



**JetMove 600**  
**Version Update**  
**from V1.20 to V1.21**



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# 1 Introduction

Overview of Version Update			
Version	Function	expanded	corrected
V1.21	Register 1x118 "Max. Speed"	✓	
	ASCII parameter initialization	✓	
	ASCII parameter SERCSET	✓	
	Axis Coordination System Interface	✓	
	Capture Function	✓	
	Command 100 "Reset Errors"	✓	
	Motor Database	✓	
	Special Cam Function	✓	
	Master – Slave Configuration	✓	
	Reference Run	✓	
	Oszilloscope-Function		✓
	Register 1x171 "Reference Point Shift"	✓	
	Register 1x012 "Ramp Type"	✓	
	AXARR-Bit / IN-POS-Bit		✓
	Register 1x170 "Oszilloscope Channels"	✓	
	Register 1x100 "Drive Status1"	✓	
	Register "Development Version"	✓	
	Register 1x100 "Drive Status1" (AXARR and IN-POS bit)		✓
Command 44 / 45 "Follower Mode On/Off"		✓	
Amplifier Warning n32		✓	
V1.20	Special Limit Switch Function	✓	
	Register 1x004 "Positioning Mode"	✓	✓
	Register 1x171 "Reference Point Shift"		✓
	Command 3 "Set Reference"		✓
	Register 1x160 "ENCMODE"	✓	
	Axis Type – Modulo	✓	
	Register 1x097 "Error2"	✓	
	Busy bit for point-to-point positioning start		✓
	Register 1x120 "Tracking Error Limit"	✓	

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	Register 1x019 "Table Number"	✓	
V1.19	Oszilloscope-Function Command 100 "Reset Error"	✓	✓
V1.18	New register: 1x000 "Control Register" Special Limit Switch Function IN-POS-bit in register 1x100 "Drive Status1"	✓ ✓	✓

## 2 Expansions

### 2.1 Register 1x118 "Max. Speed"

The max. speed for OPMODE 0, 1, 4, 8 can be set through register 1x118.

Register 1x118 Max. Speed	
Function	Description
Read	Presents the max. speed
Write	Sets max. speed
Writing Restrictions	No writing while axis is moving
Valid	Immediately
Value Range	0 ... ASCII parameter MSPEED
Unit	rpm
DRIVE	Speed Limit (Function Group: Speed)
ASCII	VLIM, PVMAX
Value after reset	Last saved value of VLIM in the EEPROM of the drive.

### 2.2 ASCII parameter initialization

The following ASCII parameter will be set to a default value each time the amplifier is initializing. The stored values of the parameters in the EEPROM do not have effect.

```

ACCUNIT* = 0 "Acceleration in ms"
AENA* = OFF
OPMODE = 8
PEINPOS = 0
PGEARI* / PGEARO* = 1.048.576
PUNIT* = 0 "Counts"
PVMAX = VLIM
SYNCSRC* = 6
VUNIT* = 1 "1/min" or 4 "Counts / 250usec"
DRVCNFG = the following bits are set:
            bit 7      hex: 0x80
            bit 8      hex: 0x100
            bit 13     hex: 0x2000
            bit 24     hex: 0x1000000
  
```

\* The setting of the default value of those parameters can be switched off by setting bit 1 (value: 2) of ASCII parameter SERCSET. This allows units for VUNIT, PUNIT or ACCUNIT to be set that are different from the ones having been set by default. Attention: By changing VUNIT, PUNIT or ACCUNIT, certain register values may not be presented any more in the units which are described in the manual, e.g. register 1x112 "Actual Speed".

