MACmotor Register List Valid from firmware version 2.26.20 or newer

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Number	Mactalk name	Range	Description
0	No Selection		Dummy register, do not use.
1	Program version	Na	Firmware version, displayed on bottom right status line.
2	Operating mode	0 - 258	The actual operating mode of the drive.
3	Requested position	± 67000000	The target position.
4	Resynchronize position	Na	Used to update both "Actual position"and "Requested position" in a single atomic operation.
5	Velocity	Na	Desired velocity.
6	Acceleration	271 - 433353	The desired nominal acceleration.
7	Torque	0 - 1023	The maximum torque that the drive is allowed to use.
8	P_FNC	± 134217728	Used internally for relative movements.
9	Index Offset	± 2147483648	Updated after a Zero Search to show at what single-turn encoder position the zero point was detected.
10	Actual position	Na	The actual motor position measured by the internal encoder.
11	Actual Velocity 16bit	Na	V_IST (actual velocity) measured over 16 samples.
12	Actual velocity	Na	Actual velocity.
13	Load	Na	Expected load on shaft.
14	Gear output factor	Na	The nominator.
15	Gear input factor	Na	The denominator.
16	Motor load (mean)	Na	The calculated power dissipated in the motor.
17	Motor load max	Na	The limit for the value of Reg16, "Motor load (mean)".
18	Regenerative load	Na	The calculated power dissipated in the internal power dump.
19	Regenerative load Limit	Na	The limit for the value of Reg18, "Regenerative load".
20	Follow error	Na	Follow Error.
21	Control Voltage Measured	Na	The internal control voltage measured.

Number	Mactalk name	Range	Description
22	Follow error max	Na	Max Follow Error.
23	Main Supply Voltage Error Bits	Na	Main Supply Voltage Error Bits.
24	Function error	Na	Function error
25	Actual Position Rotary Table Offset	Na	Actual Position Rotary Table Offset.
26	Function error max	Na	The limit used with Reg24, "Function error".
27	Actual Postion Rotary Table Offset	± 2147483648	"Actual Position Rotary Table Offset" wrap around counter.
28	Minimum position	Na	Minimum position.
29	Actual temperature	Na	The temperature measured inside the drive.
30	Maximum position	± 2147483648	Maximum position.
31	Actual temperature max	Na	Actual temperature max.
32	Error deceleration	Na	Acceleration to use during emergency stops.
33	In position window	0 - 65535	In position window.
34	In position samples	Na	In position samples.
35	Error status	Na	Error status register.
36	Control bits	Na	This register contains a number of control and status bits.
37	Start mode	Na	Startmode after power-down
38	Home offset	Na	Value of the home position
39	HW Setup	Na	Hardware setup.
40	Home velocity	± 12780	Velocity to use during a zero search operation (Homing operation).
41	Home torque	Na	Torque to use during a zero search operation (Homing operation).
42	Home mode	Na	Defines if the motor should start a zero search immediately after start up.
43	P_REG_P	0 - 8	When set to 1..8, copies one of "Position Reg 1".."Position Reg 8" to "Requested position", then resets to 0.
44	V_REG_P	0 - 8	When set to 1..8, copies one of VEL0..VEL7 to "Velocity", then resets to 0.

Number	Mactalk name	Range	Description
45	A_REG_P	0 - 4	When set to 1..4, copies one of ACC0..ACC3 to "Acceleration", then resets to 0.
46	T_REG_P	0 - 4	When set to 1..4, copies one of TQ0..TQ3 to "Torque", then resets to 0.
47	L_REG_P	0 - 4	When set to 1..4, copies one of LOAD0..LOAD3 to KVOUT then resets to 0
48	Z_REG_P	Na	When set to 1..4, copies one of ZERO0..ZERO3 to INPOSWIN, then resets to 0.
49	Position Reg 1	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
50	CAPCOM0	Na	Used for position capture.
51	Position Reg 2	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
52	CAPCOM1	Na	Used to control the advanced scope/sampling system.
53	Position Reg 3	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
54	CAPCOM2	Na	Used to control the advanced scope/sampling system.
55	Position Reg 4	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
56	CAPCOM3	Na	Used to control the advanced scope/sampling system.
57	Position Reg 5	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
58	CAPCOM4	Na	Used to control the advanced scope/sampling system.
59	Position Reg 6	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
60	CAPCOM5	Na	Used for setting a logical digital inut depending on a register comparison.
61	Position Reg 7	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
62	CAPCOM6	Na	Used for setting a logical digital inut depending on a register comparison.
63	Position Reg 8	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.
64	CAPCOM7	Na	Used for position capture.
65	Velocity Reg 1	Na	Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Number	Mactalk name	Range	Description
66	Velocity Reg 2	Na	Velocity register V2 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
67	Velocity Reg 3	Na	Velocity register V3 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
68	Velocity Reg 4	Na	Velocity register V4 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
69	Velocity Reg 5	Na	Velocity register V5 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
70	Velocity Reg 6	Na	Velocity register V6 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
71	Velocity Reg 7	Na	Velocity register V7 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
72	Velocity Reg 8	Na	Velocity register V8 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
73	Acceleration Reg 1	Na	Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).
74	Acceleration Reg 2	Na	Acceleration 2 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).
75	Acceleration Reg 3	Na	Acceleration 3 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).
76	Acceleration Reg 4	Na	Acceleration 4 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).
77	Torque Reg 1	0 - 1023	Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
78	Torque Reg 2	0 - 1023	Torque register T2 -Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
79	Torque Reg 3	0 - 1023	Torque register T3 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
80	Torque Reg 4	0 - 1023	Torque register T4 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.
81	Load Reg 1	0 - 1023	Activated with some FastMac commands.
82	Load Reg 2	0 - 1023	Load 2- Activated with some FastMac commands.
83	Load Reg 3	0 - 1023	Load 3- Activated with some FastMac commands.

