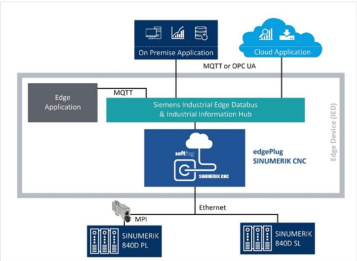
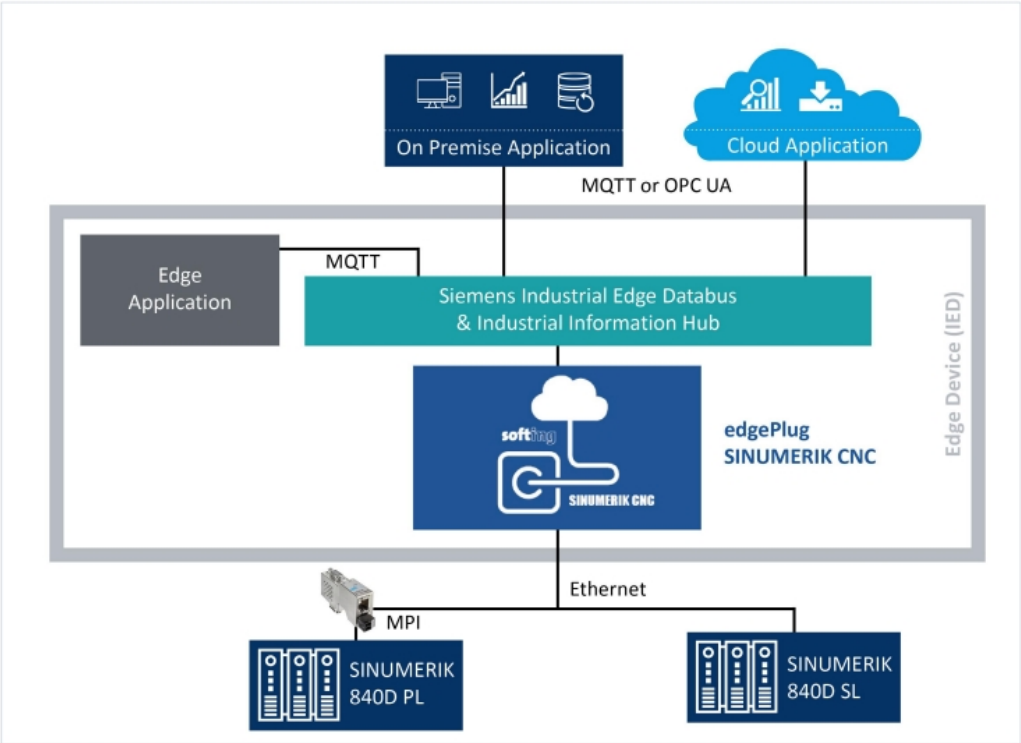


softing edgePlug SINUMERIK CNC Docker Containers User Guide

softing edgePlug SINUMERIK CNC Docker Containers User Guide



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If you are interested in oursource modifications and sources used, please contact: **info@softing.com**

Contents

About this guide

Read me first

Please read this guide carefully before using the device to ensure safe and proper use. Softing does not assume any liability for damages due to improper installation or operation of this product.

This document is not warranted to be error-free. The information contained in this document is subject to change without prior notice. To obtain the most current version of this guide, visit the **product website**.

Target audience

This guide is intended for experienced operation personnel and network specialists configuring and maintaining field devices in a Siemens network environment. Before installing and operating the edgePlug SINUMERIK CNC make sure that you have read and fully understood the safety requirements and working instructions in this guide.

Typographic conventions

The following typographic conventions are used throughout Softing customer documentation:

Keys, buttons, menu items, commands and other elements involving user interaction are set in bold font and menu sequences are separated by an arrow Open Start à Control Panel à Programs Buttons from the user interface are enclosed in brackets and set to bold typeface Press [Start] to start the application Coding samples, file extracts and screen output is set in Courier font type MaxDlsapAddressSupported=23 Filenames and directories are written in italic Device description files are located in C: \\delivery\software\Device Description files

CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Note
This symbol is used to call attention to notable information that should be followed during installation, use, or servicing of this device.

Document history

Document version	Changes since last version
1.00	first version

Related documentation

The following links direct you to additional **product information**.

You will find the user manuals and release notes of the Siemens Industrial Edge system in the Documents section of the Siemens Industrial Edge Hub.

Document feedback

We would like to encourage you to provide feedback and comments to help us improve the documentation. You can write your comments and suggestions to the PDF file using the editing tool in Adobe Reader and email your feedback to **support.automation@softing.com**.

If you prefer to write your feedback directly as an email, please include the following information with your comments:

- document name
- document version (as shown on cover page)
- page number

About edgePlug SINUMERIK CNC

The Softing edgePlug SINUMERIK CNC is a Linux-based containerized software application running on a Docker engine. It has been designed to stream SINUMERIK 840D CNC data to the Siemens Industrial Edge applications.

Intended use

The edgePlug SINUMERIK CNC integrates smoothly into the Siemens Industrial Edge connectivity and are designed to utilize all services and features of the Siemens connectivity suite.

Features and benefits

- Access to SINUMERIK 840D CNC machine tool data for the Siemens Industrial Edge
- No change of CNC program needed
- No data point configuration needed with pre-defined standard namespace
- Tight integration into Siemens Industrial Edge
- Use the IIH configurator to configure the edgePlug connectivity
- CS Databus Gateway makes the controller data available at the IE Databus
- Existing applications which use the IE Databus can consume the data provided by the edgePlug without changes

Technical data

Supported CNCs	Siemens SINUMERIK 840D Solution Line, Software Version >= V2.7 Siemens SINUMERIK 840D Power Line, Software Version >= V5.3
Tested with	Siemens Industrial Edge V1.4.0
	Siemens Industrial Information Hub V1.1
	Siemens IPC227E
Minimal Hardware Requirements	256 MB free disk space, 32 MB RAM
Licensing	Over Siemens Industrial Marketplace
Software	Siemens Industrial Edge Application

System requirements

The edgePlug SINUMERIK CNC is a connector for the Siemens Industrial Information Hub. You must have the Siemens Industrial Infomation Hub (IIH) installed on a Siemens Industrial Edge Device to use the edgePlug SINUMERIK CNC.

