

Documentation | EN

Control Drawing EPX

Connection diagrams, Ex markings and technical data for explosion protection



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1 Foreword

1.1 Notes on the documentation

Intended audience

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning these components.

The qualified personnel is obliged to always use the currently valid documentation.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation 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 this documentation.

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1.2 Safety instructions

Safety regulations

Please note the following safety instructions and explanations!

Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

Exclusion of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

Description of instructions

In this documentation the following instructions are used.

These instructions must be read carefully and followed without fail!

DANGER

Serious risk of injury! / Risque accru de blessures !

Failure to follow this safety instruction directly endangers the life and health of persons.

Si cette consigne de sécurité n'est pas respectée, il existe une situation de danger imminent pouvant porter atteinte à la vie et à la santé des personnes !

WARNING

Risk of injury! / Risque de blessures !

Failure to follow this safety instruction endangers the life and health of persons.

Si cette consigne de sécurité n'est pas respectée, il existe une situation de danger pouvant porter atteinte à la vie et à la santé des personnes !

CAUTION

Personal injuries! / Risque de dommages corporels !

Failure to follow this safety instruction can lead to injuries to persons.

Si cette consigne de sécurité n'est pas respectée, il y a un risque de dommages corporels pour les personnes !

NOTICE

Damage to environment/equipment or data loss /

Domages pour l'environnement/les appareils ou perte de données

Failure to follow this instruction can lead to environmental damage, equipment damage or data loss.

Si cette consigne de sécurité n'est pas respectée, il y a un risque de dommages pour l'environnement, de dommages pour les appareils ou de perte de données.

Tip or pointer / Conseil ou indication



This symbol indicates information that contributes to better understanding.

Ce pictogramme attire l'attention sur des informations qui permettent une meilleure compréhension.

1.3 Documentation issue status

Version	Comment
1.0.0	• First release
0.4	• Zones updated • Chapter <i>Ex-markings</i> updated
0.3	• Chapter <i>EPX EtherCAT Box modules</i> updated
0.2	• Zones updated • Chapter <i>Ex-markings</i> updated • Chapter <i>Technical data for explosion protection</i> updated • Chapter <i>Special conditions for EPX EtherCAT Box modules</i> updated
0.1	• First draft

1.4 Suggestions or proposals for documentation

If you have any suggestions or proposals for our documentation, please send us an e-mail stating the documentation title and version number to: documentation@beckhoff.com

2 EPX EtherCAT Box modules

2.1 EPX EtherCAT Box modules with digital inputs

2.1.1 EPX1058-0022

EtherCAT Box, 8-channel digital input, NAMUR, M12, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

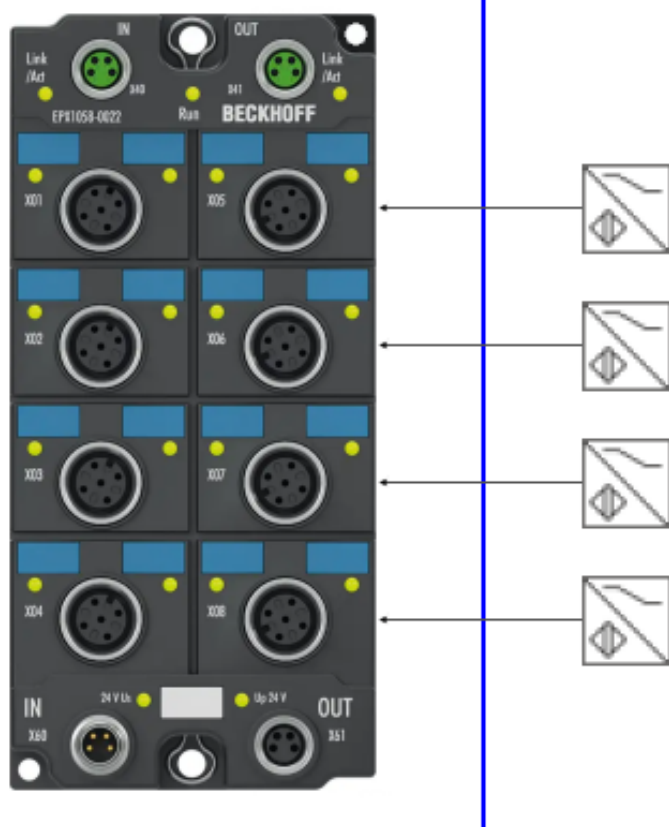


Fig. 1: EPX1058-0022 – sensor connection

2.2 EPX EtherCAT Box modules with digital outputs

2.2.1 EPX2004-0022

EtherCAT Box, 4-channel digital output, 24 V DC, 50 mA, M12, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