Number	Mactalk name	Range	Description
84	Load Reg 4	0 - 1023	Load 4- Activated with some FastMac commands.
85	In position window 1	0 - 65535	Activated with some FastMac commands.
86	In position window 2	0 - 65535	In position window 2- Activated with some FastMac commands.
87	In position window 3	0 - 65535	In position window 3 - Activated with some FastMac commands.
88	In position window 4	0 - 65535	In position window 4 - Activated with some FastMac commands.
89	Mode 1	0 - 21	Can be used with the HWI functions to change mode.
90	Mode 2	0 - 21	Can be used with the HWI functions to change mode.
91	Mode 3	0 - 21	Can be used with the HWI functions to change mode.
92	Mode 4	Na	Can be used with the HWI functions to change mode.
93	HW function 1	Na	Allow the digital inputs from Reg106 to control the values of other motor registers.
94	HW function 2	Na	HW function 2 - Allow the digital inputs from Reg106 to control the values of other motor registers.
95	HW function 3	Na	HW function 3 - Allow the digital inputs from Reg106 to control the values of other motor registers.
96	HW function 4	Na	HW function 4 - Allow the digital inputs from Reg106 to control the values of other motor registers.
97	HW function 5	Na	HW function 5 - Allow the digital inputs from Reg106 to control the values of other motor registers.
98	HW function 6	Na	HW function 6 - Allow the digital inputs from Reg106 to control the values of other motor registers.
99	HW function 7	Na	HW function 7 - Allow the digital inputs from Reg106 to control the values of other motor registers.
100	HW function 8	Na	HW function 8 - Allow the digital inputs from Reg106 to control the values of other motor registers.
101	HW function 9	Na	HW function 9 - Allow the digital inputs from Reg106 to control the values of other motor registers.
102	HW function 10	Na	HW function 10 - Allow the digital inputs from Reg106 to control the values of other motor registers.
103	HW function 11	Na	HW function 11 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Number	Mactalk name	Range	Description
104	HW function 12	Na	HW function 12 - Allow the digital inputs from Reg106 to control the values of other motor registers.
105	MAC00 module type	Na	Identifies the Generation-2 module type autodetected at startup.
106	MAC00 module inputs	0 - 65535	The registers from 106 to 120 are used to support different interface modules with the Generation-2 connectors.
107	MAC00 module status	Na	Shows various status bits for the currently mounted Gen2 module.
108	MAC00_3	Na	MAC00_3 - Not in use.
109	MAC00_4	Na	MAC00_4 - Not in use.
110	MAC00_5	Na	MAC00_5 - Not in use.
111	MAC00_6	Na	MAC00_6 - Not in use.
112	Ext. Counter inp.	Na	Counts the number of pulses received from an external encoder.
113	B41 digital outputs	Na	Controls the digital outputs O6..O1 on the MAC00-B41 module.
114	B41 digital output status	Na	Shows the status of each of the six digital outputs actually written to the hardware.
115	B41 output 1 configure	Na	Controls IO1 on MAC00-B41 (bit 0 in B41_DO).
116	B41 output 2 configure	Na	Controls IO1 on MAC00-B41 (bit 1 in B41_DO).
117	B41 output 3 configure	Na	Controls IO1 on MAC00-B41 (bit 2 in B41_DO).
118	B41 output 4 configure	Na	Controls IO1 on MAC00-B41 (bit 3 in B41_DO).
119	B41 output 5 configure	Na	Controls IO1 on MAC00-B41 (bit 4 in B41_DO).
120	B41 output 6 configure	Na	Controls IO1 on MAC00-B41 (bit 5 in B41_DO).
121	KFF5	Na	Filter coefficients used by the velocity and position regulator loops.
122	KFF4	Na	Filter coefficients used by the velocity and position regulator loops.
123	KFF3	Na	Filter coefficients used by the velocity and position regulator loops.
124	KFF2	Na	Filter coefficients used by the velocity and position regulator loops.
125	KFF1	Na	Filter coefficients used by the velocity and position regulator loops.
126	KFF0	Na	Filter coefficients used by the velocity and position regulator loops.

Number	Mactalk name	Range	Description
127	KVFX6	Na	Filter coefficients used by the velocity and position regulator loops.
128	KVFX5	Na	Filter coefficients used by the velocity and position regulator loops.
129	KVFX4	Na	Filter coefficients used by the velocity and position regulator loops.
130	KVFX3	Na	Filter coefficients used by the velocity and position regulator loops.
131	KVFX2	Na	Filter coefficients used by the velocity and position regulator loops.
132	KVFX1	Na	Filter coefficients used by the velocity and position regulator loops.
133	KVFY5	Na	Filter coefficients used by the velocity and position regulator loops.
134	KVFY4	Na	Filter coefficients used by the velocity and position regulator loops.
135	KVFY3	Na	Filter coefficients used by the velocity and position regulator loops.
136	KVFY2	Na	Filter coefficients used by the velocity and position regulator loops.
137	KVFY1	Na	Filter coefficients used by the velocity and position regulator loops.
138	KVFY0	Na	Filter coefficients used by the velocity and position regulator loops.
139	KVB4	Na	Filter coefficients used by the velocity and position regulator loops.
140	KVB3	Na	Filter coefficients used by the velocity and position regulator loops.
141	KVB2	Na	Filter coefficients used by the velocity and position regulator loops.
142	KVB1	Na	Filter coefficients used by the velocity and position regulator loops.
143	KVB0	Na	Filter coefficients used by the velocity and position regulator loops.
144	KIFX2/FOC_PIDQ_KP	Na	Filter coefficients used by the velocity and position regulator loops.
145	KIFX1/FOC_PIDQ_KI	Na	Filter coefficients used by the velocity and position regulator loops.
146	KIFY1/FOC_PIDQ_KD	Na	Filter coefficients used by the velocity and position regulator loops.
147	KIFY0/FOC_PIDD_KP	Na	Filter coefficients used by the velocity and position regulator loops.
148	KIB1/FOC_PIDD_KI	Na	Filter coefficients used by the velocity and position regulator loops.
149	KIB0/FOC_PIDD_KD	Na	Filter coefficients used by the velocity and position regulator loops.
150	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.