Installation

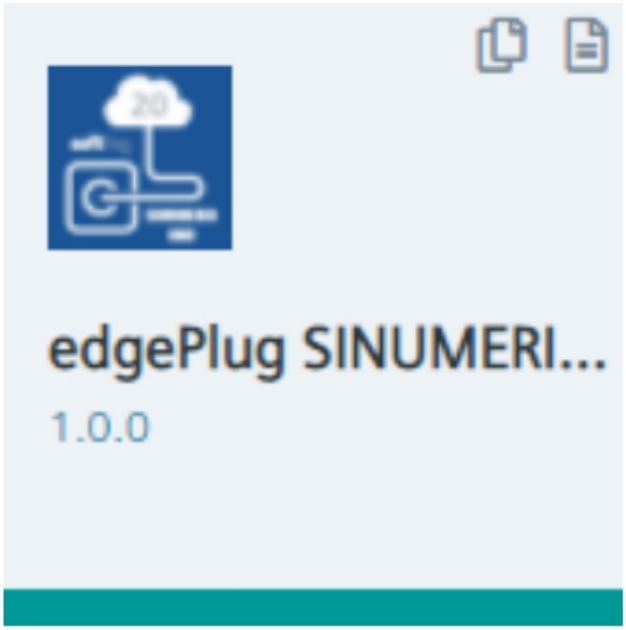
The edgePlug SINUMERIK CNC can be purchased and installed over the Siemens Industrial Edge marketplace.

Prerequisites

To be able to work with edgePlug SINUMERIK CNC you need a Siemens Industrial Edge Hub Account, a Siemens Industrial Edge Management installation and at least one Siemens Industrial Edge device. Please have a look at the “Industrial Edge Management – Getting Started” manual from Siemens which explains the installation of the Siemens Industrial Edge environment.

Copying edgePlug to IEM

After you have purchased edgePlug SINUMERIK CNC in the Siemens marketplace check the user manual of the IE Hub for further details on how to copy your edgePlug SINUMERIK CNC to IEM .

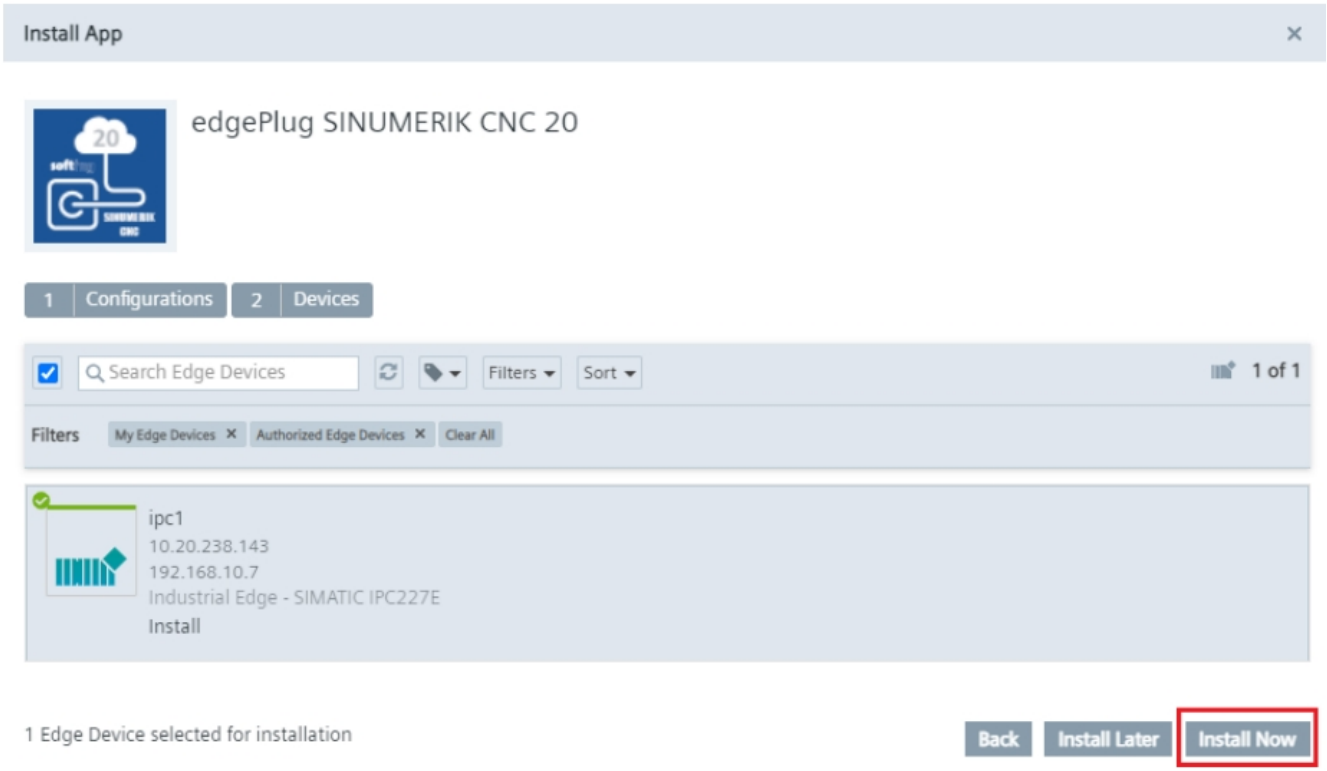


1. Click the copy to IEM catalog icon.
2. Select the IEM instances in the displayed dialog.
   The edgePlug SINUMERIK CNC will be installed to the catalog of the IEM.

Installing edgePlug to IED

1. Double-click the edgePlug SINUMERIK CNC icon in the catalog of the IEM

2. Click [Install].
3. Open the to Install App dialog.
4. Click [Next] on the Configurations page and select the IED to which you want to install the App.



