

# JC-350

## Version Update

### from V 1.03 to V 1.04



Revision 1.01

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# 1 Introduction

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**Introduction** This chapter shows the history of OS versions for the controller JC-350.

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**Operating System Update - Why?** An OS update for the controller JC-350 allows you to:

- add new functions to your controller
- fix software bugs
- make sure your controller is working with a definite OS version, for example, if a definite OS version has been released for a certain customer

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## Operating System Update

### OS File for Updating the Operating System

For updating the OS the following file is needed:

OS File	Description
JC-350_1.04.0.0.os	OS file for JC-350 with version 1.04

### Downloading the OS File

Jetter AG make operating system files available for download from their homepage at [www.jetter.de](http://www.jetter.de). OS files can be found in the support area or on the page of the JC-350 controller via quicklink.

### Operating System Update by means of JetSym

To update your OS proceed as follows:

Step	Action
1	Download the OS file from <a href="http://www.jetter.de">www.jetter.de</a>
2	Establish a connection between PC and controller
3	In JetSym, activate menu item "Build -> Update OS"
4	Select the OS File
5	Initiate the OS update by clicking OK
6	<b>Result:</b> Following Power OFF / Power ON the new OS is launched.

### Minimum Requirements

For programming a JC-350 with version 1.04 JetSym 4.1 or higher is required.

## JC-350 Version Update - Overview

**V 1.04**

The following table gives an overview of newly added features and fixed software bugs in OS version 1.04:

Feature	New	Bug
<b>JX2 System Bus:</b>		
Register Overlaying for Digital Inputs/Outputs	✓	
Support of JX-SIO modules and third-party CANopen devices	✓	
<b>JX3 System Bus:</b>		
Register Overlaying for Digital Inputs/Outputs	✓	
System bus special registers for status and control	✓	
<b>Operating System Update:</b>		
Via FTP: On completion notification the OS has actually been stored.		✓
Updating a JX2-Slave module while registers are accessed blocks communication		✓
<b>Application Program:</b>		
Task switch could fail to happen		✓
Error signal in case of invalid file "/app/start.ini"		✓
<b>Display Commands:</b>		
Redirection to JX2-SER1 works only if JX2-PRN1 has been configured		✓

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## 2 New Features

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**Introduction**

Jetter AG are continuously striving to add new features and functions to the controller JC-350. By updating your OS you are given the possibility to enhance the functionality of your controller. To do so, you need the following ...

- an OS file
- the software tool JetSym
- a connection between PC and controller

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## Register Overlaying for Digital Inputs/Outputs

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### Introduction

The controller JC-350 provides registers which are overlaid by digital inputs and outputs on the JX2 and JX3 system bus. This allows consistent access to a whole group of inputs or outputs using only one command.

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### Overlaying

- One input or output is mapped to one bit in an overlaying register.
  - There are registers where 8, 16 or 32 inputs/outputs are integrated.
  - Inputs/outputs from different modules can be combined into one register.
  - For a detailed assignment of inputs/outputs to registers refer to chapter *Quick Reference*.
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### Sample Program

#### Task:

A 2-position BCD switch is to be read out. The BCD switch is connected to inputs 1 to 8 of the first input module on the JX3 system bus.

#### Solution:

The position of the switch is read out from an overlaid I/O register and the result is converted from BCD to binary representation. In this example, the conversion is carried out using a system function or "manually" for demonstration purposes.

#### Configuration:

Connection of the switch to the input module:

Input #	BCD switch
100000201	Units place: Bit 0
100000202	Units place: Bit 1
100000203	Units place: Bit 2
100000204	Units place: Bit 3
100000205	Tens place: Bit 0
100000206	Tens place: Bit 1
100000207	Tens place: Bit 2
100000208	Tens place: Bit 3



**JetSym STX Program**

```
#Include "Platforms.stxp"

Var
    SetValue:          Int At %VL 1000100;
    BCDswitch:        Int At %VL 100004122;
    UseSystemFunction: Bool;
End_Var;

Task ReadBCDswitch Autorun
    Loop
        If UseSystemFunction Then
            Systemfunction(4, &BCDswitch, &SetValue);
        Else
            SetValue := (BCDswitch >> 4) * 10
                + (BCDswitch Wand 0x0f);
        End_If;
    End_Loop;
End_Task;
```

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## JX3 System Bus: Registers for Status and Control

### Overview

Register(s)	Function
R 10002000	JX3 system bus revision
R 10002008	Error (bit-coded)
R 10002011	Module number in case of error
R 10002013	Number of detected JX3 modules
R 10002015	Index to module array
R 10002016	Module array
R 10002111	Register number in case of error
R 10002764	Timeout for register access [ms]

### R 10002000

#### JX3 system bus revision

This register contains the revision number of the JX3 system bus driver. The revision number is a four-figure value.

1	.	2	.	3	.	4
---	---	---	---	---	---	---

Element	Function
1	Driver ID
2	Driver revision
3	0
4	0

Select the format *IP address* in the setup window of JetSym.

### R 10002008

#### Error

This register shows the error status.

#### Meaning of the individual bits

##### Bit 3 Error when accessing a JX3 module

1 = When accessing a JX3 module, an error has occurred

#### Register properties

Type of access	Read access
	Write access will delete the register content

**R 100002011**

**Module number in case of error**

This register indicates the number of the module which should be accessed when the last error occurred.

Register properties	
Values	0, 2 ... 17
Type of access	Read access Write access will delete the register content
Takes effect	if bit 3 in R 100002008 is set

**R 100002013**

**Number of detected JX3 modules**

This register indicates the number of JX3 modules which have been detected during system launch.

