BECKHOFF New Automation Technology

Operating Instructions | EN

AMI8911

TwinSAFE card for servo drive AMI81xx

Table of contents

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1 Notes on the documentation

1.1 Disclaimer

Beckhoff products are subject to continuous further development. We reserve the right to revise the operating instructions at any time and without prior announcement. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in these operating instructions.

In these operating instructions we define all permissible use cases whose properties and operating conditions we can guarantee. The use cases we define are fully tested and certified. Use cases beyond this, which are not described in these operating instructions, require the approval of Beckhoff Automation GmbH & Co KG.

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1.1.2 Patents

The EtherCAT technology is protected by patent rights through the following registrations and patents with corresponding applications and registrations in various other countries:

- EP1590927
- EP1789857
- EP1456722
- EP2137893
- DE102015105702

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All components in this product as described in the operating instructions are delivered in a specific configuration of hardware and software, depending on the application regulations. Modifications and changes to the hardware and/or software configuration that go beyond the documented options are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

The following is excluded from the liability:

- Failure to observe these operating instructions
- Improper use
- Use of untrained personnel
- Use of unauthorized spare parts

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1.2 Version numbers

Version	Comment
2.0.0	• Title changed to "Operating Instructions" • Beckhoff Services [▶ 11] updated • Certificate [▶ 31] moved to appendix • Appendix adjusted and expanded
1.1.0	• Chapter "Beckhoff Services" updated • Certificate added • Link on the back updated
1.0.0	• First released version

Currentness

Please check whether you are using the current and valid version of this document. The current version can be downloaded from the Beckhoff homepage at http://www.beckhoff.de/twinsafe. In case of doubt, please contact Technical Support (see Beckhoff Services [▶ 11]).

Origin of the document

The original documentation is written in German. All other languages are derived from the German original.

Product features

Only the product properties specified in the current operating instructions are valid. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

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1.3 References

No.	Issue	Title / description
[1]	1.4.0 or newer	**Short information AMI8100**
		This documentation contains the description of the assembly, installation and operation of an AMI8100.
[2]	1.0 or newer	**Original operating instructions AMI8100 - Compact integrated servo drive**
		Description of the mechanical and electrical parameters as well as all information necessary for the use of the AMI8100 servo drive.
[3]	1.4.1 or newer	**Operating instructions for EL6910 TwinSAFE Logic module**
		The document contains a description of the logic functions of the EL6910 and their programming
[4]	3.1.0 or newer	**Documentation TwinSAFE-Logic-FB**
		The document describes the safety function blocks that are available in the EL6910, and thus also in the TwinSAFE card, and form the safety application.
[5]	1.8.0 or newer	**TwinSAFE Application Guide**
		The Application Guide provides the user with examples for the calculation of safety parameters for safety functions according to the standards DIN EN ISO 13849-1 and EN 62061 or EN 61508:2010, such as are typically used on machines.
[6]	2006/42/EC	**Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16-7/EC (recast) of 29 June 2006**
		This directive, also known as the Machinery Directive, defines requirements for the placing on the market of machines and machine-like components, such as safety components.

1.3.1 Document classification in the overall documentation

This documentation applies exclusively to AMI81xx servo drive variants with integrated safety technology, in accordance with the type key, which can be found in document [2] at References [▶ 8].

This TwinSAFE card is a permanently installed part of a servo drive ordered with the TwinSAFE option. For this reason, some life phases, such as decommissioning and disposal, apply exclusively to the servo drive as a complete system and are not listed in this documentation.

⚠ WARNING
Observe TwinSAFE card documentation as a matter of priority
The values and specifications defined in these operating instructions apply in addition and primarily to the documents [1] and [2] at References [▶ 8]. Observe these operating instructions as a matter of priority.
Non-observance can endanger safety.

1.4　　　　Staff qualification

These operating instructions are intended exclusively for trained specialists in control technology and automation with the relevant knowledge.

The trained specialist personnel must ensure that the applications and use of the described product meet all safety requirements. This includes all applicable and valid laws, regulations, provisions and standards.

Trained specialists

Trained specialists have extensive technical knowledge from studies, apprenticeships or technical training. Understanding of control technology and automation is available. Trained specialists can:

- Independently identify, avoid and eliminate sources of hazard.
- Apply relevant standards and directives.
- Implement specifications from accident prevention regulations.
- Evaluate, prepare and set up the workplaces.
- Evaluate, optimize and execute work independently.

