

Industri<mark>al</mark> Au<mark>tomation</mark>

BLXX-PG-EN-IP for ControlLogix



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1 Introduction

1.1 About this Startup Guide

This manual contains information about setting up a programmable EtherNet/IP gateway. This example uses BL67 hardware. With the exception of the IO modules, the setup for a BL20 programmable EtherNet/IP gateway is identical.

2 Required Parts

2.1 TURCK Hardware

- The following parts will be required to setup this system.
- BL67-PG-EN-IP Programmable EtherNet/IP gateway
- BL67-8DI-P 8 discrete input module
- BL67-8DO-0.5A-P 8 discrete output module
- BL67-B-4M12 BL67 base module
 - o two bases will be needed one for each discrete module
- RSSD RJ45S 441-*M *=length in meters
- A 24 VDC power supply
- 24 VDC discrete input and output devices with M12 connectors

2.2 Other Hardware

- ControlLogix rack
- 1756 Controller module
- 1756 EtherNet Communication module

2.3 Software

The following software will be required to setup this system.

- CoDeSys v 2.3.9.26 (<u>http://turck.us/Support/Software_~_Videos/</u>)
- RSLogix5000

2.4 Target, library and program files

The following files will be required to setup this BLident system.

 Targets.zip – Target Files for CeDeSys for all Gateways (http://turck.us/Support/Software ~ Videos/)

3 Setup

3.1 Hardware Setup

- 1. Prepare the BL67 hardware.
- 2. Set the IP address of the gateway. The rotary switches should be set to a value between 000 and 254. In this case the first three bytes of the IP address are always 192.168.1. The last byte of the IP address is set using the rotary switches.
- 3. Power up the programmable gateway.
- 4. Push the SET button for 10 to store the gateway configuration.

After the reboot, the gateway I/O LED should be solid green. The hardware is ready. The final configuration should look like the figure below.



5. Connect the gateway to the PC using the Ethernet programming cable.

3.2 PC Setup

1. Open the "Network Connections" folder.



2. Right-click on the "Local Area Connection" icon and choose "Properties."

Connect using:	aurig			
Intel(R) 82579LM Gigabit Network Connection				
		Conf	figure	
This connection	uses the following items:		2	_
Client f	for Microsoft Networks			
Virtual	PC Network Filter Driver			
🗹 📙 Qo S Pa	acket Scheduler			-
File and	d Printer Sharing for Microsoft Netw	orks		-
GEIP F	PROFINET DCP			
🗹 🔺 Interne	et Protocol Version 6 (TCP/IPv6)			
🗹 🔺 Interne	et Protocol Version 4 (TCP/IPv4)			-
•	III	à	+	
Install	Uninstall	Prop	erties	
Description				_
Allows your o	computer to access resources on a 1	Micros	oft	
network.				

3. Highlight "Internet Protocol (TCP/IP)" and click on the "Properties" button.

Internet Protocol Version 4 (TC	P/IPv4) Properties					
General						
You can get IP settings assigned automatically if your network support this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.						
Obtain an IP address aut	comatically					
Ouse the following IP addr	ess:					
IP address:	192.168.1.1					
Subnet mask:	255.255.255.0					
Default gateway:	N. N. (N)					
Obtain DNS server addre	ss automatically					
Ose the following DNS se	rver addresses:					
Preferred DNS server:	· · · · · · · ·					
Alternate DNS server:						
Validate settings upon e	xit Advanced					
	OK Cancel					

- 4. Choose the "Use the following IP address" option and set the IP address to 192.168.1.x. The x can be set to anything from 0-255 and must be a unique number. It cannot be the same as the IP address chosen for the gateway.
- 5. The "Subnet Mask" should be set to 255.255.255.0.
- 6. Close the "Internet Protocol (TCP/IP) Properties" and "Local Area Connection Properties" windows by clicking the "OK" button.

3.3 Software Installation

The CoDeSys software and all TURCK target files will need to be downloaded and installed before downloading to a gateway and running this sample project. The required version of CoDeSys is version 2.3.9.26. The software can be downloaded from the following from the TURCK website: <u>http://www.turck.us/Support/Software ~ Videos/.</u> This start-up guide assumes that the software and its file and directory structure are created in the default folders dur- ing installation.

The target files, found on the same website as the CoDeSys software, also need to be downloaded. Download Targets.zip. There is no specific folder that these files need to be saved in. To install the target files into the CoDeSys software follow the instructions below. 1. Open the InstallTarget program.