Register properties	
Values	0 ... 16
Value after reset	Depending on JX3 system bus configuration
Type of access	Read access

**R 100002015**

**Index to module array**

This register is the index to the module array where the module IDs of connected JX3 modules are stored. Array data can be read in R 100002016.

Register properties	
Values	0 ... 16

**Correlation between R 100002015 and R 100002016:**

R 100002015	R 100002016
0	Number of detected JX3 modules
1	Module ID of the first JX3 module
2	Module ID of the second JX3 module
...	...

**R 100002016**

**Module array**

This register shows the contents of the module array the index of which is contained in R 100002015.

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### Register properties

Values	0 ... 65.535
Value after reset	Depending on JX3 system bus configuration
Type of access	Read access
Takes effect	once a value has been entered into R 100002015

### Module codes of JX3 modules:

Module code	JX3 module
300	JX3-DI16
301	JX3-DIO16
302	JX3-DO16
303	JX3-AI4 (16 bits)
304	JX3-AO4
305	JX3-MIX
306	JX3-REL2-2A
307	JX3-THI2-RTD
308	JX3-CNT
309	JX3-SER
311	JX3-PRN
312	JX3-THI2-TC
313	JX3-AI4 (12 bits)
314	JX3-AO2
316	JX3-DMS2
317	JX3-SV1

## R 100002111

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### Register number in case of error

This register indicates the number of the module register which should be accessed when the last error occurred.

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### Register properties

Values	0 ... 9.999
Value after reset	-1
Type of access	Read access Write access will set this register to -1
Takes effect	if bit 3 in R 100002008 is set

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R 100002764

**Timeout for register access**

This register specifies the timeout for access to a JX3 module register in milliseconds.

**Register properties**

Values	0 ... 65,535 [ms]
Value after reset	2,000
Takes effect	during the next access to a JX3 module register

## Modules suitable for connection to the system bus

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### Number of connectable modules

The following table shows the maximum number of modules which can in parallel be connected to the system bus of the controller JC-350.

Controller	JX2-I/O Modules IP67 Modules	JX-SIO CANopen Modules	JX2-Slave Modules JetMove
JC-350-4	23	10	4
JC-350-8	23	10	8

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### Connectable Modules

The following modules by Jetter AG can be connected to the system bus of the controller JC-350:

- non-intelligent JX2-I/O modules
  - intelligent JX2-Slave modules
  - servo amplifiers JetMove 1xx, JetMove 2xx, and JetMove 6xx
  - IP67 modules LioN-S and LJX7-CSL
  - JX-SIO and Smart-I/O
- 

### third-party CANopen modules

The following third-party CANopen modules can be connected to the system bus of the controller JC-350:

- valve terminals by Festo
  - valve terminals by SMC
  - valve terminals by Bürkert
  - I/O-System 750 by Wago
  - ecostep drives □ by Jenaer Antriebstechnik
  - EPOS drives by maxon
  - Milan Drive by GFC
  - AS interface master by Bihl+Wiedemann
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# 3 Fixed Software Bugs

**Introduction** This chapter describes the software bugs which have been fixed in the new operating system release.

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## Controller stalls: Program gets stuck in a task

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### Effects of this Bug

- The controller got stuck in processing only one task of the application program.
- Via Ethernet, the controller responds only to a "ping".
- Other communication is not possible.

### Affected Revisions

The following revisions of the JC-350 are affected by this bug:

OS revision	< 1.03.0.02
Hardware revision	not applicable
Configuration or operating mode	not applicable

### Remedy / Workaround

There is no remedy for affected revisions. Minimizing the number of accesses to registers on JX2 and JX3 modules reduces only the probability for this bug to happen.

### Bug Fix

Starting from the following revisions of the JC-350 this bug has been fixed:

OS revision	1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

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## Missing error signal in case of invalid file "/app/start.ini"

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**Effects of this Bug**

If the contents of file "/app/start.ini" are invalid, and, therefore, the application program can't be loaded, there is no error message in the error register. The green LED "R" is lit, and the status register of the application program indicates that the program is running.

**Affected Revisions**

The following revisions of the JC-350 are affected by this bug:

OS revision	< 1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

**Remedy / Workaround**

Download the application program in JetSym. When doing so, a new file "/app/start.ini" will be created.

**Bug Fix**

Starting from the following revisions of the JC-350 this bug has been fixed:

OS revision	1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

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## Display Redirection to JX2-SER1

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**Effects of this Bug** Redirecting display commands to a serial interface module JX2-SER1 works only if the special register for display redirection to a printer has been set to a module on the JX2 system bus.

**Affected Revisions** The following revisions of the JC-350 are affected by this bug:

OS revision	< 1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

**Remedy / Workaround** Enter the number of a module on the JX2 system bus into the special register for display redirection to a printer even if you don't have connected a printer module JX2-PRN1.

**Bug Fix** Starting from the following revisions of the JC-350 this bug has been fixed:

OS revision	1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

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## OS Update via FTP Doesn't Work Properly

**Effects of this Bug**

When the controller is rebooted following an OS update via FTP, the OS sometimes fails to launch. The controller remains in boot loader stage, as there is no proper operating system. The new OS will launch if you wait a few seconds before you reboot the controller following an OS update.

**Error Cause**

The FTP server in the controller notifies the FTP on the PC of the successful OS update regardless of the fact that the OS has not yet been saved completely.

**Affected Revisions**

The following revisions of the JC-350 are affected by this bug:

OS revision	1.02.0.00 ... 1.03.0.00
Hardware revision	not applicable
Configuration or operating mode	not applicable

**Remedy / Workaround**

Following an OS update via FTP wait at least 30 seconds before rebooting the controller.