1.5 Safety and instruction

Read the contents that refer to the activities you have to perform with the product. Always read the chapter For your safety [▶ 12] in the operating instructions.

Observe the warnings in the chapters so that you can handle and work with the product as intended and safely.

1.5.1 Explanation of symbols

Various symbols are used for a clear arrangement:

1.	The numbering indicates an action that should be taken.
•	The bullet point indicates an enumeration.
[…]	The square brackets indicate cross-references to other text passages in the document.
[1]	The number in square brackets indicates the numbering of a referenced document.

1.5.1.1 Pictograms

In order to make it easier for you to find text passages, pictograms and signal words are used in warning notices:

⚠ DANGER
Failure to observe will result in serious or fatal injuries.

⚠ WARNING
Failure to observe may result in serious or fatal injuries.

⚠ CAUTION
Failure to observe may result in minor or moderate injuries.

NOTE
Notes
Notes are used for important information on the product. The possible consequences of failure to observe these include: • Malfunctions of the product • Damage to the product • Damage to the environment

Information

This sign indicates information, tips and notes for dealing with the product or the software.

1.6   Beckhoff Services

Support

The Beckhoff Support offers technical advice on the use of individual Beckhoff products and system planning. The employees support you in the programming and commissioning of complex automation systems.

Hotline:	+49(0)5246/963-157
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Download area

In the download area you can obtain product information, software updates, the TwinCAT automation software, documentation and much more.

Web:	www.beckhoff.de/download

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2   For your safety

Read this chapter containing general safety information. In addition, always observe the safety instructions and warnings in these operating instructions for your own safety, the safety of other persons and the safety of the product.

When working with control and automation products, many dangers can result from careless or incorrect use. Work particularly thoroughly, not under time pressure and responsibly towards other people.

2.1   Due diligence

ℹ **Read and observe the complete documentation of the TwinSAFE card**

In addition to this document, the complete documentation for the TwinSAFE card includes documents [1] to [5], which are listed in chapter References [▶ 8].

Read and observe these documents.

The operator must comply with all the requirements and notes specified in these operating instructions in order to fulfill his duty of care. This includes in particular that you

- comply with the provisions defined in the chapter Limitation of liability [▶ 6].
- only operate the TwinSAFE card when it is in perfect working order.
- provide the operating instructions in a legible condition and complete at the place of use of the TwinSAFE card.
- do not remove the safety markings attached to the servo drive and maintain their legibility.

2.2 General safety instructions

2.2.1 Before operation

Use in machines according to the Machinery Directive

Only use the servo drive in machines in accordance with the Machinery Directive to ensure safe operation.

For more information, see the document [6] at References [▶ 8].

Ensure traceability

Ensure the traceability of the TwinSAFE card via the serial number of the servo drive.

For more information, see the document [2] at References [▶ 8].

Use SELV/PELV power supply unit

To supply the servo drive with 24 V_{DC}, use a SELV/PELV power supply unit with an output voltage limitation of U_{max} = 36 V_{DC} in the event of a fault.

Use permissible engineering tools and procedures

The TÜV SÜD certificate applies to the servo drive with integrated TwinSAFE card, the function blocks available in it, the documentation and the engineering tool. *TwinCAT 3.1* and the *TwinSAFE Loader* are permitted as engineering tools.

Procedures or engineering tools that deviate from this are not covered by the certificate. This is especially true for externally generated xml files for the TwinSAFE import.

Carry out commissioning test

Before commissioning, application errors and wiring faults must be excluded. Before commissioning, carry out a commissioning test. After a successful commissioning test, you can use the TwinSAFE card for the intended safety-related task.

2.2.2 During operation

Impairment due to interference emissions

Do not operate the following devices in the vicinity of the servo drive: mobile phones, radio equipment, transmitters or high-frequency systems.

The servo drive with integrated TwinSAFE card complies with the requirements of the applicable standards for electromagnetic compatibility with regard to interference emission and immunity. If you exceed the limits for interference emissions specified in the standards, the function of the TwinSAFE card may be impaired.

Observe the GND concept

When grounding the servo drive, observe special conditions.

See the document [2] at <u>References [▶ 8]</u>.

