rexroth
A Bosch Company

IoT Gateway

Software Application

Commissioning Manual
R911403022

Edition 02

Change record

Edition 02, 2020-08

Refer to tab. 1-1 "Change record" on page 1

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1 Overview

Editions of this documentation

Edition	Release Date	Note
01	2020-04	First edition
02	2020-08	Notes on the docker installation supplemented, references corrected

Tab. 1-1: Change record

1.1 Device description

The IoT Gateway connects the industrial machine environment to the company IT and can provide simple machine and process data. Based on Java, the IoT Gateway software can provide the following:

- Devices to connect field devices such as sensors or industrial control systems.
- Processing to process data.
- Processing to provide data to superordinate services and systems.

1.2 Definitions

The following definitions are used in this documentation:

Endpoint	The endpoint is the central location of a value. The name of each endpoint is unique. Each endpoint is provided with a reference to the source value. Units and descriptions can be added optionally, e.g. the temperature.
Value of an endpoint	The current value of an endpoint.
Device	A device is a data source. Endpoints can access this data source. Depending on the device type, different parameters can be configured and settings can be changed.
Processing	Processing is a data sink. The endpoint values can be provided to this data sink. A process can for example be a cloud service or a computation. The result of the computation is also shown as endpoint and can be used for other processing steps.
App	Certain functions of the IoT Gateway are available as apps (application). An app is provided by one or multiple bundles.
Bundle	A bundle is an independent module. The section "Bundles" (see chapter 5.2 "Bundles" on page 9) describes how to load, delete and enable apps.

Tab. 1-2: Definition of terms

1.3 Related documentation

Title	Part number and document type
IndraControl	R911389662
PR21	Operating Instructions
Embedded Automation Computer	Content: Mounting und commissioning hardware
IndraControl	R911384733
PR, VR, DR and DE Devices	Project Planning Manual
Software Applications	Content: Operating system Linux Ubuntu Core, network configuration, Recovery
Security Manual	R911342562
Electric Drives	Project Planning Manual
and Controls	Content: Secure operation of IT systems and general information on "IT security" in manufacturing systems
IndraControl	R911372205
S20 Bus Coupler	Data Sheet
for Ethernet	Content: Commissioning und configuration of the bus coupler S20-ETH-BK to connect to the sensor

Tab. 1-3: Required and supplementing documentation

2 System requirements of the IoT Gateway

2.1 Hardware

2.1.1 System requirements on the IoT Gateway software "Standard" and "Advanced"

Processor	Intel Atom Single Core E3815 1.46 GHz or higher (x86-64)
RAM	4 GB RAM or higher
Disk space	2 GB disk space available to install programs
Installation	USB interface or Ethernet access

Tab. 2-1: System requirements "Standard" and "Advanced"

2.1.2 System requirements on the IoT Gateway software "Performance"

Processor	Intel Core i3-6100U 2.30 GHz or higher (x86-64)
RAM	4 GB RAM or higher

Disk space	2 GB disk space available to install programs
Installation	USB installation or Ethernet access

Tab. 2-2: System requirement "Performance"

2.1.3 System requirements on the IoT Gateway software "Plant, virtual machine"

Processor	Intel Xeon E5-2650L 1.80 GHz or higher (x86-64)
RAM	8 GB RAM or higher
Disk space	2 GB disk space available to install programs
Installation	USB interface or Ethernet access

Tab. 2-3: System requirement "Plant, virtual machine"

2.2 Software

Install the software as follows:

2.2.1 Copy deployment

“Copy deployment” are application files executed by the user.

System prerequisites:

- Windows (supported 32-bit or 64-bit).
- Java Runtime: Oracle Java version 8, OpenJDK8 (Java 1.8.0), higher versions are not supported.

2.2.2 Docker for Linux

The installation is provided as Docker container.

- For information on "Docker", refer to https://docs.docker.com/engine/install/.

2.2.3 Docker for Windows

The installation is provided as Docker container.

- For information on "Docker", refer to https://docs.docker.com/docker-for-windows/install/.

2.2.4 MS Installer

Admin rights are required to install Microsoft Installer packages.