**Bug Fix**

Starting from the following revisions of the JC-350 this bug has been fixed:

OS revision	1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

## Crash When Updating the OS of a JX2-Slave Module

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**Effects of this Bug** If the system tries to access a register of a module on the JX2 system bus during OS update of a JX2-Slave module, the OS update may abort. As a result, further communication with the controller is interrupted.

**Affected Revisions** The following revisions of the JC-350 are affected by this bug:

OS revision	< 1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable
Note	853

**Remedy / Workaround** Make sure that no access is made to a register of a module on the JX2 system bus during an OS update of a JX2-Slave module.

**Bug Fix** Starting from the following revisions of the JC-350 this bug has been fixed:

OS revision	1.04.0.0
Hardware revision	not applicable
Configuration or operating mode	not applicable

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# 4 Quick Reference JC-3xx

## Operating System Release

This quick reference gives an overview of registers and flags used in connection with the controller JC-350 with OS release 1.04, as well as of the connector assignment.

## General register overview

100000 ... 100999	Electronic Data Sheet (EDS)
101000 ... 101999	Configuration
102000 ... 102999	Realtime clock
103000 ... 103999	Serial interface
104000 ... 104999	Ethernet
107000 ... 107999	SD memory card
108000 ... 108999	CPU/backplane
200000 ... 209999	General system registers
210000 ... 219999	Application program
220000 ... 229999	HMI control
230000 ... 239999	Networking via JetIP
260000 ... 269999	Remote scan
270000 ... 279999	Modbus/TCP
290000 ... 299999	E-Mail
310000 ... 319999	File system / data files
350000 ... 359999	User-programmable IP Interface

1000000 ... 1001999	JC-340: Application registers (remanent)
1000000 ... 1019999	JC-340: Application registers (remanent) with option -X
1000000 ... 1029999	JC-350: Application registers (remanent)
100mm0000 ...	JX3 modules (mm: 02 ... 17)
100mm9999	
200mm0000 ...	JX2 modules (mm: 02 ... 24)
200mm9999	

## General I/O overview

20001 ... 36000	Virtual I/Os for RemoteScan
10000mm01 ...	JX3 modules (mm: 02 ... 17)
10000mm16	
20000mm01 ...	JX2 modules (mm: 02 ... 24)
20000mm16	

## General overview of flags

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

## Electronic Data Sheet (EDS)

100500	Interface (0 = CPU, 1 = JX3 modules)
100501	Module number (2 .. 17)

Here, the EDS of the selected module is shown:

### [Identification]

100600	Internal revision number
100601	Module ID
100602 ...	Module name (register string)
100612	
100613	PCB revision
100614	PCB options

### [Production]

100700	Internal revision number
100701 ...	Serial number (register string)
100707	
100708	Day
100709	Month

100710	Year
100711	TestNum.
100712	TestRev.
<b>[Features]</b>	<b>I/O module</b>
100800	Internal revision number
100801	Diagnostic configuration
100802	Digital inputs
100803	Digital inputs, inverted
100804	Digital outputs
100805	Digital outputs, inverted
100806	Cyclic inputs
100807	Cyclic outputs
100808	Features
100809	Diagnostic mask
<b>[Features]</b>	<b>JX3-BN-ETH/JC-3xx</b>
100800	Internal revision number
100801	MAC address (Jetter)
100802	MAC address (device)
100803	Serial interface
100804	Switch
100805	STX
100806	Remanent registers
100807	JX3 Bus
100808	CAN Bus
100809	SD memory card
100810	Motion Control
100811	Intelligent slave modules
100812	HTTP / e-mail
100813	Modbus/TCP
100814	Ethernet/IP
100815	LED for SD card
100816	User LEDs
100817	RTC

## Configuration

<b>From file "/System/config.ini"</b>	
101100	IP address
101101	Subnet mask
101102	Default gateway
101013	DNS server
101132	Suffix type of host name
101133 ...	Host name (register string)
101151	
101164	Port number JetIP
101165	Port number STX debugger
<b>Used by system</b>	
101200	IP address
101201	Subnet mask
101202	Default gateway
101213	DNS server
101232	Suffix type of host name
101233 ...	Host name (register string)
101251	
101264	Port number JetIP
101265	Port number STX debugger

## Realtime clock

<b>Direct access</b>	
102911	Seconds
102912	Minutes
102913	Hours
102914	Day of the week (0 = Sunday)
102915	Day
102916	Month
102917	Year
<b>Buffer access</b>	
102921	Seconds
102922	Minutes
102923	Hours
102924	Day of the week (0 = Sunday)
102925	Day
102926	Month
102927	Year
102928	Read/write trigger

## 4 Quick Reference JC-3xx

### Serial Interface

103000	Error condition (bit-coded) Bit 14 = 1: Framing error Bit 13 = 1: Parity error Bit 12 = 1: Overflow
103001	Protocol 1: System logger 2: PRIM 3: pcomX
103002	Baud rate (1200 ... 115200)
103003	Bits per character (5 .. 8)
103004	Stop bits (1, 2)
103005	Parity 0: None 1: odd 2: even 3: 1 4: 0
103006	0 = RS-232, 1 = RS-422, 3 = RS-485/2
103010	Transmit Buffer
103011	Transmit buffer filling level
103012	Receiving buffer (without clearing)
103013	Receiving buffer (with clearing)
103014	Receiving buffer filling level
103015	Receiving buffer, 16-bit, little endian
103016	Receiving buffer, 16-bit, big endian
103017	Receiving buffer, 32-bit, little endian
103018	Receiving buffer, 32-bit, big endian
103019	Error counter