2.2.3 After operation

De-energize and switch off the servo drive before working on it

Check all safety-relevant equipment for functionality before working on the servo drive. Secure the working environment. Secure the machine or plant against being inadvertently started up.

3   Product overview

3.1   AMI81xx block diagram

The TwinSAFE card is permanently integrated in the servo drive and has a passing or interrupting effect on the PWM control signals between the drive logic and output stage.

⚠ WARNING
Consider possible motor movements
Even if STO is triggered with interrupted PWM control, a jerky movement (with a maximum of 180° per pole pair) on the motor can occur, for example due to faults in the power circuit.
Consider this in your risk and hazard analysis.
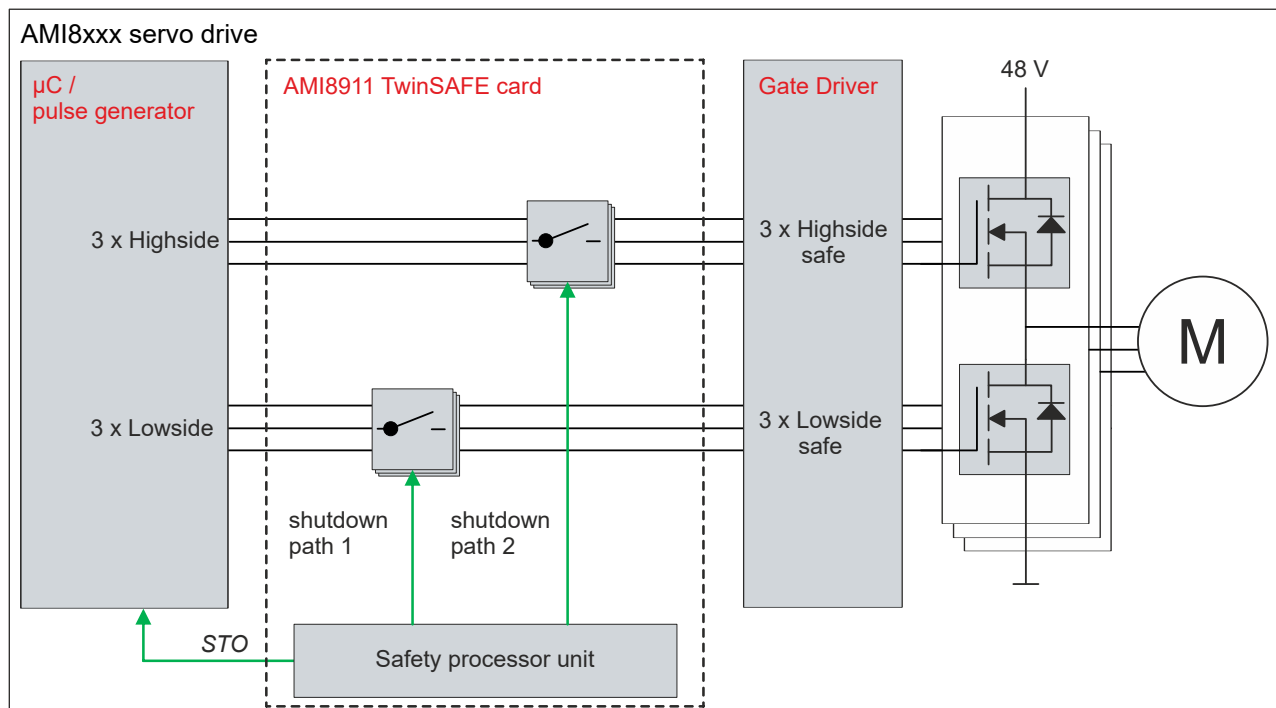
The block diagram describes the mode of operation of the TwinSAFE card within the servo drive.

The TwinSAFE card has an internal two-channel structure based on a 1oo2 structure.

3.2 Product characteristics

AMI8911 – TwinSAFE card for servo drives of the AMI81xx series

The AMI8911 TwinSAFE card is an extension of the Beckhoff servo drive series AMI81xx.

The type key of the servo drive determines whether it is a servo drive with or without integrated TwinSAFE card. The TwinSAFE card is then permanently installed in the servo drive and enables you to define the safety functions by application. In the delivery state, an initial project with the safety function STO according to EN 61800-5-2 is integrated as an example. For further information, please refer to the chapter Initial project [▶ 21].

