



Connection of MGB-L1B-El... to OMRON Sysmac Studio® from V1.45

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1. About this document

1.1. Version

Version	Date	Change/addition	Chapter
01-02/22	02/17/2022	Prepared	All

1.2. Scope





The purpose of this document is the integration and configuration of the MGB Ethernet/IP in OMRON Sysmac Studio® from V1.45.

1.3. Target group

Design engineers and installation planners for safety systems on machines, as well as setup and servicing staff possessing special expertise in handling safety components as well as expertise in the installation, setup, programming and diagnostics of programmable logic controllers (PLCs) and bus systems.

1.4. Supplementary documents

The overall documentation for this application consists of the following documents:

Document title (document number)	Contents	
Operating instructions (2126330)	Safety Systems MGB-L...B-EI... (Ethernet/IP) with Data Structure Type A	
Safety information (2126331)	Safety Information and Maintenance (part of the operating instructions for safety system MGB-L...B-EI... (Ethernet/IP))	
Application (AP000262)	MGB-EIP – IP address assignment with BOOTP/DHCP	
Possibly enclosed data sheets	Item-specific information about deviations or additions	

1.5. Notice

This application is based on the operating instructions for the MGB Ethernet/IP and the application AP000262 – MGB-EIP – IP address assignment with BOOTP/DHCP. Please refer to the operating instructions for technical details and other information.

2. Components/modules used

2.1. EUCHNER

Description	Order number / item
MGB with Ethernet/IP™ interface	All MGBs with Ethernet/IP™ interface



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.

2.2. Others

Description	Order number / item
NX102-1120 CPU UNIT	NX102-1120
NX-SL5500 Safety CPU UNIT	NX-SL5500

2.3. Software

Description	Version
OMRON Sysmac Studio®	Version Lite Edition V1.45.1

3. Functional description

The MGB-L1B-EIA-.. is a guard locking device in accordance with EN ISO 14119 according to the closed-circuit current principle; the MGB-L2B-EIA-.. is a guard locking device in accordance with EN ISO 14119 according to the open-circuit current principle. In this example, all safety functions are processed via the CIP Safety protocol. The MGB Ethernet/IP is connected via the bus module to an OMRON Safety Controller.

4. Overview of the communication data

4.1. Input

Ethernet/IP	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Connection header	1st byte	-	-	-	-	-	DA	CF	RM
	2nd byte	DiagnosticSequenceCount							
	3rd byte	-	-	-	-	-	-	-	-
	4th byte	-	-	-	-	-	-	-	-
Failsafe input 0	5th byte	FI.MS2	FI.MS1	FI.MS0	-	-	-	FI.EN	FI.ES
Failsafe input 1	6th byte	FI.UK	FI.SK	-	-	-	FI.L	FI.B	FI.D
Input 0	7th byte	EN-S1	-	S92.2	S92.1	S91.2	S91.1	S90.2	S90.1
Input 1	8th byte	EN-S2	-	S95.2	S95.1	S94.2	S94.1	S93.2	S93.1
Input 2	9th byte	S4.2	S4.1	S3.2	S3.1	S2.2	S2.1	S1.2	S1.1
Diagnostics	10th byte	D.LT	-	D.OL	D.MS	D.EN	D.ES	D.PF	-
Fault code	11th byte	FaultCode							
Fault code	12th byte	FaultCode							

4.2. Output

Ethernet/IP	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Failsafe out-put 0	1st byte	-	-	-	-	-	-	-	FO.L
Output 0	2nd byte	EN-H1	-	H95	H94	H93	H92	H91-	H90
Output 1	3rd byte	EN-H2	-	-	-	H4	H3	H2	H1
Control and ACK	4th byte	Q.PF	Q.G	-	-	ST4	ST3	ST2	ST1

Tip: The individual abbreviations are explained in the operating instructions.

5. Integrating the MGB in Sysmac Studio®

The EDS files that EUCHNER provides for the MGBs cannot be used in Sysmac Studio®. An EDS tool is integrated from Sysmac Studio® version 1.45 that enables EDS files to be created for the MGB. The MGB can then be integrated into your project and used.