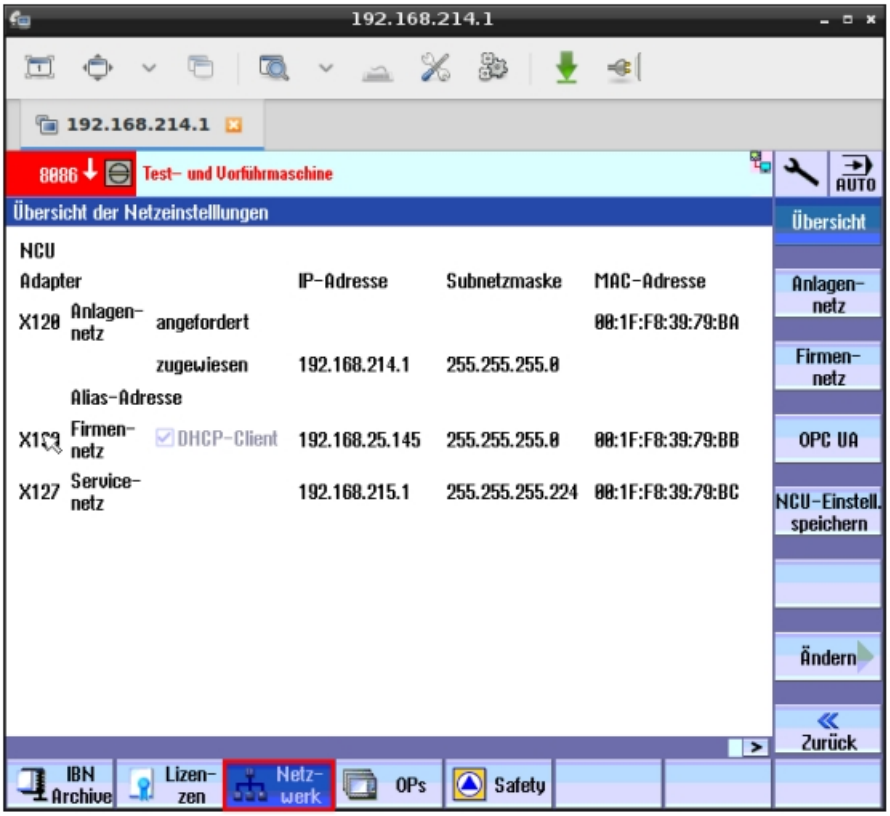
5. Click [Install Now] to install the App on the device.

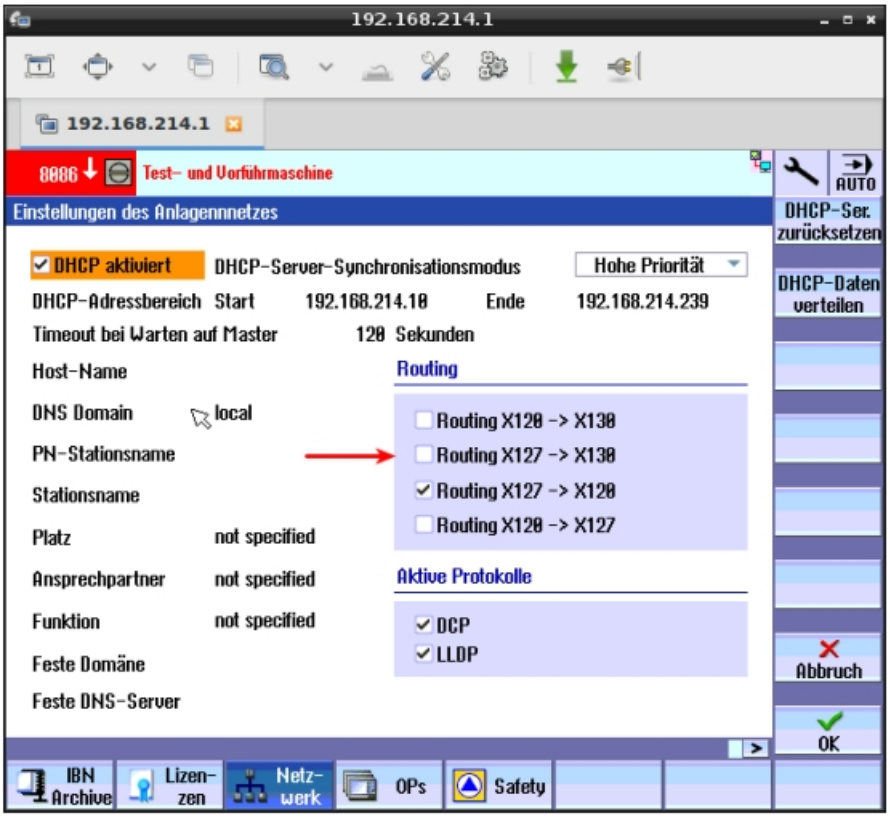
Physical connection to SINUMERIK 840D controller

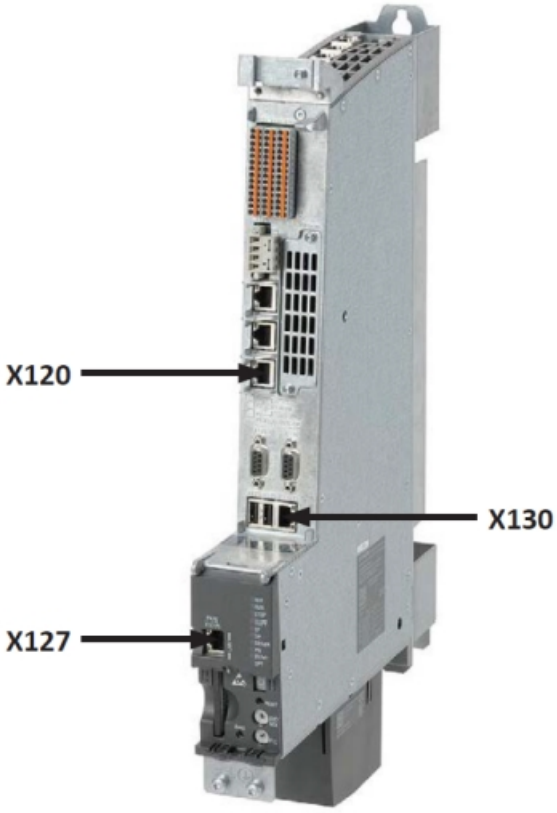
The SINUMERIK 840D variants offer two types of physical connection. SINUMERIK 840D SL variant has 3 Ethernet interfaces while SINUMERIK 840D PL variant only provides MPI access.

