EN



BB1C Control Unit with EtherNet/IP



Interface Protocol

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# 1. Use for Intended Purpose

The control unit with digital cameras or 2D/3D profile sensors is able to communicate with a PLC via EtherNet/ IP. Thus, an exchange of process data between the control unit and the PLC is possible. Furthermore, the control unit sends a status to the PLC, which in turn can send commands to the control unit.



#### NOTE!

In the manual, the EtherNet/IP integration is shown at a control unit BB1C1xx and an Allen-Bradley PLC 1769-L18ERM-BB1B with Studio 5000 Logix Designer V32. Details about the BB1C5xx control units can be found in the corresponding hardware manual.

# 2. Basics about the EtherNet/IP interface of the Control Unit

# 2.1 Identity Object

- Vendor ID: 1211
- · Vendor Name: wenglor sensoric gmbh
- · Product Type: 12 (Communications Adapter)
- Product Code: 6147
- · Product Name: control-unit
- Catalog: BB1C
- Revision: 2.3

# 2.2 Assembly Object

- Instance 101: Input Assembly (Data size depends on configuration file)
- Instance 100: Output Assembly (Data size depends on configuration file)



# 3. Network Overview



- Use LAN1 and LAN2 (Number 1) to connect digital cameras or 2D/3D profile sensors to the control unit. Further network functionalities (e.g. software uniVision for Windows, website, process data via TCP, UDP and FTP) are available via LAN1 and LAN2.
- Use CH0 and CH1 (Number 2) only for EtherNet/IP communication with a PLC.



#### NOTE!

The two EtherNet/IP connections on the front of the BB1C5xx control units are not labeled. Details about the position of the EtherNet/IP connectors of the BB1C5xx can be found in the corresponding hardware manual.

EtherNet/IP LEDs at the control unit BB1C1xx (on the BB1C5xx control units, the MS/SF or the NS/BF LEDs are not visible):

LED	Color	State	Meaning
MS/SF	(Green)	On	Operation Ready for Ethernet/IP communication
	- (Green)	Flashing	Standby (no configuration)
	(Red)	On	Fatal Error
		Flashing	Error
	- (Red/green)	Flashing	Self-test
	(Off)	Off	Switched off
NS/BF	(Green)	On	Connected
	(Green)	Flashing	No connection, but valid IP address
	e (Red)	On	Network conflict: Another device in the network has the same network configuration.
		Flashing	Connection Time-out
	- (Red/green)	Flashing	Self-test
	(Off)	Off	Switched off or no IP address
LINK (CH0 &	(Green)	On	Ethernet connection is available.
CH1)	(Off)	Off	No Ethernet connection available.
ACT (CH0 & CH1)	(Yellow)	Flashing	Control Unit sends or receives Ethernet frames.
	(Off)	Off	Control Unit sends or receives no Ethernet frames.



**Example:** A network consists of digital cameras, weCat3D sensors and a PC with the software uniVision. Another network is used for EtherNet/IP communication with the PLC and for a PC with the software Studio 5000 Logix Designer.



# 4. Input and Output Data

In the view of the PLC the following input and output data is available:

- Control unit
  - Inputs (Device to PLC)
    - 2 bytes: Status
- For each uniVision application
  - Inputs (Device to PLC)
    - 2 bytes: Status
    - x bytes: User-defined process data
  - Outputs (PLC to device)
    - 4 bytes: Commands
    - x bytes: User-defined process data



#### NOTE!

The size of the user-defined inputs and outputs is depending on the configuration file. Details about the configuration files are available in the attachement of the manual (see section "10. Attachements", page 78).

**Example:** The following example shows the configuration on the Control Unit for one uniVision application (RTE\_Config\_C001.tgz) with 66 bytes input and 32 bytes output.

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# 4.1 Status

Each uniVision device sends a two byte status information to the PLC. The following status bits are valid for each uniVision device. Not used bits are set to false.

#### **Control Unit**

Name	Data type	Bit	Description
Operation ready	Bool	0	Is true if the control unit is ready for operation.

#### uniVision Application

Name	Data type	Bit	Description
Operation ready	Bool	0	<ul> <li>Is true if the uniVision application is ready for operation.</li> <li>Possible reasons for operation not ready:</li> <li>Control Unit is booting and uniVision start project is not loaded completely</li> </ul>
			The uniVision Application is currently loading another project
			<ul> <li>No network connection between acquiring device (e.g. digital camera) and control unit</li> </ul>
			Power supply of acquiring device (e.g. digital camera) is off
			<ul> <li>uniVision application cannot connect to the acquiring device because of an open connection from another uniVision appli- cation</li> </ul>
			<ul> <li>No acquiring device is selected in the uniVision project</li> </ul>
Toggle	Bool	1	Changes every time a data evaluation is completed. It can be used to check for new measurement results.
Processing	Bool	2	Is true when the uniVision application is evaluating data.
Command Acknowledge	Bool	3	Is an echo signal of the command signal to verify that the com- mand is received.
Command Ready	Bool	4	Is true if the uniVision application is ready to receive commands.
			NOTE! Commands to uniVision devices may only be sent if the command ready signal is active. The status of the com- mand ready signal must therefore be checked before commands are sent.
Command Error	Bool	5	Is true if there was an error in the command. Possible reasons for command errors: • Several commands are sent at the same time
			<ul> <li>Command parameter contains an invalid entry</li> </ul>
			<ul> <li>Command load project fails because the project is not available.</li> </ul>

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**Example:** The following example shows the status bits of a uniVision application in Studio 5000 Logix Designer.



# 4.2 Commands

Commands (e.g. trigger command) are sent from the PLC to the uniVision application. In total the commands consist of four bytes – separated in the first two bytes for the commands and the second two bytes for a command parameter.



# NOTE!

Commands to uniVision devices may only be sent if the command ready signal is active. The status of the command ready signal must therefore be checked before commands are sent.

Commands for uniVision application (first two bytes)

Name	Data type	Bit	Description
Reserved	Bool	0	Not used
Load project	Bool	1	When the value is changed from FALSE to TRUE, the uniVi- sion Application loads the project that defined by the com- mand parameter 0. NOTE!
			<ul> <li>be saved in the following format: "xxx_testprojects must be saved in the following format: "xxx_testproject.u_p"</li> <li>(x = any integer from 0 to 9). A maximum of 255 projects can be used for all the applications combined. The project numbers can be set between 1 and 255. Every uniVision project filed needs an unambiguous number.</li> </ul>
Reserved	Bool	2	Not used
Trigger	Bool	3	When the value is changed from FALSE to TRUE, the uni-         Vision Application sends a trigger command to the acquiring device (e.g. digital camera).         NOTE!         The trigger source of the acquiring device must be set to software in order to enable triggering via EtherNet/IP. In the case of digital cameras, the "Start exposure" trigger selector must be selected for this purpose, and the "Line start" trigger selector must be
			selected for 2D/3D profile sensors.
Acquisition	Bool	4	<ul> <li>When the value is changed from FALSE to TRUE, the uniVision Application starts or stops acquisition – depending on the command parameter.</li> <li>Command parameter 0: Value 0 – Stops the acquisition</li> <li>Command parameter 0: Value 1 – Starts the acquisition</li> </ul>
			NOTE! Only when acquisition is active, the device is ready to receive trigger signals. After the system start or after loading a project, the acquisition is automatically started.

Command parameter for uniVision application (second 2 bytes)

Name	Data type	Byte	Description
Parameter 0	Byte	3	Low byte of command parameter
Parameter 1	Byte	4	High byte of command parameter

**Example:** The following example shows the command bits of a uniVision application in Studio 5000 Logix Designer.

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# 4.3 Commands and Status

For each command that is sent from the PLC to the uniVision application, an answer is sent back from the uniVision application to the PLC via the status bits.