5.1. Creating and installing the EDS file

1. Go to the Safety CPU settings and open *Connection Settings (Originator)*. Then right-click in the *Ethernet/IP Port* field. Select *EDS Library for CIP Safety...*

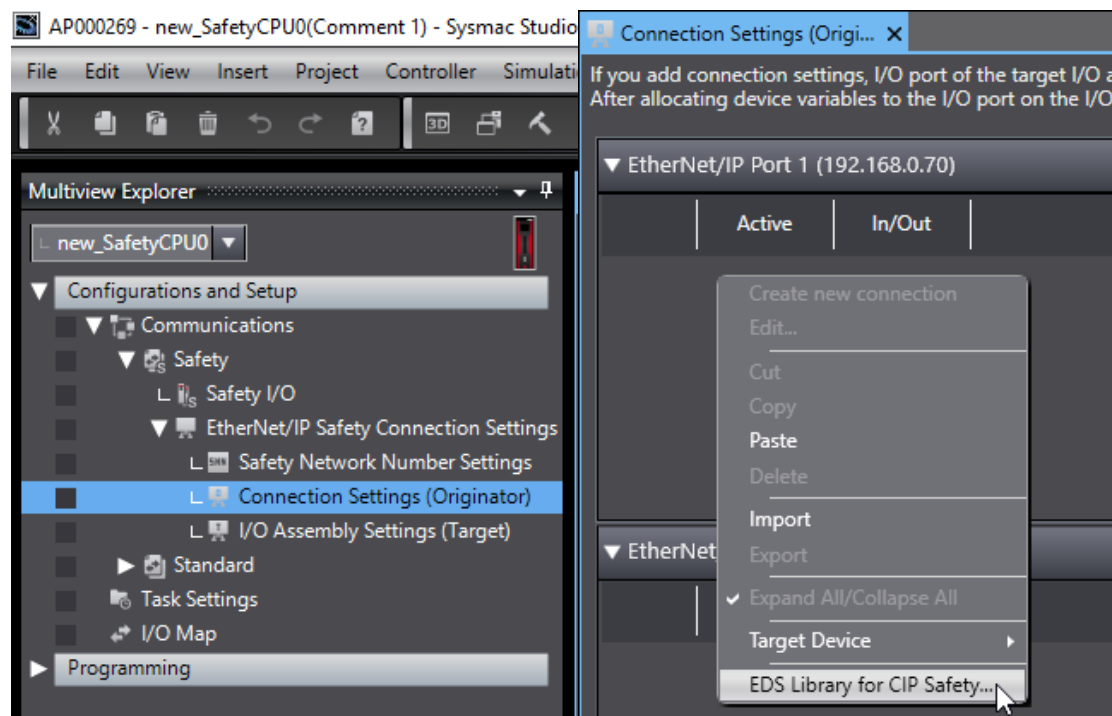


Fig. 1: Connection Settings (Originator)

Fig. 2: Opening the EDS library

2. Click *New EDS file*

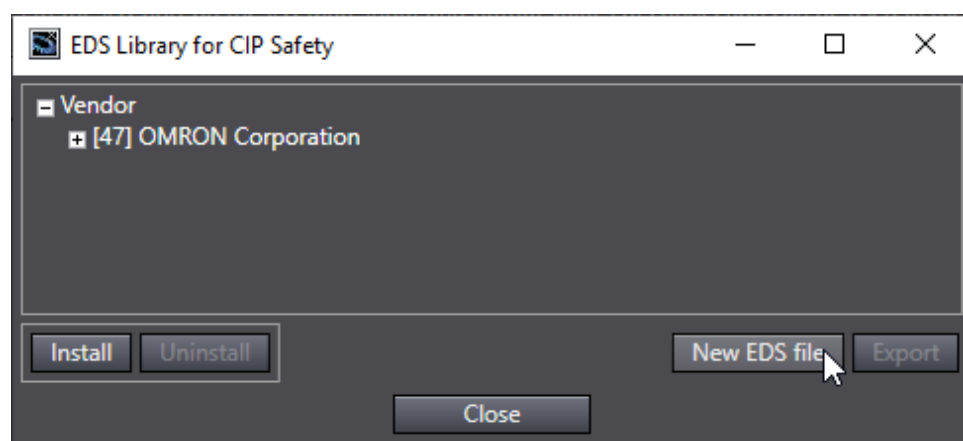


Fig. 3: Creating new EDS file

3. Complete the required data to create the EDS file. Then adopt the entries with OK afterward

Fig. 4: Parameterizing EDS file

Fig. 5: Created EDS file



NOTICE!