3.3 Intended use

Operate the TwinSAFE card exclusively for the intended activities defined in this documentation, taking into account the prescribed values.

The TwinSAFE cards are designed for machine safety functions and directly associated industrial automation tasks. The TwinSAFE cards are used to switch the servo drive torque-free in hazardous situations.

TwinSAFE cards are therefore only approved for applications with a defined fail-safe state. This safe state is the wattless state.

⚠ WARNING
Improper use
Any use which exceeds the permissible written values from the chapter Technical data [▶ 17] or which does not observe other specifications from these operating instructions or other documents of the overall documentation is considered to be not in accordance with the intended use and is therefore prohibited.
This applies in particular to the use cases defined by Beckhoff Automation, which have been fully tested and certified and whose properties and operating conditions can be guaranteed. Use cases beyond this are regarded as inappropriate and require the approval of Beckhoff Automation.
Improper use will result in loss of safety and invalidation of certifications and approval.

4 Technical data

4.1 Product data

The current certificates of all TwinSAFE products with the underlying standards and directives can be found at https://www.beckhoff.com/media/downloads/downloads/twinsafe_certificates.pdf.

Software data		Explanation
Response times		
• Cycle time	≤ 10 ms	The internal cycle time is the runtime of the logic task plus the time difference until it is called again.
• Response time in operation	≤ 50 ms	Time between the request of a safety function until the output is switched off.
• Watchdog time	2 ms – 60000 ms	
Process image		
• Input	6 - 51 bytes (1 – 24 bytes Safe Data)	For further information, please refer to the chapter Process image [▶ 22].
• Output	6 - 59 bytes (1 – 28 bytes Safe Data)	

Other product data		Explanation
• Supply voltage	24 V_{DC} (+ 6 % / - 10 %) SELV/PELV with maximum 36 V_{DC}	
• internal switch-off temperature	110 °C	If this value is exceeded, the TwinSAFE component switches to global shutdown.

4.2 Safety parameters

Calculation of the MTTF$_D$ value from the PFH$_D$ value

For calculation and estimation of the values described in the following table, refer to the following documentation:

- TwinSAFE Application Guide
- EN ISO 13849-1:2015; table K.1.

In terms of safety-related parameters, the Safety-over-EtherCAT communication is considered with 1 % of SIL3 according to the protocol specification.

Safety parameters		Explanation
Lifetime	20 a	
Prooftest interval	/	Special proof tests during the entire service life of the TwinSAFE card are not required.
PFH$_D$	2.5E-9/h	
PFD$_{avg}$	1.4E-4	
MTTF$_D$	High	
DC	High, 97 %	
SFF	>99 %	
SIL	3	according to IEC 61508:2010 and IEC 62061:2015.
Performance Level	e	according to EN ISO 13849-1:2015.
Category	4	according to EN ISO 13849-1:2015.
HFT	1	
Element classification	Type B	according to EN 61508-2:2010.

4.3   Environmental conditions

Beckhoff products are designed for operation under certain environmental conditions, which vary according to the product. The following specifications must be observed for operation and environment in order to achieve the optimum service life of the products as well as to ensure product safety.

⚠ WARNING
Do not use TwinSAFE cards under the following operating conditions: • under the influence of ionizing radiation (exceeding the natural background radiation) • in corrosive environments • in an environment that leads to unacceptable contamination of the TwinSAFE card

The environmental conditions of this TwinSAFE card are defined by the installation in the servo drive. For the conditions, refer to the "Data for operation and environment" in document [2] at References [▶ 8].

4.4   Service life

The TwinSAFE card has a service life of 20 years, during which the safety parameters are guaranteed. For more information, see the chapter Safety parameters [▶ 18].

The service life starts from the date of manufacture according to the name plate of the servo drive. For more information, see document [2] at References [▶ 8].

⚠ WARNING
Replace the servo drive after 20 years After a service life of 20 years, the safety parameters are no longer guaranteed. *Use beyond the service life may result in loss of safety.*

4.5 Error reaction

The TwinSAFE card performs a permanent self-diagnosis. In the event of a detected malfunction, the TwinSAFE card switches to the safe state according to the fail-safe principle.

Depending on the severity of the cause of the error, the system enters one of the following error states:

- Global Shutdown
- Global Fault

4.5.1 Global Shutdown

If transient faults are detected, such as overvoltage, undervoltage or EMC influences, the TwinSAFE card switches to the "Global Shutdown" state.

