does not work and no IP address is known, then follow instructions to reset the scanner to defaults using Teach button (section 7.0)

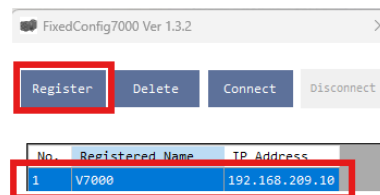
2. Set PC Ethernet adapter (IPv4) to **192.168.209.xxx** – where “xxx” is an arbitrary number between **1 and 255.**
 - Navigate to settings → Network & Internet → Ethernet.
 - Click Edit under IP assignment section.
 - Select Manual set up from the drop-down menu.
 - If required, select the IPv4 option, or turn it On by using the switch.
 - Add the IP address, subnet mask, Gateway, and Preferred DNS

Settings	Example Value
IP Address	192.168.209.100
Subnet Mask	255.255.255.0
Default Gateway	192.168.209.1
DNS Server	192.168.209.1

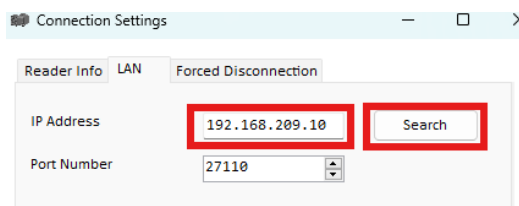
6.2 V7000 FixedConfig connection

FixedConfig – v1.3.2 can be downloaded here: Brady_ID.com/V7000

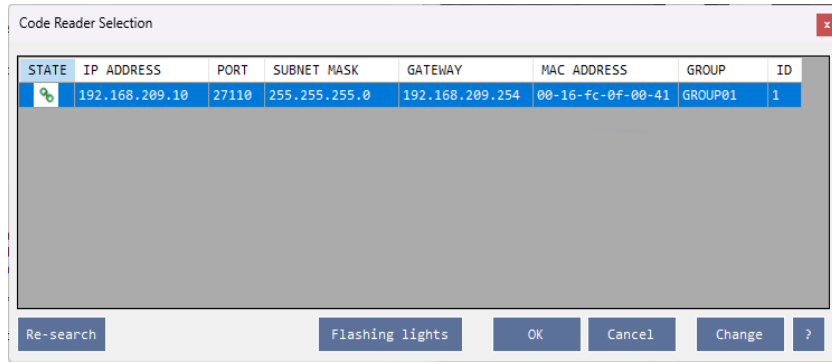
1. Open **FixedConfig7000 application**, by default a device will be registered, double-click the registered device to open its settings. If no registered device is listed, then click the Register button on the top menu. The connection settings dialog box will appear.



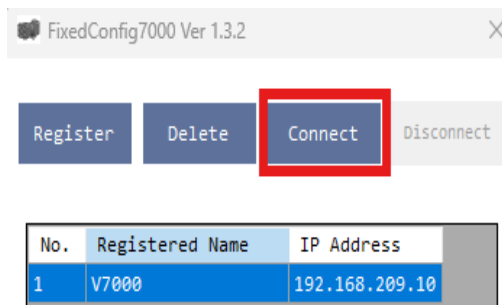
2. “**Registered Name**” and “**Model Name**” are set to V7000 by default, use existing names or set new names when registering if desired.
3. Click on the **LAN tab** to set the IP address. If the IP address is unknown, click **Search** to scan for available devices.
 1. The available V7000 IP addresses will be displayed. Select the correct device. If that does not work, then use the default V7000 IP address (192.168.209.10) or use the reset V7000 to defaults in section 7.0.



4. When the search is complete and the IP address and port number are found, click "**OK**" or **double click** on the correct V7000



5. Click **Register**.
6. **Before connecting, unplug the network cable and restart the V7000. Wait for the boot process to be complete, then reconnect the network cable**
7. Click **“Connect,”** and if all settings are correct, the FixedConfig7000 will start right away. If it does not start right away, please click **“Cancel”** on the prompt, go back to step 3, and fix the IP address.



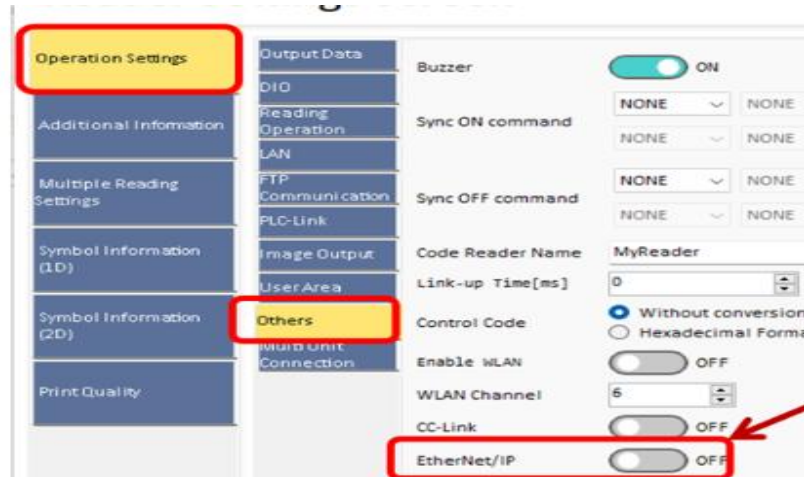
6.2.1 Enable Ethernet/IP Communication

Turn on Ethernet/IP protocol.

NOTE: There are two ways to accomplish this using FixedConfig7000 App (1. Switch, 2. Terminal).

