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ModBus Manual

ver.1 rev.01/'09

Enclosures to Service Manuals of:

- **McbNET Digital™**
- **Magnum400™**
- **MiniMagnum400™**

Summary

Release	Notes
ver.1 rev.06/'07	First edition.
ver.1 rev.12/'07	Insert notes about analog outputs.
ver.1 rev.01/'09	Notes inserted about CRC and other parameters.

**THIS MANUAL IS EXCLUSIVELY ADDRESSED TO TECHNICAL PERSONNEL WITH AN APPROPRIATE TECHNICAL KNOWLEDGE ON SERVODRIVE.
BEFORE USING THIS MANUAL READ DRIVE'S SERVICE MANUAL.**

1 ModBus Protocol

It is possible to connect the Axor drives to a PC (or a Master server) in **RS-232** using the **MODBUS communication protocol** specified in the **Modicon** instructions (see http://www.modicon.com/techpubs/).
In particular, the instructions supported by the drive are the following:

- **Read more registers** (command: **0x03**)
- **Write one register** (command: **0x06**)
- **Write more registers** (command: **0x10**)

The interrogations must be sent to the drive using the following parameters:

- RTU modality (Remote Terminal Unit)
- Baud rate = 19200
- 1 start bit
- 8 data bit
- 1 parity bit (EVEN)
- 1 stop bit

MESSAGGE STRUCTURE

Using the **RTU** mode a message has the following **structure**:

START	IDENTIFICATION	COMMAND	DATA	CRC	END
T1-T2-T3-T4	8bit	8bit	N*8bit	16bit	T1-T2-T3-T4

1. **Start**: period of silence 4 character length (T1-T2-T3-T4).
2. **Identification**: it has 8 bits and can change between 1 and 127. It represents the drive with which you want to communicate.
3. **Command**: it has 8 bits and contains the "to do" function .
4. **Data**: it can have a variable length (N*8bit) and contains the necessary information to do the set command.
5. **CRC** (Cyclical Redundancy Check): it has 16 bits and is utilised to verify the correction of the message. The low-order byte will be transmitted first, followed by the high-order byte.
6. **End**: period of silence 4 character length.

It is necessary that the bytes of the message are sent compact and continuative (not separate from one another) for this could generate an CRC alarm in reception.

CHARACTER STRUCTURE

When a message is sent, each character of the message is sent from left to right:

less significant bit (LSB)……more significant bit (MSB)

In particular, in RTU mode, the sequence of bits of every character is the following:

Start Bit	1 LSB	2	3	4	5	6	7	8 MSB	Parity bit	Stop bit

0x03 COMMAND: READ REGISTER

The **0x03 command** allows you to read the registers of the drive.

Example:

Question: the MASTER asks the SLAVE, having the 0x14 identification, to read the registers having the following addresses: 0x0005, 0x0006, 0x0007.

Character Name	Example (hex)
Identification	14
Command	03
Start address Hi	00
Start address Lo	05
Number of register Hi	00
Number of register Lo	03
CRC Lo	--
CRC Hi	--

Answer: the SLAVE, having the 0x14 identification, sends the values of the registers having the following addresses: 0x0005, 0x0006, 0x0007.

Character Name	Example (hex)
Identification	14
Command	03
Number of byte	06
Data Hi (register 0x0005)	12
Data Lo (register 0x0005)	A2
Data Hi (register 0x0006)	02
Data Lo (register 0x0006)	1F
Data Hi (register 0x0007)	0A
Data Lo (register 0x0007)	10
CRC Lo	--
CRC Hi	--

The 0x0005 register has the 0x12A2 value, the 0x0006 register has the 0x021F value, the 0x0007 register has the 0x0A10 value.

0x06 COMMAND: WRITE A REGISTER

The **0x06 command** allows you to write a value on a register of the drive.

Example:

Question: the MASTER asks the SLAVE, having the 0x14 identification, to write the 0x0003 value into the 0x0002 register.

Character name	Example (hex)
Identification	14
Command	06
Register address Hi	00
Register address Lo	02
Value Hi	00
Value Lo	03
CRC Lo	--
CRC Hi	--

Answer: the answer is an echo of the question after that the register is written.

Character name	Example (hex)
Identification	14
Command	06
Register address Hi	00
Register address Lo	02
Inserted value Hi	00
Inserted value Lo	03
CRC Lo	--
CRC Hi	--

0x10 COMMAND: WRITE N REGISTERS

The **0x10 command** allows you to write "n" consecutive registers, using only one question. The number of registers that can be written using this command are 16.

Example:

Question: the MASTER asks the SLAVE, having the 0x14 identification, to write into two registers the 0x000A and 0x0102 values, starting from the 0x0001 address.

Character name	Example (hex)
Identification	14
Command	10
Start address Hi	00
Start address Lo	01
Number of registers Hi	00
Number of registers Lo	02
Number of byte	04
Value Hi	00
Value Lo	0A
Value Hi	01
Value Lo	02
CRC Lo	--
CRC Hi	--

Answer: the answer is an echo of the identification, the command, the start address and the number of the written registers.

Character name	Example (hex)
Identification	14
Command	10
Start address Hi	00
Start address Lo	01
Number of registers Hi	00
Number of registers Lo	02
CRC Lo	--
CRC Hi	--

CRC Generation

The CRC is a 16 bit binary value, utilised to verify the correction of the sent message. It is calculated by the transmitting device, which appends the CRC to the message. The receiving device re-calculates a CRC during receipt of the message and compares the calculated value to the actual value it received in the CRC field. If the two values are not equal, an error results.
Only the eight bits of data in each character are used for generating the CRC; start and stop bits, and the parity bit, do not apply to the CRC.

A ***procedure for generating the CRC*** is the following:

1) load a 16 bit register with FFFF hex (all 1's). Call this the ***CRC register***.

2) Exclusive OR the first 8-bit bytes of the message with the low-order byte of the 16 bit CRC register, putting the result in the CRC register.

3) Shift the CRC register one bit to the right (toward LSB), zero-filling the MSB.

4) Extract and examine the LSB, then:
- if the LSB is 0: repeat step 3 (another shift);
- if the LSB is 1: exclusive OR the CRC register with the polynomial value A001 hex (= 1010 0000 0000 0001).

5) repeat steps 3 and 4 until 8 shifts have been performed. When this is done, a complete 8-bit byte will have been processed.

6) repeat steps 2 through 5 for the next 8-bit byte of the messagge. Continue doing this until all bytes have been processed.

7) The final contents of the CRC register is the CRC value. When the CRC is placed into the message, the low-order byte will be transmitted first, followed by the high-order byte.

2 ModBus Parameter

The following table illustrates all parameter *managing by modbus*.

We remind that:
- registers have 16 bits;
- registers addressed from 0 to 254 are used for the drive's control parameters;
- register having the 255 address contains the CRC of the control parameters;
- registers addressed from 256 to 831 are reserved for the integrated positioner;
- if you try to read a register having an address above 831, the "drive's timeout" exception is generated.

Parameters having apex ([PROGRESSIVE N°]), ([LETTER]) or (**) refer to a note at the end of the chapter.

Address	Parameter	Min	Max	Unit
0	Drive Version	-32768	32767	
1	Firmware Version	-32768	32767	
2	Device ID (2) (B)	0	127	
3	Baud Rate RS232 (A)	0	32767	
4	Baud Rate Can (B)	50	1000	
5	Reserved by Can	-32768	32767	
6	Reserved by Can	-32768	32767	
7	Nr. of motor pole (F)	0	12	
8	Nr. of resolver pole (F)	2	12	
9	Encoder pulses/turn (2) (F)	256	8192	pulse/turn
10	I^2t motor	0	999	
11	Phase angle (F)	0	3600	electric degree x 10
12	Feedback type (3) (F)	0	20	
13	Nominal current, Irms (4) (D)	1	50	in %
14	Peak current, Ipeak (5) (D)	1	100	in %
15	Kp current Iq (D)	0	999	
16	Ti current Iq (6) (D)	0	999	in ms x 10
17	Analog In 1 Filter (6) (G)	0	1000	in ms x 10
18	Kp current Id	0	999	
19	Ti current Id (6)	0	999	in ms x 10
20	Parity (A)	-32768	32767	
21	I^2t Drive (D)	0	999	sec x 100
22	Analog In 2 Filter (6) (G)	0	1000	in ms x 10
23	Kp speed (C)	0	4000	
24	Ki speed (C)	0	4000	
25	Kd speed (C)	0	4000	
26	Feedback filter (6) (C)	0	999	in ms x 10
27	Reference filter (6) (C)	0	999	in ms x 10
28	Dead Band An In 1 (G)	0	10000	mV
29	Offset Analog In 1 (7) (G)	-32768	32767	
30	Offset Analog In 2 (7) (G)	-32768	32767	
31	Maximum speed (C)	128	8000	rpm
32	Speed limit +	128	8000	rpm

