



JetMove 2xx
Version Update
from V. 2.07 to V. 2.09



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Table of Contents

1	Introduction	4
2	Enhancements	5
2.1	Incremental Encoder Emulation	5
2.2	Incremental Encoder Evaluation	7
2.3	Activating Digital Outputs at Position X	8
3	Bugfix	11
3.1	R196 Linear / Rotatory Transmission	11
3.2	F02 + F28 After Deactivating the Controller	11
3.3	GOTO Change of Encoder Type	11

1 Introduction

Overview of Version Updates			
Version	Function	Added	Fixed
V 2.05	Function "Table"	✓	
	Evaluation of the encoder	✓	
	"MotionStop" instruction	✓	
	I-component of the speed controller	✓	
	Multi-channel position capture	✓	
	I ² t-monitoring of the motor	✓	
	Compensation of dead time for the master position	✓	✓
	Limit switch monitoring		✓
	Machine Referencing		✓
	Standardisation of the current		
	V 2.06	Time synchronisation	
V 2.07	Operation of Stepper Motors	✓	
	"Safe Standstill" Option	✓	
	Flying Referencing		✓
	Motor Temperature Acquisition		✓
V 2.09	Incremental Encoder Emulation	✓	
	Incremental Encoder Evaluation	✓	
	Activating Digital Outputs at Position X	✓	
	R196 Linear / Rotatory Transmission		✓
	F02 + F28 After Deactivating the Controller		✓
	GOTO Change of Encoder Type		✓

2 Enhancements

2.1 Incremental Encoder Emulation

As of version V 2.07 R1 and combined with the pluggable expansion board JM_EMU (in AnyBus position 2), the devices of the JetMove 2xx series can emulate an incremental encoder.

Register 233: Operating Mode	
Function	Description
Read / Write	Operating mode of the incremental encoder emulation
Type / Unit	Int32 / [-]
Value range	0 – 1
Value after reset	0

- 0 Disabled
- 1 Enabled, connected to the encoder on the motor side

At switching from 0 to 1, the JM_EMU module is re-initialized.

Register 234: Resolution	
Function	Description
Read / Write	Resolution of the incremental encoder emulation
Type / Unit	Int32 / [encoder-increments]
Value range	4 ... 65532
Value after reset	4096

This way, the maximum counter value of the encoder to be emulated is set. This value must be divisible by four.

Register 235: Offset for Zero Pulse	
Function	Description
Read / Write	Offset for zero pulse
Type / Unit	Int32 / [encoder-increments]
Value range	0 ... Register 234-1
Value after reset	0

Counter status for setting the zero pulse. This value must be divisible by four.

Register 236: Maximum Frequency	
Function	Description
Read / Write	Maximum output frequency of the incremental encoder emulation
Type / Unit	Int32 / [kHz]
Value range	0 ... 1000
Value after reset	1000

Register 237: Filter Time	
Function	Description
Read / Write	Filter time for rotatory direction reversal
Type / Unit	Int32 / [ms]
Value range	0 ... 16383
Value after reset	0 - the filter has been deactivated

As an input signal, the filter uses the polarity bit of the angle change per scanning (= speed). What can be set is the number of pulses, for which the polarity must constantly be the same, in order to output the new angle value as a pulse pattern. The frequency of polarity changes after filtering is calculated as follows:

$$f = \frac{1}{R237ms}$$

Register 238: Set Position	
Function	Description
Read / Write	Set position of the incremental encoder emulation
Type / Unit	Int32 / [encoder-increments]
Value range	0 ... Register 234-1
Value after reset	0

2.2 Incremental Encoder Evaluation

As of version V. 2.07 R3, the JetMove can make use of the optional AnyBus module JM_CNT (in position 2) for evaluating incremental encoder systems.

The following settings must be made at the JetMove for this purpose:

- R577 Encoder Type = 12
- R117 Encoder Resolution = pulse number * 4
- Acknowledge failure

As the encoder connector X61 has not been plugged into the JetMove, the error `F08 Overtemperature Motor` will occur repeatedly. This can be prevented by bridging terminals X61:4 and X61:9.

A temperature monitoring device (NCC) at the motor can be connected to pins X61:4 and X61:9.

2.3 Activating Digital Outputs at Position X

As of version 2.07.0.7, JetMove 215-460 (and in future JetMove 204-460 and JetMove 208-460) can change the switch status of its digital outputs at any actual position that is set. For this, the following registers are required:

Register 525: DigOut Type	
Function	Description
Read / Write	Operating characteristics of the digital outputs
Type / Unit	Int32 / [...]
Value range	0 ... 2
Value after reset	0

- 0 Transparent Mode: Entries into R516 and R517 become effective immediately
- 1 Trigger Mode: Entries into R516 DigOut-Set and R517 DigOut-Clear become effective, when R109 actual position value \geq R526 DigOut-PosX.
- 2 Trigger Mode: Entries into R516 DigOut-Set and R517 DigOut-Clear become effective, when R109 actual position value \leq R526 DigOut-PosX.