#### NOTE!

Commands to uniVision devices may only be sent if the command ready signal is active. The status of the command ready signal must therefore be checked before commands are sent.

## 4.3.1 General Command and Status Behavior

The following example for a command and its status bits is valid for all types of commands.



#### **Explanation:**

- The command (e.g. load project command) is sent from the PLC to the uniVision application.
- The uniVision application answers with the status bits after receiving the command:
  - The command acknowledge signal switches from FALSE to TRUE (echo signal of command)
  - The command ready signal switches from TRUE to FALSE





• When the command that is sent from PLC to the uniVision application is removed, the command acknowledge signal switches from TRUE to FALSE. (echo signal of the command).



• When the execution of the command is finished, the command ready signal switches from FALSE to TRUE and the uniVision application is ready to receive a new command.



# 4.3.2 Trigger Command

When sending a trigger command from the PLC to the uniVision application, the application forwards the trigger command to the acquiring device (e.g. digital camera). An image or a profile is captured by the acquiring device.



#### NOTE!

Commands to uniVision devices may only be sent if the command ready signal is active. The status of the command ready signal must therefore be checked before commands are sent.





- When the uniVision application receives the trigger command, the command acknowledge signal switches from FALSE to TRUE and the command ready signal switches from TRUE to FALSE.
- When the acquiring device confirmed that it received the trigger command, the command ready signal switches from FALSE to TRUE.



#### NOTE!

In the screenshot, the command ready signal is not visible because the sampling rate of the PLC is not fast enough.

- Then the data recording (e.g. image or profile capturing) takes place and the data is sent via network to the control unit.
- As long as the uniVision application evaluates the data (e.g. image or profile), the processing signal is set to TRUE.
- As soon as the evaluation has finished, the processing signal switches from TRUE to FALSE, the toggle bit changes and all user-defined process data are available.



#### NOTE!

- After starting the control unit or after loading a project via EtherNet/IP, a command (e.g. trigger command) can be sent as soon as the command ready signal has switched from FALSE to TRUE.
- Use the toggle bit from the status to identify if the results that belong to the trigger signal are already available.
- Status signals of the uniVision application often apply for a very short time as data evaluation, for example, is very fast, depending on the size of the project. In order to still receive, e.g., all processing signals on the control, the EtherNet/IP cycle time may only be half the length of the command's process time. It is recommended to use a EtherNet/IP cycle time of 1 ms at a maximum.

## 4.3.3 Load Project Command

When sending a load project command from the PLC to the uniVision application, the uniVision application loads the project defined by the command parameter 0. The number that is used in the project name must be sent by the command parameter.

#### NOTE!

For loading projects via EtherNet/IP, all projects must be saved in the following format: "xxx\_testproject.u\_p" (x = any integer from 0 to 9).

For example 002\_MyProject.u\_p

A maximum of 255 projects can be loaded for all the applications combined. The project numbers can be set between 1 and 255. Every uniVision project filed needs an unambiguous number.



#### NOTE!

Commands to uniVision devices may only be sent if the command ready signal is active. The status of the command ready signal must therefore be checked before commands are sent.





• Command parameter 0 must be set according to the number in the project file name.



- When the load project command is received by the uniVision application, the command acknowledge signal switches from FALSE to TRUE and the command ready signal switches from TRUE to FALSE.
- When the project is loaded successfully, the command ready signal switches from FALSE to TRUE.
- After removing the load project command signal, the command acknowledge signal switches from TRUE to FALSE as well.

#### NOTE!

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- The project is loaded completely when the command ready signal has switched back to TRUE and when there was no command error. Hereafter, the next command (e.g. trigger command) can directly be sent to the uniVision application.
- For more details the project number can also be sent as process data from the control unit to the PLC. Process data are updated with each data evaluation because of a trigger signal (for more details "4.4 User-Defined Process Data", starting from 21).

## 4.3.4 Start/Stop Acquisition Command

When sending an acquisition start or stop command, the uniVision application is ready or no longer ready to receive trigger signals. Depending on the command parameter, the acquisition can be started or stopped. The trigger signals can be generated for this purpose internally by the device itself or via an external interface (e.g., digital inputs or Ethernet/IP):

- Command parameter 0: Value 0 Stops the acquisition
- · Command parameter 0: Value 1 Starts the acquisition



#### NOTE!

Only when acquisition is active, the device is ready to receive trigger signals. After the system start or after loading a project, the acquisition is automatically started.



#### NOTE!

Commands to uniVision devices may only be sent if the command ready signal is active. The status of the command ready signal must therefore be checked before commands are sent.







- The value of the command parameter 0 must be set to 0 or 1 depending on starting or stopping the acquisition.
- When the acquisition start or stop command is received by the uniVision application, the command acknowledge signal switches from FALSE to TRUE and the command ready signal switches from TRUE to FALSE.
- When the acquisition has started or stopped successfully, the command ready signal switches from FALSE to TRUE.
- After removing the acquisition start or stop command signal, the command acknowledge signal switches from TRUE to FALSE as well.

## 4.4 User-Defined Process Data

User-defined process data are configured in the uniVision project. Process data can be sent from the device to the PLC and from the PLC to the device. Details are described in the control unit settings (see section "5.3 Device Industrial Ethernet", page 24).



#### NOTE!

Compared to commands and status data that is continuously updated, process data is only evaluated and sent when data (e.g. image or profile) is executed because of a trigger signal.

# 5. Control Unit Settings

# 5.1 Installation of Configuration Files

The control unit supports several fix configuration layouts for the EtherNet/IP communication. A detailed list of available configuration files is listed in the attachement (see section "10. Attachements", page 78). The default configuration of the control unit works for Profinet. Consequently, a suitable EtherNet/IP configuration must be installed to be able to communicate via EtherNet/IP.

#### NOTE!



The EtherNet/IP communication is supported for the control units BB1C1xx starting with the firmware version 2.3.0. The BB1C5xx control units are supported from firmware 2.6.1. After a firmware update of the control unit, the configuration file is automatically reset to the default configuration. It is therefore necessary to reinstall the corresponding configuration file after a firmware installation in the control unit.

Procedure to install an EtherNet/IP configuration on the control unit:

- 1. Select suitable configuration file (see section "10. Attachements", page 78)
- 2. Download configuration file from wenglor website
- 3. Copy tgz configuration file to firmware folder on the control unit
  - a. Via USB stick and copying the file on the control unit to /media/card/firmware



b. Via FTP transfer to the firmware folder of the control unit.



#### NOTE!

For the FTP transfer a network connection from the Windows PC to the control unit is necessary. Then open the file manager and type in ftp:// + IP Address of the control unit.



Example with the default IP Address of the control unit: ftp://192.168.100.252 Login data:

- · User name: ftpuser
- · Password: ftpvision

92.168.100.252 > firmware		~	Ō	
nware_ControlUnit_2.3.0.tgz	RTE_Config.log	RTE_Config_C00	1.tgz	

4. Restart the control unit to install the configuration file (via Menu -> Reboot).

The control unit restarts and installs the configuration file. After the successful installation, an underline is added at the beginning of the file name of the configuration file.





# 5.2 Setup uniVision Applications and Projects

In order to create a communication between the uniVision application and the PLC, the following steps are necessary:

- · Setup network configuration of control unit for LAN1 and LAN2
- · Add acquiring devices (e.g. digital cameras) to the control unit
- · Create uniVision applications
- · Create and save uniVision projects
- · Setup startup behavior for uniVision applications



#### NOTE!

Details about all listed steps are explained in the uniVision software manual.

