Jetter automation



User Manual

JV-1005 - HMI

60883675

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Significance of this User Manual

This document is an integral part of the JV-1005:

- Keep this document in a way that it is always at hand until the JV-1005 will be disposed of.
- Pass this document on if the JV-1005 is sold or loaned/leased out.

In any case you encounter difficulties to clearly understand the contents of this document, please contact Jetter AG.

We would appreciate any suggestions and contributions on your part and would ask you to contact us at the following e-mail address: info@jetter.de. Your feedback will help us produce manuals that are more user-friendly, as well as address your wishes and requirements.

In this document you will find useful information on the following topics:

- Shipping
- Mechanical installation
- Electrical installation
- Programming
- Operation
- Maintenance
- Repairs

Therefore, you must carefully read, understand and observe this document, and especially the safety instructions.

In the case of missing or inadequate knowledge of this document Jetter AG shall be exempted from any liability. Therefore, the operating company is recommended to obtain the persons' confirmation that they have read and understood this manual in writing.

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1 Safety instructions

Introduction

This chapter informs the user of basic safety instructions. It also warns the user of residual dangers, if there are any. Furthermore, it contains information on EMC.

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Basic safety instructions

Introduction

This device complies with the valid safety regulations and standards. Jetter AG attaches great importance to the safety of the users.

Of course, the user should adhere to the following regulations:

- Relevant accident prevention regulations
- Accepted safety rules
- EC guidelines and other country-specific regulations

Intended use

Intended conditions of use include operation in accordance with this User Manual.

The device is intended for installation in a machine or system. The JV-1005 is an HMI with touch screen.

The HMI JV-1005 may only be operated within the limits set forth in the technical specifications. The operating voltage of the HMI JV-1005 is classified as SELV (Safety Extra Low Voltage). Therefore, the HMI JV-1005 is not subject to the EU Low Voltage Directive.

Usage other than intended

The device must not be used in technical systems which to a high degree have to be fail-safe.

The JV-1005 is no safety-related part as per Machinery Directive 2006/42/EC. This device is not qualified for safety-relevant applications and must, therefore, NOT be used to protect persons.

If you intend to operate the device at ambient conditions not being in conformity with the permitted operating conditions, please contact Jetter AG beforehand.

Personnel qualification

Depending on the life cycle of the product, the persons involved must possess different qualifications. These qualifications are required to ensure proper handling of the device in the corresponding life cycle.

Product life cycle	Minimum qualification
Transport/storage:	Trained and instructed personnel with knowledge in handling electrostatic sensitive components.
Mounting/installation:	Specialized personnel with training in electrical engineering, such as industrial electronics technician.
Commissioning/ programming:	Trained and instructed experts with profound knowledge of, and experience with, electrical/drive engineering, such as electronics engineer for automation technology.
Operation:	Trained, instructed and assigned personnel with knowledge in operating electronic devices.
Decommissioning/ disposal:	Specialized personnel with training in electrical engineering, such as industrial electronics technician.

Modifications and alterations to the module

For safety reasons, no modifications and changes to the device and its functions are permitted.

Any modifications to the device not expressly authorized by Jetter AG will

	result in a loss of any liability claims to Jetter AG. **The original parts are specifically designed for the device. Parts and equipment from other manufacturers have not been tested by Jetter AG and are, therefore, not released by Jetter AG.** The installation of such parts may impair the safety and the proper functioning of the device. Any liability on the part of Jetter AG for any damages resulting from the use of non-original parts and equipment is excluded.
Transport	The device contains electrostatically sensitive components which can be damaged if not handled properly. To exclude damages to the device during transport it must be shipped in its original packaging or in packaging protecting against electrostatic discharge. ▪ Use an appropriate outer packaging to protect the device against impact or shock. ▪ In case of damaged packaging inspect the device for any visible damage. Inform your freight forwarder and Jetter AG.
Storing	When storing the device observe the environmental conditions given in the technical specification.
Repair and maintenance	The operator is not allowed to repair the device. The device does not contain any parts that could be repaired by the operator. If the device needs repairing, please send it to Jetter AG.
Disposal	When disposing of devices, the local environmental regulations must be complied with.

Instructions on EMC

Noise immunity of a system

The noise immunity of a system is determined by the weakest component of the system. For this reason, correct wiring and shielding of cables are of paramount importance.

Measures

Measures for increasing EMI in electric plants:

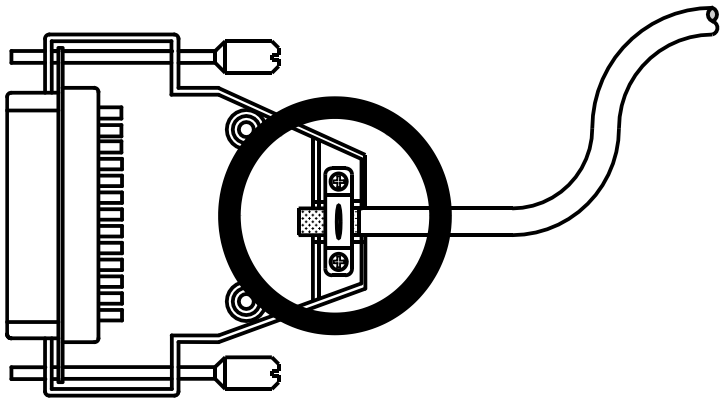
- Also refer to Application Note 016 *EMC-compliant installation of electric cabinets*.

The following instructions are excerpts from Application Note 016:

- **Physically separate** signal and power lines. We recommend a spacing greater than 20 cm. Cables and lines should cross each other at an angle of 90°.
- The following line cables must be shielded:
  Analog lines, data lines, motor cables coming from inverter drives (servo output stage, frequency converter), lines between components and interference suppressor filter, if the suppressor filter has not been placed at the component directly.
- Shield cables **at both ends**.
- Unshielded wire ends of shielded cables should be as short as possible.
- The entire shield, **must, in its entire perimeter,** be drawn behind the isolation, and then be clamped under the earthed strain relief **with the greatest possible surface area.**

When male connectors are used:

- Draw the shield, in its entire perimeter, under the shielding clamp of the metallized connector housing (impedance shielding), respectively of the EMC gland bushing, its greatest possible surface area being clamped under a strain relief.
- Only use metallized connectors, e.g. Sub-D with metallized housing. Make sure that the strain relief is directly connected with the housing here as well.

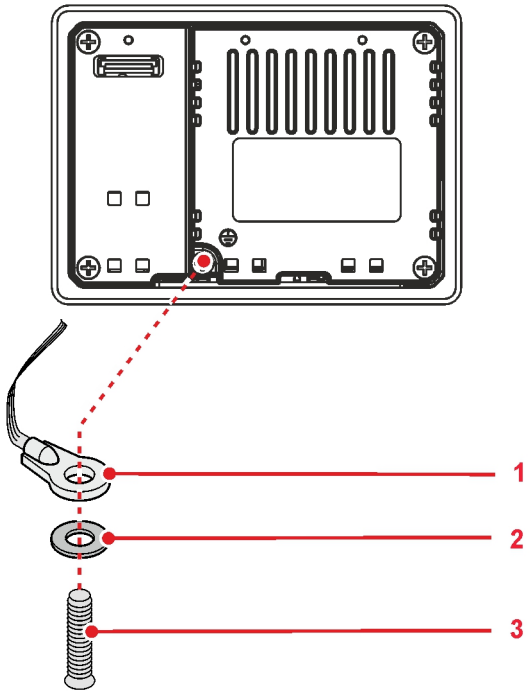


Downloading Application Note 016	You can download Application Note 016 *EMC-Compatible Installation of Electric Cabinets* from the Jetter AG **homepage http://www.jetter.de**. In order to download Application Note 016, browse the following path: *Downloads - Application Notes*.

Shielding

Connecting the shield

The device has a screw (3) on the back to which the grounding cable for shielding can be attached. Screw the grounding cable down to the shield connection with a Phillips screwdriver as shown in the illustration.



Number	Part	Description
1	Cable lug	Size 4 with grounding cable
2	Toothed lock washer	Size M4
3	Phillips screw	Size M4 x 8

Proceed as follows:

Step	Action
1	Unscrew the corresponding Phillips-head screw (3), see figure above.
2	Pull the toothed lock washer (2) and cable lug (1) over the thread of the Phillips-head screw (3).
3	Screw the Phillips screw (3) back into the JV-1005.
4	Connect the other end of the ground wire to the functional ground terminal. Make sure that the minimum cross-section of the grounding cable is 1 mm^2.

Result: Now the device is shielded.

2 Identifying the JV-1005

Purpose of this chapter

This chapter supports you in retrieving the following information about the JV-1005:

- Determining the hardware revision
- Determining the software version

Information for hotline requests

If you wish to contact the Jetter AG hotline due to a problem, please have the following information on the JV-1005 ready:

- Serial number
- Hardware revision
- Software versions

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2.1 Identification by means of the nameplate

Introduction

The nameplate is attached to the housing of the JV-1005 and contains details, such as hardware revision number and serial number. If you have to contact the hotline of Jetter AG in case of a problem, please have this information ready.

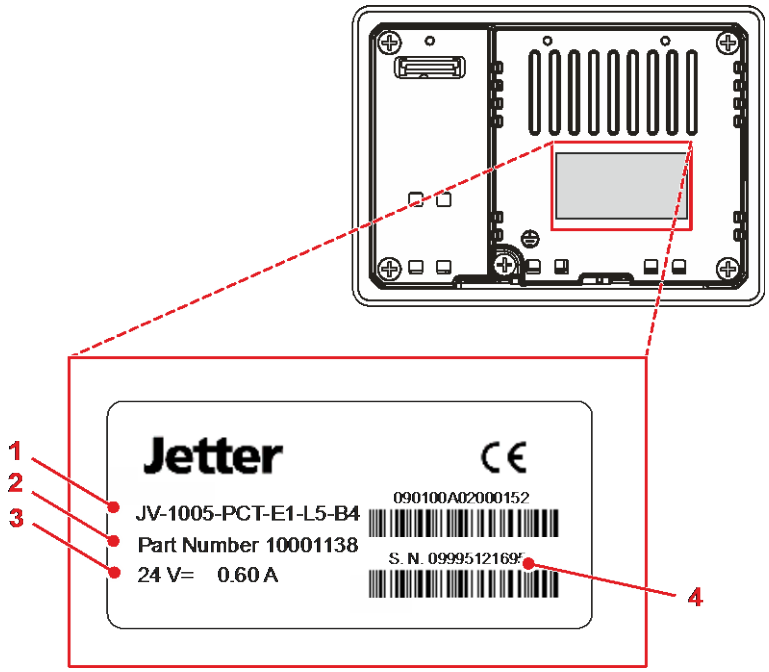
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Nameplate

Nameplate

The nameplate of a JV-1005 contains the following information:



Number	Description
1	Device designation
2	Item number
3	Electrical data
4	Serial number

2.2 Reading out the software versions

Introduction

The HMI JV-1005 has several different software versions. This chapter describes how to read out these software versions.

You can use the following options to read out the software versions:

- HMI software version - via special registers
- Windows software version - via JV Device Manager

Using the JV Device Manager

The **Device Manager** (see page 59) lets you read out the Windows software version. Proceed as follows:

Step	Action
1	Launch the **JV Device Manager**.
2	Open the **Info** menu.
3	Click the **Software** tab.

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Topic **Page**

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Software versions

Introduction

The device features software with unique version numbers which can be read out via special registers.

Format of software version numbers

The software version numbers of the device are four-figure values.

1	.	2	.	3	.	4

Element	Description
1	Major or main version number
2	Minor or secondary version number
3	Branch or intermediate version number
4	Build version number

Registers - Overview

The registers listed below let you read out the software versions:

Registers	Description
200168	Boot loader version
200169	Operating system version
210001	Version of the execution unit for the STX application program (STX VM version)

3 Product description and design

Introduction

This chapter covers the design of the device, as well as how the order reference is made up including all options.

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Order reference	25

Product description

The HMI JV-1005

The JV-1005 is a compact full-graphics HMI. It supports both gesture and touch control.

Product features

The product features are listed below:



- Display: 5" TFT 16:9 with LED backlight, typically 200 cd/m^2
- Resolution: WVGA (800 x 480 pixels)
- Real-glass touchscreen (PCT)
  - Single-touch with CE 6.0
  - Multi-touch with WEC 2013
- Dimmable display
- 128 Mbyte Flash
- 256 MByte DDR
- 1 serial interface RS-232, RS-485, RS-422. Interface type can be configured in the software.
- 2 Ethernet interfaces 10 MBit/s, 100 MBit/s, with integrated switch
- 1 USB host interface, USB 2.0 and 1.1
- SD card slot
- 1 slot for an optional expansion module
- Real-time clock with battery backup
- Buzzer

Scope of delivery

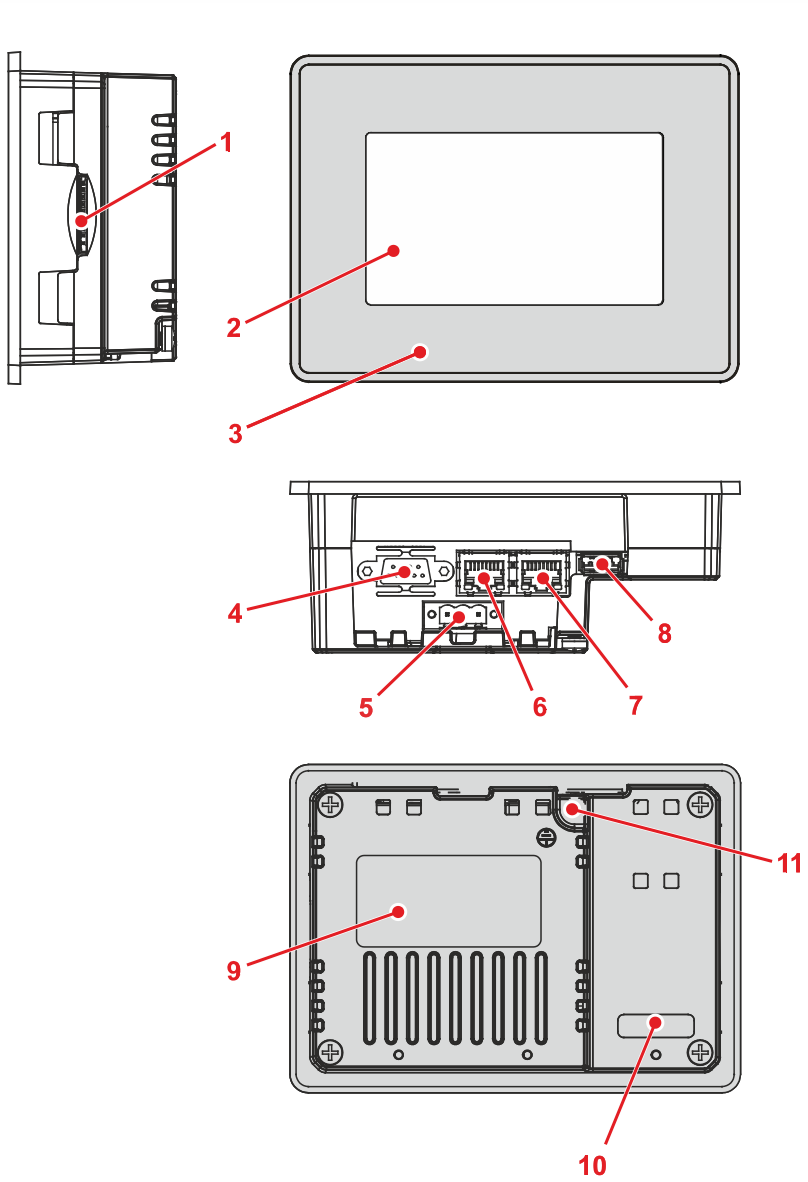
The HMI JV-1005 is shipped with the following accessories:

Quantity	Description
1	JV-1005
4	Fastening clips
1	Power supply terminal, 3 pins Phoenix Contact MSTB 2.5/3-STF-5.08
1	Gasket

Parts and interfaces

Parts and interfaces

The HMI JV-1005 has a touchscreen with a screen diagonal of 5". The illustration shows the interfaces of the device.



Number	Part	Description
1	MMC/SD card slot	MMC/SD memory card reader
2	Display screen	Active touch screen area
3	JV-1005	HMI JV
4	9-pin female Sub-D connector	Serial port

Number	Part	Description
5	Connector	DC 24 V power supply
6	RJ45 jack	Ethernet port 1 with switch
7	RJ45 jack	Ethernet port 2 with switch
8	USB port	USB host, 2.0 and 1.1
9	Nameplate	Nameplate with device-specific information
10	Socket	Socket for an optional expansion module
11	M4 screw	Shielding connection

Order reference

Order reference

You can order the HMI JV-1005 from Jetter AG under the following item number:

Item no.	Order reference
10001138	JV-1005-PCT-E1-L5-B4 Operating system Windows CE 6.0
10001441	JV-1005-PCT-E1-L5-B9 Operating system Windows Embedded Compact 2013 (WEC 2013)

Option CANopen®

As an option, the HMI can be ordered as variant -B9 with a CANopen® interface. The order reference is JV-1005-...-B9-CO.

Item no.	Order reference
10001716	JV-1005-PCT-E1-L5-B9-CO ■ Operating system Windows Embedded Compact 2013 (WEC 2013) ■ CANopen® Interface

Note that the option can only be installed at the factory.

Spare parts

You can order spare parts from Jetter AG under the following item numbers:

Item no.	Order reference
60882042	JV-1005_SP1 Service Pack 1 Installation kit 1 with 4 fastening clips and 1 power supply connector
60882045	JV-1005_SP2 Service Pack 2 Installation kit 2 with 1 gasket

4 Quick launch

Introduction

This chapter safely guides you through the feature of device quick launch.

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Quick launch

Connecting the voltage supply

For information on how to connect the power supply, please turn to **Connecting the voltage supply** (see page 48).

Connecting USB keyboard and mouse

For information on how to connect a USB keyboard and mouse, refer to **Connecting an input device** (see page 54).

Since some devices have only one USB port, it is advisable to use a USB hub.

Establishing an Ethernet connection

For connecting an Ethernet cable, please turn to **Ethernet interfaces** (see page 49).

Find an apt cable to be connected between HMI and PC.

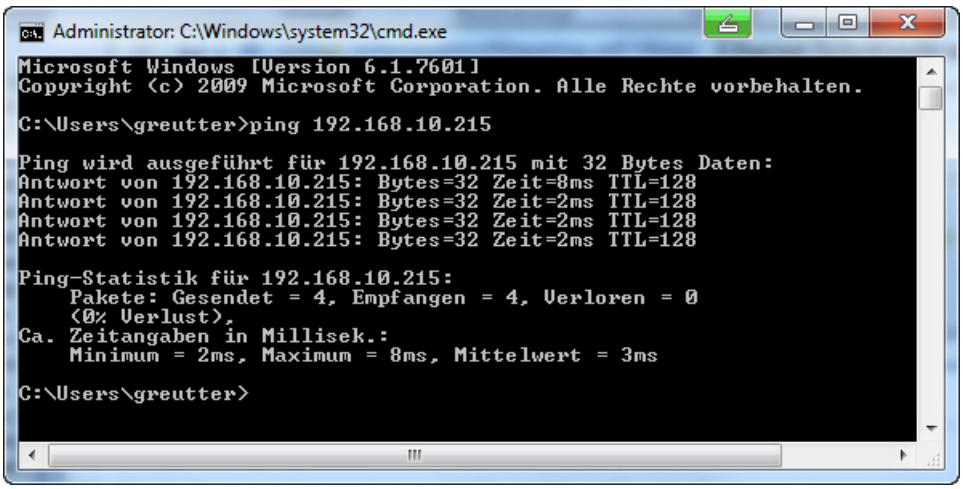
A static IP address must be set for connecting the PC. The first three octets of the IP address must match, e.g. 192.168.10.*.

If the PC has been connected to a company network, we recommend to communicate via another Ethernet network.

Checking the Ethernet connection

In the DOS shell of the PC (**cmd.exe**), issue the command **ping** followed by the IP address set on the HMI.

The following screenshot shows that the communication works.



Setting up the development environment

For information on setting up the development environment, see the JetViewSoft help.

Using the development environment	For information on how to use and program the development environment, see **Programming** (see page 111). Further information is available in the online help of JetSym and JetViewSoft.

The Windows Embedded Compact 2013 user interface

WEC 2013 user interface

If no visualization is running on the HMI, the user interface of Windows Embedded Compact 2013 appears.

If a visualization is running on the HMI, you can end it by entering **[Ctrl]+[End]**.

The user interface has only the menu item **Command**.

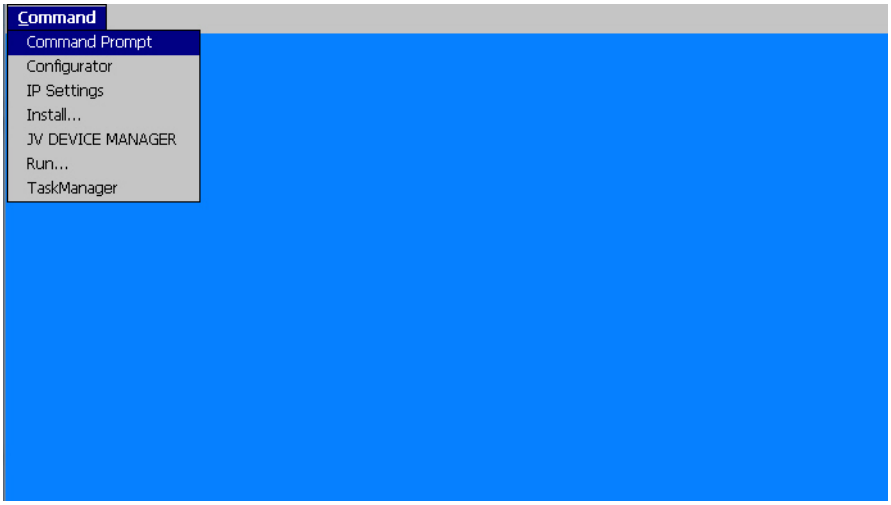
The **Command** menu has the following menu items:

- **Command Prompt**
- **Configurator**
- **IP Settings**
- **Install...**
- **JV DEVICE MANAGER**
- **Run...**
- **TaskManager**

Command Prompt

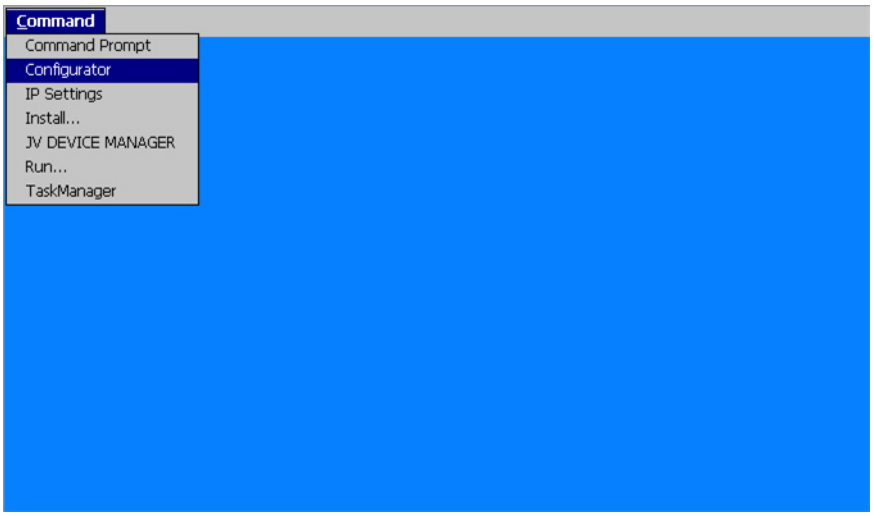
By clicking on the menu item **Command Prompt** the DOS Command Shell of Windows is invoked.

