BUCHER automation

User Manual



60888431_00

JC-VM

Virtual controller

This document has been compiled by Bucher Automation AG with due diligence based on the state of the art as known to them. Any revisions and technical advancements of our products are not automatically made available in a revised document.
Bucher Automation AG shall not be liable for any errors either in form or content, or for any missing updates, as well as for any damage or detriment resulting from such failure.

Bucher Automation AG
Thomas-Alva-Edison-Ring 10
71672 Marbach/Neckar, Germany
T +49 7141 2550-0
info@bucherautomation.com

Technical support
T +49 7141 2550-444
support@bucherautomation.com

Sales
T +49 7141 2550-663
sales@bucherautomation.com

www.bucherautomation.com

Translation of the german original User Manual

Revision	1.01
Date of issue	2/3/2025

Table of contents

1 Introduction 5
1.1 Information on this document 5
1.2 Typographical conventions 5
2 Safety 6
2.1 General Information 6
2.2 Purpose 6
2.2.1 Intended use 6
2.2.2 Usage other than intended 6
2.3 Warnings used in this document 7
3 Product description 8
3.1 System overview and system requirements 8
3.2 Feature comparison JC-VM vs. JC-440EXT/JC-96xEXT 10
3.3 Nameplate 12
3.4 Scope of delivery 12
4 Technical Specifications 13
4.1 USB dongle dimensions 13
4.2 USB flash drive properties 13
5 First steps 14
5.1 Installation 14
5.1.1 Installing the VMware® Workstation Player 14
5.1.2 Setting up the VMware® network adapter 14
5.2 Commissioning 16
5.2.1 Launching the VMware® Workstation Player 16
5.2.2 Launching the JC-VM virtual controller 16
5.2.3 Powering off the JC-VM virtual controller 19
6 Identification and Configuration 20
6.1 Identification 20
6.2 Configuration 20
6.3 Operating system 21
6.3.1 Operating system update of the controller 21
6.4 File System 21
7 Programming 22
7.1 Simulating the mode selector (RUN-STOP-LOAD) 22
7.1.1 Creating the mode selector file via FTPS 23
7.1.2 Creating and deleting the mode selector file in the VHD file 23

7.2 Saving and loading an application program ... 25
7.3 Real-time clock ... 25
7.4 Ethernet system bus ... 25
7.5 Modbus/TCP ... 26
7.6 User-programmable IP interface ... 26
7.7 Motion control ... 27
7.8 MQTT client ... 27
7.9 OPC UA server ... 27
7.10 OPC UA client ... 28
7.11 FTP server ... 28
7.12 FTP client ... 28
7.13 HTTP server ... 28
7.13.1 Device Dashboard ... 29
7.14 Automatic copying of controller data (AutoCopy) ... 31
7.14.1 Example: Copying files from a USB flash drive to a JC-440VM ... 32
8 Registers - Overview ... 37
9 Maintenance ... 58
9.1 Repairs ... 58
9.2 Storage and Shipment ... 58
9.3 Return and Disposal ... 59
10 Service ... 60
10.1 Technical support ... 60

1 Introduction

1.1 Information on this document

This document forms an integral part of the product and must be read and understood prior to using the device. It contains important and safety-related information for the proper use of the product as intended.

Target audience

This document is not a comprehensive user manual. It targets software engineers experienced with the JetSym programming environment and with programming JetControl controllers.

Start | www.bucherautomation.com

For further information refer to the following information products:

– Online help for the JetSym software
  Functions of software products with application examples
– Application-oriented manuals
  Product-independent documentation
– Version updates
  Information about changes to the software products and operating system of your device

NOTICE



Applicable documents

The user manuals of the physical JC-440EXT and JC-96xEXT control systems are available for download from www.bucherautomation.com.
Go to *JetControl series* > *JC-440EXT / JC-96xEXT* > *Downloads*.

ⓘ Info

EtherCAT®

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

1.2 Typographical conventions

This manual uses different typographical effects to support you in finding and classifying information. Below, there is an example of a step-by-step instruction:

✓ This symbol indicates requirements which have to be met before executing the following action.

► This sign or a numbering at the beginning of a paragraph marks an action instruction that must be executed by the user. Execute the instructions one after the other.

⇨ The target after a list of instructions indicates reactions to, or results of these actions.

ⓘ Info

Further information and practical tips

In the info box you will find helpful information and practical tips about your product.

2 Safety

2.1 General Information

The product corresponds to the current state of science and technology when placed on the market.
In addition to this user manual, the laws, regulations and directives of the country of operation or the EU apply to the operation of the product. The operator is responsible for compliance with the relevant accident prevention regulations and generally recognized safety rules.

2.2 Purpose

2.2.1 Intended use

The product was designed to simulate control programs.

Operate the product only in accordance with the intended conditions of use and within the limits set forth in the technical specifications.
Intended use of the product includes its operation in accordance with this manual.

2.2.2 Usage other than intended

The product must not be used to control physical machinery, such as conveyors, production machines, and handling machines.

Do not use the product in technical systems required to provide for a high level of failure safety.

Machinery Directive

The product is not a safety-related part as per Machinery Directive 2006/42/EC. This device is NOT intended for the purpose of personal safety, and must, therefore, not be used to protect persons.

2.3 Warnings used in this document

⚠ DANGER



High risk

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING



Medium risk

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION



Low risk

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE



Material damage

Indicates a situation which, if not avoided, could result in malfunctions or material damage.

3 Product description

The JC-VM is a virtual controller run on a Windows® PC within a virtual environment (VMware®).

In comparison with its physical equivalents, the JC-VM offers a near-complete range of features:

– Registers
– Motion control commands (MCX Motion Control eXtended)
– Oscilloscope function
– A full range of TCP/IP communication including OPC UA (server and client), OS update, FTP, MQTT and Modbus TCP

The JC-VM comes with all JCF options enabled. No license file is required.

3.1 System overview and system requirements

Operating a JC-VM requires at least the following:

– **USB copy protection dongle**
One USB flash drive per workplace is sufficient to operate all controller model variants.
– **File package for the respective controller model**, e.g. JC-440, JC-960, JC-965
The file packages are individually designed to the specifications of the corresponding model variant.

NOTICE

Virtual machine

Execution requires a virtual machine of the VMware® Workstation type which is not included in the product package.
We recommend that version 16.2.5 be used.

ⓘ Info

File packages and further information

A complete set of files required for the operation of the JC-VM within a VMware® Workstation along with the product documentation is available on www.bucherautomation.com.
Go to *Virtual controllers* > *JetControl-VM product page* > *Downloads*.

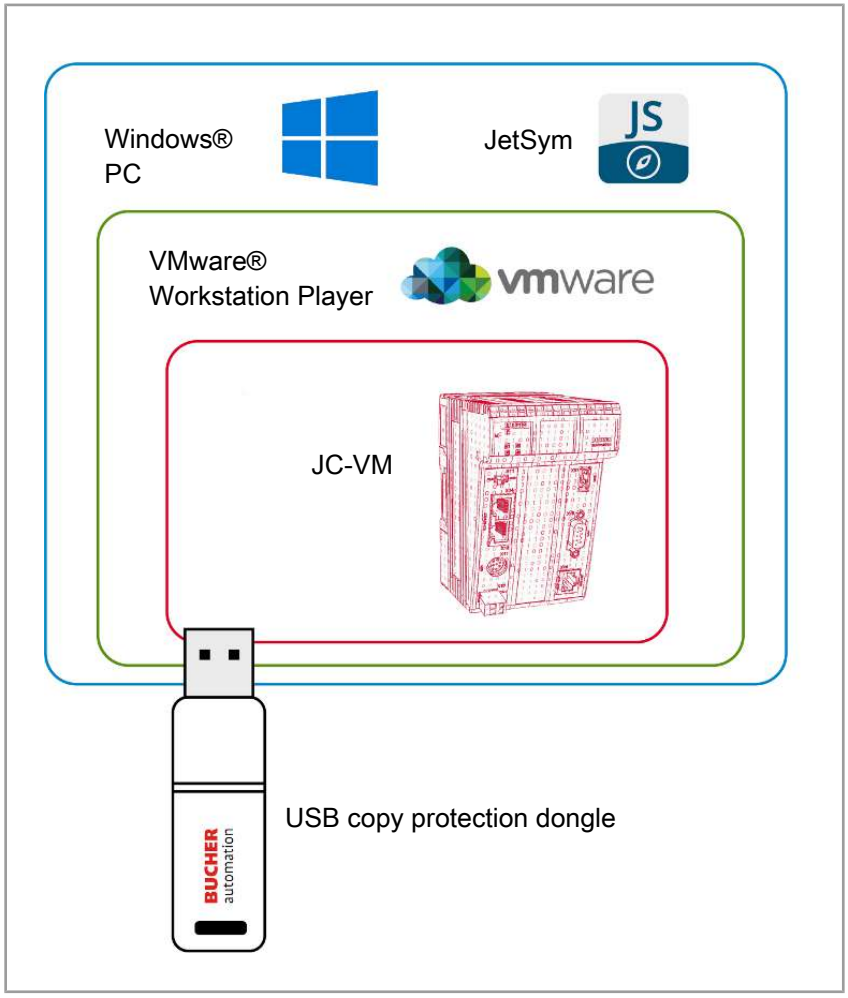


Fig. 1: System overview

Designation	Description
JC-VM	USB copy protection dongle for JC-VM virtual controllers, PC plug-in
Vmware_JC-xxx_V1_06d_vhd_JC-440.zip	File package (zip file) for virtual JC-440 controller
Vmware_JC-xxx_V1_05d_vhd_JC-960.zip	File package (zip file) for virtual JC-960 controller
Vmware_JC-xxx_V1_05d_vhd_JC-965.zip	File package (zip file) for virtual JC-965 controller
Windows® PC	Minimum PC requirements: Intel® Core™ i5-CPU, 8 GB RAM and 1 GB unused hard disk memory, Windows® operating system 10/11
JetSym	Bucher Automation programming environment, recommended version 6.01 or higher

Tab. 1: System overview and system requirements

3.2 Feature comparison JC-VM vs. JC-440EXT/JC-96xEXT

The JC-VM offers a modified range of features compared with the physical JetControl models. The following table gives a summary of the key features:

Feature	JC-VM	Physical JC-440EXT	Physical JC-96xEXT
Real-time capability	No	Yes	
Control of physical machinery	No	Yes	
Identification			
EDS file	In preparation	Yes	
EDS registers	In preparation	Yes	
Configuration			
Mode selector (RUN-STOP-LOAD)	Simulation via file system	Yes	
IP configuration	Register + config.ini		
User administration (users.ini)	Yes		
Communication			
Ping (Response)	Yes		
JetIPScan	No	Yes	
FTP server & client)	Yes		
FTPS (server)	Yes		
MQTT	Yes		
OPC UA server	Yes		
OPC UA client	Yes		
MODBUS TCP server	Yes		
MODBUS TCP client	Yes		
MODBUS-TCP RemoteScan	Yes		
JetSync master	No	Yes	
E-mail client	No	Yes	
HTTP server (DeviceDashboard)	Yes		
Ethernet PRIM (programmable Ethernet interface)	Yes		
CAN	No	Yes	
EtherCAT®	No	Yes	Yes (JC-965EXT)

Feature	JC-VM	Physical JC-440EXT	Physical JC-96xEXT
I/Os			
JX3 system bus	No	Yes	No
Ethernet system bus	With limitations (see here [▶ 25])	Yes	
EtherCAT® system bus	No	Yes (option)	Yes (JC-965EXT)
Motion control			
MCX	Yes (requires the axes to be set to simulation mode in the Motion Setup)	Yes	
JCF-SV1	No	Yes	
System			
Real-time clock (RTC)	Yes		
RTC over SNTP sync.	Yes		
Option model	No (all functions are enabled)	Yes	
NetConsistency	No	Yes	
AutoCopy	Yes		
File System	Yes		

Tab. 2: Feature comparison JC-VM vs. JC-440EXT/JC-96xEXT

3.3 Nameplate

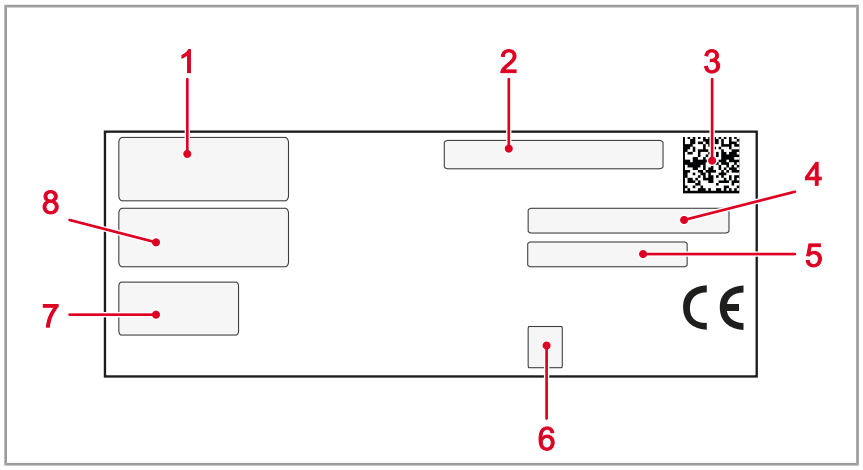


Fig. 2: Example of a nameplate

1	Company logo
2	Serial number
3	Data matrix code
4	Item number
5	Hardware revision
6	Warning and mandatory signs
7	Power supply specifications
8	Item name

3.4 Scope of delivery

Scope of delivery	Item number	Quantity
JC-VM USB copy protection dongle for virtual controllers, PC plug-in	10002558	1

NOTICE

Virtual machine

Execution requires a virtual machine of the VMware® Workstation type which is not included in the product package.
We recommend that version 16.2.5 be used.

ⓘ Info

File packages and further information

A complete set of files required for the operation of the JC-VM within a VMware® Workstation along with the product documentation is available on www.bucherautomation.com.
Go to *Virtual controllers* > *JetControl-VM product page* > *Downloads*.

4 Technical Specifications

This chapter contains the technical specifications of the USB copy protection dongle.

4.1 USB dongle dimensions

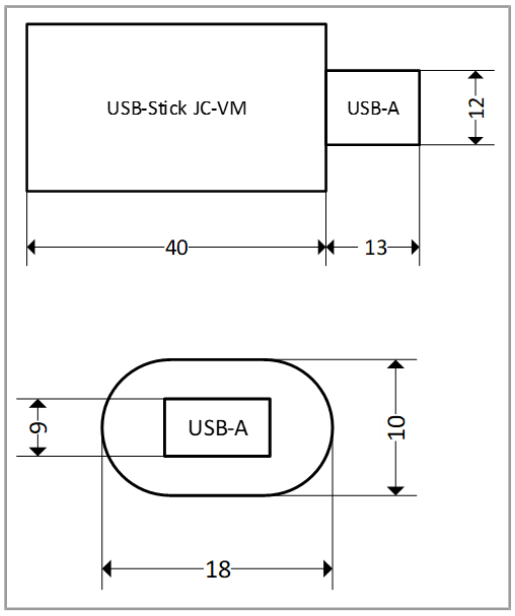


Fig. 3: Dimensions (in mm)

4.2 USB flash drive properties

Parameter	Description
Manufacturer	Xmore
Type	USB004GXQC8A017R
Form factor	USB flash drive
Mounting orientation	Any position
Cooling	Fanless; natural convection
Weight	0.02 kg
Degree of protection	IP20
Capacity	4 GB
Interface	USB 2
Flash	MLC
Temperature range	0 °C ... 70 °C

Tab. 3: USB flash drive properties

5 First steps

5.1 Installation

5.1.1 Installing the VMware® Workstation Player

The description below is for version 16.2.5 of the VMware® Workstation Player. We recommend using this version.