This operating state is a safe state and temporarily shuts down the TwinSAFE card.

Reset the operating state by disconnecting and reconnecting the 24 V supply to the servo drive.

4.5.2 Global Fault

When errors are detected that affect the integrity of the safety logic, such as memory errors, the TwinSAFE card switches to the "Global Fault" state.

This operating state permanently shuts down the TwinSAFE card.

Replace the servo drive.

5 Initial project

5.1 Description

The servo drive with integrated safety technology cannot be operated without safety. The servo drive with integrated safety technology is supplied with an initial project as an example, which enables simple commissioning.

By using the initial project you have the option of triggering the STO safety function via Safety-over-EtherCAT (FSoE).

ⓘ **No safety functions when deleting the initial project**

If you delete the initial project and do not load a customer-specific safety application on the TwinSAFE card, the PLC of the TwinSAFE card is empty and the outputs are switched off. The device is in a safe state.

Make sure that a safety project is always active on the TwinSAFE card before using the servo drive for safety purposes.

ⓘ **Address setting**

In the delivery state, a safe address of "1" is set.

If you want to use more than one AMI81xx , change the addresses of the additional AMI81xx to ensure specific addressing. Then download the project again.

For further information on address setting, please refer to the chapter Address settings.

5.2 Process image

⚠ WARNING
Use non-safe signals only functionally
For each signal in the process image, the column "Group" indicates whether it is a safety-related or a standard signal. Non-safe signals must not be used for safety-related evaluation or shutdown, but exclusively for functional purposes.

i **Process image valid for the initial project**

Note that the process image depends on the active project and the implemented safety functions. The process image listed in this document applies exclusively to the initial project. For customer-specific projects, the process image may differ from the process image shown here. For further information on customer-specific projects, please refer to the chapter Customer-specific safety application [▶ 23].

The process image of the TwinSAFE card consists of the input and the output process image. Detailed information can be found in the following tables.

5.2.1 Input

The process image of the input signals consists of 7 bytes of data, 2 bytes of which are usage data.

Offset	Name	Data type	Group	Description
0.0	ChA_STO	BOOL	Safety	**True:** no STO, STO outputs are enabled **False:** STO, safe state

5.2.2 Output

The process image of the output signals consists of 7 bytes of data, 2 bytes of which are usage data.

Offset	Name	Data type	Group	Description
0.0	STO_active_ChA	BOOL	Safety	State of the signal reported to the Drive Application (standard firmware) **True:** no STO, STO outputs are enabled **False:** STO, safe state

6   Customer-specific safety application

If you require other safety functions for your application apart from the STO function described here, you have the option of creating application-specific projects and loading them onto the TwinSAFE card.

The following local process image for the input signals and output signals is available for adapting the safety application.

6.1   Local process image

6.1.1   Input

Offset	Name	Data type	Group	Description
0.0	Ch A_STO _Error	BOOL	Safety	**True**: error detected in the switch-off paths **False**: no error
0.1	Ch A_STO_State	BOOL	Standard	**True**: axis enabled **False**: no error
2.0	Ch A_DriveReq_Run	BOOL	Standard	Run signal for axis of the drive control word
2.1	Ch A_DriveReq_ErrAck	BOOL	Standard	Error acknowledge signal for axis of the drive control word

6.1.2   Output

Offset	Name	Data type	Group	Description
0.0	Ch A_STO_1	BOOL	Safety	**True**: enable switch-off path 1 **False**: disable switch-off path 1
0.1	Ch A_STO_2	BOOL	Safety	**True**: enable switch-off path 2 **False**: disable switch-off path 2
0.2	Ch A_STO_ErrAck	BOOL	Standard	Acknowledgement of an error in the switch-off paths
0.3	Ch A_no_STO_to_Drive	BOOL	Standard	**True**: enable to servo drive: output stage is enabled for drive **False**: output stage is disabled for drive
2.0	Ch A_DriveCmd_GroupError	BOOL	Standard	Status to drive: group error
4.0	Ch A_DriveCmd_Emergency_Stop	BOOL	Standard	reserved
4.1	Ch A_DriveCmd_2	BOOL	Standard	reserved
4.2	Ch A_DriveCmd_3	BOOL	Standard	reserved
4.3	Ch A_DriveCmd_4	BOOL	Standard	reserved
4.4	Ch A_DriveCmd_5	BOOL	Standard	reserved
4.5	Ch A_DriveCmd_6	BOOL	Standard	reserved
4.6	Ch A_DriveCmd_7	BOOL	Standard	reserved
4.7	Ch A_DriveCmd_8	BOOL	Standard	reserved
6.0	Ch A_DiagMessage_1	BOOL	Standard	On falling edge, Diag message 0xD300 is entered in the Diag history.
6.1	Ch A_DiagMessage_2	BOOL	Standard	On falling edge, Diag message 0xD301 is entered in the Diag history.