2. Click on the "Open..." button.

InstallTarget	
Installation directory:	
Possible Targets:	Installed Targets:
	Close

3. Open Turck-PGs.tnf file in the folder where the target files have been saved.

Look in: 🚺 TSP_Turck_all_PGs_v2.0.0.0	- 🗢 🗈 💣 📼		
Name	Date modified	Туре	Size
BL20_PG_EN_Cfg	7/18/2013 12:48 PM	File folder	
BL20_PG_EN_DN_JA_Cfg	7/18/2013 12:48 PM	File folder	
BL20_PG_EN_DN_JA_Lib	7/18/2013 12:48 PM	File folder	
BL20_PG_EN_IP_Cfg	7/18/2013 12:48 PM	File folder	
BL20_PG_EN_IP_Lib	7/14/2011 10:27 AM	File folder	
BL20_PG_EN_Lib	7/18/2013 12:48 PM	File folder	
BL67_PG_DP_Cfg	7/18/2013 12:48 PM	File folder	
BL67_PG_DP_Lib	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_Cfg	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_DN_Cfg	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_DN_Lib	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_IP_Cfg	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_IP_DN_Cfg	7/18/2013 12:48 PM	File folder	
BL67_PG_EN_IP_DN_Lib	7/14/2011 10:27 AM	File folder	
BL67_PG_EN_IP_Lib	7/14/2011 10:27 AM	File folder	
BL67_PG_EN_Lib	7/18/2013 12:48 PM	File folder	
BL67-PG-DP_GSD_v3.5	7/18/2013 12:48 PM	File folder	
BLxx	7/18/2013 12:48 PM	File folder	
Dommon_Lib	7/18/2013 12:48 PM	File folder	
Turck-PGs.tnf	7/18/2013 12:48 PM	TNF File	1 KB

- 4. The BL67-PG-EN-IP target will be located in the "Possible Targets:" window. The targets can be installed individually or all at once.
 - a. The "Installation directory:" will be filled in automatically. To avoid possible errors while opening, compiling and downloading projects into the gateways the default directory should be used. The default directory should be C:\Program Files (x86)\Common Files\CAA-Targets\Turck\.

Installation directory	Program Files (x86)\Comm	\triangleright
Possible Targets:	Open	Turck ⊕- 3S-Smart Software Solutions GmbH
	Install	
	Remove	
,		Close

5. To install individual target, highlight BL67-PG-EN-IP in the "Possible Targets:" and click on "Install" button. The BL67-PG-EN-IP target can now be seen in the "Installed targets."

6. To install all the targets, highlight "Turck" and click on "Install" button. All TURCK targets can now be seen in the "Installed targets."

4 Sample Project

The following steps will take you through the steps required to create, compile, download and run a new CoDeSys project. The EtherNet/IP communication will also be discussed. The CoDeSys software will need to be installed for the following steps. The recommended version is 2.3.9.26. The hardware will not work with versions higher than 3.0.

4.1 Create New Project

- 1. Start CoDeSys
- 2. Open a new project
 - a. File >> New

۹,	CoDe	Sys						
File	Edit	Project	Insert	E <u>≍</u> tras	Online	Window	Help	
N	ew							
N 0 9	ew fro pen lose	m <u>t</u> emplat	te					Ctrl+O
<u>5</u> 5	ave ave <u>a</u> s ave/M	 ail Arc <u>h</u> ive	e					Ctrl+5

3. Select the BL67-PG-EN-IP target

Target Settings	CONTRACTOR OF THE OWNER.	and the second second	×
Configuration:	BL67-PG-EN-IP	-	
Target Platform	BL20-PG-EN BL20-PG-EN-CAN BL 20-PG-EN-DN-IA		1
Platform:	BL20-PG-EN-IP BL67-PG-EN BL67-PG-EN BL67-PG-EN-DN	E	
	BL67-PG-EN-IP- BL67-PG-EN-IP-DN		
☐ Intel byte c	nder		
-		Default OK	Cancel

4. Click "OK"

- a. Use the default settings
- b. NEVER change the "Byte Addressing Mode" setting

arget Platform Memory Layout Ge	neral Network functionality Visualization	
- 1/O-Configuration		
🔽 Configurable	🔲 Download as file	
	No address check	
	Download symbol file	VAR_IN_OUT as reference
	Symbol config from INI file	✓ Initialize inputs
Byte addressing mode	PLC Browser	Load bootproject automatically
✓ Initialize zero	✓ Trace	☐ SoftMotion
🔽 Online Change		Retain forcing
Update unused I/Os		

- 5. Choose a programming language
 - a. This example project is written in LD (ladder logic)
- 6. Use the default Name "PLC_PRG."
 - a. PLC_PRG is similar to OB1 in Siemens. This is the program that gets executed automatically. If you change the name, and do not do a TASK configuration, the program will not run.
 - b. The Type of the POU should be "Program."