6.2.1.1 Using FixedConfig7000 switch

1. Navigate to **Operation Settings** → **Others**.
2. Turn ON the Ethernet/IP setting by toggling this switch.



3. Click **Write Settings** and **Save Settings**.
4. **Reboot** the V7000 to apply changes.

6.2.1.2 Using Terminal window

1. Open the terminal window and send command: **IEMODE=1**



2. Verify if Ethernet/IP has been enabled by sending this command: **?IE**

Terminal Screen

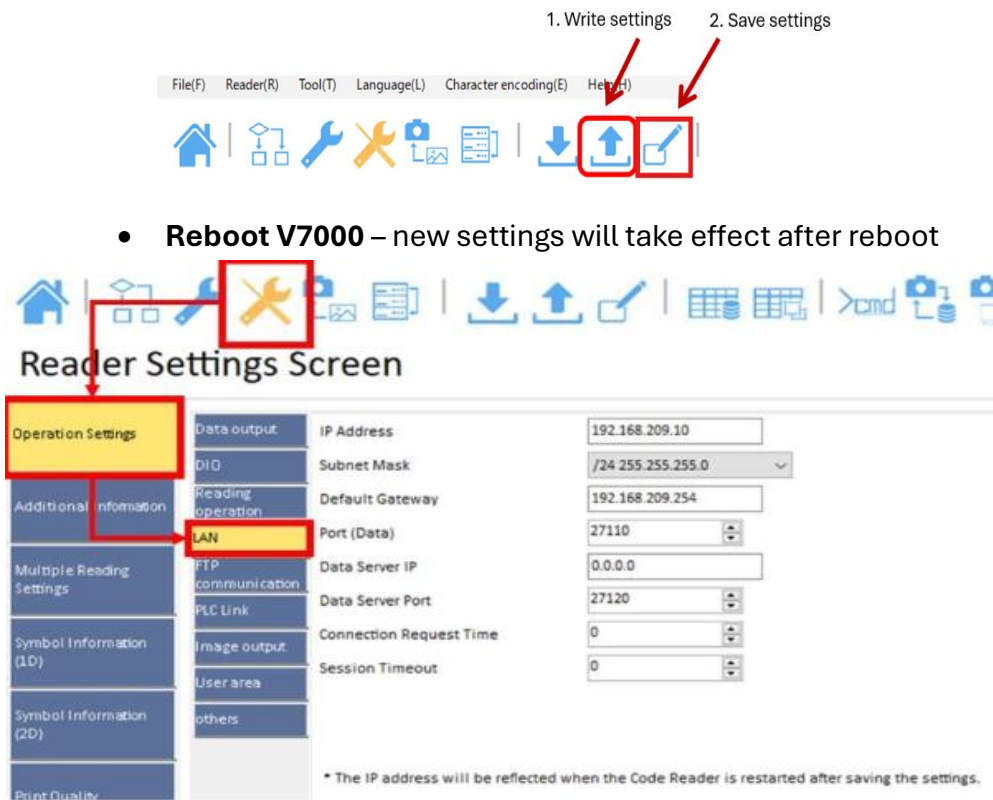
```
?IE
=====
?IE
-----
IEMODE=1    (0:OFF,1:EIP)
V7000
175-V1.4b
=====
```

NOTE: For additional terminal commands, refer to **Appendix A**.

6.2.2 Setup Ethernet Settings (Optional to change default values)

6.2.2.1 LAN settings

- Open **FixedConfig7000**.
- Click on **Reader Setting**.
- Navigate to **Operation Settings** → **LAN**.
- Set up all Ethernet Settings
- Click **Write Settings** to apply changes.
- Save settings to V7000

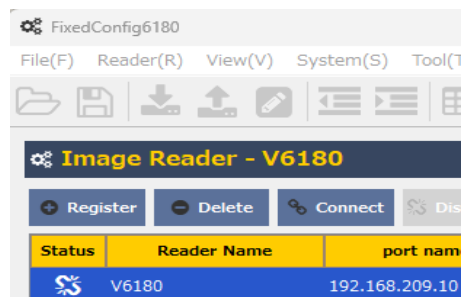


Note: If the V7000 does not apply changes, verify the IP settings, and check network connectivity.

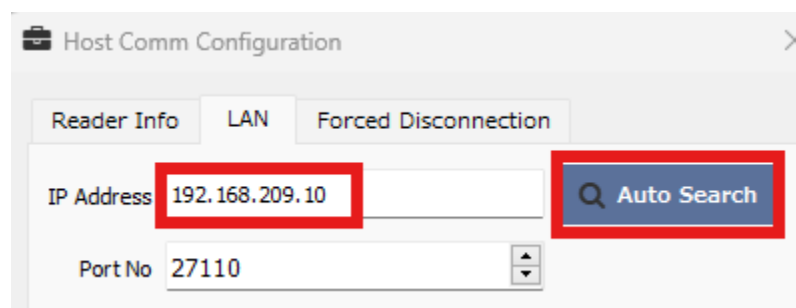
6.3 V6180 FixedConfig Connection

FixedConfig – v2.1.13 can be downloaded here: Brady_ID.com/V6180

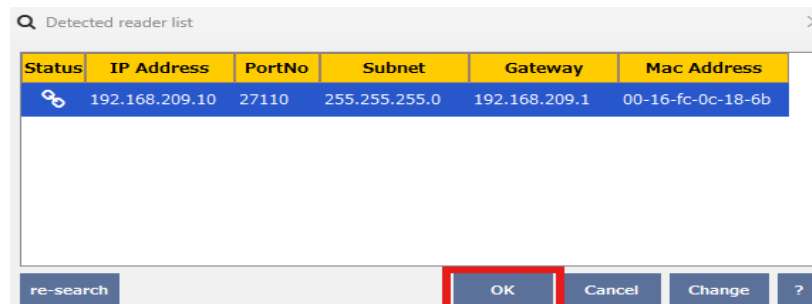
1. Open **FixedConfig6180 application**, by default a device will be registered, double-click the registered device to open its settings. If no registered device is listed, then click the Register button on the top menu. The connection settings dialog box will appear.