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Offset	Name	Data type	Group	Description
6.2	Ch A_DiagMessage_3	BOOL	Standard	On falling edge, Diag message 0xD302 is entered in the Diag history.
6.3	Ch A_DiagMessage_4	BOOL	Standard	On falling edge, Diag message 0xD303 is entered in the Diag history.
6.4	Ch A_DiagMessage_5	BOOL	Standard	On falling edge, Diag message 0xD304 is entered in the Diag history.
6.5	Ch A_DiagMessage_6	BOOL	Standard	On falling edge, Diag message 0xD305 is entered in the Diag history.
6.6	Ch A_DiagMessage_7	BOOL	Standard	On falling edge, Diag message 0xD306 is entered in the Diag history.
6.7	Ch A_DiagMessage_8	BOOL	Standard	On falling edge, Diag message 0xD307 is entered in the Diag history.
7.0	Ch A_DiagMessage_9	BOOL	Standard	On falling edge, Diag message 0xD308 is entered in the Diag history.
7.1	Ch A_DiagMessage_10	BOOL	Standard	On falling edge, Diag message 0xD309 is entered in the Diag history.
7.2	Ch A_DiagMessage_11	BOOL	Standard	On falling edge, Diag message 0xD30A is entered in the Diag history.
7.3	Ch A_DiagMessage_12	BOOL	Standard	On falling edge, Diag message 0xD30B is entered in the Diag history.
7.4	Ch A_DiagMessage_13	BOOL	Standard	On falling edge, Diag message 0xD30C is entered in the Diag history.
7.5	Ch A_DiagMessage_14	BOOL	Standard	On falling edge, Diag message 0xD30D is entered in the Diag history.
7.6	Ch A_DiagMessage_15	BOOL	Standard	On falling edge, Diag message 0xD30E is entered in the Diag history.
7.7	Ch A_DiagMessage_16	BOOL	Standard	On falling edge, Diag message 0xD30F is entered in the Diag history.

Version: 2.0.0

7 Configuration in the Safety Editor

This chapter describes configurations in the Safety Editor. A more comprehensive configuration description can be found in document [3] at References [▶ 8].

7.1 Creating a safety project

Information on creating a safety project in TwinCAT 3 can be found in chapter "Creating a safety project in TwinCAT 3" in document [3] at References [▶ 8].

For information on downloading a safety project to a target system, refer to chapter "Downloading the safety application" in document [3] at References [▶ 8].

7.2 Import/export of a safety project

For information on importing or exporting an existing safety project, refer to chapter "Export/import of the safety project" in document [3] at References [▶ 8].

7.3 Address settings

The address settings are shown here as an example using an AMP servo drive. The procedure for an AMI servo drive is identical.
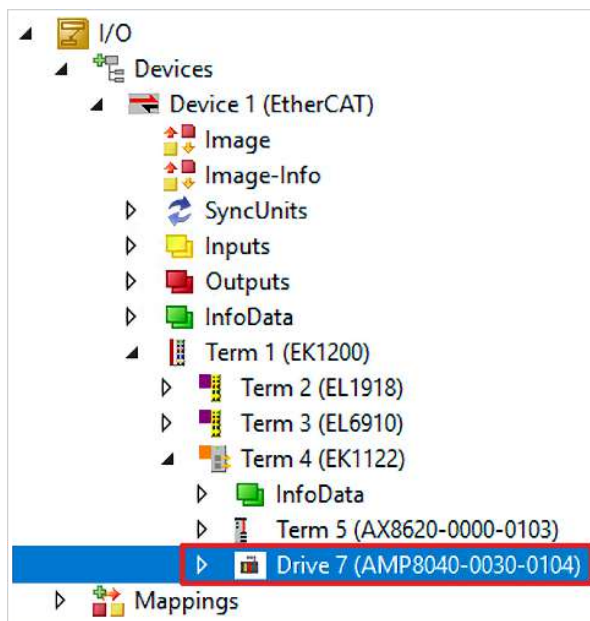
1. Open Safe Motion component
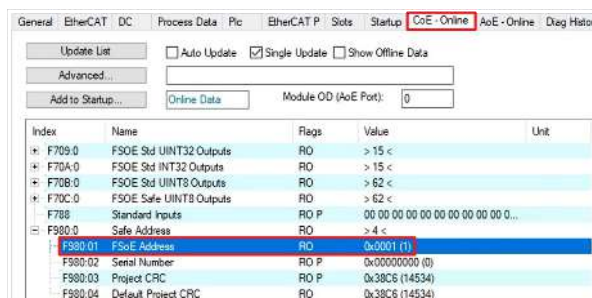
2. Open "CoE-Online" tab
At index F980:01 you see the current FSoE address.