Supported operating systems:

- Microsoft Windows 7 (supports 64-bit)
- Microsoft Windows 8 (supports 64-bit)
- Microsoft Windows 10 (supports 64-bit)

Further information on the MS Installer:

- https://www.itprotoday.com/cloud-computing/understanding-windows-installer

3 Installation

3.1 IoT Gateway software installation (Windows) as copy deployment

1. Download this file. Go to **www.boschrexroth.de ▶ Products ▶ Product Groups ▶ Electric Drives and Controls ▶ Industrial IoT ▶ IoT Gateway**.
2. Copy the ".zip" file to the installation directory.

☞ The software of the IoT Gateway cannot be opened in the “Download” folder.

---

3. Unzip the software of the IoT Gateway into the installation directory.
4. Check whether the Java Runtime Engine 1.8 is installed. Open the Windows command line and enter "java -version".
5. Open the unzipped folder and start the file "start.bat".

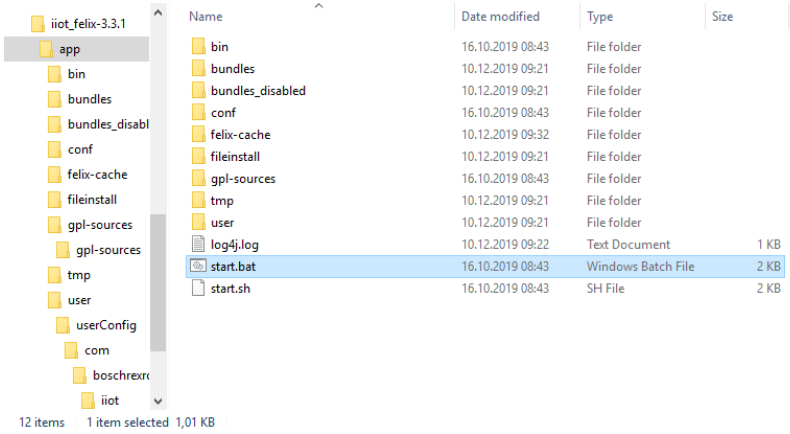

Fig. 3-1: Starting software

6. The following window opens:

Fig. 3-2: The IoT software starts

3.2 IoT Gateway software installation as Docker image

Prerequisites: The runtime environment of the Docker is installed. Check it with: `docker --version`.

1. Import the Docker package:

   `docker load < {IoT-Gateway-Docker-Image}.tar.gz`.
2. Start the Docker: `docker run -p 8888:8888 -p 9999:9999`

   `-v ~/data:/iotgateway/user/userConfig`

   `--name iiot brc/iiot:[version]`
   - `docker run`: Creates an executable Docker container from the Docker file.
   - `-p 8888:8888`: Port assignment, host(8888): Container(8888).
   - `-p 9999:9999`: OPC-UA server, port assignment, Host(9999): Container(9999)
   - `-v ~/data:/iotgateway/user/userConfig`: Directory assignment Host(~/data):Container(/iotgateway/user/userConfig)
   - `--name iiot`: Container identification using the name, here: "iiot".
   - `brc/iiot:[version]`: Image to be selected
3. List of the Docker containers: `docker ps`
4. Stop Docker containers: `docker stop iiot`.
5. Delete Docker containers: `docker rm iiot`
6. Listing of the Docker image: `docker images`
7. Delete Docker image: `docker rmi <image id>`.

3.3 IoT Gateway software installation with MS Installer

Use the Windows “Services” overview to check whether the service of the IoT Gateway is executed:

1. Press the “Windows” key once, enter the word "Services" and press "Enter".
2. Check whether the entry "boschrexroth.iot-gateway" has the following values: The "Status" column "Running" and the "Startup Type" is "Automatic".