# 5.3 Device Industrial Ethernet

Add Device Industrial Ethernet from the toolbox to the project navigator in order to configure the user-defined input and output data.





#### NOTE!

Compared to commands and status data that is continuously updated, process data is only evaluated and sent when data (e.g. image or profile) is executed because of a trigger signal. Adding the Device Industrial Ethernet is only possible if a uniVision application and a real acquiring device are connected. Device Industrial Ethernet cannot be added in offline projects.



#### Properties

Property	Description
Process Time [us]	Time in $\mu$ s for processing the module.
Module State	Signals the status of the module: • 0: No error
	• Value different to 0: Error (Details about the error code are available in the uniVision software manual)
Error Handling	If any process data is in error state, it is substituted by a user-defined replacement value

#### NOTE!

In case of loading a uniVision project that does not fit to the current configuration of the Control Unit, the Module State 1111 (Module Configuration Error) shows the mismatch in Device Industrial Ethernet. Delete Device Industrial Ethernet and add it again from the toolbox to solve the problem.

#### 5.3.1 Device to PLC

Depending on the configuration of the control unit, a list of all available process data (uniVision project results) appears.

Navigator		Ð	×
✓ Module Application >			
> 🛄 Module Pointcloud Meas	ure		
> 📄 Module Spreadsheet			
Y 🤷 Device Industrial Ethern	et		
Device to PLC			
PLC to Device			
And Mandula			
Property Y Value #1	Value FALSE		^
🖉 Data Value	Toggle Bit	\$	
Address Offset	4.0		
Data Type	BOOL		
> Value #2	FALSE		
> Value #3	FALSE		
> Value #4	FALSE		
> Value #5	FALSE		
> Value #6	FALSE		

Property	Description						
Value	Shows the resul	t of the process data (u	niVision project result	t).			
Data Value	Output can be set manual to a certain value or can be linked with any result of the project.						
	<ul> <li>Module Spreadsheet</li> <li>Device Industrial Ethe</li> <li>Device to PLC</li> <li>PLC to Device</li> <li>Error Handling</li> <li>Add Module</li> </ul>	met	-888	Data Value X			
	Property Value #1	Value TRUE	^	Linked Value     Manual Value     Module Application     Application			
	Value #1     Otta Value     Address Offset     Data Type     Value #3     Value #3     Value #4     Value #7     Value #6     Value #7     Value #7     Value #7     Value #7     Value #7     Value #7     Value #10     Value #12     Value #12     Value #13     NOTI     Use     (e.c.     Use     poi     Use     Linktin     BO	TWE Output Distance [unit] 4.0 Output Distance [unit] 4.0 BOOL FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE EI BOOL to send or recee REAL to send or recee REAL to send or recee C, x value of a found po DINT to send or recee REAL to send or recee C, x value of a found po C, x value of a	eive true/false results ive numbers with posi int). ve numbers without p e of Module Thresho eive text information ( at data type works the urns true or false dep sult: Returns true if cu inimal and maximal t out of tolerance (low a)	<pre>voide Application Process Time Last Run Run Counter Pree Memory [k8] Filename Project Version Toggle Bit &gt;     weat3d-1 voided Fointcloud Measure Process Time [us] voided Fointcloud Measure voided Fointcloud Measure voide</pre>			
		the text is empty.					



Data Value	• DINT (output)
	<ul> <li>Link BOOL result: Returns 0 for bool value false and 1 for bool value true.</li> </ul>
	<ul> <li>Link DINT: Returns current DINT value</li> </ul>
	<ul> <li>Link REAL: Returns number without digits after the comma (no round- ing!)</li> </ul>
	<ul> <li>Link CHAR: Returns the number of digits of the text</li> </ul>
	REAL (output)
	<ul> <li>Link BOOL result: Returns 0 for bool value false and 1 for bool value true.</li> </ul>
	<ul> <li>Link DINT or REAL: Returns number with digits after the comma</li> </ul>
	<ul> <li>Link CHAR: Returns the number of digits of the text</li> </ul>
	CHAR (output)
	<ul> <li>Link BOOL result: Returns false for bool value false and true for bool value true</li> </ul>
	<ul> <li>Link DINT or REAL: Returns the number</li> </ul>
	<ul> <li>Link CHAR: Returns the text</li> </ul>
Address Offset	Shows the address offset for the value.
	NOTE!
	I he address offsets help to identify the relevant bytes in the PLC.
Data Type	Shows the data type of the value

## 5.3.2 PLC to Device

Depending on the configuration of the control unit, a list of all available process data (uniVision project inputs) appears.

Property	Description
Value	Shows the result of the value (uniVision input value)
Data Value	Shows the result of the value (uniVision input value)           NOTE!           Process data from the PLC to the uniVision application is recieved when an image or a profile is evaluated in the uniVision application because of a trigger signal.
Address Offset	Shows the address offset for the value.  NOTE!  The address offsets help to identify the relevant bytes in the PLC.
Data Type	Shows the data type of the value

# 5.3.3 Error Handling

If any process data is in error state, the substitution value can be selected for each data type.

Property	Description
Substitute Bool	If a bool type used in Device Industrial Ethernet is in error state, it is replaced by low or
Types by	high (Default: low).
Substitute INT	If an INT type used in Device Industrial Ethernet is in error state, it is replaced by any
Types by	user-defined INT value (Default: 0).
Substitute DOUBLE	If a DOUBLE type used in Device Industrial Ethernet is in error state, it is replaced by
Types by	any user-defined DOUBLE value (Default: 0.0000)
Substitute STRING	If a STRING type used in Device Industrial Ethernet is in error state, it is replaced by
Types by	any user-defined STRING value (Default: Error).



# 6. EtherNet/IP Network Configuration of the Control Unit

The EtherNet/IP interface at the control unit is set to DHCP. Use a DHCP server (e.g. BOOTP from Allen Bradley) to allocate the network settings to the EtherNet/IP interface at the control unit:

- 1. Open the software BOOTP.
- 2. Select the correct LAN adapter of the PC and click on OK.



3. Click on "Tools" -> "Network Settings" to enter the network settings of the PC.

EtherNet/IP	Network Settings	× - · · ×
Add Rela	Defaults         Adapter: Broadcom NetXtreme Gigabit Ethernet           Server IP address:         192.168.1.1           Subnet         255         255         0           Gateway:         0         0         0         0           Primary         0         0         0         0         0           Secondary         0         0         0         0         0	et Iress Hostname
Errors and warni Unable to servic	Reset Defaults OK Cano	ncel Relations 2 of 256

All devices with activated DHCP settings connected to the LAN adapter are listed.



#### NOTE!

Add one device after the other in order to identify them correctly with the MAC Address.

4. Select the control unit and click on "Add Relation".

				– 🗆 X	
Add Relation Discovery History					
Ethernet Address (MAC) Type (hr:min:sec) # IP Address			Hostname		
DHCP	16:32:54	9			
	Entered Re	lations			
Ethernet Address (MAC) Type IP Address Hostname Description					
				>	
				Relations	
om 00:02:A:	2:5D:CE:53.			1 of 256	
	Type DHCP Type	Discovery F Type (hr:min:sec) DHCP 16:32:54 Entered Re Entered Re Type IP Address	Discovery History Type (hr:min:sec) # DHCP 16:32:54 9 Entered Relations Type IP Address	Discovery History          Type       [hr:min:sec]       #       IP Address         DHCP       16:32:54       9       9         Entered Relations       Entered Relations       400:02:42:50:CE:53.       Hostname	

5. Enter IP address and hostname of the control unit and click on OK to allocate the network configuration to the control unit.