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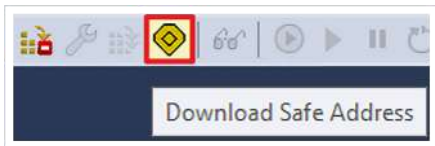
3. Click on "Download Safe Address" in the menu bar

4. In the "Choose Safety Device" window, select Safe Motion component
5. Confirm the selection with "Next"
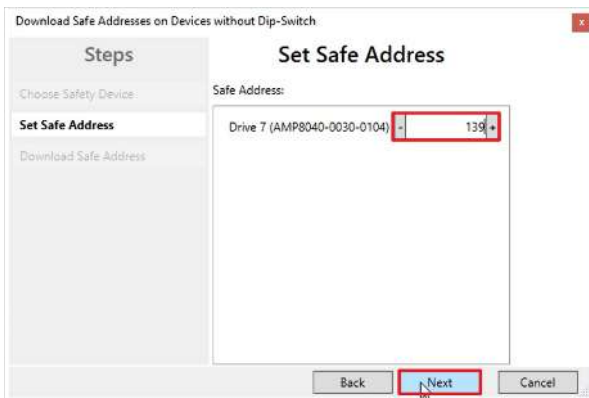
The "Set Safe Address" window opens.

6. Enter desired address
7. Confirm the entry with "Next"
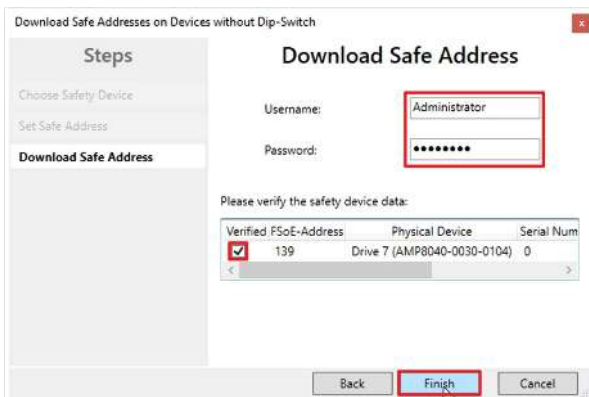
8. Enter the user name and password in the "Download Safe Address" window

Default username: Administrator

Default password: TwinSAFE

9. Select the Safe Motion component for which you want to load a new address
10. Close the window with "Finish"

11. Click on "Update List"

You will now see at index F980:01 that the new FSoE address has been successfully set.
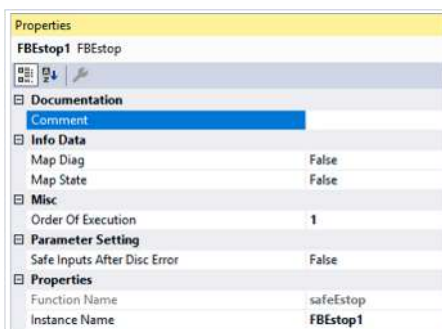
12. Download the safety project again