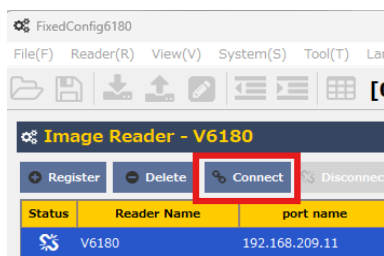
2. “**Registered Name**” and “**Model Name**” are set to V6180 by default, use existing names or set new names when registering if desired.
3. Click on the **LAN tab** to set the IP address. If the IP address is unknown, click **Search** to scan for available devices.
4. The available V6180 IP addresses will be displayed. Select the correct device. If that does not work, then use the default V6180 IP address (192.168.209.10) or use the reset to defaults in section 7.0.



- When the search is complete and the IP address and port number are found, click "**OK**" or **double click** on the correct V6180



- Click **Setting**, the V6180 will auto connect if not move to 7.
- Click "**Connect,**" and if all settings are correct, the FixedConfig6180 will start right away. If it does not start right away, please click "**No**" on the prompt, go back to step **number 3**, and fix the IP address.



6.3.1 Enable Ethernet/IP Communication

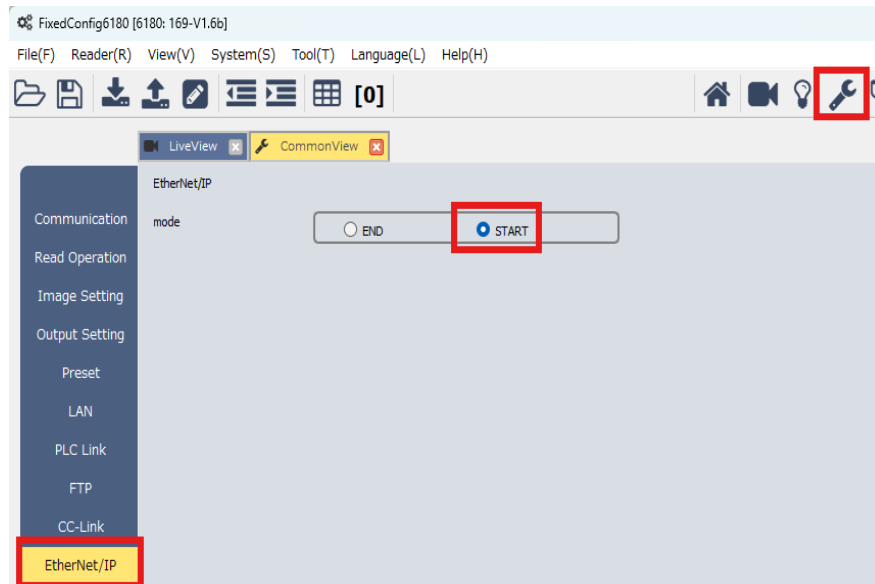
Turn on Ethernet/IP protocol.

NOTE: There are two ways to accomplish this using FixedConfig6180 App (1. Radion button, 2. Terminal).

6.3.1.1 Using FixedConfig6180 radio button

- Navigate to **View** → **common View**→ **Ethernet/IP** (or click the wrench icon)

2. Turn ON the **Ethernet/IP** protocol by selecting the “**START**” radio button



3. Click **Write Settings** and **Save Settings**.
4. **Reboot** the V6180 to apply changes.

6.3.1.2 Using Terminal window

1. Open the terminal window and send command: **IEMODE=1**



2. Verify that Ethernet/IP has been enabled by sending this command: **?IE**

```
>IEMODE=1
ACK, IEMODE=1

>?IE

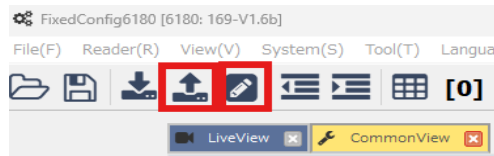
***** STATUS *****
IEMODE=1    (0:OFF,1:EIP)
***** END *****
V6180 : 169-V1.6b
```

NOTE: For additional terminal commands, refer to **Appendix A**.

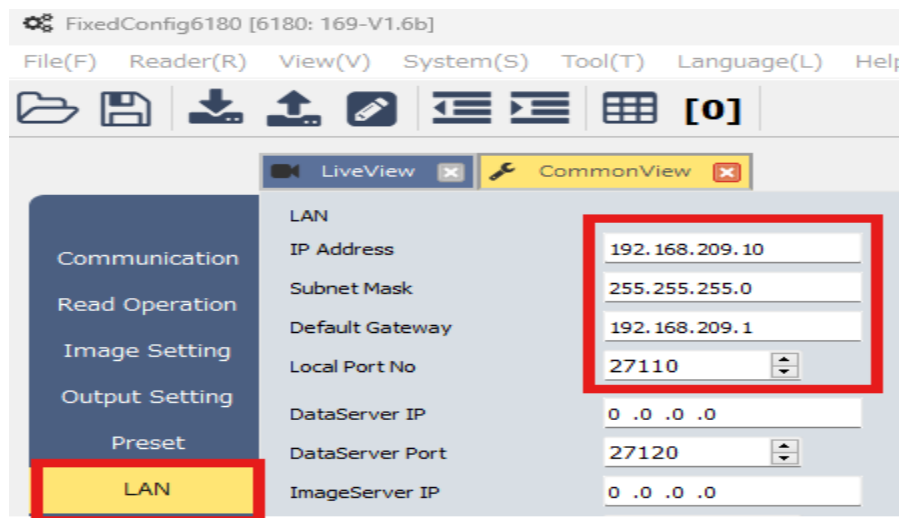
6.3.2 Setup Ethernet Settings (Optional to change default values)

6.3.2.1 LAN settings

- Open **FixedConfig6180**
- Navigate to **View → Common View → LAN**
- Set up all Ethernet Settings
- Click **Write Settings** to apply changes.
- Save settings to **V6180**



- **Reboot V6180** – new settings will take effect after reboot



7.0 Reset the IP address to defaults (Optional)

1. Turn off V7000/V6180 by removing the power.
2. Hold down the **TEACH key (button)** and turn On the V7000/V6180 without releasing the TEACH key.