Standard Windows commands, such as **copy** or **ping**, can be executed there.



Configurator

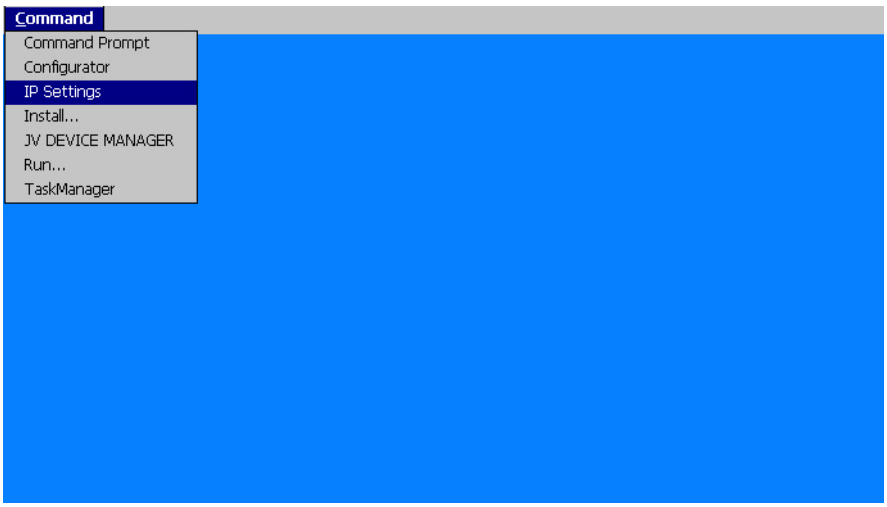
By clicking on the menu item **Configurator** the configurator of the JV-1005 is invoked.



The menus of the configurator are described in **Configurator** (see page 76).

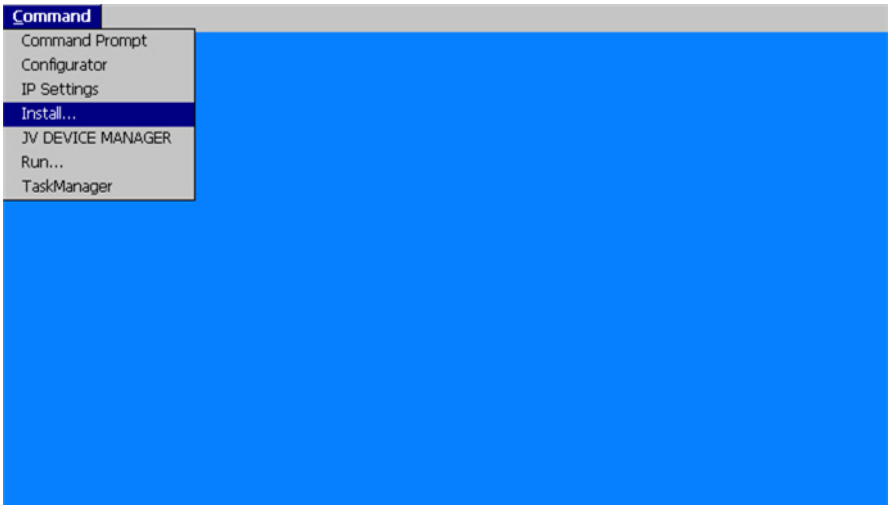
IP Settings

By clicking on the menu item **IP Settings**, the IP address and subnet mask for the HMI can be set.



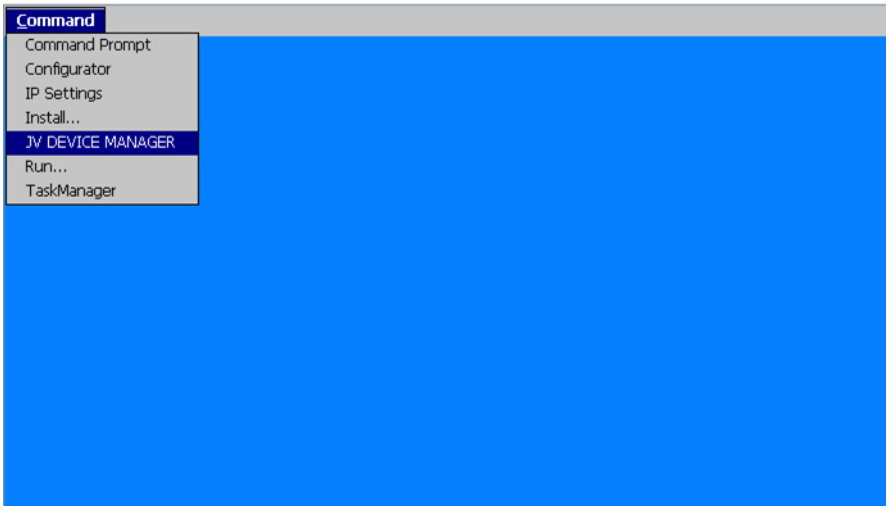
Install

By clicking the menu item **Install...** cabinet files (***.cab**) can be installed. The installation package for the Embedded Runtime is stored in a cabinet file.



JV DEVICE MANAGER

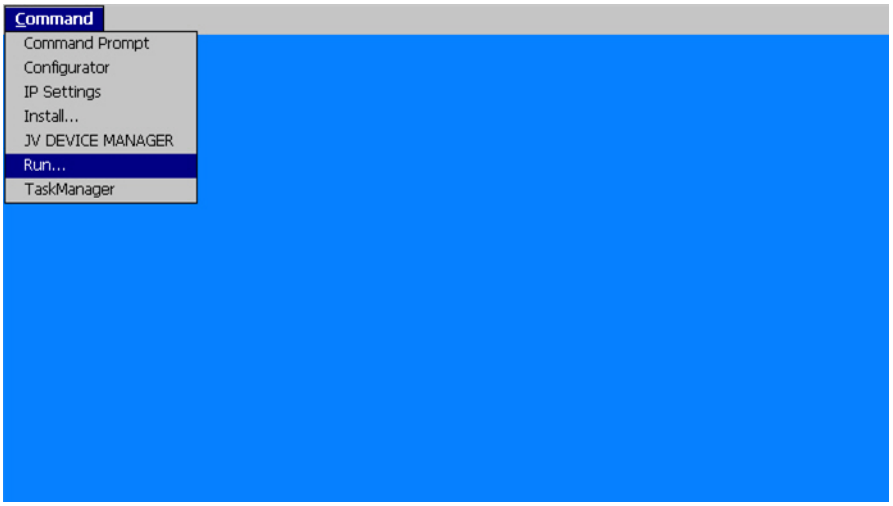
By clicking on the menu item **JV Device Manager** the JetView Device Manager of the JV-1005 is invoked.



The menus of JetView Device Managers are described in the **JetView Device Manager** (see page 59).

Run

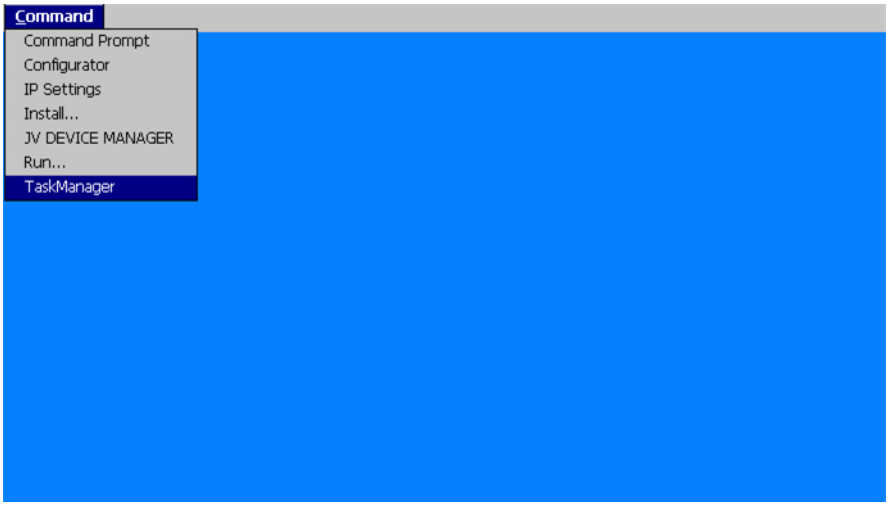
By clicking the menu item **RUN...** executable files (***.exe**) can be executed.



TaskManager

By clicking on the menu item **TaskManager** the Task Manager is invoked. The Task Manager starts and closes programs.

	NOTE!
	Software crash possible! The device's software may crash. The device must then be restarted. ➢ Do not use the Task Manager.

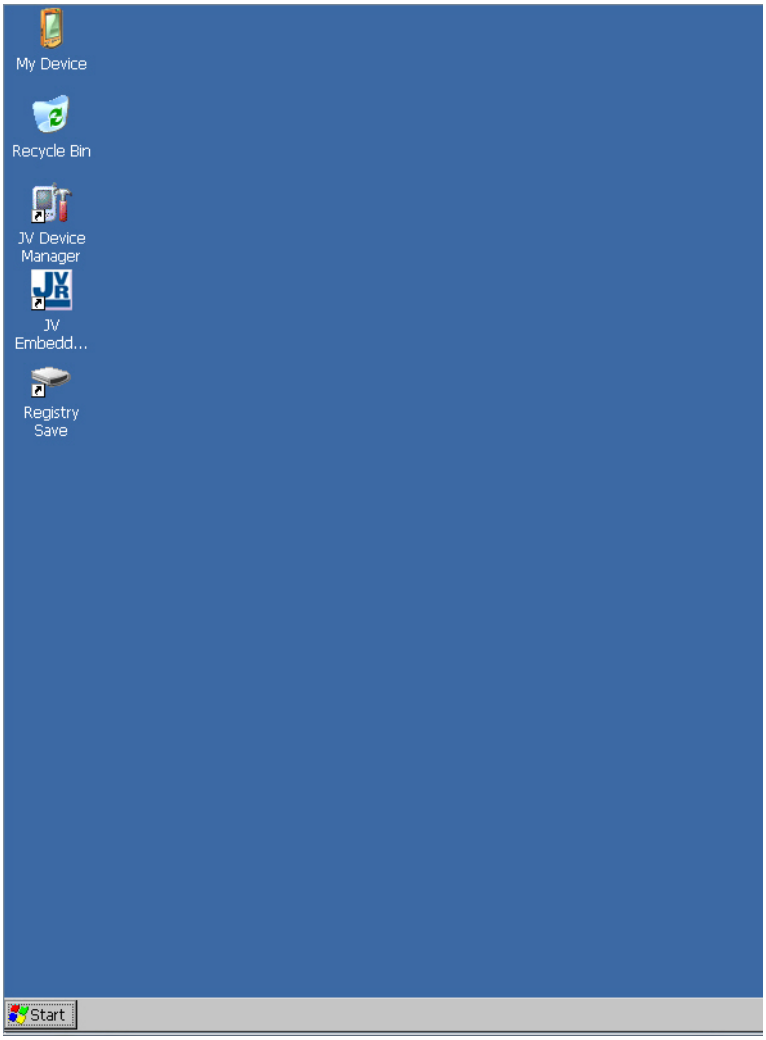


Windows CE 6.0 user interface

Windows CE 6.0 user interface

If no visualization is running on the HMI, the following interface of Windows CE 6.0 appears.

If a visualization is running on the HMI, you can end it by entering **[Ctrl]+[End]**.



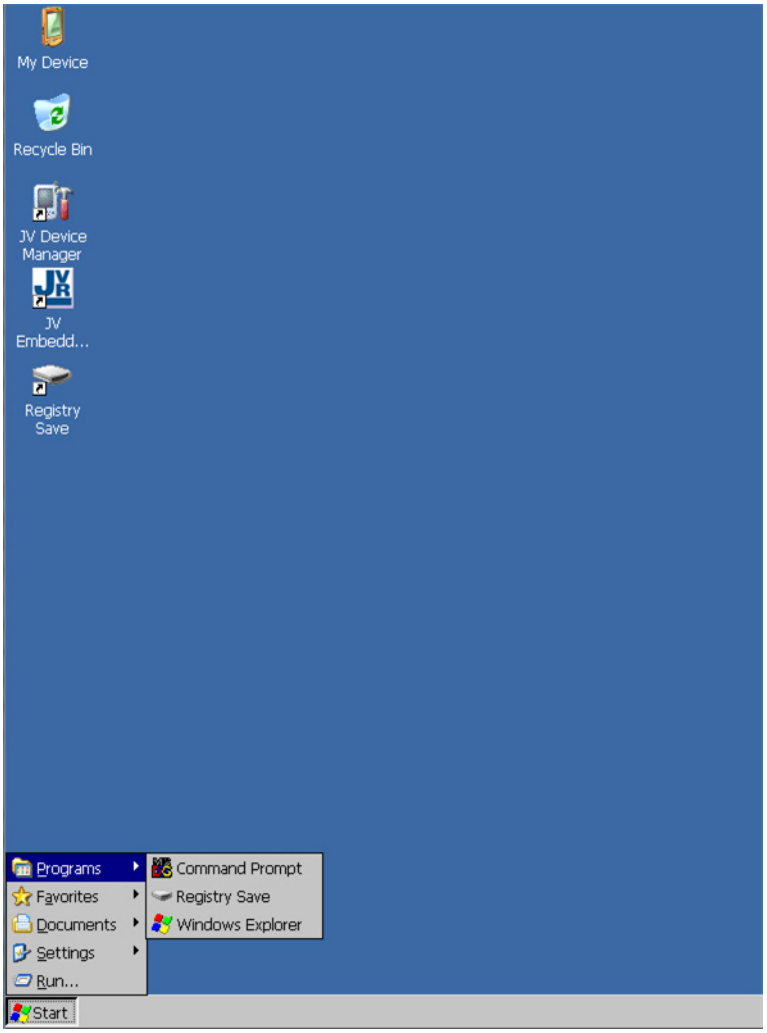
The menu of Windows CE 6.0 has the following menu items:

- **Command Prompt**
- **IP Settings**
- **JV Device Manager**
- **Run...**

Command Prompt

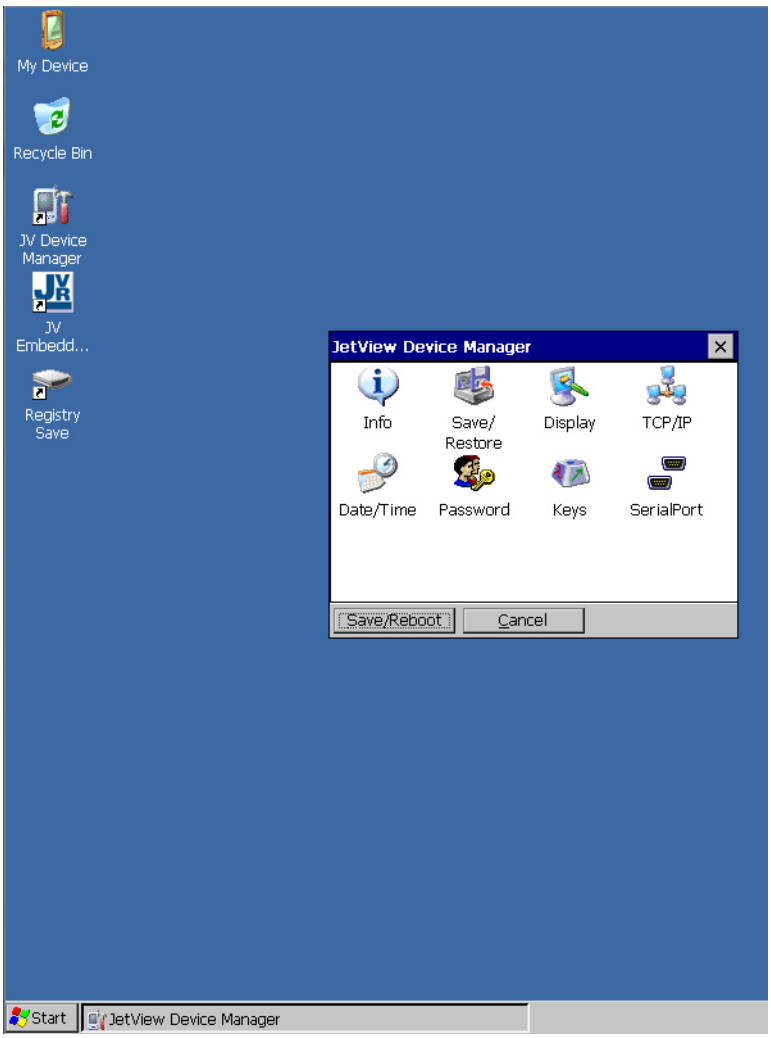
By clicking on **Start -> Programs -> Command Prompt** the DOS Command Shell of Windows is invoked.

Standard Windows commands, such as **copy** or **ping**, can be executed there.



JV Device Manager

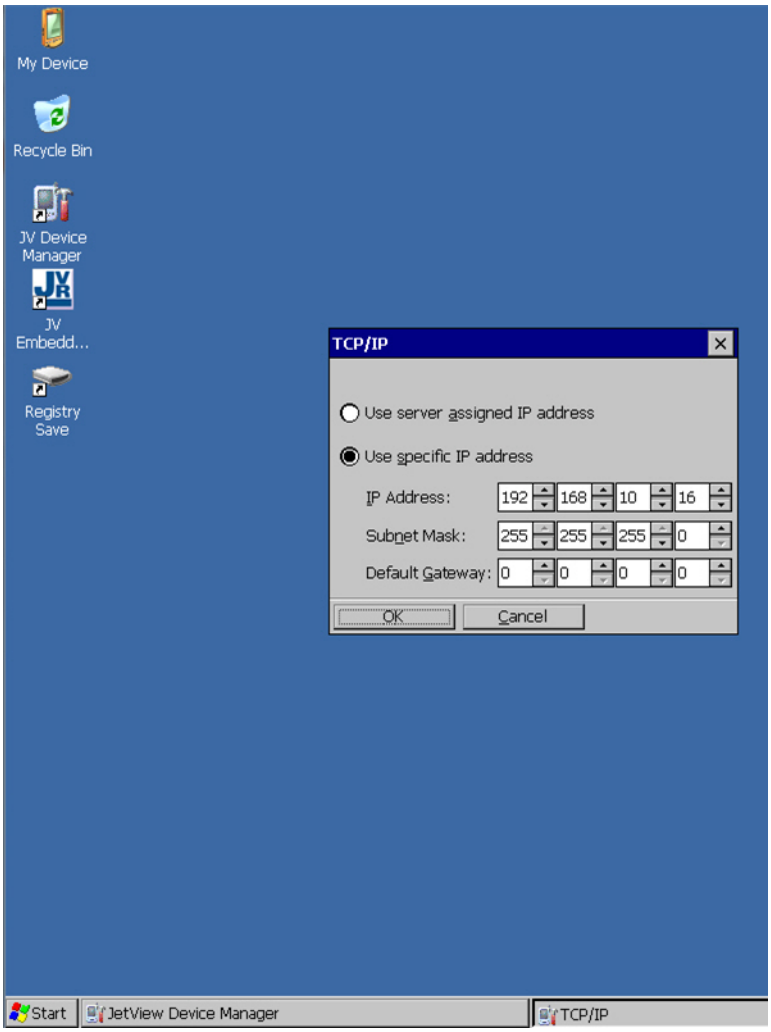
By double-clicking on the menu item **JV Device Manager** the JetView Device Manager of the JV-1005 is invoked.



The menus of JetView Device Managers are described in **JetView Device Manager** (see page 59).

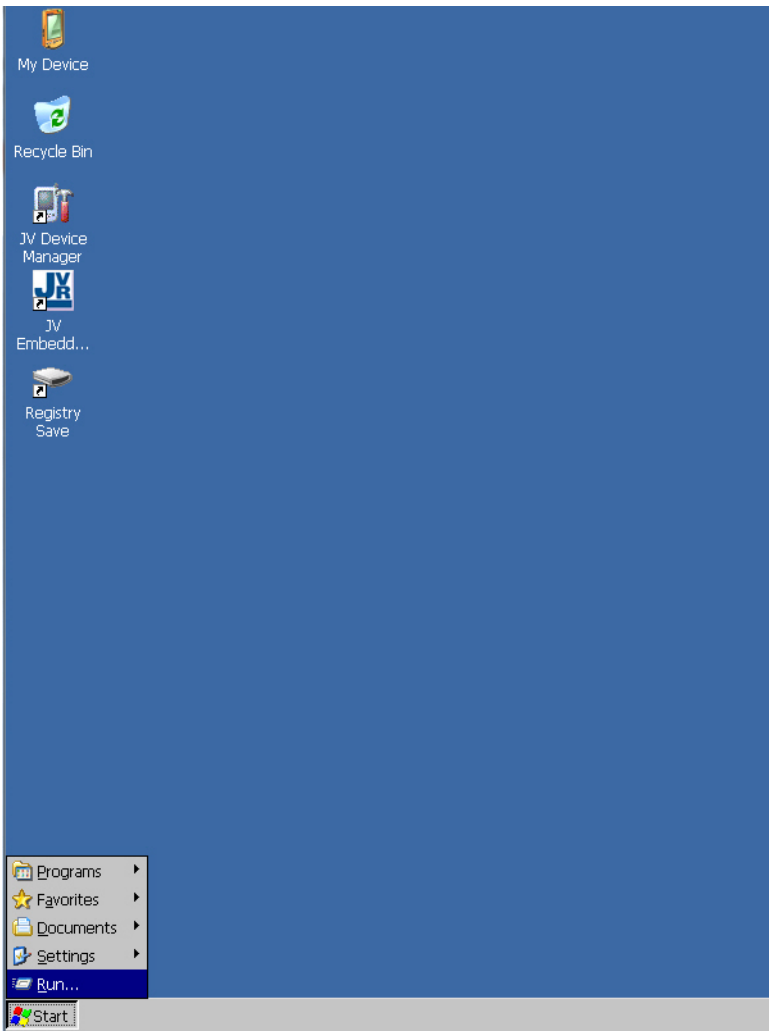
IP Settings

The IP address is set in menu item **TCP/IP** in JetView Device Manager. Double-click the **JV Device Manager** icon to open the **JetView Device Manager** menu. Double-click the **TCP/IP** icon to open the **TCP/IP** menu where you can set the IP address.



Run

By clicking the menu item **Start-> Run** executable files (***. exe**) can be executed.



5 Mechanical and electrical installation

Purpose of this chapter

This chapter deals with mechanical and electrical installation of the HMI JV-1005 regarding the following aspects:

- Space requirement of the HMI
- Installation instructions
- Planning the wiring layout
- Configuration of the IP interface

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5.1 Installing the JV-1005

Introduction

This chapter describes how to install the JV-1005.

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Installation location

Selecting an installation location

Select a suitable place for the device to be installed. The place where the device is to be installed must meet the following requirements:

- To ensure ventilation, the mounting surface must not be more than 3 mm thick.
- The installation location must allow air to circulate.
- The installation location must be accessible for servicing.
  - It should be possible to disconnect the connectors at any time.
  - You must be able to insert the MMC/SD card into the slot and remove it from the slot at any time.