► If the VMware® Workstation Player is not installed on your PC, download the current version from the Internet and install it on a Windows® PC.

NOTICE



Functionality not tested for Linux

The functionality of the JC-VM has not been tested for Linux operating systems.

► Use the Windows® version of the VMware® Workstation Player.

ⓘ Info

Download of the VMware® Workstation Player

www.bucherautomation.com/jetcontrol-vm/sw10134#product-downloads

or

www.vmware.com/products/desktop-hypervisor/workstation-and-fusion

5.1.2 Setting up the VMware® network adapter

Adjust the network adapter settings as follows:

1. Open the Windows® Control Panel > Network and Sharing Center.
2. Double-click VMware Network Adapter VMnet1.
3. Click Properties.
4. Click Internet Protocol Version 4 (TCP/IPv4).
5. Click Properties.
6. Check the Use the following IP-address box.
7. Enter the IP address that corresponds to your JC-VM (identical subnet).
   E. g. 192.168.10.252, if the IP address of your JC-VM is 192.168.10.15.
   NOTICE! Be careful to enter an IP address that is not being used already.
8. Go to Advanced... to add additional IP addresses for the network adapter, if needed.

⇨ The VMware® network adapter setup is complete.

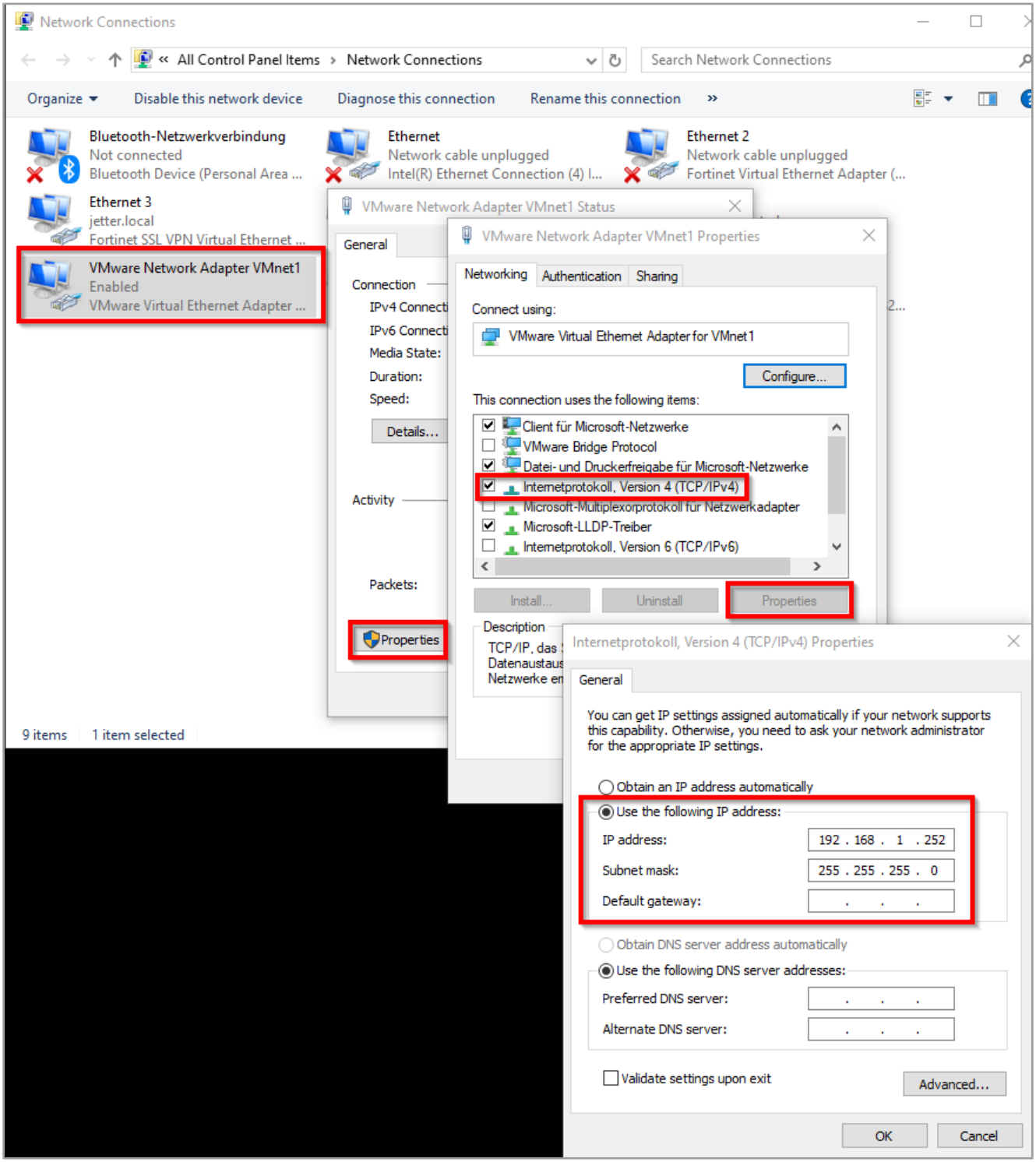


Fig. 4: Configuring the network adapter

5.2 Commissioning

This chapter describes the commissioning of the JC-VM within a virtual machine of the VMware® Workstation Player.

5.2.1 Launching the VMware® Workstation Player

► Launch the VMware® Workstation Player on your Windows® PC.

⇨ The main menu opens.

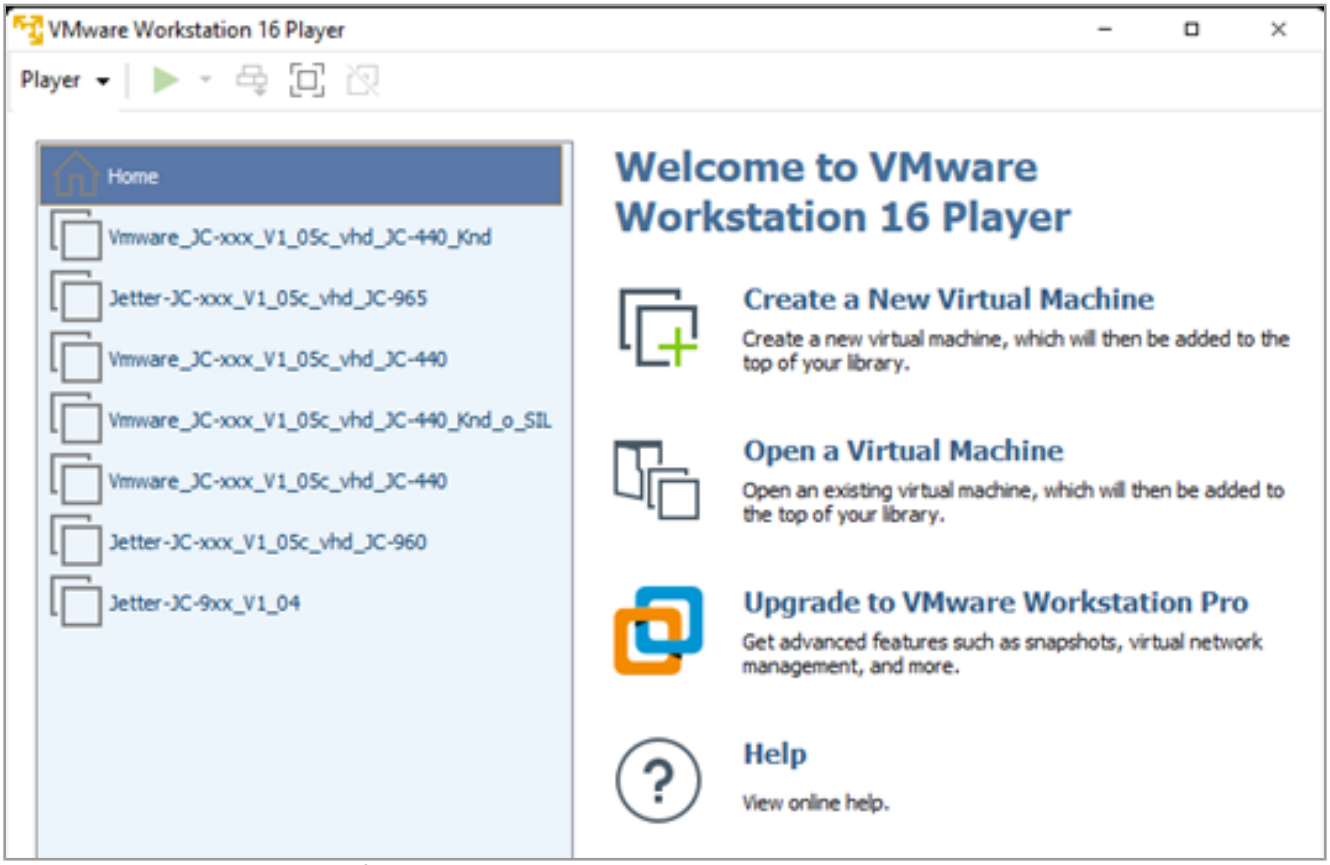


Fig. 5: Main menu of the VMware® Workstation Player

5.2.2 Launching the JC-VM virtual controller

To start the JC-VM, open the respective VMX file in the VMware®.

ⓘ Info

File packages and further information

A complete set of files required for the operation of the JC-VM within a VMware® Workstation along with the product documentation is available on www.bucherautomation.com.
Go to *Virtual controllers* > *JetControl-VM product page* > *Downloads*.

ⓘ Info

Plug the USB dongle prior to launching the virtual machine

If the USB dongle is not plugged when launching the virtual machine, this will make the virtual controller boot, however it will not start processing the STX program.

Booting the JC-VM

✓ The VMware® Workstation Player is running.

✓ The USB dongle is plugged.

✓ The VMX file was downloaded and ideally unzipped to a separate directory.

1. In the main menu of the VMware® Workstation Player, click Open a Virtual Machine.



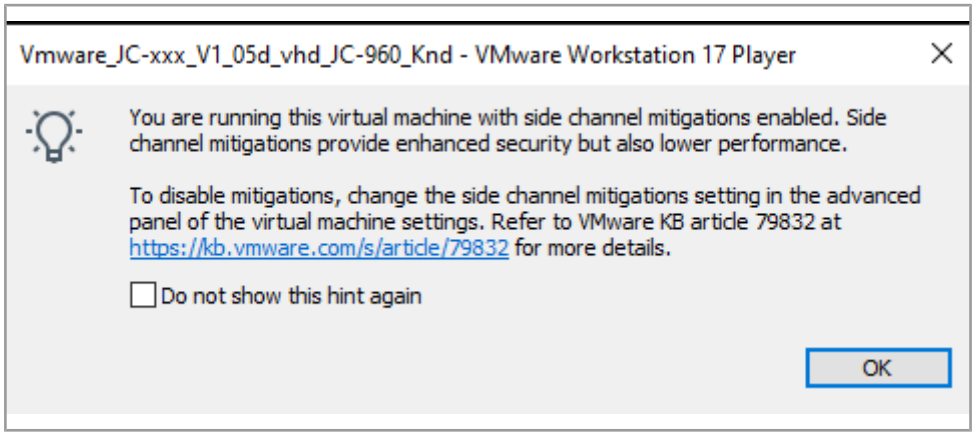
⇨ The Windows® File Explorer opens.

2. Select the desired VMX file from the directory and click Open.
3. Click Play virtual machine.



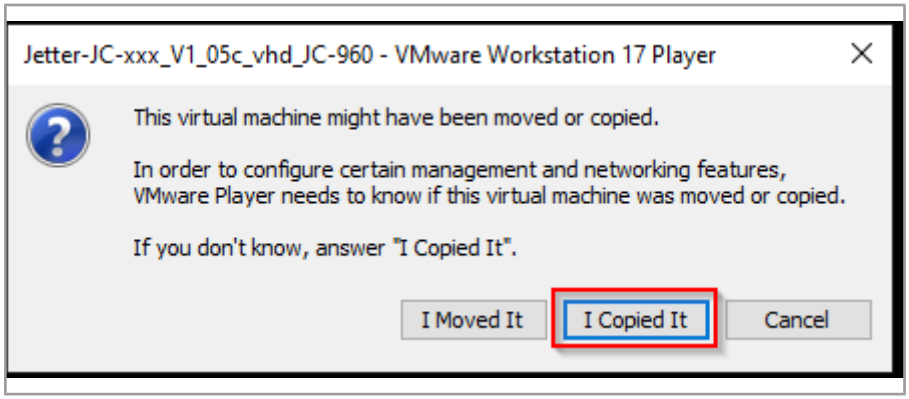
⇨ The virtual machine is being launched and the JC-VM boots.

4. If the system prompts Side channel mitigations enabled,



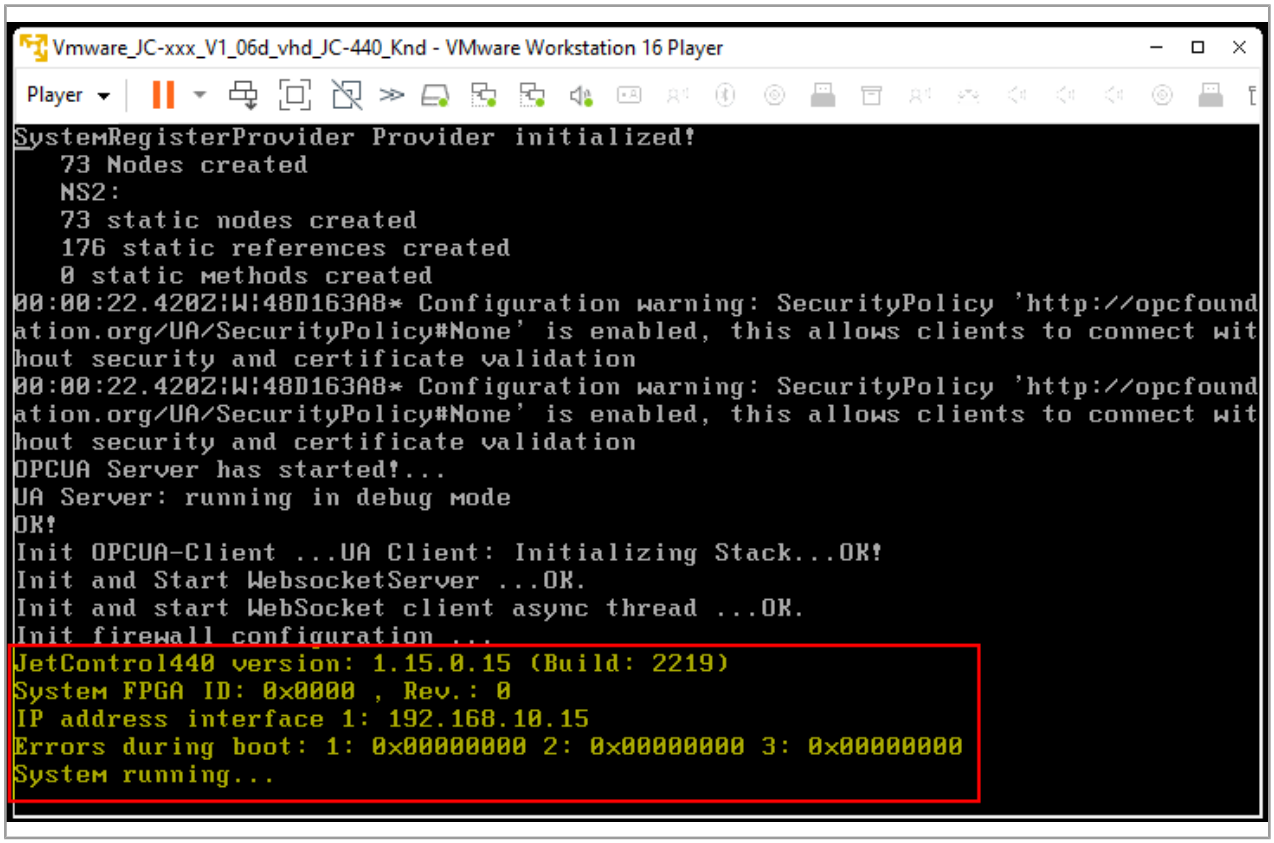
check Do not show this hint again and confirm.