3. The V7000/V6180 will begin its boot up process, release the **TEACH** key when the status **LED-READY** lights up.
4. The **IP address** will be temporarily set to the default IP address: **192.168.209.10**, **but the Ethernet saved settings will not be overwritten**. Connect to the V7000/V6180, and reset the Ethernet settings, then **write** the settings, and **save** the settings.

NOTE: After rebooting, the V7000/V6180 will reload its saved Ethernet settings, not the temporary default settings.

Default values: **IP address: 192.168.209.10**

Subnet mask: /24 or 255.255.255.0

Server Port number: 27110

Default gateway: 192.168.209.254

8.0 PLC Rockwell connection Setup

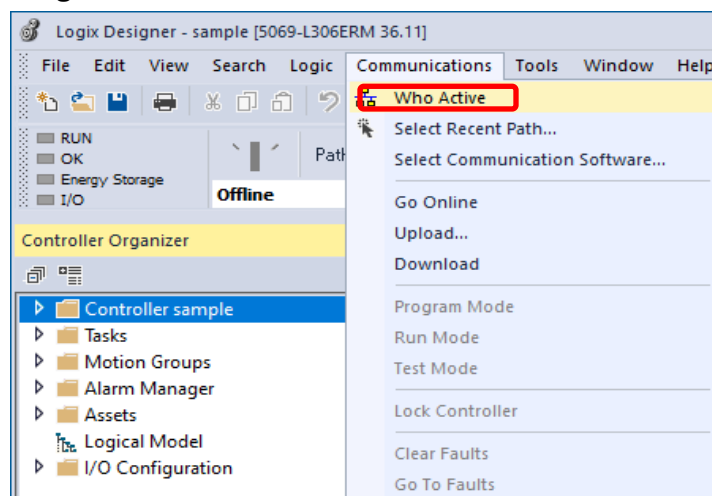
This section describes the configuration procedure using "**Logix Designer**", a configuration tool for **Rockwell Automation PLCs**.

8.1 EtherNet/IP

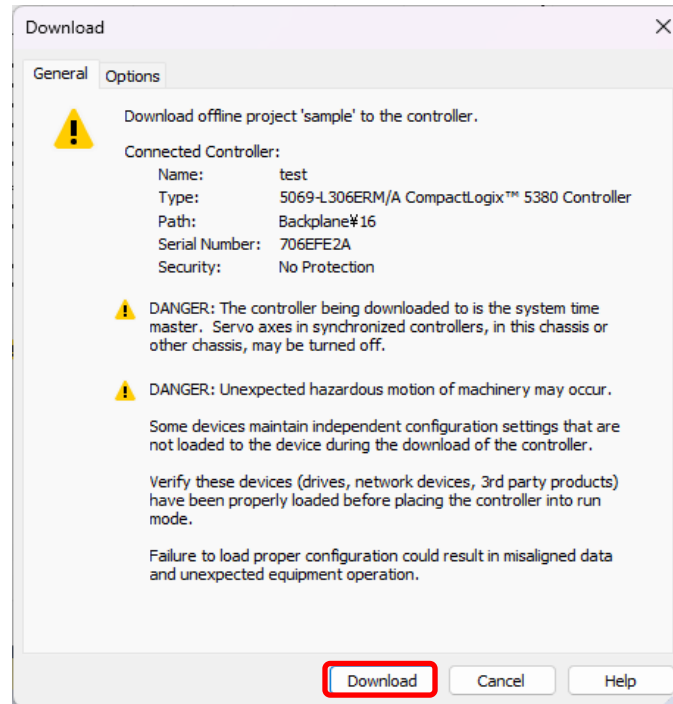
An **EDS file** is required when connecting to a code reader.

8.1.1 Setting the IP address

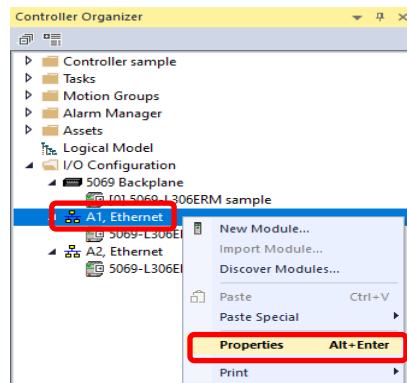
1. Open "**Logix Designer**".
2. Navigate to **Communications → Who Active**.