SINUMERIK 840D SL

- Ethernet interface X120 for the device connection to HMIs and keyboards
- Ethernet interface X130 for the company network
- Ethernet interface X127 for service purposes


192.168.214.1
192.168.214.1
8886
Test- und Vorführmaschine
AUTO
Übersicht der Netzeinstelllungen
Übersicht
NCU
Adapter
IP-Adresse
Subnetzmaske
MAC-Adresse
X120 Anlagen-netz
angefordert
00:1F:F8:39:79:BA
zugewiesen
192.168.214.1
255.255.255.0
Alias-Adresse
Anlagen-netz
Firmen-netz
X1?? Firmen-netz
DHCP-Client
192.168.25.145
255.255.255.0
00:1F:F8:39:79:BB
OPC UA
X127 Service-netz
192.168.215.1
255.255.255.224
00:1F:F8:39:79:BC
NCU-Einstell. speichern
Ändern
Zurück
IBN Archive
Lizen-zen
Netz-werk
OPs
Safety


192.168.214.1
192.168.214.1
8886
Test- und Vorführmaschine
AUTO
Einstellungen des Anlagennnetzes
DHCP-Ser. zurücksetzen
DHCP aktiviert
DHCP-Server-Synchronisationsmodus
Hohe Priorität
DHCP-Adressbereich Start
192.168.214.10
Ende
192.168.214.239
Timeout bei Warten auf Master
120 Sekunden
DHCP-Daten verteilen
Host-Name
Routing
DNS Domain
local
Routing X120 -> X130
PN-Stationsname
Routing X127 -> X130
Routing X127 -> X120
Stationsname
Routing X120 -> X127
Platz
not specified
Ansprechpartner
not specified
Aktive Protokolle
Funktion
not specified
DCP
LLDP
Feste Domäne
Feste DNS-Server
Abbruch
OK
IBN Archive
Lizen-zen
Netz-werk
OPs
Safety



Ethernet interface	Description
X120	This interface is used for connecting the automation network (operator panel interface). The interface is not isolated by a firewall. Ideally, the Softing dataFEED edgeConnector 840D should therefore be operated using this interface. This interface uses the fixed IP address 192.168.214.1. For connecting to the machine network the gateway then should be configured using a fixed IP address as well(e.g. an IP address higher than 192.168.214.250).
X127	This interface serves exclusively as a service socket (service interface). It cannot be used for connection purposes.
X130	This interface connects the controller to the factory network (company Ethernet). This interface can be used as an alternative interface for connecting the dataFEED edgeConnector 840D. Here, however, the NCU firewall (port TCP/102) has to be enabled to allow for SIMATIC S7 communication.

The Softing dataFEED edgeConnector 840D uses the SIMATIC S7 communication protocol (TCP/102) of SINUMERIK 840D SL. By default, this protocol is available at the X120 interface. Alternatively, it can be enabled for the X130 interface.

The host PC running the dataFEED edgeConnector 840D therefore needs either a physical connection to the X120 interface and a unique IPv4 address within the corresponding network or a physical connection to the X130 interface, a unique IPv4 address within the corresponding network as well as the SIMATIC S7 communication

protocol explicitly enabled for this interface.

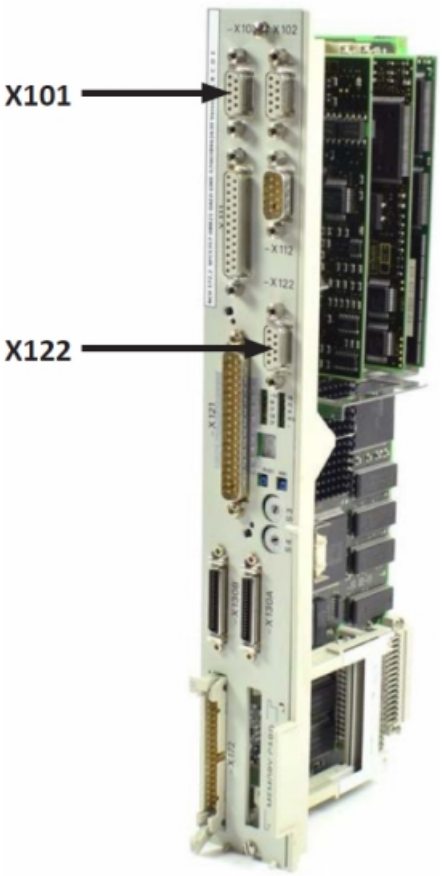
SINUMERIK 840D PL

As the SINUMERIK 840D PL does not have an Ethernet interface, a D-Sub 9 connector is required for connectivity purposes to map the SINUMERIK 840D PL-specific communication to Ethernet communication.

The Softing product echolink S7-compact supports the PG/MPI to Ethernet conversion. The Ethernet-toMPI converter translates the RFC-1006 TSAP addresses to MPI addresses. As a result the default SINUMERIK 840D PL MPI addresses are translated into the following TSAP settings:

- TSAP NCK (powerline): 03 03
- TSAP PLC (powerline): 03 02

It must be ensured that the SINUMERIK 840D PL has been switched on and its communication settings are correct. Ensure that a valid MPI address is assigned and that it is not assigned twice in the configuration. Individually configured addresses can be determined by checking the hardware configuration of the SIMATIC STEP 7 project. As MPI address 30 is typically not used it can be assigned toecholink S7-compact.



