

# MGB-L1B-EI... on Allen Bradley ControlLogix with Gateway in Network



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Guard locking according to EN ISO 14119 actuated by spring force applied - power-ON released (closed-circuit current princi	ple). 2
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# Guard locking according to EN ISO 14119 actuated by spring force applied – power-ON released (closed-circuit current principle)

 Safety function
 Guard locking for personnel protection acc. to EN ISO 14119

 Reliability values according to EN ISO 13849
 Category 4, PL e

# Components/modules used

## EUCHNER

Description	Order no./item designation Set	Order no./item designation Evaluation unit
Safety system MGB with Ethernet/IP interface, guard locking with guard lock monitoring	126636 / MGB-L1HB-EIA-R-126636 126638 / MGB-L1HB-EIA-L-126638	126635 / MGB-L1B-EIA-R-126635 126637 / MGB-L1B-EIA-L-126637

Tip: More information and downloads about the aforementioned EUCHNER products can be found at www.euchner.com. Simply enter the order number in the search box.

# Others

Description	ltem
Allen Bradley ControlLogix 4 Slots Chassis	Mat No PN-240518
Allen Bradley Logix 5576S Automation Controller 8M/4M	Mat No PN-98688
Allen Bradley Logix L7SP SIL3 PLe Safety Partner	Mat No PN-98690
Allen Bradley 2-PORT CLX HI-CAP ENET/IP MODULE – TP	Mat No. 184724

Notice: The MGB can be used on control systems of the type RSLogix5000 from version 20 (firmware 20.011).

### Software



Figure 1



# **Functional description**

### General

The MGB-L1B-EL...is guard locking in accordance with EN ISO 14119 according to the closed-circuit current principle. If an MGB is to be operated in a different subnet than the one used by the control system, the MGB is connected to an Allen Bradley Control-Logix CPU via a gateway. Figure 2 shows a very simple example.



Figure 2

# Setting the gateway address in the MGB

**Notice**: The following screen shots were created with version 28.0 of the Studio 5000 software. Depictions with RSLogix5000 or other versions of Studio 5000 can differ from the images shown here.

The procedure used here works both for MGBs that were never used before and for MGBs that have already saved an IP address. This requires creating an auxiliary project in Studio 5000. This project is used only to set the gateway address, an IP address and the subnet mask.

**Tip**: There is also software available, e.g. from EtherNet/IP Tools, with which a gateway address and other settings can be made directly on the MGB.

# 1. Assigning a temporary IP address for the MGB

As the first step, use the DIP switches on the side of the MGB to set an address. The first seven digits of this setting are always 192.168.1.xxx, with "xxx" being replaced with the DIP switch setting. Any IP address in the network 192.168.1.xxx is used for the control system for this example, and 192.168.1.2 is used as the temporary IP address of the MGB.

Set the DIP switches to the following positions and then switch on the voltage at the MGB:



Figure 3

Once the MGB has booted, the MGB adopts the IP address 192.168.1.2.



Now switch the voltage off again and set the following DIP switch position:





Now switch the MGB on again. Since DIP switch 2 remains OFF, DHCP is not activated. The previously saved address 192.168.1.2 continues to be used. The MGB communication parameters can be changed in this DIP switch setting.

# 2. Creating an auxiliary project in RSLogix5000

It is now necessary to create a small auxiliary project with a CPU, an Ethernet adapter and the MGB. The communication settings for the MGB can now be changed on the "Port Configuration" tab of the generic safety module.

Create the MGB as follows:



#### Figure 5

Use this to open the dialog field to add a new module.