Please refer to the type labels on the MGB for the Vendor ID, the Product Type, the Product Code, the Major and Minor Revisions and the Product Name. The remaining inputs must be adopted as shown in Fig. 4.

Setting parameters	Input/Output	Setting values
Input Assembly Instance	Safety Input	1025
	Safety Output	1279
Output Assembly Instance	Safety Input	1279
	Safety Output	1057
Size (8-bit)	Safety Input	12
	Safety Output	4
Configuration Assembly Instance		1088

Table 1: General setting values

5.2. Configuring the MGB

The MGB can now be found in the Toolbox. Select the MGB and drag and drop it at the port to which the MGB is physically connected. Parametrize the *EPI* for the *Safety Input* and *Safety Output* as shown in Fig. 6.

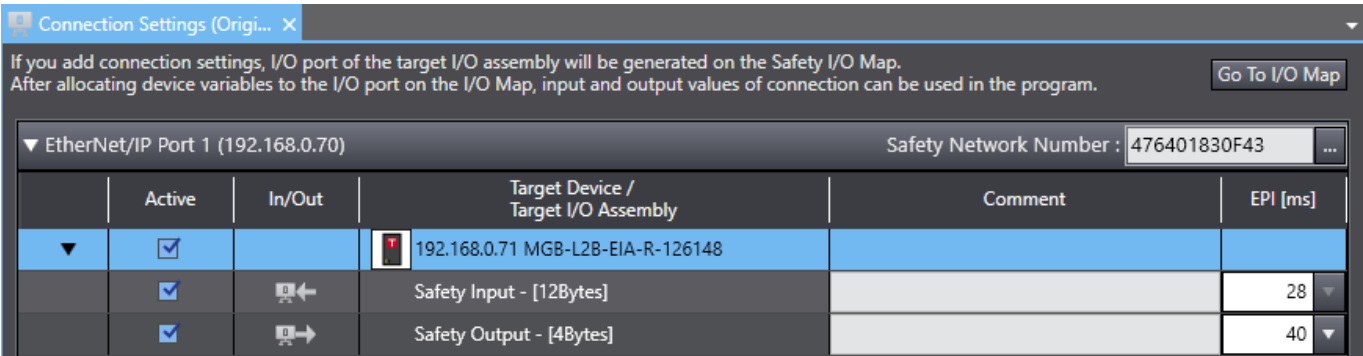


Fig. 6: Configured connection



NOTICE!

EPI (Extended Packet Interval) refers to the transfer interval of safety data packets in CIP Safety communication. The *EPI* influences the safety reaction time.

Double-click the MGB to set the IP address. The IP address must match the IP address set in the device.