Name of the new POU:	PLC_PRG	OK
Type of POU	Language of the POU	Cancel
Program	CIL	-
C Function Block		
C Function	C FBD	
Return Type:	C SFC	
BOOL	C ST	
_	C CFC	

- 7. Click "OK"
- 8. Save your new project
 - a. File >> Save as...
 - b. Choose a directory



- c. Enter a name
- d. Click "Save"

This is your new project

•	🗞 CoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]		3
	🎭 File Edit Project Insert Extras Online Window Help	- 8	×
	POUs 0001 PROGRAM PLC_PRG 0002 VAR 0003 END_VAR 0004		+
			• •
H		+	



4.2 PLC I/O Configuration

- 1. Open the BL67 IO configuration
 - a. Resources tab >> PLC Configuration >> Configuration BL67-PG-EN-IP >> BL67-IO[SLOT] >> Input/Output

a Resources ⊢ Giobal Variables ⊢ Ibray BL∞loSys.lb 19.1.07 08:2 ⊢ Gai Tools ⊢ Malam configuration ∭ Chray Manager	E-Configuration BL67-PG-EN-IP BL67-I0[SL07] Ethernet/IP Words[SL07]	Base parameters Input/Output User parameters Max. length of input data: 1024 Byte Max. length of incluput data: 1024 Byte Max. length of in-/output data: 2048 Byte Max. length of in-/output data: 2048 Byte	Length of input data: Length of output data: Length of in-/output data: Number of modules:	0 Byte 0 Byte 0 Byte 0
Tools Marm configuration Marm configuration Litzay Manager Did Log PLC - Browser PLC - Browser PLC - Browser PLC - Browser PLC - Stromseton Sampling Trace Taget Settings Taget Settings Volk-ond Recipe Manager Workspace	•	B: Input Modules B: Input Modules B: B: 401-P B: B: 57-401-P0 B: B: 57-401-P0 B: B: 57-801-P0 B: B: 57-801-P1 B: B: 57-801-P1 B: B: 57-801-P1 B: B: 57-801-P1 B: B: 57-281-P1 B: B: B: 74-281-P1 B: B: 57-281-P1 B: B: 57-281-P1	Selected Modules	
) PD	۲			

2. Insert the 8DI-P module by highlighting it and clicking the "Select>>" button.

🔩 CoDeSys - (Untitled)* - [PLC Configura	ation]		
File Edit Project Insert Extras	Online Window Help		_ & ×
Resources Sicbal Variables Sicbal Vari	E-Conliguration BL6-FC-EW-IP Ethernet/IP Words[SLOT]	Base parameters hput/Output User parameters Max. length of input data: 1024 Byte Length of input data: Max. length of output data: 1024 Byte Length of input data: Max. length of inv/output data: 2048 Byte Length of inv/output data: Max. number of modules: 34 Number of modules: Input Modules 34 Number of modules: BLS7-401PD BLS7-401PD Select >> BLS7-201P BLS7-201P Select >> BLS7-201P BLS7-201P Select >> BLS7-201P BLS7-201P Select >> BLS7-201P BLS7-201P Properties BLS7-201P BLS7-201P BLS7-201P BLS7-201P BLS7-201P Properties BLS7-201P BLS7-201P BLS7-201P BLS7	0 Byte 0 Byte 0 Byte 0
<	۲		•
<u></u>	•		ONLINE OV READ



- 3. Repeat for the 8DO-0.5A-P module.
- 4. Got the EtherNetIP configuration
 - a. Resources tab >> PLC Configuration >> Configuration BL67-PG-EN-IP >> Ethernet/IP Words[SLOT] >> Input/Output tab
- 5. Insert one input and one output register by highlighting the registers and clicking the "Select>>" button