🐻 Eth	herNet/IP Commissione	er		_	
File 1	Tools Help				
	Add Relation	Discov	ery History		Clear History
Ett	hernet Address (MA	New Entry		× stnar	пе
00.	.02.A2.3D.CE.33	Server IP Address:	192.168.1.1		
		Client Address (MAC):	00:02:A2:5D:CE:53		
		Client IP Address:	192 . 168 . 1 . 50		
		Hostname:	controlunit		
Ett	hernet Address (MA	Description:		script	ion
		OK	Cancel		
	I				
<					>
Errors Unabl	and warnings le to service DHCP reques	st from 00:02:A2:5D:CE:53.			Relations 1 of 256



6. In order to keep the network settings for the next startup of the control unit, select the control unit and click on "Disable BOOTP/DHCP".

	EtherNet/IP Commissioner					- 🗆 >	×
Fil	e Tools Help						
	Add Relation		Discovery H	listory		Clear History	
	Ethernet Address (MAC)	Туре	(hr:min:sec)	#	IP Address	Hostname	Τ
	00:02:A2:5D:CE:53	DHCP	16:33:59	14			-
	Delete Relation		Entered Re	elations	Enable BOOTP/DHCF	Disable BOOTP/DHCP	
	Ethernet Address (MAC)	Туре	IP Address		Hostname	Description	
	00:02:A2:5D:CE:53		192.168.1.50	)	controlunit		
	1						
						Deletion	
	rrors and warnings Inable to service DHCP request fro	m 00:02:43	2:5D:CE:53			1 of 256	s

# i

#### NOTE!

If the network configuration of the EtherNet/IP interface is no longer known, the network configuration of the EtherNet/IP interface can be reset by reinstalling the control unit firmware. The configuration file must then be reinstalled (see section "5.1 Installation of Configuration Files" on page 22).

# 7. PLC Settings at Allen-Bradley PLCs

Ethernet/IP integration is shown with an Allen-Bradley PLC 1769-L18ERM BB1B with Studio 5000 Logix Designer V32. The following network settings are used for this:

- PC with Studio 5000 Logix Designer V32: 192.168.1.1
- PLC: 192.168.1.10
- Control unit (Ethernet/IP interface): 192.168.1.50

The following settings are necessary on PLC side.



#### NOTE!

If possible, use the EDS file to integrate the Control Unit. In case of some old Allen-Bradley PLCs, EDS files are not supported. Consequently the Control Unit must be integrated as generic device (see section "7.5 Integrate Control Unit without EDS file" on page 42).

# 7.1 EDS File

The EDS file is available on the wenglor website in the download section of the control unit. Download the EDS file, unzip the file and install it on PLC.



#### NOTE!

After downloading the zip file, please unzip the file before installing it on the Allen-Bradley PLC.

In the software Studio 5000 Logix Designer, the EDS file is added via "TOOLS" → "EDS Hardware Installation Tool".





## The EDS wizard starts.



# Select "Register an EDS file(s)."

Rockwell A	lute	omation's EDS Wizard			×
Options Wha	at ta	isk do you want to complete?			
<b>S</b>	•	Register an EDS file(s). This option will add a device(s) to our database.			
	C	Unregister a device. This option will remove a device that has been registered by an EDS file from our database.			
×	0	Create an EDS file. This option creates a new EDS file that allows our software to recognize your device.			
	0	Upload EDS file(s) from the device. This option uploads and registers the EDS file(s) stored in the device.			
			< Zurück	Neiter >	Abbrechen

## Select the path of the EDS file.

ockwell Automation's EDS Wizard		×
Registration Electronic Data Sheet file(s) will be added to your system for use in f	Rockwell Automation applications.	
<b>6 .</b>		
<ul> <li>Register a single file</li> </ul>		
C Register a directory of EDS files  Look in subfolders		
Named:		
C:\Users\MartinKn\Desktop\EtherNetIP\2020_10_01\Product_descrip	ti Browse	
If there is an icon file (ico) with the same name as the file(s) yo then this image will be associated with the device.	ou are registering	
	To perform an installation test on the file(s), click Next	
	< Zurück Weiter > Abbrech	nen

Add the EDS file to the project. It is also possible to view the file.

Rockwell Automation's EDS Wizard	$\langle  $
EDS File Installation Test Results This test evaluates each EDS file for errors in the EDS file. This test does not guarantee EDS file validity.	
Installation Test Results     C:\usersmathcal{ma	
< >>	
View file	
<zurück weiter=""> Abbrechen</zurück>	



The image associated with the device is shown.

Rockwell Automation	n's EDS Wizard	×
Change Graphic You can change	Image e the graphic image that is associated with a device.	V
Change icon	Product Types	
	< Zurück Weiter > Abbre	chen

#### Add the selected device.

Rockwell Automation's EDS Wizard			×
Final Task Summary This is a review of the task you want to complete.			
You would like to register the following device, control unit			
	< Zurück	Weiter >	Abbrechen

## The installation of the EDS file is finished.




# 7.2 Add Control Unit to PLC Network

Open the context menu at "Ethernet" with a right click and select "New Module..." to add the control unit to the PLC network.



Then search for the control unit in the catalog. Select the control unit and click on "Create".

Logix Designer - PLC in Manual_Ethernet/P.ACD [1769-L18ERM-8818 32.11]					22.4		
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▲ 💭 Controller PLC							
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A STasks	> Loc	control-unit	Clear Filters		Show Filters ¥	ABitmbedded_Discre	A General Name LocaldrC
A 🖓 MainTask	> Loc	Catalog Burders Decembers	Mandas	Column		AB:Embedded_Discre	Description
MainProgram		Catalog Honder Description	venuor	Category			Usage <controller></controller>
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Assets							Scope PCC External & Read/Write
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Deletion							Constant No
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📻 Search Results 👼 Watch							
Ready						Communication 1	offware: FactoryTalk Line
						Companyor (Companyor)	

Enter the device name and the network configuration of the control unit that was used in the DHCP server tool (see section "6. EtherNet/IP Network Configuration of the Control Unit" on page 29). In the example, the IP address 192.168.1.50 and the name "controlunit" is used.





# 7.3 Configure Input and Output Data

Click on "Change" in order to set up the input and output data.

Logix Designer - PLC in Manual_EthernetiP.ACD (1769-L18ERM-8818 32.11)*		8.0	- 8 ×
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Ready			Communication Software: FactoryTalk Linx

Adjust the input and output size according to the configuration file of the Control Unit.

**Example:** The following example shows the configuration on the control unit for one uniVision application (RTE\_Config\_C001.tgz) with 66 bytes input and 32 bytes output. The input and output size for all configuration files can be found in the appendix (see section "10. Attachements" on page 78).

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	ACCUT			Commandation Software Factory fait Lifte

Click on Apply and on OK.

# 7.4 Download Configuration to PLC

Click on "Communications" -> "Download" in order to download the current configuration to the PLC.



Select "Run Mode" to update the input and output data.

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### All input and output data of the Control Unit is available at controllunit: I and controlunit:O.

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# 7.5 Integrate Control Unit without EDS file

In case of some old Allen-Bradley PLCs, EDS files are not supported. Consequently the Control Unit must be added as generic device.

Open with a right click the context menu at "Ethernet" and select "New Module..." to add the Control Unit to the PLC network.



Search for generic and select the "Generic Ethernet Module".





