

JetControl 24x
Version Update
V 3.14 to V 3.15



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1 Introduction

Version Updates - Survey			
Version	Function	upgraded	corrected
V. 3.15	Communication	✓	✓
	Registers	✓	
	Interpreter		✓
	System bus	✓	✓
	E-mail	✓	
V. 3.14	System bus	✓	✓
	Communication	✓	
	Operating system update	✓	
	Interpreter	✓	✓
	Registers	✓	✓
	Debugger		✓
	HTTP-Server	✓	
V. 3.13	Registers		✓
	Modbus	✓	✓
	Scheduler	✓	
	Communication		✓
	Debugger		✓
	E-mail		✓
	HTTP-Server		✓

2 Expansions

2.1 MAC-Address

Die Ethernet-MAC-Adresse der Steuerung ist jetzt in den Register **10171** und **10172** lesbar.

In register 10171, the manufacturer-specific part, in register 10172, the device number will be displayed.

Example:

```
Reg. 10171 = 20683      (0x0050cb : Jetter AG, constant)
Reg. 10172 = 9210      (0x0023fa : unambiguous device number)
```

2.2 Net-Copy-List

By means of the Net-Copy-List function, several write/read requests made by various registers can be combined in one Ethernet frame in another controller.

In the following instants, this will lead to a significant performance gain:

- The contents of several registers having been stored to various memory positions are to be transmitted.
- By one access, registers are both to be read and written.

If contiguous register sets are to be written into or read, using the instructions N_Copy_To2 and N_Copy_From2 is more advantageous.

The Net-Copy-List function can be accessed by using special / system functions 150, 151, and 152.

A project is able to hold up to 10 lists of different lengths. The total of communication units must not exceed 50.

A frame cannot contain more than 64 register values.

2.2.1 Prerequisites

Only participants supporting the JetIP protocol version 1.1 can make use of these functions.

2.2.2 Configuring a Net-Copy-List

JetSym SPECIALFUNCTION (150, Parameter1, Parameter2)

JetSym ST SYSTEMFUNCTION (150, Parameter1, Parameter2);

Operating Principle A Net-Copy-List is configured by means of special / system function 150. Communication does not take place yet, though.

Parameter 1: Number of the first register / address of the first variable of a description set.

Offset	Meaning
0	IP address of the remote control
1	Port number

Communication unit 1

2	Instruction: Read = 1, Write = 2
3	Mode: Autoincrement = 1
4	Amount of registers
5	Local register number
6	Remote register number

...

Communication unit n

$(n-1) \times 5 + 2$	Instruction: Read = 1, Write = 2
$(n-1) \times 5 + 3$	Mode: Autoincrement = 1
$(n-1) \times 5 + 4$	Amount of registers
$(n-1) \times 5 + 5$	Local register number
$(n-1) \times 5 + 6$	Remote register number
$n \times 5 + 2$	Final identification = 0

Parameter 2: Number of the register / address of the variable of the function result.

A positive number is the reference number of this list. This value must be stored, because it will be needed as a parameter for functions 151 and 152.

A negative figure stands for an error code.

Potential errors:	Error code	Meaning
	-1	All lists have already been used; a free list has not been found any more
	-2	All communication units have already been used; a free communication unit has not been found any more
	-3	Free list
	-4	Invalid list
	-5	Invalid IP-address
	-6	Invalid instruction
	-8	Invalid mode
	-9	The amount of registers is too big
	-10	The requested transmission buffer is too big
	-11	The requested receive buffer is too big
	-20	There is no JetIP V. 1.1 available

2.2.3 Clearing a Net-Copy-List

JetSym	SPECIALFUNCTION (151, Parameter1, Parameter2)	
JetSym ST	SYSTEMFUNCTION (151, Parameter1, Parameter2);	
Operating Principle	A Net-Copy-List generated by function 150 is cleared by means of special / system function 151.	
Parameter 1:	Reference to the list (result of carrying out function 150 successfully)	
Parameter 2:	Number of the register / address of the variable of the function result.	
Potential errors:	Error code	Meaning
	-7	Invalid reference
	-20	There is no JetIP V. 1.1 available

2.2.4 Transmitting a Net-Copy-List

JetSym	SPECIALFUNCTION (152, Parameter1, Parameter2)	
JetSym ST	SYSTEMFUNCTION (152, Parameter1, Parameter2);	
Operating Principle	A Net-Copy-List generated by function 150 is transmitted by means of special / system function 152. This function joins the communication units of a NetCopyList in a JetIP V. 1.1 frame.	
Parameter 1:	Reference to the list (result of carrying out function 150 successfully)	
Parameter 2:	Number of the register / address of the variable of the function result.	
Potential errors:	Error code	Meaning
	-7	Invalid reference
	-12	At least one negative acknowledgment in the reply
	-20	There is no JetIP V. 1.1 available

2.2.5 Examples of JetSym ST Applications

Below, there is an example of JetSym ST declarations for 10 lists of 5 communication units max. each (the sixth unit is used for storing the final identification).

```
type stNetCopyListHeader : struct
    nIpAddress : INT;
    nPort      : INT;
end_struct;
end_type;

type stNetCopyListElement : struct
    nCommand   : INT;
    nMode      : INT;
    nCount     : INT;
    nLocalReg  : INT;
    nRemoteReg : INT;
end_struct;
end_type;

type stNetCopyList : struct
    stHeader : stNetCopyListHeader;
    astElement : array[6] of stNetCopyListElement;
end_struct;
end_type;

var
aNetCopyLists : array[10] of stNetCopyList at %vl 100;
end_var;
```


2.3 E-Mail

2.3.1 DNS

In the initialization file for the e-mail function, the IP addresses of the SMTP server and of the optional POP3 server can be specified as names. Then, the operating system of the JC-24x will resolve the name into an IP address by means of a DNS server.