Number	Mactalk name	Range	Description
151	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.
152	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.
153	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.
154	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.
155	ID_RESERVED	Na	Contains the last ID of the velocity filter written by MacTalk.
156	S-Profile setup	Na	Modify/smooth the acceleration at the beginning and end of a change in velocity.
157	Sample time divider	Na	Divider value for the velocity loop.
158	Sample 1	Na	Register number, bit field and min/max/average sample type for the first value in each sample.
159	Sample 2	Na	Register number, bit field and min/max/average sample type for the second value in each sample.
160	Sample 3	Na	Register number, bit field and min/max/average sample type for the third value in each sample.
161	Sample 4	Na	Register number, bit field and min/max/average sample type for the fourth value in each sample.
162	Actual index - scope	Na	Index into the sample buffer used for scope functionality.
163	Ext. encoder velocity	Na	Unscaled/Raw velocity of external encoder input in pulses per 1.3ms.
164	Ext. encoder velocity, geared	Na	Velocity of external encoder input V_EXT, after being scaled.
165	Not executed geared pulses	Na	Actual target velocity generated from the Gear mode function blocks.
166	FNC_OUT	Na	Output from the currently active function block.
167	FF_OUT	Na	Output from the Feed Forward part of the velocity filter.
168	VB_OUT	Na	Value from the backwards calculation part of the velocity filter.
169	Actual torque	± 300	Actual torque. +/- 1023 means +/- 300 percent.
170	Analogue input	± 2047	Voltage (including applied ANINP_OFFSET) .
171	Analogue input offset	± 2047	Offset to the analogue input. Same scaling as Reg170, ANINP.
172	ELDEG_OFFSET	Na	<used with motor current loop>

Number	Mactalk name	Range	Description
173	PHASE_COMP	Na	<used with motor current loop>
174	AMPLITUDE	Na	<used with motor current loop>
175	MAN_I_NOM	Na	<used with motor current loop>
176	MAN_ALPHA	Na	<used with motor current loop>
177	UMEAS	Na	<used with motor current loop>
178	I_NOM/FOC_ANGLE	Na	<used with motor current loop>
179	PHI_SOLL/FOC_IQ	Na	<used with motor current loop>
180	IA_SOLL/FOC_ID	Na	<used with motor current loop>
181	IB_SOLL/FOC_IQ_ERR	Na	<used with motor current loop>
182	IC_SOLL/FOC_ID_ERR	Na	<used with motor current loop>
183	IA_IST	Na	<used with motor current loop>
184	IB_IST	Na	<used with motor current loop>
185	IC_IST	Na	<used with motor current loop>
186	IA_OFFSET	Na	<used with motor current loop>
187	IB_OFFSET	Na	<used with motor current loop>
188	KIA	Na	<used with motor current loop>
189	KIB	Na	<used with motor current loop>
190	ELDEG_IST	Na	<used with motor current loop>
191	V_ELDEG	Na	<used with motor current loop>
192	UA_VAL	Na	<used with motor current loop>
193	UB_VAL	Na	<used with motor current loop>
194	UC_VAL	Na	<used with motor current loop>
195	EMK_A/FOC_VQ	Na	<used with motor current loop>
196	EMK_B/FOC_VD	Na	<used with motor current loop>

Number	Mactalk name	Range	Description
197	EMK_C	Na	<used with motor current loop>
198	Bus voltage	Na	The actual voltage of the internal DC bus.
199	U_BUS_OFFSET	Na	Factory offset used to calibrate the measurement of Reg198, U_BUS.
200	TC0_CV1	Na	<used by JVL only to monitor internal timing´>
201	TC0_CV2	Na	<used by JVL only to monitor internal timing´>
202	Motor address	Na	The motor address used for the MacTalk protocol.
203	Motor type	Na	Type of JVL motor.
204	Serial number	Na	JVL serial number of the motor.
205	HW Version	Na	JVL Hardware Version of the motor.
206	Check sum	Na	Checksums of the firmware and the bootloader.
207	Basic motor output 1 + 2	Na	User motor output 1 & 2.
208	Serial interface com. errors	0 - 2147483648	Number of communication errors on the MacTalk serial interface.
209	Single turn position	0 - 8191	Actual single-turn position of the internal encoder. (0-8191 or 0-7999)
210	Hardware Position limits - FSx	Na	Hardware position limits.
211	Special Command	Na	Should be used with caution, as commands can change motor preformance.
212	UART0: Setup serial MacTalk	Na	Setup for MacTalk serial communication.
213	UART1: Setup serial RS422/MF1	Na	Setup for RS422/MF1 serial communication.
214	Signal Setup Label app.	Na	Supports setup for label dispenser functionality with the MAC00-B41 module.
215	IO_POLARITY	Na	Invert logical state of hardware inputs in Reg106, DIGITAL_INPUTS
216	Analog input 1	± 2047	The input of hardware analogue input 1.
217	Analog input 1 offset	± 2047	Offset for Reg216 analogue input 1.
218	Analog input 2	± 2047	The input of hardware analogue input 2.
219	Analog input 2 offset	± 2047	Offset for Reg218 analogue input 2.

Number	Mactalk name	Range	Description
220	Analog input 3	± 2047	The input of hardware analogue input 3 .
221	Analog input 3 offset	Na	Offset for Reg220 analogue input 3 .
222	Analog input selector	Na	Changes analogue input 1 with analogue input X.
223	Analog output	Na	Analog output to the 4-20 mA hardware output on the MAC00-P5/P4 modules.
224	Analog output offset	Na	Offset that is added to ANOUT1 before writing to hardware.
225	Abs Enc. offset	± 2147483648	Used to adjust the zero position for absolute multi-turn encoders.
226	Abs. Enc. Pos.	Na	The full multi-turn position read directly from the absolute encoder, if mounted.
227	Analog input filter slope	Na	limit the rise time on the currently selected analogue input.
228	Analog input filter factor	Na	Can be set to filter the currently selected analogue input.
229	Fast act. pos. 100uS	Na	The fast actual position of the internal encoder.
230	Indirect register addr	Na	Address of extended registers, XREGs.
231	Indirect register data	Na	Data to or from extended registers.
232	Fieldbus address	Na	Can be used to override DIP switches for bus address on some modules, like MAC00-FCx.
233	Fieldbus Speed	Na	Can be used to override DIP switches for bus speed on some modules, like MAC00-FCx
234	ePLC setup	Na	Controls operation of the built-in nanoPLC/eRxP.
235	Error Status register 2	Na	Expansion of Reg35, "Error status".
236	Setup Bits special	Na	Various setup bits to enable special functions:
237	STATUS_BITS	Na	Bits to indicate internal status, not otherwise visible:
238	STO INPUTS	Na	RM4 only Safe Torque Off Input register.
239	STO VALUES	Na	RM4 only Safe Torque Off values register.
240	Modbus frmn/Par. err. cnt.	0 - 4294967296	Counter of Modbus framing and parity errors.
241	ModBus CRC err. cnt.	Na	Counter of Modbus CRC errors.
242	Error Info - Special	Na	NOTE: This is intended only for JVL technicians.