33	Speed limit -	128	8000	rpm
34	Acceleration ramp (C)	0	5000	ms
35	Deceleration ramp (C)	0	5000	ms
36	Emergency ramp (C)	0	5000	ms
37	Square wave period	0	32767	ms
38	Dynamic gain (H)	0	999	
39	Static gain (H)	0	999	
40	Reserved positioner	0	999	
41	Position feedforward (H)	0	150	
42	Max. position error (H)	1000	32767	pulses
43	Reserved (Position state)	-32768	32767	
44	Reserved (Position control)	-32768	32767	
45	Pulse/rev Master (H)	128	16384	pulse/turn
46	Numerator gear (H)	-32768	32767	
47	Denominator gear (H)	1	32767	
48	Reserved for Pulse/Dir	-32768	32767	
49	Pulse/Direction filter (6)	0	999	in ms x 10
50	Dead Band An In 2 (G)	0	10000	mV
51	Alarm HI (8)	-32768	32767	
52	Alarm LO (8)	-32768	32767	
53	Bus voltage (29)	0	1000	V
54	Motor temperature	-32768	32767	
55	Drive temperature	-32768	32767	
56	Iu Offset	-32768	32767	
57	Iv Offset	-32768	32767	
58	Current feedback (9)	-32768	32767	
59	Speed feedback	-32768	32767	rpm
60	Position feedback	-32768	32767	
61	Monitor 1	-32768	32767	
62	Monitor 2	-32768	32767	
63	State 1	-32768	32767	
64	State 2	-32768	32767	
65	State digital I/O (10)	-32768	32767	
66	Settings Analog OUT1 (25)	0	50	
67	Settings Analog OUT2 (26)	0	50	
68	Encoder Out settings (11) (E)	1	8	
69	Commands (12)	-32768	32767	
70	Reserved (Configurations 1)	-32768	32767	
71	Operative Mode (13)	0	20	
72	HW digital I/O (14)	-32768	32767	
73	I/O dig SW set (15)	-32768	32767	
74	I/O dig SW clr (16)	-32768	32767	
75	Tar. V_Bus 1 (27)	-32768	32767	

76	Tar. V_Bus 2 (27)	-32768	32767	
77	Tar. drive temperature	-32768	32767	
78	Tar. motor temperature	-32768	32767	
79	Current digital reference (17)	-4096	4095	
80	Speed digital reference (18)	-32768	32767	
81	Position digital reference	-32768	32767	
82	Password	-32768	32767	
83	Historical alarms HI (8)	-32768	32767	
84	Historical alarms LO (8)	-32768	32767	
85	Boot Version (B)	-32768	32767	
86	Main Voltage (28)	0	480	Vac
87	DGT-IN3 settings (19) (M)	0	32767	
88	DGT-IN4 settings (19) (M)	0	32767	
89	Reserved positioner	-32768	32767	
90	Homing speed (L)	1	1000	rpm
91	Homing type (20) (L)	0	100	
92	Homing_offset_HI (**) (L)	-32768	32767	pulses
93	Homing_offset_LO (**) (L)	-32768	32767	pulses
94	ModBus_Command	-32768	32767	
95	ModBus_Data_HI	-32768	32767	
96	ModBus_Data_LO	-32768	32767	
97	ModBus_Answer_HI	-32768	32767	
98	ModBus_Answer_LO	-32768	32767	
99	Flash Alarm Code	-32768	32767	
100	Abs position 2	-32768	32767	
101	Abs position 1	-32768	32767	
102	Abs position 0	-32768	32767	
103	Regen resistor	-32768	32767	
104	DGT-IN2 settings (19) (M)	-32768	32767	
105	DGT-IN5 settings (19) (M)	-32768	32767	
106	Homing Acc (L)	10	5000	ms
107	Homing zero speed (L)	1	50	rpm
108	Max search angle (L)	0	359	deg
109	Reserved by Can	-32768	32767	
11	Reserved by Can	-32768	32767	
111	Reserved by Can	-32768	32767	
112	Reserved by Can	-32768	32767	
113	Reserved by Can	-32768	32767	
114	Reserved by Can	-32768	32767	
115	Reserved by Can	-32768	32767	
116	Reserved by Can	-32768	32767	
117	Reserved by Can	-32768	32767	
118	Reserved by Can	-32768	32767	

119	Reserved by Can	-32768	32767	
120	Reserved by Can	-32768	32767	
121	Reserved by Can	-32768	32767	
122	Reserved by Can	-32768	32767	
123	P_Codice_Alrm_FLASH	-32768	32767	
124	PULSE In settings (21) (M)	-32768	32767	
125	DGT-OUT1 settings (22) (M)	-32768	32767	
126	DGT-OUT2 settings (22) (M)	-32768	32767	
127	Dir_In_settings (21) (M)	-32768	32767	
128	DGT-IN2_value (23) (M)	-32768	32767	
129	DGT-IN3_value (23) (M)	-32768	32767	
130	DGT-IN4_value (23) (M)	-32768	32767	
131	DGT-IN5_value (23) (M)	-32768	32767	
132	Pulse-In_value (23) (M)	-32768	32767	
133	Dir-In_value (23) (M)	-32768	32767	
134	Vis_Position_hi (**) (30)	-32768	32767	turns
135	Vis_Position_lo (**) (30)	-32768	32767	
136	DGT-OUT1_value (24) (M)	-32768	32767	
137	DGT-OUT2_value (24) (M)	-32768	32767	
138	Vis Analog In 1	-32768	32767	
139	Vis Analog In 2	-32768	32767	
140	Deflux_1	-32768	32767	
141	Deflux_2	-32768	32767	
142	Deflux_3	-32768	32767	
143	Kp speed 2	0	4000	
144	Ki speed 2	0	4000	
145	Kd speed 2	0	4000	
146	Feedback filter 2	0	999	
147	PID-filter 2	0	999	
148	Switch speed	64	8000	
149..159	Reserved for future use			
160	Aux_Monitor 1	-32768	32767	
161	Aux_Monitor 1	-32768	32767	
162..255	Reserved for future use			

256	Reserved for future use			
257	Pstop Sw Hi (**)	-32768	32767	pulses
258	Pstop Sw Lo (**)	-32768	32767	pulses
259	Nstop Sw Hi (**)	-32768	32767	pulses
260	Nstop Sw Lo (**)	-32768	32767	pulses
261...319	Reserved for future use			
320	Task 1:Final position HI (**)	-32768	32767	pulses
321	Task 1:Final position LO (**)	-32768	32767	pulses
322	Task 1:Speed	10	6000	rpm
323	Task 1:Acceleration time	10	5000	ms
324	Task 1:Deceleration time	10	5000	ms
325	Task 1:Window position HI (**)	-32768	32767	pulses
326	Task 1:Window position LO (**)	-32768	32767	pulses
327	Task 1:Window Time	0	65535	ms
328	Task 1:Next Profile	0	32	
329	Task 1:Delay Time	0	65535	ms
330	Reserved for future use			
331	Reserved for future use			
332	Reserved for future use			
333	Reserved for future use			
334	Task 1:Settings	-32768	32767	
335	Task 1:State	-32768	32767	
336	Task 2:Final position HI (**)	-32768	32767	pulses
337	Task 2:Final position LO (**)	-32768	32767	pulses
338	Task 2:Speed	10	6000	rpm
339	Task 2:Acceleration time	10	5000	ms
340	Task 2:Deceleration time	10	5000	ms
341	Task 2:Window position HI (**)	-32768	32767	pulses
342	Task 2:Window position LO (**)	-32768	32767	pulses
343	Task 2:Window Time	0	65535	ms
344	Task 2:Next Profile	0	32	
345	Task 2:Delay Time	0	65535	ms
346	Reserved for future use			
347	Reserved for future use			
348	Reserved for future use			
349	Reserved for future use			
350	Task 2:Settings	-32768	32767	
351	Task 2:State	-32768	32767	
352	Task 3:Final position HI (**)	-32768	32767	pulses
353	Task 3:Final position LO (**)	-32768	32767	pulses
354	Task 3:Speed	10	6000	rpm
355	Task 3:Acceleration time	10	5000	ms
356	Task 3:Deceleration time	10	5000	ms

357	Task 3:Window position HI (**)	-32768	32767	pulses
358	Task 3:Window position LO (**)	-32768	32767	pulses
359	Task 3:Window Time	0	65535	ms
360	Task 3:Next Profile	0	32	
361	Task 3:Delay Time	0	65535	ms
362	Reserved for future use			
363	Reserved for future use			
364	Reserved for future use			
365	Reserved for future use			
366	Task 3:Settings	-32768	32767	
367	Task 3:State	-32768	32767	
368	Task 4:Final position HI (**)	-32768	32767	pulses
369	Task 4:Final position LO (**)	-32768	32767	pulses
370	Task 4:Speed	10	6000	rpm
371	Task 4:Acceleration time	10	5000	ms
372	Task 4:Deceleration time	10	5000	ms
373	Task 4:Window position HI (**)	-32768	32767	pulses
374	Task 4:Window position LO (**)	-32768	32767	pulses
375	Task 4:Window Time	0	65535	ms
376	Task 4:Next Profile	0	32	
377	Task 4:Delay Time	0	65535	ms
378	Reserved for future use			
379	Reserved for future use			
380	Reserved for future use			
381	Reserved for future use			
382	Task 4:Settings	-32768	32767	
383	Task 4:State	-32768	32767	
384	Task 5:Final position HI (**)	-32768	32767	pulses
385	Task 5:Final position LO (**)	-32768	32767	pulses
386	Task 5:Speed	10	6000	rpm
387	Task 5:Acceleration time	10	5000	ms
388	Task 5:Deceleration time	10	5000	ms
389	Task 5:Window position HI (**)	-32768	32767	pulses
390	Task 5:Window position LO (**)	-32768	32767	pulses
391	Task 5:Window Time	0	65535	ms
392	Task 5:Next Profile	0	32	
393	Task 5:Delay Time	0	65535	ms
394	Reserved for future use			
395	Reserved for future use			
396	Reserved for future use			
397	Reserved for future use			
398	Task 5:Settings	-32768	32767	
399	Task 5:State	-32768	32767	