### Ethernet

#### ARP

104200	Sent requests
104201	Received requests
104202	Sent responses
104203	Received responses
104204	Dynamic entries
104205	Static entries
104206	Obsolete entries
	<b>IP</b>
104500	Sent packets
104501	Sent bytes
104502	Received packets
104503	Received bytes
104504	Invalid packets
104505	Received packets discarded
104506	Checksum error at reception
104507	Transmit packets discarded
104508	Sent fragments
104509	Received fragments
104531	Current IP address (rw)
104532	Current subnet mask (rw)
104533	Current default gateway (rw)

#### TCP

104800	Sent packets
104801	Sent bytes
104802	Received packets
104803	Received bytes
104804	Invalid packets
104805	Received packets discarded
104806	Checksum error
104807	Connections
104808	Disconnections
104809	Connections discarded
104810	Repeatedly sent packets

#### UDP

104900	Sent packets
104901	Sent bytes
104902	Received packets
104903	Received bytes
104904	Invalid packets
104905	Received packets discarded
104906	Checksum error

### SD memory card

107000	Bit 0 = 1: Card exists Bit 1 = 1: Card is ready
107001	1 = card is write-protected (only valid if register 107000 = 3)
107002	Size in MByte

### CPU/backplane

108002	All LEDs ON/OFF (bit-coded) Bit 0: LED R Bit 1: LED E Bit 2: LED D1 Bit 3: LED D2
108003	LED R 0 = OFF 1 = blinking slowly 2 = blinking fast 3 = ON
108004	LED E 0 = OFF 1 = blinking slowly 2 = blinking fast 3 = ON
108005	LED D1 0 = OFF 1 = blinking slowly 2 = blinking fast 3 = ON
108006	LED D2 0 = OFF 1 = blinking slowly 2 = blinking fast 3 = ON
108007	LED SD 0 = OFF 3 = ON
108008	LEDs U1 through U4 ON/OFF (bit-coded) Bit 0: LED U1 Bit 1: LED U2 Bit 2: LED U3 Bit 3: LED U4
108010	DIP switch - all switches
108011	DIP switch - address
108012	DIP switch - mode
108015	Mode selector 1 = LOAD 2 = RUN 3 = STOP
108020	Backplane revision
108021	CPU board revision
108099	Delete EEPROM (0x12345678)
108100 ...	EEPROM register on backplane
108227	

### General system registers

200000	OS version (Major * 100 + Minor)
200001	Application program is running (bit 0 = 1)
200008	Error register (identical to 210004) Bit 1: Error JX3 bus Bit 2: Error JX2 bus Bit 8: Invalid jump Bit 9: Invalid call Bit 10: Invalid index Bit 11: Invalid Opcode Bit 12: Division by 0 Bit 13: Stack overflow Bit 14: Stack underflow Bit 15: Invalid stack Bit 16: Error while loading the application program Bit 24: Cycle timeout Bit 25: Tasklock timeout Bit 31: Unknown error

200168	Bootloader version (IP format)	210057	Calculated total cycle time in $\mu$ s
200169	OS version (IP format)	210058	Maximum time slice per task in $\mu$ s
200170	Controller type (340/350)	210060	Task ID (for register 210061)
		210061	Task priority [reg. 210060]
		210063	Length of scheduler table
		210064	Index in scheduler table
201000	Runtime register(s) in milliseconds (rw)	210065	Task ID in scheduler table
201001	Runtime register(s) in seconds (rw)	210070	Task ID (for register 210071)
201002	Runtime register(s) in register 201003 Units (rw)	210071	Timer number (0 .. 31)
		210072	Manual triggering of a timer event (bit-coded)
201003	* 10 ms units for register 201002 (rw)	210073	End of cyclic task (task ID)
201004	Runtime register(s) in milliseconds (ro)	210074	Command for cyclic tasks
		210075	Number of timers
		210076	Timer number (for reg. 210077)
		210077	Timer value in milliseconds
202930	Web status (bit-coded)		
	Bit 0: 1 = FTP server available	210100 ...	Task condition
	Bit 1: 1 = HTTP server available	210199	
	Bit 2: 1 = E-mail function available		
	Bit 3: 1 = Data file function available		
	Bit 4: 1 = Modbus/TCP has been licensed	210400 ...	Task program address
	Bit 5: 1 = Modbus/TCP is available	210499	
	Bit 6: 1 = Ethernet/IP available		
202936	Password for file system		
	0xc4697a4b: Formatting the flash disk	210600	Task ID of a cyclic task (for register 210601)
	0xd364e64d: Formatting the SD card	210601	Processing time of a cyclic task in per thousand
	0x2c9b3c94: Checking the SD card	210609	Tasklock timeout in ms
202960	Password for system command register (0x424f6f74)		-1: Monitoring disabled
202961	System command register		
		210610	Timeout (bit-coded, bit 0 -> timer 0 etc.)
202980	Error history: Number of entries		
202981	Error history: Index		
202982	Error history: Item		
203000	Interface Monitoring: JetIP		
203001	Interface Monitoring: SER		
203005	Interface Monitoring: Debug server		
203100 ...	32-bit overlaying flag 0 .. 255		
203107			
203108 ...	16-bit overlaying flag 0 .. 255		
203123			
203124 ...	32-bit overlaying flag 2048 .. 2303		
203131			
203132 ...	16-bit overlaying flag 2048 .. 2303		
203147			
209700	System logger: Global enabling		
209701 ...	Enabling of system components		
209739			
<b>Application program</b>			
210000	Application program is running (bit 0 = 1)		
210001	JetVM version		
210004	Error register (bit-coded)		
	Bit 1: Error JX3 bus		
	Bit 2: Error JX2 bus		
	Bit 8: Invalid jump		
	Bit 9: Invalid call		
	Bit 10: Invalid index		
	Bit 11: Invalid Opcode		
	Bit 12: Division by 0		
	Bit 13: Stack overflow		
	Bit 14: Stack underflow		
	Bit 15: Invalid stack		
	Bit 16: Error while loading the application program		
	Bit 24: Cycle timeout		
	Bit 25: Tasklock timeout		
	Bit 31: Unknown error		
210006	Highest task number		
210007	Minimum program cycle time		
210008	Maximum program cycle time		
210009	Current program cycle time		
210010	Current task number		
210050	Current program location within an execution unit		
210051	ID of the execution unit currently being processed		
210056	Desired total cycle time in $\mu$ s		
		222804	Total number of display characters
		222805	Number of characters per line
		222806	Text selection (DisplayText2)
		222808	Number of decimal places (UserInput)
		222810	Number of decimal places (DisplayValue)
		222811	Maximum number of decimal places (UserInput)
		222812	Field length (DisplayValue)
		222813	Field length (UserInput)
		222814	Indirect cursor position
		222815	Default value (UserInput) (integer/float)
		222816	Sign suppression
		222817	Status UserInput
		222818	Enable/disable monitor functions
		222819	Display text for monitor function
		222820	Switch to monitor
		222821	Dialog language
		222824	Indirect buffer number
			<b>Multi-display mode</b>
		222825	Text buffer for display 1
		222826	Text buffer for display 2
		222827	Text buffer for display 3
		222828	Text buffer for display 4
		222829	Basic flag number Display 1
		222830	Basic flag number Display 2
		222831	Basic flag number Display 3
		222832	Basic flag number Display 4
		222833	Register number LED Display 1
		222834	Register number LED Display 2
		222835	Register number LED Display 3
		222836	Register number LED Display 4
		222837	Module number PRN (display redirection)
		222838	Module number SER (display redirection)
		222839	Character code for "Delete Screen"
		222840	Character code for "Delete to end of line"
			<b>Networking via JetIP</b>
		230000	JetIP/TCP server: Number of open connections
		230001	JetIP/TCP server:Mode
		230002	JetIP/TCP server:Time
		232708	Timeout in milliseconds
		232709	Response time in milliseconds