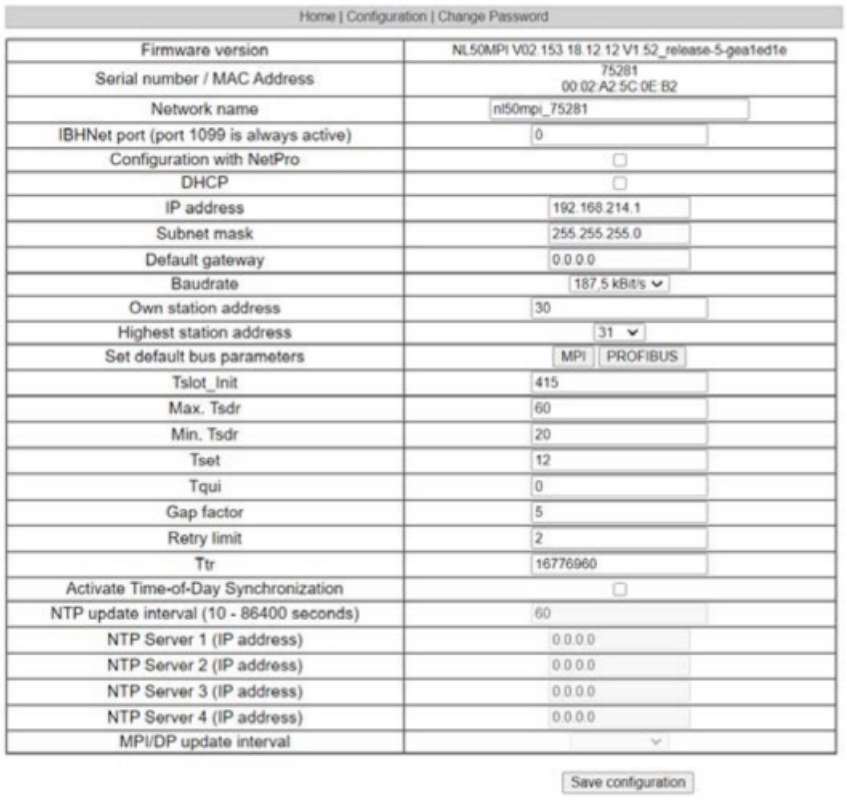
Ethernet interface	Description
X120	This interface is used for connecting a programming or remote maintenance device (PG interface) and is recommended for the echolink S7-compact. It requires its own 24 V power supply, since the connector X122 does not provide any voltage. If a connector is connected echolink S7-compact can be plugged on top or in between.
X101	It is used for connecting the control panel/operating panel (control panel interface) and is not recommended for communication via echolink S7- compact .

Configure echolink S7-compact

The echolink S7-compact configuration is performed in the appropriate configuration page (see the figure below).

The important echolink S7-compact settings include:

Variable	Description
IP Address	Address for reaching echolink S7-compact. The IP address is freely selectable (e.g. 192.168.214.XXX), but has to be located in the same network as the MACHINE network of dataFEED edgeConnector 840D.
Baudrate	The transmission speed has to be set to 187.5 kBit/s.
Own Station Address	MPI address of echolink S7-compact. **Important**: This address must not be used by another station.
Set Default Bus Parameter	Select MPI and use the default parameters.



Configuration

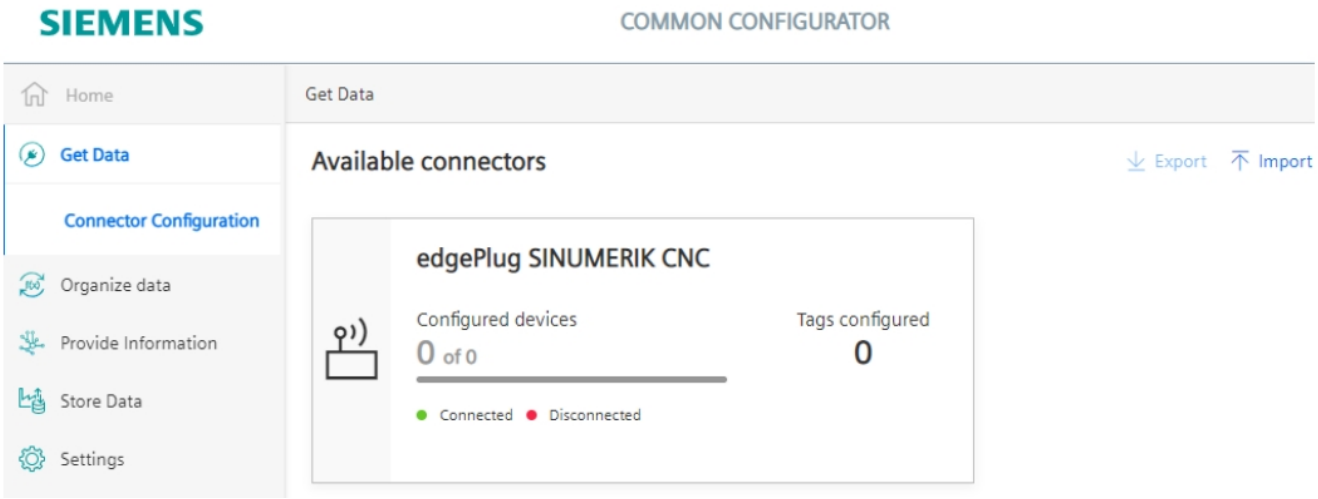
Prerequisites

The IED along with the installed edgePlug SINUMERIK CNC is connected over Ethernet to a SINUMERIK 840D CNC controller.

IIH Configurator

1. Click the Apps page in the user interface of the IED to run the IIH configurator.

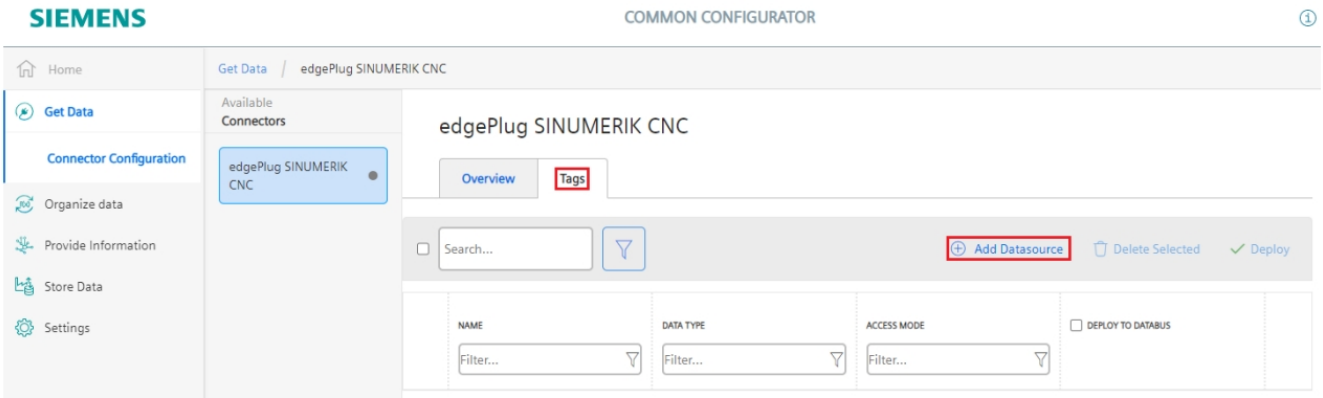
   The browser will open a new tab displaying the configurator.
2. See the Connector Configuration page for a list of installed and running connectors.