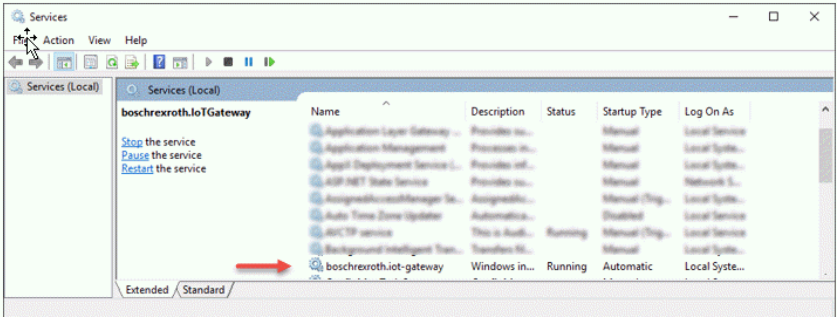

Fig. 3-3: Overview on the Windows “Services”

4 Initial start of the IoT Gateway

1. Open the site in the web browser

   `https://[IP-of-Host-Server/PC]:8888/`

2. Ignore the security warning of the browser if present.

   Your browser displays this notification, as the certificate from our website is unknown. In order not to receive this notification anymore, change the certificate to a known certificate.

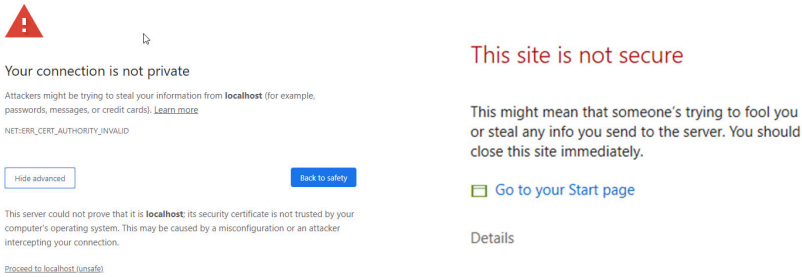

Fig. 4-1: Browser security warnings

3. The following site opens. Enter username and password upon the first log-in. The username is "admin" and the password is "admin".

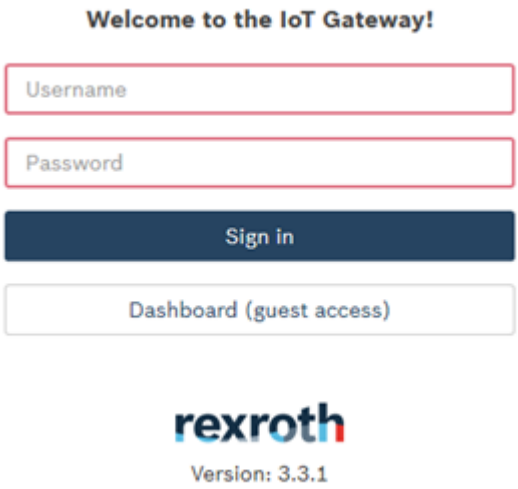

Fig. 4-2: First login

4. Accept the end-user license agreement (EULA).
5. Specify a new username and password.

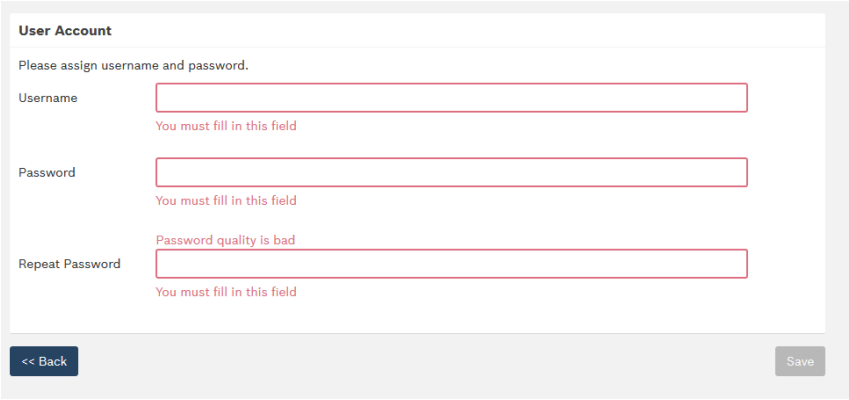

Fig. 4-3: Change username and password

The web interface allows to configure and manage the IoT Gateway.