# 3. Selection: "Generic EtherNet/IP Safety Module"

Er	nter Search Text for Module Ty	De		Sh <u>o</u> w Filters ≯
	<ul> <li>Catalog Number</li> </ul>	Description	Vendor	Category
	1791ES-IB16 1791ES-IB8XOBV4 2094-EN02D-M01-S1 2198-H003-ERS2 2198-H008-ERS2 2198-H015-ERS2 2198-H025-ERS2 2198-H040-ERS2 2198-H070-ERS2 ETHERNET-SAFETYMO PowerFlex 755-EENET-C PowerFlex 755-HiPwr-EE	16 Point 24 VDC Sink Safety Input 8 Point 24 VDC Sink Safety Input, 8 Point 24 VDC Bip Kinetix 6500 Single Axis Ethemet Safe Speed Monitori Kinetix 5500, 1A, 195-528 Volt, CIP Safe Torque Off Dr Kinetix 5500, 2.5A, 195-528 Volt, CIP Safe Torque Off Dr Kinetix 5500, 5A, 195-528 Volt, CIP Safe Torque Off Dr Kinetix 5500, 8A, 195-528 Volt, CIP Safe Torque Off Dr Kinetix 5500, 13A, 195-528 Volt, CIP Safe Torque Off In Kinetix 5500, 23A, 195-528 Volt, CIP Safe Torque Off In Kinetix 5500, 23A, 195-528 Volt, CIP Safe Torque Off In Kinetix 5500, 23A, 195-528 Volt, CIP Safe Torque Off In Kinetix 5500, 23A, 195-528 Volt, CIP Safe Torque Off In Genetic EtherNet/IP Safety Module PowerRex 755 AC Drive via Embedded Ethemet - CIP PowerRex 755 High Power AC Drive via Embedded Eth	Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley	Safety,Digital Safety,Digital Safety,Drive,Motion Drive,Motion,Safety Drive,Motion,Safety Drive,Motion,Safety Drive,Motion,Safety Drive,Motion,Safety Drive,Motion,Safety Safety,Other Safety,Drive,Motion Safety,Drive,Motion
		III		4
12	of 404 Module Types Found			Add to Favorites

#### Figure 6

Create the "Generic Ethernet/IP Safety Module" as a new device on the Ethernet.



# 4. Parameter settings for the MGB

#### General:

	ion   Safety   Module Info	Port Configuration   1	Port Diagnostics			
Type: E	THERNET-SAFETYMODULE Ge	eneric EtherN				
Parent: Et	hernet_Adaptor_1		Ethernet Address			
Name: n	ngb		Private Network:	193	2.168.1.	2 🊔
Description:		<u>_</u>	IP Address:			
					Advanc	:ed
			Safety Network Number:	40CA_020 5/30/2017 1	E_DA42 1:35:27.8	 810 AM
Module Definition	1 eters	Connec	tion Parameters			
Vendor: Product Type: Product Code:	1 0 26	connec	Input Assembly Instance	Output Assembly Instance	Size	
	1.001	Safety	1	199	1	(8-biť
Revision:	ng: Exact Match	Safety	199	1	1	(8-bit
Revision: Electronic Keyi			ation Assembly Instan	ce: 1	.99	
Revision: Electronic Keyi Input Data: Output Data:	Safety Safety	Configur	adon Assembly Instant			

Figure 7

- Assign any name to the MGB.
- Assign the device the IP address 192.168.1.2.

The MGB parameters will <u>not</u> be set correctly below; the purpose here is only to set the gateway address and the IP address of the MGB correctly. All other parameters must be set correctly in the actual project.

Tip: Use the application AP000223 in your actual project to perform full parameter assignment for the MGB.



### Safety:

New Module					<b></b>
General* Connec	ction Safety* Mod	dule Info Port Configu	ration Port	Diagnostics	
Connection Type	Requested Packet Interval (RPI) (ms)	Connection Reaction Time Limit (ms)	Max Obs Network D	erved	
Safety Input Safety Output	10 🚖	40.1	J	Reset Reset	Advanced
Configuration Or Reset Ow Configuration ID: Date: Time:	wnership: nership ← n Signature:	(Hex)	Copy Paste	Di cł ar	isabling the Configuration Signature sables the configuration validation ack performed when connections e established.
Status: Creating				OF	Cancel Help

#### Figure 8

Deselect the configuration signature (the MGB does not include any configuration data).



# 5. Downloading the configuration

Now go online with the control system and load the auxiliary project into the control system.

#### 6. Setting the gateway address and the IP address

Subsequently open the "Port Configuration" tab in the MGB properties.

You can make all settings for the network in this screen. Set the gateway to the desired address and set the MGB's IP address at the same time. You can also set the subnet mask if necessary.