6. Click on “Download.”

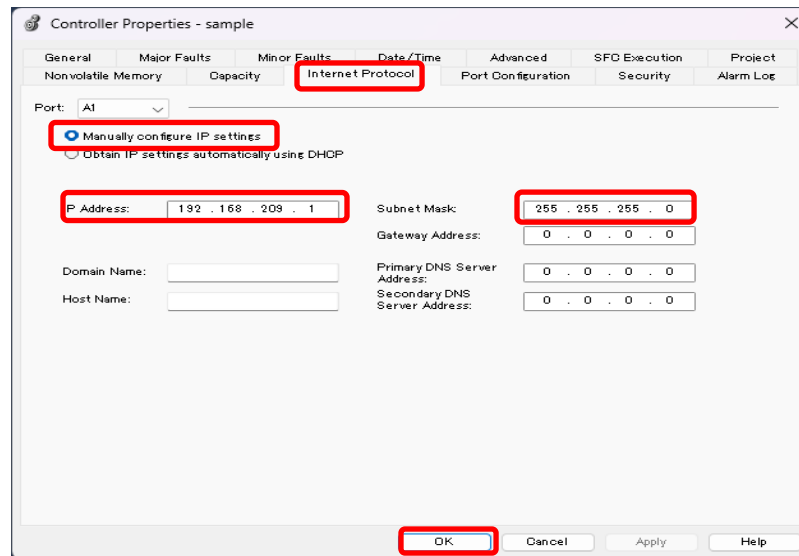


7. In the "Controller Organizer", select "I/O Configuration" → Right click on "Ethernet" → Click “Properties.” (If setting up IP using USB cable select: “USB” → Click “Properties”



- Click on “Internet Protocol.”
- Select on “Manually configure IP settings.”
- Check “IP Address and Subnet Mask”
- Make sure the settings on the IP addresses of the PLC and Barcode reader match up to the **third octet**, if not, make any changes.
 - NOTE: In the case of the following screen, set the IP address to "192.168.209.xxx" for both Barcode reader and PLC. “xxx” is an arbitrary number between **1 and 255**.

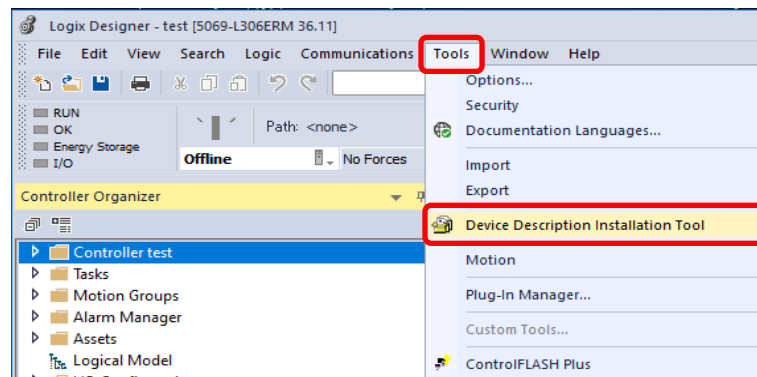
- After changing the settings, click “OK.”



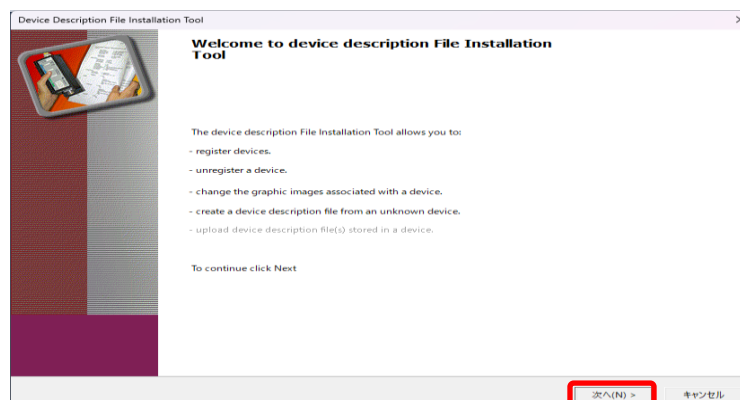
8.2 Registration of EDS File

NOTE: Brady_V6180.eds for **V6180** -- Brady_V7000.eds for **V7000**

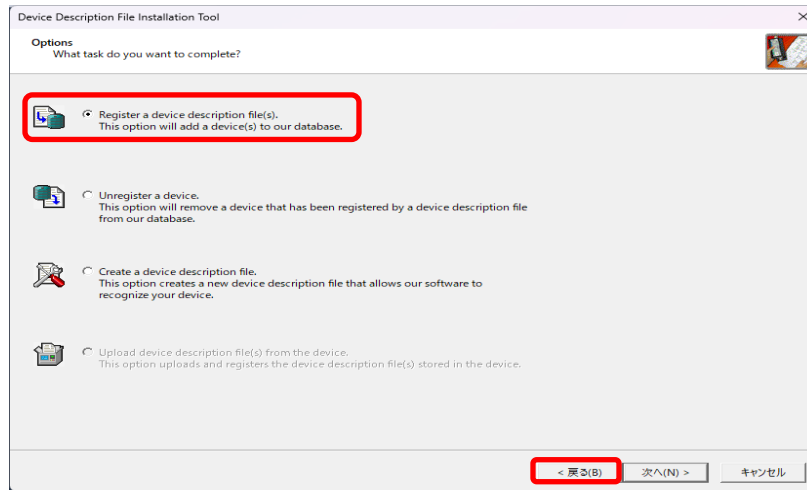
1. Click on “Tools” → Device Description Installation Tool.



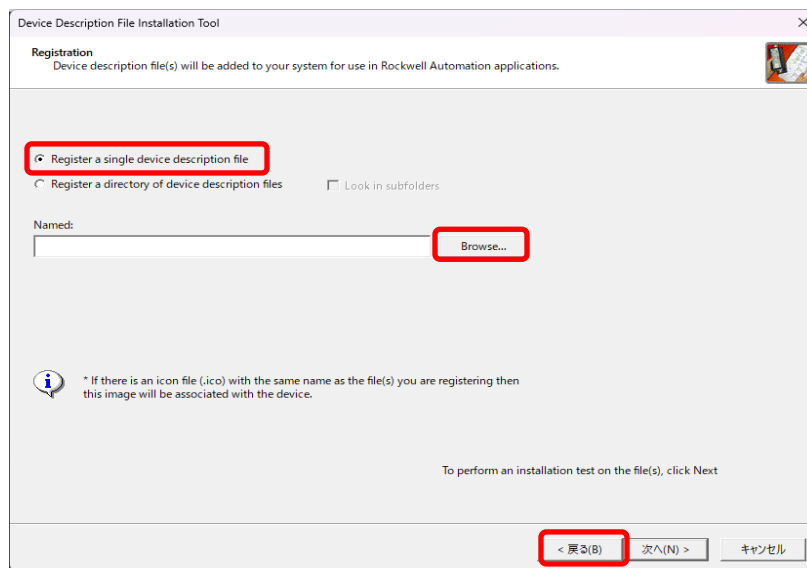
2. When the "Device Description File Installation Tool" wizard opens, click “Next.”



