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1 Foreword

1.1 Notes on the documentation

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 following notes and explanations are followed when installing and commissioning these components.

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.

For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics.

In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning.

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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Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents:

EP1590927, EP1789857, DE102004044764, DE102007017835

with corresponding applications or registrations in various other countries.

The TwinCAT Technology is covered, including but not limited to the following patent applications and patents:

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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 symbols

In this documentation the following symbols are used with an accompanying safety instruction or note. The safety instructions must be read carefully and followed without fail!

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="danger.png" alt="DANGER" /></td>
<td>Serious risk of injury! Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.</td>
</tr>
<tr>
<td><img src="warning.png" alt="WARNING" /></td>
<td>Risk of injury! Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.</td>
</tr>
<tr>
<td><img src="caution.png" alt="CAUTION" /></td>
<td>Personal injuries! Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.</td>
</tr>
<tr>
<td><img src="attention.png" alt="Attention" /></td>
<td>Damage to the environment or devices Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.</td>
</tr>
<tr>
<td><img src="note.png" alt="Note" /></td>
<td>Tip or pointer This symbol indicates information that contributes to better understanding.</td>
</tr>
</tbody>
</table>
Speaking about *(Embedded*)-PC-based control, the topic Remote Access is very extensive.

In this section, the Beckhoff Information System introduces some of the various possibilities.

- Pure IT solution (tools included in the Operating System resp. 3rd-Party software available on the market)
- TwinCAT network capabilities in local or Wide Area Networks and in pure Microsoft -based or heterogeneous networks
- Remote access
- Web-based diagnosis and configuration capabilities
3 Scenario

3.1 Scenario: ADS via NAT

This example is used to describe how a TwinCAT system can be accessed over a remote network (e.g. internet or vpn), if your engineering system is located behind a NAT router. Network address translation (NAT) is used to hide a private network behind a routable official IP address. The router exchanges the source IP addresses of the engineering system. Therefore the TwinCAT system tries to answer to a private IP address, which will not be routed over the internet. You must adjust the routes of the TwinCAT system, to the official external IP address of the NAT router.

Alternatively, you can enable the NAT discovery on the TwinCAT system with the following RegKey:

Path: HKEY_LOCAL_MACHINE\SOFTWARE\Beckhoff\TwinCAT3\System
RegKey: EnableNatDiscovery = 1
Type: Reg_DWord

Requirement:

TwinCAT 2.11 Build 2239 or greater
TwinCAT 3.1 Build 4013 or greater

3.2 Scenario: ADS connection through a firewall

This example is used to describe how an ADS device (e.g. TwinCAT Engineering PC, third-party Scada systems etc...) can communicate with a TwinCAT Runtime through a firewall.

Firewallrules/Portfilter settings

You have to configure following rules for incoming connections to your TwinCAT Runtime to establish the ADS communication:

<table>
<thead>
<tr>
<th>Direction</th>
<th>Local Port</th>
<th>Remote Port</th>
<th>Protocol</th>
<th>Action</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming</td>
<td>48898</td>
<td>*</td>
<td>TCP</td>
<td>Allow</td>
<td>Communication</td>
</tr>
<tr>
<td>Incoming</td>
<td>48899</td>
<td>*</td>
<td>UDP</td>
<td>Allow</td>
<td>Broadcast search</td>
</tr>
</tbody>
</table>

Remote Access Version: 1.0