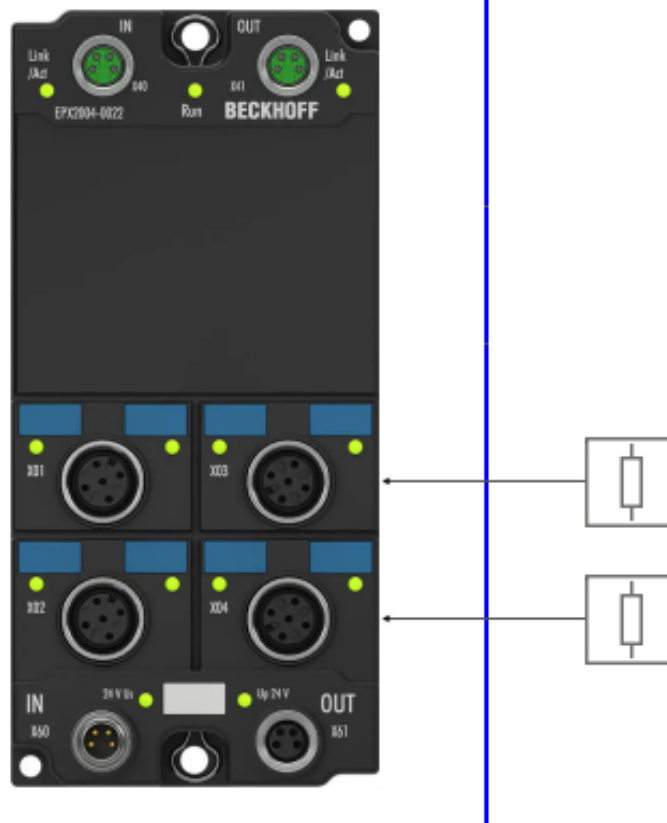


Fig. 2: EPX2004-0022 – actuator connection

2.3 EPX EtherCAT Box modules with analog inputs

2.3.1 EPX3158-0022

EtherCAT Box, 8-channel analog input, 4...20 mA, 16-bit, single-ended, M12, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

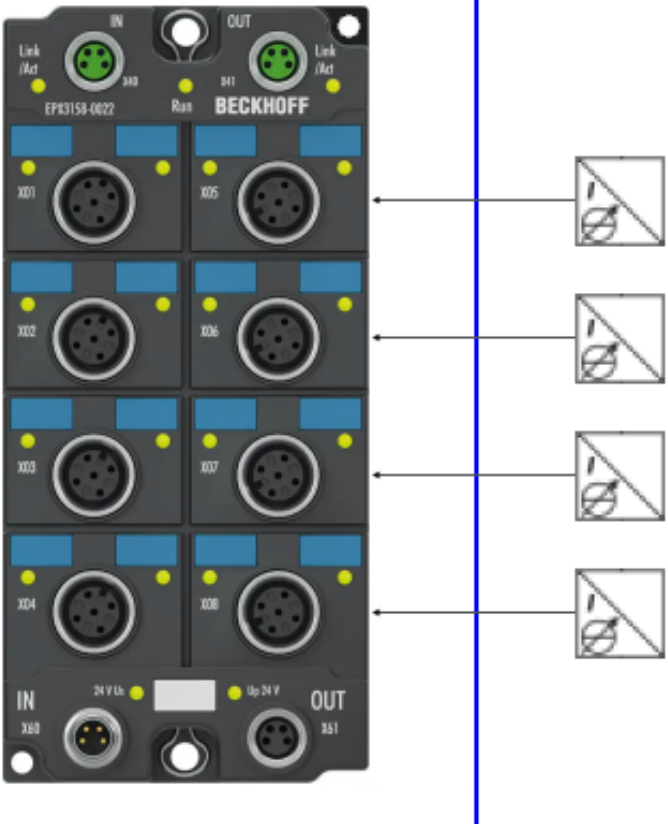


Fig. 3: EPX3158-0022 – sensor connection

2.3.2 EPX3184-0022

EtherCAT Box, 4-channel analog input, 4...20 mA, 16-bit, single-ended, M12, HART, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