Enter the name and the IP address of the Control Unit. Set the Communication Format to "Data - SINT". Furthermore the instances must be configured accordingly:

- Input: Instance 101 with 4 + x bytes (4 fix bytes + input data size depending on configuration file)
- Output: Instance 100 with x bytes (Output data size depending on configuration file)
- · Configuration: Instance 1 with 0 bytes (not used)

#### NOTE!



In the example, the configuration file RTE\_Config\_C001.tgz is used with 66 bytes input and 32 bytes output. So the input size must be set to 70 bytes (66 + 4 bytes) and the output size to 32 bytes.

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Download the configuration to the PLC and go online. The status of the Control Unit starts with controlunit: I. Data[4].

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## 7.6 PLC Parameters and Local Tags

Select the Main Routine and the PLC Parameters and Local Tags to add the input and output data to your PLC project. Use the address offsets and the data types provided within the uniVision project for the process data.



### NOTE!

Data types and address offsets are available for all user-defined process data.

### 7.6.1 BOOL Data

Example: In the example, the toggle bit is linked to the first boolean result with the Address Offset 4.0.

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On the PLC, the boolean result is shown at controlunit:I.Data[4].0

In order to copy the boolean result in a local tag, add the "Examine On" and the "Output Energize" in the Main Routine. Link the "Examine On" to byte 4 bool 0 and link the "Output Energize" to a new boolean tag (e.g. BOOL1).

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Unscheduled		COP
A Control Groups	9	Source Parameter_Low
A States		Dest controlunit:O.Data(2)
Add-On Instructions		- and
Þ 🗰 Data Types		
🔺 🖳 Trends	controlunt1Data[4].0	BOOL1
Acquisition	10	
Project_Load		
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🖌 🚍 PointIO		· · · · · · · · · · · · · · · · · · ·
[0] 1769-L18ERM-BB1B PLC		
<ul> <li>Embedded I/O</li> </ul>		
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Controller Organizer 🗢 🗣 🛪	🛷 Controller Tags - PLC(controller) 🛛 🔋 MainProgram - M	ainRoutine 🥝 Program P	arameters and Local Tags - MainP	rogram ×					-
Ø #	Scope: In MainProgram V Show: All Table				V T Etter	Name Filter			v
▲ 😅 Controller PLC		and the			0 + T	0.14	6.1.1		
Controller Tags	name	iiii × Usige	value • Force Mask	• Style	Data type	Description	Constant	Properties	
Controller Fault Handler	Acquisition	Local	0	Decimal	BOOL			10년 달에 가지 않	Extended Proc. •
A C Tarke	Command_Acknowledge	Local	U	Decimal	BOOL			A General	00014
A Ch MainTask	Command_Error	Local	0	Decimal	ROOL			Description	BOOLI
A b MainProgram	Command_Ready	Local	1	Decimal	BOOL			Usage	Local
Parameters and Local Tags	Load_Project	Local	0	Decimal	BOOL			Type	Base
MainRoutine	Operation_Ready	Local	1	Decimal	BOOL			Alias For	
Unscheduled	Parameter_Low	Local	1	Decimal	SINT			Base Tag	
Incroups	Processing	Local	0	Decimal	BOOL			Data Type	BOOL
A Stats	Togale Bit	Local	1	Decimal	BOOL			Scope	MainProgram
Add-On Instructions	Tinner Command	Incel	0	Decimal	8001			External Acc.	Read Only
👂 💼 Data Types	ROOL 1	Local	1	Decimal	ROOL			Style	Decimal
Trends	booch	LOCA		Decinar	0001			Constant	NO
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Ready							Communication S	oftware: FactoryTalk Linx	8

The boolean result is available in the Parameters and Local Tags.

# 7.6.2 DINT and REAL Data

- The example shows linking DINT and REAL values. DINT: Linked with Run Counter (Address Offset 6)
- REAL: Linked with Output Distance (Address Offset 18)

Navigator		8	×
✓ Module Application			
> 🔯 wecat3d-1			
> 🔟 Module Pointcloud Meas	ure		
> 📄 Module Spreadsheet			
🗸 Device Industrial Ethern	et		
Device to PLC			
PLC to Device			
Property	Value		^
> Value #6	FALSE		
> Value #7	FALSE		
> Value #8	FALSE		
> Value #9	FALSE		
> Value #10	FALSE		
> Value #11	FALSE		
> Value #12	FALSE		
> Value #13	FALSE		
> Value #14	FALSE		
> Value #15	FALSE		
> Value #16	FALSE		
✓ Value #17	4167131		
🔗 Data Value	Run Counter	\$	
Address Offset	6		
Data Type	DINT		
> Value #18	0		
> Value #19	0		
✓ Value #20	44.321445		
🔗 Data Value	Output Distance [unit]	\$	
Address Offset	18		
Data Type	REAL		
> Value #21	0.000000		
(			



On the PLC, the DINT result is available at controlunit: I.Data[6-9] and the REAL result is available at controlunit: I.Data[18-21].

Logix Designer - PLC in Manual_EthernetiP.ACD (1769-L18ERM-8818 32.11)				<b>2</b> 2				- @ ×
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10 OK Rem Run No Forces Pu No Edits	Add-On Add-On	Alarms Bit Timer/Counter Input/Output	Compare Compute/Math	Move/Logical File/Mis	c. File/Shift Sequence	er Program Control For/Break S	pecial Hill Trigonometry Advanced	stat
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Controller Tags	iname	LE A VALUE POICE MASK	- Style	contraction of the second	Vescription	Constant	The De Land	1
Controller Fault Handler		1-1	1-1 Decimal	SHALFOOL			20 Ye 10 Ye	Extended Prop *
a Taks	<ul> <li>controlunicituata(o)</li> </ul>		Decimal	20141			A General	and the local distance of the local distance
4 🔿 MainTask	controlunit1.Data[1]	0	Decimal	SINT			Description	
▲ L MainProgram	controlunit:I.Data[2]	19	Decimal	SINT			Usage	
Parameters and Local Tags	controlunit1.Data[3]	0	Decimal	SINT			Type	Base
10 MainRoutine	controlunit:LData[4]	1	Decimal	SINT			Alias For	
Unscheduled	controlunit1.Data[5]	0	Decimal	SINT			Base Tag	
Introduced Aver	controlunitLData(6)	-15	Decimal	SINT			Data Type	SINT
A Sasets	controlunit1.Data[7]	-29	Decimal	SINT			Scope	PLC
Add-On Instructions	k. controlunit-I Data[8]	63	Decimal	SINT			External Acc.	. Read/Write
👂 💼 Data Types	h sector is the Determined		Desired	CALT			Style	Decimal
4 📹 Trends	<ul> <li>Controlonicitzata(4)</li> </ul>		Decimal	SINT CAUT			Constant	NO
Acquisition	<ul> <li>controlunici.tuata(10)</li> </ul>	0	Decimal	20141			Vicible	
Fright Tright	controluniti.Data[11]	0	Decimal	SINT			/ Data	
h. Logical Model	<ul> <li>controlunit1.Data(12)</li> </ul>	0	Decimal	SINT			Value	-15
✓ ≤ VO Configuration	controlunit1.Data[13]	0	Decimal	SINT			Force Mask	
🖌 📾 PointlO	controlunitI.Data[14]	0	Decimal	SINT			Produced Co	nnection
[0] 1769-L18ERM-BB1B PLC	controlunit1.Data[15]	0	Decimal	SINT			Consumed C	annection
Embedded (/O     Information II)	controlunit1.Data(16)	0	Decimal	SINT			<ul> <li>Parameter C</li> </ul>	onnections (0:0)
Francisco I/O. 0 Machiler	controlunit:I.Data[17]	9	Decimal	SINT				New Connection
Ethernet	controlunit:LData[18]	113	Decimal	SINT				
	A control with Data 191	71	Decimal	CINT				
	A control with Data (20)		Desired	CINIT				
	<ul> <li>Control control and (20)</li> </ul>	49	Decimal	31111				
	<ul> <li>composition(c).totata(21)</li> </ul>	00	Decimal	20141				
	<ul> <li>controlunitIIData[22]</li> </ul>	0	Decimal	SINT				
	controlunit:I.Data[23]	0	Decimal	SINT				
	controlunit1.Data[24]	0	Decimal	SINT			~	
	Monitor Tags (Edit Tags /		<				>	
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	Complete - 0 error(s), 0 warning(s)							^
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D= Controller Organizer	٤							>
search Results 😹 Watch								
						6	mounication Software: Parton/Talk Line	a