Avoiding unsuitable installation locations

The following installation locations are unsuitable for mounting the HMI:

Unsuitable installation location	Reason
Outdoor installation	The HMI must not be exposed to rain or a jet of water. Therefore, do not use a steam jet or other such devices to clean the HMI.
This location is not ventilated.	The HMI could overheat as heat builds up.
Location close to heat-sensitive materials	The materials could become warped or misshapen as a result of heat produced by the HMI.
Uneven surface of the mounting cutout with ribs and elevations	The installation surface could become misshapened when fitting the HMI. Fastening is unstable and precarious.

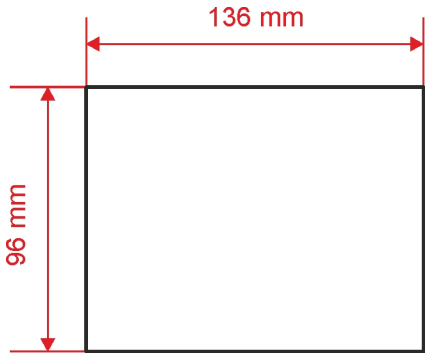
Ergonomic principles

Avoid installation locations that are unsuitable from an ergonomic point of view:

- Extreme angles which could make it difficult to read the HMI
- Unsuitable lighting conditions with reflection and glare
- Concealed installation locations that are difficult for the user to access

Preparing for installation

Make a square opening. The diagram shows the dimensions:



Installation

Prerequisite

You have prepared a mounting cutout for the HMI.

Ventilation slots

When installing, make sure that the ventilation slots are not covered.

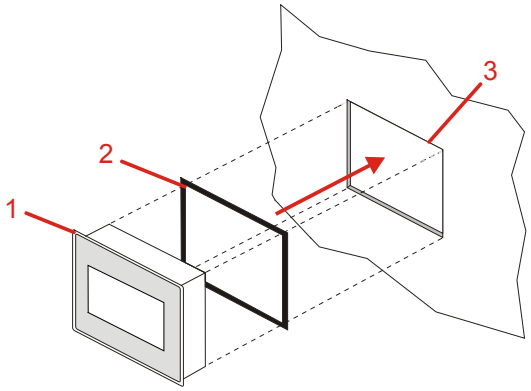
Fastening material

The following fastening parts are required for installation:

- Screw terminals
- Screwdriver
- Gasket

Installing the gasket

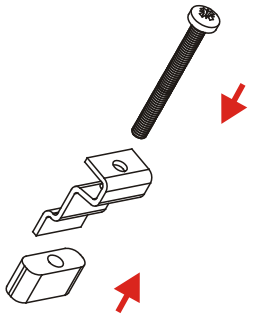
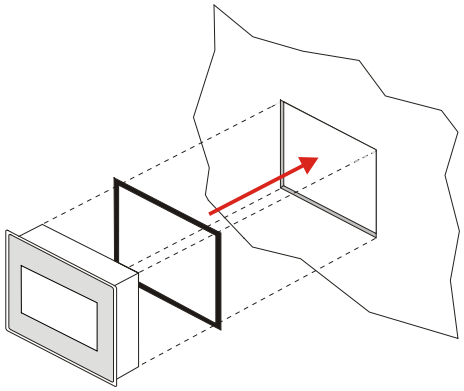
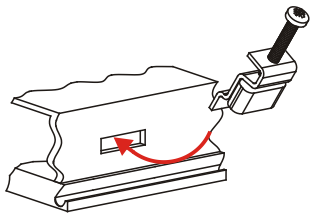
The figure shows how to install the gasket during installation.



Number	Description
1	HMI
2	Gasket
3	Cutout e.g. in the control cabinet

Installation

To fasten the HMI, proceed as follows:

Step	Action
1	Assemble the parts of the supplied fastener sets to become four screw brackets. 
2	Insert the HMI with its gasket into the cutout. 
3	Fasten the HMI with the four screw brackets. Tighten the screws until the frame rests on its entire surface. 

5.2 Ports and interfaces

Power supply connector

The connector has the following functions:

- Power supply of the JV-1005

Ethernet interface

The two RJ45 jacks have the following function:

- Ethernet interface to a PC
- Ethernet interface to other devices, such as a controller

Serial port

The 9-pin Sub-D connector (female) has the following function:

- Serial interface to a PC
- Serial interface to any device

USB port

The USB port serves the following purposes:

- Updating the system via USB flash drive
- Interface to USB flash drives for memory expansion
- Interface for USB devices, such as mouse or keyboard

Slot for removable storage

The device has a slot for SD cards.

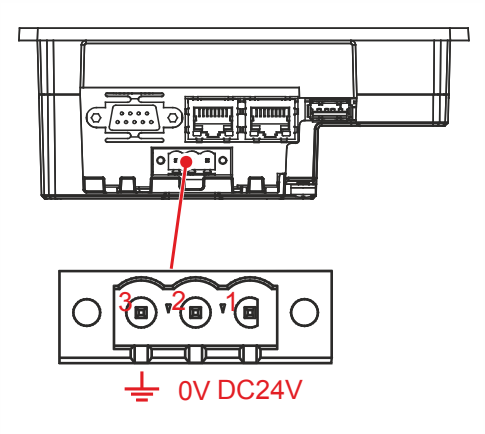
Content

Topic	Page
Power supply	48
Ethernet interfaces	49
Serial port	51
Expansion slot	53
USB port	54
SD memory cards	55

Power supply

Power supply

The illustration shows the pin assignment of the power supply connector.



Pin	Signal	Description
1	DC 24 V	Supply voltage
2	0 V	Reference potential
3	SHLD	Shielding connection

Technical specifications

Parameter	Description
Operating voltage	DC 24 V
Permissible voltage range	DC 18 V ... DC 32 V
Current consumption, max.	0.8 A
Power consumption, max.	19.2 W

Related topics

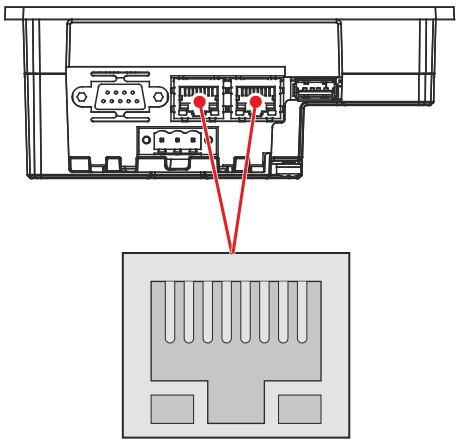
- **Connecting a device to the Ethernet interface** (see page 49)
- **Connecting a device to the serial interface** (see page 51)

Ethernet interfaces

Ethernet interface: RJ45 jacks

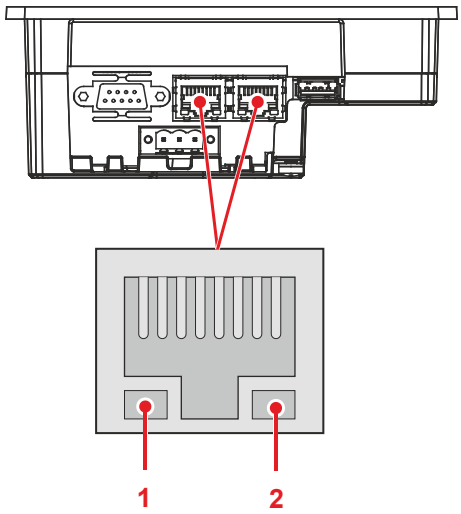
The two RJ45 jacks let you connect the following devices:

- Controller
- PC
- Any device with Ethernet interface



LEDs

The illustration below shows the status LEDs of the RJ45 jack:



Number	Element	Description
1	LED (amber)	Lights up when connection has been established
2	LED (green)	Blinks when active

Technical specifications

Parameter	Description
Connector type	RJ45 Ethernet port
Number of ports	Two; interconnected via internal switch
Bit rate	10 MBit/s, 100 MBit/s (Cat 5e)
Auto-crossover	Yes

Cables for RJ45 jacks

For connecting devices to the RJ45 jacks you can order the following cables:

Item no.	Item
60537500	Patch cable 1:1, 1 m, gray, Hirose, Cat 5e, shielded
60854512	Patch cable 1:1, 2 m, gray, Hirose, Cat 5e, shielded
60854514	Patch cable 1:1, 5 m, gray, Hirose, Cat 5e, shielded
60854515	Patch cable 1:1, 10 m, gray, Hirose, Cat 5e, shielded
60854078	Patch cable cross-over, 1 m, gray, Hirose, Cat 5e, shielded
60851216	Patch cable cross-over, 3 m, gray, Hirose, Cat 5e, shielded
60854079	Patch cable cross-over, 10 m, gray, Hirose, Cat 5e, shielded

Related topics

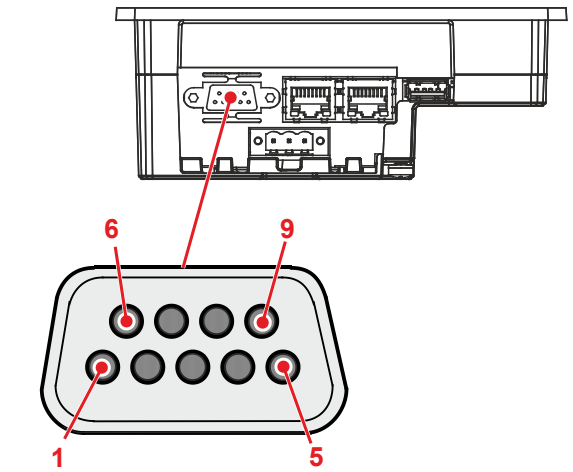
- **Connecting the voltage supply** (see page 48)
- **Connecting a device to the serial interface** (see page 51)

Serial port

Pin assignment

You need a 9-pin Sub-D connector for connection to the device.

The figure below shows the position and assignment of the individual pins of the serial interface.



Pin	Signal for RS-232	Signal for RS-422/RS-485	Description
1	GND	GND	Ground reference
2	-	-	
3	TxD	CHA-	Transmit data (reference: JV/differential connection CHA
4	RxD	CHB-	Receive data (reference: JV/differential connection CHB
5	-	-	
6	5 V output	5 V output	
7	-	CHB+	Differential connection CHB
8	-	CHA+	Differential connection CHA
9	-		

Note on RS-485 connection

To enable data transfer via RS-485 connection, jumper the following pins of the Sub-D connector (male):

- Jumper pin 3 and pin 4
- Jumper pin 7 and pin 8

Note on the cables

When wiring the serial interface with devices of other manufacturers, note that the pin assignment of the serial interface of other devices may differ from the assignment of the pre-assembled cables from Jetter AG.

Setting in JV Device Manager

The JV Device Manager lets you configure the device. At the time of delivery, the default setting is RS-232.

Set which serial interface is connected. Select RS-232, RS-422 or RS-485 in theJV Device Manager.

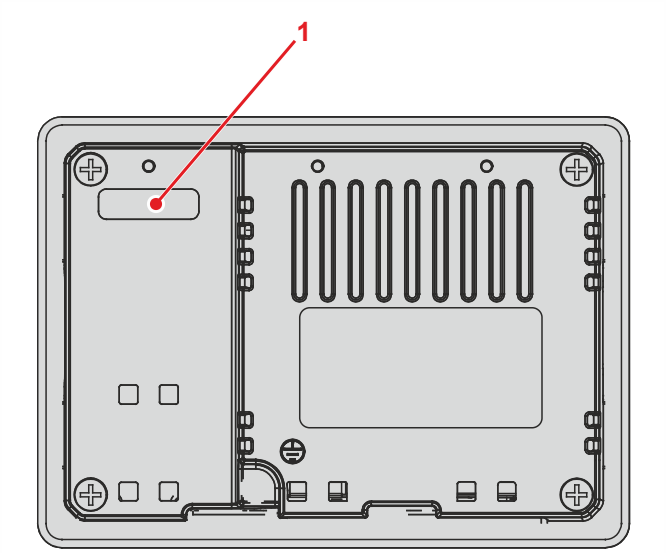
Related topics

- **Configuring the serial interface** (see page 71)
- **Connecting the voltage supply** (see page 48)
- **Connecting the device to the Ethernet port** (see page 49)

Expansion slot

Slot position

The following figure shows the position of the slot (1) for an optional expansion module on the HMI JV-1005.



Purpose of the slot

The slot provides the communication channels for the following optional expansion module:

- CANopen® interface for the model **CO**.

USB port

Type of access

The HMI can read from and write to a USB flash drive. The HMI supports both, USB 1.1 and 2.0.

Prerequisites

The USB flash drive must be formatted in FAT format and be compatible with USB 1.1 or 2.0.

Supported USB flash drives

Jetter AG gives no guarantee that an HMI can read from or write to all USB flash drives available on the market.

Read/write acces to a USB flash drive

To read data from a USB flash drive or to write data to it, proceed as follows:

Step	Action	
1	Insert the USB flash drive into the USB port.	
⇨	In Windows Explorer the folder **USBMemory** is now visible.	
2	**If ...**	**... then ...**
	... the visualization application is running, ...	... you can use the STX file functions to save files to the USB flash drive or read them. For more information on STX file functions, such as FileOpen, refer to JetSym help.
	... the visualization application has been closed, ...	... you can access the USB flash drive via Windows Shell.

Backing up and loading user data

An SD memory card or a USB flash drive lets you back up and load user data.

Connecting a USB input device

You can connect an external keyboard or mouse to the USB port of the HMI.

Approved USB keyboard

The USB keyboard by CHERRY with the article number G84-4100LCMDE-0/02 has been approved as an input device.

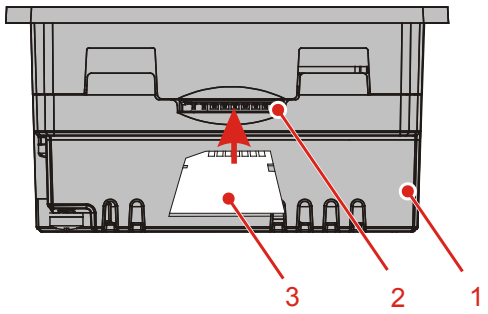
Related topics

- **Backing up and restoring the runtime environment and projects** (see page 91)
- **Read/write access to SD memory cards** (see page 55)

SD memory cards

Inserting an SD memory card

Insert an SD memory card as shown in the figure. The SD card snaps into place with an audible click.



Number	Description
1	HMI JV-1005
2	SD card slot
3	SD memory card

Prerequisite

Format the SD card in **FAT format** so that the HMI can read and write to the SD card.

Read/write access to a memory card

To read data from a memory card or to write data to it, proceed as follows:

Step	Action	
1	Insert the SD card into the card slot.	
	If ...	**... then ...**
	... the JV-1005 with its display points **upwards, ...**	... insert the card with the **contacts facing up** into the card slot until the SD card audibly clicks into place.
⇨	In Windows Explorer the folder **Storage Card** appears.	
2	**If ...**	**... then ...**
	... the visualization application is running, ...	... you can use the STX file functions to save files to the SD card or read them. For more information on STX file functions, such as FileOpen, refer to JetSym help.
	... the visualization application has been closed, ...	... you can access the SD card drive via Windows Shell.

Backing up and loading user data	An SD memory card or a USB flash drive lets you back up and load user data.
Related topics	

- **Backing up and restoring the runtime environment and projects** (see page 91)
- **Read/write acces to a USB flash drive** (see page 54)

6 Configuring the HMI

Introduction

This chapter describes the JV Device Manager and Configurator. Your can use both tools to configure the HMI.

Furthermore, it describes the update of the JVER and the tool **JVERSystemupdate**, with which you can safely save and load the runtime environment and projects.

Connecting a USB keyboard

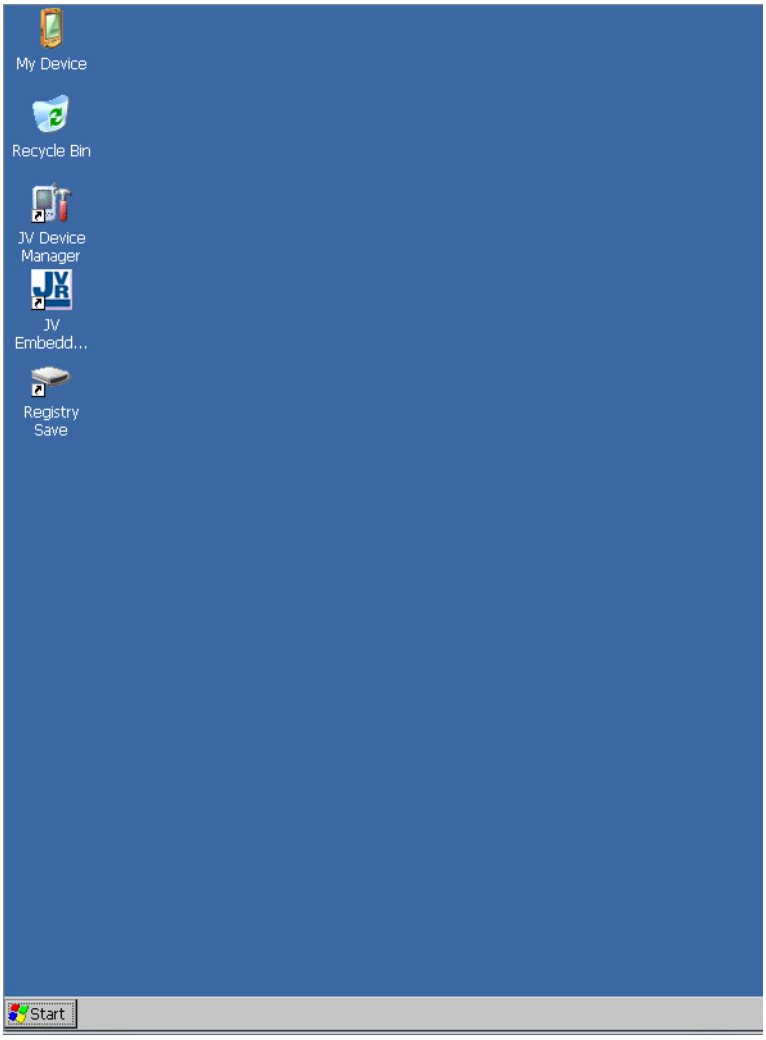
For service purposes it makes sense to connect a keyboard and mouse via the USB interface, because it is difficult to select the commands by touching them due to the low hit accuracy. It also makes sense to use a USB hub since only one USB port, which supports USB 2.0 and USB 1.1, is available.

Closing the visualization application

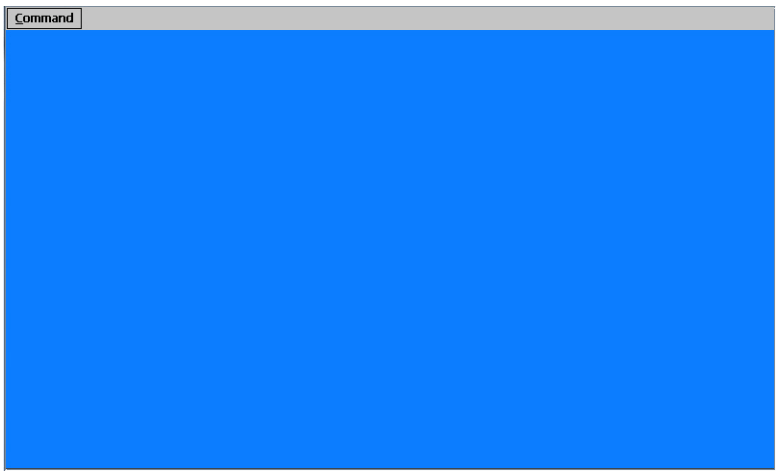
If a visualization application is running on the HMI, you can close it by entering **[Ctrl] + [End]**.

Then, the Windows interface appears.

Windows CE 6.0:



Windows Embedded Compact 2013:



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Topic	Page
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Backing up and restoring the runtime environment and projects	91
Updating JVER in JetViewSoft via Ethernet	95

6.1 Der JV Device Manager

Introduction

This chapter describes the functions of the JV Device Manager and how to use it.

JV Device Manager is a Windows user interface for calling up the various menus used, for example, for configuring the HMI software. It lets you display all important software and hardware information and configure your HMI.

You can save the settings made to the system in a configuration file. This configuration file can be reused for other HMIs with the same system requirements. Simply import this file into the other device.

Contents

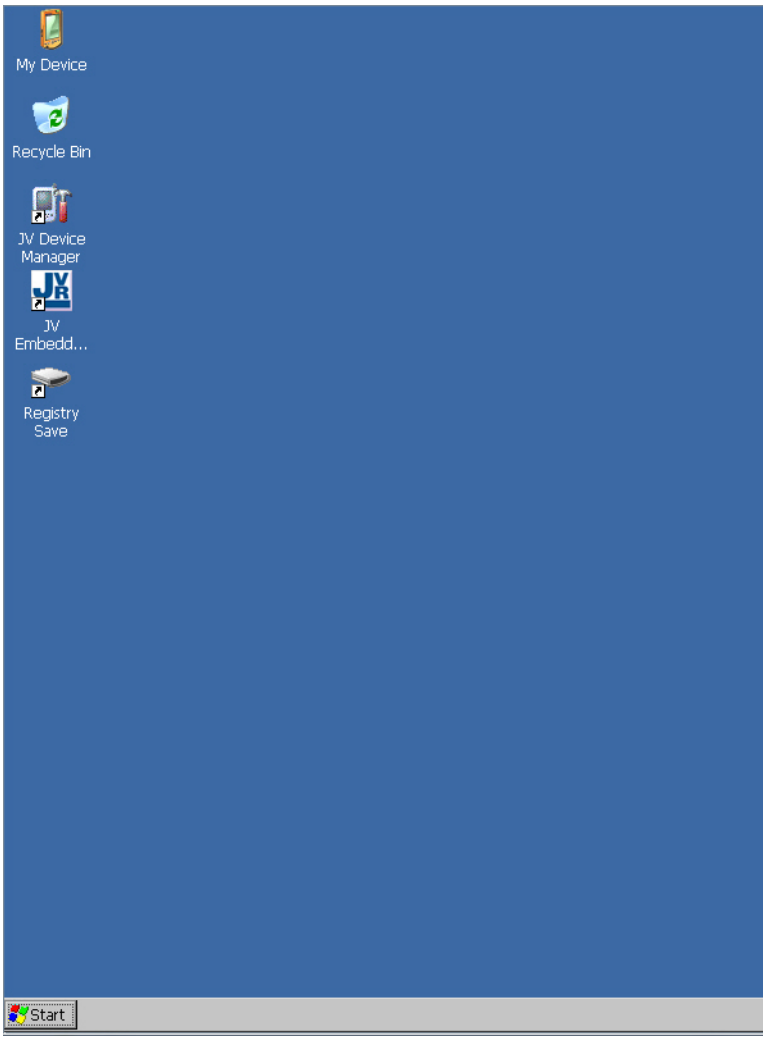
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JV Device Manager - Main menu

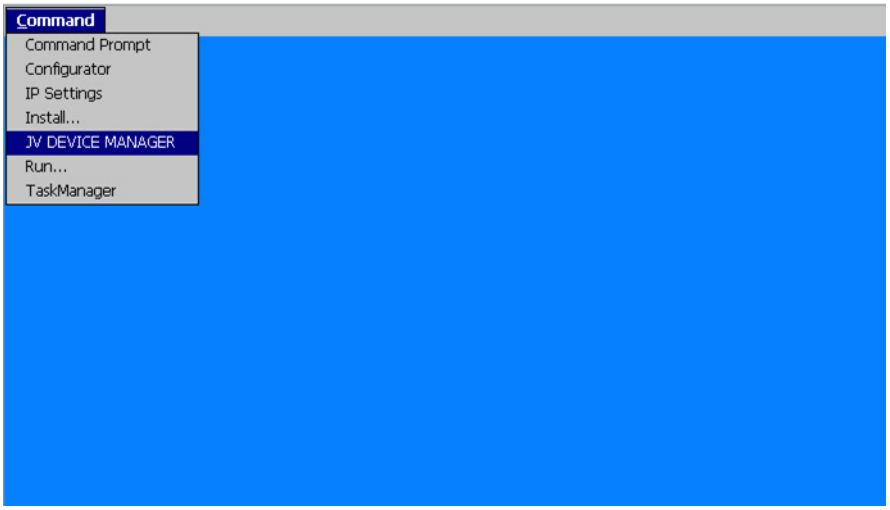
Launching the JV Device Manager

In the case of Windows CE 6.0:

To start the JV Device Manager, double-click the **JV Device Manager** icon.