## 2.3 ASCII parameter SERCSET

SERCSET is bit-oriented (32 bit). The following bits can be used:

Bit	Description
00	<p><b>Special Limit Switch Function</b></p> <p>1 = Special limit switch function is activated during initialization of the amplifier (bit 20 of register 1x000 "Control Register" is automatically set during initialization which activates the limit switch function).</p> <p>0 = Special limit switch function is not activated.</p>
01	<p><b>ASCII Parameter Initialization</b></p> <p>1 = Certain ASCII parameters of a selected group are not initialized during initialization of the amplifier (see ASCII parameter amplifier).</p> <p>0 = All selected ASCII parameters of the selected group will be initialized.</p>
02	<b>RESERVED</b>
03	<b>RESERVED</b>
04	<b>RESERVED</b>

## 2.4 Axis Coordination System Interface

JetMove 600 has now got an interface to Delta CPUs or JetControl 6xx with JX6-CON-MOVE-BP configuration and JetControl 6xx MC. These systems are provided together with hard- and software for axis coordination. They are capable of coordinating several JetMove 600 axis via the System Bus.

To use this interface, the amplifier has first got to be set up with the help of the drive software as follows:

The functions for all inputs have to be reset to "OFF" (no function is active) in function group "Digital I/O". The reference switch signal, if available, has to be connected to digital input 2, the positive hardware limit switch signal, if available, has to be connected to digital input PSTOP and the negative hardware limit switch signal, if available, has to be connected to the digital input NSTOP.

For the complete description please refer to the new JX6-CON-Move (BP) manual.

## 2.5 Capture Function

The capture function is able to capture the actual axis position by a raising or falling edge event of a selected input of the JetMove 600. All 4 inputs are available for this function. It is possible to process a capture event for all 4 inputs at the same time.

The operating of the function depends on the hardware system groups in which the amplifier is used. There are two different hardware system groups. Each group requires a different numbering for necessary registers or different configuration.

First group: Nano CPUs, JetControl 24x, Delta or JetControl 64x with JX6-SB-I configuration.

Second group: System with axis coordinating systems interfaces (Delta CPUs or JetControl 6xx with JX6-CON-MOVE-BP configuration, except JetControl 6xx MC).

If the limit switch inputs PSTOP and NSTOP are used for capturing, the function definition for these inputs has to be reset to "OFF" (no function is active) with the help of the DRIVE software in function group "Digital I/O". If the amplifier is used with the second group, the following additional parameters must be set: In register 1xy004, the "Polarity" bit 5 has to be set which will deactivate the limit switch check.

First, the function has to be set up with the help of certain registers which will be explained below. For setup, the voltage level which activates each input will first have to be defined. The inputs which are being captured have to be selected. The capture edges have to be defined.

To start the function, command 34, that is written in the command register of the axis module, must be issued. This will set all inputs, which have been selected for capturing, to "enabled". This is also shown in register "Capture State". If an input needs to be added to the already "enabled" inputs, or if an input having caused a capture event needs to be set to "enabled" again command 34 has to be issued. Yet, this does not change the capture state of already "enabled" inputs. If a capture event has taken place, the captured position will be stored in a register which is associated with the input.

If the amplifier is used with the second group, please note: The registers which contain the captured positions after a capture event contain only a valid position if they are read in between the last capture event and the next overflow of the actual position of the axis.

The capture events are depending on the logical input state of the selected inputs (see register "Logical Input State").

Following, the registers for this function have been listed:

Register	Numbering First Group		Numbering Second Group
	Nano B/C/D JetControl 24X	Delta / JetControl 647 mit SB-I – Karte (m = Modulsteckplatz)	
Command register	1x101	3m1x101	1xy001
Input Edge Definition	1x510	3m1x510	1xy310
Logical Input State	1x511	3m1x511	1xy311
Capture Selection	1x512	3m1x512	1xy312
Capture State	1x513	3m1x513	1xy313
Capture Edge Definition	1x514	3m1x514	1xy314
Captured Position -> PSTOP (Digital input 3)	1x186	3m1x186	1xy262
Captured Position -> NSTOP (Digital input 4)	1x187	3m1x187	1xy263
Captured Position -> Digital input 2	1x188	3m1x188	1xy264
Captured Position -> Digital input 1	1x189	3m1x189	1xy265

