Application manual
CC-Link IE Field Network Basic
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Overview of this manual

About this manual
This manual describes the following options and contains instructions on how to configure them in an OmniCore system.

- 3066-2 CC-Link IE Field Basic Device

Note
It is the responsibility of the integrator to provide safety and user guides for the robot system.

Usage
This manual should be used during installation and configuration of the option for CC-Link IE Field Network Basic.

Note
Before any work on or with the robot is performed, the safety information in the product manual for the controller and manipulator must be read.

Who should read this manual?
This manual is intended for:

- Personnel that are responsible for installations and configurations of industrial network hardware/software.
- Personnel that make the configurations of the I/O system.
- System integrators.

Prerequisites
The reader should have the required knowledge of:

- CC-Link network
- I/O system configuration
- OmniCore controller
- RobotStudio

References
ABB documents

<table>
<thead>
<tr>
<th>Reference</th>
<th>Document ID</th>
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<tbody>
<tr>
<td>Application manual - I/O Engineering</td>
<td>3HAC082346-001</td>
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<tr>
<td>Technical reference manual - System parameters</td>
<td>3HAC065041-001</td>
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<tr>
<td>Product manual - OmniCore C30</td>
<td>3HAC060860-001</td>
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<tr>
<td>Product manual - OmniCore C90XT</td>
<td>3HAC073706-001</td>
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<tr>
<td>Product manual - OmniCore E10</td>
<td>3HAC079399-001</td>
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<tr>
<td><em>Product manual - OmniCore V250XT</em></td>
<td>3HAC073447-001</td>
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<tr>
<td><em>Operating manual - OmniCore</em></td>
<td>3HAC065036-001</td>
</tr>
<tr>
<td><em>Operating manual - RobotStudio</em></td>
<td>3HAC032104-001</td>
</tr>
<tr>
<td><em>Operating manual - Integrator's guide OmniCore</em></td>
<td>3HAC065037-001</td>
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### Other references

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><a href="https://www.cc-link.org/">https://www.cc-link.org/</a></td>
<td>CC-Link Partner Association (CLPA)</td>
</tr>
</tbody>
</table>

### Revisions

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>First edition. Released with RobotWare 7.6.</td>
</tr>
</tbody>
</table>
| B        | Released with RobotWare 7.7.  
  - Minor corrections in *CC-Link IE Field Network Basic for OmniCore* on page 12.  
  - Reference to AM I/O Engineering added, and section "I/O Engineering user interface" removed. |
Network security

This product is designed to be connected to and to communicate information and data via a network interface. It is your sole responsibility to provide, and continuously ensure, a secure connection between the product and to your network or any other network (as the case may be).

You shall establish and maintain any appropriate measures (such as, but not limited to, the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB Ltd and its entities are not liable for damage and/or loss related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.
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1 Introduction

1.1 What is CC-Link IE Field Network Basic

General

CC-Link IE is a protocol for communication between a PLC (Programmable Logic Controller) and remote input/output devices. CC-Link IE is governed by the CC-Link Partner Association (CLPA).

Standardization

CC-Link IE conforms to the following international standards:

- International Standard: IEC, IEC61158 and IEC61784

Communication profiles

CC-Link IE has a modular design and different communication profiles are all combinations of modular elements from the groups transmission technology, communication protocol, and application profiles.

The communication profile used in CC-Link IE for OmniCore is CC-Link IE Field Network Basic. This is a Ethernet based network with the following characteristics:

- Standard Ethernet UDP/IP communication.
- Cyclic communication between master and devices.
- Devices can be assigned to groups. The master station talks to each group sequentially. Each device belongs to one group only.

CSP+ file

CC-Link IE uses CSP+ files (.cspp) for configuration. The CSP+ (Control & Communication System Profile Plus) file is an XML-based format file that is used to describe the devices (network parameter information, memory map, etc.). The file can be imported into the engineering tool, and is used to set up the communication between the PLC/controller and the devices.

Data

The following table specifies a number of CC-Link IE data:

<table>
<thead>
<tr>
<th>Network type</th>
<th>Ethernet based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication profile</td>
<td>CC-Link IE Field Network Basic</td>
</tr>
<tr>
<td>Installation</td>
<td>Standard Off the Shelf (COTS) Ethernet cables and connectors.</td>
</tr>
<tr>
<td></td>
<td>10/100/1000 Mbit/s TX Ethernet cable or fibre optics.</td>
</tr>
<tr>
<td></td>
<td>RJ45, M12 or fibre optic connectors.</td>
</tr>
<tr>
<td>Speed</td>
<td>100 Mbit/s</td>
</tr>
<tr>
<td>Hardware requirements</td>
<td>No specialized hardware required.</td>
</tr>
<tr>
<td>Number of stations per network</td>
<td>64</td>
</tr>
</tbody>
</table>
1.2 CC-Link IE Field Network Basic for OmniCore

General

The CC-Link IE Field Network Basic network is running on the OmniCore main computer and does not require any additional hardware.