3. Select “**Register a device description file(s)**” and click “**Next.**”



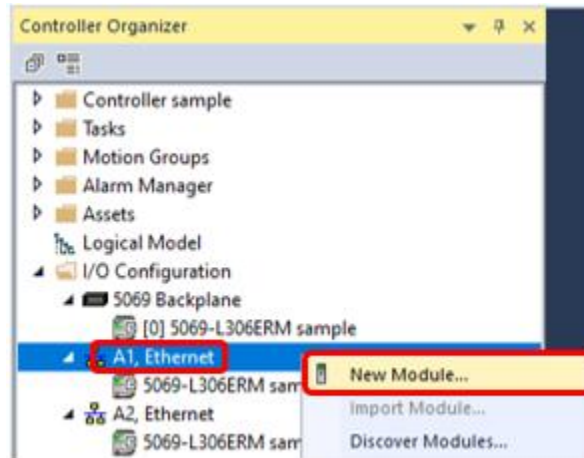
4. Select “**Register a single device description file**” and click “**Browse...**”



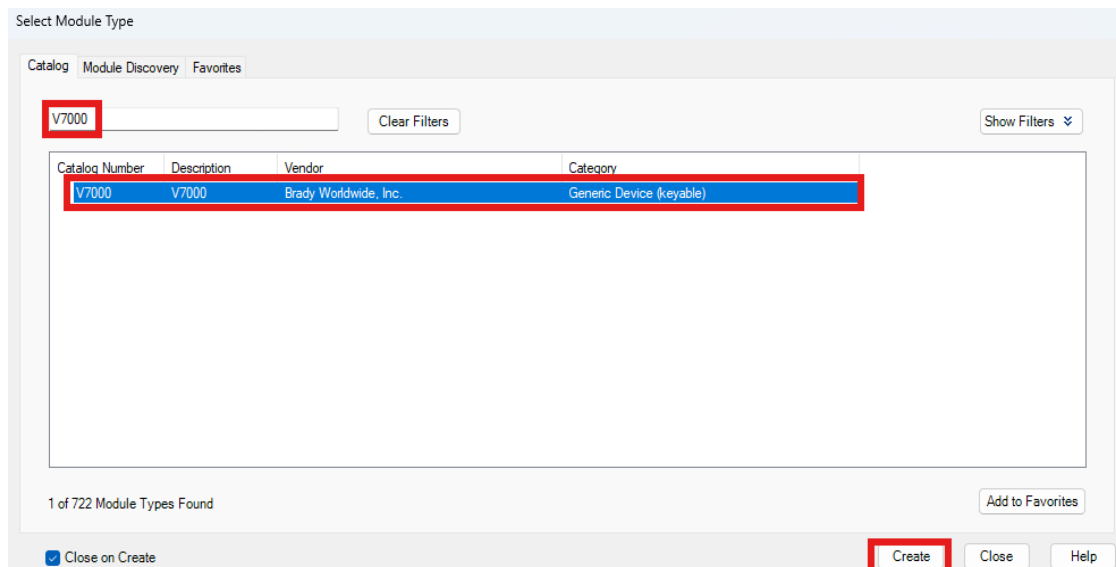
5. Select the EDS file and click “**Open.**”
6. Click **Next** through the following prompts until you reach the **Finish** button.

8.3 Setup Module

1. In the "**Controller Organizer**", select "**I/O Configuration**" → Right click on "**Ethernet**" → Click "**New Module.**"

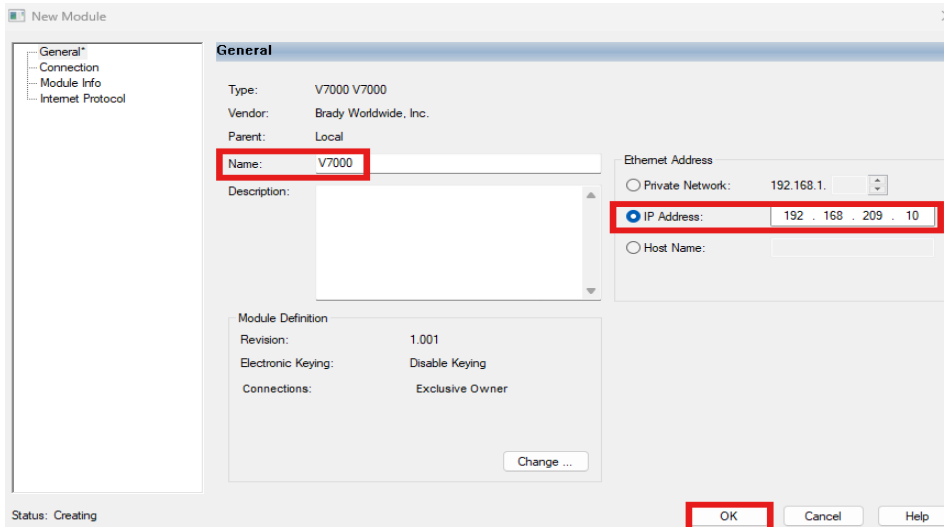


2. In the **Catalog** tab, use the **Search field** and type "V7000" for V7000 barcode reader and "V6180" for V6180 barcode reader to find the module.
3. Select the appropriate **code reader model** and click **Create**.