400	Task 6:Final position HI (**)	-32768	32767	pulses
401	Task 6:Final position LO (**)	-32768	32767	pulses
402	Task 6:Speed	10	6000	rpm
403	Task 6:Acceleration time	10	5000	ms
404	Task 6:Deceleration time	10	5000	ms
405	Task 6:Window position HI (**)	-32768	32767	pulses
406	Task 6:Window position LO (**)	-32768	32767	pulses
407	Task 6:Window Time	0	65535	ms
408	Task 6:Next Profile	0	32	
409	Task 6:Delay Time	0	65535	ms
410	Reserved for future use			
411	Reserved for future use			
412	Reserved for future use			
413	Reserved for future use			
414	Task 6:Settings	-32768	32767	
415	Task 6:State	-32768	32767	
416	Task 7:Final position HI (**)	-32768	32767	pulses
417	Task 7:Final position LO (**)	-32768	32767	pulses
418	Task 7:Speed	10	6000	rpm
419	Task 7:Acceleration time	10	5000	ms
420	Task 7:Deceleration time	10	5000	ms
421	Task 7:Window position HI (**)	-32768	32767	pulses
422	Task 7:Window position LO (**)	-32768	32767	pulses
423	Task 7:Window Time	0	65535	ms
424	Task 7:Next Profile	0	32	
425	Task 7:Delay Time	0	65535	ms
426	Reserved for future use			
427	Reserved for future use			
428	Reserved for future use			
429	Reserved for future use			
430	Task7:Settings	-32768	32767	
431	Task 7:State	-32768	32767	
432	Task 8:Final position HI (**)	-32768	32767	pulses
433	Task 8:Final position LO (**)	-32768	32767	pulses
434	Task 8:Speed	10	6000	rpm
435	Task 8:Acceleration time	10	5000	ms
436	Task 8:Deceleration time	10	5000	ms
437	Task 8:Window position HI (**)	-32768	32767	pulses
438	Task 8:Window position LO (**)	-32768	32767	pulses
439	Task 8:Window Time	0	65535	ms
440	Task 8:Next Profile	0	32	
441	Task 8:Delay Time	0	65535	ms
442	Reserved for future use			

443	Reserved for future use			
444	Reserved for future use			
445	Reserved for future use			
446	Task8:Settings	-32768	32767	
447	Task 8:State	-32768	32767	
448	Task 9:Final position HI (**)	-32768	32767	pulses
449	Task 9:Final position LO (**)	-32768	32767	pulses
450	Task 9:Speed	10	6000	rpm
451	Task 9:Acceleration time	10	5000	ms
452	Task 9:Deceleration time	10	5000	ms
453	Task 9:Window position HI (**)	-32768	32767	pulses
454	Task 9:Window position LO (**)	-32768	32767	pulses
455	Task 9:Window Time	0	65535	ms
456	Task 9:Next Profile	0	32	
457	Task 9:Delay Time	0	65535	ms
458	Reserved for future use			
459	Reserved for future use			
460	Reserved for future use			
461	Reserved for future use			
462	Task 9:Settings	-32768	32767	
463	Task 9:State	-32768	32767	
464	Task 10:Final position HI (**)	-32768	32767	pulses
465	Task 10:Final position LO (**)	-32768	32767	pulses
466	Task 10:Speed	10	6000	rpm
467	Task 10:Acceleration time	10	5000	ms
468	Task 10:Deceleration time	10	5000	ms
469	Task 10:Window position HI (**)	-32768	32767	pulses
470	Task 10:Window position LO (**)	-32768	32767	pulses
471	Task 10:Window Time	0	65535	ms
472	Task 10:Next Profile	0	32	
473	Task 10:Delay Time	0	65535	ms
474	Reserved for future use			
475	Reserved for future use			
476	Reserved for future use			
477	Reserved for future use			
478	Task 10:Settings	-32768	32767	
479	Task 10:State	-32768	32767	
480	Task 11:Final position HI (**)	-32768	32767	pulses
481	Task 11:Final position LO (**)	-32768	32767	pulses
482	Task 11:Speed	10	6000	rpm
483	Task 11:Acceleration time	10	5000	ms
484	Task 11:Deceleration time	10	5000	ms
485	Task 11:Window position HI (**)	-32768	32767	pulses

486	Task 11:Window position LO (**)	-32768	32767	pulses
487	Task 11:Window Time	0	65535	ms
488	Task 11:Next Profile	0	32	
489	Task 11:Delay Time	0	65535	ms
490	Reserved for future use			
491	Reserved for future use			
492	Reserved for future use			
493	Reserved for future use			
494	Task 11:Settings	-32768	32767	
495	Task 11:State	-32768	32767	
496	Task 12:Final position HI (**)	-32768	32767	pulses
497	Task 12:Final position LO (**)	-32768	32767	pulses
498	Task 12:Speed	10	6000	rpm
499	Task 12:Acceleration time	10	5000	ms
500	Task 12:Deceleration time	10	5000	ms
501	Task 12:Window position HI (**)	-32768	32767	pulses
502	Task 12:Window position LO (**)	-32768	32767	pulses
503	Task 12:Window Time	0	65535	ms
504	Task 12:Next Profile	0	32	
505	Task 12:Delay Time	0	65535	ms
506	Reserved for future use			
507	Reserved for future use			
508	Reserved for future use			
509	Reserved for future use			
510	Task 12:Settings	-32768	32767	
511	Task 12:State	-32768	32767	
512	Task 13:Final position HI (**)	-32768	32767	pulses
513	Task 13:Final position LO (**)	-32768	32767	pulses
514	Task 13:Speed	10	6000	rpm
515	Task 13:Acceleration time	10	5000	ms
516	Task 13:Deceleration time	10	5000	ms
517	Task 13:Window position HI (**)	-32768	32767	pulses
518	Task 13:Window position LO (**)	-32768	32767	pulses
519	Task 13:Window Time	0	65535	ms
520	Task 13:Next Profile	0	32	
521	Task 13:Delay Time	0	65535	ms
522	Reserved for future use			
523	Reserved for future use			
524	Reserved for future use			
525	Reserved for future use			
526	Task 13:Settings	-32768	32767	
527	Task 13:State	-32768	32767	

528	Task 14:Final position HI (**)	-32768	32767	pulses
529	Task 14:Final position LO (**)	-32768	32767	pulses
530	Task 14:Speed	10	6000	rpm
531	Task 14:Acceleration time	10	5000	ms
532	Task 14:Deceleration time	10	5000	ms
533	Task 14:Window position HI (**)	-32768	32767	pulses
534	Task 14:Window position LO (**)	-32768	32767	pulses
535	Task 14:Window Time	0	65535	ms
536	Task 14:Next Profile	0	32	
537	Task 14:Delay Time	0	65535	ms
538	Reserved for future use			
539	Reserved for future use			
540	Reserved for future use			
541	Reserved for future use			
542	Task 14:Settings	-32768	32767	
543	Task 14:State	-32768	32767	
544	Task 15:Final position HI (**)	-32768	32767	pulses
545	Task 15:Final position LO (**)	-32768	32767	pulses
546	Task 15:Speed	10	6000	rpm
547	Task 15:Acceleration time	10	5000	ms
548	Task 15:Deceleration time	10	5000	ms
549	Task 15:Window position HI (**)	-32768	32767	pulses
550	Task 15:Window position LO (**)	-32768	32767	pulses
551	Task 15:Window Time	0	65535	ms
552	Task 15:Next Profile	0	32	
553	Task 15:Delay Time	0	65535	ms
554	Reserved for future use			
555	Reserved for future use			
556	Reserved for future use			
557	Reserved for future use			
558	Task 15:Settings	-32768	32767	
559	Task 15:State	-32768	32767	
560	Task 16:Final position HI (**)	-32768	32767	pulses
561	Task 16:Final position LO (**)	-32768	32767	pulses
562	Task 16:Speed	10	6000	rpm
563	Task 16:Acceleration time	10	5000	ms
564	Task 16:Deceleration time	10	5000	ms
565	Task 16:Window position HI (**)	-32768	32767	pulses
566	Task 16:Window position LO (**)	-32768	32767	pulses
567	Task 16:Window Time	0	65535	ms
568	Task 16:Next Profile	0	32	
569	Task 16:Delay Time	0	65535	ms
570	Reserved for future use			