5. The system prompts This virtual machine might have been moved or copied.



Confirm with I Copied it.

⇨ When the controller has completed the booting sequence, the following prompt is shown:

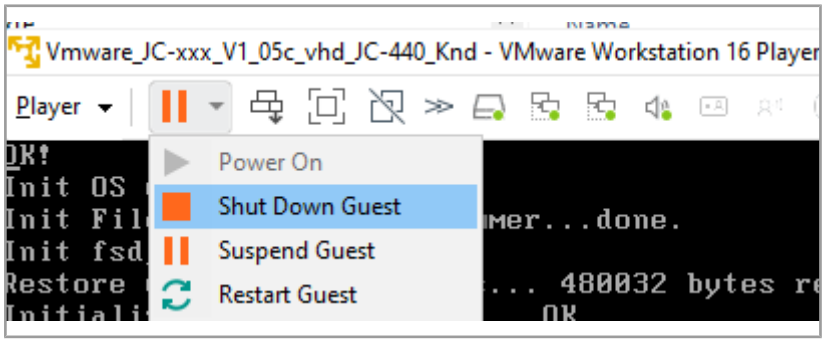


In the given case, a JC-440(EXT) has been launched and its IP address is 192.168.10.15. There are no errors pending and the controller OS is running.

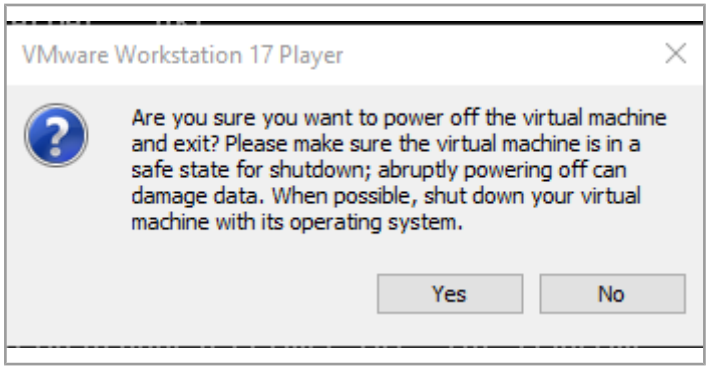
5.2.3 Powering off the JC-VM virtual controller

To power off the JC-VM, shut down the guest operating system from within the VMware® Workstation Player.

1. In the VMware® Workstation Player, click Shut Down Guest.



2. If the system prompts the following message:



Confirm.

Further options

– Suspend Guest
Puts the guest operating system, and hence the JC-VM, in standby mode.
We strongly advise that this mode not be used. If there are active online connections when changing to suspend mode, waking up the OS can lead to inconsistent states in the JC-VM.

– Restart Guest
Relaunches the JC-VM.
Same as system command 102 in register 202961.

6 Identification and Configuration

6.1 Identification

To identify the JC-VM, use the IP address and the running VMware®.

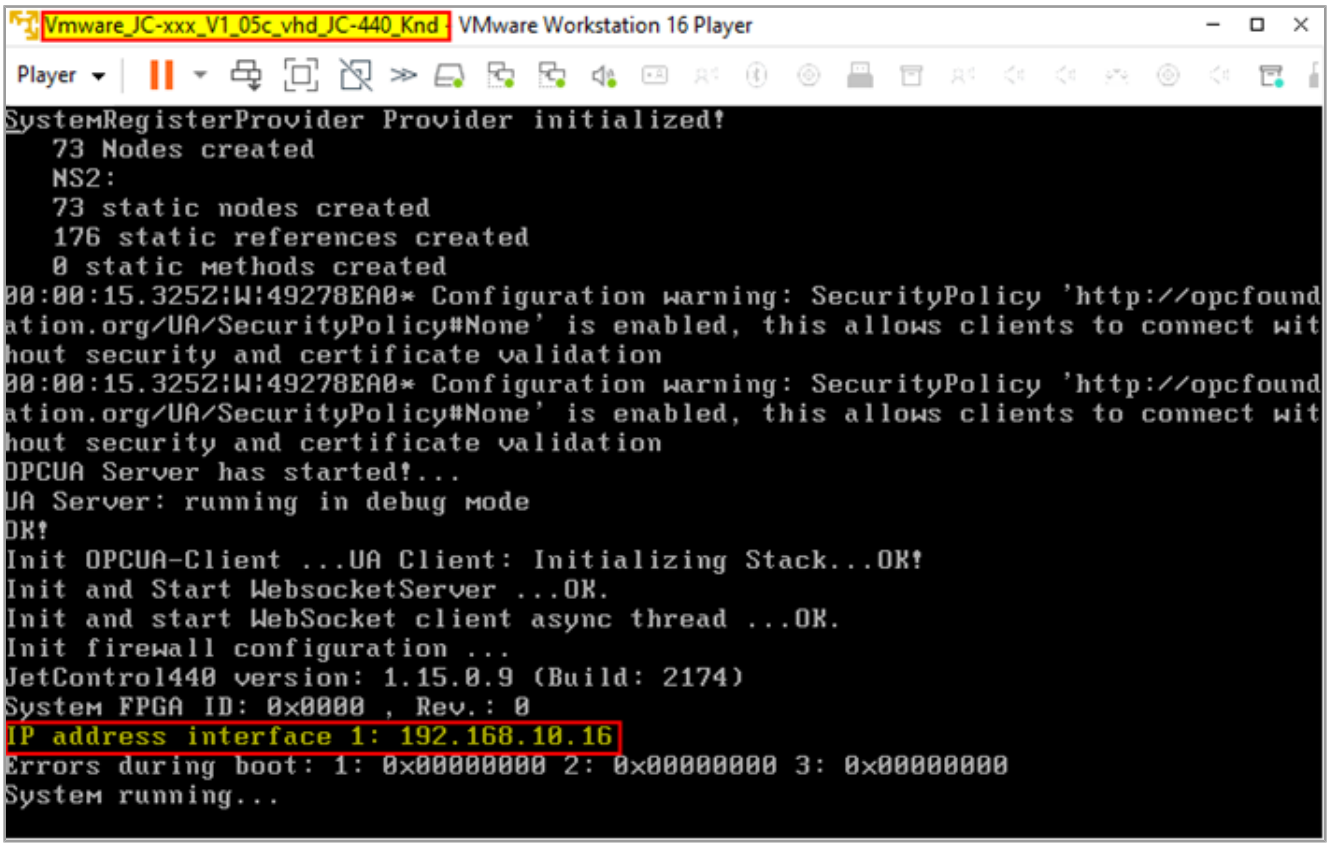


Fig. 6: Identification

6.2 Configuration

The configuration of the JC-VM, such as setting the IP address, is largely identical with their physical equivalents.

You can set the IP address via the `config.ini` file, for example.

6.3 Operating system

We are continuously striving to enhance the operating systems of our products. Enhancing means adding new features, and upgrading existing functions. Current OS files are available for download from our website on the pages of the respective product.

ⓘ Info

Further information

More information on this subject is available on our website.

Start | www.bucherautomation.com

6.3.1 Operating system update of the controller

There are several ways of transferring the OS file to the controller:

– Using the programming tool JetSym
– Via an FTP connection
– From a USB flash drive

The process is identical with the physical JetControl system.

NOTICE



Functional impairment due to incorrect operating system

Uploading the OS of a physical JetControl system to JC-VM impairs the product's functional reliability. It stalls the JC-VM's boot process.

► Remedy: Shut the VMware® down. Overwrite the VHD file in your working directory with the original VHD file provided by Bucher Automation.

6.4 File System

Accessing the JC-VM file system is identical to the physical JetControl systems.

The file system lets you access files located on the internal flash disk or an USB flash drive. Some files may be protected against read/write access or deletion. This is normal behavior. Some of these files are virtual files, such as firmware images, or protected files, such as EDS files.

NOTICE



Malfunctions caused by missing or damaged system files

Careless working with system files can result in malfunctions of the device.

► Do not delete or move any system files.

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7 Programming

Programming the JC-VM in JetSym is identical to the programming a physical JetControl system.

NOTICE



Applicable documents

The user manuals of the physical JC-440EXT and JC-96xEXT control systems are available for download from www.bucherautomation.com.
Go to *JetControl series* > *JC-440EXT / JC-96xEXT* > *Downloads*.

ⓘ Info

Limited set of functionalities

The JC-VM offers a modified range of features compared with the physical JetControl models. For details, refer to Feature comparison JC-VM vs. JC-440EXT/JC-96xEXT [▸ 10].

Procedure

1. Create a new project or open an existing one.
2. If you have launched the `Vmware_JC-xxx_V1_06d_vhd_JC-440_Knd`, select the JC-VM hardware equivalent as the controller type, in this case JC-440EXT.
3. In the hardware configuration field enter the IP address of the JC-VM and test the connection.

7.1 Simulating the mode selector (RUN-STOP-LOAD)

Being a virtual controller, the JC-VM does not feature a mode selector. Instead, it is simulated by creating a file.

Store the file in the **Drive_C** folder of the controller file system.

There is a separate file for each state following bootup:

State	File
RUN	`vmware_switch_run.txt`
STOP	No file present (default state)
LOAD	`vmware_switch_load.txt`

Tab. 4: States of the simulated mode selector

While the files must be present, they can be empty. Ensure that no 2 files are present simultaneously.

As with a physical JetControl system, the state of the mode selector is read during bootup only.

7.1.1 Creating the mode selector file via FTPS

The file must be present in the **Drive_C** folder. Access to the **Drive_C** folder is reserved for the **admin** user. Note that the **admin** user login is possible via FTPS only.

► Copy or create a file named `vmware_switch_run.txt` or `vmware_switch_load.txt` in **Drive_C** on the JC-VM.

NOTICE

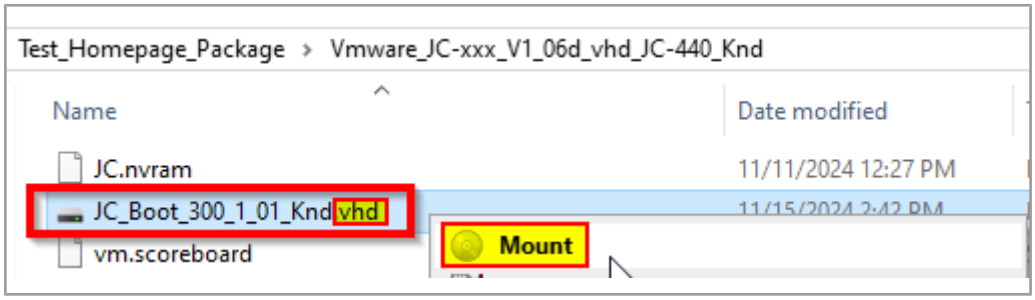
No FTPS access in LOAD state

With the controller in **LOAD** state, you have no FTPS access to delete the file.

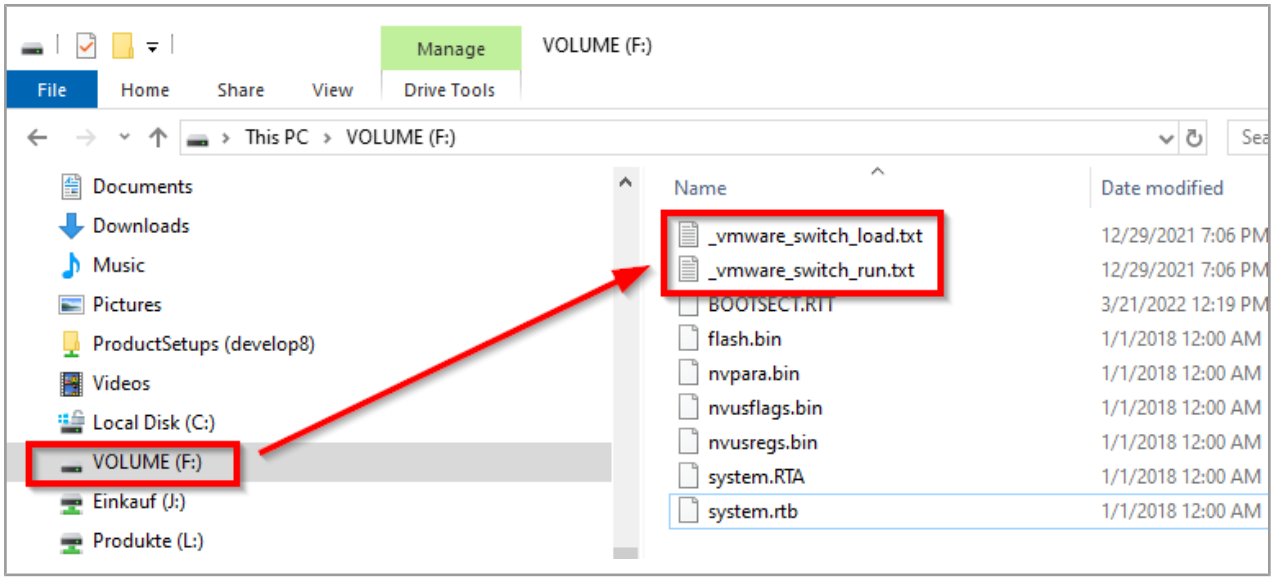
► To disable the file, proceed as outlined in chapter Creating the mode selector file [▶ 24].

7.1.2 Creating and deleting the mode selector file in the VHD file

1. Open the Windows® File Explorer and navigate to the directory, where the VMX file (VMware® configuration file) is stored.
   ⇨ This directory also holds a file suffixed `*.vhd` (e.g. `JC_Boot_300_1_01_Knd.vhd`). This is a virtual hard disk serving as the boot device for the VMware® client.
2. Right-click the file and select Mount.



⇨ This mounts the VHD file as a new Windows® volume and displays it as **VOLUME** drive.



Creating the mode selector file

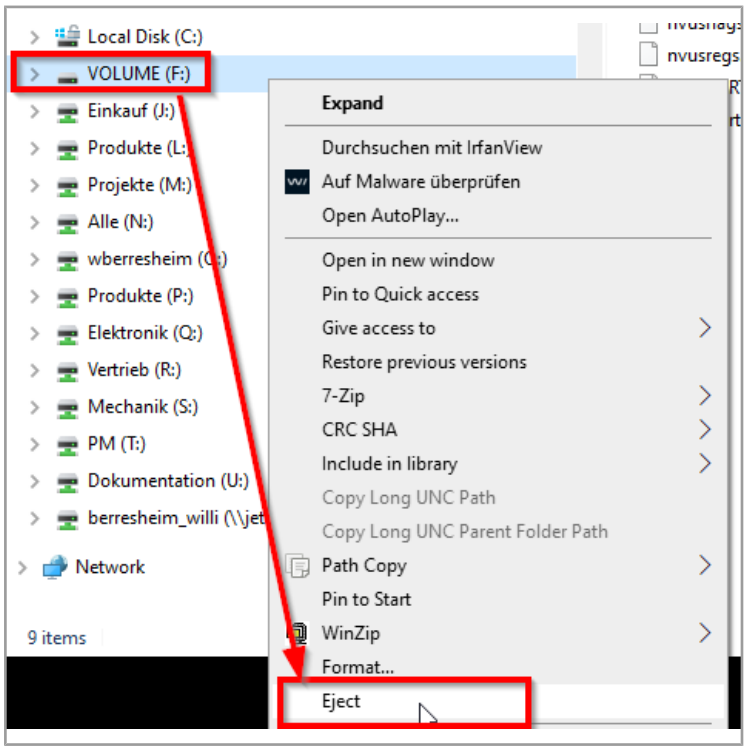
NOTICE

Malfunctions caused by missing or damaged system files

Careless working with system files can result in malfunctions of the device.