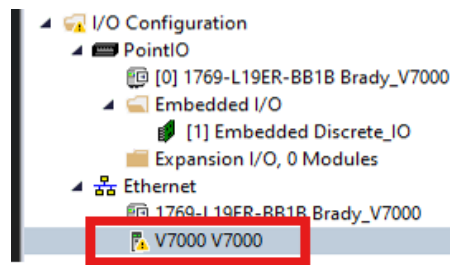
4. When the "**New Module**" appears, enter the IP address of the reader in the IP Address field under Ethernet Address. (default: **192.168.209.10**)
5. Add Name (e.g., **V7000** or **V6180**)

6. Click on “OK.”



7. Click on “Yes.”

8. Registered code readers are displayed with a warning icon.



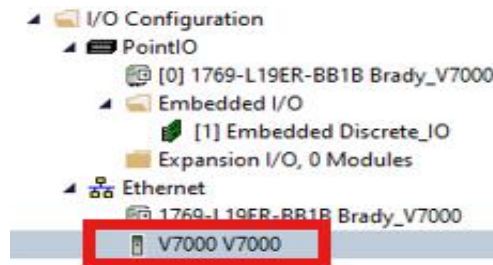
NOTE: If an electric **keying mismatch** error appears, follow the instructions in section **10.0**.

8.4 Transmission of settings

NOTE: Complete the connection download transmission settings.

1. Click on Communications → “**Go Offline.**”
2. Click on Communications → “**Download.**”
3. Click on “**Download.**”

NOTE: When connection with the reader is established after the settings are applied, the warning icon will disappear.

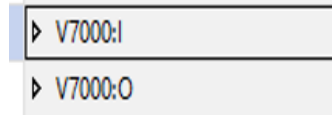


9.0 Testing PLC communication

9.1 Control tags

NOTE: The following steps apply to V7000 and V6180.

1. **V7000/V6180 Input and V7000/V6180 Output tags** will be displayed.



2. Expand **V7000:O > V7000:O.Data > V7000:O.Data[0]**
3. Set V7000:O.Data[0].6 to 1 → Permit transmission read data.
4. Set V7000:O.Data[0].7 to 1 → Clear “Data transmission complete.”
5. Trigger the scanner by setting **V7000:O.Data[0].1 to 1 (single decode)**
Request start reading.

▲ V7000:O	{...}	{...}
▲ V7000:O.Data	{...}	{...}
▲ V7000:O.Data[0]	81	
V7000:O.Data[0].0	1	
V7000:O.Data[0].1	0	
V7000:O.Data[0].2	0	
V7000:O.Data[0].3	0	
V7000:O.Data[0].4	1	
V7000:O.Data[0].5	0	
V7000:O.Data[0].6	1	
V7000:O.Data[0].7	0	
▶ V7000:O.Data[1]	0	

6. Stop transmission by setting **V7000:O.Data[0].1 to 0** and Set **V7000:O.Data[0].4 to 1.**
7. To request a read again set **V7000:O.Data[0].4 to 0**, then **V7000:O.Data[0].1 to 1**. If **V7000:O.Data[0].4** is still **1** then the scanner will **start continuous scanning without decoding**.

9.2 V7000/V6180 reading results.

NOTE: The following steps apply to V7000 and V6180.

1. Expand V7000:I > V7000:I.Data
2. Data results will be displayed after V7000:I.Data[10]
3. Refer to **Appendix B** for more register information.

▼ V7000:I.Data	{...}	{...}	Decimal
▶ V7000:I.Data[0]	4		Decimal
▶ V7000:I.Data[1]	4		Decimal
▶ V7000:I.Data[2]	12		Decimal
▶ V7000:I.Data[3]	0		Decimal
▶ V7000:I.Data[4]	1		Decimal
▶ V7000:I.Data[5]	0		Decimal
▶ V7000:I.Data[6]	1		Decimal
▶ V7000:I.Data[7]	0		Decimal
▶ V7000:I.Data[8]	-1		Decimal
▶ V7000:I.Data[9]	0		Decimal
▶ V7000:I.Data[10]	'B'		ASCII
▶ V7000:I.Data[11]	'A'		ASCII
▶ V7000:I.Data[12]	':'		ASCII
▶ V7000:I.Data[13]	'C'		ASCII
▶ V7000:I.Data[14]	'b'		ASCII
▶ V7000:I.Data[15]	'a'		ASCII
▶ V7000:I.Data[16]	':'		ASCII
▶ V7000:I.Data[17]	'c'		ASCII
▶ V7000:I.Data[18]	'2'		ASCII
▶ V7000:I.Data[19]	'1'		ASCII
▶ V7000:I.Data[20]	'4'		ASCII
▶ V7000:I.Data[21]	'3'		ASCII

10.0 Electronic Keying Mismatch

10.1 Electronic Keying

1. Keying is a feature designed to minimize the risk of using an incorrect device in a control system. An incorrect device can be:
 - A replacement device for one that is already in use.
 - A device that is installed during the initial system installation. The wrong device does not support the same functionality as the device intended for use in the system. When the wrong device is used, unexpected system behavior can occur.
2. Electronic Keying automatically compares the expected device, as defined in your RSLogix 5000™ or Logix Designer project, to the installed device. If keying fails, the controller does not establish a connection to the device and a fault occurs on the device.
3. For each device in the project, the user-selected keying option determines if, and how, an Electronic Keying check is performed. Three options are available:
 - **Compatible Module**
 - **Disable Keying**
 - **Exact Match**

Click this link for more details:

https://literature.rockwellautomation.com/idc/groups/literature/documents/at/logix-at001_-en-p.pdf
4. Carefully consider the benefits and implications of each keying option when selecting between them. For some device types, fewer options are available.