Resources Global Variables Global Variables	nfiguration BL67-PG-EN-IP -BL67-D[SL07] -Ethernet/IP Words[SL07] - Input Word - Output Word	Base parameters input/Output Max. length of input data: Max. length of output data: Max. length of output data: Max. rumber of modules:	User parameters 496 Byte 496 Byte 992 Byte 496	Length of input data: Length of output data: Length of in-/output data: Number of modules:	2 Byte 2 Byte 4 Byte 2
- 19 Log PLC-Bower - 19 PLC-Bower - 19 PLC-Bower - 19 PLC-Bower - 20 Sarcher Jack - 19 Jack Carlingtation - 20 Watch and Recipe Manager - 20 Workspace		 □ Input Modules □ Input World □ Input Worlds □ Input Worlds □ Input Worlds □ 16 Input Worlds □ 32 Input Worlds □ Output Worlds 	Select >> <td>Selected Modules Input Word Dutput Word</td> <td></td>	Selected Modules Input Word Dutput Word	
		 4 Output Words 8 Output Words 16 Output Words 32 Output Words 	Properties		

4.3 Write a program

- 1. Open the "PLC Configuration" in the "Resources" tab
- 2. Define the following aliases in the "BL67-IO[SLOT]" and "Ethernet/IP Words[SLOT]"
 - *f* Discrete_In AT %IB0: BYTE;
 - *f* Discrete_Out AT %QB0: BYTE;
 - *f* EtherNet_In AT %IW1: WORD;
 - f EtherNet_Out AT %QW1: WORD;
 - b. Expand the 8DI-P, 8DO-0.5A-P, Input Word and Output Word.
 - c. Click on the "AT." A text box appears.
 - d. Type in "Discrete_In," "Discrete_Out," "EtherNet_In" and "EtherNet_Out" AT "%IBO:BYTE;" "%QB0: BYTE;" "%IW1: WORD;" and "%QW1: WORD;" respectively.



3. Open the "PLC_PRG (PRG)" program in the "POU's" tab.

😍 CoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]	A REAL PROPERTY AND ADDRESS OF THE OWNER OWNER OF THE OWNER	
🍤 File Edit Project Insert Extras Online Window	Help	_ <i>B</i> ×
	107 % • E E + + + + + + + + + + + + + + + + +	日 四 超 超 優 / S _R
POUs	0001 PROGRAM PLC_PRG 0002 VAR 0004 0005 ED_VAR 0006 0006 0007 0008 0001 0011 0011	
📄 POUs 💾 Data types 💭 Visualizations 🛱 Resources	<	4
		ONLINE OV READ

4. Insert a Box with EN by right-clicking on the rung.

CoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]			
🍫 File Edit Project Insert Extras Online Window	Help		
628 80 ~ 822 4	107 % · E E + + + + + + + + + + + + + + + + +		
POUs	0001 0002 0003 0004 0005 0006 0005	Cut	Ctrl+X
	0009	Copy	Ctrl+C
	0010	Paste	Ctrl+V
1 1	0001	Delete	Del
		Network (before) Network (after)	Ctrl+T
		Contact	Ctrl+K
		Contact (negated)	Ctrl+G
		Parallel Contact	Ctrl+R
		Parallel contact (negated)	Ctrl+D
		Function Block Rising edge detection Falling edge detection Timer (TON)	Ctrl+8
1 1		Coil	Ctrl+L
		'Set' coil	Ctrl+I
		'Reset' coil	
		Box with EN	
		Insert at Blocks	
		Jump	
POUs Data types Visualizations 🚛 Resources	<	Return	

5. Click on the name of the box, "AND", and rename it to "WORD_TO_BYTE."

6. Set the input of the "WORD_TO_BYTE" box as EtherNet_In and the output as Discrete_Out.

CoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]			
🌯 File Edit Project Insert Extras Online Window	Help		- 6)
	0001D05LAF PLC_PRG 0002 LR 0002 LR 0002 LR 0002 L 0002 L	Ethernet_In-	ORD_TO_BYTE NDiscrete_Out

7. Right-click anywhere in the programming window and choose "Network (after)"

ScoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]				
File Edit Project Insert Extras Online Window Help	23			- 8 ×
□ □	CRAM PLC_PRG	Cut Copy Paste Delete Network (before) Network (after)	Ctrl+X Ctrl+C Ctrl+V Del	80_TO_BYTE
		Contact Contact (negated) Parallel Contact Parallel contact (negated) Function Block Rising edge detection Fullion edge detection	Ctrl+K 1- Ctrl+G Ctrl+R Ctrl+D Ctrl+B	Discrete_Out

8. Insert a "BYTE_TO_WORD" box with "Discrete_In" as the input and "EtherNet_Out" as the output.

ScoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]		- 0 - X
Sile Edit Project Insert Extras Online Window	Help	_ # ×
	107% · EE 44 44 44 44 44 00 00 00 00 00 00 00 00	
	1000_COSAM FIC_F80 100	· · · · · · · · · · · · · · · · · · ·

- 9. Compile the project.
 - a. Project >> Rebuild all

🎭 CoDeS	ys - (U	Intitled)* - [PLC	PRG (PRG	6-LD)]						
CoDeS	ys - (U Edit	Intitled)* - [PLC Project] Insee Build Rebuild a Clean all Load dow Object Project d Options. Translate Docume	PRG (PRG t Extras ull vnload inf atabase into othe nt	online	Window F11	+ + +	Ip 101 P 102 V 103 E 105 106 107 108 109 110 110 110 109 110 109 109	% ROGRAM AR ND_VAR] E E	<u>11- 47- 47- 47</u>
		Export Import								

The results of the compilation are displayed in the message screen.