571	Reserved for future use			
572	Reserved for future use			
573	Reserved for future use			
574	Task 16:Settings	-32768	32767	
575	Task 16:State	-32768	32767	
576	Task 17:Final position HI (**)	-32768	32767	pulses
577	Task 17:Final position LO (**)	-32768	32767	pulses
578	Task 17:Speed	10	6000	rpm
579	Task 17:Acceleration time	10	5000	ms
580	Task 17:Deceleration time	10	5000	ms
581	Task 17:Window position HI (**)	-32768	32767	pulses
582	Task 17:Window position LO (**)	-32768	32767	pulses
583	Task 17:Window Time	0	65535	ms
584	Task 17:Next Profile	0	32	
585	Task 17:Delay Time	0	65535	ms
586	Reserved for future use			
587	Reserved for future use			
588	Reserved for future use			
589	Reserved for future use			
590	Task 17:Settings	-32768	32767	
591	Task 17:State	-32768	32767	
592	Task 18:Final position HI (**)	-32768	32767	pulses
593	Task 18:Final position LO (**)	-32768	32767	pulses
594	Task 18:Speed	10	6000	rpm
595	Task 18:Acceleration time	10	5000	ms
596	Task 18:Deceleration time	10	5000	ms
597	Task 18:Window position HI (**)	-32768	32767	pulses
598	Task 18:Window position LO (**)	-32768	32767	pulses
599	Task 18:Window Time	0	65535	ms
600	Task 18:Next Profile	0	32	
601	Task 18:Delay Time	0	65535	ms
602	Reserved for future use			
603	Reserved for future use			
604	Reserved for future use			
605	Reserved for future use			
606	Task 18:Settings	-32768	32767	
607	Task 18:State	-32768	32767	
608	Task 19:Final position HI (**)	-32768	32767	pulses
609	Task 19:Final position LO (**)	-32768	32767	pulses
610	Task 19:Speed	10	6000	rpm
611	Task 19:Acceleration time	10	5000	ms
612	Task 19:Deceleration time	10	5000	ms
613	Task 19:Window position HI (**)	-32768	32767	pulses

614	Task 19:Window position LO (**)	-32768	32767	pulses
615	Task 19:Window Time	0	65535	ms
616	Task 19:Next Profile	0	32	
617	Task 19:Delay Time	0	65535	ms
618	Reserved for future use			
619	Reserved for future use			
620	Reserved for future use			
621	Reserved for future use			
622	Task 19:Settings	-32768	32767	
623	Task 19:State	-32768	32767	
624	Task 20:Final position HI (**)	-32768	32767	pulses
625	Task 20:Final position LO (**)	-32768	32767	pulses
626	Task 20:Speed	10	6000	rpm
627	Task 20:Acceleration time	10	5000	ms
628	Task 20:Deceleration time	10	5000	ms
629	Task 20:Window position HI (**)	-32768	32767	pulses
630	Task 20:Window position LO (**)	-32768	32767	pulses
631	Task 20:Window Time	0	65535	ms
632	Task 20:Next Profile	0	32	
633	Task 20:Delay Time	0	65535	ms
634	Reserved for future use			
635	Reserved for future use			
636	Reserved for future use			
637	Reserved for future use			
638	Task 20:Settings	-32768	32767	
639	Task 20:State	-32768	32767	
640	Task 21:Final position HI (**)	-32768	32767	pulses
641	Task 21:Final position LO (**)	-32768	32767	pulses
642	Task 21:Speed	10	6000	rpm
643	Task 21:Acceleration time	10	5000	ms
644	Task 21:Deceleration time	10	5000	ms
645	Task 21:Window position HI (**)	-32768	32767	pulses
646	Task 21:Window position LO (**)	-32768	32767	pulses
647	Task 21:Window Time	0	65535	ms
648	Task 21:Next Profile	0	32	
649	Task 21:Delay Time	0	65535	ms
650	Reserved for future use			
651	Reserved for future use			
652	Reserved for future use			
653	Reserved for future use			
654	Task 21:Settings	-32768	32767	
655	Task 21:State	-32768	32767	

656	Task 22:Final position HI (**)	-32768	32767	pulses
657	Task 22:Final position LO (**)	-32768	32767	pulses
658	Task 22:Speed	10	6000	rpm
659	Task 22:Acceleration time	10	5000	ms
660	Task 22:Deceleration time	10	5000	ms
661	Task 22:Window position HI (**)	-32768	32767	pulses
662	Task 22:Window position LO (**)	-32768	32767	pulses
663	Task 22:Window Time	0	65535	ms
664	Task 22:Next Profile	0	32	
665	Task 22:Delay Time	0	65535	ms
666	Reserved for future use			
667	Reserved for future use			
668	Reserved for future use			
669	Reserved for future use			
670	Task 22:Settings	-32768	32767	
671	Task 22:State	-32768	32767	
672	Task 23:Final position HI (**)	-32768	32767	pulses
673	Task 23:Final position LO (**)	-32768	32767	pulses
674	Task 23:Speed	10	6000	rpm
675	Task 23:Acceleration time	10	5000	ms
676	Task 23:Deceleration time	10	5000	ms
677	Task 23:Window position HI (**)	-32768	32767	pulses
678	Task 23:Window position LO (**)	-32768	32767	pulses
679	Task 23:Window Time	0	65535	ms
680	Task 23:Next Profile	0	32	
681	Task 23:Delay Time	0	65535	ms
682	Reserved for future use			
683	Reserved for future use			
684	Reserved for future use			
685	Reserved for future use			
686	Task 23:Settings	-32768	32767	
687	Task 23:State	-32768	32767	
688	Task 24:Final position HI (**)	-32768	32767	pulses
689	Task 24:Final position LO (**)	-32768	32767	pulses
690	Task 24:Speed	10	6000	rpm
691	Task 24:Acceleration time	10	5000	ms
692	Task 24:Deceleration time	10	5000	ms
693	Task 24:Window position HI (**)	-32768	32767	pulses
694	Task 24:Window position LO (**)	-32768	32767	pulses
695	Task 24:Window Time	0	65535	ms
696	Task 24:Next Profile	0	32	
697	Task 24:Delay Time	0	65535	ms
698	Reserved for future use			

699	Reserved for future use			
700	Reserved for future use			
701	Reserved for future use			
702	Task 24:Settings	-32768	32767	
703	Task 24:State	-32768	32767	
704	Task 25:Final position HI (**)	-32768	32767	pulses
705	Task 25:Final position LO (**)	-32768	32767	pulses
706	Task 25:Speed	10	6000	rpm
707	Task 25:Acceleration time	10	5000	ms
708	Task 25:Deceleration time	10	5000	ms
709	Task 25:Window position HI (**)	-32768	32767	pulses
710	Task 25:Window position LO (**)	-32768	32767	pulses
711	Task 25:Window Time	0	65535	ms
712	Task 25:Next Profile	0	32	
713	Task 25:Delay Time	0	65535	ms
714	Reserved for future use			
715	Reserved for future use			
716	Reserved for future use			
717	Reserved for future use			
718	Task 25:Settings	-32768	32767	
719	Task 25:State	-32768	32767	
720	Task 26:Final position HI (**)	-32768	32767	pulses
721	Task 26:Final position LO (**)	-32768	32767	pulses
722	Task 26:Speed	10	6000	rpm
723	Task 26:Acceleration time	10	5000	ms
724	Task 26:Deceleration time	10	5000	ms
725	Task 26:Window position HI (**)	-32768	32767	pulses
726	Task 26:Window position LO (**)	-32768	32767	pulses
727	Task 26:Window Time	0	65535	ms
728	Task 26:Next Profile	0	32	
729	Task 26:Delay Time	0	65535	ms
730	Reserved for future use			
731	Reserved for future use			
732	Reserved for future use			
733	Reserved for future use			
734	Task 26:Settings	-32768	32767	
735	Task 26:State	-32768	32767	
736	Task 27:Final position HI (**)	-32768	32767	pulses
737	Task 27:Final position LO (**)	-32768	32767	pulses
738	Task 27:Speed	10	6000	rpm
739	Task 27:Acceleration time	10	5000	ms
740	Task 27:Deceleration time	10	5000	ms
741	Task 27:Window position HI (**)	-32768	32767	pulses

742	Task 27:Window position LO (**)	-32768	32767	pulses
743	Task 27:Window Time	0	65535	ms
744	Task 27:Next Profile	0	32	
745	Task 27:Delay Time	0	65535	ms
746	Reserved for future use			
747	Reserved for future use			
748	Reserved for future use			
749	Reserved for future use			
750	Task 27:Settings	-32768	32767	
751	Task 27:State	-32768	32767	
752	Task 28:Final position HI (**)	-32768	32767	pulses
753	Task 28:Final position LO (**)	-32768	32767	pulses
754	Task 28:Speed	10	6000	rpm
755	Task 28:Acceleration time	10	5000	ms
756	Task 28:Deceleration time	10	5000	ms
757	Task 28:Window position HI (**)	-32768	32767	pulses
758	Task 28:Window position LO (**)	-32768	32767	pulses
759	Task 28:Window Time	0	65535	ms
760	Task 28:Next Profile	0	32	
761	Task 28:Delay Time	0	65535	ms
762	Reserved for future use			
763	Reserved for future use			
764	Reserved for future use			
765	Reserved for future use			
766	Task 28:Settings	-32768	32767	
767	Task 28:State	-32768	32767	
768	Task 29:Final position HI (**)	-32768	32767	pulses
769	Task 29:Final position LO (**)	-32768	32767	pulses
770	Task 29:Speed	10	6000	rpm
771	Task 29:Acceleration time	10	5000	ms
772	Task 29:Deceleration time	10	5000	ms
773	Task 29:Window position HI (**)	-32768	32767	pulses
774	Task 29:Window position LO (**)	-32768	32767	pulses
775	Task 29:Window Time	0	65535	ms
776	Task 29:Next Profile	0	32	
777	Task 29:Delay Time	0	65535	ms
778	Reserved for future use			
779	Reserved for future use			
780	Reserved for future use			
781	Reserved for future use			
782	Task 29:Settings	-32768	32767	
783	Task 29:State	-32768	32767	