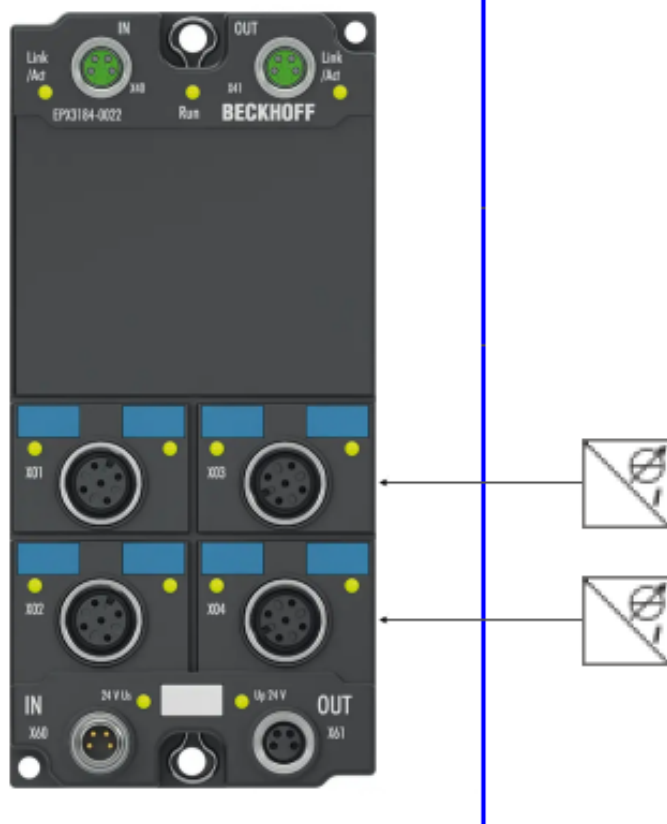


Fig. 4: EPX3184-0022 – sensor connection

2.3.3 EPX3184-0092

EtherCAT Box, 4-channel analog input, 4...20 mA, 16-bit, single-ended, M12, HART, Ex i, TwinSAFE SC

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

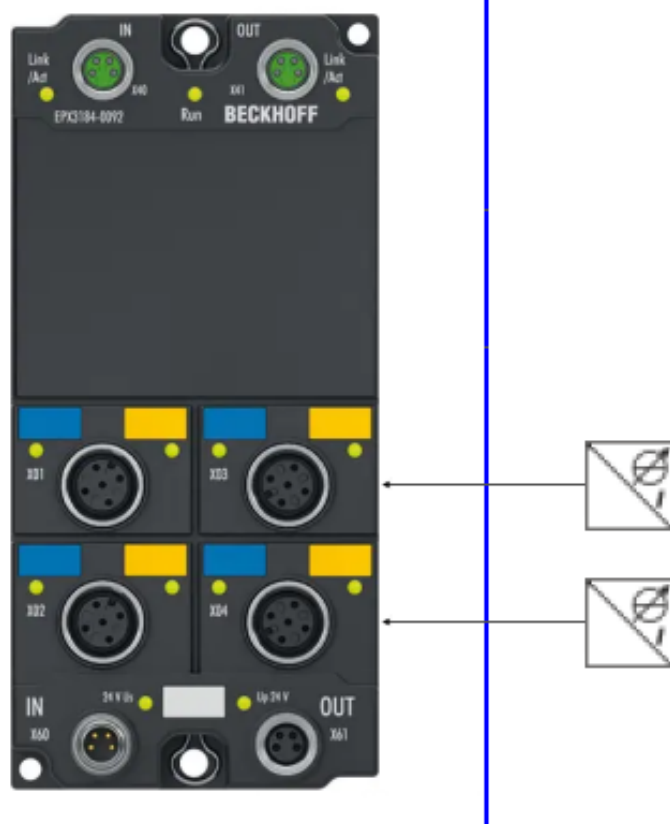


Fig. 5: EPX3184-0092 – sensor connection

2.3.4 EPX3204-0022

EtherCAT Box, 4-channel analog input, temperature, RTD (Pt100), 16-bit, M12, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