► Do not delete or move any system files.

1. Create a file using a text editor program and name it `vmware_switch_load.txt` or `vmware_switch_run.txt`.
2. Remove the virtual drive, in this case **VOLUME**. To do so, right-click the drive and select Eject.



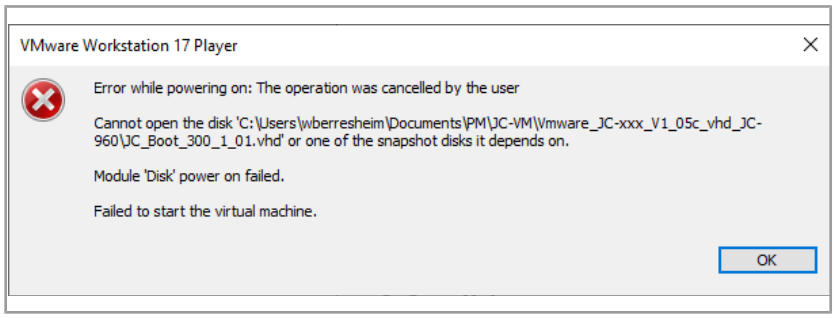
Disabling the file

► To disable the `vmware_switch_*.txt` file, rename it.

If no file is enabled or present, the default state when launching the JC-VM is **STOP**.

Failure to eject the VHD file will make it impossible for the VMware® to access it and boot.

The system prompts the following error:



7.2 Saving and loading an application program

Downloading the application program from JetSym to the JC-VM by default stores the program as a file to the internal flash drive.

If you want the device to write the application program to a USB flash drive, you need to configure the file path.

When restarting the application program via JetSym or after booting the JC-VM, the application program is loaded via the file system and executed. The JC-VM allows for several application programs to be stored. The user determines the program to be executed.

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.3 Real-time clock

The JC-VM features a real-time clock (RTC). However, date and time are not buffered.

Using SNTP (simple network time protocol) allows the RTC to be synchronized with the NTP server.

ⓘ Info

Further information

For in-depth information, see the *System Registers* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.4 Ethernet system bus

The bus is based on TCP, UDP/IP allowing it to be used in parallel with other TCP and UDP/IP protocols.

Usage

The Ethernet system bus has been designed for data exchange via standard Ethernet between the following devices:

– Programming PC
– Controllers
– Bus node
– Communication modules

Functions

The JC-VM has implemented the following bus functions:

– Acyclic data interchange via NETCOPY commands

The JC-VM has **not** implemented the following bus functions:

– Cyclic process data exchange (PubSub)
– Error evaluation of the communication modules
– NetConsistency

– JetIPScan
– Connection management

ⓘ Info

Further information

For in-depth information, see the *Ethernet System Bus* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.5 Modbus/TCP

The MODBUS TCP function is available as provided by the JC-VM being used.

ⓘ Info

Further information

For more information on this subject, refer to the JetSym Online Help.

7.6 User-programmable IP interface

The user-programmable IP interface lets you send or receive any data via Ethernet interface (jacks X14 and X15) using TCP/IP or UDP/IP. The data is processed in the application program entirely.

Applications

The user-programmable IP interface allows for data exchange via Ethernet connections which do not use standard protocols, such as FTP, HTTP, JetIP or Modbus/TCP. The following applications are possible:

– Server
– Client
– TCP/IP
– UDP/IP

ⓘ Info

Further information

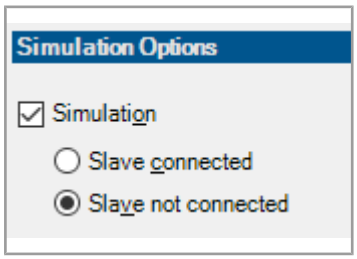
For in-depth information, see the *User-programmable Interface* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.7 Motion control

The JC-VM supports the full range of **Motion Control eXtended (MCX)** functions.

► To do so, in the JetSym Motion Setup select Simulation Options for the axes.



ⓘ Info

Further information

For more information on Motion Control programming, refer to the JetSym Online Help.

7.8 MQTT client

As with a physical JetControl system, the JC-VM controller can be used as MQTT client. The MQTT client must be programmed via the STX application program.

The MQTT protocol is an open message protocol that has established itself as a standard in machine-to-machine communication and the Internet of Things. It is based on the publisher/subscriber architecture where a broker provides clients with messages about specific topics.

ⓘ Info

Further information

For more information on this subject, refer to the JetSym Online Help.

7.9 OPC UA server

As with a physical JetControl 44x or 96x control system, the JC-VM can be used as UPC UA server.

The OPC UA server and client allow the user to access the following controller objects:

– Selected system registers
– Globally declared STX variables (non-localized)
– Globally declared STX variables (localized in the application register array of the controller)
– Method call-up

ⓘ Info

Further information

For more information on this subject, refer to the JetSym Online Help.

7.10 OPC UA client

As with a physical JetControl 44x or 96x system, the JC-VM controller can be used as OPC UA client.

Access to the OPC UA server is ensured via the OPC UA client. It is possible to configure the client as STX program in JetSym. It is based on the PLCopen standard.

ⓘ Info

Further information

For more information on this subject, refer to the JetSym Online Help.

7.11 FTP server

The controller supports the *FTP server* feature. The FTP server handles directories and files using an FTP client.

The files can be stored to the following storage media:

– Internal flash drive

– USB flash drive

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.12 FTP client

The controller supports the *FTP client* feature. The FTP client allows a remote network device to access files and directories from within the application program by communicating with the FTP server of this network device.

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.13 HTTP server

The controller supports the *HTTP server* feature. A standard browser is sufficient for accessing the HTTP server.

The browser allows you to read and display files that have been transfered to the controller via FTP.

Using SSI (Server Side Includes) allows for register content and state information on inputs, outputs, and flags to be integrated into HTML pages at runtime.

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.13.1 Device Dashboard

The controller comes with the Device Dashboard installed.

The Device Dashboard is a browser-based software application designed to display in a user-friendly way key information and settings of a JC-4xx generation and higher Bucher Automation control system. The purpose of this application is to provide machine manufacturers and operators with additional first-level support resources.

ⓘ Info

The values displayed are read-only and may not be adjusted from within the application. To do this, the JetSym software tool is required.

System requirements

To use the Device Dashboard, the following requirements must be met:

– PC or mobile device running a standard browser.
– The control system and dashboard client are connected to the same IP network.
– The IP address of the controller is known.

Starting the Device Dashboard

ⓘ Info

Adjusting the IP address

Following initial call-up, the default IP address of a Bucher Automation control system (192.168.1.1) usually needs to be replaced by the customer-specific IP address.

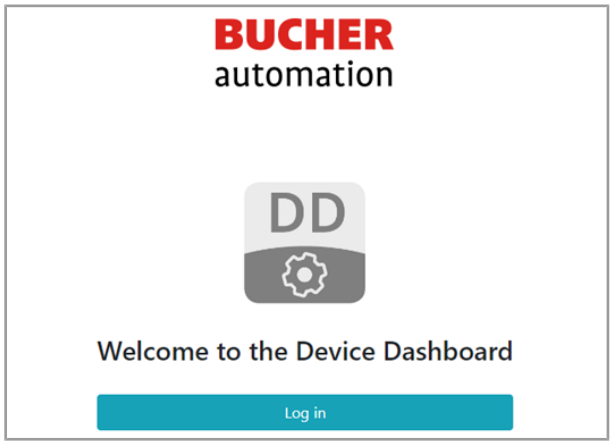
ⓘ Info

Protection against unauthorized access

It is recommended that the controller log-in credentials be changed to prevent unauthorized access to the Device Dashboard. To change the Device Dashboard log-in credentials, use the `/system/users.ini` file.

To open the Device Dashboard proceed as follows:

1. Enter the following URL in your browser's address bar:
   http://192.168.1.1/index.html
   ⇨ The login page is shown:



2. Click Log in.

3. Enter the login credentials. These are by default:
   User name: service
   Password: service
4. Click OK.

⇨ You are logged into the system. The homepage of the Device Dashboard is shown. By default, this is the Status page.

User interface layout

The main areas of the application's user interface are:

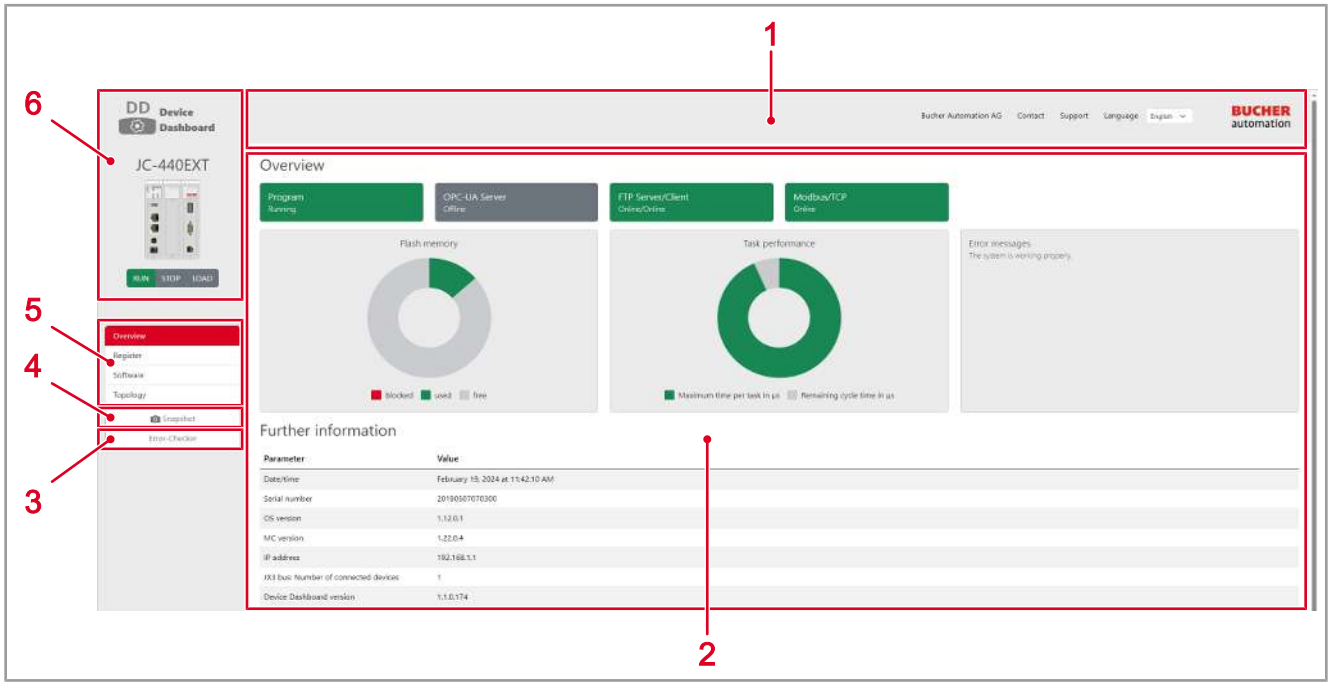


Fig. 7: User interface of the application

1	Header bar
2	Content area
3	Error checker feature
4	Snapshot feature
5	Menu
6	Status graphic

ⓘ Info

Further information

For further information, see the *Device Dashboard* application manual on www.bucherautomation.com.

ⓘ Info

Further information

For more information on this topic refer to the online help in our software products or to the application-oriented manuals on www.bucherautomation.com.

7.14 Automatic copying of controller data (AutoCopy)

The controller supports the *AutoCopy* feature. This feature allows for controller data to be automatically copied within one controller, and/or between the controller and an FTP server and another controller sharing the same network.

Use cases

For example, *AutoCopy* allows for a new application program or operating system to be transfered from a USB flash drive to the controller.

Requirements

The *AutoCopy* feature is run only during boot-up of the JC-VM. Prior to booting the device, the following requirements must be met:

– The JC-VM is in **LOAD** state.

– The `vmware_switch_load.txt` file is enabled in the **Drive_C** root directory on the JC-VM (see Simulating the mode selector (RUN-STOP-LOAD) [▶ 22]).

ⓘ Info

Further information

For in-depth information, see the *File System* application-oriented manual.

For application-oriented manuals open www.bucherautomation.com and go to *product page JC-VM > Product-independent documentation*.

7.14.1 Example: Copying files from a USB flash drive to a JC-440VM

✓ The USB flash drive includes a valid `autocopy.ini` command file containing the required copy commands.

✓ In the `config.ini` file of the controller, the path and file name of the command file in the `[FILES]` section must be entered in `AutoCopyIni`. Access to the configuration file requires user credentials with system rights. Example for a JC-VM:

```
[FILES]
AutoCopyIni = /USB/autocopy.ini
```

1. Plug the USB flash drive into the PC. You can use the USB flash drive serving as dongle for the JC-VM.
2. Copy the desired file to the root directory of the USB flash drive (in the given case `JC-440VM_1.15.0.15.os`).
3. Create the `autocopy.ini` file in the root directory of the USB flash drive. The file must contain the following entries:

```
[OPTIONS]
CommandCount = 1
LogFile = /USB/autocopy.log
LogAppend = 0
EMERGENCY = 1

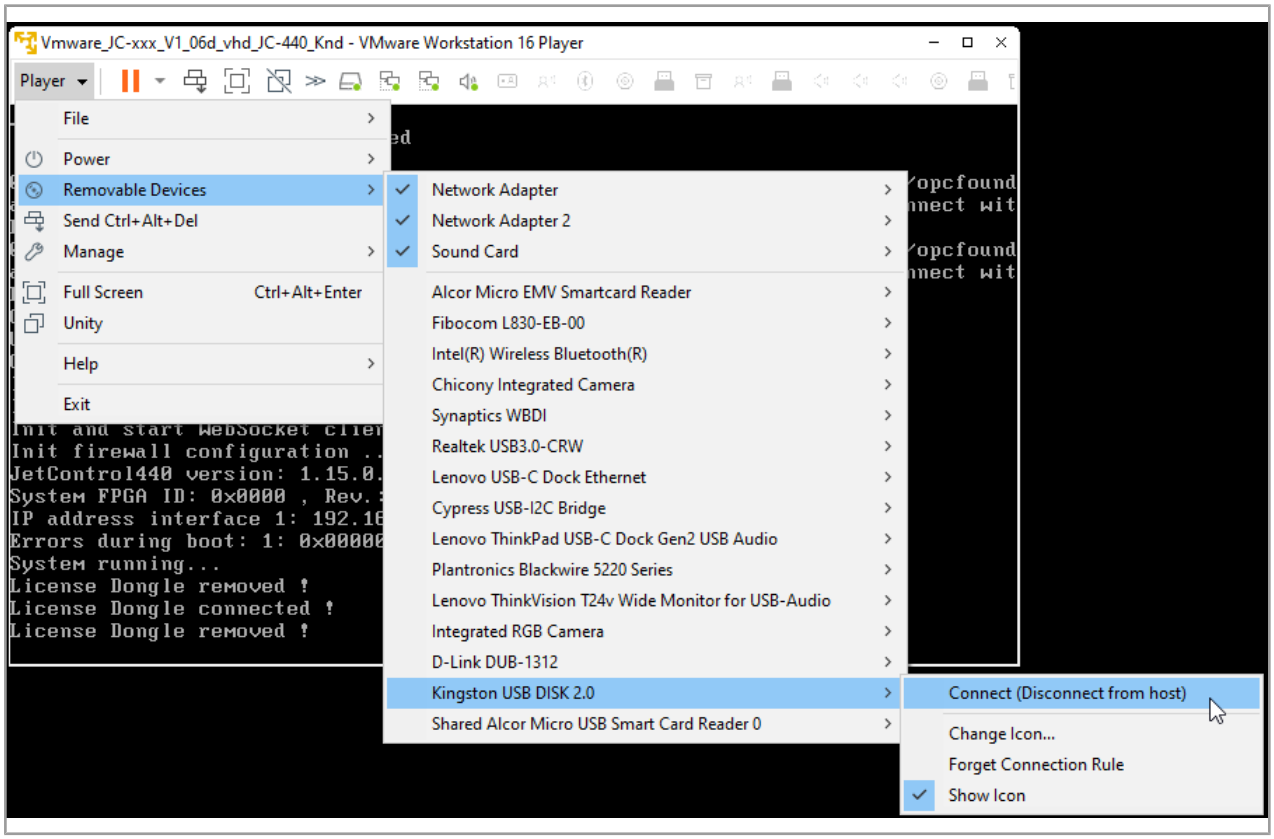
[COMMAND_1]
Command = FILECOPY
Source = /USB/JC-440VM_1.15.0.15.os
Destination = /System/OS/system.os
```

In the `Source` line, enter the name of the file to be copied.