784	Task 30:Final position HI (**)	-32768	32767	pulses
785	Task 30:Final position LO (**)	-32768	32767	pulses
786	Task 30:Speed	10	6000	rpm
787	Task 30:Acceleration time	10	5000	ms
788	Task 30:Deceleration time	10	5000	ms
789	Task 30:Window position HI (**)	-32768	32767	pulses
790	Task 30:Window position LO (**)	-32768	32767	pulses
791	Task 30:Window Time	0	65535	ms
792	Task 30:Next Profile	0	32	
793	Task 30:Delay Time	0	65535	ms
794	Reserved for future use			
795	Reserved for future use			
796	Reserved for future use			
797	Reserved for future use			
798	Task 30:Settings	-32768	32767	
799	Task 30:State	-32768	32767	
800	Task 31:Final position HI (**)	-32768	32767	pulses
801	Task 31:Final position LO (**)	-32768	32767	pulses
802	Task 31:Speed	10	6000	rpm
803	Task 31:Acceleration time	10	5000	ms
804	Task 31:Deceleration time	10	5000	ms
805	Task 31:Window position HI (**)	-32768	32767	pulses
806	Task 31:Window position LO (**)	-32768	32767	pulses
807	Task 31:Window Time	0	65535	ms
808	Task 31:Next Profile	0	32	
809	Task 31:Delay Time	0	65535	ms
810	Reserved for future use			
811	Reserved for future use			
812	Reserved for future use			
813	Reserved for future use			
814	Task 31:Settings	-32768	32767	
815	Task 31:State	-32768	32767	
816	Task 32:Final position HI (**)	-32768	32767	pulses
817	Task 32:Final position LO (**)	-32768	32767	pulses
818	Task 32:Speed	10	6000	rpm
819	Task 32:Acceleration time	10	5000	ms
820	Task 32:Deceleration time	10	5000	ms
821	Task 32:Window position HI (**)	-32768	32767	pulses
822	Task 32:Window position LO (**)	-32768	32767	pulses
823	Task 32:Window Time	0	65535	ms
824	Task 32:Next Profile	0	32	
825	Task 32:Delay Time	0	65535	ms
826	Reserved for future use			

827	Reserved for future use			
828	Reserved for future use			
829	Reserved for future use			
830	Task 32:Settings	-32768	32767	
831	Task 32:State	-32768	32767	

(2) *Device ID*: To activate this parameter **save on EEPROM**, then **turn the drive off and then on**.

(3) *Feedback type*: Insert 0 to set the *Encoder feedback*, insert 1 to set the *Resolver feedback*.

(4) *Nominal current, Irms*: Insert the value in *percentage* of the rated current furnished by the drive referred to the peak current; example: setting 15%, having a drive size 8/16A, the rated current will be equal to 2,4A (in fact 16x15/100=2,4).

(5) *Peak current, Ipeak*: Insert the value in *percentage* of the peak current furnished by the drive; example: setting 75%, having a drive size 8/16A, the peak current will be equal to 12A (in fact 16x75/100=12).

(6) Value expressed *in ms* and *multiplied by 10*.
Example: Suppose we want to set a value equal to 1,2ms ⇨ insert into the predisposed address the value 12 (in fact 1,2x10=12).

(7) The value has to be normalized reference to +/-10V.
Example: Suppose we want to set the offset of the analog input 1 equal to 16mV ⇨ insert on the address F5 → H7 this value:

$$\frac{16m \times 2^{15}}{10} = 53$$

(8) The following table illustrate the meaning of each bit about Parameters: **Alarms HI/Historic Alarms HI**, **Alarms LO/Historic Alarms LO**:

Alarms HI and Historic Alarms HI	
Bit	**Description**
0	Eeprom alarm
1	Overcurrent alarm
2	Drive temperature alarm
3	Hall alarm
4	Encoder alarm
5	I2t drive alarm
6	Motor temperature alarm
7	Regen resistance alarm
8	Min/Max voltage alarm
9	NA
10	NA
11	Resolver alarm
12	NA
13	Following error alarm
14	Limit switch alarm
15	NA

(continue ...)

Alarms LO and Historic Alarms LO	
0	Overcurrent regen resistance alarm (only Magnum400 and MiniMagnum)
1	Holding brake alarm (only Magnum400 and MiniMagnum)
2	In-rush bus alarm (only Magnum400 and MiniMagnum)
3	Auxiliry voltage alarm (alarm Magnum400 and MiniMagnum)
4	NA
5	NA
6	Flash alarm
7	CanBus alarm
8	NA
9	Homing alarm
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA

(9) Feedback current [in Ampere] can be calculated by using this formula:

$$I_{feedback}[A] = I_{peak} \times \frac{\text{Visualised value}}{8192}$$

(10) If:
- bit 0 = 1 on digital input DGT-IN1 there is a high logical signal (hardware and/or software)
- bit 1 = 1 on digital input DGT-IN2 there is a high logical signal (hardware and/or software)
- bit 2 = 1 on digital input DGT-IN3 there is a high logical signal (hardware and/or software)
- bit 3 = 1 on digital input DGT-IN4 there is a high logical signal (hardware and/or software)
- bit 4 = 1 on digital input DGT-IN5 there is a high logical signal (hardware and/or software)
- bit 5 = 1 on digital input DGT-IN6 there is a high logical signal (hardware and/or software)
- bit 6 = 1 on digital input DGT-IN7 there is a high logical signal (hardware and/or software)
- bit 7 = 1 on digital input DGT-IN8 there is a high logical signal (hardware and/or software)
- bit 8 = 1 on digital input DGT-IN9 there is a high logical signal (hardware and/or software)
- bit 9 = 1 on digital input DGT-IN-AUX1 there is a high logical signal (hardware and/or software)
- bit 10 = 1 on digital input DGT-IN-AUX2 there is a high logical signal (hardware and/or software)
- bit 14 = 1 on digital output DGT-OUT1 there is a high logical signal (hardware and/or software)
- bit 15 = 1 on digital output DGT-OUT2 there is a high logical signal (hardware and/or software)

(11) Insert: - 1 to divide the encoder pulse per turn by 1;
- 2 to divide the encoder pulse per turn by 2;
- 3 to divide the encoder pulse per turn by 4;
- 4 to divide the encoder pulse per turn by 8;
- 5 to divide the encoder pulse per turn by 16;
- 6 to divide the encoder pulse per turn by 32;
- 7 to divide the encoder pulse per turn by 64;
- 8 to divide the encoder pulse per turn by 128.

(12) Insert: - 1 to read EEPROM's parameters
- **2 to memorise parameters into EEPROM**
- 4 to load on EEPROM default parameters
- 8 to execute auto-speed offset
- 16 to execute the autophasing
- 32 to write motion parameters into Flash
- 64 to read motion parameters from Flash
- 256 to execute auto-torque offset

(13) Insert the number of the desired *operative mode*:
- 0 to set Analog Speed
- 1 to set Digital Speed
- 2 to set Analog Torque
- 3 to set Digital Torque
- 4 to set Position Mode
- 5 to set Gearing
- 6 to set Pulse/Dir Mode
- 7 to set Can Open
- 10 to set Square Wave

(14) If:
- bit 0 = 1 there is a voltage on DGT-IN1 pin
- bit 1 = 1 there is a voltage on DGT-IN2 pin
- bit 2 = 1 there is a voltage on DGT-IN3 pin
- bit 3 = 1 there is a voltage on DGT-IN4 pin
- bit 4 = 1 there is a voltage on DGT-IN5 pin
- bit 5 = 1 there is a voltage on DGT-IN6 pin
- bit 6 = 1 there is a voltage on DGT-IN7 pin
- bit 7 = 1 there is a voltage on DGT-IN8 pin
- bit 8 = 1 there is a voltage on DGT-IN9 pin
- bit 9 = 1 there is a voltage on DGT-IN-AUX1 pin
- bit 10 = 1 there is a voltage on DGT-IN-AUX2 pin
- bit 14 = 1 the output DGT-OUT1 is closed
- bit 15 = 1 the output DGT-OUT2 is closed

[15] Set:

- bit 0 to set the digital input DGT-IN1
- bit 1 to set the digital input DGT-IN2
- bit 2 to set the digital input DGT-IN3
- bit 3 to set the digital input DGT-IN4
- bit 4 to set the digital input DGT-IN5
- bit 5 to set the digital input DGT-IN6
- bit 6 to set the digital input DGT-IN7
- bit 7 to set the digital input DGT-IN8
- bit 8 to set the digital input DGT-IN9
- bit 9 to set the digital input DGT-IN-AUX1
- bit 10 to set the digital input DGT-IN-AUX2

Example: if you want to set the digital input DGT-IN5, set bit 4; if you want to set *contemporary* digital inputs DGT-IN6 and DGT-IN9, set bits 5 and 8.

Example: if you want to *enable the drive*, set bit 0.