In the case of Windows Embedded Compact 2013:
Start the JV Device Manager via menu **Command -> JV DEVICE MANAGER**.



JV Device Manager - Main menu

The following screenshot shows the areas of the JV Device Manager.



Number	Element	Description
1	Icons	Click on one of the icons to open the configuration menus.
2	Buttons	The **Save/Reboot** button lets you save the settings made. If necessary, the HMI reboots. Click the **Cancel** button to exit the JV Device Manager. Any changes made to the settings will be discarded.

Operating the JV Device Manager

Selecting or opening a menu

Buttons and icons let you open various menus and setting options. To access these menus, you have the following options:

If ...	... and ...	... then ...
... you connect an external keyboard and mouse, ...	-	... the operation is as usual under Windows.
... you use the touchscreen ...	... you want to select a button, ...	... touch the button once.
... you use the touchscreen ...	... want to open a menu, ...	... touch the button twice briefly (like double-clicking).

Available controls

A menu has several controls. You operate these controls via touchscreen as follows:

Control	Operation
Button	Touch the button to select it.
Radio Buttons	Touch the option to select it.
Check box	Touch the check box to select it.
Drop-down list	Touch the drop-down list to select it.
Text box	Tapping lets you only select a text box. If you want to enter or change a value, you need an external keyboard or a numeric keypad.
Combo box	■ To expand a combo box, tap the combo box arrow. ■ Tap on the desired entry.
Arrows	To change values or scroll, tap the arrows.
Slider	Tap and drag the slider.

Use of external keyboard and mouse

If you connect a keyboard and mouse to the HMI, the operation of the elements is the same as under Windows.

Info menu

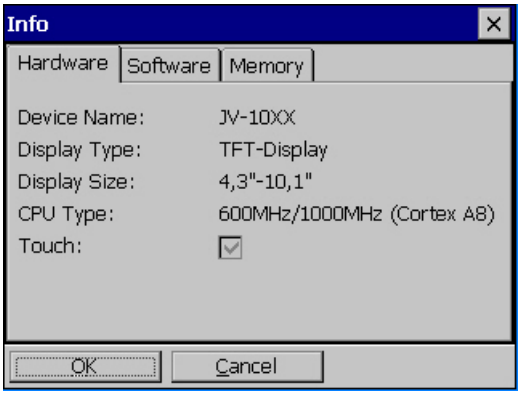
Contens of Info menu

The **Info** menu displays all relevant system information of the HMI. The menu has three tabs. The first tab displays information about the HMI hardware. The second tab contains information about the software. The third tab displays information about the memory.

The **Info** menu only displays information for which you have no setting options.

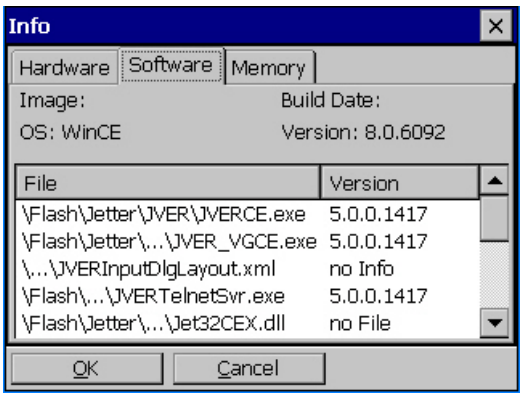
Hardware information

On the **Hardware** tab you can see all hardware information about the HMI.



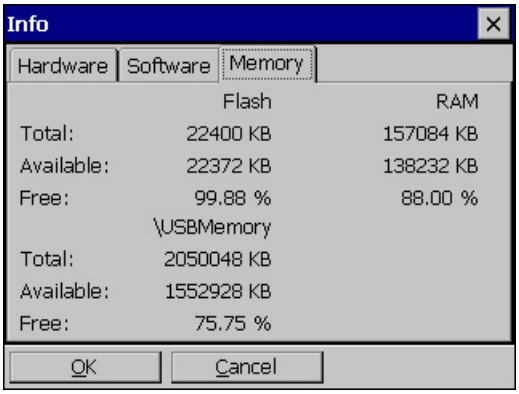
Software information

The **Software** tab displays the software installed on the HMI.



Memory information

The **Memory** tab shows the available and free memory of the HMI.



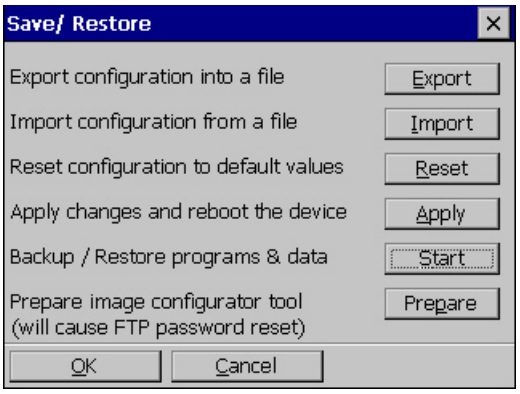
Save/Restore menu

Introduction

This menu lets you save settings to a configuration file or load a saved configuration from a file. It also lets you reset the HMI to its default values.

Save/Restore menu

The screenshot below shows the structure of the **Save/Restore** menu.



The menu has the following buttons:

Button	Description
Export	This button lets you save all settings made in the device manager to a configuration file. You can use this configuration file to configure other HMIs.
Import	This button lets you import an existing configuration file into the HMI. **Note**: When importing, all settings not saved at that moment are overwritten.
Reset	This button lets you reset the current HMI configuration to its default values.
Apply	Use this button to apply any changes. If necessary, the HMI reboots.
Start	Use this button to launch the **JVERSystemupdate.exe** tool. You can use this tool to save and load data, among other things.
Prepare	This button lets you perform the preparatory steps necessary to create images.

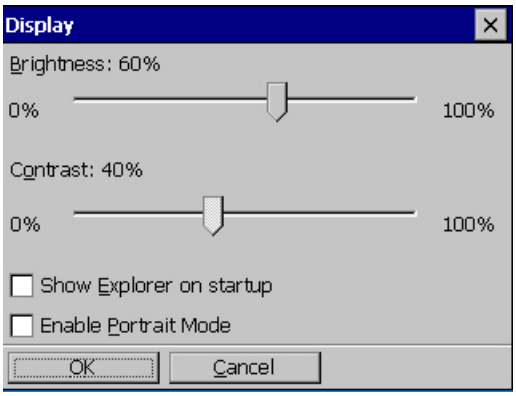
Display menu

Introduction

Use this menu to adjust the brightness and contrast of the HMI display.
In the **Display** menu you can also configure a screen saver.

Display menu

The following screenshot shows the controls of the **Display** menu.



Control	Description
Brightness slider	Lets you set the display brightness.
Contrast slider	Lets you set the display contrast. Depending on the HMI display, this function is available or not.
Check box **Show Explorer on startup**	Lets you enable/disable whether the Windows shell should be displayed.
Check box **Enable Portrait Mode**	Lets you set the display to portrait format.

Related topics

- **Operating the Device Manager** (see page 62)

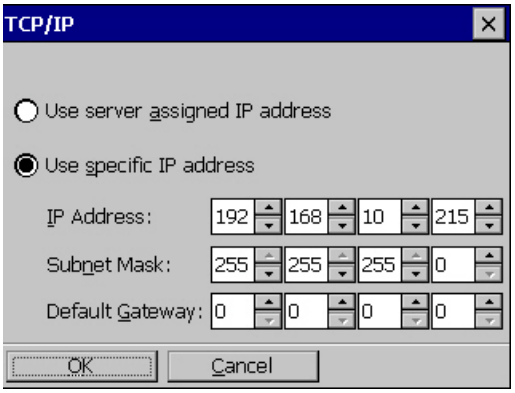
TCP/IP menu

Introduction

The **TCP/IP** menu lets you set network connections for the HMI, e.g. DHCP or a fixed IP address.

TCP/IP menu

The following screenshot shows the controls of the **TCP/IP** menu.



Radio Buttons	Description
Use server assigned IP address	Use DHCP. If you select this radio button, the server assigns dynamic network settings.
Use specific IP adress	If you select this option, you can set a specific IP address, subnet mask and a default gateway.

Date/Time menu

Introduction

The **Date/Time** lets you set time and date of the HMI's real-time clock (RTC = Real-Time Clock).

RTC

The RTC only runs if the HMI is supplied with power or if an internal power source supplies the real-time clock in the event of a power failure.

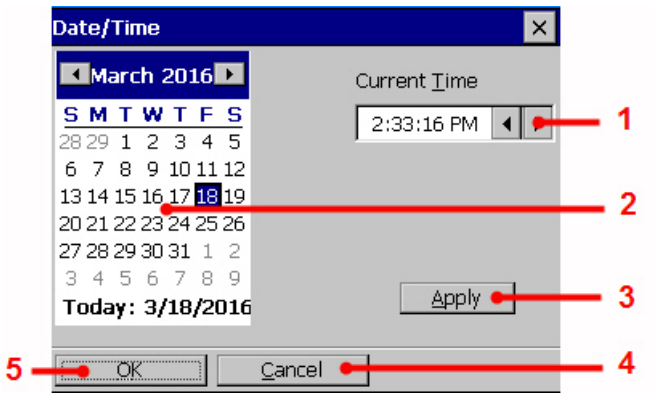
A VL 2330 lithium battery is installed in the HMI. The lithium battery cannot be replaced by the customer.

When the power supply is interrupted, RTC settings are cleared and the RTC stops.

Charge the internal lithium battery by leaving the HMI connected to power supply for at least 48 hours. In the event of a power failure, the internal lithium battery bridges a period of three months at 25 °C.

Date/Time menu

The following screenshot shows the controls of the **Date/Time** menu.



Number	Element	Description
1	**Current Time** text box	In the text box, set the current time, either with the arrow keys or by directly entering the new time.
2	Calendar	Here you set the current month and day.
3	**Apply** button	Use this button to apply the changes. The menu remains open.
4	**Cancel** button	Use this button to discard the changes. The menu closes.
5	**OK** button	Use this button to apply the changes. The menu closes.

Password menu

Introduction

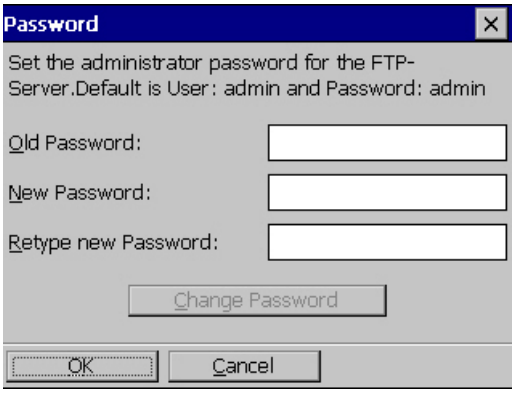
The **Password** menu lets you define an FTP password. You need this password to establish an FTP connection. Use the password of the JetViewSoft deployment.

Prerequisite

To enter passwords an external keyboard is required.

Password menu

The following screenshot shows the controls of the **Password** menu.



Control	Description
Old Password text box	Enter here the current/old FTP password. The default password is **admin**.
New Password text box	Enter here the new FTP password.
Retype new Password text box	Repeat here your new password.
Change Password button	If you have entered a new password, this button becomes active. If you click on the button, the device applies the new password.
OK button	The device applies all changes and closes the dialog.
Cancel button	The device discards all changes and closes the dialog.

Related topics

- **Operating the Device Manager** (see page 62)

Keys menu

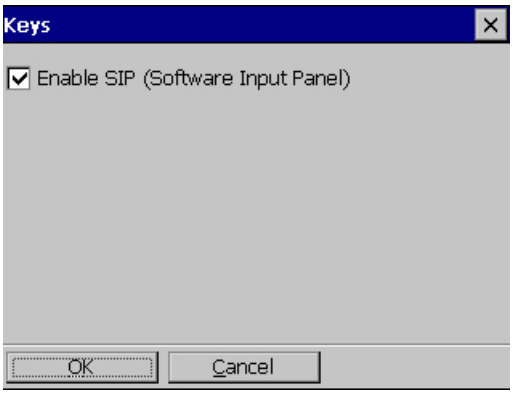
Introduction

In the **Keys** menu you can enable a software keyboard (SIP = Software Input Panel). This keyboard is not used by JetView Embedded Runtime.

When you enable SIP, Windows displays a keyboard. You can select the visual representation (small or large) of the software keyboard from the Windows toolbar.

Keys menu

The following screenshot shows the controls of the **Keys** menu.



To activate the keyboard, tick the check box **Enable SIP** (Software Input Panel).

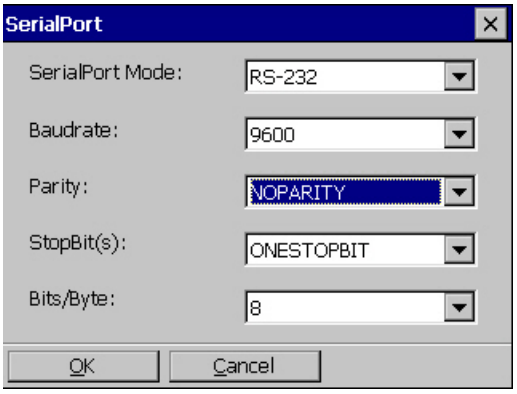
SerialPort menu

Introduction

The SerialPort menu lets you adjust the properties of the serial interface of the HMI.

SerialPort menu

The following screenshot shows the controls of the **SerialPort** menu.



Drop-down list	Description
SerialPortMode	This list lets you select the type of the serial connection: ■ RS-232 ■ RS-422 ■ RS-485
Baud rate	This list lets you select the baud rate of the serial connection: ■ 9,600 ■ 14,400 ■ 19,200 ■ 38,400 ■ 57,600 ■ 115,200
Parity	This list lets you select the parity: ■ None (NOPARITY) ■ Odd ■ Even ■ Mark ■ Space
StopBit(s)	This list lets you select the number of stop bits: ■ 1 Bit (ONESTOPBIT) ■ 2 bits

Drop-down list	Description
Bits/Byte	This list lets you select the number of data bits to be transmitted: ■ 5 bits ■ 6 bits ■ 7 bits ■ 8 bits

All parameters except SerialPortMode can also be changed via registers, see Quick Reference.

Related topics

- **Operating the Device Manager** (see page 62)
- **Quick reference** (see page 135)

6.2 IP configuration

Introduction

This chapter covers the IP configuration for the HMI JV-1005. The following parameters can be set:

- IP address of the HMI
- Subnet mask

Required skills of the network configurator

To carry out the IP configuration of the HMI JV-1005, knowledge of IP networks is required, such as:

- IP addressing (IP address, port number, subnet masks etc.)
- FTP connections (connection setup, data transmission, etc.)

Contents

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Factory settings	74
Making permanent changes to the IP address	75

Factory settings

Introduction

Before the HMI JV-1005 is shipped, various parameters are set to a certain value.

The following parameters can be changed by the user:

- IP address of the HMI
- Subnet mask
- IP address of default gateway

Factory settings

Parameter	Value
IP address of the HMI	192.168.10.15
Subnet mask	255.255.255.0
IP address of default gateway	0.0.0.0
IP address of DNS server	0.0.0.0
HMI name	JV-1005
IP port number for debugger	52000
IP port number for JetIP	50000

Making permanent changes to the IP address

Making permanent changes to the IP address in the configuration memory	The HMI loads the parameters for initializing the IP interface from the configuration memory during the boot phase. These parameters can be permanently changed by the user.
Prerequisite	You have closed the visualization application.
Setting IP addresses and subnet mask	You can change the settings of the IP interface via JV Device Manager. **In the case of Windows Embedded Compact 2013**: ▪ Open the **Command -> JV DEVICE MANAGER** menu. ▪ Open the **TCP/IP** menu. ▪ You can set IP address, subnet mask and default gateway. ▪ When you have changed the settings, click the **OK** button. **In the case of Windows CE 6.0**: ▪ Click the **JV DEVICE MANAGER** icon. ▪ Click the **TCP/IP** icon. ▪ You can set IP address, subnet mask and default gateway. ▪ When you have changed the settings, click the **OK** button. **Result**: The IP address has been changed permanently. The HMI can communicate again.

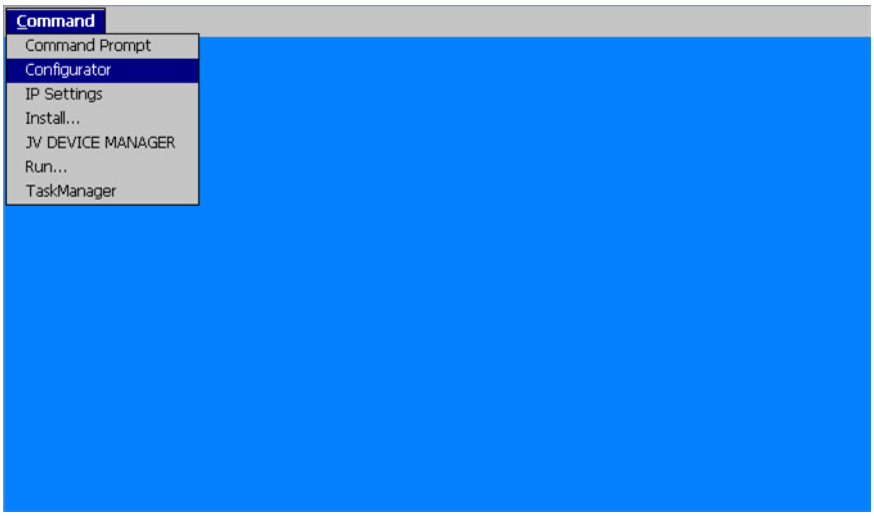
6.3 The Configurator tool

Introduction

This chapter describes the functions of the Configurator tool and how to use it. The configurator is only available under Windows Embedded Compact 2013.

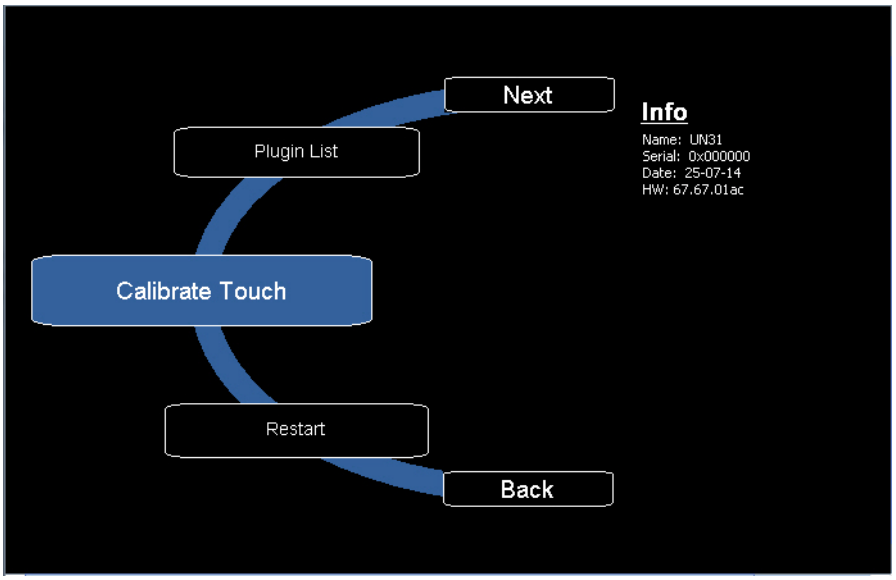
Launching the Configurator

Start the Configurator via menu **Command -> Configurator**.



Configurator main menu

The following screenshot shows the main menu of the Configurator tool.



The active function is indicated by a blue button. You can switch between the functions by clicking on the **Next** and **Back** buttons.

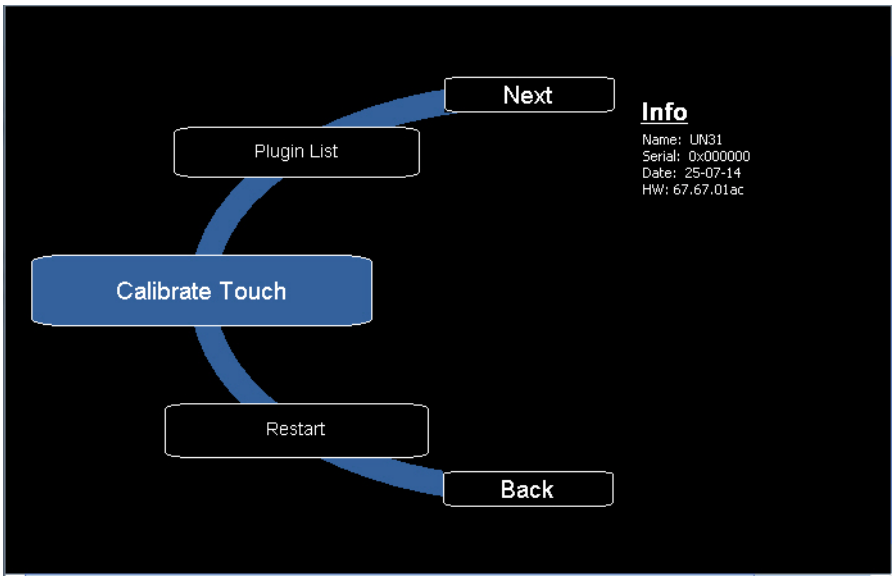
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Restart menu	79
Close menu	80
Display Settings menu	81
Regional Settings menu	83
Time menu	84
BSP Settings menu	86
Network menu	88
Plugin List menu	90

Calibrate Touch menu

Calibrate Touch menu

If you want to calibrate the touch display, click on the **Calibrate Touch** button.

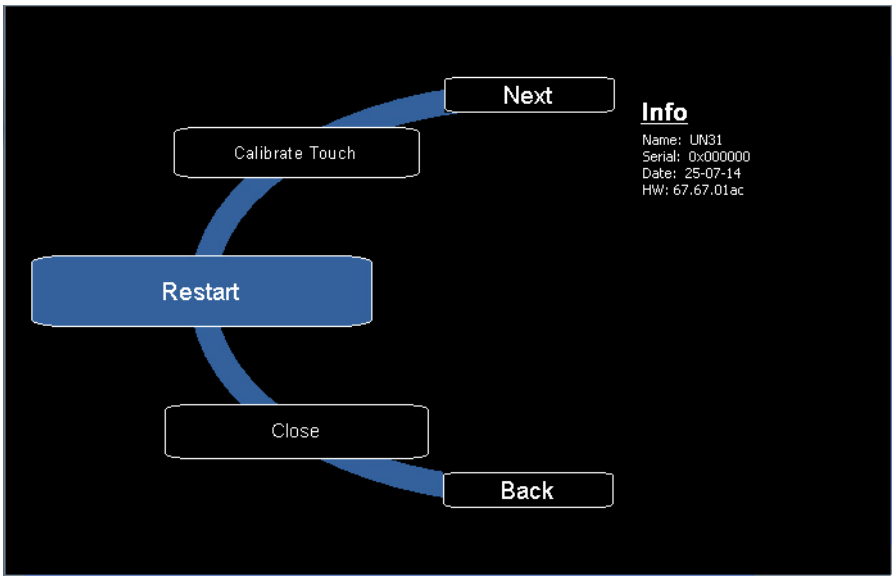


Instructions will guide you through the touch calibration.