In order to create DINT or REAL results out of the single bytes, use the FILE COPY (COP) function in the Main Routine. In the example, the source is linked to byte 6 for the Run Counter and to byte 18 for the distance value. Create new tags for the destination (with data type DINT or REAL and a length of 4 bytes).

Logix Designer - PLC in Manual_EthernetiP.ACD [1769-L18ERM-8818 32.11]*		- 0 ×
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Energy Storage OK Rean Pure Ma Energy & Ma Energy	4 > Fevorites Add-On Alerns Bit Timer/Counter InoutOutout Compare Compute/Math MoveLogical File/Mac. File/Shift Sequencer Program/Control For/Break Special HMI T	Trigonometry Advanced Nat
BOOK Rein Rain Box Hordital Pur Hordital E		
	Controller Tag- RU (performer) - Manifegram - Manifegram - Van Room Para Para (See Tag- Para) - An Anni Pergram - Manifegram - Manifegr	
A Cardenilles N.C.		
Controller Fact		Dest controlunt:O.Data[2]
Controller Fault Handler		Leigth 1
Power-Up Handler		
🔺 🖳 Tasks		
A Ch MainTesk	controlunt (Data)4.0	BOOL1
A 5 MainProgram		
Parameters and Local Tags		COP
MainRoutine	11	Source controlunit:LData[6]
Unscheduled		Dest DNT1
A GL Motion Groups		- Congun
I funded Axes		
Add On Instructions		COP
P Data Types	12	Dest BFAL1
4 😴 Trends		Length 4
Acquisition		
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🗹 Trigger	610	
N Logical Model		
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A PointIO		
D ID 1769-LISERM-BETE PLC		
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Financian I/O. 0 Modular		
b & Ethernet		
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	Accepting the Wending Edits of routine 'MainRoutine' in program 'MainFrogram' Tarting afts for proving 'MainFrogram'	^
	Assembling edits for program 'MainFrogram'	
	Complete - 0 error(s), 0 warning(s)	
By Controlling Companying Distantian Companying		~
De courses ordeners Decelerational	ζ	>
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Ready	Communication Software: FactoryTak Linx	Rung 12 of 13 APP VER

Logix Designer - PLC in Manual_EthernetIP.ACD (1769-L18ERM-8818 32-	11]*				A			- @ Y
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Run Mode Path: A8_ETHEP-1\192.168.1.10	<b>**</b> * < + = =	$+ \vdash + + + + + + + + + + + + + + + + + +$						•
ID OK Rem Run No Forces P., No f	Edits @. ← Favorites Add-	On Alarms Bit Timer/Counter	Input/Output Compare Comp	ute/Math Move/Logical	Fiel/lisc. FielShift S	equencer Program Control FonBreak Special	HMI Trigonometry Advanced	Mat
ntroller Organizer	👻 🔻 🌾 Controller Tags - PLC(controller) 🗮 MainPro	ogram - MainRoutine* 🤣 Program	Parameters and Local Tags - Main	Program ×				
	Scoge: 5 MainProgram - Shger: Al Tage				V T. Enter)	Harse Filter		
Controller PLC	Name	TRL . Urane	Value . * Force Mark	* Style	Data Turne	Description Constant	A Dropartiar	
Controller Tags     Controller Such Manufas	Acquisition	Las - Orașe	0	Decimal	8001		91.91	Extended Pror
Power-Up Handler	Command Astronalative	local	0	Decimal	8001		di 2º provinci	Discribes may
Tasks	Command from	Local	0	Decimal	8001		Name	BOOL1
4 🔿 MainTask	Command_prof	Cocal	0	Decimal	8001		Description	
A b MainProgram	Command_neady	Local		Decimai	BOOL		Usage	Local
Parameters and Local Tags	Load_Project	Local	0	Decimal	BOOL		Type	Base
MainKoutine	Operation_Ready	Local	1	Decimal	BOOL		Alias For	
Motion Groups	Parameter_Low	Local	1	Decimal	SINT		Base Tag	
Ungrouped Axes	Processing	Local	0	Decimal	BOOL		Data Type	BOOL
C Assets	Toggle_Bit	Local	0	Decimal	BOOL		Scope External Acc	MainProgram Creat Only
Add-On Instructions	Trigger_Command	Local	0	Decimal	BOOL		Stude	Decimal
Data Types	BOOL1	Local	1	Decimal	BOOL		Constant	No
Acquisition	> DINTI	Local	4251266	Decimal	DINT		Required	
M Project Load	PEAL1	Local	A4 22102	Boxt	PEAL		Visible	
Configuration     Portion     Portion     Port     P							Force Mask Produced Co Consumed C Parameter C	nnection snnection onnections (0:0)
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	Accepting the Fending Edits of routin Teating edits for program 'MainProgr Assembling edits for program 'MainPro Complete - 0 error(s), 0 warning(s)	<pre>% 'MainRoutine' in program am' ogram'</pre>	'MainFrogram'					
Controller Organizer	۲ 📃							>
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aay						Communica	tion Software: FactoryTalk Line	

The DINT and REAL results are available in the Parameters and Local Tags.

## 7.6.3 STRING data

The example shows linking a STRING value. The STRING is linked with the filename (Address offset 34).





In the software Studio 5000 Logix Designer, the filename is available starting with byte 34 and has a length of 32 bytes.