Register 515: DigOut Status	
Function	Description
Read / Write	Switch status of the digital outputs on X31:1-4
Type / Unit	Int32 / [...]
Value range	0 ... 15
Value after reset	0

The register is bit-coded. The bit numbers have been assigned to the following output signals:

- 0 Output 1 on X31:1
- 1 Output 2 on X31:2
- 2 Output 3 on X31:3
- 3 Output 4 on X31:4

Note: Writing access to the status word is directly set by the digital outputs according to the assignment listed above. Positive logic is standard; i.e. by "1" an output is activated (= +24 V), by "0", an output is deactivated (= 0 V).

Register 516: DigOut Set	
Function	Description
Read / Write	Register for setting the digital outputs 1-4. Assignment as in R515 DigOut Status.
Type / Unit	Int32 / [...]
Value range	0 ... 15
Value after reset	0

Writing access to this register set the digital outputs of "1" belonging to their bit number to status "Activated" (= +24 V). The respective bits are also set in the status word of R515. Outputs of "0" belonging to their bits remain unchanged.

Register 517: DigOut Clear	
Function	Description
Read / Write	Clearing register for the digital outputs 1-4. Assignment as in R515 DigOut Status.
Type / Unit	Int32 / [...]
Value range	0 ... 15
Value after reset	0

Writing access to this register set the digital outputs of "1" belonging to their bit number to status "Deactivated" (= 0V). The respective bits are also cleared in the status word of R515. Outputs of "0" belonging to their bits remain unchanged.

Register 526: DigOut PosX	
Function	Description
Read / Write	Comparison value for the actual position value
Type / Unit	Float [mm] or [°]
Value range	R182 Max-Pos to R183 Min-Pos
Value after reset	0

For correct functioning, please make sure the comparison value is within the limits defined for the axis motion (R182 Max-Pos to R183 Min-Pos).

When making use of this function, the following procedure is recommended:

1. Initialize digital outputs by writing into register R515 DigOut Status. This way, the driver component of the output is activated and the desired hardware signals are definitely available.
2. Enter the position value for the switch-over event into register R526 DigOut-PosX.
3. Set the desired operating characteristics in register R525 DigOut Type.
4. Enter into register R516 DigOut Set, which outputs are to be activated.
5. Enter into register R517 DigOut Clear, which outputs are to be deactivated.

Triggered modification of the digital outputs is based on an event-driven system. After passing the set position X in the direction of the fulfilled condition according to R525, and after having modified the digital outputs by means of the JetMove as set in R516 and R517, the mode is deactivated automatically. This function can by no means be compared with the function of a cam group, though!

If this function is activated the condition already having been met, the switching procedure is blocked. When the condition is not met any more, the blockage is cleared. At the next passing of the comparison value in the direction of the condition being met, switching is carried out.

As long as switching has not been carried out yet, the function in process can be deactivated again without modifying the switch status of the outputs. For this, the following steps have to be taken:

- Set register R516 DigOut Set = 0
- Set register R517 DigOut Clear = 0
- Set register R525 DigOut Type = 0

3 Bugfix

3.1 R196 Linear / Rotatory Transmission

In former versions it was also possible for rotatory axes (axis type R191 = 1) to modify the transmission ratio mechanically / in rotatory manner (R196), although only value 360.0 makes sense there.

Thus, the following problem could arise as of version 2.04:

If a DA file defined for a linear axis is assigned to a rotatory axis, the transmission factor linear / rotatory is modified into the value originally set for the linear axis. This way, the axis does not move by the correct speed. The defined position range is not kept to, either.

This problem has been solved as of version 2.07 R1. The transmission factor linear / rotatory R196 can only be set, if the axis type has been set to linear (R191 = 1) beforehand.

3.2 F02 + F28 After Deactivating the Controller

As of version V2.05R5, the errors `F02 Phase failue` and `F28 Error in power charging circuit` occur at deactivating the controller by command 2 and switching off the mains voltage (400 V~) after that. This problem is caused by a runtime error within the JetMove operating system; it can only be solved by making an operating system update to version V 2.07 R3 or later.

3.3 GOTO Change of Encoder Type

As of version 2.05 R5, an offset between R130 "Set Position Value" and R109 "Actual Position Value" can occur in case of a JetMove 2xx plus encoder switchover at initializing the encoder types 4, 5, 8 (rectangular and sine incremental encoder); the axis will jump by this offset.

This problem has been solved as of version 2.07 R2.