Number	Mactalk name	Range	Description
243	Error value - Special	Na	NOTE: This is intended only for JVL technicians.
244	Reserved 244	Na	Only RM4 ETHERNET_STATUS and ETHERNET_INFO.
245	Reserved 245	Na	Only RM4 ETHERNET_CRC_ERROR and ETHERNET_SEQ_ERROR.
246	Scope/Samp.bits	Na	Individual bits enable and trigger options.
247	Reserved 247	Na	
248	Reserved 248	Na	
249	Reserved 249	Na	
250	Extended Program Version	Na	Extended program version.
251	Reserved 251	Na	Hardware Revision
252	Reserved 252	Na	Only RM4, Bootloader version
253	Reserved 253	Na	Build number as a unique time stamp.
254	Reserved 254	Na	Version code of the FPGA image.
255	Reserved 255	± 2147483648	Free running counter that ticks every 100 us.
256	SAMPLE5	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.
257	SAMPLE6	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.
258	SAMPLE7	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.
259	SAMPLE8	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.
260	Analog input 4	± 2047	The input of hardware analogue input 4 .
261	Analog input 4 offset	Na	Offset for Reg260 analogue input 4 .
262	Reserved 262	Na	Last register number read over the Modbus interface.
263	Reserved 263	Na	Last register Value read over the Modbus interface.
264	Reserved 264	Na	Last register Number written over the Modbus interface.

Number	Mactalk name	Range	Description
265	Reserved 265	Na	Last register Value written over the Modbus interface.
266	EPLC_COMM_STATUS	0 - 4	Result of the communications operation ordered from the eRxP system.
267	EPLC_COMM_ERRCNT	Na	Error counter for eRxP communications operations.
268	Reserved 268	Na	This register can be configured so each bit is a copy of a bit in another register.
269	Reserved 269	Na	Hold values of actual mode, velocity and torque.
270	Reserved 270	Na	Selects a timer and reload value to monitor timeouts on received Modbus telegrams.
271	Reserved 271	Na	Memory area and byte offset for GIMPREAD and GIMPWRITE telegrams.
272	Minimum Velocity	Na	Velocity limit for low-speed load factor KVOUT_LO.
273	Maximum Velocity	Na	Velocity limit for high-speed load factor KVOUT_HI.
274	Low Speed Factor	Na	Load factor for velocities below KVOUT_MIN_VEL.
275	Velocity Selector	Na	choose which VEL reg to use.
276	Reserved 276	Na	Used when "Velocity" hires enabled to make room for 64-bit P_FNC.
277	High Resolution Index Offset	± 2147483648	Hiword of G_FNC_LO - used only in VSOLL_HIRES mode.
278	Reserved 278	Na	Prepared for multi-tasking in the ePLC system.
279	Reserved 279	Na	
280	Reserved 280	Na	Voltage threshold for power dump to activate (in UBUS units)
281	Reserved 281	Na	Outer loop counts 'dead time' between internal brake resistor activations.
282	Reserved 282	Na	Outer loop counts 'dead time' between internal brake resistor activations.
283	Reserved 283	Na	Encoder type for rotary shaft rotation.
284	Reserved 284	Na	(Only RM4) Raw encoder value read from QEP counter.
285	Reserved 285	Na	(Only RM4) Linearization table offset.
286	Connector option	Na	Connector option on MACxxx_G3 motor
287	Reserved 287	Na	
288	Reserved 288	Na	

Number	Mactalk name	Range	Description
289	Reserved 289	Na	
290	Reserved 290	Na	
291	Reserved 291	Na	
292	Reserved 292	Na	
293	Reserved 293	Na	
294	Reserved 294	Na	
295	Reserved 295	Na	Maxium torque and torque-option
296	Reserved 296	Na	
297	Reserved 297	Na	
298	Reserved 298	Na	(Only RM4) Temperature in driver.
299	Reserved 299	Na	(Only RM4)Counts up when a BISS reading in inner-loop has the WARNING bit set.
300	Reserved 300		(Only RM4) Counts up when a BISS reading in inner-loop has the ERROR bit set.
301	Reserved 301		
302	Reserved 302		
303	Reserved 303		
304	Reserved 304		
305	Reserved 305		
306	Reserved 306		
307	Reserved 307		
308	Reserved 308		
309	Reserved 309		
310	Reserved 310		
311	Reserved 311		
312	Reserved 312		

Number	Mactalk name	Range	Description
313	Reserved 313		
314	Reserved 314		
315	Reserved 315		
316	Reserved 316		
317	Reserved 317		
318	Reserved 318		
319	Reserved 319		
320	Reserved 320		
321	Reserved 321		
322	Reserved 322		
323	Reserved 323		
324	Reserved 324		
325	Reserved 325		
326	Reserved 326		
327	Reserved 327		
328	Reserved 328		
329	Reserved 329		
330	Reserved 330		Cyclic SPI pointer register.
331	Reserved 331		Cyclic SPI pointer register.
332	Reserved 332		Cyclic SPI pointer register.
333	Reserved 333		Cyclic SPI pointer register.
334	Reserved 334		Cyclic SPI pointer register.
335	Reserved 335		Cyclic SPI pointer register.
336	Reserved 336		Cyclic SPI pointer register.