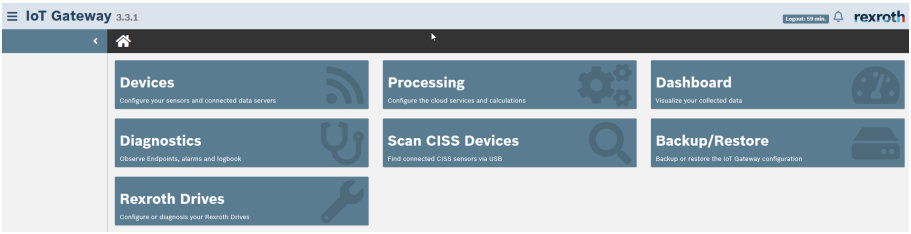

Fig. 4-4: The tiles show the basic functions enabled in the basic setting. More functions can be enabled, added or removed. Make these changes in the "Bundles" and "Licensing" menu.

Software licenses are required to use the IoT Gateway. To add a new license, refer to chapter 5.3 "Licensing" on page 9.

All functions can be used without license for two hours after restart.

4.1 Working with the IoT Gateway software, first steps

Information on how to send and receive data for the first time, refer to https://www.youtube.com/playlist?list=PLRO3LeFQeLyNgT0yDhpFOM3SXzyZzPaT_.

For more information on the IoT Gateway software, refer to chapter 8 "Help" on page 12.

5 Functional description

This chapter describes the main functions of the web interface of the IoT Gateway. For detailed error information, see chapter 8 "Help" on page 12.

5.1 Menu

Fig. 5-1: Opening menu

5.1.1 Settings

Go to the menu item "Settings" to configure a proxy server and to enable a web console for the analysis. The authentication settings can also be changed here.

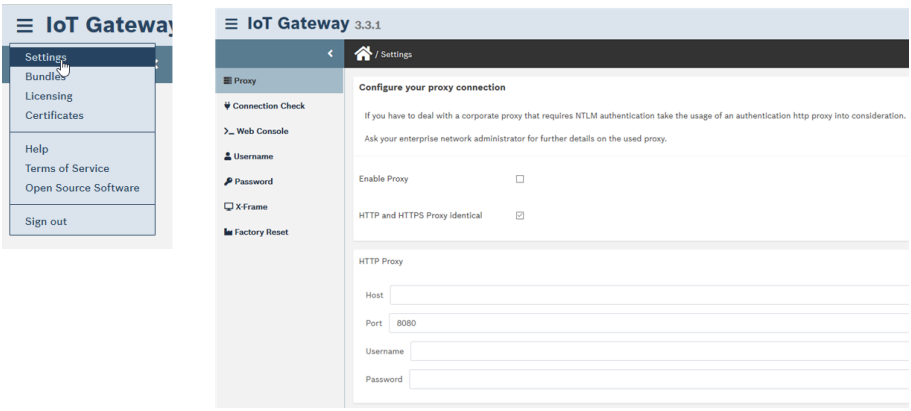

Fig. 5-2: Opening "Settings"

5.2 Bundles

Go to the menu item "Bundles" to enable and disable functional bundles ("apps"). They increase the performance and accelerate the booting if you disable the apps that are not required.

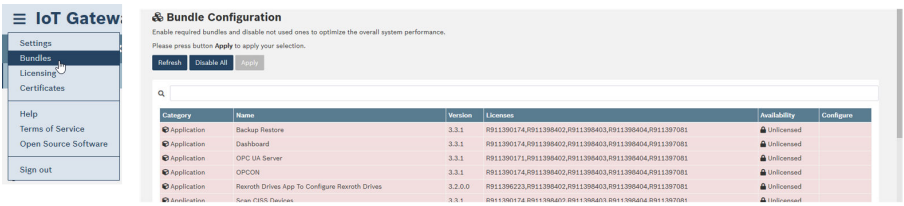

Fig. 5-3: Opening "Bundles"

5.3 Licensing

Go to the menu item "Licensing" to add and remove the license keys for different IoT Gateway features. This overview lists the available features and whether they are currently enabled.