[16] Set:

- bit 0 to reset the digital input DGT-IN1
- bit 1 to reset the digital input DGT-IN2
- bit 2 to reset the digital input DGT-IN3
- bit 3 to reset the digital input DGT-IN4
- bit 4 to reset the digital input DGT-IN5
- bit 5 to reset the digital input DGT-IN6
- bit 6 to reset the digital input DGT-IN7
- bit 7 to reset the digital input DGT-IN8
- bit 8 to reset the digital input DGT-IN9
- bit 9 to reset the digital input DGT-IN-AUX1
- bit 10 to reset the digital input DGT-IN-AUX2

Example: if you want to reset the digital input DGT-IN4, set bit 3; if you want to set *contemporary* digital inputs DGT-IN2 and DGT-IN6, set bits 1 and 5.

Example: if you want to dis*able the drive*, set bit 0.

[17] Insert the normalized current reference, reference the peak current of the drive.
Example: Suppose we want to insert a current digital reference equal to 5A, having a drive size 10/20 (10A= rated current, 20A= peak current) ⇨ at address 79 insert this value

$$\frac{5 \times 8192}{20} = 2048$$

[18] Insert the normalized speed reference, reference the "Speed Limit" parameter set in the "Speed" window (see address 31).
Example: Suppose we want to insert a speed reference equal to 1500rpm, having as max speed 3000rpm ⇨ at address 80 insert this value:

$$\frac{1500 \times 2^{15}}{3000} = 16384$$

(19) Insert the value of the desired function on inputs **DGT-IN2**, **DGT-IN3**, **DGT-IN4**, **DGT-IN5**:

	Digital inputs			
Function number	**DGT-IN2**	**DGT-IN3**	**DGT-IN4**	**DGT-IN5**
0	0: Off	0: Off	0: Off	0: Off
1	1:Ref-On	1:PStop	1:NStop	1:Brake
2	2:PStop	2:Ref-On	2:Ref-On	2:Ref-On
3	3:NStop	3:NStop	3:PStop	3:PStop
4	4:Brake	4:Brake	4:Brake	4:NStop
5	5:P+N Stop	5:P+N Stop	5:P+N Stop	5:P+N Stop
6	6: Homing Sensor	6: Homing Sensor	6: Homing Sensor	6: Homing Sensor
7	7:Start_JOG	7:Start_JOG	7:Start_JOG	7:Start_JOG
8	8:Start_Task_n°	8:Start_Task_n°	8:Start_Task_n°	8:Start_Task_n°
9	9:Start Task I/O	9:Start Task I/O	9:Start Task I/O	9:Start Task I/O
10	10:Start Sequence	10:Start Sequence	10:Start Sequence	10:Start Sequence
11	11:Start Next	11:Start Next	11:Start Next	11:Start Next
12	12:Emergency	12:Emergency	12:Emergency	12:Emergency
13	13:Start Homing	13:Start Homing	13:Start Homing	13:Start Homing
14	14:Reset Fault	14:Reset Fault	14:Reset Fault	14:Reset Fault
15	15:Speed Inv.	15:Speed Inv.	15:Speed Inv.	15:Speed Inv.
16...31	xx:Reserved	xx:Reserved	xx:Reserved	xx:Reserved

(20) Insert the value reference to desired *homing procedure*:

Parameter value	Homing type
0	No homing
3	Homing clockwise with normally open sensor + zero encoder
4	Homing counter clockwise with normally closed sensor + zero encoder
5	Homing counter clockwise with normally open sensor + zero encoder
6	Homing clockwise with normally closed sensor + zero encoder
7	Homing clockwise with normally open sensor
8	Homing counter clockwise with normally closed sensor
9	Homing counter clockwise with normally open sensor
10	Homing clockwise with normally closed sensor
35	Immediate Homing

(21) Insert the value of the desired function on inputs **DGT-IN-AUX1** and **DGT-IN-AUX2**:

Function number	DGT-IN-AUX1 and DGT-IN-AUX2
0	0: Off
1	1:P+N Stop
2	2:Ref-On
3	3:PStop
4	4:NStop
5	5:Brake
6	6: Homing Sensor
7	7:Start_JOG
8	8:Start_Task_n°
9	9:Start Task I/O
10	10:Start Sequence
11	11:Start Next
12	12:Emergency
13	13:Start Homing
14	14:Reset Fault
15	15:Speed Inv.
16...31	xx:Reserved

(22) Insert the value of the desired function on outputs **DGT-OUT1** and **DGT-OUT2**:

Function number	DGT-OUT1 and DGT-OUT2
0	0: Off
1	1:|Speed|>x
2	2:|Speed|<x
3	3:Homing OK
4	4:I2t
5	5:|Irms%|>x
6	6:|Irms%|<x
7	7:Target OK
8	8:Error
9	9:Ready
10	10:P.A Max
11	11:Reserved
12	12:|Error Pos|>x
13	13:|Error Pos|<x
14	14:Next Target
15...31	xx:Reserved

(23) Insert the auxiliary variable reference to the function set on inputs **DGT-IN2**, **DGT-IN3**, **DGT-IN4**, **DGT-IN5, DGT-IN-AUX1 and DGT-IN-AUX2 (Attention: Not all setting function need an auxiliary variable)**:

Function	Auxiliary variable
0: Off	No variable.
1:Ref-On	No variable.
2:PStop	No variable.
3:NStop	No variable.
4:Brake	No variable.
5:P+N Stop	No variable.
6: Homing Sensor	No variable.
7:Start_JOG	Speed reference [in RPM] during a Start Jog profile.
8:Start_Task_n°	Number of profile to execute (from 1 to 32)
9:Start Task I/O	No variable.
10:Start Sequence	No variable.
11:Start Next	No variable.
12:Emergency	No variable.
13:Start Homing	No variable.
14:Reset Fault	No variable.
15:Speed Inv.	No variable.
xx:Reserved	No variable.

(24) Insert the auxiliary variable reference to the function set on outputs **DGT-OUT1** and **DGT-OUT2 (Attention: Not all setting function need an auxiliary variable)**:

Function	Auxiliary variable
0: Off	No variable.
1:|Speed|>x	Speed in RPM
2:|Speed|<x	Speed in RPM
3:Homing OK	No variable.
4:I2t	No variable.
5:|Irms%|>x	Current in %.
6:|Irms%|<x	Current in %.
7:Target OK	No variable.
8:Error	No variable.
9:Ready	No variable.
10:P.A Max	No variable.
11:Reserved	No variable.
12:|Error Pos|>x	Position error in pulses (from 0 to 32767).
13:|Error Pos|<x	Position error in pulses (from 0 to 32767).
14:Next Target	No variable.
xx:Reserved	No variable.

(25) Insert the value of the desired function on output **Analog Out1**:

Analog Out1	
Function	**Value**
Speed_Rpm	0
I_Phase_U	1
I2t_Drive	2
I2t_Regen	3
FF_vel	4
Posit_Err	5
Id	6
V_Bus	7
Angle	8
Iq	9
+10 Volt	10

(26) Insert the value of the desired function on output **Analog Out2**:

Analog Out2	
Function	**Value**
Iq	0
I_Phase_U	1
I2t_Drive	2
I2t_Regen	3
FF_vel	4
Posit_Err	5
Id	6
V_Bus	7
Angle	8
Iq	9
-10 Volt	10

(27) *Tar. V_Bus 1* and *Tar. V_Bus 2*: they are not modifyable parameters; they are set during drive testing.

(28) *Main Voltage*: it corresponds to the ***Main Voltage*** parameter visible in the main window of the *Speeder One* interface.

(29) *Bus Voltage*: it corresponds to the ***Bus Voltage*** parameter visible in the main window of the *Speeder One* interface.

(30) *Vis_Position_hi* (parameter 134) contains the whole number of completed motor shaft turns at the most recent power up, while *Vis_Position_lo* (parameter 135) contains the fractional numbers of the motor shart turns, opportunely calculated between -2^{15} e $(2^{15}-1)$ as shown below.
Example 1: Suppose we visualize the following values:

Vis_Position_hi	7
Vis_Position_lo	4208

The values above suggest the motor made, at last start up, the following number of turns: 7 + 4208/65536 = 7 + 0,064208 = 7,064208. The motor made 7 complete turns and 23 mechanical degrees of a turn (in fact 0,064208 x 360°= 23°).