## 4 Quick Reference JC-3xx

232710	Quantity of network errors
232711	Error code of the last access
	0 = No error
	1 = Timeout
	3 = Error message from remote station
	5 = Invalid network address
	6 = Invalid amount of registers
	7 = Invalid interface number
232717	Maximum number of retries
232718	Number of retries

### RemoteScan

262965	Protocol type
262966	Number of configuration blocks
262967	Status

### Modbus/TCP

272702	Register offset
272703	Flag offset
272704	Input offset
272705	Output offset
272800 ...	16-bit I/O registers overlaid by virtual I/Os 20001 ... 36000
2728999	

### E-Mail

292932	IP address of SMTP server
292933	IP address of POP3 server
292934	Port number of SMTP server
292933	Port number of POP3 server
292937	Status of e-mail processing
292938	E-Mail Task ID

### File system / data file function

312977	State of file operation
312978	Task ID

### User-programmable IP Interface

#### IP PRIM connectivity list readout

350000	Last result (-1 = no connection selected)
350001	1 = Client; 2 = Server
350002	1 = UDP; 2 = TCP
350003	IP address
350004	Port number
350005	Condition of the connection
350006	Number of sent bytes
350007	Number of received bytes

### Application registers

1000000 ...	JC-340: 32-bit integer or floating point value (remanent)
1001999	
1000000 ...	JC-340: 32-bit integer or floating point value (remanent); with option -X
1019999	
1000000 ...	JC-350: 32-bit integer or floating point value (remanent)
1029999	

### JX3 system bus registers

100002000	JX3 system bus revision
100002008	Error (bit-coded)
	Bit 3: Errors
100002011	Module number on error
100002013	Number of detected JX3 modules
100002015	Index in module array
100002016	Module array
100002111	Register number on error
100002764	Timeout time for register access [ms]
100003mm0 ...	Registers on I/O modules
100003mm9	(compatibility mode)
	mm: Module number - 2 (00 .. 15)

100004000	Registers overlaid with inputs and outputs
...	(see below)
100004367	
100mm0000 ...	Registers on I/O modules
100mm9999	(direct access)
	mm: Module number (02 .. 17)

### JX2 system bus registers

200002000	JX2 system bus revision
200002008	Error (bit-coded)
	Bit 3: Access to JX2-I/O or JX-SIO
	Bit 4: Access to JX2-Slave
200002011	JX2-I/O or JX-SIO module number on error
200002012	JX2-Slave module number on error
200002013	Amount of JX2-I/O modules
200002014	Amount of JX2-Slave modules
200002015	Index in module array
200002016	Module array
200002023	Dummy I/O modules
200002024	Dummy slave modules
200002028	Monitoring interval for I/O modules [ms]
200002029	CAN baud rate
200002032	ON delay
200002070	Amount of CANopen modules
200002071	Current number of I/Os
200002072	Revision of JX2 system bus driver
200002073	Timeout time for CANopen access
200002074	CANopen sync interval [ms]
200002075	Index for CANopen module info
200002076	CANopen module info
200002077	Enabling JX2 system bus special functions
	Bit 2: CAN PRIM
200002080	CANopen module index
200002081	CANopen vendor ID
200002082	CANopen product code
200002083	CANopen serial number
200002085	SysBus application registers: Register number (65-89)
200002086	SysBus application registers: Object number
200002087	SysBus application registers: Sub index
200002088	SysBus application registers: Length
200002089	SysBus application registers: Type
200002760	Maximum number of retries for JX2-I/O
200002761	Index in JX2-I/O retry counter
200002762	JX2-I/O retry counter
200002763	JX2-I/O monitoring time
200002764	JX2-I/O timeout for register access [ms]
200002765	JX2-Slave timeout for register access [ms]
200002767	Index in JX2-I/O, LioN module array
200002768	JX2-I/O, LioN module array
200002769	Index in JX2-Slave module array
200002770	JX2-Slave module array
200002780	JX2 system bus condition
	Bit 13: Busy
200002781	JX2 system bus command
	30: System bus start
200002995	Revision of JX2 system bus bootloader
200003000 ...	Registers on I/O modules
200003229	
200004000	Registers overlaid with inputs and outputs
...	(see below)
200004367	
200005000	I/O registers CANopen / JX-SIO
...	
200006999	
200007000	Configuration registers CANopen / JX-SIO
...	
200007999	
200010500 ...	CAN PRIM
200010549	