Options

In order to run CC-Link IE Field Network Basic, the following option is required:

- 3066-2 CC-Link IE Field Basic Device

Compatibility

CC-Link IE Field Network Basic has passed conformance tests to ensure compatibility according to the CC-Link IE Conformance Test Regulation from CC-Link Partner Association (CLPA).

The device is certified for the CC-Link IE Field Network Basic version 2.0.

Predefined network

When the robot system is installed with the CC-Link IE Field Network Basic option, a predefined network with the name **CC_Link_IE** and a device with the name **CC_Internal_Device** are created at system startup.

The network and the internal device are ready to be used at once, see Quick start instructions on page 15.

However, if needed, the internal device can be configured using I/O Engineering in RobotStudio. For example, you can define device names, identification labels, input and output sizes and edit signals, see Configuring the CC-Link IE Field Network Basic system on page 17.

Note

The defined IP address controls whether **CC_Link_IE** is run on the Private Network or the I/O Network.

Information about the internal device

General

To use the CC-Link IE Field Network Basic internal device, the OmniCore controller must be installed with the option 3066-2 CC-Link IE Field Basic Device.

The CC-Link IE Field Network Basic internal device can be used to connect an OmniCore controller to a PLC.

Note

In this manual, the CC-Link IE device is referred to as internal device.
Specification overview, internal device

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-Link IE Field Network Basic version</td>
<td>2.0</td>
</tr>
<tr>
<td>CSP+ version</td>
<td>CCLinkFamilyProfileVersion 2.2</td>
</tr>
<tr>
<td>Connection size</td>
<td>Maximum 288 input bytes and 288 output bytes.</td>
</tr>
<tr>
<td>Number of stations per internal device</td>
<td>Maximum 4 stations. Each station holds 72 bytes.</td>
</tr>
</tbody>
</table>
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2 Quick start instructions

Quick start

The CC-Link IE Field Network Basic system is predefined, and can be started without any configuration.

Follow this procedure for a quick start of the CC-Link IE Field Network Basic functionality:

• Create a system with option 3066-2 CC-Link IE Field Basic Device. See Operating manual - Integrator's guide OmniCore.
• Define the IP address on the network. See Operating manual - Integrator's guide OmniCore.
• Open the firewall for the ports using the Firewall Manager. See Operating manual - Integrator's guide OmniCore.
• Connect the CC-Link IE Field Network Basic master to the physical port.

Note

If you want to configure the system before using it, this is done using I/O Engineering in RobotStudio. See Configuring the CC-Link IE Field Network Basic system on page 17 and Application manual - I/O Engineering for more information.
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3 Configuring the CC-Link IE Field Network Basic system

3.1 Prerequisites

3.1.1 Logging in with configuration grant

Log in with configuration grant

For configuration in I/O Engineering, the user grant Modify configuration is required. See Operating manual - RobotStudio, section Managing user rights and write access on a controller.
3 Configuring the CC-Link IE Field Network Basic system

3.2 Configuring the CC-Link IE Field Network Basic network properties

Configure the CC-Link IE Field Network Basic network properties

1. In the Controller tab in RobotStudio, select I/O Engineering. The I/O Engineering tab is displayed.

2. In the Configuration browser, select CC_Link_IE (under I/O system).

3. In the Properties browser, you can configure the following:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Allowed values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification Label</td>
<td>This parameter is an optional way to provide a label that will help the operator to identify the internal device.</td>
<td>A string with maximum 80 characters.</td>
</tr>
<tr>
<td>Simulated</td>
<td>Select Yes or No, indicating if the industrial network and all its connected I/O devices should be treated as simulated.</td>
<td></td>
</tr>
</tbody>
</table>
3.3 Configuring the CC-Link IE Field Network Basic device properties

Configure the CC-Link IE Field Network Basic device properties
1. In the Controller tab in RobotStudio, select I/O Engineering. The I/O Engineering tab is displayed.
2. In the Configuration browser, select the device.

![Configuration browser screenshot]

3. In the Properties browser, you can configure the following:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Allowed values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter the name to be used for the internal device.</td>
<td>A string with maximum 80 characters.</td>
</tr>
<tr>
<td>Identification Label</td>
<td>This parameter is an optional way to provide a label that will help the operator to identify the internal device.</td>
<td>A string with maximum 80 characters.</td>
</tr>
<tr>
<td>Input Size</td>
<td>Enter the input size.</td>
<td>1 - 288</td>
</tr>
<tr>
<td>Output Size</td>
<td>Enter the output size.</td>
<td>1 - 288</td>
</tr>
</tbody>
</table>

**Note**

The field Occupied Stations is automatically updated when the Input Size or Output Size is changed. The maximum value per station is 72. The device can have up to 4 stations.
3.4 Editing signals

Overview

All signals are preloaded at installation. You can, however, edit the signal name.

Edit signals

1. In the Controller tab in RobotStudio, select I/O Engineering. The I/O Engineering tab is displayed.
2. Select Signal Editor.
3. In the Configuration browser, select the I/O module for which signals are to be configured.
4. In the column Name, edit the signal name.
3.5 Saving the configuration

When the configuration is finished, save the configuration to the robot controller. In the ribbon, click Write config. When asked if you would like to restart the controller, answer Yes for the new configuration to take effect.
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