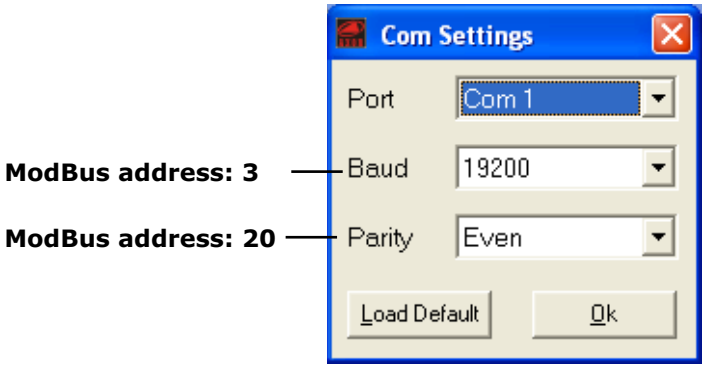
Example 2: Suppose we visualize the following values:

Vis_Position_hi	9
Vis_Position_lo	-27504

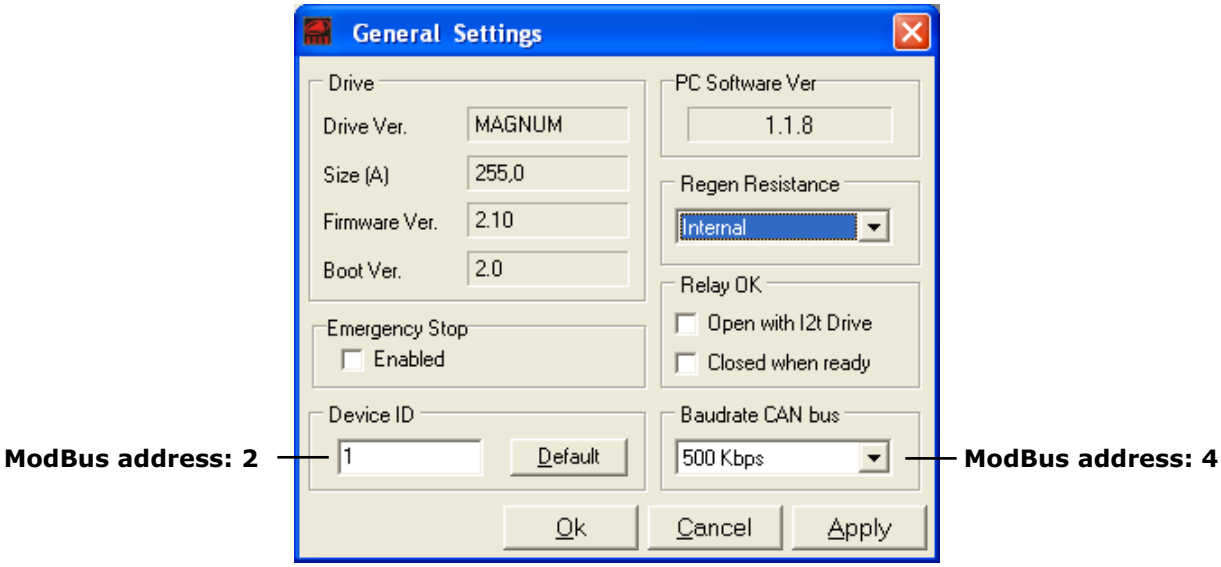
The values above suggest the motor made, at last start up, the following number of turns: 9 + ((-27504+65536)/65536) = 9,580322. The motor made 9 complete turns and 208 mechanical degrees of a turn (in fact 0,580322 x 360° = 208°).

(**) The value is between the range -2^{31} and 2^{31}.

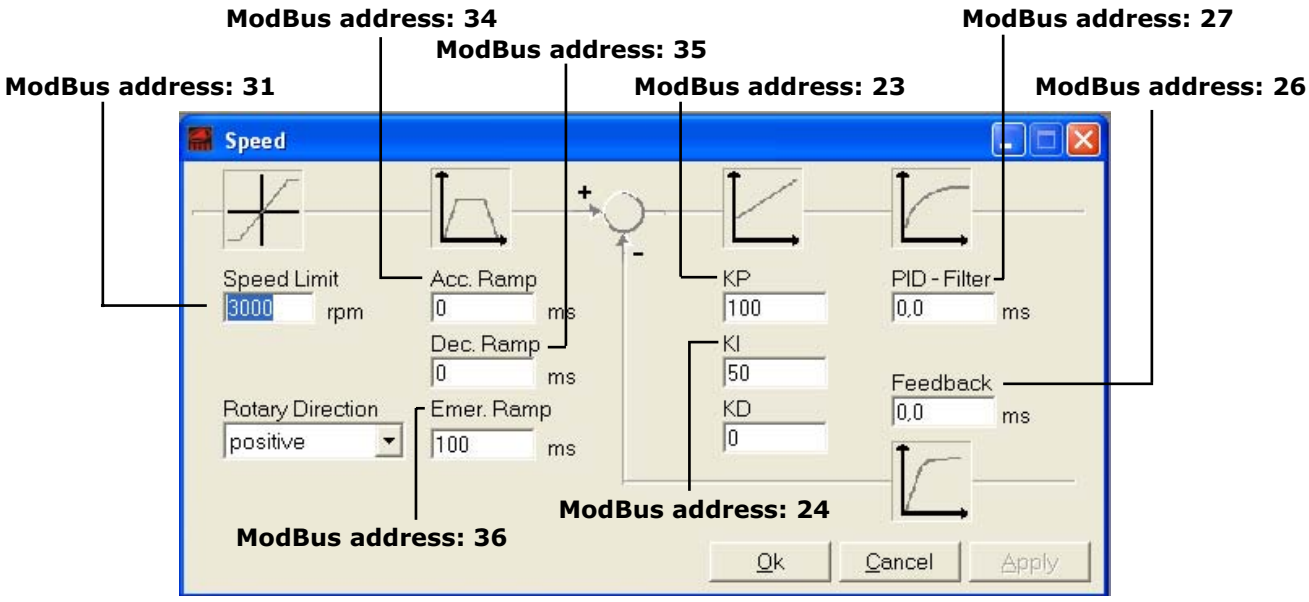
(A) see the "**Com Settings**" window in the *Speeder One* interface:



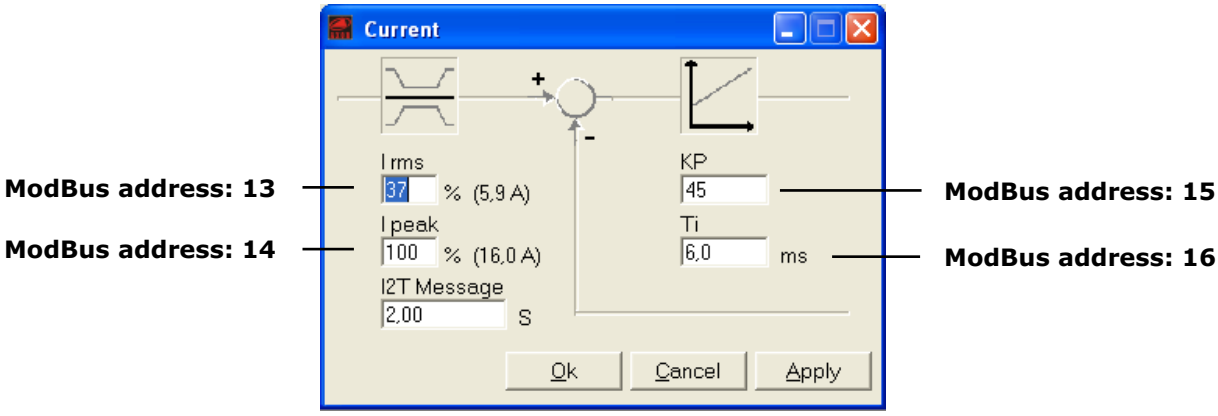
(B) see the "**General Settings**" window in the *Speeder One* interface:



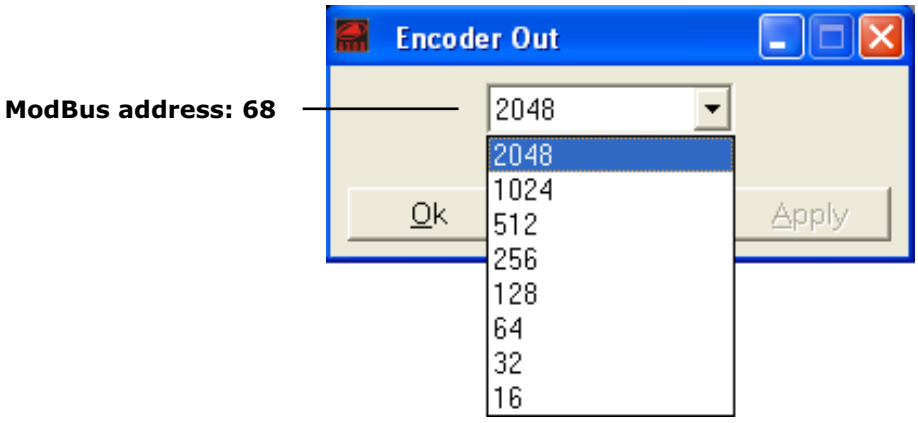
(C) see the "**Speed**" window in the *Speeder One* interface:



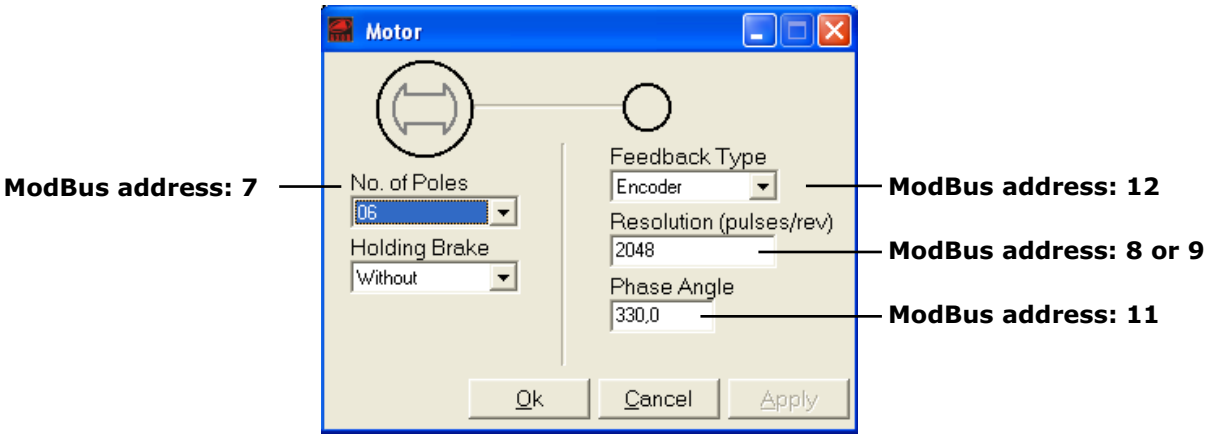
(D) see the "**Current**" window in the *Speeder One* interface:



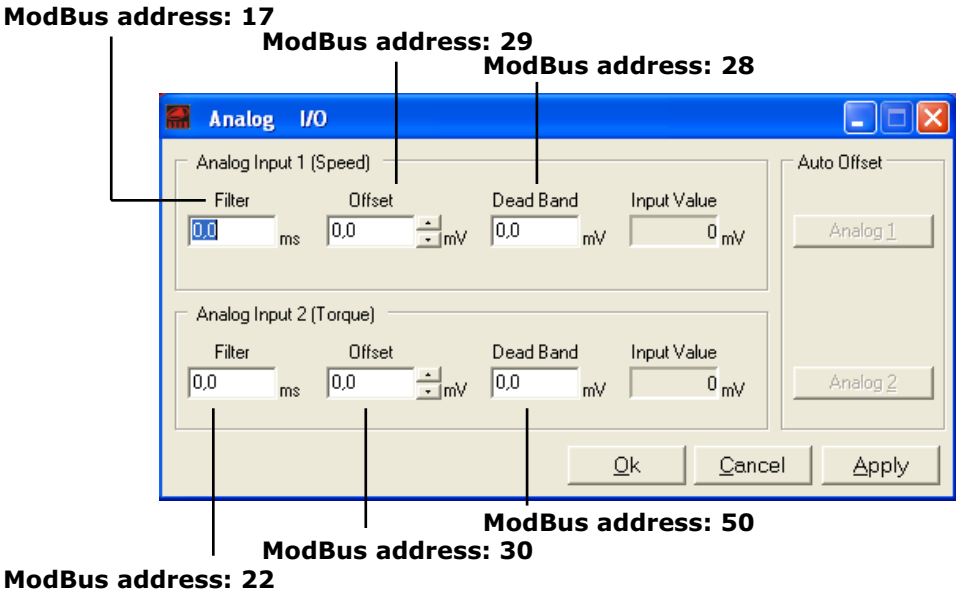
(E) see the "**Encoder Out**" window in the *Speeder One* interface:



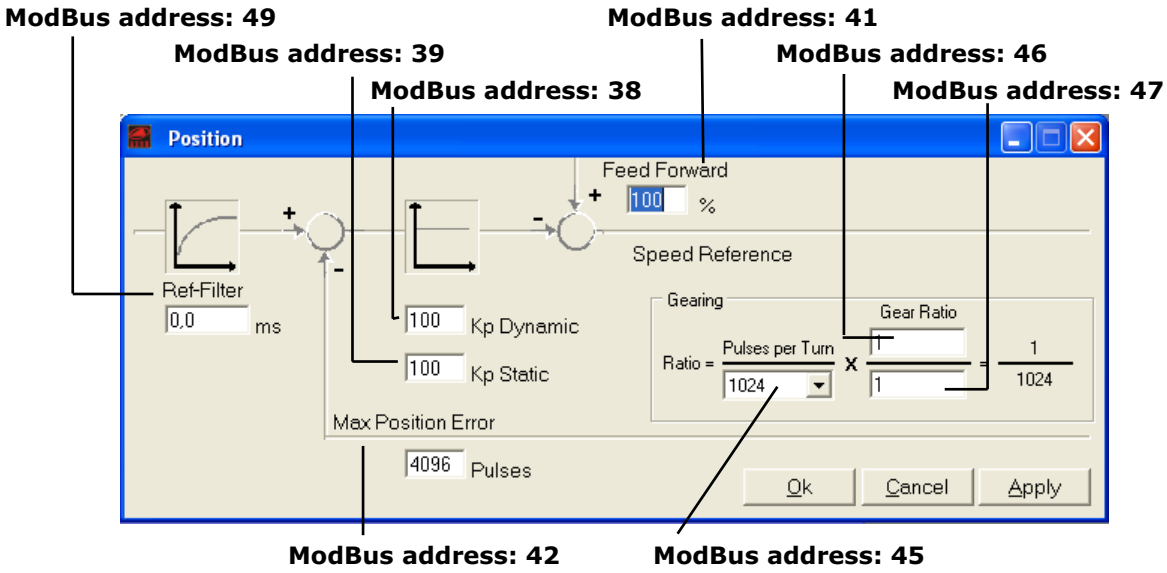
(F) see the "**Motor**" window in the *Speeder One* interface:



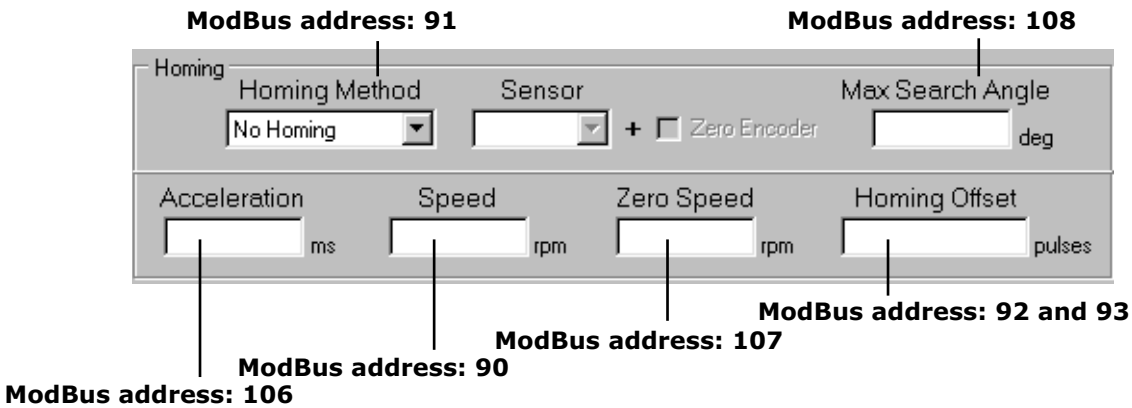
(G) see the "**Analog I/O**" window in the *Speeder One* interface:



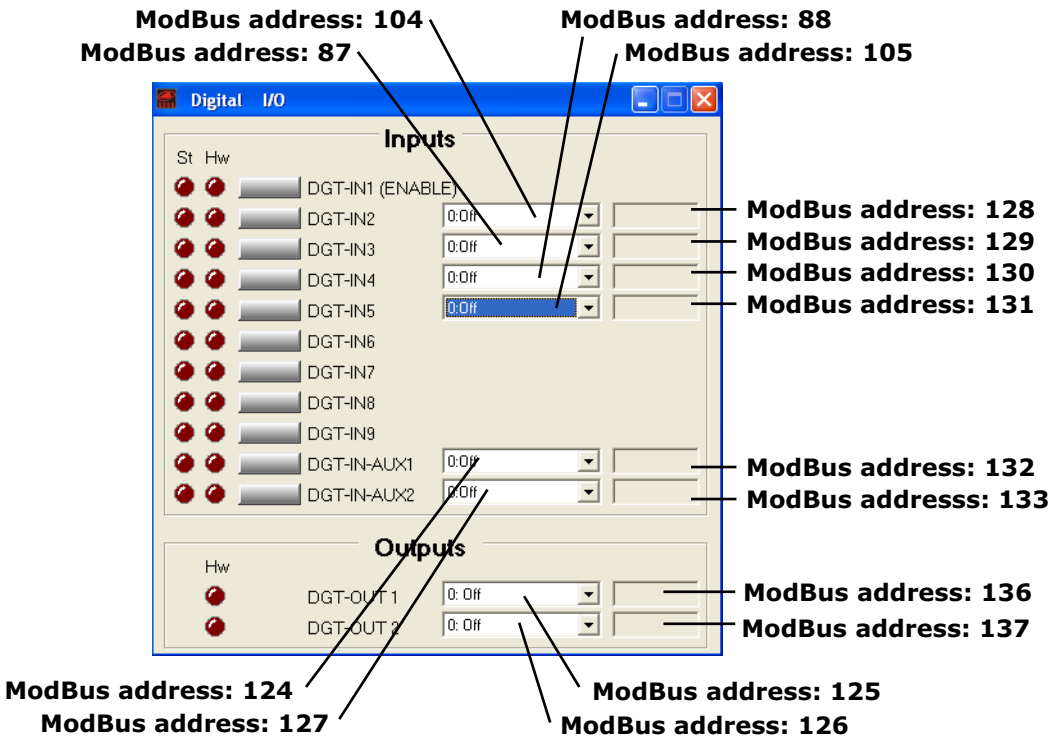
(H) see the "**Position**" window in the *Speeder One* interface:



(L) see the "**Homing**" window in the *Speeder One* interface:



(M) see the "**Digital I/O**" window in the *Speeder One* interface:



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CERTIFIED UNI EN ISO 9001 CERTIFIED N.9135 CERTIFIED

CSQ CERTIFICAZIONE DEI SISTEMI DI QUALITA' DELLE AZIENDE UNI EN ISO 9001 CERTIFIED N° 9135