Number	Mactalk name	Range	Description
337	Reserved 337		Cyclic SPI pointer register.
338	Reserved 338		Cyclic SPI pointer register.
339	Reserved 339		Cyclic SPI pointer register.
340	Reserved 340		Cyclic SPI pointer register.
341	Reserved 341		Cyclic SPI pointer register.
342	Reserved 342		Cyclic SPI pointer register.
343	Reserved 343		Cyclic SPI pointer register.
344	Reserved 344		Cyclic SPI pointer register.
345	Reserved 345		Cyclic SPI pointer register.
346	Reserved 346		Counts progressive encoder errors
347	Reserved 347		Counts consecutive CRC erros.
348	Reserved 348		Counts on encoder error in inner loop.
349	Reserved 349		Counts if an invalid velocity is detected in inner loop.
350	Reserved 350		
351	Reserved 351		
352	Reserved 352		
353	Reserved 353		
354	Reserved 354		
355	Reserved 355		
356	Reserved 356		
357	Reserved 357		
358	Reserved 358		
359	Reserved 359		
360	Reserved 360		

Number	Mactalk name	Range	Description
361	Reserved 361		
362	Reserved 362		
363	Reserved 363		
364	Reserved 364		
365	Reserved 365		
366	Reserved 366		
367	Reserved 367		
368	Reserved 368		
369	Reserved 369		
370	Reserved 370		
371	Reserved 371		
372	Reserved 372		
373	Reserved 373		
374	Reserved 374		
375	Reserved 375		
376	Reserved 376		
377	Reserved 377		
378	Reserved 378		
379	Reserved 379		
380	Reserved 380		
381	Reserved 381		
382	Reserved 382		
383	Reserved 383		
384	Reserved 384		

Number	Mactalk name	Range	Description
385	Reserved 385		
386	Reserved 386		
387	Reserved 387		
388	Reserved 388		
389	Reserved 389		
390	Reserved 390		
391	Reserved 391		
392	Reserved 392		
393	Reserved 393		
394	Reserved 394		
395	Reserved 395		
396	Reserved 396		
397	Reserved 397		
398	Reserved 398		
399	Reserved 399		
400	Reserved 400		
401	Reserved 401		
402	Reserved 402		
403	Reserved 403		
404	Reserved 404		
405	Reserved 405		
406	Reserved 406		
407	Reserved 407		
408	Reserved 408		

Number	Mactalk name	Range	Description
409	Reserved 409		
410	Reserved 410		
411	Reserved 411		
412	Reserved 412		
413	Reserved 413		
414	Reserved 414		
415	Reserved 415		
416	Reserved 416		
417	Reserved 417		
418	Reserved 418		
419	Reserved 419		
420	Reserved 420		
421	Reserved 421		
422	Reserved 422		
423	Reserved 423		
424	Reserved 424		
425	Reserved 425		
426	Reserved 426		
427	Reserved 427		
428	Reserved 428		
429	Reserved 429		
430	Reserved 430		
431	Reserved 431		
432	Reserved 432		

Number	Mactalk name	Range	Description
433	Reserved 433		
434	Reserved 434		
435	Reserved 435		
436	Reserved 436		
437	Reserved 437		
438	Reserved 438		
439	Reserved 439		
440	Reserved 440		
441	Reserved 441		
442	Reserved 442		
443	Reserved 443		
444	Reserved 444		
445	Reserved 445		
446	Reserved 446		
447	Reserved 447		
448	Reserved 448		
449	Reserved 449		
450	Reserved 450		
451	Reserved 451		
452	Reserved 452		
453	Reserved 453		
454	Reserved 454		
455	Reserved 455		
456	Reserved 456		

Number	Mactalk name	Range	Description
457	Reserved 457		
458	Reserved 458		
459	Reserved 459		
460	Reserved 460		
461	Reserved 461		
462	Reserved 462		
463	Reserved 463		
464	Reserved 464		
465	Reserved 465		
466	Reserved 466		
467	Reserved 467		
468	Reserved 468		
469	Reserved 469		
470	Reserved 470		
471	Reserved 471		
472	Reserved 472		
473	Reserved 473		
474	Reserved 474		
475	Reserved 475		
476	Reserved 476		
477	Reserved 477		
478	Reserved 478		
479	Reserved 479		
480	Reserved 480		

Number	Mactalk name	Range	Description
481	Reserved 481		
482	Reserved 482		
483	Reserved 483		
484	Reserved 484		
485	Reserved 485		
486	Reserved 486		
487	Reserved 487		
488	Reserved 488		
489	Reserved 489		
490	Reserved 490		
491	Reserved 491		
492	Reserved 492		
493	Reserved 493		
494	Reserved 494		
495	Reserved 495		
496	Reserved 496		
497	Reserved 497		
498	Reserved 498		
499	Reserved 499		
500	Reserved 500		
501	Reserved 501		
502	Reserved 502		
503	Reserved 503		
504	Reserved 504		

Number	Mactalk name	Range	Description
505	Reserved 505		
506	Reserved 506		
507	Reserved 507		
508	Reserved 508		
509	Reserved 509		
510	Reserved 510		
511	Reserved 511		

Number	Mactalk name	Range	Description
0	No Selection		Dummy register, do not use.

Firmware Name: PRM0

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
1	Program version	Na	Firmware version, displayed on bottom right status line.

Description: **Firmware version** : This value contains major and minor version number, and bits for overall drive types miniMAC, MAC400...3000 or stepper drives/controllers. Displayed on bottom right status line

Firmware Name: PROG_VERSION

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0-5	VERSION_MINOR	
6-12	VERSION_MAJOR	
13	BETA	BETA (1=> Beta firmware)
14	SMC75_MIS	SMC75/MIS 0=> MAC motor
15	BIGMAC	1 =>BIGMAC
16	CPU163	This is not really used anymore, and for some reason always set on RM4 motors
17-24	GENERATION_TYPE	Generation type
25	RM4_HW	RM4 hardware
26-28	GENERATION_TYPE_EX	Generation type extended

Example: MAC140F: Generation => 102 => 0110 0110

```
[31:14] = 0000.0000.0001.1001.10
Breakout:
[25:17] = 1100  => 12 (decimal)
[16]    = 1     => CPU162
[15]    = 1     => BIGMAC
[14]    = 0     => MAC motor
[13]    = 0     => not Beta firmware
```

Number	Mactalk name	Range	Description
2	Operating mode	0 - 258	The actual operating mode of the drive.

Description: In general, the motor will either be passive, attempt to reach a certain position, attempt to maintain a constant velocity or attempt to produce a constant torque. The various modes define the main type of operation as well as what determines the setpoint for that operation.