200012100 ... Slave registers  
200019999

**Inputs / Outputs**

20001 ... Virtual I/Os for RemoteScan  
36000  
10000mm01 ... JX3 modules (mm: 02 ... 17)  
10000mm16  
20000mm01 ... JX2 modules (mm: 02 ... 24)  
20000mm16

**32 combined inputs**

<b>JX3 system bus: + 100000000</b>				
<b>JX2 system bus: + 200000000</b>				
4000	101..108	109..116	201..208	209..216
4001	109..116	201..208	209..216	301..308
4002	201..208	209..216	301..108	309..316
4003	209..216	301..108	309..316	401..408
4004	301..108	309..316	401..408	409..416
4005	309..316	401..408	409..416	501..508
4006	401..408	409..416	501..508	509..516
4007	409..416	501..508	509..516	601..608
4008	501..508	509..516	601..608	609..616
4009	509..516	601..608	609..616	701..708
4010	601..608	609..616	701..708	709..716
4011	609..616	701..708	709..716	801..808
4012	701..708	709..716	801..808	809..816
4013	709..716	801..808	809..816	901..908
4014	801..808	809..816	901..908	909..916
4015	809..816	901..908	909..916	1001..1008
4016	901..908	909..916	1001..1008	1009..1016
4017	909..916	1001..1008	1009..1016	1101..1108
4018	1001..1008	1009..1016	1101..1108	1109..1116
4019	1009..1016	1101..1108	1109..1116	1201..1208
4020	1101..1108	1109..1116	1201..1208	1209..1216
4021	1109..1116	1201..1208	1209..1216	1301..1308
4022	1201..1208	1209..1216	1301..1308	1309..1316
4023	1209..1216	1301..1308	1309..1316	1401..1408
4024	1301..1308	1309..1316	1401..1408	1409..1416
4025	1309..1316	1401..1408	1409..1416	1501..1508
4026	1401..1408	1409..1416	1501..1508	1509..1516
4027	1409..1416	1501..1508	1509..1516	1601..1608
4028	1501..1508	1509..1516	1601..1608	1609..1616
4029	1509..1516	1601..1608	1609..1616	1701..1708
4030	1601..1608	1609..1616	1701..1708	1709..1716
4031	1609..1616	1701..1708	1709..1716	1801..1808
4032	1701..1708	1709..1716	1801..1808	1809..1816
4033	1709..1716	1801..1808	1809..1816	1901..1908
4034	1801..1808	1809..1816	1901..1908	1909..1916
4035	1809..1816	1901..1908	1909..1916	2001..2008
4036	1901..1908	1909..1916	2001..2008	2009..2016
4037	1909..1916	2001..2008	2009..2016	2101..2108
4038	2001..2008	2009..2016	2101..2108	2109..2116
4039	2009..2016	2101..2108	2109..2116	2201..2208
4040	2101..2108	2109..2116	2201..2208	2209..2216
4041	2109..2116	2201..2208	2209..2216	2301..2308
4042	2201..2208	2209..2216	2301..2308	2309..2316
4043	2209..2216	2301..2308	2309..2316	2401..2408
4044	2301..2308	2309..2316	2401..2408	2409..2416

**16 combined inputs**

<b>JX3 system bus: + 100000000</b>		
<b>JX2 system bus: + 200000000</b>		
4060	101..108	109..116
4061	109..116	201..208
4062	201..208	209..216
4063	209..216	301..108
4064	301..108	309..316
4065	309..316	401..408
4066	401..408	409..416
4067	409..416	501..508
4068	501..508	509..516
4069	509..516	601..608
4070	601..608	609..616
4071	609..616	701..708
4072	701..708	709..716

4073	709..716	801..808
4074	801..808	809..816
4075	809..816	901..908
4076	901..908	909..916
4077	909..916	1001..1008
4078	1001..1008	1009..1016
4079	1009..1016	1101..1108
4080	1101..1108	1109..1116
4081	1109..1116	1201..1208
4082	1201..1208	1209..1216
4083	1209..1216	1301..1308
4084	1301..1308	1309..1316
4085	1309..1316	1401..1408
4086	1401..1408	1409..1416
4087	1409..1416	1501..1508
4088	1501..1508	1509..1516
4089	1509..1516	1601..1608
4090	1601..1608	1609..1616
4091	1609..1616	1701..1708
4092	1701..1708	1709..1716
4093	1709..1716	1801..1808
4094	1801..1808	1809..1816
4095	1809..1816	1901..1908
4096	1901..1908	1909..1916
4097	1909..1916	2001..2008
4098	2001..2008	2009..2016
4099	2009..2016	2101..2108
4100	2101..2108	2109..2116
4101	2109..2116	2201..2208
4102	2201..2208	2209..2216
4103	2209..2216	2301..2308
4104	2301..2308	2309..2316
4105	2309..2316	2401..2408
4106	2401..2408	2409..2416