CoDeSys - (Untitled)* - [PLC_PRG (PRG-LD)]		×
File Edit Project Insert Extras Online Window	Help	8 1
(철말 POUs (노예) (제요) (위요) (위요)	0001 PROCEAN FLC_PRG 0002 VAR 0002 VAR 0000 C0005 0006 0006 0007 0007 0008 000 000	
	0001 Ethernet_InDiscrete_Out	
	0002 Discrete_In_EX	
	• • • • • • • • • • • • • • • • • • •	
	Declarations of the global variables Data allocation Check task configuration Attention: Unused I/Os will not be updated (see target settings)! Inplementation of POU "PAC_PRO" Check for the parameter configuration Hardware-Configuration	^
Data topo 20 Visualization 20, Resourced	POU indices:110 (10%) Size of used data: 40 of 524280 bytes (0.01%) Size of used retain data: 0 of 15384 bytes (0.00%) 0 Error(s). 0 Warning(s).	



4.4 Configuring the Communication Parameters

- 1. Open the "Communication Parameters" dialogue box.
 - a. Online >> Communication Parameters

CoDeSys - (Untitled)* - [PLC_PRG (PRG-LI				
🍫 File Edit Project Insert Extras 🕻	Online Window Help			- @ ×
2 5 5 5 5 6	Login	Alt+F8	4F4F () () () () () () (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	
	Logout	Ctrl+F8		
	Download			
•	Run	F5	F	
	Stop	Shift+F8		
	Reset			
	Reset (cold)			
	Reset (original)			
	Toggle Breakpoint	F9		
	Breakpoint Dialog			
	Step over	F10	WORD_TO_BYTE	
	Step in	F8	Ethernet_InDiscrete_Ou	t
	Single Cycle	Ctrl+F5		
	Write Values	Ctrl+F7	·	
	Force Values	F7		
	Release Force	Shift+F7	WORD TO BYTE	
	Write/Force-Dialog	Ctrl+Shift+F7		
	Show Call Stack		Discrete_InEthernet_Ou	· ·
	Display Flow Control			
	Simulation Mode		al variables	^
	Communication Parameters		11 not be undated (see taynet settings))	
	Sourcecode download		LC_PRG'	
	Create boot project		philguration .	
	Write file to PLC		524288 butes (0 01%)	
	Read file from PLC		0 of 16384 bytes (0.00%)	<u>=</u>
POUs Data types Visualizations	Resources +	(57) v soumeny(5 H		
				Inumer for locie
Mows seeing or the continunication parameters				TOUTINE TOA INEAD

2. Click on "New"

_hannels ⊡- 'localhost' via Tcp/Ip				OK
	Name	Value	Comment	Cancel
				New
				Remove
				Gateway
				Update

3. Enter a name, select "Tcp/Ip (Level 2)" and click "OK"

Device		Cancel
Name Serial (BS232)	Info 3S Serial BS232 driver	
Tcp/lp (Level 2)	3S Tcp/Ip level 2 driver	
Tcp/lp (Level 2 Route	3S Tcp/Ip Level 2 Router Driver	

4. Enter the IP Address of the gateway, change the Motorola byteorder to Yes and click "OK"

Communication Parameters				×
Channels - Tocalhost via Tcp/lp - BL67_PG_EN_IP	T cp/lp (Level 2) Name Address Port Blocksize Motorola byteorder	Value 192,168,1.1 1200 128 Yes	Comment IP address or hosti Must match with ru	OK Cancel New Remove Gateway
				Update

- 4.5 Download the Project
 - 1. Login to the BL67-PG-EN-IP gateway.
 - a. Online >> Login
 - b. The first time you login, CoDeSys will bring up a dialogue box that will ask if you want to download the program. Click "Yes."