The special cases 256..258 are used to perform a few special operations on the entire set of registers.

Firmware Name: MODE_REG

Data Type: uint32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_MODE	Velocity mode - The drive will attempt to run the motor at a constant velocity selected by Reg5, V_SOLL, without violating the maximum torque or acceleration.
2	P_MODE	Position mode - The drive will at all times attempt to move the actual motor position to the position selected by Reg3, P_SOLL, without violating the maximum velocity, torque or acceleration.
3	GP_MODE	Gear Position mode - With safe distance to prevent overshoot
4	AT_MODE	Analogue torque mode.
5	AV_MODE	Analogue velocity mode.
6	AVG_MODE	Analog Velocity Gear mode.
7	MANI_MODE	Manual current mode.
8	TESTU_MODE	Step response test mode - For internal use to find the transfer function for the current loop
9	TESTA_MODE	Internal test mode.
10	BRAKE_MODE	Brake mode.
11	STOP_MODE	Stop mode.
12	THOME_MODE	Torque based Homing/Zero-search mode.
13	FHOME_MODE	Forward Home/zero-search mode.
14	FBHOME_MODE	Forward + backward zero search mode.
15	SAFE_MODE	Safe mode - Used when flashing and possibly other states.
16	AVZ_MODE	Analogue velocity with dead-band mode.
17	VAT_MODE	Velocity limited Analog Torque mode.
18	AG_MODE	Analogue gear mode.
19	COIL_MODE	Coil mode - For winding applications.
20	A2POS_MODE	Analogue bi-position mode - Change between two fixed positions based on the analog input voltage.
21	APOS_MODE	Analogue to position mode.
22	TESTKI_MODE	Internal test mode -Adjustment of KIA and KIB for current measurement scaling/balancing.
23	TESTTQ_MODE	Internal test mode.
24	GF_MODE	Gear follow mode - No safe distance - will overshoot if pulses stop suddenly
25	IHOME_MODE	IHOME mode - Index homing using slower but accurate technique

#	Name	Description
26	IIHOME_MODE	IIHOME mode - Index homing using fast but less accurate method
256	LOAD_FW_DEFAULT	Load default values from Firmware.
257	RELOAD_REG_VAL	Reload defalt register vaules.
258	SAVE_REG_IN_FLASH	Save registers in flash.

Number	Mactalk name	Range	Description
3	Requested position	± 67000000	The target position.

Description: The target position that the drive will attempt to reach in position related modes.

Firmware Name: P_SOLL

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
4	Resynchronize position	Na	Used to update both "Actual position"and "Requested position" in a single atomic operation.

Description: Used to update both Actual_Position and Requested_max_velocity in a single atomic operation to prevent motor movements during the change.
Requested_position holds either an absolute position or a relative position.

After writing a value to Requested_position, update both bits 8 and 6 in Reg36, Control bits.
Bit 8, SYNCPOSREL, will select a relative position update when set or an absolute update when cleared.
Setting bit 6, SYNCPOSMAN, executes the P_IST+"Requested position" update, that is, either both are set equal to Requested_position, or Requested_position is added to both, using signed addition. P_FNC is updated accordingly.

The undocumented FastMac commands 23 and 24 can also be used to set these bits and perform the same absolute and relative updates.

This is useful for expanding the logical position range beyond +/- 2^{26}.

Firmware Name: P_NEW

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
5	Velocity	Na	Desired velocity.

Description: Desired velocity.
1 RPM=2.77056 counts/sample for encoder resolution of 8000 PPR or 1 RPM = 2.83989 counts/sample for encoder resolution of 8192 PPR.
Default: 277 (100 RPM) with 8000 resolution.
Default: 284 (100 RPM) with 8192 resolution.

Firmware Name: V_SOLL

Data Type: int32

Default Value: Na

Example: To obtain 100 RPM, Velocity must be set to 277 on a MAC800 (8192 resolution).

Number	Mactalk name	Range	Description
6	Acceleration	271 - 433353	The desired nominal acceleration.

Description: The desired nominal acceleration.
1000 RPM/s = 3.6053333 counts/Sample^2 for encoders with 8000 PPR, or 3.6918613 for encoders with 8192 PPR.
Default:18 (4875 RPM/s^2).

Firmware Name: A_SOLL

Data Type: int32

Default Value: 18

Example: To obtain 100000 RPM/s^2, "Acceleration" must be set to 361 or 369 dep. on encoder resolution (8000 or 8192).

Number	Mactalk name	Range	Description
7	Torque	0 - 1023	The maximum torque that the drive is allowed to use.

Description: The maximum torque that the drive is allowed to use.
The value 1023 corresponds to 300% of nominal load, and is the absolute maximum peak torque allowed.
Default: 1023 (300%).

Firmware Name: T_SOLL

Data Type: int32

Default Value: 1023

Example: The value 341 gives 100% (nominal load).

Number	Mactalk name	Range	Description
8	P_FNC	± 134217728	Used internally for relative movements.

Description: Used internally for relative movements.
When one of the P1...P8 registers are activated with a FastMac command in relative positioning mode, this register is modified to allow a movement without changing the Requested position register and therefore avoid position rangeoverflow.
When the VelAccHiRes option is selected, this register must hold a 64-bit value. In this case Register 8 holds the lowest 32 bits, and the next register, Register 9, Index Offset, holds the highest 32 bits.

Firmware Name: P_FNC

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
9	Index Offset	± 2147483648	Updated after a Zero Search to show at what single-turn encoder position the zero point was detected.

Description: Updated after a Zero Search to show at what single-turn encoder position the zero point was detected. This is used by MacTalk on the Test tab to show if the zero search resulted in a valid zero position.
When the VelAccHiRes option is selected, this register holds the highest 32 bits of P_FNC.

Firmware Name: INDEX_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
10	Actual position	Na	The actual motor position measured by the internal encoder.

Description: The actual motor position measured by the internal encoder. Updated every 1.3ms (or every 2.6 ms with Reg157, "Sample time divider"=2).
Note that this register is maintained incrementally, which means that the user can update it to offset the working range. When updating when the drive is not in Passive mode, "Actual position" and "Requested position" should be updated together in an atomic operation, using Reg4, "Resynchronize position", or other special measures. Also note that the firmware will change this register after a zero search operation has completed.