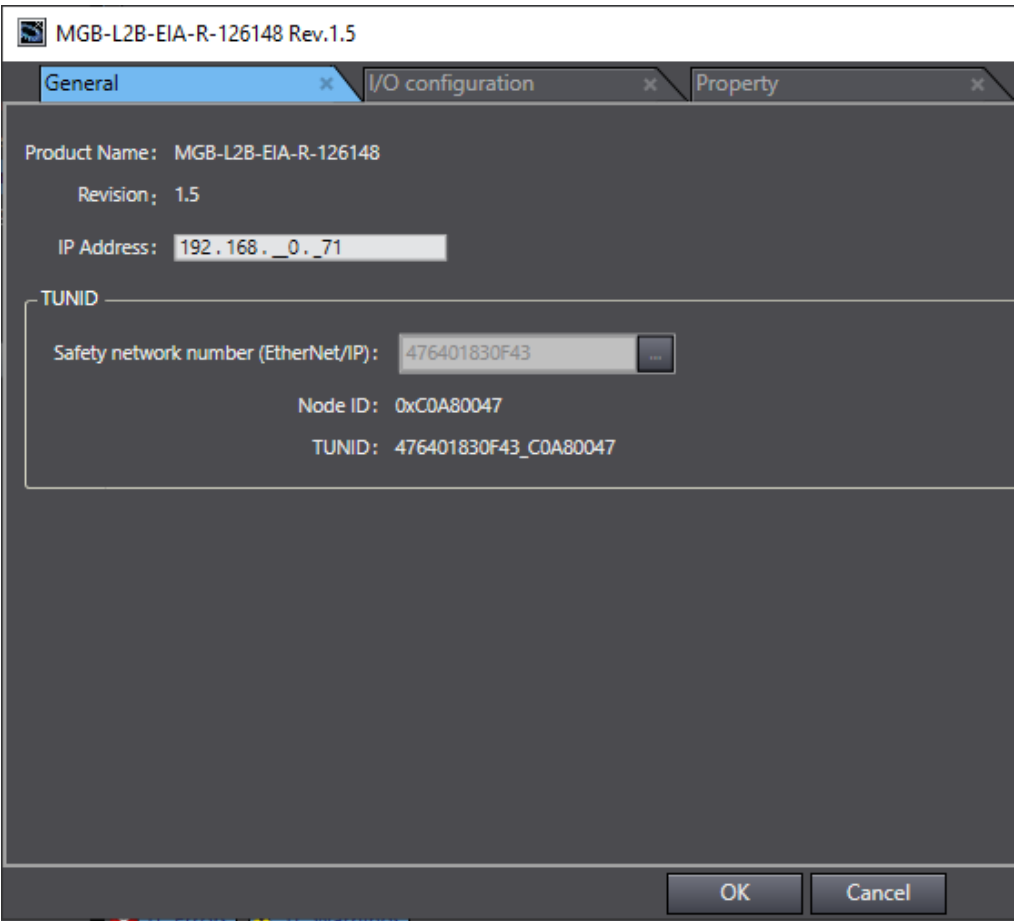


Fig. 7: Setting the IP address

Go *online* and right-click the MGB. Select *Target Device* and then click *Set TUNID* (Target Unique Network Identifier).