10.2 Disable Keying – (use only for testing)

1. Edit the created module and click under “**Edit module definition.**”
2. Set electronic **Keying to Disable.**
3. Click “**Ok**”
4. Then try to go Online with the registered device V7000
5. **Communication → Go Online**

Appendix A: Terminal Commands

Term	Command	Description
Configuration reference	?	Status transmission (First page)
	?2	Status transmission (Second page)
	?3	Status transmission (Third page)
	?4	Status transmission (Fourth page)
	?IMG	Status transmission (Settings for image output)
	?TBL	Status transmission (Settings for Table Mode)
	?ROI	Status transmission (Settings for ROI)
	?PLC	Status transmission (Settings for PLC Link)
	?FCS	Status transmission (Settings for Focus adjustment)
	?TRP	Status transmission (Settings for trapezoid correction)
	?TX	Status transmission (Settings for additional information)
	?IE	Status transmission (Settings for Industrial Ethernet)
	?UA	Status transmission (Settings for user area)
	?PQ	Status transmission (Settings for symbol printing check)
	?IO	Status transmission (Settings for buzzer and digital I/O)
	?VER	Status transmission (Model name and software version)
	?READY	Status transmission (Status of Ready Signal)
	?STP	Status transmission (Status of Auto-Tuning)
	?WLAN	Status transmission (Settings for Wireless LAN) 
	?MLT	Status transmission (Settings for Multi Unit Connection)
	?MLTSTAT	Status transmission (Connection State for Leader)

Appendix B: Registers Input/output

Result Data (Input Assemblies)

Address	Bit	Name	Description
0	0	Read success	0→1: Code reader successfully reads barcode. 1→0: -
	1	Read failed	0→1: Code reader failed to read barcode. 1→0: -
	2	Data transmission complete	0→1: Code reader transmitted read data. 1→0: -

3	FTP communication complete	0→1: Code reader has completed FTP communication. 1→0: -
4	Setup operation success	0→1: Code reader succeeded in Setup operation. 1→0: -
5	Setup operation failed	0→1: Code reader failed in Setup operation. 1→0: -
6	Automatic adjustment success	0→1: Code reader succeeded in Automatic adjustment. 1→0: -
7	Automatic adjustment failed	0→1: Code reader failed in Automatic adjustment. 1→0: -
8	READY	0→1: Code reader is in READY state. (Readings, setup, and auto-adjustment are ready to run) 1→0: Code reader is in BUSY state. (Reading, setup, or auto-adjustment is in progress)
9	BUSY(Reading)	0→1: Code reader is in BUSY state. (Reading) 1→0: Code reader is not in BUSY state. (Reading)
10	BUSY (Data transmission)	0→1: Code reader is in BUSY state. (Transmitted read data) 1→0: Code reader is not in BUSY state. (Transmitted read data)
11	BUSY (FTP communication)	0→1: Code reader is in BUSY state. (FTP communication) 1→0: Code reader is not in BUSY state. (FTP communication)
12	BUSY (Setup operation)	0→1: Code reader is in BUSY state. (Setup operation)

			1→0: Code reader is not in BUSY state. (Setup operation)
	13	BUSY (Automatic adjustment)	0→1: Code reader is in BUSY state. (Automatic adjustment) 1→0: Code reader is not in BUSY state. (Automatic adjustment)
	14	Reserved	-
	15	Reserved	-
1	0to15	Data length	Length of read data
2	0to15	Read data Transmission number	Number of the data currently being transmitted. If it does not split, it is fixed at 1.
3	0to15	Read data. number of divisions	Number of divisions of read data. If it does not split, it is fixed at 1.
4	0to15	Symbol grade	Overall grade of ISO/IEC 15415 or ISO/IEC TR 29158. (0 to 4) If Symbol grade is disabled, fixed at 255.
5to128	0to15	Read data	Read data (max. 248 bytes)

Control Data (Output Assembly)

Address	Bit	Name	Description
0	0	Request Start Reading	0→1: Code reader starts reading. 1→0: -
	1	Request Setup Load	0→1: Code reader starts loading setup. Target is specified by the "Setting number." 1→0: -
	2	Request Setup Save	0→1: Code reader starts saving setup. Target is specified by the "Setting number." 1→0: -

3	Request Automatic adjustment	0→1: Code reader starts automatic adjustment. Table number where the adjustment results are saved is specified by "Setting number". 1→0: -
4	Clear "Read success"	0→1: Set "Read success" to 0. 1→0: -
5	Clear "Read failed"	0→1: Set "Read failed" to 0. 1→0: -
6	Permit transmission read data	0→1: Permit code reader to transmission read data. 1→0: Do not permit code reader to transmission read data.
7	Clear "Data transmission complete"	0→1: Set "Data transmission complete" to 0. 1→0: -
8	Clear "Setup operation success"	0→1: Set "Setup operation success" to 0. 1→0: -
9	Clear "Setup operation failed"	0→1: Set "Setup operation failed" to 0. 1→0: -
10	Clear "Automatic Adjustment success"	0→1: Set "Automatic adjustment success" to 0. 1→0: -
11	Clear "Automatic Adjustment failed"	0→1: Set "Automatic adjustment failed" to 0. 1→0: -
12	Clear "FTP communication complete"	0→1: Set "FTP communication complete" to 0. 1→0: -
13	Reserved	-
14	Reserved	-

	15	Reserved	-
1	0to15	Setting number	Used for “Setup operation” or “Automatic adjustment.” Setup operation: Number of the setup to be load or save. (1to20) Automatic adjustment: Table number where the adjustment results are saved. (1to16)

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