FILE EDIT VIEW SEARCH LOGIC COMMUNICATIONS TOOLS WINDOW HELP								
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controller organizer • • • •	Controller Tags - PLC(controller) ×							
0 -	Scope: BPLC V Show: All Tag	•			V T. Etter	Name Filter		· · · · · · · · · · · · · · · · · · ·
A Controller PLC	Name	II - Value	Force Mask	<ul> <li>Style</li> </ul>	Data Type	Description	Properties	- 9 - 9
Controller Fault Handler	controluniti.Data[21]		65	Decimal	SINT		20 R4 JI to Extended Pr	operties.
Power-Up Handler	controlunit:LData[22]		0	Decimal	SINT		▲ General	
🔺 🖳 Tasks	controlunitLData[23]		0	Decimal	SINT		Name	controlunit:LData[34]
A C MainTask	controlunit:LData[24]		0	Decimal	SINT		Description	
<ul> <li>Insubrogram</li> </ul>	b controluniti.Data[25]		0	Decimal	SINT		Usage	
A C Motion Groups	controlunit:LData[26]		0	Decimal	SINT		hipe Aliar For	Base
Ungrouped Axes	h. controluniti Data(27)		0	Decimal	SNT		Base Tan	
Assets	k controlunit/Data[28]		0	Decimal	SINT		Data Type	SINT
S Logical Model ▲ □ I/D Configuration	h controlumit   Data [29]		0	Decimal	SNT		Scope	PLC
A EP PointiO	<ul> <li>Control unit (Data (20))</li> </ul>			Desimal	CINIT		External Access	Read/Write
(0) 1769-L18ERM-BB1B PLC	<ul> <li>Controlumic (Data (30)</li> <li>A control unit ( Data (31)</li> </ul>		•	Desired	CAUT.		Style	Decimal
Embedded I/O	<ul> <li>Control units Data [31]</li> </ul>		•	Decimal	SINT CAR		Constant	140
[1] Embedded Discrete IO	P controlumetData(sz)			Decimal	2010		Visible	
A 2 Ethernet	P controluntLData[33]		0	Decimal	SINI		▲ Data	
(3) 1769-L18ERM-BB1B PLC	Economication (EC)		T	ASUI	SINT		Value	4
W 681C controlunit	P controlunitil.Data[35]			ASCII	SINT		Force Mask	
	controlunit:LData[36]		V	ASCII	SINT		Produced Connection	
	controlunitiLData[37]		2	ASCII	SINT		Consumed Connection	0
	controlunit:LData[38]		'p'	ASCII	SINT		· Farameter connections (w	New Connection
	controlunitiLData[39]		0	Decimal	SINT			
	controlunit:LData[40]		0	Decimal	SINT			
	controlunitiLData[41]		0	Decimal	SINT			
	controlunitLData[42]		0	Decimal	SINT			
	controlunitil.Data[43]		0	Decimal	SINT			
	controlunitLData[44]		0	Decimal	SINT			
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	Downloading all 'MainFrogram' Routin	ea						
	Downloading routine 'MainRoutine'							
	Downloading all Tasks							
	Downloading task 'MainTask'							
< > >	Downloading all Data Logs							
De Controller Organizer	Downloading Controller attributes							,
🕞 Search Results 🔜 Watch								

To copy the bytes in a string, use the FILE COPY (COP) function in the Main Routine. In the example the source is linked to controlunit: I.Data[34] and a new string with 32 bytes length is created. The destination is set to STRING.Data[0] and the size of the string is set fix to 32 bytes.

FILE EDIT VIEW	SEARCH LOGIC COMMUNICATION	IS TOOLS WINDOW HELP																	
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Run Mode	T Path: A8_ETH0P-1\192.168.1	1.10	× 4		+ <del>6</del> 64	++ ++ +() -	<ul><li>(L)</li></ul>										•		
= 1/0 OK	Rem Run 🔍 No Forces	▶ No Edits in		4 9 1	avontes App-	on Alarma Be	Tenerocourter P	perceptor comp	are Computers	an novertopca	FINNING.	risoniti sequ	ancer progra	in Centrol Ponore	sak opecial mi	n Ingonomeory	Advanced Mat		
Controller Organizer		÷ 9 ×	Controlle	tr Tags - PLC(cont	troller) 🗄 Main	Program - MainRo	sutine ×												
d 11			📲 🛀 😫			17 is 10	Q Q  01  1	5 % G G 🕴	HE 12 H. T 0	e>									
Controller PL0     Controller     Controller     Power-Up     Forks	C Tags Fault Handler Handler		30													COP Source Dest Length	controlunit (Data(1) REAL	8] .0 4	^
<ul> <li>▲ O MainTask</li> <li>▲ b MainP</li> <li>Ø Par</li> <li>15) Ma</li> </ul>	rogram rameters and Local Tags sinRoutine		31													COP Source Dest Length	controlunit I.Data(2 REAL	2] .1 4	
Motion Group Ungroupe Ungroupe Assets	led 25 d Axes d		32													COP Source Dest Length	controlunit i Data[2) REAL	6] .2 4	
▲	ition 19-L18ERM-8818 PLC 3ded I/O Embedded Discrete_JO sion I/O, 0 Modules		33													COP Source Deat Length	controlunit (Data(3) REAL	0] .3 4	
▲ 🚵 Lthernet 💮 1769-L 🖉 BB1C (	.18ERM-8818 PLC controlunit		34													COP Source Dest Length	controlunit i Data(3 STRING. DATAQ 3	4] 0] 12	
			(End)															-	
Туре	Ladder Diagram (Main)																		۷
Description																		+	
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Number of Rungs	53		0	0 Errora	<u>Δ</u> 01	Warninga 🚺	31 Messages									Search			P
			Downloadir Downloadir Downloadir Downloadir Downloadir Downloadir	ng all 'MainP ng routine 'M ng all Module ng all Tasks. ng task 'Main ng Security C	rogram' Rout lainRoutine' # Task' Onfiguration	ines													^
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Run Mode Path: AB ETHIP-1\192.168.1.10	5 4 1 4 Internet	1 F 44 C 40 AD				
III Energy Storage OK	4 + Favorites Ad	d-On Alarma Bit Timer/Co	unter input/Output Compare Compute/Math MoveU	opical FileMac. File/Shi	ft Sequencer Program	Control For/Break Special HMI Trigonometry
	Controller Trees Di Circoltration 19 11	history Maintan /	Designed Designed and Local Trans. Mala Designed			
4) 11			rogiani raraneleis and cocar lags - maniriogram		Feter Neme Sher	
4 Controller PLC	Scope: 5 Manifogram V Show: 2	n rayo		v []		
Controller Tags	Name	<u>∷</u> ≋ ∧ Usage	Value Force Mask	<ul> <li>Style</li> </ul>	Data Type	Descrip ^ Properties
Controller Fault Handler	A STRING	Local	'1.u_p\$00\$00\$00\$00\$00\$00\$00\$00\$00	()	STRING	3월 및 · 제 to Extended
Power-Up Handler	STRING.LEN		32	Decimal	DINT	▲ General
A 🔛 lasks	✓ STRING.DATA		()	() ASCII	SINT[82]	Name
4 h MainProgram	STRING.DATA[0]		ч <sup>.</sup>	ASCII	SINT	Description
Parameters and Local Tags	STRING.DATA[1]			ASCII	SINT	Time
10 MainRoutine	STRING.DATA[2]		V	ASCII	SINT	Alias For
Unscheduled	STRING.DATA[3]			ASCII	SINT	Base Tag
A Control Groups	STRING.DATAI41		W .	ASCI	SINT	Data Type
Assets	STRING, DATAISI		500	ASCI	SINT	Scope
Societ Model     Gejcal Model     Gold Configuration     General     Gold Diversion     Gold Diversion	STRING DATAI61		500	ASCIL	SINT	External Access
	STRING DATAI71		500	ASCIL	SINT	Style
	N STRING DATAIRI		500	ASCIL	ONT	Required
	<ul> <li>STRING DATAIOI</li> </ul>		100	ASCI	CINIT	Visible
[1] Embedded Discrete_IO	<ul> <li>STRAC DATALLOI</li> </ul>		300	ALC:	CALL.	⊿ Data
iii Expansion I/O, 0 Modules	P STRING DATA[10]		300	AGCI	SINT	Value
A 📩 Ethernet	P SINNO.DADA[11]		500	ASCI	20141	Force Mask
B 1769-L18ERM-BB1B PLC	STRING.DATA[12]		500	ASCII	SINT	Produced Connection
Berc competence	STRING.DATA[13]		\$00'	ASCII	SINT	Consumed Connection     Recompeter Connection
	STRING.DATA[14]		'\$00'	ASCII	SINT	- Faranter Connections
	STRING.DATA[15]		\$00'	ASCII	SINT	
	STRING.DATA[16]		'\$00'	ASCII	SINT	
	STRING.DATA[17]		'\$00'	ASCII	SINT	
	STRING.DATA[18]		'\$00'	ASCII	SINT	
	STRING.DATA[19]		'\$00'	ASCII	SINT	
	STRING.DATA[20]		'\$00'	ASCII	SINT	
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Te Controller Organizer	Downloading Controller attribute	*				

### The STRING result is available in the Parameters and Local Tags.



# 8. PLC Settings at Omron PLCs

The Control Unit can also be integrated via EtherNet/IP at Omron PLCs. The following description shows the relevant steps for a NX102-1200 PLC from Omron with Sysmac Studio Version 1.41.0.10.