	Login	Alt+F8	48 4/8 4	> 4> 4>	8 8 8 8 8	1 SR		
and a second	Logout	Ctri+18	-					
POUs R PLC PRO (PRO)	Download							
	Run	F5						
	Stop	Shift=F8						
	Reset							
	Reset (cold)							
	Reset (original)		_					
	Toggle Breakpoint	F9	-					
	Breakpoint Dialog							
	Step over	F10						VORD_
	Step in	FB					Ethernet I	n-EN
	Single Cycle	Ctrl+F5						
	Write Values	Ctrl+F7						
	Force Values	F7						
	Release Force	Shift+F7						Fueno :
	Write/Force-Dialog	Ctrl+Shift+F7	<u> </u>				-	EN
	Show Call Stack						Discrete_I	n
	Display Flow Control							
	Simulation Mode		al variab	les				
	Communication Parameters							
	Sourcecode download		LC PRG'	e updated	(see target	settings	21	





- 2. The program is now in the PLC. Create a boot project. This will create a project in the gateway that will automatically boot and run when the gateway is powered up.
 - a. Online >> Create boot project

😍 CoDeSys - (Untitled)* - [PLC Configuration	on]				
🔟 File Edit Project Insert Extras	Online Window Help				_ @ ×
Image: Second System Image: Se	Login Logout Download Run Stop Reset	Alt+F8 Ctrl+F8 F5 Shift+F8	EN ÂT	Modbus-NetVar-Channel Address: 20001	
Lotay Manager	Reset (cold) Reset (original)		.0T] r AT		
Workspace	Toggle Breakpoint Breakpoint Dialog Step over Step in Single Cycle	F9 F10 F8 Ctrl+F5	ər AT		
	Write Values Force Values Release Force Write/Force-Dialog	Ctrl+F7 F7 Shift+F7 Ctrl+Shift+F7			
	Show Call Stack Display Flow Control				
	Simulation Mode Communication Parameters Sourcecode download				
	Create boot project Write file to PLC Read file from PLC				

- 3. Switch the gateway to RUN status
 - a. Online >> Run or F5

File Edit Project Insert Extras	nline Window Help	Tau -		
69	Login Logout	Alt+F8 Ctrl+F8		
Resources	Download	EN	Modbus-Net Var-Channel	
Bibrary BLxxloSys.lib 19.1.07 08:20:56	Run	FS		
Tools Molarm configuration Library Manager Library Manager Library Manager Dig Log PLC - Browser	Stop Reset Reset (cold) Reset (original)	Shift+F8 -P AT IOT] AT	Address: SQW1	
Sampling Trace Target Settings	Toggle Breakpoint Breakpoint Dialog	F9 br AT		
- Watch: and Becine Manager	Step in	F10		
-X Workspace	Single Cycle	Ctrl+F5		
	Write Values	Ctrl+F7		
	Force Values	F7		



4. The program can be confirmed by connecting some inputs. In this case a discrete input device was connected to channel 3 of the 8-discrete-input module. The following can be observed:





5 Ethernet Communication

The BL67-PG-EN-IP gateway communicates with a Ethernet master via the Ethernet/IP Words that are created in the PLC configuration. In the previous steps, one input and one output register were created in the configuration. These registers were aliased as Ethernet_In and Ethernet_Out respectively and used in the program. The Ethernet words that are created in the "PLC Configuration" of the BL67-PG-EN-IP are mapped to the Ethernet/IP scanner, i.e. 1756-ENBT/A in an Allen-Bradley ControlLogix rack, etc.



^{*} See Appendix A

TURCK Inc. 3000 Campus Drive Minneapolis, MN 55441 Application Support: 1-800-544-7769 Fax: (763) 553-0708 www.turck.com



In the following steps the Ethernet communication will be confirmed using an Allen-Bradley ControlLogix controller.

- 1. Open a new RSLogix5000 program.
 - a. Name the Controller and click "OK."

New Controlle	r		X
Vendor:	Allen-Bradley		
Туре:	1756-L63 ControlLogix5563 Controller	-	OK
Revision:	16 💌		Cancel
	Redundancy Enabled		Help
Name: 🤇	BL67_PG_EN_IP_Communication_Sample	>	
Description:		^	
		×	
Chassis Type:	1756-A10 10-Slot ControlLogix Chassis	•	
Slot	0 💼 Safety Partner Slot:		
Create In:	C:\RSLogix 5000\Projects		Browse