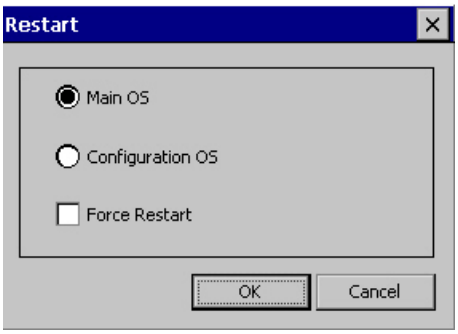
Restart menu

Restart menu

If you want to restart the system, click the **Restart** button.



The following dialog box opens:

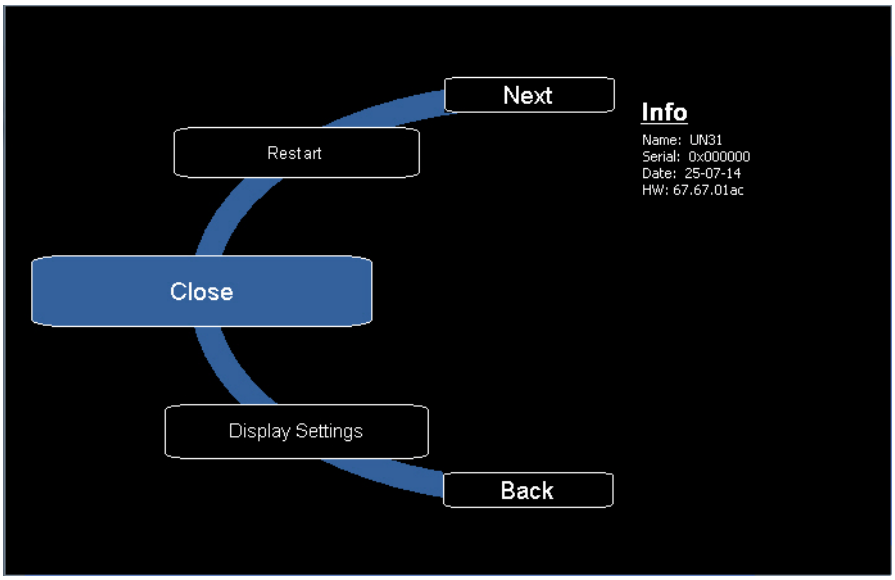


Control	Description
Main OS radio button	If you select the **Main OS** radio button and then click the **OK** button, the operating system is restarted.
Configuration OS radio button	If you select the **Configuration OS** radio button and then click the **OK** button, another menu of the Configurator opens. This menu lets you back up and restore the operating system and create and restore images of the data partition.
Force Restart check box	Selecting the **Force Restart** check box and clicking the **OK** button forces a restart.
OK button	The device executes the settings and exits the menu.
Cancel button	The device discards any changes made and exits the menu.

Close menu

Close menu

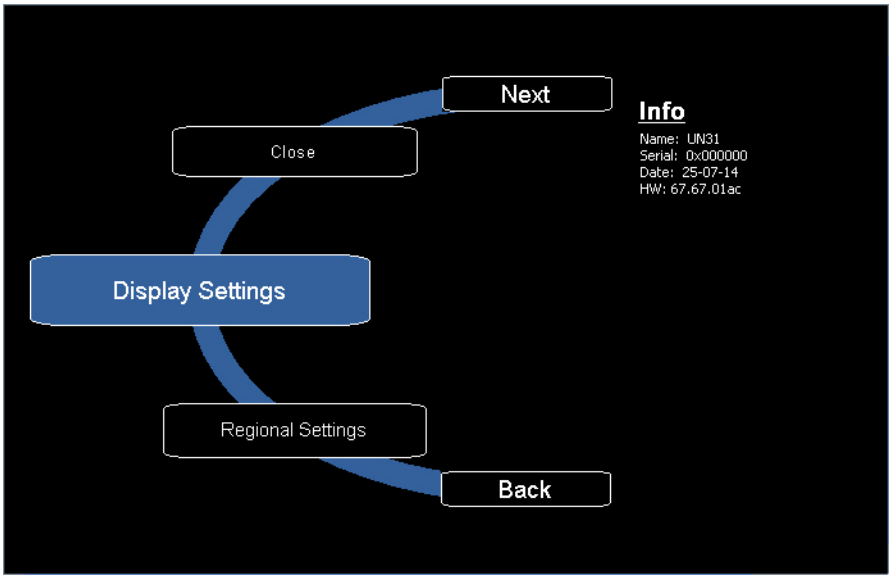
If you want to exit the Configurator, click on the button **Close**.



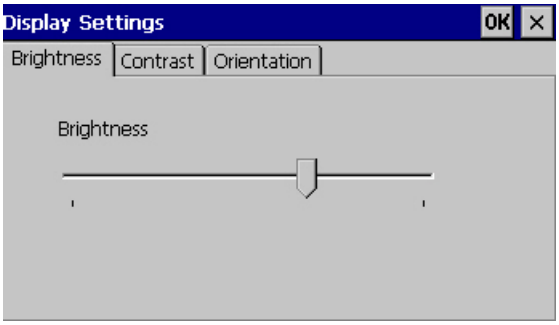
Display Settings menu

Display Settings menu

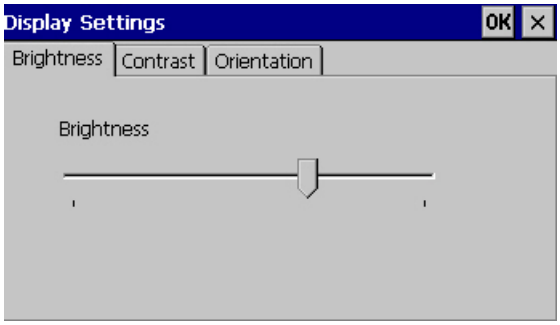
If you want to make changes to display settings, such as brightness and contrast, click the **Display Settings** button.



The following dialog box opens:

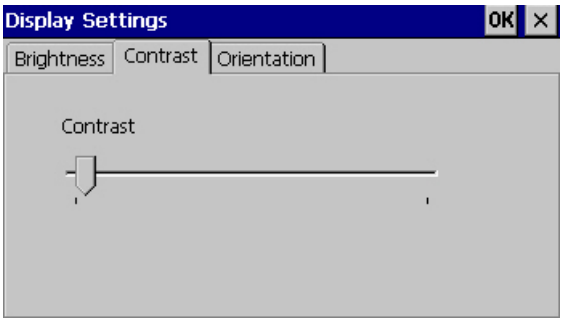


Brightness tab



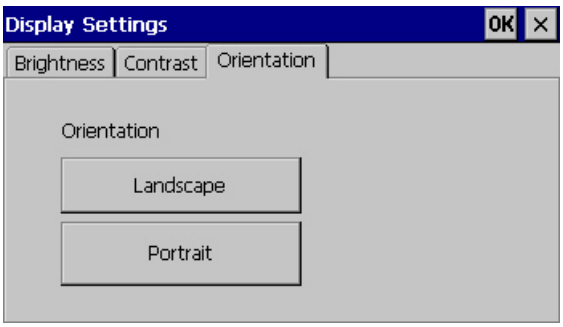
Control	Description
Brightness slider	This slider lets you set the display brightness.

Contrast tab



Control	Description
Contrast slider	This slider lets you set the display contrast.

Orientation tab

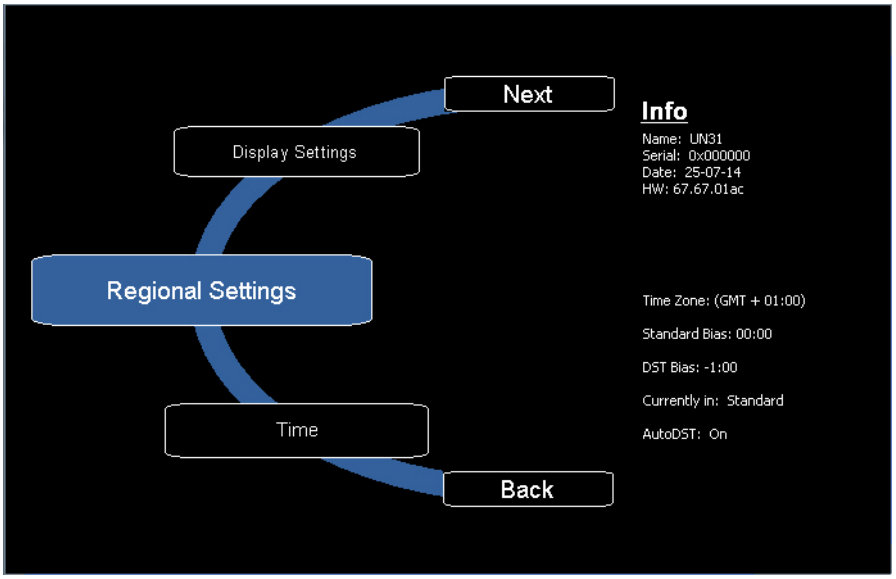


Control	Description
Landscape button	Click this button to set the display to Landscape format.
Portrait button	Click this button to set the display to portrait format.

Regional Settings menu

Regional Settings menu

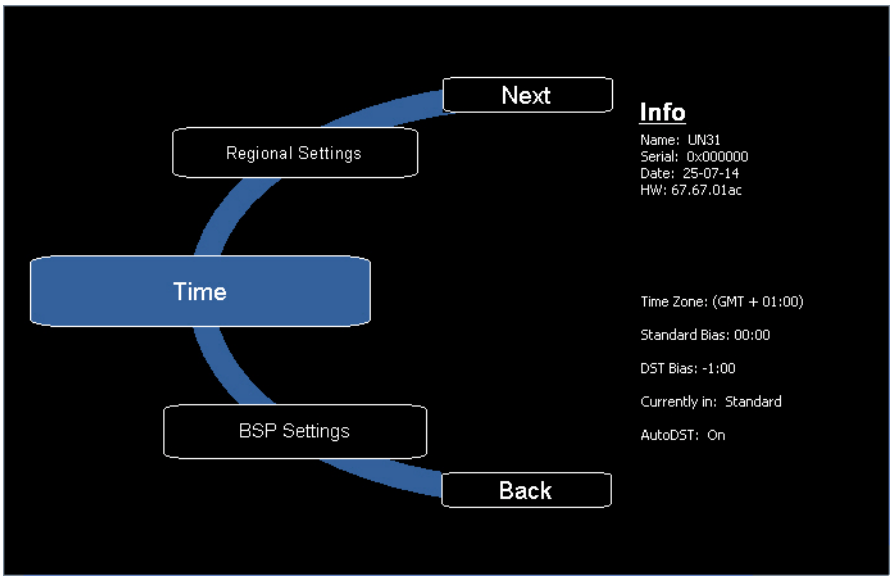
The **Regional Settings** button does not open a menu; instead, the regional settings are displayed in the bottom right-hand corner of the screen.



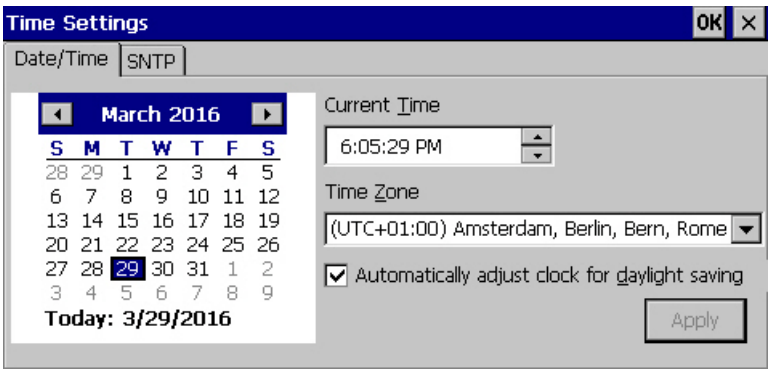
Time menu

Time menu

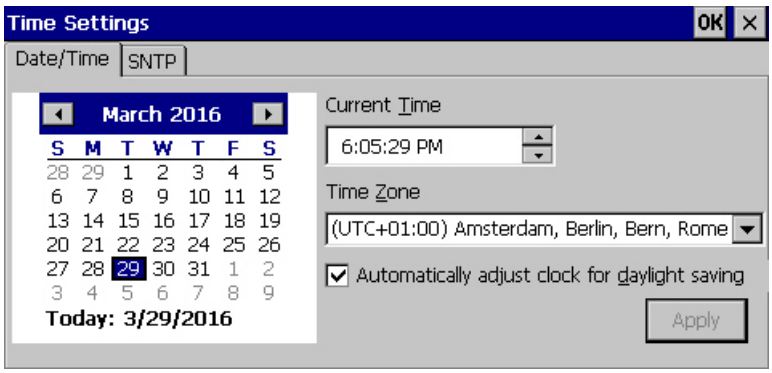
If you want to set the time, click on the button **Time**.



The following dialog box opens:



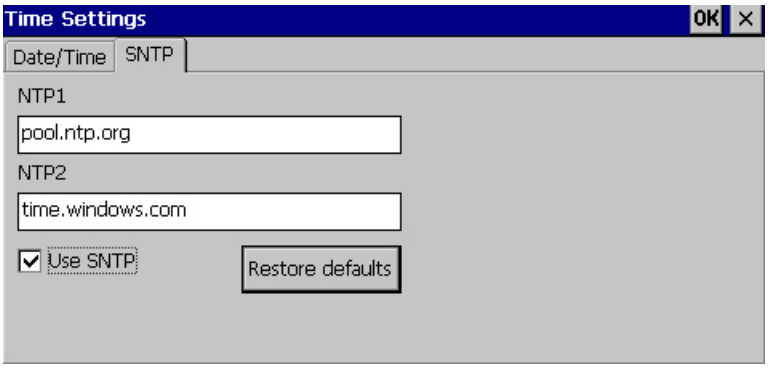
Date/Time tab



Control	Description
Calender	The calender lets you set the date.
Current Time edit box	This edit box lets you set the current time.
Time Zone list box	This list box lets you set the time zone.
Automatically adjust clock for daylight saving check box	The time is automatically set to daylight saving time.

SNTP tab

SNTP is the abbreviation for Simple Network Time Protocol. SNTP is a simplified protocol compared to the Network Time Protocol (NTP). Windows systems can get the exact time via NTP from the Internet (Internet time).



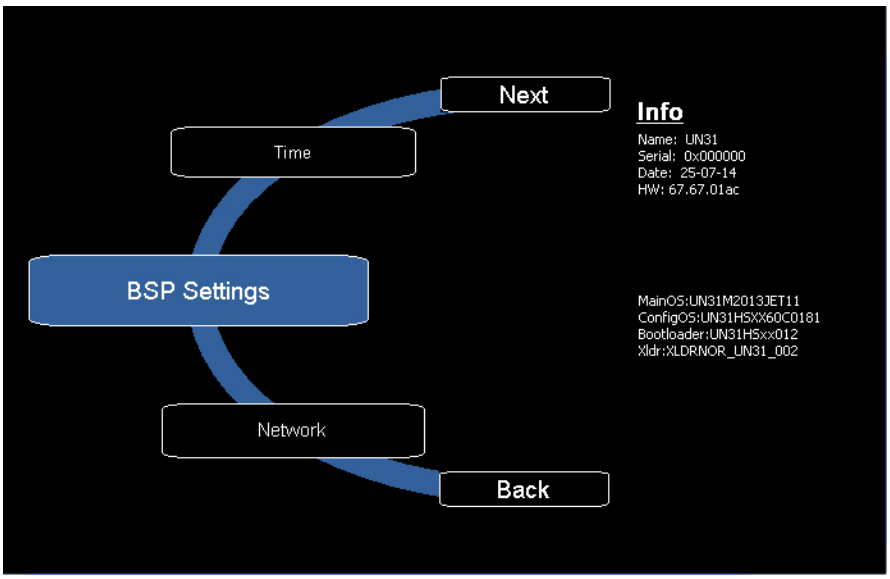
Control	Description
NTP1 and **NTP2** edit box	Enter the Internet pages of time servers here.
Use SNTP check box	If this check box is ticked, Simple Network Time Protocol is used.
Restore defaults button	Lets you restore the system to its default settings.

BSP Settings menu

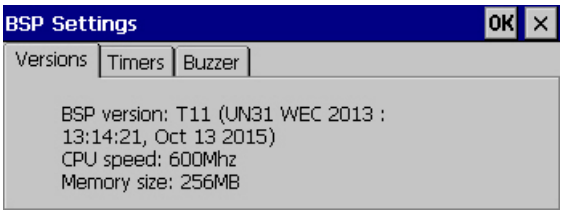
BSP Settings menu

If you want to read information related to the hardware and make settings for the buzzer, click the **BSP Settings** button.

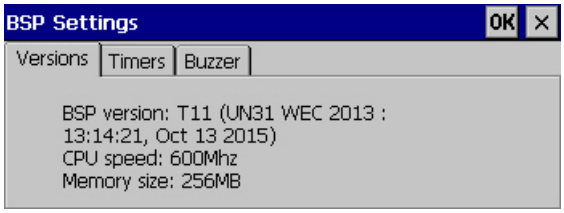
BSP is the abbreviation for Board Support Package and abstracts the hardware.



The following dialog box opens:

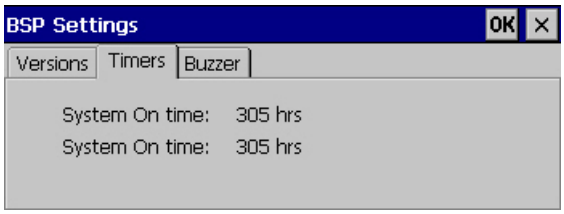


Versions tab



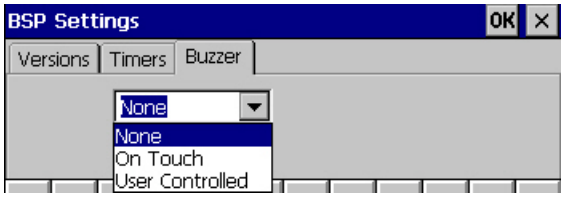
The **Versions** tab provides information on the BSP version, CPU clock frequency, and memory size.

Timers tab



The **Timers** tab shows how much time (in hours) has elapsed since the device was switched on.

Buzzer tab



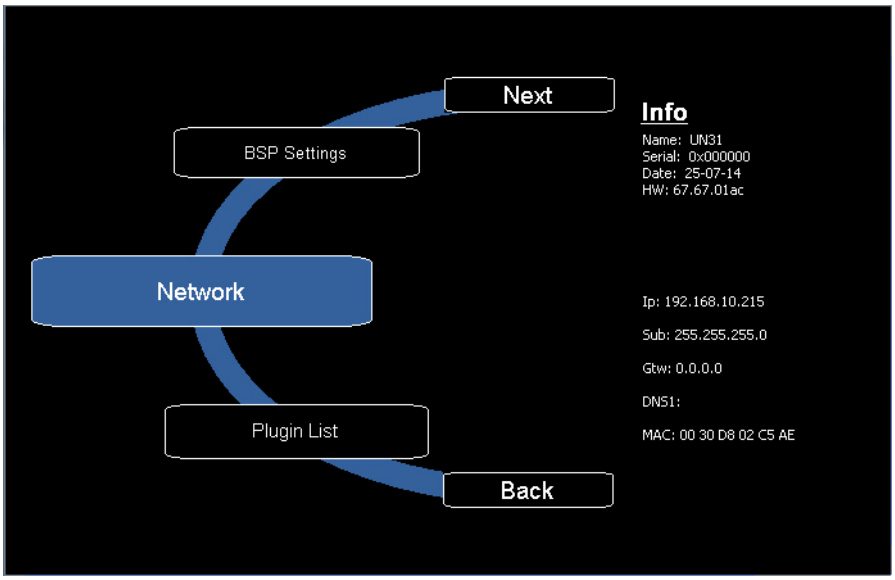
The **Buzzer** tab has a list box where you can configure the buzzer settings. The following settings are available:

- None - Buzzer OFF
- On Touch - An acoustic signal is generated when you touch the display
- User Controlled - User-controlled operation

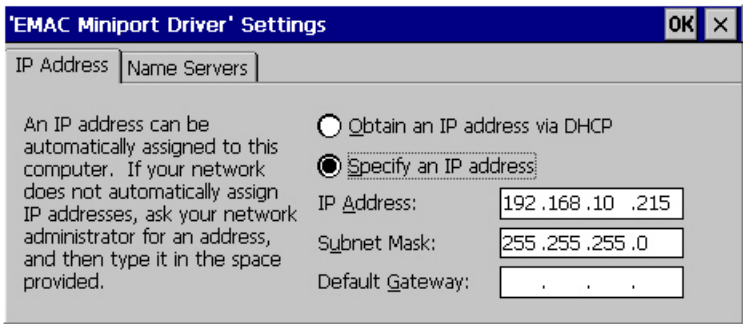
Network menu

Network menu

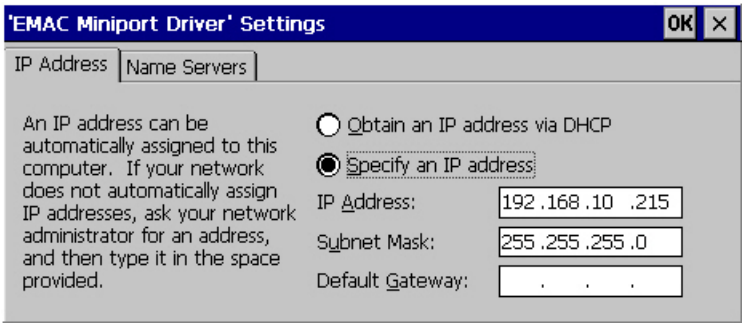
If you want to make changes to network settings click on the **Network** button.



The following dialog box opens:

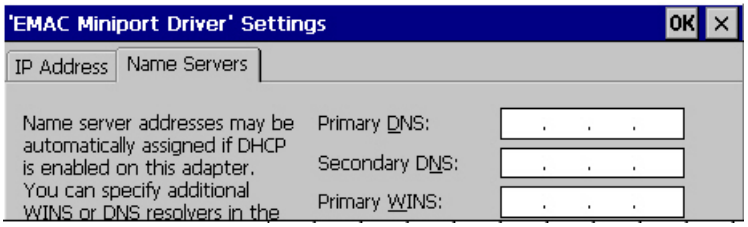


IP Address tab



Optionally, you can use radio buttons to choose between an IP address via DHCP or a given IP address.