**8 combined inputs**

<b>JX3 system bus: + 100000000</b>	
<b>JX2 system bus: + 200000000</b>	
4120	101..108
4121	109..116
4122	201..208
4123	209..216
4124	301..108
4125	309..316
4126	401..408
4127	409..416
4128	501..508
4129	509..516
4130	601..608
4131	609..616
4132	701..708
4133	709..716
4134	801..808
4135	809..816
4136	901..908
4137	909..916
4138	1001..1008
4139	1009..1016
4140	1101..1108
4141	1109..1116
4142	1201..1208
4143	1209..1216
4144	1301..1308
4145	1309..1316
4146	1401..1408
4147	1409..1416
4148	1501..1508
4149	1509..1516
4150	1601..1608
4151	1609..1616
4152	1701..1708
4153	1709..1716
4154	1801..1808
4155	1809..1816
4156	1901..1908
4157	1909..1916
4158	2001..2008
4159	2009..2016
4160	2101..2108

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4161 2109..2116  
 4162 2201..2208  
 4163 2209..2216  
 4164 2301..2308  
 4165 2309..2316  
 4166 2401..2408  
 4167 2409..2416

### 32 combined outputs

**JX3 system bus: + 100000000**

**JX2 system bus: + 200000000**

4200	101..108	109..116	201..208	209..216
4201	109..116	201..208	209..216	301..308
4202	201..208	209..216	301..108	309..316
4203	209..216	301..108	309..316	401..408
4204	301..108	309..316	401..408	409..416
4205	309..316	401..408	409..416	501..508
4206	401..408	409..416	501..508	509..516
4207	409..416	501..508	509..516	601..608
4208	501..508	509..516	601..608	609..616
4209	509..516	601..608	609..616	701..708
4210	601..608	609..616	701..708	709..716
4211	609..616	701..708	709..716	801..808
4212	701..708	709..716	801..808	809..816
4213	709..716	801..808	809..816	901..908
4214	801..808	809..816	901..908	909..916
4215	809..816	901..908	909..916	1001..1008
4216	901..908	909..916	1001..1008	1009..1016
4217	909..916	1001..1008	1009..1016	1101..1108
4218	1001..1008	1009..1016	1101..1108	1109..1116
4219	1009..1016	1101..1108	1109..1116	1201..1208
4220	1101..1108	1109..1116	1201..1208	1209..1216
4221	1109..1116	1201..1208	1209..1216	1301..1308
4222	1201..1208	1209..1216	1301..1308	1309..1316
4223	1209..1216	1301..1308	1309..1316	1401..1408
4224	1301..1308	1309..1316	1401..1408	1409..1416
4225	1309..1316	1401..1408	1409..1416	1501..1508
4226	1401..1408	1409..1416	1501..1508	1509..1516
4227	1409..1416	1501..1508	1509..1516	1601..1608
4228	1501..1508	1509..1516	1601..1608	1609..1616
4229	1509..1516	1601..1608	1609..1616	1701..1708
4230	1601..1608	1609..1616	1701..1708	1709..1716
4231	1609..1616	1701..1708	1709..1716	1801..1808
4232	1701..1708	1709..1716	1801..1808	1809..1816
4233	1709..1716	1801..1808	1809..1816	1901..1908
4234	1801..1808	1809..1816	1901..1908	1909..1916
4235	1809..1816	1901..1908	1909..1916	2001..2008
4236	1901..1908	1909..1916	2001..2008	2009..2016
4237	1909..1916	2001..2008	2009..2016	2101..2108
4238	2001..2008	2009..2016	2101..2108	2109..2116
4239	2009..2016	2101..2108	2109..2116	2201..2208
4240	2101..2108	2109..2116	2201..2208	2209..2216
4241	2109..2116	2201..2208	2209..2216	2301..2308
4242	2201..2208	2209..2216	2301..2308	2309..2316
4243	2209..2216	2301..2308	2309..2316	2401..2408
4244	2301..2308	2309..2316	2401..2408	2409..2416

### 16 combined outputs

**JX3 system bus: + 100000000**

**JX2 system bus: + 200000000**

4260	101..108	109..116
4261	109..116	201..208
4262	201..208	209..216
4263	209..216	301..108
4264	301..108	309..316
4265	309..316	401..408
4266	401..408	409..416
4267	409..416	501..508
4268	501..508	509..516
4269	509..516	601..608
4270	601..608	609..616
4271	609..616	701..708
4272	701..708	709..716
4273	709..716	801..808
4274	801..808	809..816
4275	809..816	901..908
4276	901..908	909..916
4277	909..916	1001..1008

4278	1001..1008	1009..1016
4279	1009..1016	1101..1108
4280	1101..1108	1109..1116
4281	1109..1116	1201..1208
4282	1201..1208	1209..1216
4283	1209..1216	1301..1308
4284	1301..1308	1309..1316
4285	1309..1316	1401..1408
4286	1401..1408	1409..1416
4287	1409..1416	1501..1508
4288	1501..1508	1509..1516
4289	1509..1516	1601..1608
4290	1601..1608	1609..1616
4291	1609..1616	1701..1708
4292	1701..1708	1709..1716
4293	1709..1716	1801..1808
4294	1801..1808	1809..1816
4295	1809..1816	1901..1908
4296	1901..1908	1909..1916
4297	1909..1916	2001..2008
4298	2001..2008	2009..2016
4299	2009..2016	2101..2108
4300	2101..2108	2109..2116
4301	2109..2116	2201..2208
4302	2201..2208	2209..2216
4303	2209..2216	2301..2308
4304	2301..2308	2309..2316
4305	2309..2316	2401..2408
4306	2401..2408	2409..2416