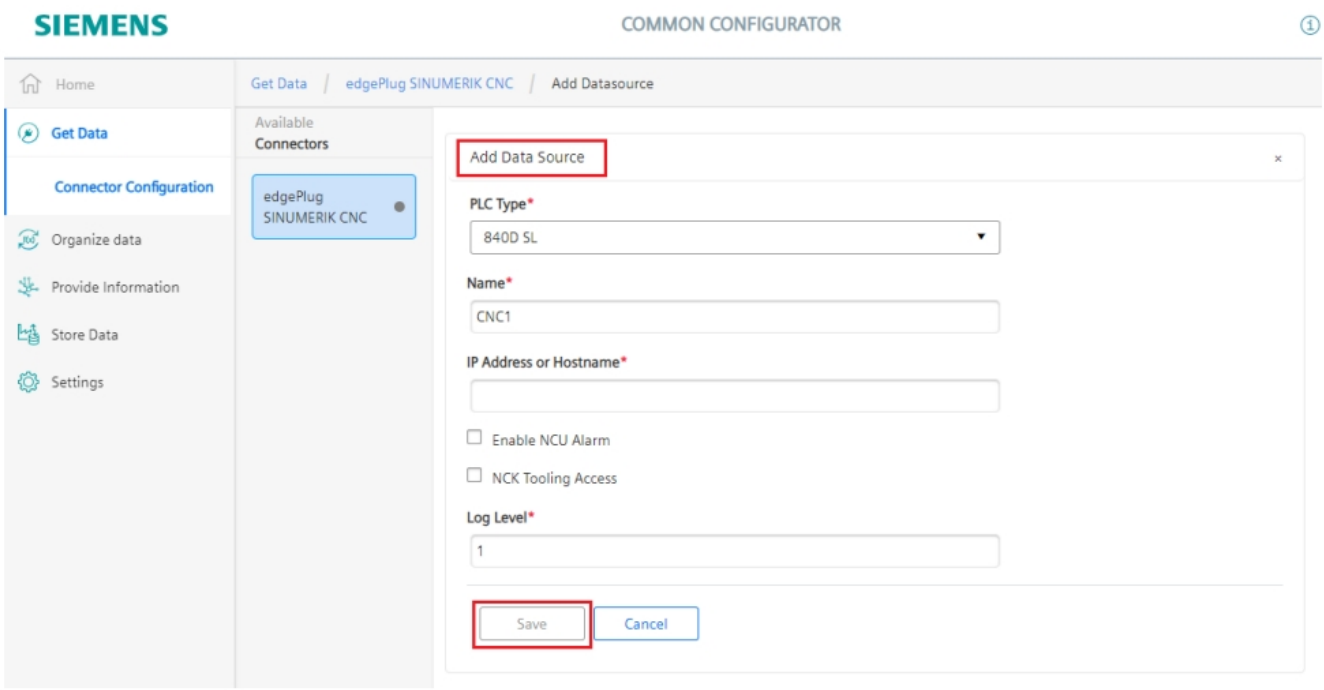
3. Select the edgePlug SINUMERIC CNC.

Data source configuration

1. Open the Tags tab of the edgePlug SINUMERIK CNC.
2. Click Add Datasource.

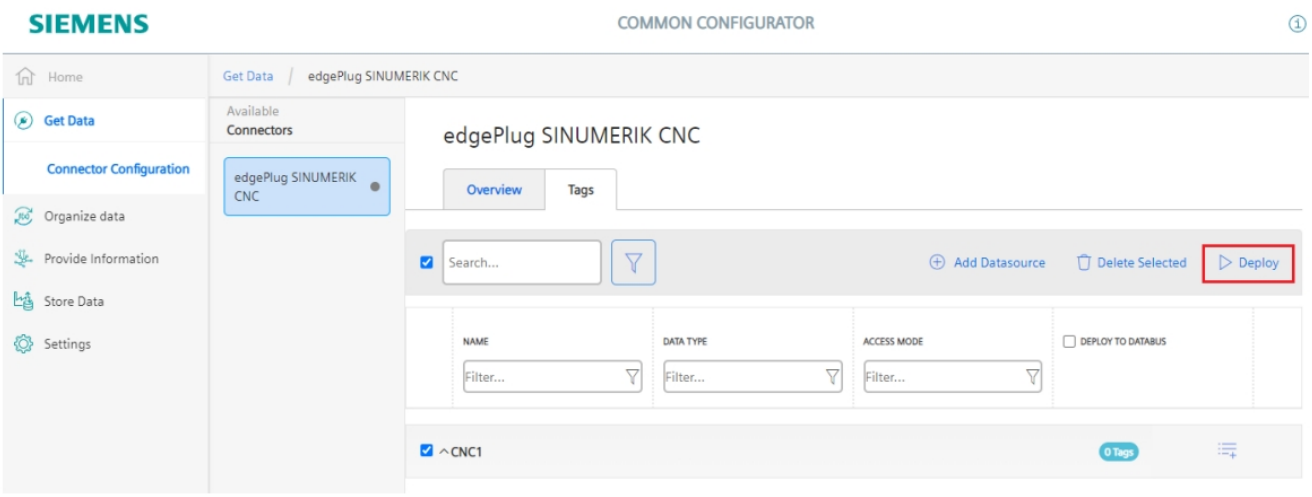


3. See the Connector Configuration page for a list of installed and running connectors.
4. Enter the Data Source connection parameters into the Add Data Source dialog fields.
5. Click [Save].