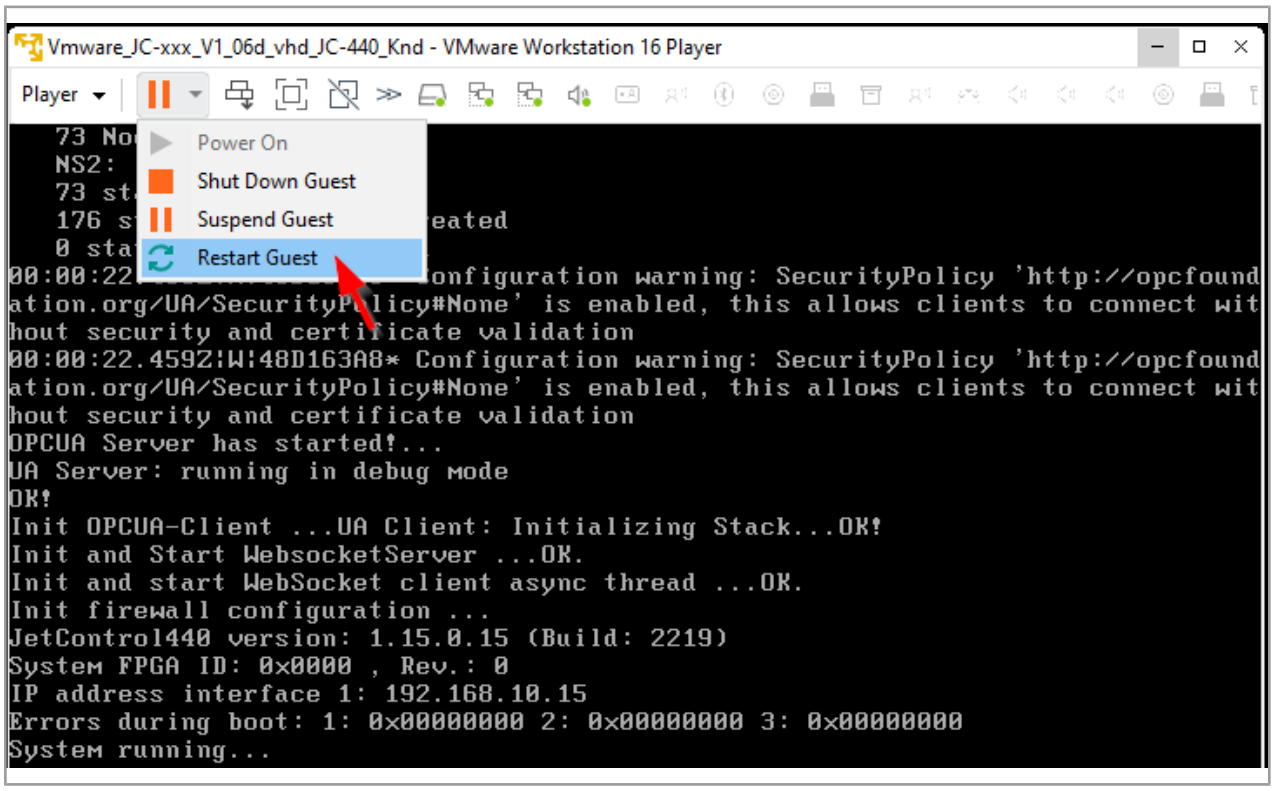
Enabling AutoCopy after the JC-VM has been launched

1. Log in as the **admin** user and establish an FTPS connection to the controller (e.g. using Total Commander).
2. Copy the `vmware_switch_load.txt` file to the **Drive_C** root directory of the controller. No file content is required
(see Simulating the mode selector (RUN-STOP-LOAD) [▶ 22]).

3. Mount the VMware® USB flash drive. This step is redundant, if you are using the USB copy protection dongle to *AutoCopy*.



4. Restart the OS by means of Restart Guest.

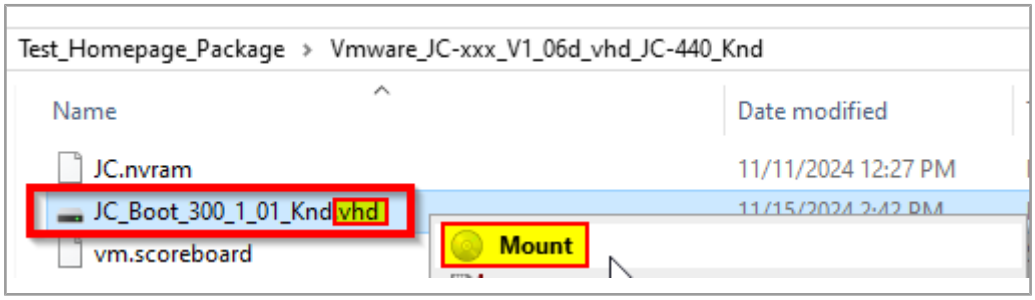


Enabling AutoCopy prior to launching the JC-VM

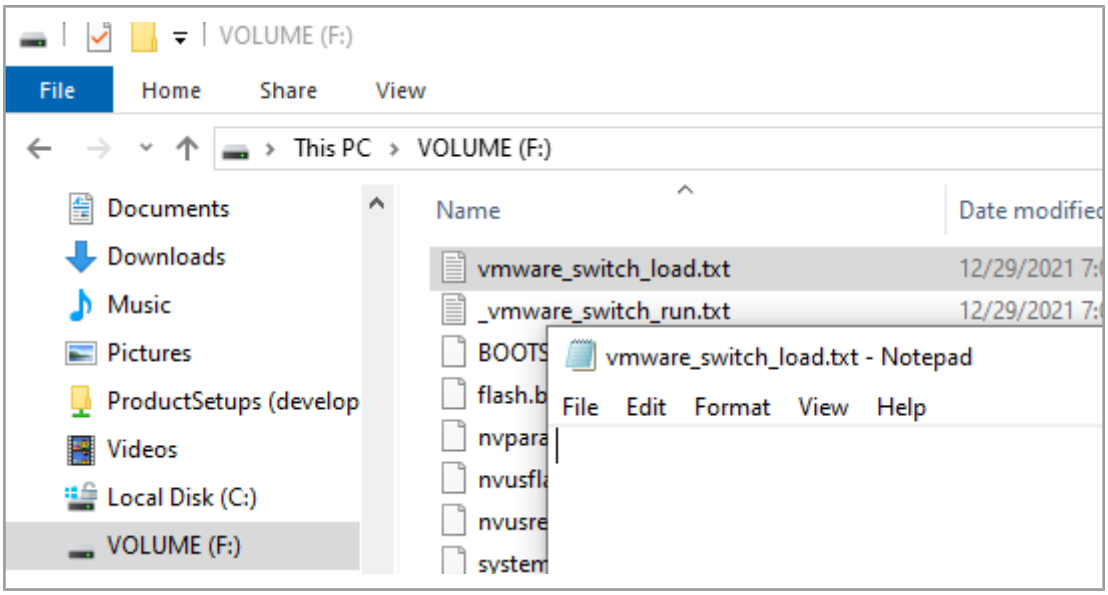
The *AutoCopy* function can be enabled even before launching the JC-VM.

✓ You have administrator privileges.

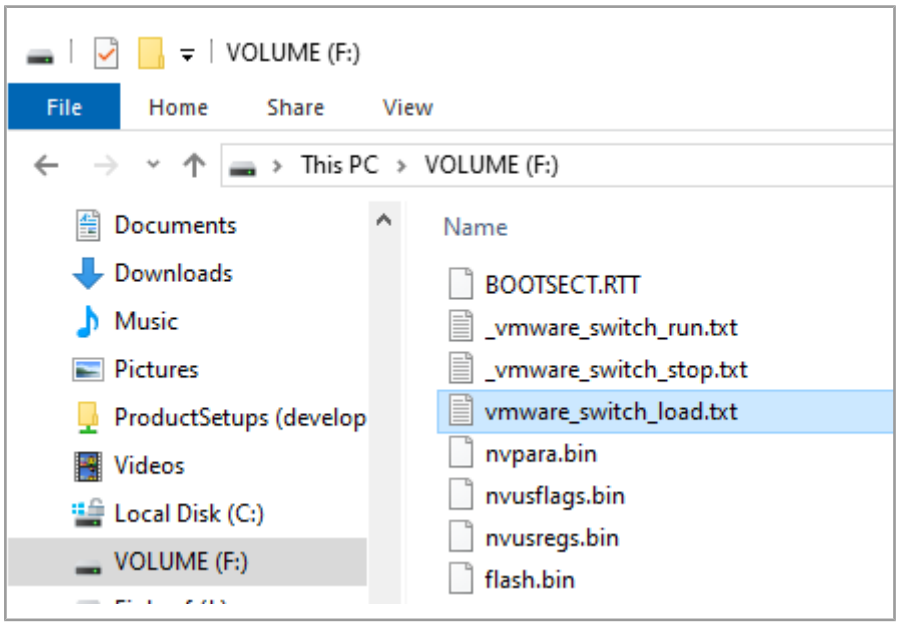
1. Open the Windows® File Explorer and navigate to the directory, where the VMX file (VMware® configuration file) is stored.
   ⇨ This directory also holds a file suffixed `*.vhd` (e.g. `JC_Boot_300_1_01_Knd.vhd`). This is a virtual hard disk serving as the boot device for the VMware® client.
2. Right-click the file and select Mount.



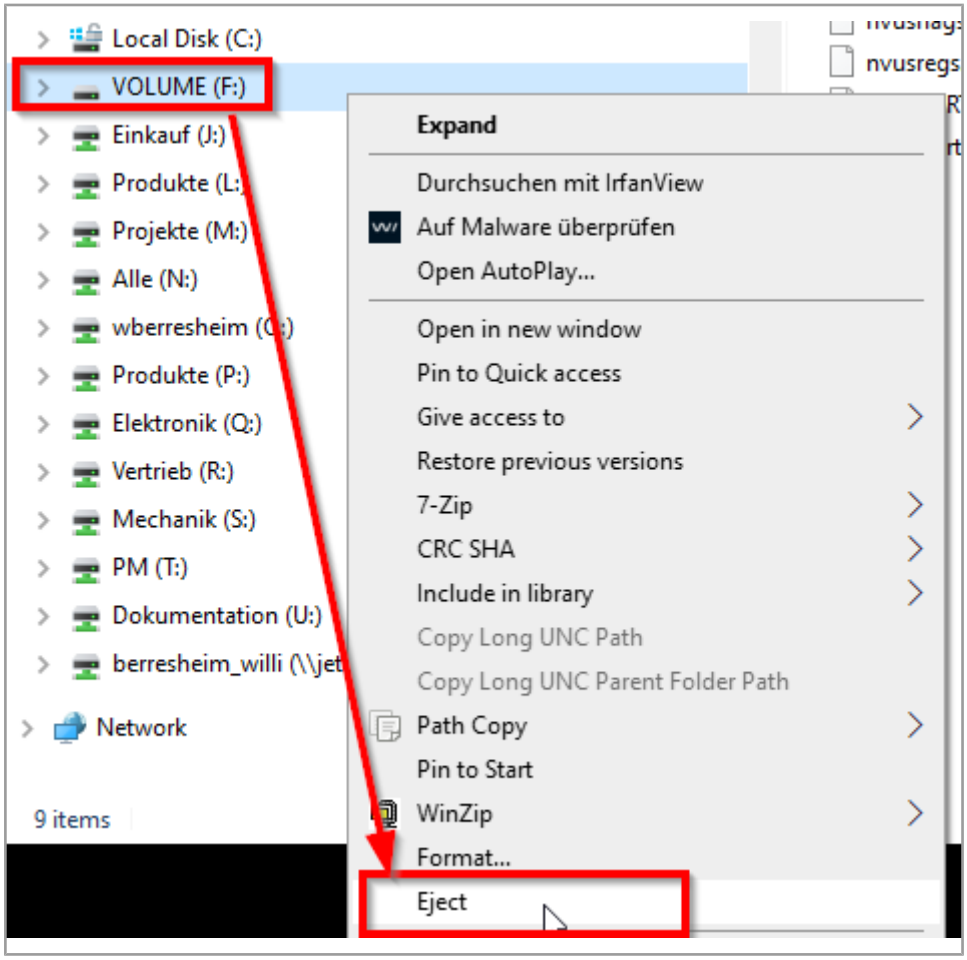
⇨ The VHD is mounted as a new **VOLUME** drive.



3. Create the `vmware_switch_load.txt` file and disable the `vmware_witch_run.txt` and `vmware_switch_stop.txt` files by renaming them.