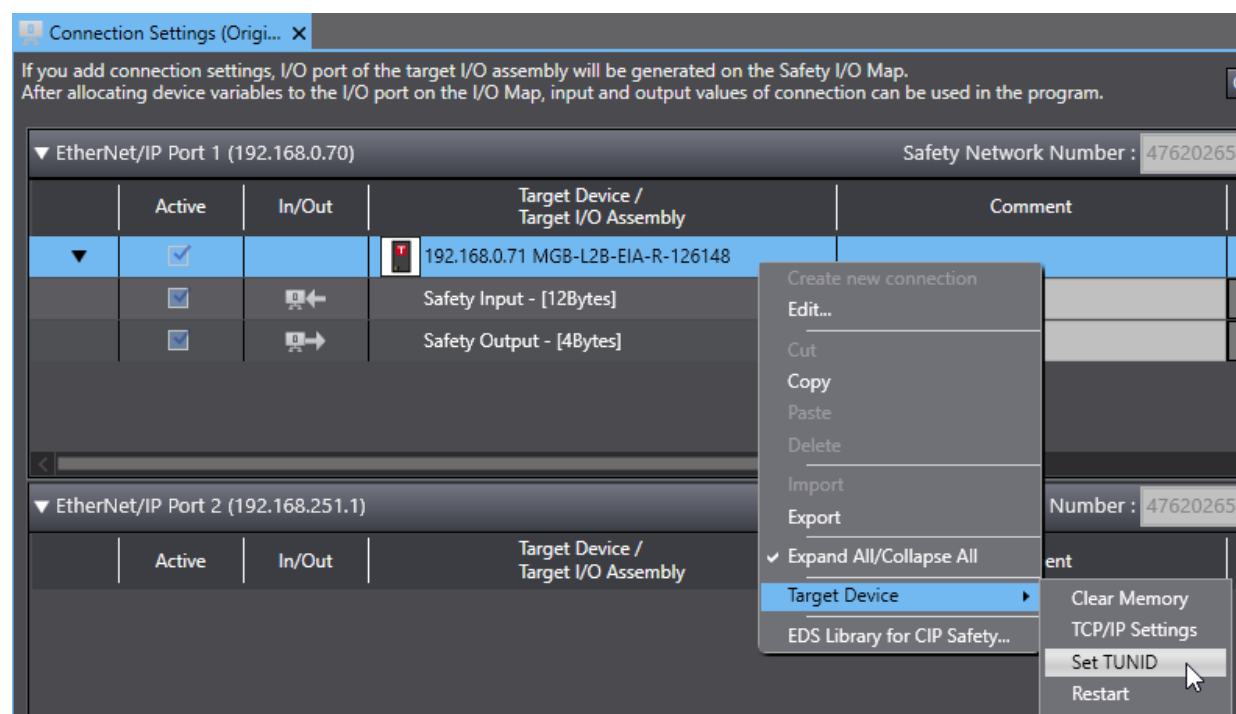


Fig. 8: Setting the *TUNID*

5.3. Creating the device variables

Open the variable table by clicking **Go To I/O Map** in the upper corner of the *Connection Settings (Originator)* tab, for example. Create device variables by right-clicking *Safety Input* and *Safety Output* of the configured MGB. Select one of the two options (here: *Create Device Variable with Prefix*).

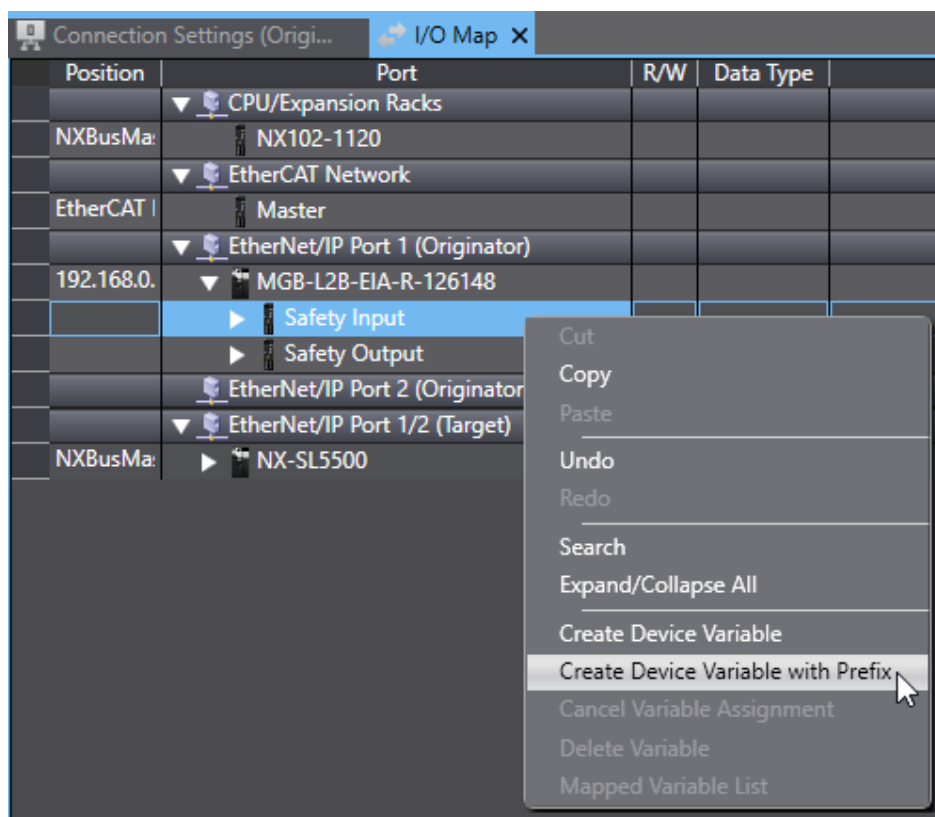


Fig. 9: Creating device variables

The created device variables can now be used in the program.

6. 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 example provided 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 danger zone and the software must also be considered in the safety evaluation, for example.

The applications provided 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.

According to the Machinery Directive 2006/42/EC, the design engineer of a machine or installation has the obligation to perform a risk assessment and take measures to reduce the risk. While doing this, the engineer must comply with the applicable national and international safety 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 for functional safety 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 engineering himself. The examples must not be used for an 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.

In particular in relation to a fault exclusion, it must be noted that a fault can be excluded only by the machine's or installation's design engineer and this action requires justification. A 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.

Euchner GmbH + Co. KG
Kohlhammerstraße 16
70771 Leinfelden-Echterdingen
info@euchner.de
www.euchner.com

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