Name Servers tab

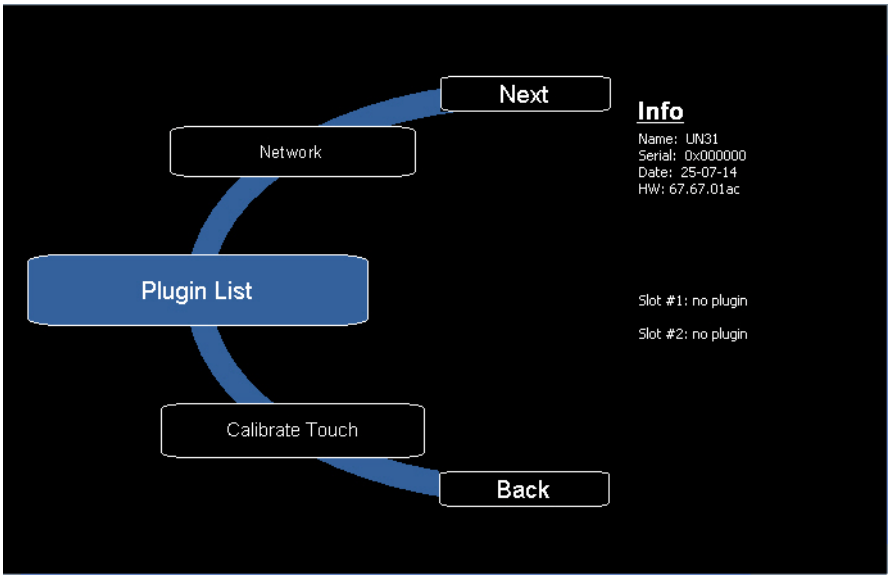


The settings on this tab do not apply to applications.

Plugin List menu

Plugin List menu

The button **Plugin List** does not open a menu, but shows whether plug-in modules are installed.



The following is displayed on the right side of the screen:

- Slot #1: no plugin
- Slot #2: no plugin

This means that no expansion module is plugged into the expansion slot. For the **CO** device option, **PLCM01** is displayed here.

6.4 Backing up and restoring the runtime environment and projects

Introduction

This chapter covers the tool **JVERSystemupdate.exe** which lets you copy the runtime environment and projects from HMIs of the JV-10xx and transfer them to other HMIs of the JV-10xx.

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Topic	Page
Backing up the runtime environment and projects from an HMI of the JV-10xx and restoring them	92

Backing up the runtime environment and projects from an HMI of the JV-10xx and restoring them

Introduction

The tool **JVERSystemupdate.exe** lets you copy the runtime environment and projects from an existing HMI of the JV-10xx and transfer them to other HMIs of the JV-10xx. Once this process is completed, the HMIs run the same runtime environment and visualization projects.

Prerequisites

- Your USB flash drive or SD card must be **FAT** formatted and have a capacity of at least 1 GB. In the following text the storage medium is referred to as USB flash drive only.
- The tool consisting of the executable file **JVERSystemupdate.exe** must be available.

Where is the tool located?

The tool **JVERSystemupdate.exe** can be found at the following location:

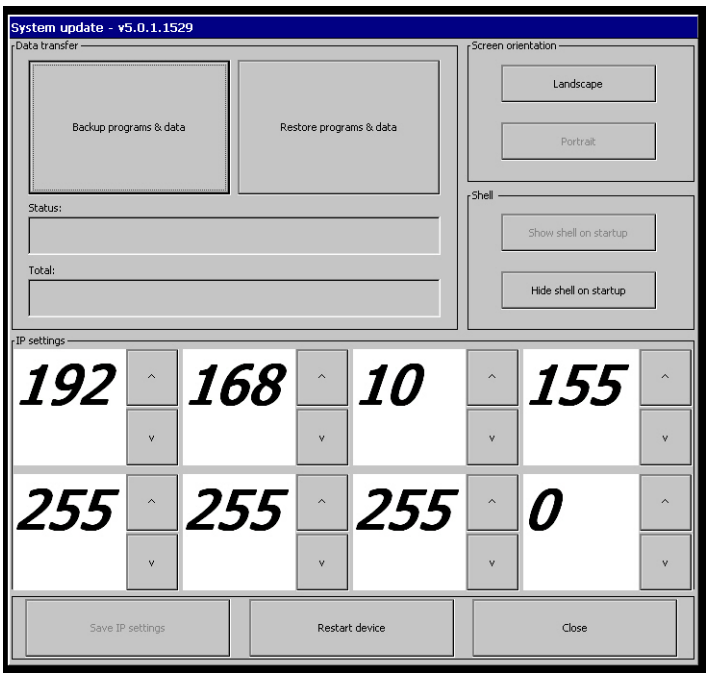
- In the Device Manager menu **Save/Restore** by clicking the button **Start** (HMIs -B4 with CE6.0) or menu **Command** (HMIs -B9, WEC 2013).

Launching the tool

This is an example of how you can launch the tool from within **Device Manager**.

Step	Action
1	Launch the Device Manager on the HMI the runtime environment and visualization projects of which you wish to copy to the USB flash drive.
2	Now turn to **Save/Restore** again.
3	Click the button **Start**.

Result: The tool **JVERSystemupdate.exe** opens.



Features of this tool

The tool **JVERSystemupdate.exe** lets you make different settings. The settings always refer to the HMI from which the data are to be copied to another HMI. This tool lets you do the following:

- Make changes to the IP address of the HMI.
- Switch the screen orientation. You may select **Landscape** or **Portrait**.
- Have the shell displayed on HMI startup. Normally, an HMI of the JV-10xx directly launches the Embedded Runtime without Windows shell. If you select this option, the HMI launches the Windows shell.
- Restart the HMI (**Restart device**)
- Backup data from the device to a USB flash drive or SD card (**Backup programs & data**)
- Transfer data, for example from a USB flash drive to another HMI (**Restore programs & data**)

Copying data to the USB flash drive

To copy the runtime environment and visualization projects to a USB flash drive, click the button **Backup programs & data**. This process involves a great number of files. The two progress bars **Status** and **Total** keep you informed about the progress of the backup process. To exit the tool, click the button **Close**.

Copying data from a USB flash drive to a JV-10xx

This is an example of how to restore data from a USB flash drive to a HMI using Device Manager:

Step	Action
1	Plug the USB flash drive into the HMI to which you wish the runtime environment and visualization projects from another HMI to be restored.
2	Launch the Device Manager on the HMI to which you wish to copy the data from the USB flash drive.
3	Double-click the icon of the tool **JVERSystemupdate.exe**: **Result:** The tool opens.
4	Click the button **Restore programs & data**. **Result:** The Data are copied to the HMI. This process may take some time.
5	Make the following settings ■ Screen orientation ■ Shell ■ IP address
6	Click the button **Restart device** to relaunch the HMI. **Result:** A dialog box opens. Confirm by clicking **OK**.

Result: The data have been copied to the HMI. Now, you can copy the same data from the USB flash drive to other HMIs.

Enabling Autorun

JV-1005 lets you enable the Autorun feature for a USB flash drive or SD card. If you plug this USB flash drive or SD card into a JV-10xx, the tool **JVERSystemupdate.exe** is automatically launched.

To enable Autorun, proceed as follows:

Step	Action
1	Create a folder on the USB flash drive and name it **1207**.
2	Copy the tool **JVERSystemupdate.exe** into the folder **1207**.
3	In folder **1207**, create the file **AutoRun.bat** with the following text: **start \USBMemory\1207\JVERSystemupdate.exe**

Result: When you plug the USB flash drive into an HMI of the JV-10xx, the tool starts up automatically.

6.5 Updating JVER in JetViewSoft via Ethernet

Purpose of this chapter

This chapter describes how to update the JetView Embedded Runtime in JetViewSoft via Ethernet after selecting a CAB file.

Contents

Topic	Page
Selecting an update file	96
Updating via Ethernet in JetViewSoft	98

Selecting an update file

Introduction

If you wish to update an HMI using the dialog **Update Device**, select the update file first.

Prerequisites

This description applies to **JetViewSoft** version 5.0.

Correlation between HMI and update file

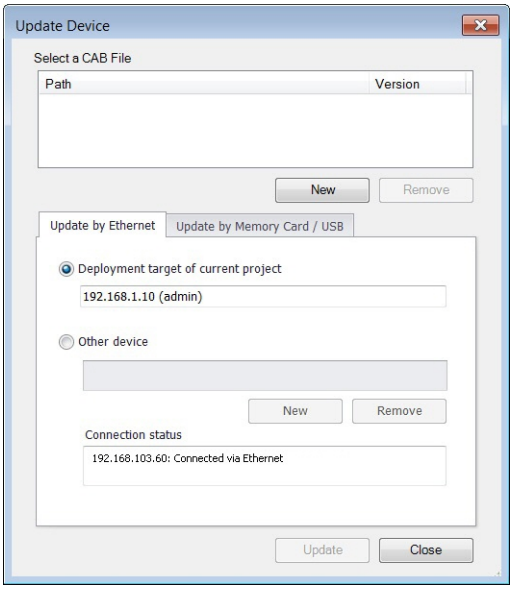
The following correlation applies:

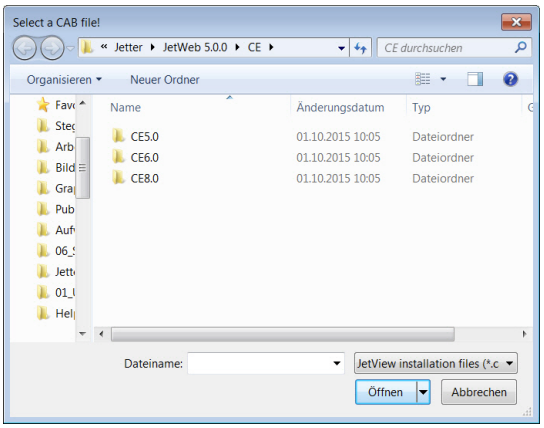
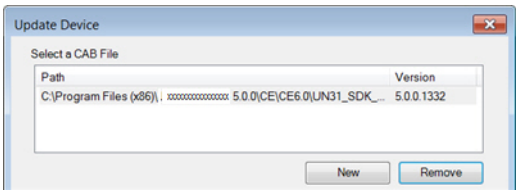
Device	Operating system	Location	Update file
JV-1005-...-B4	CE6.0	C:\...\CE\CE6.0\UN31_SDK_ARMV4I	StorageCard_5xx.xxxx.zip
JV-1007-...-B4	CE6.0	C:\...\CE\CE6.0\UN31_SDK_ARMV4I	StorageCard_5xx.xxxx.zip
JV-1010-...-B4	CE6.0	C:\...\CE\CE6.0\UN31_SDK_ARMV4I	StorageCard_5xx.xxxx.zip
JV-1005-...-B9	WEC 2013	C:\...\CE\CE8.0\UN31_SDK_ARMV7	StorageCard_5xx.xxxx.zip
JV-1007-...-B9	WEC 2013	C:\...\CE\CE5.0\UN31_SDK_ARMV7	StorageCard_5xx.xxxx.zip
JV-1010-...-B9	WEC 2013	C:\...\CE\CE8.0\UN30_SDK_ARMV7	StorageCard_5xx.xxxx.zip

The location of the update file on your PC is in the installation directory of JetViewSoft.

Selecting the update file

To select the update file, proceed as follows:

Step	Action
1	Navigate to menu **Tools/Update Display** to open the dialog box **Update Device**. 

Step	Action
2	Click the button **New** below the section **Select a CAB File**. **Result:** The file explorer opens. 
3	Navigate to the folder that corresponds to your HMI, for example, **CE6.0**.
4	Navigate to the corresponding folder, for example, **UN31_SDK_ARMV4I**. Select the corresponding **ZIP file**, e.g., **StorageCard_500.xxxx.zip** by double-clicking on it. **Result:** The update file is selected and the path entered in the dialog box. The path remains stored in the dialog. To delete the stored path, click the button **Remove**. 

Related topics

- **Updating via Ethernet in JetViewSoft** (see page 98)

Updating via Ethernet in JetViewSoft

Introduction

There are the following options if you wish to update an HMI using the dialog **Update Device**:

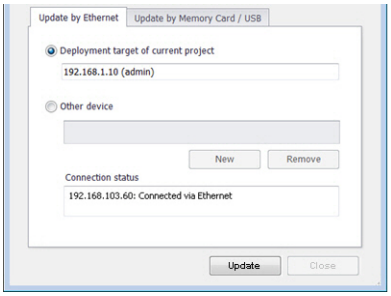
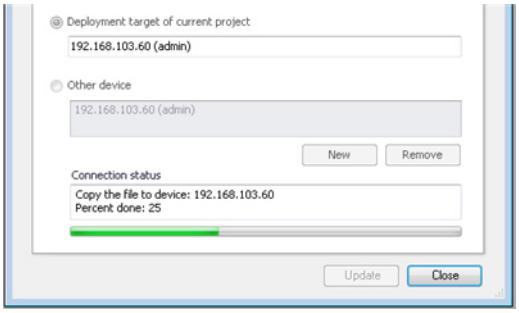
- If you have already opened a project in JetViewSoft, use the deployment settings of your project.
- If you have not yet opened a project in JetViewSoft, use the dialog **Update Device** to configure the settings of the Ethernet connection.

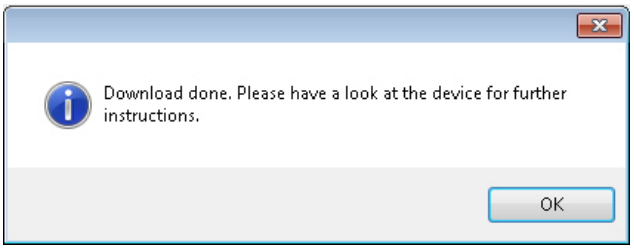
Prerequisites

- **JetViewSoft** version 5.0 or higher.
- The update file must have been selected in the dialog **Update Device**. For more information, click **here** (see page 96).

Updating an HMI using the project settings

Once you have selected the update file, you can update your HMI. To carry out the update, proceed as follows:

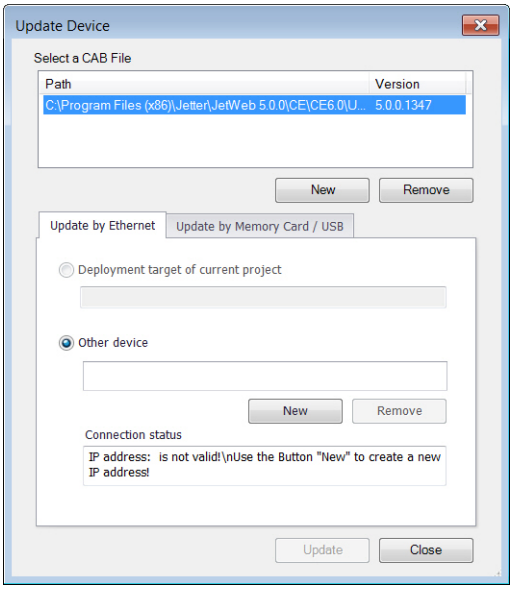
Step	Action
1	Navigate to menu item **Tools/Update Device** to open the dialog box. **Result:**  If the deployment settings are correct, the connection with the HMI is automatically established. The CAB file for updating the HMI is selected.
2	Click the button **Update**. **Result:** The **CAB file** is being copied to the HMI. The progress of the copy job is displayed. 

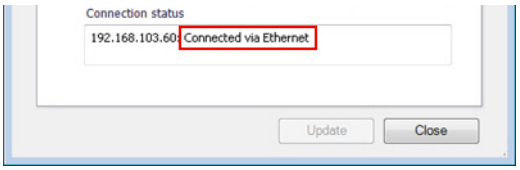
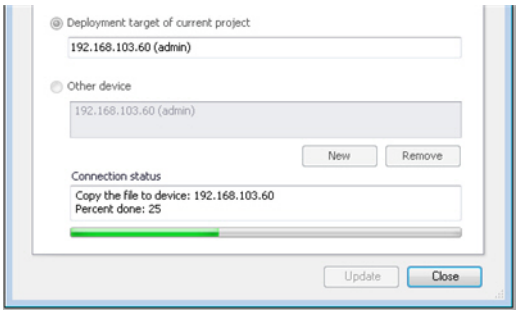
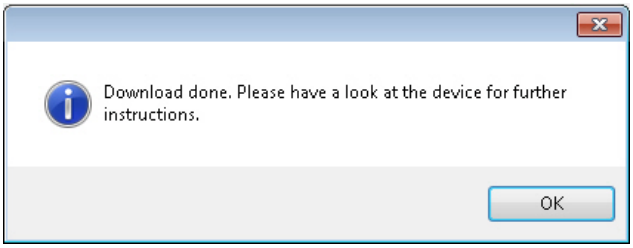
Step	Action
3	If the copy operation was successful, the following message box appears:  Close the box by clicking **OK**.
4	In the dialog box **Update Device** click on the button **Close**.
5	Follow the instructions displayed on the HMI.

Result: The HMI is updated.

Updating an HMI without using the project settings

JetViewSoft lets you update an HMI without the need to open a project, or even update an HMI that is not included in your project. To carry out the update, proceed as follows:

Step	Action
1	Navigate to menu item **Tools/Update Device** to open the dialog box.
2	Select on the tab **Update by Ethernet** the radio button **Other device**. 
3	Click the button **New**. **Result:** The dialog box **Insert new User** opens. 
4	Enter here the user name *admin*. This is the default user name for most file systems.
5	Enter the IP address of the HMI to be updated.
6	Enter the password *admin*. This is the default password for most file systems. In the next box repeat the password.
7	Confirm your entries by clicking **OK**

Step	Action
8	Under "Connection Status" check whether an Ethernet connection with the HMI has been established. 
9	Click the button **Update**. **Result:** The **CAB file** is being copied to the HMI. The progress of the copy job is displayed. 
10	If the copy operation was successful, the following message box appears:  Close the box by clicking **OK**.
11	In the dialog box **Update Device** click on the button **Close**.
12	Follow the instructions displayed on the HMI.

Result: The HMI is updated.

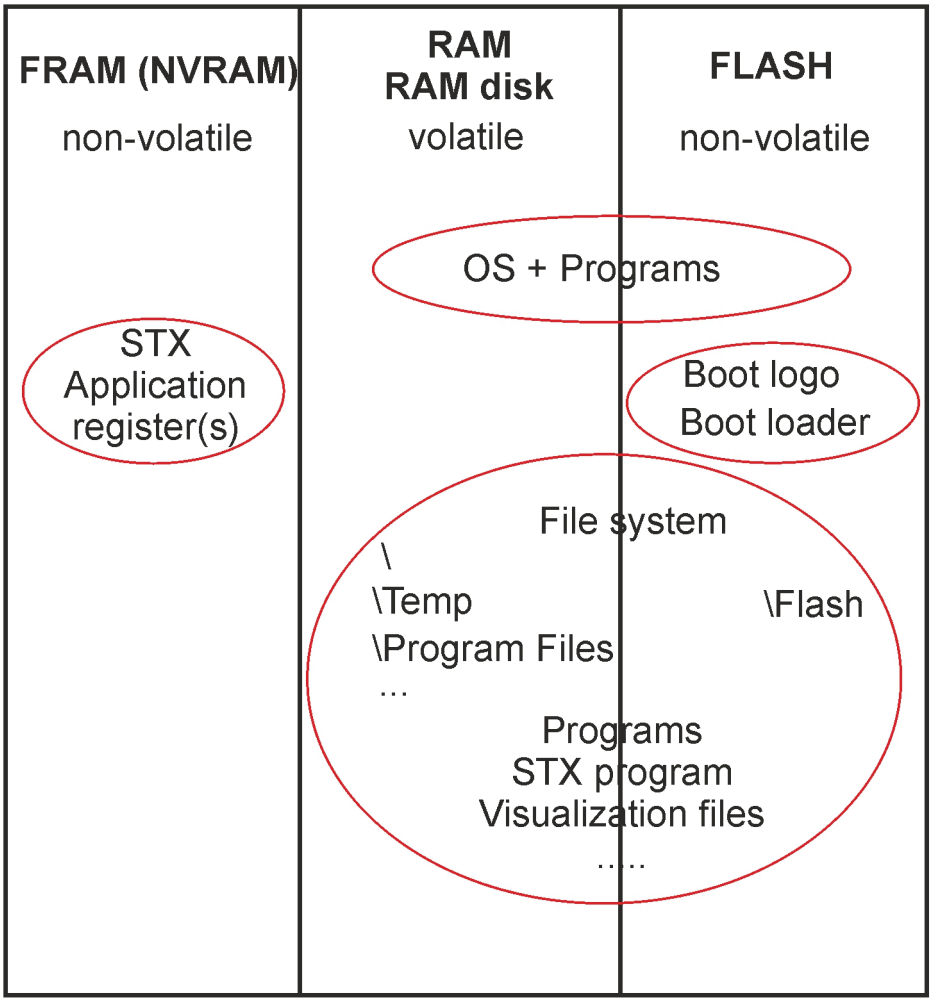
7 Memory types - Overview

Introduction

The HMI features several types of program and data memory. There is volatile memory. Volatile memory loses its content at switching off. Non-volatile memory keeps its content even when the power supply is off.

This chapter gives an overview of the available memory.

Memory types - Overview



Content

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Operating system memory	104
File system memory	105
Application program memory	106
Memory for non-volatile application program registers	107
Memory for non-volatile application program variables	108

Operating system memory

Introduction	The OS is stored to a non-volatile flash memory in the CPU. Therefore, the OS can be executed immediately after the device is powered up.
Properties	▪ Internal flash memory for storing OS data ▪ Internal volatile RAM for storing OS data
Memory access	▪ The user cannot access the memory area of the operating system.

File system memory

Introduction	The file system accessible to the user is located partly in the user area of the flash disk and partly in the RAM as RAM disk. Furthermore, SD cards and USB flash drives can be used for data and program storage.
Properties	▪ Internal flash disk, SD card and USB flash drive ▪ Non-volatile ▪ Limited number of write/erase cycles: Approx. 1 million ▪ Size of internal flash disk: 80 MByte
Memory access	▪ By JetViewSoft ▪ By JetSym ▪ Via FTP connection ▪ By means of file commands from within the application program

Application program memory

Introduction	By default, the application program (STX) is transferred from JetSym to the HMI and stored in the file system of the user area.
Properties	▪ Stored as file within the file system ▪ Default directory *Flash/JVER/app* ▪ Files may also be stored to other directories (or on SD memory card or USB flash drive)
Memory access	▪ By operating system ▪ By JetSym ▪ Via FTP connection ▪ By means of file commands from within the application program

Memory for non-volatile application program registers

Introduction

Non-volatile registers are used to store data which must be maintained when the JV-1005 is de-energized.

Properties

- Global variables with dedicated addresses (%VL)
- Register variables always occupy 4 bytes.
- Register variables are not initialized by the operating system.
- Number of register variables: 6,000
- Register numbers: 1,000,000 ... 1,005,999

Memory access

- By JetSym
- From the application program

STX program

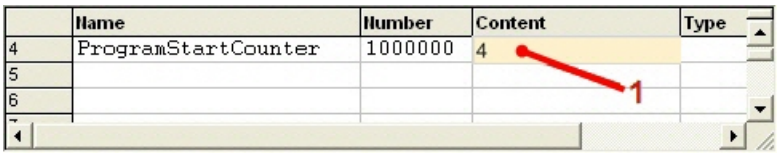
The following program increments the content of a register variable every time the application program is started. This way, the number of program starts is counted.

```
Var
   ProgramStartCounter: Int At %VL 1000000;
End_Var;

Task Work Autorun
   ProgramStartCounter := ProgramStartCounter + 1;
   Loop
      // ...
   End_Loop;
End_Task;
```

Setup pane

The JetSym setup pane displays the content of the register variable.



Number	Description	Function
1	Present content of the register variable	The content of the register variable is incremented by one every time the program is started.