4. Right-click the **VOLUME** drive and select Eject.

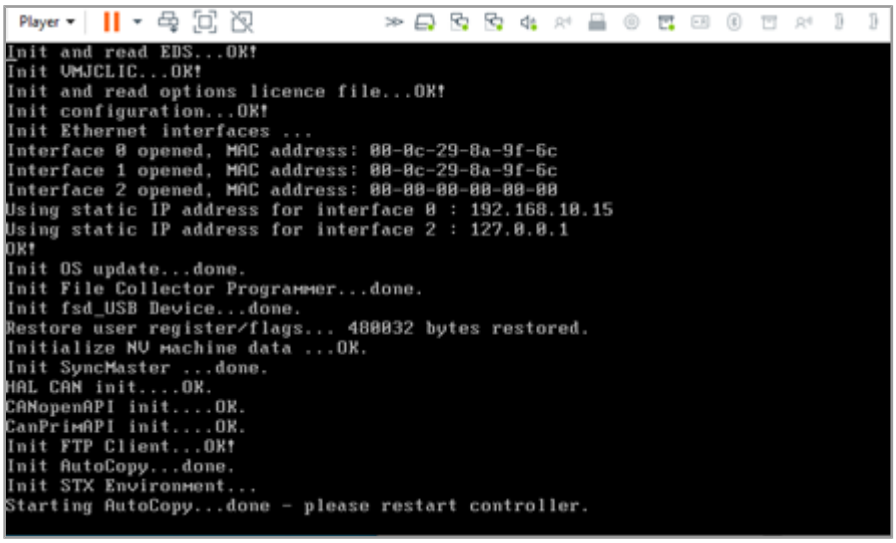


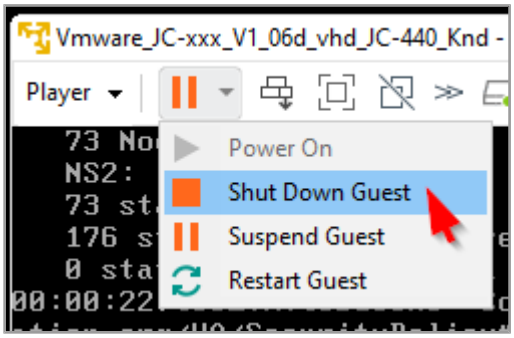
Launching VMware®

✓ The USB flash drive must be assigned to VMware®.

► Processing *AutoCopy* takes a few seconds. When `Starting AutoCopy… done - please restart controller` is shown, shut down the VMware® with Shut Down Guest.

NOTICE! Do not use Restart Guest as this would relaunch the AutoCopy process.





Disabling AutoCopy

To disable *AutoCopy*, you must disable the `winvnc.exe` file.

1. This may require remounting of the VMware® VHD file.
2. Delete or rename the `vmware_switch_load.txt` file.
3. Right-click the **VOLUME** drive and select Eject.

8 Registers - Overview

This register overview gives a condensed summary of the registers and flags available in the physical JC-44x and JC-96x controllers. The JC-VM does not feature the full range of registers.

General overview – registers

Register range	Description
100000 ... 100999	Electronic Data Sheet (EDS)
101000 … 101999	Configuration
102000 … 102999	Real-time clock
104000 ... 104999	Ethernet
107500 ... 107599	Flash drive
108000 ... 108999	CPU
109000 … 109020	USB flash drives
200000 ... 209999	General system registers
210000 ... 219999	Application program
230000 ... 239999	JetIP networking
240000 ... 249999	JetSync
250000 ... 259999	Ethernet system bus
260000 ... 269999	RemoteScan
270000 ... 279999	Modbus/TCP
290000 ... 299999	Email
310000 ... 319999	File system/data files
320000 ... 324999	FTP client
350000 ... 359999	User-programmable IP interface
380000 ... 389999	Error history
390000 ... 399999	I/O networking
470000 ... 479999	NetConsistency
510000 ... 519999	DNS server/DNS cache
520000 ... 529999	JetIPScan
6yy000 … 6yy999	SW module JCF-SV1 Axis count: yy = 00 … 16
1000000 ... 1119999	Application registers (non-volatile; integer/float)
50000000 ... 59999999	Motion control
Networking via Ethernet system bus GNN: nnn = 000 ... 199	
1nnn020000 ... 1nnn179999	JX3 module register
1nnn810000 ... 1nnn819999	JetMove registers
1nnn980000 ... 1nnn980199	Indirect access via local register 236xxx
1nnn990000 ... 1nnn999999	Indirect access with varying destination windows

I/Os – general overview

I/O numbers	Description
20001 ... 36000	Virtual I/Os for RemoteScan
20SJ00101 ... 20SJ00108	JX6-IO16CB

I/O numbers	Description
20SJ0xx01 ... 20SJ0xx16	JX2-IO modules (xx: 02 ... 32); JX3-IO modules connected to a JX3-BN-CAN (xx: 02 ... 17)
1Nnn010201 ... 1nnn011716	JX3-IO modules via JX3-BN-ETH (GNN: nnn = 000 ... 199)

Flags - General overview

Flag	Description
0 ... 255	Application flags (non-volatile)
256 ... 2047	Overlaid by registers R 1000000 through 1000055
2048 ... 2303	Special flags

Electronic Data Sheet (EDS)

Register range	Description
100500	Interface (0 = CPU)
100600 … 100614	**[Identification]**
100600	Internal version number
100601	Module ID
100602 ... 100612	Module name (register string)
100613	PCB revision
100614	PCB options
100700 … 100712	**[Production]**
100700	Internal version number
100701 ... 100707	Serial number (register string)
100708	Day
100709	Month
100710	Year
100711	TestNum.
100712	TestRev.
100800 … 100817	**[Features]** JC-VM
100800	Internal version number

Register range	Description
100801	MAC address (Bucher Automation)
100802	MAC address (device)
100803	Serial port
100804	Mode selector RUN-STOP-LOAD
100805	STX
100806	Non-volatile registers
100807	JX3 bus
100808	CAN bus
100810	Motion control
100811	Axes
100812	HTTP
100813	Modbus/TCP
100816	User-defined LEDs
100817	RTC
100825	USB
100826	LED for USB
100829	JCF-SV1 axis count

Configuration

Registers	Description
From file /system/ config.ini	
101100	IP address
101101	Subnet mask
101102	Default gateway
101103	DNS server
101132	Host name suffix type
101133 ... 101151	Host name (register string)
101164	Port number JetIP
101165	Port number for STX debugger
101180 ... 101198	File name for AutoCopy
Used by the system	
101200	IP address
101201	Subnet mask
101202	Default gateway

Registers	Description
101203	DNS server
101232	Host name suffix type
101233 … 101251	Host name (register string)
101264	Port number JetIP
101265	Port number for STX debugger
101280 ... 101298	File name for AutoCopy
101299	Saving the settings (0x77566152)
101908	CRC of ModConfig.da

Real-time clock

Registers	Description
102910 … 102917	**Direct access**
102910	Milliseconds
102911	Seconds
102912	Minutes
102913	hours
102914	Day of the week (0 = Sunday)
102915	Day
102916	Month
102917	Year
102920 … 102928	**Buffer access**
102920	Milliseconds
102921	Seconds
102922	Minutes
102923	hours
102924	Day of the week (0 = Sunday)
102925	Day
102926	Month
102927	Year
102928	Read/write trigger

Ethernet

Registers	Description
Link status	
104002	**Link status ETH1**
0	No link
10	10 MBit/s, half duplex
20	10 MBit/s, full duplex
100	100 MBit/s, half duplex
200	100 MBit/s, full duplex
1000	1000 MBit/s, half duplex
2000	1000 MBit/s, full duplex
104004	**Link status ETH2**
0	No link
10	10 MBit/s, half duplex
20	10 MBit/s, full duplex
100	100 MBit/s, half duplex
200	100 MBit/s, full duplex
1000	1000 MBit/s, half duplex
2000	1000 MBit/s, full duplex
MAC	
104111	ETH1 MAC address (manufacturer)
104112	ETH1 MAC address (device)
104121	ETH2 MAC address (manufacturer)
104122	ETH2 MAC address (device)
ARP	
104250	IP address for ARP request
104251	ARP cache: IP address
104252	ARP cache: MAC address (manufacturer)
104253	ARP cache: MAC address (device)
104254	ARP cache: TTL
104350	GNN
IP	
104531	ETH1: Current IP address (rw)
104532	ETH1: Current subnet mask (rw)
104533	ETH1: Current default gateway (rw)
104534	IP address of DNS server (rw)

104540	ETH2: Current IP address (rw)
104541	ETH2: Current subnet mask (rw)
104542	ETH 3: Current IP address (rw)
104543	ETH 3: Current subnet mask (rw)
104544	ETH2: Current default gateway (rw)

104542	ETH 3: Current IP address (rw)
104543	ETH 3: Current subnet mask (rw)
104545	ETH 3: Current default gateway (rw)
Routing table	
104550	**Status**
0	No error
-1	Routing table is full
-2	Entry not found
-3	Port is not active
-4	TCP/IP stack not initialized
104551	**Command**
1	Add route
0	Delete route

104552	**Port number**
1	ETH1 (X102)
2	ETH2 (X103)
3	ETH 3 (X104)
104553	IP address
104554	Subnet mask
104555	Gateway

Flash disk

Register range	Description
107500	Status
107501	**Command**
30	Read statistics
107510 … 107513	**Sector statistics**
107510	Total
107511	Used
107512	Blocked
107513	Free
107520 … 107523	**Byte statistics**
107520	Total
107521	Used
107522	Blocked
107523	Free

LEDs

Registers	Description
108002	**All LEDs on/off (bit-coded)**
Bit 0	RUN LED
Bit 1	ERR LED
Bit 2	D1 LED
108003	**RUN LED**
0	OFF
1	Flashing slowly
2	Flashing fast
3	ON
108004	**ERR LED**
0	OFF
1	Flashing slowly
2	Flashing fast
3	ON
108005	**D1 LED**
0	OFF
1	Flashing slowly
2	Flashing fast
3	ON

CPU

Registers	Description
108015	**Mode selector**
1	LOAD
2	RUN
3	STOP

General system registers

Registers	Description
200000	OS version (major * 100 + minor)
200001	**Application program is running (bit 0 = 1)**
0/2	Stops program
1	Starts program
3	Resumes program
200008	**Error register 1 (identical with 210004)**
Bit 0	Error on flash drive
Bit 2	Error on JX2 system bus
Bit 3	Error on Ethernet system bus
Bit 4	Error in application register
Bit 7	Error in extended error register
Bit 8	Illegal jump
Bit 9	Illegal call
Bit 10	Illegal index
Bit 11	Illegal opcode
Bit 12	Division by zero
Bit 13	Stack overflow
Bit 14	Stack underflow
Bit 15	Illegal stack
Bit 16	Error while loading the application program
Bit 17	Memory protection violated
Bit 24	Cycle time timeout
Bit 25	Task lock timeout
Bit 31	Unknown error
200009	**Enhanced error register 1 (bit-coded)**
Bit 1	Error in the bus system
Bit 2	DeviceManager error
Bit 3	Error in ModConfig.da
Bit 4	RPC error
Bit 5	JetVM error
Bit 10	A bus node (publish/subscribe client) has reported an error
Bit 12	JetIPScan has reported an error
Bit 16	NetConsistency has reported an error
Bit 20	Internal memory error
Bit 21	Application program error
Bit 22	System logger is active (R 209700 = 213)
Bit 29	SNTP client error
Bit 30	DeviceManager register error
Bit 31	License violation
200010	**Enhanced error register 2 (bit-coded)**
Bit 1	Error in the MC object
Bit 2	JCF-SV1 error
Bit 3	NV machine data error
Bit 7	File system error
Bit 24	OPC UA server error
Bit 25	OPC UA client error
200051	JetIPScan **error numbers**
0	No error or warning
5	The user has terminated the function
1001	The response received first does not match responses 2 and 3
1002	The response received second does not match responses 1 and 3
1003	The response received third does not match responses 2 and 3
-1	All three responses are dissimilar
-2	The IP settings of at least one node are dissimilar
-3	The JetIPScan function was called while already active

-10	The length of the set value list is <1 or >255, or the pointer to the list is invalid
-11	A GNN of the set value list is <1 or >255, or exists multiple times
-20 ... -40	Internal error
-1001 ... -1199	The node has reported the wrong CtrlID or CtrlIDopt
-2001 ... -2199	The node has not called
-3001 ... -3199	Several nodes of the same GNN have called
200061	Error numbers of NetConsistency, see R 470040
200169	OS version (IP format)
200170	Controller type (940/970)
200300	Currently available heap
200301	Available heap at system launch
200302	Available heap ahead application program boot-up
201000	Runtime register in milliseconds (rw)
201001	Runtime register in seconds (rw)
201002	Runtime register in register 201003 (rw)
201003	10 ms units for register 201002 (rw)
201004	Runtime register in milliseconds (ro)
201005	Runtime registers in microseconds (ro)
202930	**Web status (bit-coded)**
Bit 0 = 1	FTP server is available
Bit 1 = 1	HTTP server is available
Bit 2 = 1	E-mail is available
Bit 3 = 1	Data file function is available
Bit 4 = 1	Modbus/TCP has been licensed
Bit 5 = 1	Modbus/TCP is available
Bit 7 = 1	FTP client is available

202936	**Control register – file system**
0xc4697a4b	Format the flash drive
202960	Password for system command register (0x424f6f74)
202961	**System command register**
102	Controller restart (reboot)
103	Application register test
104	Reset non-volatile parameters
122	Wait for communication – OFF
123	Wait for communication – ON
160	Task switch on I/O access OFF
161	Task switch on I/O access ON
170	Resume task time slice OFF
171	Resume task time slice ON
301	Save the flash drive
310	Load the configuration files
311	Load the module configuration
312	Load process data configuration for Ethernet system bus
313	Stop process data configuration for Ethernet system bus
330	JetIPScan client OFF
331	JetIPScan client ON
202962	**System status register**
Bit 0 = 1	Task switch on I/O access
Bit 1 = 1	Without waiting for communication
Bit 2 = 1	JetIPScan client ON
Bit 3 = 1	Resume task time slice ON
202970	Password for start delay (0x424f6f74)
202971	Start delay in steps of 100 ms
203000	Interface monitoring: JetIP
203005	Interface monitoring: STX debug server
203100 ... 203107	32-bit overlaying – Flag 0 ... 255
203108 ... 203123	16-bit overlaying – Flag 0 ... 255
203124 ... 203131	32-bit overlaying – Flag 2048 ... 2303

203132 ... 203147	16-bit overlaying – Flag 2048 ... 2303
209700	System logger: Global enable
209701 ... 209754	System components enable

Networking via JetIP

Registers	Description
TCP Autoclose for JetIP**/TCP server**	
230000	Total of open connections
230001	Mode
230002	Time
Other registers for networking via JetIP	
232708	Timeout in milliseconds
232709	Response time in milliseconds
232710	Count of network errors
232711	**Error code of latest access**
0	No error
1	Timeout
3	Error message from remote station
5	Illegal network address
6	Invalid amount of registers
7	Illegal interface number
232717	Maximum number of retries
232718	Total of retries

Network registers	
235000 ... 235399	IP addresses
235400 ... 235799	Port numbers
236000 ... 236399	Indirect register numbers GNN: nnn = 000 ... 199
1nnn020000 ... 1nnn179999	JX3 module register
1nnn810000 ... 1nnn819999	JetMove registers
1nnn980000 ... 1nnn980199	Indirect access via local register 236xxx
1nnn990000 ... 1nnn999999	Indirect access with varying destination windows

RemoteScan

Registers	Description
262965	Protocol type
262966	Amount of configuration blocks
262967	Status

Modbus/TCP

Registers	Description
272702	Register offset
272704	Input offset
272705	Output offset
278000 ... 278999	16-bit I/O registers overlaid by virtual I/Os 20001 ... 36000

File system/data file function

Register	Description
312977	Status of file operation
312978	Task ID

FTP client

Registers	Description
320000	Number of open connections
320001	Command
320002	Timeout
320003	Server port
320004	Selection via number
320005	Selection via handle
320006	Server socket: IP address
320007	Server socket: Port
320008	Client socket: IP address
320009	Client socket: Port
320100	Access status
320101	Task ID