## 8.1 Network Settings

In the example, the following network settings are used:

- PC with Sysmac Studio and uniVision software: IP address 192.168.100.1
- Control Unit (EtherNet/IP interface): IP address 192.168.100.10
- PLC: IP address 192.168.100.20

Open Sysmac Studio and define the network settings of the PLC.

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## Click on "Tools" -> "Ethernet/IP Connection Settings".

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### Double click on the relevant IP address.

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	192.168.100.20	Built-in EtherNet/IP Port Settings - Port	1 NX102-1200		
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### Select the connection button.

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# 8.2 EDS file

Open the context menu at the toolbox with a right click and select "Display EDS Library".



### Click on "Install" to install an EDS file.





Select the EDS file of the Control Unit. Visit www.wenglor.com and search for the article number of the Control Unit in order to download the EDS file.



After the installation of the EDS file, it is shown at "wenglor sensoric gmbh" -> "Communications Adapters".





# 8.3 Add Control Unit to PLC network

Close the window and click on the add symbol in the "Taget Device" window.



Enter the IP address, the name "control-unit" and the revision of the Control Unit and click on "Add".

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Open the context menu of the device in order to edit the settings.

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Depending on the configuration file (see section "10. Attachements" on page 78), the input and output size must be set. In the example RTE\_Config\_C001.tgz is used.

Consequently, the following settings must be done:

- Assembly Output Size: 32 bytes
- Assembly Input Size: 66 bytes

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Add the Control Unit to the connections.

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# 8.4 Configure Input and Output Data

Open the global variables and create new variables.





One array of bytes is necessary for the input data and one output array of bytes is needed for the output data.



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Switch to the tag definition and click on "Registration All".



Select all and click on "Register".

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€∕ Cam Data Settings	Select th	e variables to set.						
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Select in the connections the input and output variables.

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I →      B POUs     ✓ m Data     L≷ Data Types     Gobal Variables     ► m Tasks		+ Device Bandwidth			Variable Name   Size (Byte)
	Output	Restort	Transfer to Controller	Return All to Defaul	τ τ×
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# 8.5 Download Configuration to PLC

Go online and select "Transfer to Controller" to send the configuration to the PLC.



Click on "Monitor" at the relevant IP address to check the connection status.




The blue LED shows that the connection from the PLC to the Control Unit is ok.



Open "Watch Tab Page (Table)" in order to see all input or output bytes.





Enter the input or output byte array and check the single byte values.



### 8.6 PLC Variables

In order to create variables out of the single bytes open "Programs" -> "Program0" -> "Section0". Add the function "AnyByteTo" in order to create DINT, REAL or STRING values out of the byte array.

The following example shows how to create a DINT result for the Run Counter. The input (In) is set to the start byte value, the size of DINT is UINT#4, the order is "\_LOW\_HIGH" and a new global variable must be created with data type DINT.





# 9. Sample PLC program

The download area for the control unit at www.wenglor.com contains sample PLC projects for various controllers. The projects show examples of the required settings on the controller side for Ethernet/IP communication with the control unit.

Samples are available for the following controllers:

- Allen-Bradley 1769-L18ERM BB1B PLC with Studio 5000 Logix Designer V32
- Omron NX102-1200 PLC with Sysmac Studio Version 1.41.0.10
- Beckhoff TwinCAT 3

How to use the sample PLC programs:

- 1. Download the sample file from the wenglor website and unzip it.
- 2. Install the corresponding configuration file RTE\_Config\_C001.tgz on the control unit.
- 3. Open the sample PLC program, adjust the network configuration, and transfer the program to the PLC, or activate it on the PLC.

# 10. Attachements

Overview of the configuration files for the control unit.

#### NOTE!



By default, RTE\_Config\_B002 is installed on the control unit for PROFINET communication. In order to use the EtherNet/IP protocol, one of the following configuration files must be installed (RTE\_Config\_Cxxx) (see section "5.1 Installation of Configuration Files", page 22). After a firmware update of the control unit, the configuration file is automatically reset to the default configuration. It is therefore necessary to reinstall the corresponding configuration file after a firmware installation in the control unit.

### 10.1 RTE\_Config\_C0xx (001 - 007)

Configuration file for 1 – 7 uniVision applications (xx = number of uniVision applications)

#### Slot configuration:

- · 2 bytes Input (Status Control Unit)
- · 64 bytes Input (for every application)
  - 2 bytes: Status Application
  - 2 bytes: 16 BOOL
  - 12 bytes: 3 DINT
  - 16 bytes: 4 REAL
  - 32 bytes: 1 CHAR with 32 bytes
- · 32 bytes Output (for every application)
  - 4 bytes: Commands
  - 4 bytes: 32 BOOL
  - 8 bytes: 2 DINT
  - 16 bytes: 4 REAL

Number of input and output bytes for each configuration:

Configuration Name	Input Bytes	Output Bytes
RTE_Config_C001	66	32
RTE_Config_C002	130	64
RTE_Config_C003	194	96
RTE_Config_C004	258	128
RTE_Config_C005	322	160
RTE_Config_C006	386	192
RTE_Config_C007	450	224



## 10.2 RTE\_Config\_C1xx (101 - 107)

Configuration file for 1 - 7 uniVision applications (xx = number of uniVision applications)

#### Slot configuration:

- · 2 bytes Input (Status Control Unit)
- · 64 bytes Input (for every application)
  - 2 bytes: Status Application
  - 2 bytes: 16 BOOL
  - 28 bytes: 7 DINT
  - 32 bytes: 8 REAL
- · 32 bytes Output (for every application)
  - 4 bytes: Commands
  - 4 bytes: 32 BOOL
  - 8 bytes: 2 DINT
  - 16 bytes: 4 REAL

Number of input and output bytes for each configuration:

Configuration Name	Input Bytes	Output Bytes
RTE_Config_C101	66	32
RTE_Config_C102	130	64
RTE_Config_C103	194	96
RTE_Config_C104	258	128
RTE_Config_C105	322	160
RTE_Config_C106	386	192
RTE_Config_C107	450	224

## 10.3 RTE\_Config\_C2xx (201 - 203)

Configuration file for 1 – 3 uniVision applications (xx = number of uniVision applications)

#### Slot configuration:

- · 2 bytes Input (Status Control Unit)
- 64 + 64 bytes Input (for every application)
  - 2 bytes: Status Application
  - 2 bytes: 16 BOOL
  - 12 bytes: 3 DINT
  - 16 bytes: 4 REAL
  - 32 + 64 bytes: 3 CHAR with 32 bytes
- 64 bytes Output (for every application)
  - 4 bytes: Commands
  - 4 bytes: 32 BOOL
  - 8 bytes: 2 DINT
  - 16 bytes: 4 REAL
  - 32 bytes: 1 CHAR of 32 bytes

Number of input and output bytes for each configuration:

Configuration Name	Input Bytes	Output Bytes
RTE_Config_C201	130	64
RTE_Config_C202	258	128
RTE_Config_C203	386	192