Memory for non-volatile application program variables

Introduction

Non-volatile variables are used to store data which must be maintained when the JV-1005 is de-energized.

Properties

- Global variables which are assigned to permanent registers (%RL)
- Variables are stored in a compact way.
- Size: 24,000 bytes
- Register numbers: 1,000,000 ... 1,005,999

Memory access

- By JetSym
- From the application program

STX program

The following program increments the content of four non-volatile variables every second.

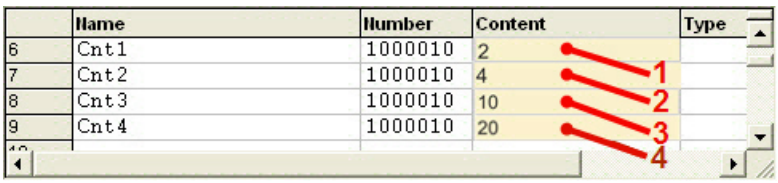
The working range of the counters is between 0 and 255 (variable type: byte). For these four variables the four bytes of register 1000010 are used.

```
Var
   Cnt1, Cnt2, Cnt3, Cnt4: Byte At %RL 1000010;
End_Var;

Task Count4 Autorun
   Loop
      Inc(Cnt1);
      Inc(Cnt2, 2);
      Inc(Cnt3, 5);
      Inc(Cnt4, 10);
      Delay(T#1s);
   End_Loop;
End_Task;
```

Setup pane

The JetSym setup pane displays the content of the variable. As the type of the four counters is byte, this will result in counter overflow after a relatively short time:



Number	Description	Function
1	Current content of the variable Cnt1	The content of the variable is incremented by one every second.
2	Current content of the variable Cnt2	The content of the variable is incremented by two every second.
3	Current content of the variable Cnt3	The content of the variable is incremented by five every second.
4	Current content of the variable Cnt4	The content of the variable is incremented by ten every second.

8 Programming

Purpose of this chapter

This chapter is for supporting you in programming the HMI JV-1005 in the following fields of activity:

- Programming in STX and access to the created visualization objects
- Entering values via touch display
- Changing visualization objects using visualization commands
- Changing visualization objects via object-oriented access
- Exchanging variable values between the STX program and the visualization runtime via Jet32 services

Content

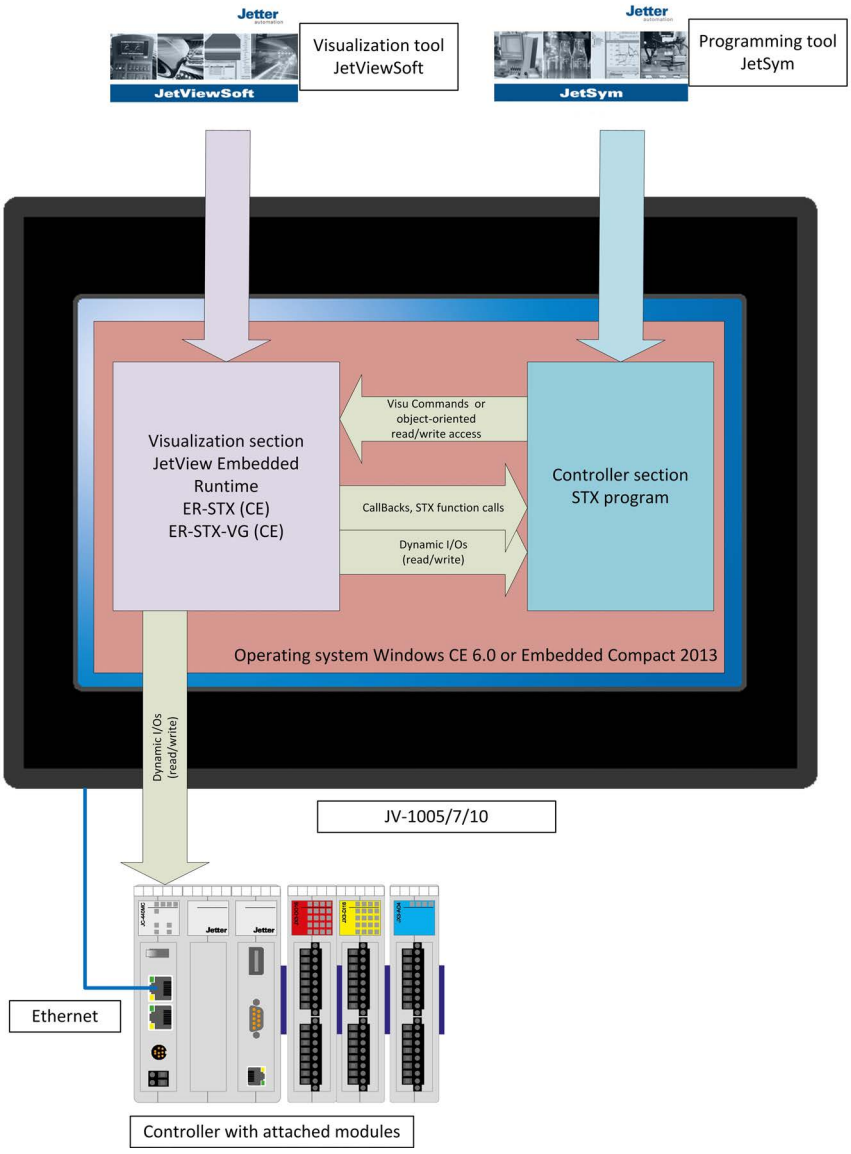
Topic	Page
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Exchanging data between visualization unit and controller	114
Access mechanisms between visualization and internal control program	118
Examples of the interaction between visualization and control	120
CANopen® (option -CO)	133

8.1 JV-1005 - System overview

Introduction

The JV-1005 HMI contains a visualization unit and a controller unit.

System overview



Visualization unit

The visualization unit provides the runtime environment for visualization projects which you create with JetViewSoft and download to the HMI device. In JetViewSoft there are different platforms on which you can create a visualization project. The runtime environment on the HMIs can process projects on the ER-STX (CE) and ER-STX-VG (CE) platforms. The VG platform can display SVG objects (Scalable Vector Graphics). Please use VG platform projects only in connection with the operating system WEC 2013.

Controller unit	The control unit of the HMI can run an STX program that you have created and downloaded with JetSym. Visualization projects can be accessed directly from the STX application program using so-called VisuCommands.

8.2 Exchanging data between visualization unit and controller

Introduction

The internal data exchange between the visualization runtime and the controller unit can take place in several ways (also refer to **Access mechanisms** (see page 120)).

Content

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I/O dynamics (Dynamic I/O)	115
VisuCommands or object-oriented access	116
Callbacks	117

I/O dynamics (Dynamic I/O)

I/O dynamics	Dynamic properties are assigned to a visualization object via I/O dynamics, e.g. a bar graph function to a rectangle. The I/O dynamics must be linked to a variable that passes its values. This variable can come locally from the runtime, from the controller unit of the HMI or from an external controller. The visualization runtime polls the variables at runtime according to the specified update interval and displays them in the assigned objects.
Declaring linked variables	If the variable comes from a controller, whether from the HMI internal controller or an external controller, it must be declared as %VL (register) there.
Creating linked variables	In JetViewSoft, variables can be created manually in the object pool or in the variables window, or they can be transferred from JetSym using the Tag DB Manager.
Further information	For more information, see the JetViewSoft help index under the keyword **Variables**.

VisuCommands or object-oriented access

Influencing object properties directly	The programming tool JetSym in combination with the programming language STX offers the possibility to directly influence the properties of objects on HMIs with VisuCommands or object-oriented access. Object-oriented access lets you access all properties of visualization objects. For more information, refer to the JetViewSoft help index under the keyword **STX Programming**. Minimum requirements for object-oriented access are JetViewSoft V 5.2 and JetSym V 5.4.
Restriction	VisuCommands and object-oriented access can only be executed by a local control program. An external controller cannot access visualization objects.

Callbacks

Callbacks	A callback is the possibility to call from the visualization runtime functions in the STX program of the controller unit.

8.3 Access mechanisms between visualization and internal control program

Introduction

As regards programming, the device JV-1005 is closely coupled with a corresponding JetViewSoft visualization project. There is an interaction between the visualization and the internal controller unit.

In addition to a command interface (VisuCommands), direct access to the properties of visualization objects and the callback mechanisms, the device JV-1005 also offers the register range from 365000 to 365009 for special adaptations of a visualization project.

Visualization commands

The *Visualization Library* lets you manipulate visualization objects directly from the STX application program. The library offers various commands for addressing different aspects of the visualization objects. A description of the commands can be found in the JetSym help.

To make use of the visualization commands, you must have added the *Visualization Library*.

How to add the visualization library is described in the JetViewSoft help.

Example:

```
// Switching to another mask
VisuCmdActiveMask(WorkingSet_0, MySecondMask);
```

Object-oriented access

The *Visualization Library* lets you manipulate visualization objects directly from the STX application program. In addition to the commands described above, the library offers object-oriented access to visualization objects to address different aspects of these objects.

Direct access to properties of visualization objects requires that you have added the *Visualization Library*.

How to add the visualization library is described in the JetViewSoft help.

Example:

```
// Setting the needle of a meter object to 100.
_MeterEx_28000.NeedlePosition := 100;
```

Callback mechanisms

Callback mechanisms implement process sequences that are triggered by an event within the visualization project. Examples of events:

- Keystroke
- Events from other input devices (mouse, ...)
- Changes to variables within the visualization, etc.

These callback mechanisms are subdivided as follows:

- Preset callbacks
- Individually defined callbacks

Preset callbacks

By including the **VisualInterface.stxp** file, two predefined functions (`Forward`

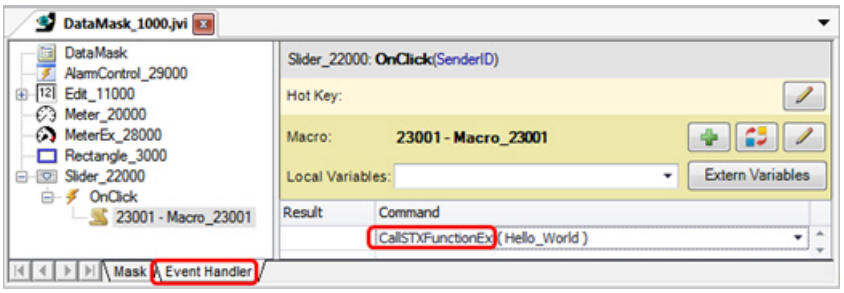
`Function`) are automatically included in the application program (`OnKeyDown` & `OnKeyUp`).

You must include these two functions in your application program and leave them there as an empty function trunk, since the JV-1005 has no keys. JetViewSoft automatically generates the **VisualInterface.stxp** file for the respective HMI.

Individually defined callbacks

Besides preset callbacks, you can also define callback functions to your own liking and link them with various events for visualization.

To do this, in JetViewSoft extend the desired event handler with a macro. Within the macro, the command `CallSTXFunctionEx` can be invoked. Function name and parameters must correspond to the function signature given later. If such a macro has been defined, a new JetViewSoft build must be made. As a result, the corresponding forward declaration is added to the **VisualInterface.stxp** file. It is mandatory to implement this function.



8.4 Examples of the interaction between visualization and control

Introduction

The programming language STX offers you the possibility to access the visualization objects created with JetViewSoft and control the display on the HMI. You program the HMI with the STX language like a controller. The compiled programs can be processed in the HMI without the need for an external controller. This is made possible by the STX interpreter and the graphical runtime environment JVER (Embedded Runtime). Both form an integral part of the HMI's operating system.

Prerequisite

The description below applies to the ER-STX-VG (CE) and ER-STX (CE) platforms.

Additional information

For more information refer to the JetSym and JetSym online help.

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Value input via the touch display using dynamic I/O	122
Exchanging variable values cyclically between the STX program and the visualization runtime via Jet32 services using dynamic I/O	126
Using visualization commands to manipulate visualization objects	130
Changing visualization objects via object-oriented access	132

Simple language switching via register access

Introduction

This simple example shows how to switch the language via special registers from the internal STX program. For a description of the internal special registers, refer to **Quick Reference** (see page 135).

Languages are managed in a JetViewSoft project using resource files and can be easily switched at runtime.

Special registers

Via register 365100 language selection by means of the Locale IDs available in the project is possible.

Via further special registers (register range 365000 to 365009), for example, the currently active project title of the device JV-1005 can be read out as a register string.

STX program - Example

The program switches between languages of the HMI every 15 seconds.

```
Var

   Locale_ID: Int At %VL 365100;
End_Var;

Task MiniBeispiel Autorun
   Loop
      Locale_ID := 1;
Delay (T#15s);
      Locale_ID := 2;
Delay (T#15s);
   End_Loop;
End_Task;
```

Value input via the touch display using dynamic I/O

Introduction

A few lines of program code enable you to enter data via touch display on the HMI. These data are then available in an STX application program.

Prerequisite

The HMI must be equipped with a touch display.

Creating an Edit Numeric input object

To create an Edit Numeric object by which to enter values via touch display, proceed in JetViewSoft as follows:

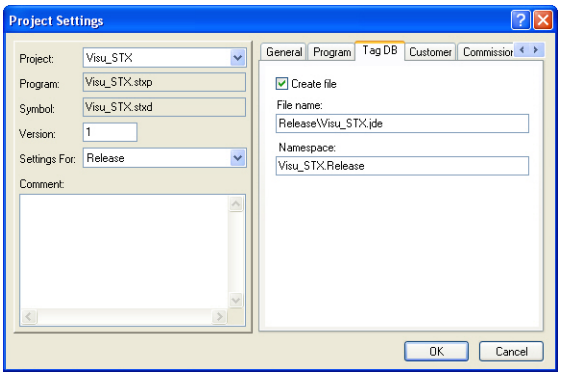
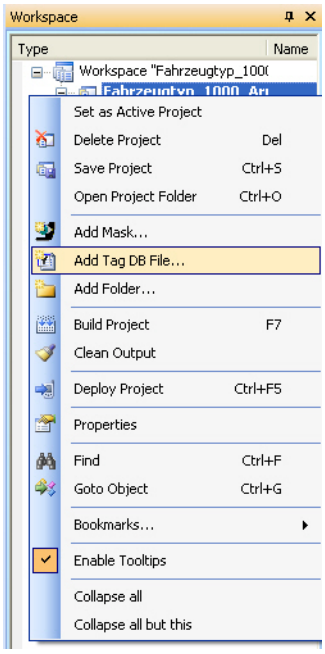
Step	Action
1	Click the button **Edit Numeric** on the toolbar or on the **Drawing** menu. **Result:** The mouse pointer turns into a cross.
2	Position the mouse pointer at the point on the mask where the object should start.
3	Press the left mouse button and keep it pressed.
4	Move the mouse pointer until the object has reached the desired size.
5	Release the mouse button. **Result:** The object is now done and selected.
6	Change to the **Properties** pane.
7	Tick the two checkboxes **Input Dialog**/**Numeric Input** and **Input Dialog**/**Show on Mouse Click**.

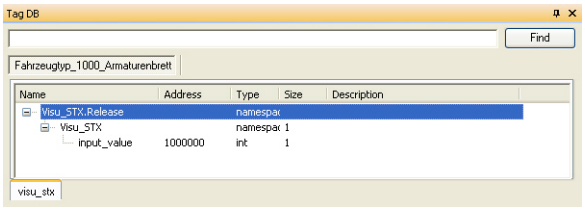
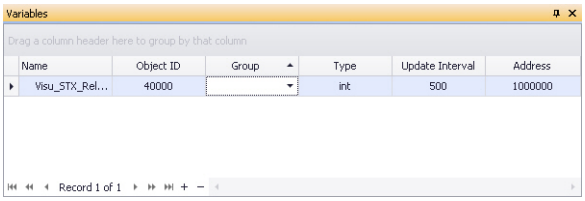
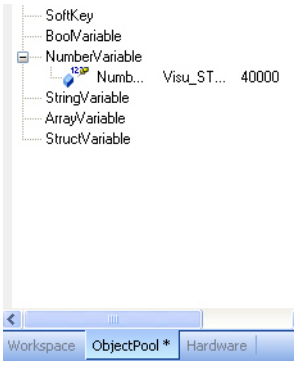
Entering values via touch display

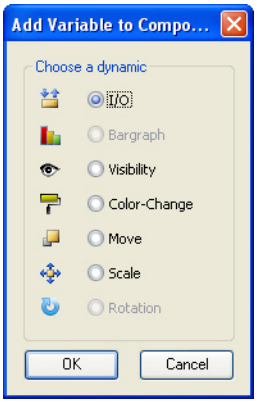
To enter a value into an application register via touch display, proceed as follows:

Step	Action

1	Declare the variables in the STX program using [export jde].
	
	`Task Visu_STX Autorun`
	`Var`
	`input_value: Int At %VL 1000000 [export jde];`
	`End_Var;`
	`End_Task;`

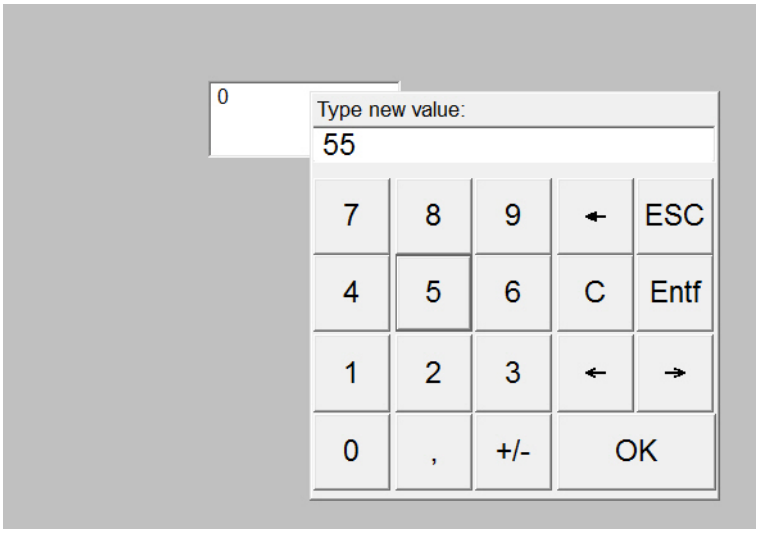
Step	Action
2	To export variables from the JetSym development environment to the JetViewSoft development environment, activate in JetSym in the dialog **Project - Settings ...** on the **TagDB** tab the **Create File** checkbox. 
3	Open the menu **Build**. Select menu item **Build**. Or else, press the key **[F7]**.
⇨	During the build process JetSym will then create a TagDB file with the extension *.jde. This file holds the declarations of all variables. **Storage location:** JetSym creates a folder named **Release**. This is where the file is stored.
4	Embed the TagDB file into your JetViewSoft visualization project. To this end, activate the shortcut menu in the workspace and click on **Add TagDB File...** . 

Step	Action
⇨	JetViewSoft displays the variables declared in the TagDB file in the TagDB window. 
5	Use Drag&Drop to drag a variable into the window **Variables**.
⇨	JetViewSoft creates a variable of the type *Number Variable* as an object. This is what the window **Variables** looks like:  This is what the tab **ObjectPool** looks like:  If the TagDB file contains controller information, JetViewSoft creates a controller and links it with the variables.
6	Use Drag&Drop to drag the variable from the window **Variables** or **ObjectPool** over the visualization object **Edit Numeric**. When the PLUS sign appears, release the mouse button. **Result:** A link between visualization object and variable has been created.

Step	Action
7	Select the corresponding dynamic feature, such as I/O.  **Result:** JetViewSoft adds the variable and dynamic feature to the object properties.
8	In JetSym and JetViewSoft, carry out **Build** and **Deploy**. **Result:** The application is now available on the HMI.
9	Restart the HMI.

Result:

The HMI shows the start screen. Now, you can use the touch display and a soft-touch keyboard to enter a value in the object **Edit Numeric**.



If you enter in the JetSym setup pane register number 1000000, JetSym displays - in our example - value 55.

Exchanging variable values cyclically between the STX program and the visualization runtime via Jet32 services using dynamic I/O

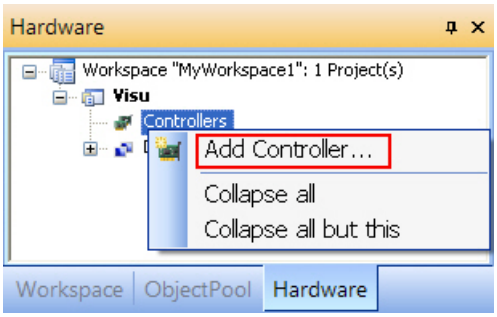
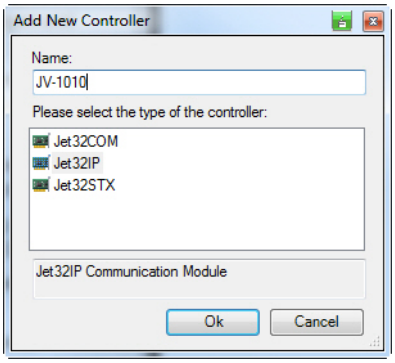
Introduction

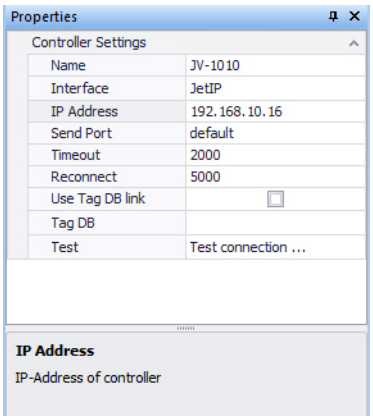
At this point you will learn how the variable value is displayed on the Meter object via Jet32 services.

The control unit of the HMI is used as controller.

Configuring the controller

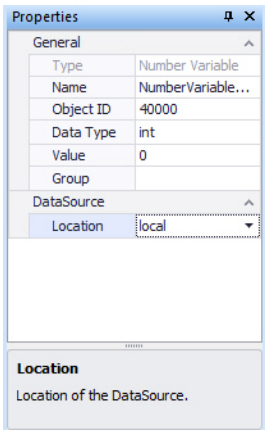
To configure a controller in a JetViewSoft project, proceed as follows::

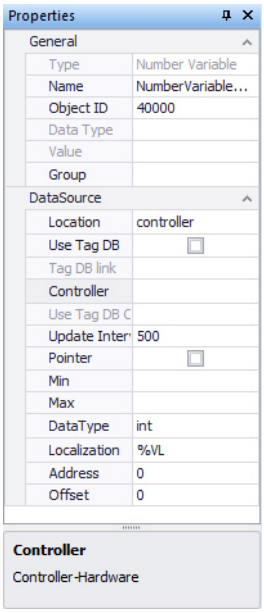
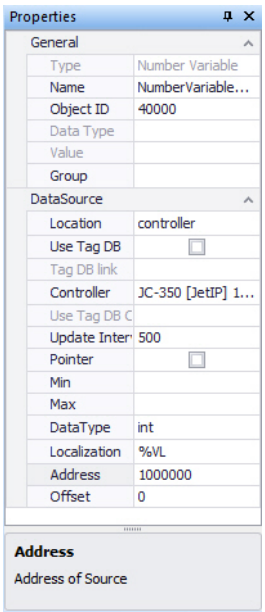
Step	Action
1	In your project, change to the **Hardware** pane.
2	Select the folder **Controllers**.
3	Open the shortcut menu of the folder **Controllers** by pressing the right mouse button.
4	Click on menu command **Add Controller...**. 
5	The dialog box **Add New Controller** opens. Enter into the text box **Name** the name of the controller.
6	From the dialog box, select the controller type **Jet32IP** or **Jet32STX**. Confirm by clicking **OK** 
7	Change to the **Properties** pane.