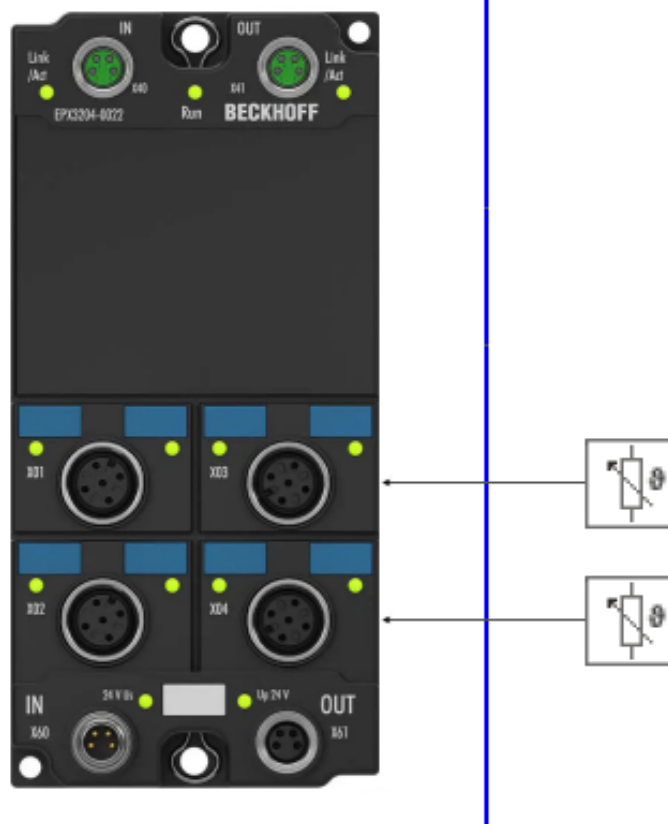


Fig. 6: EPX3204-0022 – sensor connection

2.3.5 EPX3314-0022

EtherCAT Box, 4-channel analog input, temperature, thermocouple, 16-bit, M12, Ex i

non-hazardous location	non-hazardous location
or	or
classified hazardous location	classified hazardous location
Class I, II, III, Div. 2, Group A, B, C, D, F, G	Class I, II, III, Div. 1, Group A, B, C, D, E, F, G
or	or
Zone 2, 22, Group I, IIC, IIIC	Zone 0, 20, 1, 21, 2, 22, Group I, IIC, IIIC