Firmware Name: P_IST

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
11	Actual Velocity 16bit	Na	V_IST (actual velocity) measured over 16 samples.

Description: Desired velocity.
1 RPM=2.77056 counts/sample for encoder resolution of 8000 PPR or 1 RPM = 2.83989 counts/sample for encoder resolution of 8192 PPR.
Default: 277 (100 RPM) with 8000 resolution.
Default: 284 (100 RPM) with 8192 resolution.

Firmware Name: V_IST_16

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
12	Actual velocity	Na	Actual velocity.

Description: 1RPM=0.173333 counts/sample for 8000 CPR encoders (MAC800, MAC1200 default) or 0.1774933 for 8192 CPR encoders (MAC400, 402, 1500 and 3000).

Firmware Name: V_IST

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
13	Load	Na	Expected load on shaft.

Description: Must be set to the ratio between the total inertia driven by the motor relative to the motors own rotor inertia. So for at motor shaft that is not mechanically connected to anything, this value should be 1.0.
The load factor is perhaps the single most important value of the filter setup. Always try to set this right before experimenting with filter setups.
When the system to use an automatic load factor base on velocity is enabled, this register holds the highest value of the load factor range. The load factor scaling system allows to automatically use a lower load factor at lower velocities to avoid oscillations, typically with belt drive systems.
Default: 65536 (1.0).

Firmware Name: KV_OUT

Data Type: int32

Default Value: 65536

Number	Mactalk name	Range	Description
14	Gear output factor	Na	The nominator.

Description: The nominator used to scale / gear pulses from an external encoder/source. Used in gear modes.

Firmware Name: GEAR1

Data Type: int32

Default Value: 2000

Number	Mactalk name	Range	Description
15	Gear input factor	Na	The denominator.

Description: The denominator used to scale / gear pulses from an external encoder/source. Used in gear modes.

Firmware Name: GEAR2

Data Type: int32

Default Value: 500

Number	Mactalk name	Range	Description
16	Motor load (mean)	Na	The calculated power dissipated in the motor.

Description: The calculated power dissipated in the motor, and thus an approximated value for the rise in temperature inside the physical motor.
See also "Motor load max" (Reg 17).

MacTalk value is calculated as [%]="Motor load (mean)"/"Motor load max" x 100
Note that in v2.09 and later, this value is initialized to 80 percent of" Motor load max" after reset to prevent overheating the motor in case of frequent resets.
Default: 80%.

Firmware Name: I2T

Data Type: int32

Default Value: 80

Number	Mactalk name	Range	Description
17	Motor load max	Na	The limit for the value of Reg16, "Motor load (mean)".

Description: The limit for the value of Reg16, "Motor load (mean)", where bit 0, I2T_ERR, in Reg35, "Error status" will be set and the motor will change into passive mode. Each motor type has a firmware defined value.
Default: 100%.

Firmware Name: I2TLIM

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
18	Regenerative load	Na	The calculated power dissipated in the internal power dump.

Description: The calculated power dissipated in the internal power dump/brake resistors, and thus a way to estimate their rise in temperature.
See also "Regenerative load Limit" (Reg 19).

MacTalk value is calculated as [%]="Regenerative load"/"Regenerative load"LIM x 100
Note that in v2.09 and later, this value is initialized to 80 percent of "Regenerative load Limit" after reset to prevent overheating the motor in case of frequent resets.
Default: 60%.

Firmware Name: UIT

Data Type: int32

Default Value: 60

Number	Mactalk name	Range	Description
19	Regenerative load Limit	Na	The limit for the value of Reg18, "Regenerative load".

Description: The limit for the value of Reg18, "Regenerative load", where bit 3, UIT_ERR, in Reg35, "Error status" will be set and the motor will change into passive mode.
Each motor has a firmware defined value, that is suitable when using the built-in brake resistor.
When using an external brake resistor, use the value 0 to drive both the internal and external brake resistors in parallel, or the value 1 to drive only the external brake resistor.
Default: 100%.

Firmware Name: UITLIM

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
20	Follow error	Na	Follow Error.

Description: A measure of how far the drive is from its ideal regulation goal. This value is calculated differently in the various modes, and can mean things like ‘pulses from theoretical position’ or ‘difference in "actual velocity" to "Velocity"’. Contact JVL for more detailed information for specific modes.

Firmware Name: FLW_ERR

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
21	Control Voltage Measured	Na	The internal control voltage measured.

Description: 55 volt equals 4095 counts

Firmware Name: U_24V

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
22	Follow error max	Na	Max Follow Error.

Description: When Reg20, "Follow error", exceeds this limit, bit 1, "Follow error", in Reg35, "Error status", is set and the motor will stop if Reg22 is non-zero. Usually this value is set experimentally to detect situations where a movement is blocked or fails.

Firmware Name: FLW_ERR_MAX

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
23	Main Supply Voltage Error Bits	Na	Main Supply Voltage Error Bits.

Description: Bits to determine what will happen when the main supply voltage to the motor is below the threshold for motor operation.
Any combination of the following bits can be set.
Bit 0: Set bit 9, UV_ERR, in Reg35, "Error status".
Bit 1: Perform a controlled stop, then go passive.
Bit 2: Set "Velocity" to zero, do not go passive.

Firmware Name: UV_HANDLE

Data Type: uint32

Default Value: 0

Type:

#	Name	Description
0	SET_UV_ERR	If under voltage detected -> set undervoltage bit 9 in Reg35 "Error status" .
1	UV_CONTR_STOP	If under voltage detected -> set motor in passiv mode.
2	UV_VSOLL0	If under voltage detected -> Set Reg5 "Velocity" to zero.

Number	Mactalk name	Range	Description
24	Function error	Na	Function error

Description: Shows how much the motor is behind the ideal movement.
Precise operation depends on mode.
When this accumulated value exceeds Reg26, "Function error max", the FNC_ERR bit is set in Reg35, "Error status" and the motor will stop.

Firmware Name: FNCERR

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
25	Actual Position Rotary Table Offset	Na	Actual Position Rotary Table Offset.