2. Right-click on "1756 Backplane, 1756 A10" and click on "New Module..."





3. Choose the correct EtherNet communication module from the "Select Module" window and click "OK."

lodule	Description	Vendor
🛨 Analog		
 Communications 		
- 56AMXN	DCSNet Interface	Allen-Bradley
-1756-CN2/A	1756 ControlNet Bridge	Allen-Bradley
-1756-CN2/B	1756 ControlNet Bridge	Allen-Bradley
-1756-CN2R/A	1756 ControlNet Bridge	Allen-Bradley
-1756-CN2R/B	1756 ControlNet Bridge	Allen-Bradley
- 1756-DNB	1756 DeviceNet Scanner	Allen-Bradley
- 1756-EN2F/A	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley
-1756-EN2T/A	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
- 1756-ENBT/A	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
-1756-ENET/A	Allen-Bradley	
- 1756-ENET/B	1756 Ethernet Communication Interface	Allen-Bradley
- 1756-EWEB/A	1756 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv	Allen-Bradley
	SynchLink Interface	Allen-Bradley
Controllers		
🛨 Digital		
Drives		
Motion		
🕀 Other		
Specialty		
		1
	Find	Add Favorit
Ru Catagoriu Bul	Vendor Eavorites	

- 4. Name the module and type in the IP address of the 1756 communication module.
 - a. Make sure the communication module's IP address is in the same network (192.168.1.x) as the BL67-PG-EN-IP.

New Module	
Type: Vendor: Parent: Name: Description:	1756-ENBT/A 1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media Allen-Bradley Local EtherNetIP_Network ● IP Address: 192 . 168 . 1 . 25 ● Host Name:
Slot: Revision:	1 1 3 3 3 3 Electronic Keying: Compatible Keying Ule Properties OK

5. Right-click on "Ethernet" and click on "New Module..."



6. Choose the "Generic Etheret Module" for the BL67-PG-EN-IP gateway from the "Select Module" window and click "OK."

Module	Description	Vendor
Communications		
- 1734-AENT/A	1734 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
- 1738-AENT/A	1738 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
-1756-EN2F/A	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley
- 1756-EN2T/A	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
- 1788-EWEB/A	1788 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv	Allen-Bradley
- 1794-AENT/A	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
- 1794-AENT/B	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
- Drivelogix5730 Eth.	10/100 Mbps Ethernet Port on DriveLogix5730	Allen-Bradley
ETHERNET-BRIDGE	Generic EtherNet/IP CIP Bridge	Allen-Bradley
ETHERNET-MODULI	E Generic Ethernet Module	Allen-Bradley
- EtherNet/IP	SoftLogix5800 EtherNet/IP	Allen-Bradley
PH-PSSCENA/A	Ethernet Adapter, Twisted-Pair Media	Parker Hannifi
Drives		
±-HMI		
	Find	Add Favorite
P. P. J.	(ander Exumited	
By Category By	vendor Pavorites	



- 7. Name the module, type in the IP address of the BL67-PG-EN-IP gateway and enter the Connection Parameters and click "OK."
 - a. Make sure the Connection Parameters are as follows. These parameters will always be the same for both, the standard, BL67-GW-EN-IP, EtherNet/IP gateway and the programmable, BL67-PG-EN-IP, EtherNet/IP gateway.

New Module	
Type: ETHERNET-MODULE Generic Etherne Vendor: Allen-Bradley Parent: EtherNetIP Network Name: BL67_PG_EN_IP Description: Image: Comm Format: Data - INT Image: Comm Format: Address / Host Name Ip2 . 168 . 1 . 1 Image: Host Name Image: Comm Format:	t Module Connection Parameters Assembly Instance: Size: Input: 101 128 (16-bit) Output: 102 128 (16-bit) Configuration: 1 0 (8-bit) Status Input: Status Cutput:
C Open Module Properties	OK Cancel Help

8. RSLogix automatically creates the 128 input and 128 output words in the "Controller Tags." These are the registers referenced in the mapping described on page 21.

Centroller BL67_PG_EN_IP_Communication_Sample	Scope: BL67_PG_EN_IF Show Show All
Controller Tags	Name 🛆 Valu 🕈 Forct Style Data Type
Power-Up Handler	+ BL67_PG_EN_IP:C {} { AB:ETHE
🖃 📇 Tasks	BL67_PG_EN_IP:I {} { AB:ETHE
🖻 🤕 MainTask	
🕀 🕞 MainProgram	
Unscheduled Programs / Phases	🛨 BL67_PG_EN_IP:0.Data / {} { Dec. INT[128]
Endan groups	

- 9. Download the program to the controller and go online with the controller.
- 10. The CoDeSys project created before contains one input word and one output word for the EtherNet/IP communication. According to the mapping on page 21, these words will be available as output 1 and input 1, respectively, in the ControlLogix program. In this case, output 1 and input 1 are BL67_PG_EN_IP:O.Data[1] and BL67_PG_EN_IP:I.Data[1] respectively.