In the following bit-oriented registers, the inputs have been allocated to the bit numbers as follows:

Bit	Description
00	Hardware ENABLE signal
01	PSTOP (Digital input 3)
02	NSTOP (Digital input 4)
03	Digital input 2
04	RESERVED
05	RESERVED
06	RESERVED
07	Digital input 1

Register "Input Edge Definition"	
Function	Description
Read	Actual input edge definition
Write	Set input edge definition
Writing Restrictions	-
Valid	Immediately
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	11111111 11111111 11111111b

0 = Low active  
 1 = High active

Register "Logic Input State"	
Function	Description
Read	Actual logic input state
Write	Not allowed
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	Actual logic input state

0 = Not active  
 1 = Active

The state depends on register "Input Edge Definition"

Register "Capture Selection"
------------------------------

Function	Description
Read	Actual capture selection
Write	Set capture selection
Writing Restrictions	-
Valid	Immediately
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	0

0 = Input is not selected for capturing

1 = Input is selected for capturing

Bit 0 "Hardware ENABLE signal" cannot be used for capturing even if selected.

Register "Capture State"	
Function	Description
Read	Actual capture state
Write	Not allowed
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	11111111 11111111 11111111b

0 = Not captured yet, the input is enabled for capturing

1 = Input is captured

Register "Capture Edge Definition"	
Function	Description
Read	Actual capture edge definition
Write	Set capture edge definition
Writing Restrictions	-
Valid	Immediately
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	11111111 11111111 11111111b

0 = Capture on falling edge

1 = Capture on raising edge

## 2.6 Command 100 "Reset Error"

If command 100 is issued through the command register the busy bit (register 100 "Drive Status1", bit 13) must be checked for not being set before continuing with the PLC program.

## 2.7 Motor Database

The JL and JK motor series can be selected from the motor database. The range of motors available depends on the size of JM600. An amplifier automatically preselects the motors which are suitable and presents this list for selection, e.g. no JL3 motor will be shown in the list while using a JM620.

## 2.8 Special Cam Function

This function can only be used in a hardware configuration with the Nano family or the JetControl 2xx family or the JetControl 6xx with a JX6-SB-I configuration.

With this cam function, up to 100 cams can be defined by the user. Each cam is defined by a negative position and a positive position. The positions can be any position of the position range of the axis. The negative position has to be smaller than the positive position.

The function processes each cam after another. Before it continues with the next cam the actual cam condition has to become true. This continues until a cam is reached which is not set valid. In this case the function continues with the first cam again. Overlapping of the cams by the defined position area is possible, but only the actual cam is processed at a time. A cam condition becomes true if the actual position is within the defined position area. A register number and its value also are defined for each cam. If the cam condition becomes true this register is set immediately to the value which is defined for it.

It can be determined by the user if the input for the cam processing is the actual position of the drive itself or the actual position of the master in a SSI master - slave configuration instead.

There are register which are set to the defined value within 250µsec and register which are set within 1ms after the cam condition is true. The following register can be changed automatically through the function:

Nr.	Description	Reaction Time
1x060	Nominal Speed	within 250 µsec
1x101	Command Register Only this commands (see below): 74, 75, 76, 77	within 250 µsec
1x156	Factor Follower Mode	within 250 µsec
1x157	Divisor Follower Mode	within 250 µsec
1x101	Command Register All commands except 74, 75, 76, 77	within 1 msec
1x102	Set Point Position	within 1 msec
1x103	Nominal Speed	within 1 msec

The following register are available to setup the cam function:

<b>Register 1x300 "CAM - General Control"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual cam function general control information
Write	Set cam function general control
Writing Restrictions	-
Valid	Immediately
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	0

Meaning of individual bits:

<b>Bit</b>	<b>Description</b>
00	CAM Activity 0: Disables CAM function 1: Enables CAM function
01	Position Input 0: Input is actual position of amplifier 1: Input is actual position of master, in a SSI master - slave configuration (cam function is running in the slave)

<b>Register 1x307 "CAM –Index Processed CAM"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual cam function index of actually processed cam record
Write	Set cam function index for actually processed cam record
Writing Restrictions	-
Valid	Immediately
Value Range	0 ... 99
DRIVE	-
ASCII	-
Value after reset	0

<b>Register 1x308 "CAM – Index CAM Record"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual cam function index of cam record
Write	Set cam function index for cam record
Writing Restrictions	-

Valid	Immediately
Value Range	0 ... 99
DRIVE	-
ASCII	-
Value after reset	0

### Register 1x309 "CAM – Negative Position"

Function	Description
Read	Actual cam function negative position of indexed cam
Write	Set cam function negative position of indexed cam
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607
DRIVE	-
ASCII	-
Value after reset	0

### Register 1x310 "CAM – Positive Position"

Function	Description
Read	Actual cam function positive position of indexed cam
Write	Set cam function positive position of indexed cam
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607
DRIVE	-
ASCII	-
Value after reset	0

### Register 1x311 "CAM – Register Number"

Function	Description
Read	Actual cam function register number of indexed cam
Write	Set cam function register number of indexed cam
Writing Restrictions	-
Valid	Immediately
Value Range	60, 101, 102, 103, 156, 157 (Only the last 3 digits of the complete register numbers)
DRIVE	-

ASCII	-
Value after reset	199

<b>Register 1x312 "CAM – Register Value"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual cam function register value of indexed cam
Write	Set cam function register value of indexed cam
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607 (The value range also depends on the register which is chosen through register 1x311)
DRIVE	-
ASCII	-
Value after reset	0

<b>Register 1x313 "CAM – CAM Control"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual cam function control of indexed cam
Write	Set cam function control of indexed cam
Writing Restrictions	-
Valid	Immediately
Value Range	bit-oriented, 24 Bit
DRIVE	-
ASCII	-
Value after reset	0

Meaning of individual bits:

<b>Bit</b>	<b>Description</b>
00	CAM validation 0: CAM is not valid 1: CAM is valid
01	RESERVED

## 2.9 Master – Slave Configuration

This expansion of the master – slave configuration register can only be used if the slave is a JetMove 600 and the master is either a SSI encoder or another JetMove 600 connected with the slave through an SSI communication. The master-slave configuration is necessary for functions which use the master information as a part of their processing, e.g. the special cam function. Here the actual position of the master is used for cam processing. At the moment, only the special cam function uses master information.

The following registers are used for configuring the master information, mainly the master position, in a more detailed way. The master position, for example, can be processed as a modulo axis with different max. borders (register 1x158 and 1x159). Further, the master position can be changed by the user (register 1x271). With this register the master position in the slave must be made exactly the same as the one of the real master (register 1x205 and 1x206). This is necessary, because the master position in the slave does not absolutely match the real master position. Positions can vary.

<b>Register 1x195 "Master Position"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual position of the master
Write	Not permitted
Value Range	- 8,388,608 ... 8,388,607
Unit	Extern counts (External counts depending on the value of register 1x206 "Master-Slave - Position Resolution")
DRIVE	-
ASCII	-
Value after reset	0

The position is influenced by setting registers 1x158, 1x159, 1x205 and 1x206 and using register 1x271. This means, the master position of the master amplifier could be different to this displayed master position. The master position is updated every 250 µsec.

<b>Register 1x158 "Master-Slave - Max. Negative Position"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual max. negative position for master – slave configuration
Write	Set max. negative position for master – slave configuration
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607 (Value must be smaller than the value of the max. positive position)
Unit	Extern counts (External counts, depends on the value of register 1x206 "Master-Slave - Position Resolution")
DRIVE	-
ASCII	-
Value after reset	- 8,388,608

This register is used to set the max. negative position for the master position. The master position is set to the max. positive position – 1, if it exceeds the max. negative position.