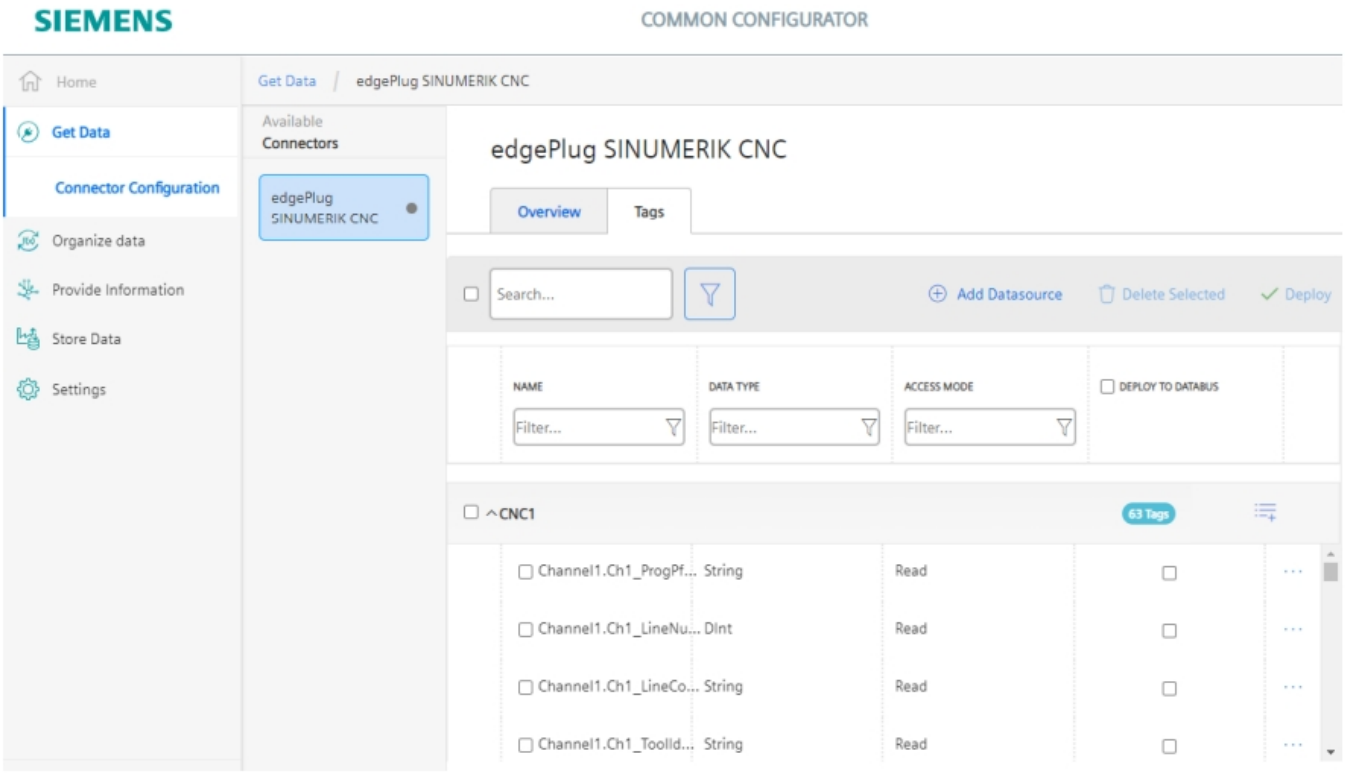


Field	Description
PLC Type	840D SL for SINUMERIK 840D Solution Line controllers 840D PL for SINUMERIK 840D Power Line controllers
Name	Name of the connection used within the IE applications
IP Address or hostname	The IP address or hostname of the SINUMERIK CNC
Enable NCU Alarm	Enable the monitoring of NCU alarms. This creates an additional communication load on the CNC.
NCK Tooling Access	Enable the monitoring of NCU tooling data. This creates an additional communication load on the CNC.
Log Level	The level of generated logs 0 = Only Error logs 1 = Error and Warning logs 2 = Error, Waring and Information logs 3 = Error, Waring, Information and Debug logs

6. Select the datasource and press [Deploy] to write the configuration to the edgePlug SINUMERIK CNC.



Data point configuration



840D SL
All accessible data points are listed below the connection on the “Tabs” page. You can’t add additional data points.

840D PL
All accessible data points are listed below the connection on the “Tabs” page. You can’t add additional data points.

Note
To see the data points after the configuration of the data source, close the IIH Configurator and reopen it after 30 seconds.

Note
With the V1.2 of the IIH Configurator the configuration of the Databus Gateway is only possible for one connector.

Databus gateway

1. Now you can select the data points you want to be available on the IE Databus.
2. Select the data points and check the “DEPLOY TO DATABUS” box for the ones you want be available on the IE Databus and press [Deploy].
   This will reconfigure and restart the Databus Gateway and will make the datapoints available on the IE Databus.

Diagnosis

The Softing Support Team will assist you in troubleshooting your edgePlug SINUMERIK CNC.

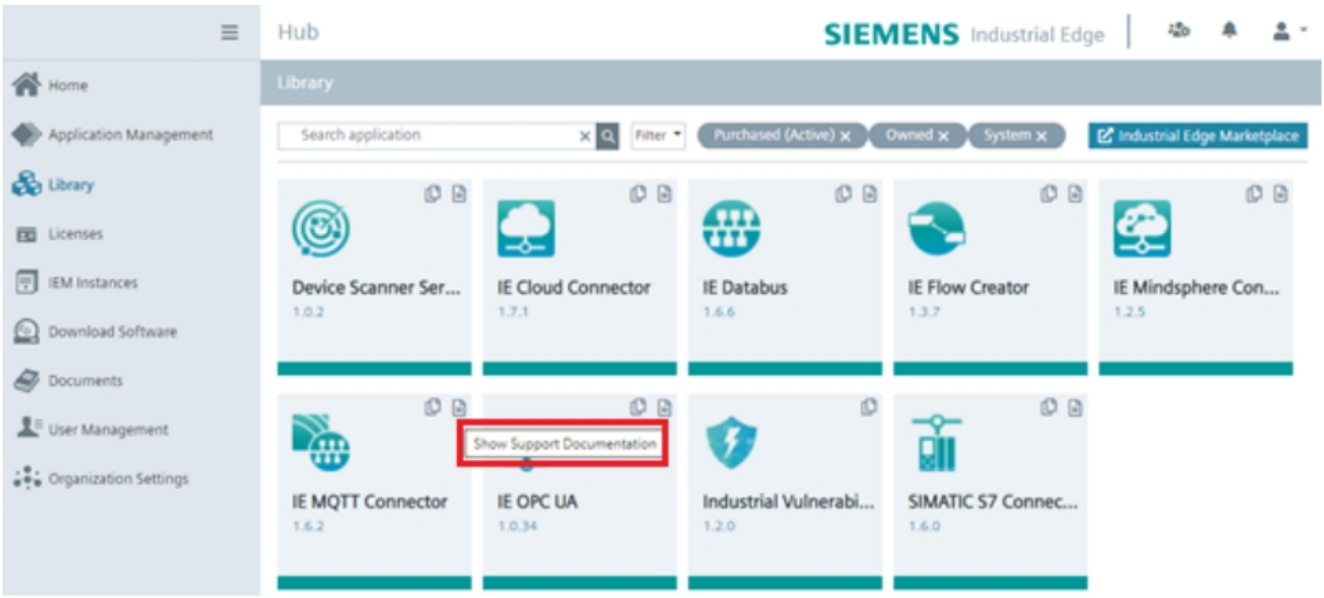
1. Open the IIH Configurator and set the Log Level of one of the configured data sources to 3 and deploy it.
   This will give you a complete set of diagnostic data.
2. Contact Softing support and email our team the diagnostics of your edgePlug SINUMERIK CNC.
3. Open the Apps page.
4. Click the 3 dots of the edgePlug SINUMERIK CNC and select the Download Logs menu.
   The Log file is downloaded to the Downloads folder of your PC.