11. To confirm the communication from the BL67-PG-EN-IP to the Allen-Bradley PLC set one of the inputs connected to the 8DI-P module, and observe the input word in the ControlLogix program. In this example a sensor connected to 8DI-P channel 3 is be flagged. The data from the 8DI-P module is moved to the BL67-PG-EN-IP EtherNet/IP Output Word 1 by the ladder logic in the CoDeSys project. This is mapped to BL67_PG_EN_IP:I.Data[1]. This is confirmed by the ControlLogix program.







E-BL67_PG_EN_IP:I	{}	{		AB:ETHE
BL67_PG_EN_IP:I.Data	{}	{	Deci	INT[128]
+ BL67_PG_EN_IP:LData[0]	0		Deci	INT
BL67_PG_EN_IP:I.Data[1]	8	\supset	Deci	INT
BL67_PG_EN_IP:I.Data[1].0	0		Deci	BOOL
BL67_PG_EN_IP:I.Data[1].1	0		Deci	BOOL
BL67_PG_EN_IP:LData[1].2	0		Deci	BOOL
BL67_PG_EN_IP:I.Data[1].3	1	\supset	Deci	BOOL
BL67_PG_EN_IP:I.Data[1].4	0		Deci	BOOL
BL67_PG_EN_IP:I.Data[1].5	0		Deci	BOOL
BL67_PG_EN_IP:I.Data[1].6	0		Deci	BOOL
BL67_PG_EN_IP:I.Data[1].7	0		Deci	BOOL
BL67 PG EN IP:I.Data[1].8	0		Deci	BOOL

 To confirm the communication from the Allen-Bradly PLC to the BL67-PG-EN-IP force the output word in the ControlLogix program and observe the LED's on the 8DO-0.5A-P module. Set bits 0 through 3 of BL67_PG_EN_IP:O.Data[1]. The data from BL67_PG_EN_IP:O.Data[1] is mapped to BL67-PG-EN-IP Ether-Net/IP Input Word 1. This data is moved to the 8DO-0.5A-P module by the ladder logic in the CoDeSys project. This is confirmed by the CoDeSys project as well as the LED's 0-3 on the 8DO-0.5A-P module.

E-BL67_PG_EN_IP:I	{} {	AB:ETHE	
⊞-BL67_PG_EN_IP:I.Data	{} {	Deci INT[128]	
-BL67_PG_EN_IP:0	{} {	AB:ETHE	
BL67_PG_EN_IP:0.Data	{} {	Deci INT[128]	
+ BL67_PG_EN_IP:0.Data[0]	0	Deci INT	
BL67_PG_EN_IP:0.Data[1]	15	Deci INT	
BL67_PG_EN_IP:0.Data[1].0		Deci BOOL	
BL67_PG_EN_IP:0.Data[1].1	1	Deci BOOL	
BL67_PG_EN_IP:0.Data[1].2	1	Deci BOOL	
BL67_PG_EN_IP:0.Data[].3	1	Deci BOOL	
BL67_PG_EN_IP:0.Data[1].4	v	Deci BOOL	
BL67_PG_EN_IP:0.Data[1].5	0	Deci BOOL	
BL67_PG_EN_IP:0.Data[1].6	0	Deci BOOL	





Appendix A – Gateway Status R	Register
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Bit	Name	Description	
Gateway			
15	I/O Controller Error	The communication controller for the I/O-system is faulty.	
14	Force Mode Active Error	The Force-Mode is activated. The state of the outputs may no long-	
		er accord to the settings made via the fieldbus.	
13	Reserved		
12	Reserved		
Module bus			
11	I/O Cfg Modified Error	The I/O-configuration has been changed and is now incompatible.	
10	I/O Communication Lost Error	No communication on the I/O module bus.	
Voltage errors			
9	U _{svs} too low	System supply voltage too low (<18 VDC.)	
8	U _{sys} too high	System supply voltage too high (>30 VDC.)	
7	U _L too low	Load voltage too low (<18 VDC.)	
6	U _L too high	Load voltage too high (>30 VDC.)	
5	I _{sys} too high	Overload of the system voltage supply.	
4	Reserved		
Warnings			
3	I/O Modified Warning		
2	Reserved		
1	Reserved		
0	I/O Diagnostics Active Warning	At least one I/O-module sends active diagnostics.	