User-programmable IP interface

Registers	Description
Reading out the connection list	
350000	Last result (-1 = no connection selected)
350001	1 = Client; 2 = Server
350002	1 = UDP; 2 = TCP
350003	IP address
350004	Port number
350005	Connection state
350006	Total of bytes sent
350007	Total of bytes received
350008	Total of bytes discarded
350009	Total of packets discarded
350016	Total of bytes sent last
350017	Total of bytes received last
350090	Maximum number of connections
350091	Total of open connections
350092	Total of open connections
350093	Total of closed connections
350099	Version number

Error history

Register	Description
380000	**Status**
Bit 0 = 1	Recording
Bit 1 = 1	Stop if buffer is full
Bit 2 = 1	Stop on error code
Bit 3 = 1	Non-volatile memory
380001	**Command**
1	Clear error log
2	Start error log
3	Stop error log
4	Stop if error buffer is full
5	Circular buffer
6	Stop on error code ON
7	Stop on error code OFF
10	Non-volatile memory
11	Dynamic memory
380002	Buffer length
380003	Maximum buffer length
380004	Number of error entries
380005	Index to error list
380006	Error entry
380007	Error stop code
380008	Number of codes until stop
380029	Group index to error list
380030 ... 380093	64 error entries

NetConsistency function

Registers	Description
Basic drivers	
470000 ... 470008	Cookie
470009	Version
470010	**Status**
Bit 0 = 1	Error
Bit 1 = 1	Alarms
Bit 2 = 1	Basic driver initialized
470011	**Command**
0	There are no commands
470020	Maximum possible number of instances
470021	Number of instances ready for operation
470030	Max. number of error messages for the logger
470031	Number of error messages transmitted to the logger
470032	Max. number of warnings for the logger
470033	Number of warnings forwarded to the logger
470034	Max. possible number of error history entries
470035	Number of entries in the error history

Registers	Description
470040	Error numbers
470041	Time of the error in ms
470042	Instance, at which the error occurred
470043	Number of error parameters
470044 ... 470048	Error parameters 1 through 5
470049	Number of characters of the error message
470050 ... 470157	Text of the error message
First instance	
471010	**Status**
Bit 0 = 1	Error
Bit 1 = 1	Alarms
Bit 2 = 1	An instance has been initialized
Bit 3 = 1	Execution in process
471011	**Command**
0	There are no commands

DNS client

Registers	Description
510000	**Status**
Bit 0 = 0	**/etc/hosts** file was not read or is not existing
Bit 0 = 1	**/etc/hosts** file was read and entries were stored to the cache
Bit 1 = 0	Access to the DNS server failed
Bit 1 = 1	Access to the DNS server was successful
Bit 2 = 0	Access to the DNS server is not active
Bit 2 = 1	Access to the DNS server is active
Bit 3 = 0	No error on DNS server access
Bit 3 = 1	Error on DNS server access
510001	**Command**
1	Select the first entry in the cache
2	Select the next entry in the cache
3	Clear the entry from the cache

Registers	Description
510002	Current IP address of DNS server
510003	**Error code**
-1	DNS server access error, e.g. fails to respond
-2	Invalid response of the DNS server
-3	No IP address could be retrieved from the response
510009	Total of entries in the DNS cache
510010	Timeout
510011	IP address of the cache entry called by command 1 or 2
510012 ... 510029	Displays the name of the cache entry selected by command 1 or 2 as register string.

JetIPScan

Registers	Description
Global status information	
520000	Summary of status messages
520010	State of execution - corresponds to the return value *State*
520011	Number of cycles - corresponds to the return value *Count*
520012	Number of changes - corresponds to the return value *Changed*
520013	Result of the function - corresponds to the return value *Result*
Warnings and errors	
521000 ... 521006	All 3 responses are different
521010 ... 521016	Response 1 is different
521020 ... 521026	Response 2 is different
521030 ... 521036	Response 3 is different
521100 ... 521106	Wrong CtrlID or CtrlIDopt
521200 ... 521206	The node has not called
521300 ... 521306	Multiple call

Registers	Description
521400 ... 521406	The IP settings could not be changed
Configuration	
522000	GNN
522010 ... 522015	Set configuration
522110 ... 522123	Actual configuration 1
522210 ... 522223	Actual configuration 2
522310 ... 522323	Actual configuration 3

SyncMaster

Registers	Description
530000	Status (bit-coded) Bit 0: SyncMaster started Bit 1: Component cycle error Bit 2: Fatal component cycle error Bit 3: Error: Component is not ready Bit 4: Fatal error: Component is not ready
530002	Length of scheduler table
530009	Software version
530012	Global error index

Licensing

Registers	Description
550000	Status
550005	License violation: Option ID
550006	License violation: licensed value
550007	License violation: required value
550008	Error state
550009	Software version
550020	Total of valid licenses
550021	Valid licenses (bit-coded)
550030	Total of invalid licenses
550031	Invalid licenses (bit-coded)
550040	Total of license violations
550041	License violations (bit-coded)

NV machine data

Registers	Description
560000	Status (bit-coded) Bit 0: feature enabled Bit 1: NV feature was initialized successfully Bit 2: File feature was initialized successfully Bit 3: Machine offsets in NV RAM are valid Bit 4: Encoder overflows in NV RAM are valid Bit 13: File feature is running Bit 16: Error while writing file Bit 17: Error while reading file Bit 18: Fatal error in file task
560002	Current file command
560003	File command state
560005	Last file command
560006	Outcome of latest file command
560007	Latest file command with error
560008	Outcome of latest file command with error
560009	Software version
560010	Machine offset: Total of data blocks
560011	Machine offset: Total of values per data block
560012	Machine offset: Data width of values
560013	Encoder overflows: Total of data blocks
560014	Encoder overflows: Total of values per data block
560015	Encoder overflows: Data width of values
560016	Total of read file operations
560017	Total of write file operations
560018	Duration of latest file operation [µs]

Application registers

Registers	Description
1000000 ... 1119999	32-bit integer or floating point number (non-volatile)

Basic register for initializing the PCIe bus

Registers	Description
201100000	**Global status register**
Bit 30	Initialization completed
Bit 31	Error while initializing
201100001	**Command register**
1	Initialize the bus
201100002	Total of riser cards detected
201100005	**Bus initialization status**
0	Initialization is running
1	Initialization OK
-1	Error while initializing
201100006	Total of JX2 modules
201100007	JX6-**IO submodule type**
73	JX6-SB and JX6-SB-I
5	JX6-SV1
16	JX6-IO16CB
201100010	Timeout while waiting for command acknowledge
201100011	Timeout while waiting for semaphore
201100012	Timeout in the interpreter for overall access

32 combined inputs

Registers	Description			
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)				
4000	101 ... 108	109 ... 116	201 ... 208	209 ... 216
4001	109 ... 116	201 ... 208	209 ... 216	301 ... 308
4002	201 ... 208	209 ... 216	301 ... 308	309 ... 316
4003	209 ... 216	301 ... 308	309 ... 316	401 ... 408
4004	301 ... 308	309 ... 316	401 ... 408	409 ... 416
4005	309 ... 316	401 ... 408	409 ... 416	501 ... 508
4006	401 ... 408	409 ... 416	501 ... 508	509 ... 516
4007	409 ... 416	501 ... 508	509 ... 516	601 ... 608
4008	501 ... 508	509 ... 516	601 ... 608	609 ... 616
4009	509 ... 516	601 ... 608	609 ... 616	701 ... 708
4010	601 ... 608	609 ... 616	701 ... 708	709 ... 716
4011	609 ... 616	701 ... 708	709 ... 716	801 ... 808
4012	701 ... 708	709 ... 716	801 ... 808	809 ... 816
4013	709 ... 716	801 ... 808	809 ... 816	901 ... 908
4014	801 ... 808	809 ... 816	901 ... 908	909 ... 916
4015	809 ... 816	901 ... 908	909 ... 916	1001 ... 1008
4016	901 ... 908	909 ... 916	1001 ... 1008	1009 ... 1016
4017	909 ... 916	1001 ... 1008	1009 ... 1016	1101 ... 1108
4018	1001 ... 1008	1009 ... 1016	1101 ... 1108	1109 ... 1116
4019	1009 ... 1016	1101 ... 1108	1109 ... 1116	1201 ... 1208

4020	1101 ... 1108	1109 ... 1116	1201 ... 1208	1209 ... 1216
4021	1109 ... 1116	1201 ... 1208	1209 ... 1216	1301 ... 1308
4022	1201 ... 1208	1209 ... 1216	1301 ... 1308	1309 ... 1316
4023	1209 ... 1216	1301 ... 1308	1309 ... 1316	1401 ... 1408
4024	1301 ... 1308	1309 ... 1316	1401 ... 1408	1409 ... 1416
4025	1309 ... 1316	1401 ... 1408	1409 ... 1416	1501 ... 1508
4026	1401 ... 1408	1409 ... 1416	1501 ... 1508	1509 ... 1516
4027	1409 ... 1416	1501 ... 1508	1509 ... 1516	1601 ... 1608
4028	1501 ... 1508	1509 ... 1516	1601 ... 1608	1609 ... 1616
4029	1509 ... 1516	1601 ... 1608	1609 ... 1616	1701 ... 1708
4030	1601 ... 1608	1609 ... 1616	1701 ... 1708	1709 ... 1716
4031	1609 ... 1616	1701 ... 1708	1709 ... 1716	1801 ... 1808
4032	1701 ... 1708	1709 ... 1716	1801 ... 1808	1809 ... 1816
4033	1709 ... 1716	1801 ... 1808	1809 ... 1816	1901 ... 1908
4034	1801 ... 1808	1809 ... 1816	1901 ... 1908	1909 ... 1916
4035	1809 ... 1816	1901 ... 1908	1909 ... 1916	2001 ... 2008
4036	1901 ... 1908	1909 ... 1916	2001 ... 2008	2009 ... 2016
4037	1909 ... 1916	2001 ... 2008	2009 ... 2016	2101 ... 2108
4038	2001 ... 2008	2009 ... 2016	2101 ... 2108	2109 ... 2116
4039	2009 ... 2016	2101 ... 2108	2109 ... 2116	2201 ... 2208
4040	2101 ... 2108	2109 ... 2116	2201 ... 2208	2209 ... 2216
4041	2109 ... 2116	2201 ... 2208	2209 ... 2216	2301 ... 2308
4042	2201 ... 2208	2209 ... 2216	2301 ... 2308	2309 ... 2316
4043	2209 ... 2216	2301 ... 2308	2309 ... 2316	2401 ... 2408
4044	2301 ... 2308	2309 ... 2316	2401 ... 2408	2409 ... 2416

16 combined inputs

Regis-ters	Description
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)	

4060	101 … 108	109 … 116
4061	109 … 116	201 … 208
4062	201 … 208	209 … 216
4063	209 … 216	301 … 308
4064	301 … 308	309 … 316
4065	309 … 316	401 … 408
4066	401 … 408	409 … 416
4067	409 … 416	501 … 508
4068	501 … 508	509 … 516
4069	509 … 516	601 … 608
4070	601 … 608	609 … 616
4071	609 … 616	701 … 708
4072	701 … 708	709 … 716
4073	709 … 716	801 … 808
4074	801 … 808	809 … 816
4075	809 … 816	901 … 908
4076	901 … 908	909 … 916
4077	909 … 916	1001 … 1008
4078	1001 … 1008	1009 … 1016
4079	1009 … 1016	1101 … 1108
4080	1101 … 1108	1109 … 1116
4081	1109 … 1116	1201 … 1208
4082	1201 … 1208	1209 … 1216
4083	1209 … 1216	1301 … 1308
4084	1301 … 1308	1309 … 1316
4085	1309 … 1316	1401 … 1408
4086	1401 … 1408	1409 … 1416

4087	1409 … 1416	1501 … 1508
4088	1501 … 1508	1509 … 1516
4089	1509 … 1516	1601 … 1608
4090	1601 … 1608	1609 … 1616
4091	1609 … 1616	1701 … 1708
4092	1701 … 1708	1709 … 1716
4093	1709 … 1716	1801 … 1808
4094	1801 … 1808	1809 … 1816
4095	1809 … 1816	1901 … 1908
4096	1901 … 1908	1909 … 1916
4097	1909 … 1916	2001 … 2008
4098	2001 … 2008	2009 … 2016
4099	2009 … 2016	2101 … 2108
4100	2101 … 2108	2109 … 2116
4101	2109 … 2116	2201 … 2208
4102	2201 … 2208	2209 … 2216
4103	2209 … 2216	2301 … 2308
4104	2301 … 2308	2309 … 2316
4105	2309 … 2316	2401 … 2408
4106	2401 … 2408	2409 … 2416

8 combined inputs

Regis-ters	Description
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)	
4120	101 ... 108
4121	109 ... 116
4122	201 ... 208
4123	209 ... 216
4124	301 ... 308
4125	309 ... 316
4126	401 ... 408
4127	409 ... 416
4128	501 ... 508
4129	509 ... 516
4130	601 ... 608
4131	609 ... 616
4132	701 ... 708
4133	709 ... 716
4134	801 ... 808
4135	809 ... 816
4136	901 ... 908
4137	909 ... 916
4138	1001 ... 1008
4139	1009 ... 1016
4140	1101 ... 1108
4141	1109 ... 1116
4142	1201 ... 1208
4143	1209 ... 1216
4144	1301 ... 1308
4145	1309 ... 1316
4146	1401 ... 1408
4147	1409 ... 1416
4148	1501 ... 1508
4149	1509 ... 1516
4150	1601 ... 1608
4151	1609 ... 1616
4152	1701 ... 1708
4153	1709 ... 1716
4154	1801 ... 1808
4155	1809 ... 1816
4156	1901 ... 1908
4157	1909 ... 1916
4158	2001 ... 2008
4159	2009 ... 2016
4160	2101 ... 2108
4161	2109 ... 2116
4162	2201 ... 2208
4163	2209 ... 2216
4164	2301 ... 2308
4165	2309 ... 2316
4166	2401 ... 2408
4167	2409 ... 2416

32 combined outputs

Regis-ters	Description
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)	