Connecting with IE MQTT connector

The easiest way to access the data points on the IE Databus which are provided by the edgePlug is to use the IE MQTT Connector.

Configure the IE MQTT Connector

- Download the User Manual oft he IE MQTT Connector by pressing the icon Show Support Documentation.



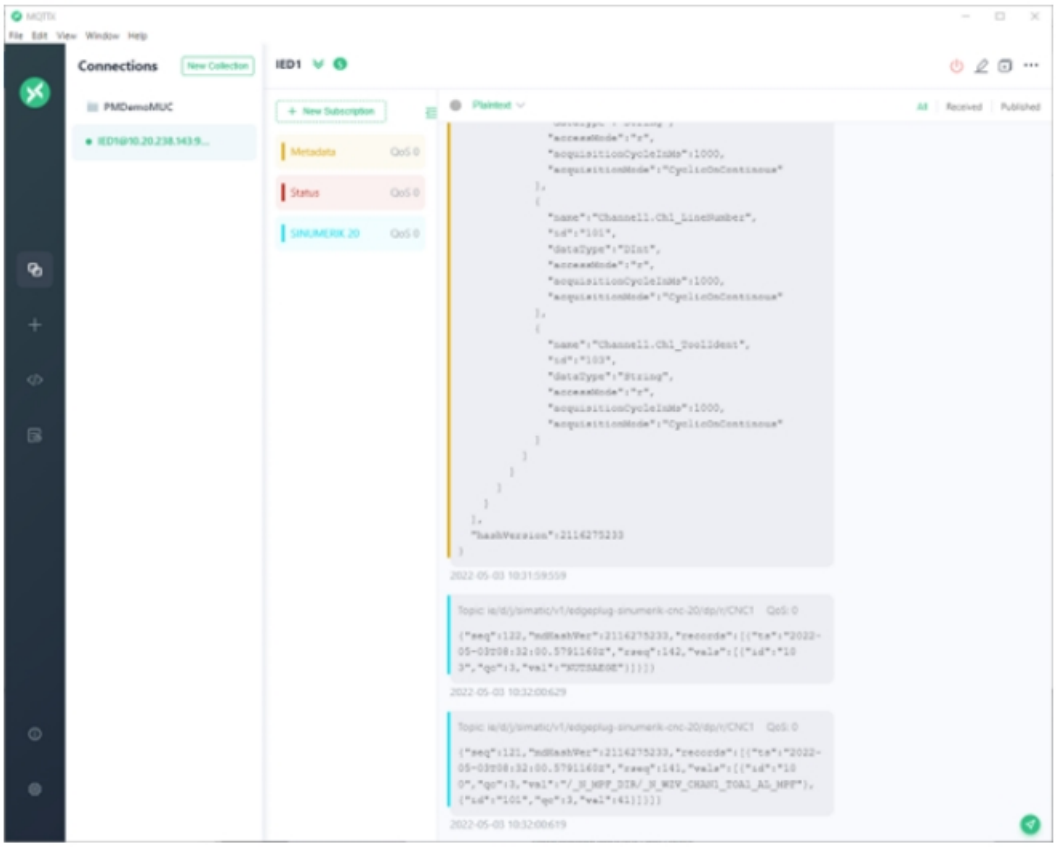
The User Manual describes how to configure the IE MQTT Connector.

- Create a configuration with the following settings and deploy it.
- Select a user name of your choice.

Connect an MQTT client

ou can use a standard MQTT client, like MQTTX which is used in the screenshots, to connect to the IE MQTT Connector.

The URL for the connection is: mqtt://:9883 using the configured user (softing) with its password. You must subscribe to the „ie/#“ topic tree.



You will receive MQTT messages on the following topics:

- ie/s/j/simatic/v1/edgeplug-sinumerik-cnc-20/status Status messages of the Databus Gateway regarding the edgePlug connector
- ie/m/j/simatic/v1/edgeplug-sinumerik-cnc-20/dp Metadata of the Databus Gateway for the edgePlug connector. This includes information about subscribed data points
- ie/d/j/simatic/v1/edgeplug-sinumerik-cnc-20/dp/r/ Change notifications for the values of the subscribed data points

Glossary

Terms & Abbreviations	Definition
CNC	Computerized Numerical Control
IED	Industrial Edge Device
IEM	Industrial Edge Management
MQTT	Message Queuing Telemetry Transport
OPC UA	OPC Unified Architecture
PL	Power Line
PLC	Programmable Logic Controller
SaaS	Software as a Service
SL	Solution Line

Support

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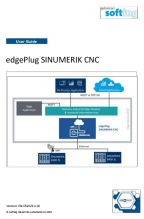
Richard-Reitzner-Allee 6 85540 Haar / Germany
Web: https://industrial.softing.com
Call: + 49 89 45 656-340
+ 49 89 45 656-488
Email: info.automation@softing.com

Documents / Resources

	softing edgePlug SINUMERIK CNC Docker Containers [pdf] User Guide edgePlug, SINUMERIK CNC Docker Containers, Docker Containers, edgePlug, SINUMERIK CNC

References

- Softing Industrial | Data Networks & Data Intelligence Solutions
- edgePlug SINUMERIK CNC | Softing
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