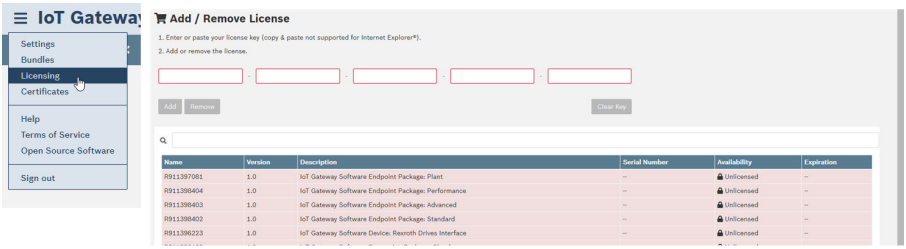

Fig. 5-4: Opening "Licensing"

5.4 Certificates

Go to the menu item "Certificates" for an overview on the certificates.

Fig. 5-5: Opening "Certificates"

5.5 Help

Go to the menu item "Help" for detailed information on different functions.

Fig. 5-6: Opening "Help"

5.6 Terms of Service

Go to the menu item "Terms of Service" for the license information on the software.

5.7 Open Source Software

Go to the menu item "Open Source Software" for the open source software components used by the IoT Gateway.

5.8 Sign out

Go to the menu item "Sign out" to exit the editing mode of the IoT Gateway.

6 Basic configuration steps

1. Data source
   - Adding devices
   - Adding endpoints
2. Data targets (processing)
   - Connecting endpoints (processing and computation)
   - Providing endpoints and cloud services (processing and cloud services)
3. Representing endpoints (dashboard).

The steps 1,2 and 3 and be executed in any sequence.

7 Snap installation

1. Download the required snaps (https://inside-docupedia.bosch.com/confluence/display/mlogic/IoT+Gateway+Software, currently only for Bosch employees).

   The .zip file includes:

   - iiot_[Version]_amd64.snap
2. Copy the .zip file to your installation directory.

The .zip file can maybe not be opened in the “Download” folder.

3. Connect the PC to the PR21 using a network cable.

If the IP address does not work, refer to the latest hardware operating instructions.

Standard IP configuration of the PR21:

XF5 port: DHCP

XF6-Port: static IP [192.168.0.1]

4. Modify the IP address of the PC correspondingly.

   If the standard IP configuration of the PR21 is used, the following configuration can be used for your PC:

   PR21: 192.168.0.1 → PC: 192.168.0.10

5. Copy the files to the PR21 using an SFTP tool (e.g. WinSCP, MobaXterm).

   Target folder on the PR21: `/home/boschrexroth/`

   IP address: [IP address of the PR21, see point 3]

   Username: `boschrexroth`

   Password: `boschrexroth`

6. Set up the connection to the PR21 using SSH (e.g. putty).

   IP address: [IP address of the PR21, see point 3]

   Username: `boschrexroth`

   Password: `boschrexroth`

   Enter the commands line-by-line into the console and press "Enter".

7. Install the snap.

   ```
   # sudo snap install [iiot_*.snap] --devmode
   ```

8. Restart the PR21.

   ```
   # sudo reboot
   ```

9. Wait until the snap finished booting. Booting can take up to two minutes.

10. Activate the license. To activate the license, open the web browser on your PC and enter the following address: https://[IP address-PR21]:8888, see chapter 5.3 "Licensing" on page 9.

8 Help

For different topics, such as connecting a PLC or a sensor and how to send data to a cloud, refer to:

https://www.youtube.com/playlist?list=PLRO3LeFQeLyNgT0yDhpFOM3SXzyZz-PaT_. The search term for the YouTube interface: "Rexroth IoT Gateway".

To open the help in the IoT Gateway web interface, refer to chapter 5.5 "Help" on page 10.

9 License conditions

A license from Bosch Rexroth is required. For the license conditions, refer to:

https://www.boschrexroth.com/en/xc/home/legal

10 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

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Fax:	**+49 9352 18 4941**
E-mail:	service.svc@boschrexroth.de
Internet:	http://www.boschrexroth.com

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

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