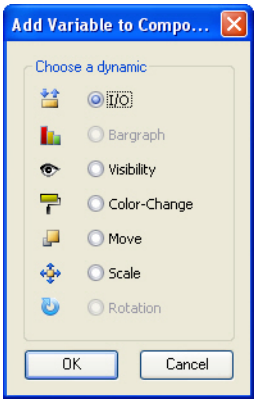
Step	Action
8	Enter the IP address of the external controller under **Controller Settings => IP Address**. 
9	Save your settings using the shortcut **[Ctrl]+[S]**.

Assigning a number variable to the Meter object

To assign a number variable of an external control to the Meter object, proceed as follows:

Step	Action
1	Open the **Object Pool** pane in your project.
2	If you have not already done so, create a variable of type **Number Variable**. To do so, click the right mouse button and open the shortcut menu **Insert new Object -> Number Variable**.
3	Select the previously created variable from the Object Pool.
4	The **Properties** pane displays the properties of the selected variable. 

Step	Action
5	Select as location **Controller**. 
6	Select the previously created external controller as **Controller** and enter, for example, 1000000 for **Address** from the application register area. 
7	Drag and drop the variable from the Variables or Object Pool pane to the Meter visualization object. When the PLUS sign appears, release the mouse button. Result: A link between visualization object and variable has been created.

Step	Action
8	Select the corresponding dynamic feature, such as I/O.  **Result:** JetViewSoft adds the variable and dynamic feature to the object properties.
9	Save your settings using the shortcut **[Ctrl]+[S]**.

10	In JetSym, write a program in which the value of variable **1000000** is changed.
	Sample program:
	`Var`
	`  v: Int At %VL 1000000;`
	`End_Var;`
	
	`Task Main Autorun`
	`Var`
	`  i: Int;`
	`End_Var;`
	`Loop`
	`  i := 0;`
	`  v := 0;`
	`  While i < 101 Do`
	`  Inc(i);`
	`  Inc(v);`
	`  Delay(T#1s);`
	`  End_While;`
	`End_Loop;`
	`End_Task;`

11	In JetSym and JetViewSoft carry out **Build** and **Deploy**. **Result:** The application is now available on the HMI.
12	Restart the HMI.

Using visualization commands to manipulate visualization objects

Introduction

Visualization commands are functions included in the JetSym visualization library. These function can be invoked in the STX program. Thus, visualization commands let you manipulate visualization objects directly from within the STX program. The description below shows how to change, for example, the fill color of an ellipse using the corresponding visualization command.

Components of the visualization library

All available commands have been declared in the file **VISU_Functions.stxp**. Predefined data types, such as the color as RGB value, attributes and key codes have been declared in the file **VISU_Defines.stxp**. Both files form an integral part of the visualization library.

Prerequisites

For the compiler to compile the following program without errors, add the program code listed below to the sample programs:

```
#Include "VisualInterface.stxp";

Function OnKeyDown (KeyCode:long, Flags:long)
End_Function;
Function OnKeyUp (KeyCode:long, Flags:long)
End_Function;
```

Task 1

The application program is to control the color change of an ellipse through the fill color attribute. After 5 seconds the fill color is to change from red to blue and after another 5 seconds back from blue to red.

Task 1 - Solution

The application program invokes the function **VisuCmdAttribute()** at regular intervals (cycles).

Task 1 - STX program

```
Var
    Flag:    Bool At %MX 1;
End_Var;

Task Visu_STX Autorun
Flag := FALSE;
Loop
    If Flag = FALSE Then
        Flag := TRUE;
    ELSE
        Flag := FALSE;
    End_If;

Case Flag Of
    TRUE:  VisuCmdAttribute (Ellipse_4000,
ELLIPSE_ATTR_FILLATTRIBUTE, FillAttribute_Blue);
    Break;
    FALSE: VisuCmdAttribute (Ellipse_4000,
ELLIPSE_ATTR_FILLATTRIBUTE, FillAttribute_Red);
    Break;
End_Case;
```

```
Delay(T#5s);
End_Loop;
End_Task;
```

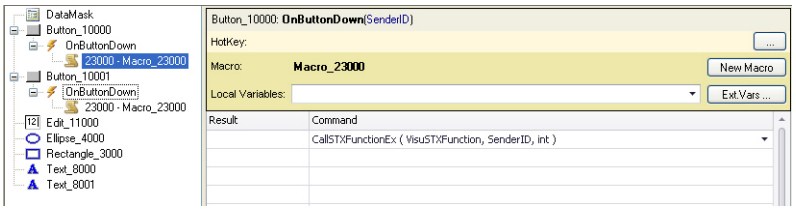
Task 2

When a certain button is activated (Button_10000), the fill color of a rectangle object is to change to red.

When a second button is activated (Button_10001), the fill color of the same rectangle object is to change to blue. The digipot or touch is used to activate the buttons.

Task 2 - Solution

Assign in JetViewSoft the event **OnButtonDown** to both buttons. When this event occurs, the macro function **CallSTXFunctionEx()** is invoked.



In the application program, a function has been declared which in turn executes a visualization command. In the given case it is the function **VisuSTXFunction()**.

The SenderID holds the information which button has been pressed. A case instruction is used to retrieve this information.

Task 2 - STX program

```
Function VisuSTXFunction (SenderID : long)

Case SenderID Of
    Button_10000: VisuCmdAttribute (Rectangle_3000;
RECTANGLE_ATTR_FILLATTRIBUTE, FillAttribute_Red);
    Break;
    Button_10001: VisuCmdAttribute (Rectangle_3000;
RECTANGLE_ATTR_FILLATTRIBUTE, FillAttribute_Blue);
    Break;
End_Case;
End_Function;

Task Visu_STX Autorun

End_Task;
```

Note

Once you have selected the macro function **CallSTXFunctionEX()** in a macro object, this function with its name is declared in the file **VisualInterface.stxp** as **forward**. This means that the function has to be implemented. Please make sure you do not implement the function in the file **VisualInterface.stxp**, as this file is newly created at each JetViewSoft build procedure.

Changing visualization objects via object-oriented access

Introduction

As an alternative to the access via the visualization commands described above, the properties of visualization objects can be changed via direct object-oriented access from the STX program.

The description below shows how to change the fill color of an ellipse using object-oriented access to the property.

Components of the visualization library

All available commands have been declared in the "**VISU_Functions.stxp** file. Predefined data types, such as the color as RGB value, attributes and key codes have been declared in the **VISU_Defines.stxp** file. Both files form an integral part of the visualization library.

Prerequisites

- JetViewSoft version 5.2 or higher.
- JetSym version 5.4 or higher.

For the compiler to compile the following program without errors, add the program code listed below to the sample program:

```
#Include "VisualInterface.stxp";

Function OnKeyDown(KeyCode:long, Flags:long) End_Function;
```

Task

The application program is to control the color change of an ellipse through the fill color attribute. After 5 seconds the fill color is to change from red to blue and after another 5 seconds back from blue to red.

Solution

The application program invokes the **VisuCmdAttribute** () function at regular intervals (cycles).

STX program for the task

```
Task Visu_STX Autorun

Loop
_Ellipse_4000.FillAttribute.FillColor := clBLUE;
Delay(T#5s);
_Ellipse_4000.FillAttribute:FillColor ;= clRED;
Delay(T#5s);
End_Loop;
End_Task;
```

8.5 CANopen® (option -CO)

Programming

As an option, the HMI can be ordered with a CANopen® interface (ordering option:- CO).

Programming is done via the CANopen®-STX-API integrated in the STX language.

For a description of the CANopen®-STX-API refer to the application-oriented manual CANopen® STX API.

9 Quick reference

Corresponding OS version

This quick reference summarizes in brief the registers and flags of the HMI JV-1005 running OS version 5.20.0.00

General overview - Registers

100000 ... 100999	Electronic Data Sheet (EDS)
102000 … 102999	Realtime clock
104000 ... 104999	Ethernet
106000 ... 106999	CAN
107000 ... 107499	SD memory card
107500 ... 107599	Flash disk
108500 ... 108599	System information
109000 ... 109999	USB flash drive
200000 ... 209999	General system registers
210000 ... 219999	Application program
230000 ... 239999	Networking via JetIP
260000 ... 269999	RemoteScan
270000 ... 279999	Modbus/TCP
290000 ... 299999	E-mail
310000 ... 319999	File system/data files
350000 ... 359999	User-programmable IP interface
360000 ... 369999	Display

I/Os - General overview

Input keys

361000 ... 361007	Bit-coded map of input keys (e.g. with USB keyboard connected)

Flags - General overview

0 ... 255	Application flags (remanent)
256 ... 2047	Overlaid by registers R 1000000 through 1000055
2048 ... 2303	Special flags

Electronic Data Sheet (EDS)

100801	MAC address (3 MSB)
100802	MAC address (3 LSB)

Serial interface

X = COM port number - 1

103X02	Baud rate (1,200 … 115,200)
103X03	Bits per character (5 ... 8)
103X04	Stop bits (1, 2)
103X05	Parity 0: None 1: Odd 2: Even 3: 1 4: 0
103X07	Port activation 1: ON 2: OFF
103X10	Transmit buffer
103X11	Transmit buffer filling level
103X12	Receiving buffer (without immediate clearing)
103X13	Receiving buffer (with immediate clearing)
103X14	Receive buffer filling level
103X15	Receive buffer, 16-bit, little endian
103X16	Receive buffer, 16-bit, big endian
103X17	Receive buffer, 32-bit, little endian
103X18	Receive buffer, 32-bit, big endian
103X19	Error counter

Real-time clock

Direct access

102910	Milliseconds
102911	Seconds
102912	Minutes
102913	Hours
102914	Weekday (0 = Sunday)
102915	Day
102916	Month
102917	Year

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

IP (not remanent)

104531	Current IP address (rw)
104532	Current subnet mask (rw)

CAN (hardware option -CO)

106000	Baud rate CAN 0
106001	Node ID CAN 0
106100	Baud rate CAN 1 (only for JV-1007 and JV-1010)
106101	Node ID CAN 1 (only for JV-1007 and JV-1010)

SD memory card

107000	Bit 0 = 1: Card installed Bit 1 = 1: Card is ready
107002	Size in MB (float)

Flash disk

107501	Statistics 30: Read present flash disk statistics 99: Clear flash disk statistics
107510	Available sectors
107511	Used sectors
107512	Blocked sectors
107513	Free sectors
107520	Size of the flash disk in bytes
107521	Used memory in bytes
107522	Blocked memory in bytes
107523	Free memory in bytes

System information

108500 ... 108509	JetVM-DII version string
108510 ... 108519	Version string of the host application
108520 ... 108529	File name of the host application
108530 ... 108539	OS version Windows (string)
108570	CPU type
108571	Number of CPUs
108573	Physical RAM
108574	Free physical RAM
108575	Memory utilization (in %)
108581	Screen width (in pixels)
108582	Screen height (in pixels)
108590	HID version

USB flash drive

109000	Bit 0 = 1: Data medium is available
	Bit 1 = 1: Data medium is ready
109002	Size in MBytes

General system registers

200000	STX OS version (major * 100 + minor)
200001	Application program is running (bit 0 = 1)
200008	Error register
	Bit 8: Illegal jump
	Bit 9: Illegal call
	Bit 10: Illegal index
	Bit 11: Illegal opcode
	Bit 12: Division by 0
	Bit 13: Stack overflow
	Bit 14: Stack underflow
	Bit 15: Illegal stack
	Bit 16: Error when loading the application program
	Bit 24: Timeout - Cycle time
	Bit 25: Timeout - Task lock
	Bit 31: Unknown error
200169	STX OS version (IP format)
200170	Controller type
201000	Runtime register in milliseconds (rw)
201001	Runtime register in seconds (rw)
201002	Runtime register in register 201003
	Units (rw)
201003	* 10 ms units for register 201002 (rw)
201004	Runtime register in milliseconds (ro)
202930	Web status (bit-coded)
	Bit 0 = 1: FTP server available
	Bit 1 = 0: HTTP-server not available
	Bit 2 = 1: E-mail available
	Bit 3 = 1: Data file function available
	Bit 4 = 1: Modbus/TCP has been licensed
	Bit 5 = 1: Modbus/TCP available
202960	Password for system command register (0x424f6f74)
202961	System command register
202980	Error history: Number of entries
202981	Error history: Index
202982	Error history: Entry
203000	Interface monitoring: JetIP
203001	Interface monitoring: SER
203005	Interface monitoring: 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 ... 209739	Enabling system components

Application program

210000	Application program is running (bit 0 = 1)
210001	JetVM version
210004	Error register (bit-coded)
	Bit 8: Illegal jump
	Bit 9: Illegal call
	Bit 10: Illegal index
	Bit 11: Illegal opcode
	Bit 12: Division by 0
	Bit 13: Stack overflow
	Bit 14: Stack underflow
	Bit 15: Illegal stack
	Bit 16: Error when loading the application program
	Bit 24: Timeout - cycle time
	Bit 25: Timeout - task lock
	Bit 31: Unknown error
210006	Highest task number
210007	Minimum program cycle time
210008	Maximum program cycle time
210009	Current program cycle time
210011	Current task number
210050	Current program position within an execution unit
210051	ID of the execution unit being processed
210056	Desired total cycle time in µs
210057	Calculated total cycle time in µs
210058	Maximum time slice per task in µs
210060	Task ID (for R210061)
210061	Priority for task [R210060]
210063	Length of scheduler table
210064	Index in scheduler table
210065	Task ID in scheduler table
210070	Task ID (for R210071)
210071	Timer number (0 ... 31)
210072	Manual triggering of a timer event (bit-coded)
210073	End of cyclic task (task ID)
210074	Command for cyclic tasks
210075	Number of timers

210076	Timer number (for R210077)
210077	Timer value in milliseconds
210100 ... 210199	Task state
210400 ... 210499	Task - Program address
210600	Task ID of a cyclical task (for R210601)
210601	Processing time of a cyclical task in per mil figure
210609	Task lock timeout in ms -1: Monitoring disabled
210610	Timeout (bit-coded) Bit 0 -> Timer 0, etc.

File system/data file function

312977	Status of file operation
312978	Task ID

Application registers

1000000 ... 1005999	32-bit integer (non-volatile)

Display

Input keys

361000 ... 361007	Bitwise representation of pressed input keys (USB keyboard) - Keycode from Microsoft

Display

364000	Background lighting Brightness gradation: 0 ... 255

Visualization

365000 ... 365009	Name of the visualization project
365100	Language selection according to locale ID

32 combined flags

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

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

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

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

Overlaid application registers/flags

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
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
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 function

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

4	Conversion from BCD to HEX
5	Conversion from 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	Sorting 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	Initializing RemoteScan
81	Starting RemoteScan
82	Stopping RemoteScan
90	Writing a data file
91	Appending a data file
92	Reading a data file
96	Deleting a data file
110	Sending an e-mail
150	Configuring NetCopyList
151	Deleting NetCopyList
152	Sending NetCopyList

STX functions

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

Appendix

Introduction

This appendix contains electrical and mechanical data, as well as operating data.

Contents

Topic	Page
Ports and interfaces	140
Technical specifications	143
Additional information	149
Index	150

A: Ports and interfaces

Power supply connector

The connector has the following functions:

- Power supply of the JV-1005

Ethernet interface

The two RJ45 jacks have the following function:

- Ethernet interface to a PC
- Ethernet interface to other devices, such as a controller

Serial port

The 9-pin Sub-D connector (female) has the following function:

- Serial interface to a PC
- Serial interface to any device

USB port

The USB port serves the following purposes:

- Updating the system via USB flash drive
- Interface to USB flash drives for memory expansion
- Interface for USB devices, such as mouse or keyboard

Slot for removable storage

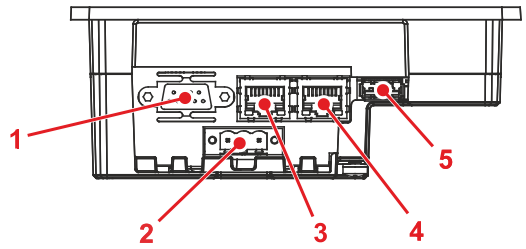
The device has a slot for SD cards.

Content

Topic	Page
Connector pinout	141

Connector pinout

Overview



Connector	Description
1	Serial port
2	Power supply
3	Ethernet port
4	Ethernet port
5	USB port, USB 2.0 and 1.1

Serial port

Pin assignment of the 9-pin female Sub-D connector:

Pin	Signal for RS-232	Signal for RS-422/RS-485	Description
1	GND	GND	Ground reference
2	-	-	
3	TxD	CHA-	Transmit data (reference: JV/differential connection CHA
4	RxD	CHB-	Receive data (reference: JV/differential connection CHB
5	-	-	
6	5 V output	5 V output	
7	-	CHB+	Differential connection CHB
8	-	CHA+	Differential connection CHA
9	-		

Power supply

Pin assignment of the 3-pin Phoenix connector:

Pin	Signal	Description
1	DC 24 V	Supply voltage
2	0 V	Reference potential
3	SHLD	Shielding connection

Ethernet port	The function of the RJ45 jack is as follows: ▪ PC ▪ Ethernet port to other devices, such as a controller
USB port	The USB port serves the following purposes: ▪ Updating the system via USB flash drive ▪ Port for USB flash drives ▪ Interface for USB devices, such as mouse or keyboard

B: Technical specifications

Introduction

This chapter contains information on electrical and mechanical data, as well as on operating data of the JV-1005.

Table of contents

Topic	Page
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Physical dimensions	146
Operating parameters - Environment and mechanics	147
Operating parameters - EMC	148

Technical specifications

Specification: Power supply

Parameter	Description
Rated voltage	DC 24 V
Permissible voltage range	DC 18 V ... DC 32 V
Typical input current	500 mA at DC 24 V
Power consumption	Max. 0.6 x 24 V = 14.4 W

Display screen

Parameter	Description
Display screen	5" TFT LCD flat screen monitor Real-glass touchscreen (PCT)
Brightness	LED background lighting (white), dimmable, typ. 200 cd/m^2
Display resolution	800 x 480 pixels
Colors	64 k

USB

Parameter	Description
Power supply	5 V, max. 150 mA
USB port	USB host interface, USB 2.0 and 1.1
Data rate	To USB-2.0 standard

Ethernet

Parameter	Description
Number of RJ45 jacks	2
Data rate	10 Mbps, 100 Mbps
Special feature:	Integrated switch

Serial port

Parameter	Description
Interface	RS-232, RS-485, RS-422
Configuration	Adjustable by means of software
Data rates	2400 baud ... 1 Mbaud

Memory configurations

Parameter	Description
Number of non-volatile registers	6,000
Non-volatile memory for variables	24,000 bytes
Flash disk	128 MB
RAM	256 MB DDR

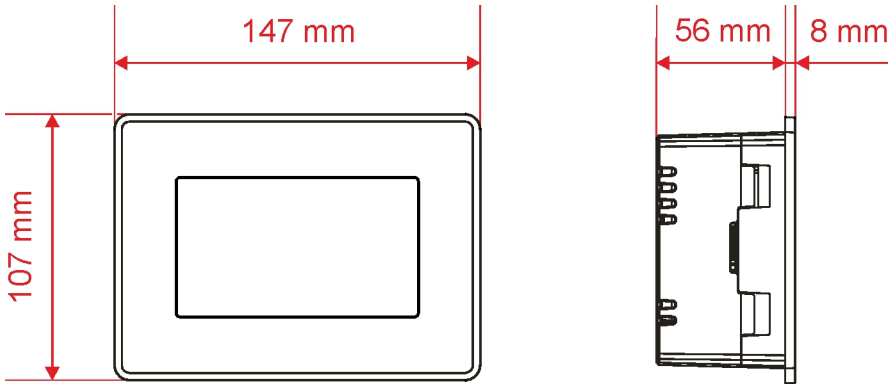
Battery

Parameter	Description
Battery type	Lithium battery, VL 2330
Voltage	3 V
Capacity	50 mAh
Power reserve	3 months at 25 °C (prerequisite: Battery is fully charged)
Accuracy (RTC)	< 100 ppm (at 25 °C)

Physical dimensions

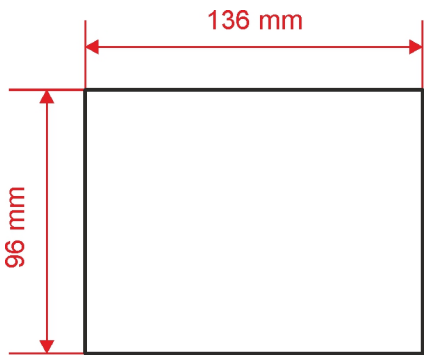
Physical dimensions

The following illustration shows the physical dimensions of the JV-1005.



Panel cutout

The following illustration shows the dimensions of the panel cutout.



Operating parameters - Environment and mechanics

Environmental conditions

Parameter	Value	Standard
Operating temperature range	-20 ... +50 °C	DIN EN 60068-2-14
Storage temperature range	-20 ... 70 °C	DIN EN 60068-2-14
Air humidity	5 ... 85 %, non-condensing Do not use a steam jet or other such devices to clean the device.	DIN EN 60068-2-30
Operating Altitude	Max. 2,000 m above sea level	DIN EN 61131-2

Mechanical parameters

Parameter	Value	Standard
Free falls withstanding test	Height of fall (units within packing): 1 m Product packaging 0.3 m	DIN EN 60068-2-32
Vibration resistance	5 ... 9 Hz: Amplitude 7 mm 9 ... 150 Hz: 1 g acceleration:	DIN EN 60068-2-6
Shock resistance	±50 g, 11 ms, 3 shocks per axis	DIN EN 60068-2-27
Degree of protection	Front panel: IP66 built-in with gasket Rear panel: IP20	DIN EN 60529

Operating parameters - EMC

EMC - Emitted interference

Parameter	Value	Standard
Enclosure	Class A	DIN EN 61000-6-4 DIN EN 55011

EMC - Immunity to interference

Parameter	Value	Standard
ESD	Discharge through air: Test Peak Voltage 8 kV (Humidity Rating RH-2 / ESD-4) Contact discharge: Test Peak Voltage 4 kV (severity level 2), criterion A	DIN EN 61000-4-2
Electromagnetic RF Field, amplitude-modulated	▪ Frequency band 80 MHz ... 1 GHz, test field strength 10 V/m ▪ Frequency band 1.4 GHz ... 2 GHz, test field strength 3 V/m ▪ Frequency band 2 GHz ... 2.7 GHz, test field strength 1 V/m	DIN EN 61000-4-3
Asymmetric RF, amplitude-modulated	Frequency band 0.15 ... 80 MHz Test voltage 10 V	DIN EN 61000-4-6
Surge withstand capability	± 0.5 kV DC mains connection (line to earth) ± 0.5 kV DC mains connection (line to line) ± 1 kV DC signal line (line to earth)	DIN EN 61000-4-5
Bursts	Test voltage 2 kV (DC power supply line) Test voltage 1 kV (signal lines)	DIN EN 61000-4-4

C: Additional information

Additional information

For more information refer to the JetSym and JetSym online help.

Please also refer to the following application-oriented manuals:

- File system
  - It contains topics on storing and uploading of *application programs*.

You can download these application-oriented manuals from the Jetter AG **homepage https://www.jetter.de/en/downloads/product-independent-documentation/application-oriented-manual.html**.

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