Exam-ple	Use the register 1001914202 to access outputs 1 ... 8 and 9 ... 16 of the JX3 module at positions 2 and 3 on a JX3-BN-ETH with GNN 001.			
4200	101 ... 108	109 ... 116	201 ... 208	209 ... 216
4201	109 ... 116	201 ... 208	209 ... 216	301 ... 308
4202	201 ... 208	209 ... 216	301 ... 308	309 ... 316
4203	209 ... 216	301 ... 308	309 ... 316	401 ... 408
4204	301 ... 308	309 ... 316	401 ... 408	409 ... 416
4205	309 ... 316	401 ... 408	409 ... 416	501 ... 508
4206	401 ... 408	409 ... 416	501 ... 508	509 ... 516
4207	409 ... 416	501 ... 508	509 ... 516	601 ... 608
4208	501 ... 508	509 ... 516	601 ... 608	609 ... 616
4209	509 ... 516	601 ... 608	609 ... 616	701 ... 708
4210	601 ... 608	609 ... 616	701 ... 708	709 ... 716
4211	609 ... 616	701 ... 708	709 ... 716	801 ... 808
4212	701 ... 708	709 ... 716	801 ... 808	809 ... 816
4213	709 ... 716	801 ... 808	809 ... 816	901 ... 908
4214	801 ... 808	809 ... 816	901 ... 908	909 ... 916
4215	809 ... 816	901 ... 908	909 ... 916	1001 ... 1008
4216	901 ... 908	909 ... 916	1001 ... 1008	1009 ... 1016
4217	909 ... 916	1001 ... 1008	1009 ... 1016	1101 ... 1108
4218	1001 ... 1008	1009 ... 1016	1101 ... 1108	1109 ... 1116
4219	1009 ... 1016	1101 ... 1108	1109 ... 1116	1201 ... 1208
4220	1101 ... 1108	1109 ... 1116	1201 ... 1208	1209 ... 1216
4221	1109 ... 1116	1201 ... 1208	1209 ... 1216	1301 ... 1308
4222	1201 ... 1208	1209 ... 1216	1301 ... 1308	1309 ... 1316
4223	1209 ... 1216	1301 ... 1308	1309 ... 1316	1401 ... 1408
4224	1301 ... 1308	1309 ... 1316	1401 ... 1408	1409 ... 1416
4225	1309 ... 1316	1401 ... 1408	1409 ... 1416	1501 ... 1508
4226	1401 ... 1408	1409 ... 1416	1501 ... 1508	1509 ... 1516
4227	1409 ... 1416	1501 ... 1508	1509 ... 1516	1601 ... 1608
4228	1501 ... 1508	1509 ... 1516	1601 ... 1608	1609 ... 1616
4229	1509 ... 1516	1601 ... 1608	1609 ... 1616	1701 ... 1708
4230	1601 ... 1608	1609 ... 1616	1701 ... 1708	1709 ... 1716
4231	1609 ... 1616	1701 ... 1708	1709 ... 1716	1801 ... 1808
4232	1701 ... 1708	1709 ... 1716	1801 ... 1808	1809 ... 1816
4233	1709 ... 1716	1801 ... 1808	1809 ... 1816	1901 ... 1908
4234	1801 ... 1808	1809 ... 1816	1901 ... 1908	1909 ... 1916
4235	1809 ... 1816	1901 ... 1908	1909 ... 1916	2001 ... 2008
4236	1901 ... 1908	1909 ... 1916	2001 ... 2008	2009 ... 2016
4237	1909 ... 1916	2001 ... 2008	2009 ... 2016	2101 ... 2108
4238	2001 ... 2008	2009 ... 2016	2101 ... 2108	2109 ... 2116
4239	2009 ... 2016	2101 ... 2108	2109 ... 2116	2201 ... 2208

4240	2101 ... 2108	2109 ... 2116	2201 ... 2208	2209 ... 2216
4241	2109 ... 2116	2201 ... 2208	2209 ... 2216	2301 ... 2308
4242	2201 ... 2208	2209 ... 2216	2301 ... 2308	2309 ... 2316
4243	2209 ... 2216	2301 ... 2308	2309 ... 2316	2401 ... 2408
4244	2301 ... 2308	2309 ... 2316	2401 ... 2408	2409 ... 2416

16 combined outputs

Registers	Description
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)	

Example	Use the register 1001914262 to access outputs 1 ... 8 and 9 ... 16 of the JX3 module at position 2.	
4260	101 ... 108	109 ... 116
4261	109 ... 116	201 ... 208
4262	201 ... 208	209 ... 216
4263	209 ... 216	301 ... 308
4264	301 ... 308	309 ... 316
4265	309 ... 316	401 ... 408
4266	401 ... 408	409 ... 416
4267	409 ... 416	501 ... 508
4268	501 ... 508	509 ... 516
4269	509 ... 516	601 ... 608
4270	601 ... 608	609 ... 616
4263	209 ... 216	301 ... 308
4271	609 ... 616	701 ... 708
4272	701 ... 708	709 ... 716
4273	709 ... 716	801 ... 808
4274	801 ... 808	809 ... 816
4275	809 ... 816	901 ... 908
4276	901 ... 908	909 ... 916
4277	909 ... 916	1001 ... 1008
4278	1001 ... 1008	1009 ... 1016
4279	1009 ... 1016	1101 ... 1108
4280	1101 ... 1108	1109 ... 1116
4281	1109 ... 1116	1201 ... 1208
4282	1201 ... 1208	1209 ... 1216
4283	1209 ... 1216	1301 ... 1308
4284	1301 ... 1308	1309 ... 1316
4285	1309 ... 1316	1401 ... 1408
4286	1401 ... 1408	1409 ... 1416
4287	1409 ... 1416	1501 ... 1508
4288	1501 ... 1508	1509 ... 1516
4289	1509 ... 1516	1601 ... 1608
4290	1601 ... 1608	1609 ... 1616
4291	1609 ... 1616	1701 ... 1708
4292	1701 ... 1708	1709 ... 1716
4293	1709 ... 1716	1801 ... 1808
4294	1801 ... 1808	1809 ... 1816
4295	1809 ... 1816	1901 ... 1908
4296	1901 ... 1908	1909 ... 1916
4297	1909 ... 1916	2001 ... 2008
4298	2001 ... 2008	2009 ... 2016
4299	2009 ... 2016	2101 ... 2108
4300	2101 ... 2108	2109 ... 2116
4301	2109 ... 2116	2201 ... 2208
4302	2201 ... 2208	2209 ... 2216
4303	2209 ... 2216	2301 ... 2308
4304	2301 ... 2308	2309 ... 2316
4305	2309 ... 2316	2401 ... 2408
4306	2401 ... 2408	2409 ... 2416

8 combined outputs

Registers	Description
JX3-BN-ETH network: 1nnn910000 (nnn = GNN)	

Example	Use the register 1001914322 to access outputs 1 ... 8 of the JX3 module at position 2 on a JX3-BN-ETH with GNN 001.
4320	101 ... 108
4321	109 ... 116
4322	201 ... 208
4323	209 ... 216

4324	301 ... 308
4325	309 ... 316
4326	401 ... 408
4327	409 ... 416
4328	501 ... 508
4329	509 ... 516
4330	601 ... 608
4331	609 ... 616
4332	701 ... 708
4333	709 ... 716
4334	801 ... 808
4335	809 ... 816
4336	901 ... 908
4337	909 ... 916
4338	1001 ... 1008
4339	1009 ... 1016
4340	1101 ... 1108
4341	1109 ... 1116
4342	1201 ... 1208
4343	1209 ... 1216
4344	1301 ... 1308
4345	1309 ... 1316
4346	1401 ... 1408
4347	1409 ... 1416
4348	1501 … 1508
4349	1509 ... 1516
4350	1601 … 1608
4351	1609 ... 1616
4352	1701 ... 1708
4353	1709 … 1716
4354	1801 … 1808
4355	1809 … 1816
4356	1901 … 1908
4357	1909 … 1916
4358	2001 … 2008
4359	2009 … 2016
4360	2101 … 2108
4361	2109 ... 2116
4362	2201 … 2208
4363	2209 … 2216
4364	2301 … 2308
4365	2309 … 2316
4366	2401 … 2408
4367	2409 … 2416

Special flags for networks

Flag	Description
2075	JetIP networking error

Special flags – publish/subscribe

Flag	Description
2080	Enable for publishing an error
2081	Collective error message of the subscriber

Special flags – interface monitoring

Flag	Description
2088	JetIP OS flag
2089	JetIP user flag
2098	Debug server OS flag
2099	Debug server user flag

32 combined flags

Registers	Description
203100	0 ... 31
203101	32 ... 63
203102	64 ... 95
203103	96 ... 127
203104	128 ... 159
203105	160 ... 191
203106	192 ... 223
203107	224 ... 255

16 combined flags

Registers	Description
203108	0 ... 15
203109	16 ... 31
203110	32 ... 47
203111	48 ... 63
203112	64 ... 79
203113	80 ... 95
203114	96 ... 111
203115	112 ... 127
203116	128 ... 143
203117	144 ... 159
203118	160 ... 175
203119	176 ... 191
203120	192 ... 207
203121	208 ... 223
203122	224 ... 239
203123	240 ... 255

32 combined special flags

Registers	Description
203124	2048 ... 2079
203125	2080 ... 2111
203126	2112 ... 2143
203127	2144 ... 2175
203128	2176 ... 2207
203129	2208 ... 2239
203130	2240 ... 2271
203131	2272 ... 2303

16 combined special flags

Registers	Description
203132	2048 ... 2063
203133	2064 ... 2079
203134	2080 ... 2095
203135	2096 ... 2111
203136	2112 ... 2127
203137	2128 ... 2143
203138	2144 ... 2159
203139	2160 ... 2175
203140	2176 ... 2191
203141	2192 ... 2207
203142	2208 ... 2223
203143	2224 ... 2239
203144	2240 ... 2255
203145	2256 ... 2271
203146	2272 ... 2287
203147	2288 ... 2303

Application registers with overlaid flags

Registers	Description
1000000	256 ... 287
1000001	288 ... 319
1000002	320 ... 351
1000003	352 ... 383
1000004	384 ... 415
1000005	416 ... 447
1000006	448 ... 479
1000007	480 ... 511
1000008	512 ... 543
1000009	544 ... 575
1000010	576 ... 607
1000011	608 ... 639
1000012	640 ... 671
1000013	672 ... 703
1000014	704 ... 735
1000015	736 ... 767
1000016	768 ... 799
1000017	800 ... 831
1000018	832 ... 863
1000019	864 ... 895
1000020	896 ... 927
1000021	928 ... 959
1000022	960 ... 991

Registers	Description
1000023	992 ... 1023
1000024	1024 ... 1055
1000025	1056 ... 1087
1000026	1088 ... 1119
1000027	1120 ... 1151
1000028	1152 ... 1183
1000029	1184 ... 1215
1000030	1216 ... 1247
1000031	1248 ... 1279
1000032	1280 ... 1311
1000033	1312 ... 1343
1000034	1344 ... 1375
1000035	1376 ... 1407
1000036	1408 ... 1439
1000037	1440 ... 1471
1000038	1472 ... 1503
1000039	1504 ... 1535

Registers	Description
1000040	1536 ... 1567
1000041	1568 ... 1599
1000042	1600 ... 1631
1000043	1632 ... 1663
1000044	1664 ... 1695
1000045	1696 ... 1727
1000046	1728 ... 1759
1000047	1760 ... 1791
1000048	1792 ... 1823
1000049	1824 ... 1855
1000050	1856 ... 1887
1000051	1888 ... 1919
1000052	1920 ... 1951
1000053	1952 ... 1983
1000054	1984 ... 2015
1000055	2016 ... 2047

System Functions

For compatibility reasons, the system functions are listed here.
In JetSym STX, use the corresponding JetSym STX functions instead of the system functions.

System function	Description
4	Converting BCD to HEX
5	Converting HEX to BCD
20	Square root
21	Sine
22	Cosine
23	Tangent
24	Arc sine
25	Arc cosine
26	Arc tangent
27	Exponential function
28	Natural logarithm
29	Absolute value
30	Separation of digits before and after the decimal point
50	Sort register values
60	CRC generation for Modbus RTU
61	CRC check for Modbus RTU
65/67	Reading register block via Modbus/TCP
66/68	Writing register block via Modbus/TCP
80/85	Initialize RemoteScan
81	Start RemoteScan
82	Stop RemoteScan

System function	Description
90	Write a data file
91	Append a data file
92	Read a data file
96	Delete a data file
150	Configure NetCopyList
151	Delete NetCopyList
152	Send NetCopyList

System function	Corresponding JetSym STX function
4	Function Bcd2Hex(Bcd: int): Int;
5	Function Hex2Bcd(Hex: int): Int;
50	Function QSort(DataPtr: Int, ElementCnt: Int, ElementSize: Int, SortOffset: Int, SortType: STXBASETYPE, SortMode: QSORTMODE): Int;
60	Function ModbusCRCgen(FramePtr: Int, Length: int): Int;
61	Function ModbusCRCcheck(FramePtr: Int, Length: int): Int;
65/67	Function ModbusReadReg(Const Ref MbParam: MODBUS_PARAM): Int;
66/68	Function ModbusWriteReg(Const Ref MbParam: MODBUS_PARAM): Int;
80/85	Function RemoteScanConfig(Protocol: RSCAN_PROTOCOL, Elements: Int, Const Ref Configuration: RSCAN_DSCR): Int;
81	Function RemoteScanStart(Protocol: int): Int;
82	Function RemoteScanStop(Protocol: int): Int;
90/91	Function FileDAWrite(Const Ref FileName: String, Const Ref Mode: String, VarType: DAWRITE_TYPE, First: Int, Last: int): Int;
92	Function FileDARead(Const Ref FileName: String): Int;
110	Function EmailSend(Const Ref FileName: String): Int;
150	Function NetCopyListConfig(IPAddr: Int, IPPort: Int, Const Ref List: TNetCopyLinstL): Int;

System function	Corresponding JetSym STX function
151	Function NetCopyListSend(Handle: int): Int;
152	Function NetCopyListDelete(Handle: int): Int;

9 Maintenance

This product is maintenance-free. The operation of the product does not required inspection or maintenance efforts.

9.1 Repairs

Defective components can cause dangerous malfunctions and compromise safety.
Only the manufacturer is authorized to perform repair work.
It is forbidden to open the product.

Product modifications

Modifications and alterations to the product and its functions are not allowed. The manufacturer exempts from liability for any modifications made to the product.

The original parts are specifically designed for the product. Parts and equipment from other manufacturers must not be used.

The manufacturer exempts from liability for any damage resulting from the use of non-original parts and equipment is excluded.

9.2 Storage and Shipment

Storage

When storing the product, observe the environmental conditions given in chapter “Technical specifications”.

Shipment and packaging

The product contains electrostatically sensitive components which can be damaged if not handled properly. Damages to the product can impair its reliability.

To protect the product from impact or shock, it must be shipped in its original packaging, or in an appropriate protective ESD packaging.
If the packaging is damaged, inspect the device for any visible damage, and immediately inform your freight forwarder and Bucher Automation AG of the damage caused during shipment. It is strictly forbidden to use a product that has been damaged or dropped.

9.3 Return and Disposal

The WEEE icon (crossed-out wheeled bin) says that end users must not dispose of waste electrical and electronic equipment together with household waste, but separately in an appropriate way. Applicable local environmental directives and regulations must be complied with.



Fig. 8: WEEE icon – crossed out wheeled bin

Disposal options

To do so, you may either resort to professional disposal service providers or return waste electronics to Bucher Automation AG.

Find detailed information along with the required Return Delivery Form on our website.

Batteries

Prior to disposing of waste electronics, remove any batteries where this is possible in a safe and non-destructive way. Dispose of batteries properly.

Personal data

It is the responsibility of the end user to delete any personal data stored on waste electric and electronic equipment prior to disposal.

Packaging material

The product's packaging materials must not be disposed of together with household waste.
Find detailed information on how to return packaging material to Bucher Automation AG on our website.

10 Service

10.1 Technical support

In case of questions, suggestions, or issues, please contact our experts from Technical Support. You may reach out by phone or through the contact form on our homepage:

Technical Support | www.bucherautomation.com

Or email us:

support@bucherautomation.com

Please supply the following information when contacting Technical Support:

– Hardware revision and serial number
  The hardware revision and serial number is printed on the nameplate of the product.

List of figures

Fig. 1 System overview 9
Fig. 2 Example of a nameplate 12
Fig. 3 Dimensions (in mm) 13
Fig. 4 Configuring the network adapter 15
Fig. 5 Main menu of the VMware® Workstation Player 16
Fig. 6 Identification 20
Fig. 7 User interface of the application 30
Fig. 8 WEEE icon – crossed out wheeled bin 59

List of tables

Tab. 1 System overview and system requirements 9
Tab. 2 Feature comparison JC-VM vs. JC-440EXT/JC-96xEXT 10
Tab. 3 USB flash drive properties 13
Tab. 4 States of the simulated mode selector 22

Bucher Automation AG
Thomas-Alva-Edison-Ring 10
71672 Marbach/Neckar, Germany
T +49 7141 2550-0
info@bucherautomation.com

www.bucherautomation.com