<b>Register 1x159 "Master-Slave - Max. Positive Position"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual max. positive position for master – slave configuration
Write	Set max. positive position for master – slave configuration
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607 (Value must be greater than value of max. negative position)
Unit	Extern counts (External counts, depends on the value of register 1x206 "Master-Slave - Position Resolution")
DRIVE	-
ASCII	-
Value after reset	+ 8,388,607

This register is used to set the max. positive position for the master position. The master position is set to the max. negative position if it exceeds the max. positive position –1.

<b>Register 1x205 "Master-Slave – PRBASE"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual PRBASE of the master of a master – slave configuration
Write	Set PRBASE of the master of a master – slave configuration
Writing Restrictions	-
Valid	Immediately
Value Range	16, 20
Unit	-
DRIVE	-
ASCII	-
Value after reset	20

This value determines whether the resolution per revolution is 16 bit or 20 bit. The register has to be set to the value which is set for the ASCII parameter PRBASE of the master amplifier. This is important to synchronize the master position in the slave with the real master.

For the SSI master – slave configuration there is a restriction of the position range if the PRBASE is set to 16. In the real master the internal position range is 32 bit while the internal position range of the master position in the slave is 28. This means that setup like this the real master position and the master position in the the slave are not synchronized anymore if the real master position exceeds + 134,217,727 or – 134,217,728. The master

position in the slave will then overflow while the real master continues to the 32 bit overflow.

<b>Register 1x206 "Master-Slave – Position Resolution"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual position resolution of the master position of a master – slave configuration
Write	Set position resolution of the master position of a master – slave configuration
Writing Restrictions	-
Valid	Immediately
Value Range	0 ... 8
Unit	-
DRIVE	-
ASCII	-
Value after reset	8

The register determines how the internal positions of the master configuration are displayed on the user interface. The register has to be set to the value which is set for the register 1x006 "Position Resolution" of the master amplifier. This is important for synchronizing the master position in the slave with the real master.

This register influences the following master – slave configuration registers:

register 1x195 "Master Slave - Master Position"  
 register 1x158 "Master-Slave - Max. Negative Position"  
 register 1x159 "Master-Slave - Max. Positive Position"  
 register 1x271 "Master-Slave – Reference Point Shift"

<b>Register 1x271 "Master-Slave –Reference Point Shift"</b>	
<b>Function</b>	<b>Description</b>
Read	Actual (latest) value of reference point shift of the master position of a master – slave configuration
Write	Set reference point
Writing Restrictions	-
Valid	Immediately
Value Range	- 8,388,608 ... 8,388,607
Unit	Extern counts (External counts, depends on the value of register 1x206 "Master-Slave - Position Resolution")
DRIVE	-
ASCII	-
Value after reset	0

The value and function of this register is in analogy with register 1x171 "Reference Point Shift", except this register sets reference to the master position, register 1x195 "Master-Slave – Master Position". This is important for synchronizing the master position in the slave with the real master.

## 2.10 Reference Run

It was not possible to change the speed after a reference run started by command 9 or 10. Now the speed can be changed any time during the reference run.

Further, for NREF 1-4 error F26 will occur and bit 12 of register 1x100 "Drive Status1" will be set in the following situations:

For NREF 1, 3:

- Positive direction (command 9) and negative limit switch
- Negative direction (command 10) and positive limit switch
- Any direction and positive limit switch and negative limit switch

For NREF 2, 4:

- Any direction and positive limit switch and negative limit switch

Further, the BUSY-bit and the AXARR-bit can be used to detect the start and the end of an reference run. The BUSY-bit is set and the AXARR is reset for the duration of the reference run.