Module Properties: Ethernet_Ada	ptor_1 (ETHERNET	-SAFETYMODULE 1.0	001)	- • •
General Connection Safety Mo	dule Info Port Confi	guration Port Diagnos	tics	
General       Connection       Safety       Mod <ul> <li>Static</li> <li>Bootp</li> <li>(Configure DHCP to return a fixed a</li> <li>IP Address:</li> <li>192.168</li> <li>(Must Match IP Address on General</li> <li>Subnet Mask:</li> <li>255.255</li> <li>Gateway Address:</li> <li>0.0</li> </ul>	ODHCP           iddress)           . 1 . 2           I Tab)           . 255 . 0           . 0 . 0	guration Port Diagnos Domain Name: Host Name: Port Diagnos Host Name: Enable Auto-Nego Select Port Speed: Current Port Speed: Select Duplex: Current Duplex:	tiate Speed and Duplex 100 Mbps Half Duplex Full Duplex	
Primary DNS Server Address:	• •	(Reset module to cha Duplex.) Refresh	Set	
Status: Shutting Down		ОК	Cancel Apply	Help

#### Figure 9

For the example from Figure 2, make the settings as shown in Figure 10.

Notice: The MGB must be in the same subnet as the gateway. Studio 5000 will otherwise display an error message.

# EUCHNER

More than safety.

Module Properties: E     General Connection	thernet_Adaptor_1 (ETHERN	ET-SAFETYMODULE 1.001)
General Connection    Static	Safety         Module Into         Poil Co           Bootp         DHCP           etum a fixed address)         192 . 168 . 5 . 2           ss on General Tab)         255 . 255 . 0           192 . 168 . 5 . 1	Port Diagnostics     Domain Name:   Host Name:     Image: Comparison of the second of t
Status: Faulted		OK Cancel Apply Help

#### Figure 10

Click "Set" to accept the values. The following warning then appears:

RSLogix S	5000
	DANGER. Multi-controller systems:
-	If two or more controllers are sharing this module, applying these configuration changes could affect the operation of the other controllers.
	DANGER: Module Identity Mismatch Operation may interrupt control.
	Apply the changes to the module configuration?
	Yes No Help

#### Figure 11

Click "Yes." The settings will now be saved in the MGB. These values will be adopted when you switch the MGB off and then back on again.

ATTENTION: Do not change the DIP switch position afterwards!

**IMPORTANT**: You can no longer reach the MGB from the control system with the auxiliary project. The MGB can be reached again only when you correctly position the MGB in the network via the gateway. Use your actual project for this purpose, no longer the auxiliary project for setting the gateway address.

**IMPORTANT**: Set the "Safety Network Number" only in the actual project, <u>never</u> in this auxiliary project.



# Important note - please observe carefully!

This document is intended for a design engineer who possesses the requisite knowledge in safety engineering and knows the applicable standards, e.g. through training for qualification as a safety engineer. Only with the appropriate qualification is it possible to integrate the introduced example into a complete safety chain.

The example represents only part of a complete safety chain and does not fulfill any safety function on its own. In order to fulfill a safety function, the energy switch-off function for the hazard location and the software within the safety evaluation must also be considered, for example.

The introduced applications are only examples for solving certain safety tasks for protecting safety doors. The examples cannot be comprehensive due to the application-dependent and individual protection goals within a machine/installation.

#### If questions concerning this example remain open, please contact us directly.

In accordance with Machinery Directive 2006/42/EC, the design engineer of a machine or installation is obligated to perform a risk assessment and take measures to reduce the risk. When doing this, the engineer must comply with the applicable national and international standards. Standards generally represent the current state of the art. Therefore, the design engineer should continuously inform himself about changes in the standards and adapt his considerations to them. Relevant standards include EN ISO 13849 and EN 62061. This application must be regarded only as assistance for the considerations about safety measures.

The design engineer of a machine/installation has the obligation to assess the safety technology him/herself. The examples must not be used for assessment, because only a small excerpt of a complete safety function was considered in terms of safety engineering here.

In order to be able to use the safety switch applications correctly on safety doors, it is indispensable to observe the standards EN ISO 13849-1, EN ISO 14119 and all relevant C-standards for the respective machine type. Under no circumstances does this document replace the engineer's own risk assessment, and it cannot serve as the basis for a fault assessment.

Particularly in case of fault exclusion, it must be noted that this can be performed only by the design engineer of a machine or installation and requires a reason. General fault exclusion is not possible. More information about fault exclusion can be found in EN ISO 13849-2.

Changes to products or within assemblies from third-party suppliers used in this example can lead to the function no longer being ensured or the safety assessment having to be adapted. In any event, the information in the operating instructions on the part of EUCHNER, as well as on the part of third-party suppliers, must be used as the basis before this application is integrated into an overall safety function. If contradictions should arise between the operating instructions and this document, please contact us directly.

#### Use of brand names and company names

All brand names and company names stated are the property of the related manufacturer. They are used only for the clear identification of compatible peripheral devices and operating environments in relation to our products.

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