### 8 combined outputs

**JX3 system bus: + 100000000**

**JX2 system bus: + 200000000**

4320	101..108
4321	109..116
4322	201..208
4323	209..216
4324	301..108
4325	309..316
4326	401..408
4327	409..416
4328	501..508
4329	509..516
4330	601..608
4331	609..616
4332	701..708
4333	709..716
4334	801..808
4335	809..816
4336	901..908
4337	909..916
4338	1001..1008
4339	1009..1016
4340	1101..1108
4341	1109..1116
4342	1201..1208
4343	1209..1216
4344	1301..1308
4345	1309..1316
4346	1401..1408
4347	1409..1416
4348	1501..1508
4349	1509..1516
4350	1601..1608
4351	1609..1616
4352	1701..1708
4353	1709..1716
4354	1801..1808
4355	1809..1816
4356	1901..1908
4357	1909..1916
4358	2001..2008
4359	2009..2016
4360	2101..2108
4361	2109..2116
4362	2201..2208
4363	2209..2216
4364	2301..2308
4365	2309..2316

4366 2401..2408  
4367 2409..2416

**Special flags - Network**

2075 Error in networking via JetIP

**Special flags - interface monitoring**

2088 OS flag - JetIP  
2089 User flag - JetIP  
2090 OS flag - SER  
2091 User flag - SER  
2098 OS flag - debug server  
2099 User flag - debug server

**Special Flags - HMI**

does not apply to LCD 27

2160 Key "0"  
2161 Key "1"  
2162 Key "2"  
2163 Key "3"  
2164 Key "4"  
2165 Key "5"  
2166 Key "6"  
2167 Key "7"  
2168 Key "8"  
2169 Key "9"

2170 Key "Shift + 0"  
2171 Key "Shift + 1"  
2172 Key "Shift + 2"  
2173 Key "Shift + 3"  
2174 Key "Shift + 4"  
2175 Key "Shift + 5"  
2176 Key "Shift + 6"  
2177 Key "Shift + 7"  
2178 Key "Shift + 8"  
2179 Key "Shift + 9"

2181 Key "Shift + F1"  
2182 Key "Shift + F2"  
2183 Key "Shift + F3"  
2184 Key "Shift + F4"  
2185 Key "Shift + F5"  
2186 Key "Shift + F6"  
2187 Key "Shift + F7"  
2188 Key "Shift + F8"  
2189 Key "Shift + F9"  
2190 Key "Shift + F10"  
2191 Key "Shift + F11"  
2192 Key "Shift + F12"

2193 Key "Shift + ←"  
2194 Key "Shift + →"  
2195 Key "Shift + R"  
2196 Key "Shift + I/O"  
2197 Key "Shift + ="  
2198 Key "Shift + C"  
2199 Key "Shift + ENTER"

2200 Key "Shift"

2201 Key "F1"  
2202 Key "F2"  
2203 Key "F3"  
2204 Key "F4"  
2205 Key "F5"  
2206 Key "F6"  
2207 Key "F7"  
2208 Key "F8"  
2209 Key "F9"  
2210 Key "F10"  
2211 Key "F11"  
2212 Key "F12"

2213 Key "→"  
2214 Key "←"  
2215 Key "R"  
2216 Key "I/O"  
2217 Key "="  
2218 Key "C"  
2219 Key "ENTER"  
2220 Key "-"  
2221 Key "Shift + -"  
2222 Key "."  
2223 Key "Shift + ."

2224 LED of key "F1"  
2225 LED of key "F2"  
2226 LED of key "F3"  
2227 LED of key "F4"  
2228 LED of key "F5"  
2229 LED of key "F6"  
2230 LED of key "F7"  
2231 LED of key "F8"  
2232 LED of key "F9"  
2233 LED of key "F10"  
2234 LED of key "F11"  
2235 LED of key "F12"

**Special flags for HMI LCD 27**

2209 Key "-"  
2210 Key "↓"  
2211 Key "C"  
2212 Key "ENTER"

**Special flags for HMI NUM 25**

2186 Key "Shift + S1"  
2187 Key "Shift + S2"  
2188 Key "Shift + S3"  
2189 Key "Shift + S4"  
2190 Key "Shift + S5"  
2206 Key "S1"  
2207 Key "S2"  
2208 Key "S3"  
2209 Key "S4"  
2210 Key "S5"

**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

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### 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 user 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 functions

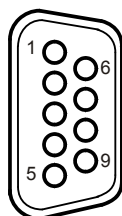
4	BCD to HEX conversion
5	HEX to BCD conversion
20	Square Root
21	Sine
22	Cosine
23	Tangent
24	Arc Sin
25	Arc Cosine
26	Arc Tangent
27	Exponential Function
28	Natural Logarithm
29	Absolute value
30	Separation of digits before and after the decimal point
60	CRC generation for Modbus RTU
61	CRC check for Modbus RTU
65/67	Reading register block via Modbus/TCP
66/68	Writing register block via Modbus/TCP
80	Initializing RemoteScan
81	Starting RemoteScan
82	Stopping RemoteScan
90	Writing data file
91	Appending data file
92	Reading data file
96	Deleting data file
110	Sending e-mails
150	Configuring NetCopyList
151	Deleting NetCopyList
152	Sending NetCopyList

**Pin assignment of female MiniDIN connector X11**



Pin	Signal	Function
1	RDA	RS-422; receive data inverted
2	GND	Reference potential
3	RDB	RS-422; receive data not inverted
4	RxD	RS-232; receive data
5	SDB	RS-422; transmit data not inverted
6	DC24V	RS-485; transmit/receive data not inverted HMI supply voltage
7	SDA	RS-422; transmit data inverted RS-485; transmit/receive data inverted
8	TxD	RS-232; transmit data

**Pin assignment of female SUB-D connector X19**



Pin	Signal	Function
1	CMODE0	Commissioning
2	CL	Data signal
3	GND	Reference potential
4	CMODE1	Commissioning
5	Unused	
6	Unused	
7	CH	Data signal
8	Unused	
9	Unused	