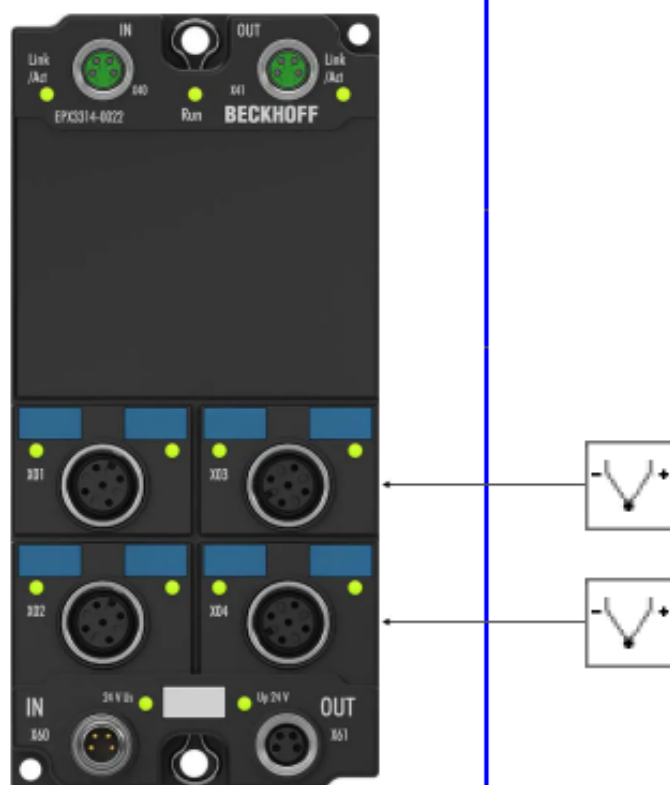


Fig. 7: EPX3314-0022 – sensor connection

3 Ex markings

Ex markings on EPX modules

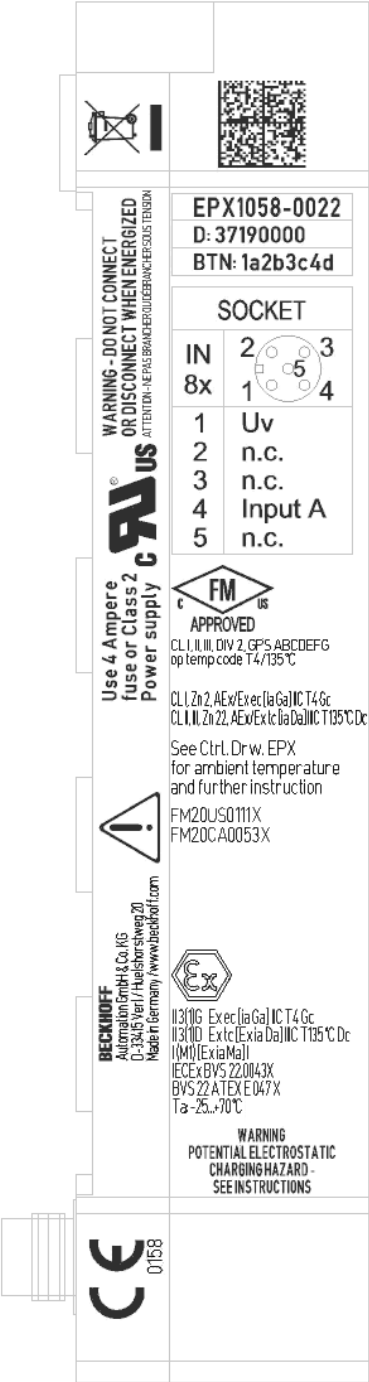


Fig. 8: EPX1058-0022 with Ex marking

The Ex marking in this Figure is identical on all EPX modules, that includes EPX1058-0022, EPX2004-0022, EPX3158-0022, EPX3184-0022, EPX3184-0092, EPX3204-0022 and EPX3314-0022.

4 Technical data for explosion protection

Parameters of intrinsically safe circuits

EPX EtherCAT Box	Connection	P ₀ [mW]	U ₀ [V]	I ₀ [mA]	Groups	L ₀ [mH]	C ₀ [μF]
EPX1058-0022-****	see page [► 8]	28	10.72	10.4	A, B	100	2.14
					C, E	100	15
					D, F, G	100	66
EPX2004-0022-****	see page [► 9]	804	27	119	A, B	0.043	0.09
					C, E	6.4	0.705
					D, F, G	12	2.33
EPX3158-0022-****	see page [► 10]	540	27	80	A, B	2.8	0.09
					C, E	21	0.705
					D, F, G	35	2.33
EPX3184-0022-****	see page [► 11]	534	27	79	A, B	2.8	0.09
					C, E	21	0.705
					D, F, G	35	2.33
EPX3184-0092-****	see page [► 12]	534	27	79	A, B	2.8	0.09
					C, E	21	0.705
					D, F, G	35	2.33
EPX3204-0022-****	see page [► 13]	18	5.36	13	A, B	100	65
					C, E	100	1000
					D, F, G	100	1000
EPX3314-0022-****	see page [► 14]	18	5.36	13	A, B	100	65
					C, E	100	1000
					D, F, G	100	1000

NOTICE



Installation, parameterization, programming, etc.

Further information on installation, parameterization, programming etc. can be found in the product-specific documentation, which can be downloaded from the relevant product page at www.beckhoff.com/EPXxxxx.

5 Appendix

5.1 EtherCAT AL Status Codes

For detailed information please refer to the [EtherCAT system description](#).

5.2 Special conditions for EPX EtherCAT Box modules

WARNING

Observe the special conditions for the intended use of Beckhoff EPX EtherCAT Box modules in hazardous areas (ATEX Directive 2014/34/EU)!

- The connection points are to be protected by a modification in such a way that a protection against mechanical danger is guaranteed!
- If the temperatures during nominal operation are higher than 70 °C at the feed-in points of cables, lines or pipes, or higher than 80°C at the wire branching points, then cables must be selected whose temperature data correspond to the actual measured temperature values!
- When using EPX EtherCAT Box modules in hazardous areas, observe the permissible ambient temperature range of -25 to +70 °C!
- Measures must be taken to protect against the nominal operating voltage being exceeded by more than 40% due to short-term interference voltages! The power supply of the EPX EtherCAT Box must comply with overvoltage category II according to EN 60664-1.
- SELV/PELV circuits (Safety Extra Low Voltage, Protective Extra Low Voltage) with a maximum error voltage of 60 V_{DC} must be used to supply the EPX EtherCAT Box modules!
- The power and EtherCAT connectors of the certified components may only be connected or disconnected when the supply voltage has been switched off or when a non-explosive atmosphere is ensured!
- The EPX EtherCAT Box modules must be protected from direct sunlight.

5.3 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages: www.beckhoff.com

You will also find further documentation for Beckhoff components there.

Support

The Beckhoff Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

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e-mail: service@beckhoff.com
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Headquarters Germany

Beckhoff Automation GmbH & Co. KG

Hülshorstweg 20
33415 Verl
Germany

Phone: +49 5246 963 0
e-mail: info@beckhoff.com
web: www.beckhoff.com

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More Information:
www.beckhoff.com/EPXxxxx

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com