Further, it is no longer possible to use the ASCII parameter ROFFS, "Offset" in function group "Homing" for setting a position different from 0 as a reference by issuing commands 3, 9 and 10. To issue this commands will ignore parameter ROFFS and will set the reference position always to 0. Register 1x171 "Reference Point Shift" has to be used to change the reference position to a position different from 0.

## 2.11 Register 1x012 "Ramp Type"

In the former versions the acceleration and the deceleration for a point to point positioning had always a trapeze form, through the new register 1x012 also sine<sup>2</sup> form can be chosen. The ramps for endless positioning and reference run are always trapeze form and cannot be changed into another form.

Register 1x012 "Ramp Type"	
Function	Description
Read	Actual (latest) value of the ramp type
Write	Set ramp type
Writing Restrictions	This register should only be writing while axis is not moving. Drive can be enabled.
Valid	Next point-to-point positioning
Value Range	0,1,10
Unit	-
DRIVE	-
ASCII	SPSET, O_ACC2, O_DEC2
Value after reset	0

- 0 = Trapez für Start/Stop
- 1 = Sinus<sup>2</sup> für Start/Stop
- 10 = Tabelle für Start / Stop

## 2.12 Register 1x170 "Oszilloscope Channels"

This register is used in combination with the oscilloscope function in JetSym.

Register 1x170 "Oszilloscope Channels"	
Function	Description
Read	Actual max. number of channels
Write	Set max. number of channels
Writing Restrictions	Do not write while oscilloscope function is in use
Valid	Next use of oscilloscope function
Value Range	2 ... 3
Unit	-
DRIVE	-
ASCII	-
Value after reset	2

- 2 = 2 Channels with 750 values per channel
- 3 = 3 Channels with 500 values per channel

JetSym adapts the number of values automatically.

## 2.13 Register 1x100 "Drive Status1"

The "Drive Status1"-register is expanded with bit 19 "Amplifier warning":

- 0 = No warnings are currently active
- 1 = At least 1 warning is currently active

## 2.14 Register "Development Version"

Register numbers:

- Nano B/C/D, JetControl 24x: 1x198
- Delta or JetControl 647 with SB-I Submodul (m = modul slot number) 3m1x198
- CON-MOVE 1xy398
- JetControl 647 MC 1xy598

Register "Development Version"	
Function	Description
Read	Development Version
Write	Not permitted
Value Range	0 ... 10.000
Unit	

---

DRIVE	-
ASCII	-
Value after reset	-

This register tells the development version of the current version. With every new development version this value is incremented with 1. If the value is 0 the current firmware version is an officially released version.

## **3 Eliminated Software Bugs**

### **3.1 Oscilloscope Function**

The first third of the shown data of the second channel would not be read out and displayed correctly in JetSym. Now the reading is correct.

Also the time per division could not be changed; while changing, the old value would automatically be set. This has been corrected as well.

The function can only be used with Jetter JetSym not with Sympas.

Also, the oscilloscope function can be setup now to be used with 2 channels and 750 values per channel or 3 channels and 500 values per channel. To switch between this settings register 1x170 "Oscilloscope Channels" is added. Refer to the description of this register in this Version Update.

### **3.2 Register 1x171 "Reference Point Shift"**

Originally, this register was not prepared for being used with a HIPERFACE encoder. Now the reference point shift works correctly with HIPERFACE as well as with a resolver.

### **3.3 Amplifier Warning n32**

Amplifiers without SB1 expansion card would show warning 32 at operation. This is now eliminated.

### **3.4 Register 1x100 "Drive Status1"**

In some situations during a positioning the bit 1 "AXARR" and bit 2 "IN-POS" could have been set incorrect, e.g. at a start of a positioning they could have been set again before the axis even started moving. This is now corrected.

### **3.5 Command 44 / 45**

If the command 44 was given two times in a row, than command 45 did not switch back the opmode to the value 8. This is now corrected.