Up to now, the host names would only be resolved once during start-up of the controller. As of this version, a DNS resolution is carried out each time an e-mail is transmitted, if the connection to the POP3 or SMTP server could not be established.

If host names and IP addresses are not allocated by means of DNS, but in the file "/etc/hosts", this allocation will remain stable during runtime of the controller. It can only be changed by reboot of the JC-24x.

2.3.2 SMTP-Authentication

Background

By standard, an authentication is not needed for the SMTP protocol which is used for transmitting e-mails. When, in the early eighties, this protocol was being developed, this was not considered necessary. At that time, the dimensions of today's Internet could not be foreseen.

From the present point of view, this is an intolerable safety loophole. Pestering by Spam mails increases daily. For this reason, the classic SMTP protocol has been upgraded by the authentication feature. In order to be able to transmit e-mails via SMTP server, a user name and password have to be entered now. They will be coded before transmitting. This way, misusing a mailserver for transmitting e-mails without permission is blocked.

Supported Authentication Procedures

1. POP3-before-SMTP

At this procedure, the JetControl must first establish a connection to the POP3 server; for this, a user name and password are needed. Then, transmission from the user's address will be enabled for a certain time (mostly 10 – 30 minutes). JetControl has supported this method from its very beginning.

2. SMTP-AUTH

The original SMTP protocol has been changed in such a way, that now user registration is permitted as well. When this method is applied, only a user and his password for the SMTP server must be entered.

The SMTP-AUTH procedures supported by JetControl are LOGIN, PLAIN, and CRAM-MD5.

Konfiguration von SMTP-AUTH

For this purpose, a USER and a PASSWORD must be entered in the SMTP section of the configuration file "/EMAIL/email.ini".

Example:

```
[ SMTP ]
```

```
IP=sntp.web.de  
USER=JetControl0815  
PASSWORD=my_password
```

2.4 Counting Rate

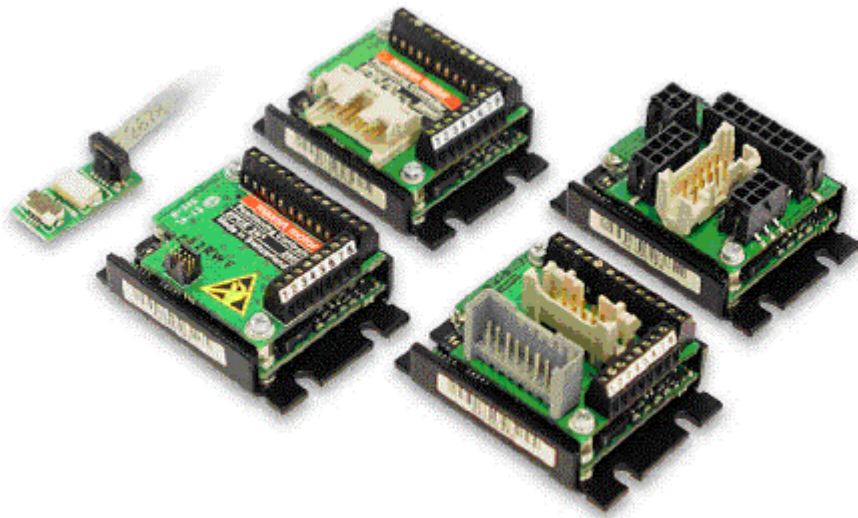
After optimizing certain features of the JC-24x operating system, the counting rate could be increased. Yet, it is dependent on the respective application and the connected peripherals to a great extent. An increase of up to 30 % is possible.

2.5 New System Bus Driver V. 1.32

2.5.1 EPOS 24/1- Positioning Control

EPOS 24/1 positioning controls of the maxon motor ag can be connected to the system bus directly. For information on how to connect the EPOS 24/1 positioning control to the system bus, please refer to the corresponding documentation.

EPOS 24/1- Positioning Control



Technical Data of maxon Drives		
Maximum amount of EPOS 24/1-positioning controls	JC -241	7
	JC -243	10
	JC -246	10
Size of I/Os	16	
Module Code	75	
Documentation	maxon_bi_100_benutzerinformation (still to be translated into English)	

3 Eliminated Software Bugs

3.1 pcom7 / JetIP

The instructions for reading and writing of outputs and flags via pointer register and index (instruction codes 0x76 through 0x7b) would be refused by JetControl 24x Version 3.14, although they had been transmitted correctly.

(This only concerns users who implemented the communication protocol by themselves)

3.2 System-/Specialfunction 5

At converting a register content from internal binary into BCD representation, only 7 places would be converted. The place of highest value would be occupied by '0'. As of this version, all 8 places are converted.

3.3 JetIP/TCP

The commands for uploading the user program (0x5A) and for copying the user program from and to a file (0x56) would not be carried out via a TCP/IP connection.

(This only concerns users who implemented the communication protocol by themselves)