7.4 Parameter Settings

Open the parameter settings of the individual function blocks as follows:
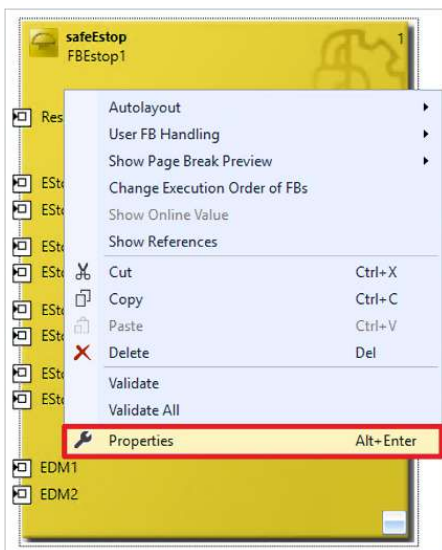
1. Right-click on a function block
2. Click on "Properties"

The Properties window opens. Here you can configure the available parameter settings depending on the function block and get further information.

8 Diagnostic history

For information on diagnostics, refer to the chapters "Diag History tab" and "Diagnosis History" in document [3] at References [▶ 8].

9 Appendix

9.1 Volatility

If there are requirements concerning the volatility of products in your application, for example of the U.S. Department of Defense or similar authorities or security organizations, the following process applies:

The product has both volatile and non-volatile components. Volatile components lose their data immediately after removing power. Non-volatile components keep the data even after loss of power.

If there is customer specific data saved on the product, it cannot be ensured that this data might not be restored through for example forensic measures, even after the data is deleted through the provided tool chain. If this data is confidential, the scrapping of the product after usage is recommended to protect this data.

9.2 Focus of certificates

The most decisive document for certified components of the TwinSAFE department is the EC type examination certificate. The document contains both the test coverage and the regarded component and component family.

The current certificates of all TwinSAFE components with the underlying standards and directives can be found at https://www.beckhoff.com/en-en/support/download-finder/certificates-approvals/.

If the document refers only to the first four figures of a product (ELxxxx), the certificate is valid for all available variants of the component (ELxxxx-abcd). This is applicable for all components like EtherCAT Terminals, EtherCAT Boxes, EtherCAT plug-in modules and Bus Terminals.

If you regard the example EL1918 in the picture, the certificate is valid for both the EL1918 and the available variant EL1918-2200.

9.3   Certificate

CERTIFICATE

No. Z10 062386 0086 Rev. 00

Holder of Certificate: **Beckhoff Automation GmbH & Co. KG**
Hülshorstweg 20
33415 Verl
GERMANY

Certification Mark:

Product: **Safety components**

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. This certificate is valid until the listed date, unless it is cancelled earlier. All applicable requirements of the testing and certification regulations of TÜV SÜD Group have to be complied. For details see: www.tuvsud.com/ps-cert

Test report no.:   BV97184T

Valid until: 2026-08-16

Date,   2021-08-27

(Peter Weiß)

Page 1 of 2
TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

BECKHOFF

C E R T I F I C A T E

No. Z10 062386 0086 Rev. 00

Parameters:

Supply voltage: logic 24VDC / motor 48VDC
Ambient temperature: +5°C ... +40°C

Tested according to:

EN 61508-1:2010 (up to SIL 3)
EN 61508-2:2010 (up to SIL 3)
EN 61508-3:2010 (up to SIL 3)
IEC 62061:2021 (maximum SIL 3)
EN ISO 13849-1:2015 (up to Cat.4 PL e)
EN 61800-5-2:2017

Model(s): **AMI8xxx with integrated AMI8911**

Nomenclature of Product type AMI81uv-abcc–wxyz

AMI81uv-abcc-wxyz			
AMI8	Product line	AMI8	Integrated servo drives
1	Number of channels	1	1-channel servo axis
u	Flange code	2	flange code F2
v	Motor length	1	motor length 1
		2	motor length 2
		3	motor length 3
a	Feedback	3	single-turn absolute encoder, 17 bit resolution
		4	multi-turn absolute encoder, 17 bit resolution
b	TwinSAFE	0	without TwinSAFE
		1	TwinSAFE STO via FSoE
cc	Customer specific mechanical variant	00-99	customer specific variant
w	Shaft	0	smooth shaft
		1	shaft with groove and feather key according to DIN 6885
		2	shaft with IP 65 sealing ring and smooth shaft
		3	shaft with IP 65 sealing ring and shaft with groove and feather key according to DIN 6885
x	Winding code	F, J	winding code F, J
y	Communication interface	1	EtherCAT
z	Holding brake	0	without holding brake
		1	with holding brake

More Information:
www.beckhoff.com/AMI8100