Description: Displays the actual position, like "Actual position", but is offset by N times the rotary table working range so P_IST_TURNTAB is always between "Minimum position" and "Maximum position". Used mainly with the Rotary table option.

Firmware Name: P_IST_TURNTAB

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
26	Function error max	Na	The limit used with Reg24, "Function error".

Description: The limit used with Reg24, Function error.

Firmware Name: FNC_ERR_MAX

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
27	Actual Postion Rotary Table Offset	± 2147483648	"Actual Position Rotary Table Offset" wrap around counter.

Description: Holds a count of the number of times the value of Reg25, "Actual position", wraps around one of its limits, "Minimum position" or "Maximum position".
Used only with the Rotary table option. Counts up or down depending on the direction of the wrap around.

Firmware Name: TURNTAB_COUNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
28	Minimum position	Na	Minimum position.

Description: Used to define and enable the minimum software position limit, so the motor will stop (and enter passive mode) if the value of "Actual position" gets below this value.
If "Minimum position" is zero, the low position limit will not be enabled. In Rotary Table operation, this limit is used as the lower wrap-around position count.

Firmware Name: MIN_P_IST

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
29	Actual temperature	Na	The temperature measured inside the drive.

Description: The temperature measured inside the drive. Showed in integer degree Celsius or in counts Approximately 0.1221 Degree Celsius per count.

Firmware Name: DEGC

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
30	Maximum position	± 2147483648	Maximum position.

Description: Used to define and enable the maximum software position limit, so the motor will stop (and enter passive mode) if the value of "Actual position" gets above this value.
If "Maximum position" is zero, the high position limit will not be enabled.
In Rotary Table operation, this limit is used as the higher wrap-around position count

Firmware Name: MAX_P_IST

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
31	Actual temperature max	Na	Actual temperature max.

Description: The maximum value of Reg29, "Actual temperature", before the motor will set the Temperature error bit in "Error status" and change into Passive mode. Same scaling as Reg29, "Actual temperature".

Firmware Name: DEGCMAX

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
32	Error deceleration	Na	Acceleration to use during emergency stops.

Description: Acceleration to use during emergency stops.

Firmware Name: ACC_EMERG

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
33	In position window	0 - 65535	In position window.

Description: The value of this parameter depends on the operating mode. In all cases it helps to define when the motor is InPosition and thus will set the InPosition bit in the "Error status" register.

For normal Position related modes, the motor is considered to be in position when the actual position is less than INPOSWIN encoder counts away from its target position "Requested position" and have been detected to be so at least INPOSCNT times.

For Velocity related modes, the concept of InPosition will instead mean AtVelocity and work in a similar way that the actual velocity V_IST must have been measured INPOSCNT consecutive times to be within INPOSWIN counts/sample before the InPosition bit is set in Reg35, "Error status".

Firmware Name: IN_POS_WIN

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
34	In position samples	Na	In position samples.

Description: The number of consecutive times the In Position condition must have been met before the InPosition bit is set in "Error status". See description above for INPOSWIN.

Firmware Name: IN_POS_CNT

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
35	Error status	Na	Error status register.

Description: This register contains a number of status and error bits.
Note that there is an extended Error register in Reg235 "Error Status register 2", and Reg242 "Error Info - Special" for more information about the error. In some cases an error value may be found in Reg243 "Error value - Special".

Firmware Name: ERR_STAT

Data Type: uint32

Default Value: 0x80000

Type:

#	Name	Description
0	I2T_ERR	**Overload:** Set when the calculated thermal energy stored in the physical motor exceeds a limit. Condition is that Reg16, I2T gets larger than Reg17, I2TLIM.
1	FLW_ERR	**Follow error:** Set if the follow error in Reg20, FLWERR, gets larger than Reg22, FLWERRMAX. Never set if Reg22, FLWERRMAX is zero.
2	FNC_ERR	**Function error:** Set if the function error in Reg24, FNCERR, gets larger than Reg26, FNCERRMAX. Never set if Reg26, FNCERRMAX is zero.
3	UIT_ERR	**Regenerative overload:** Set when the calculated energy/temperature in the internal brake resistor (power dump) get dangerously high.
4	IN_POS	**Position mode:*** Status of when/whether the motor position is inside the inposition window defined by RegReg33, INPOSWIN, for the number of samples defined in Reg34, INPOSCNT. In Velocity mode, this bit means rather 'At Velocity'. For other modes, like Torque modes, see the technical manual for details of how the inposition status is calculated/maintained.
5	ACC_FLAG	**Acceleration flag:** Set when the motor is accelerating, which means that the velocity changes from a higher value to a lower value over tah latest samples. Please note that, when the velocity is negative, this flag is set when the velocity changes from a more negative value to a less negative value (closer to zero). This may not be intuitive, but can be said to be mathematically correct, and is maintained for backwards compatibility reasons
6	DEC_FLAG	**Decelerating flag:** Set when the motor is decelerating. Please see the description for ACC_FLAG above to understand the behaviour with negative velocity.
7	PLIM_ERR	**Position limit exceeded:** Set when one of the software position limits in Reg28 and Reg30 have been exceeded. Note that there is an option to temporarily disable position limits to be able to be move inside the position limit range again.
8	DEGC_ERR	**Temperature too high:** Set when the value in Reg29, DEGC, exceeds the value in Reg31, DEGCMAX.
9	UV_ERR	**Under voltage error** Can be set when either the AC sense detects missing 230 or 120 V AC input, or when the DC bus voltage get below a threshold voltage of approximately 80 V DC. Note that this error will only get set if bit 0 in Reg23, UV_HANDLE, is set. The AC sense input is not used with MAC402.
10	UV_DETECT	**Low AC-voltage:** Reflects the current status of missing AC input or low DC bus voltage, on the same condition as UV_ERR above. The bit will be cleared when the under voltage condition is no longer present for about one second. Note that there is a hysteresis built-in, so the DC bus voltage must be 1.25 times higher than the cut-off voltage threshold before the under voltage condition is cleared.

#	Name	Description
11	OV_ERR	**Overvoltage on bus:** Set when the DC bus voltage is measured to be above 450 V for MAC400 and MAC800, or 1000 V DC for MAC1500 and MAC3000, or 63 V DC for MAC402. Overvoltage often comes when the motor is braking a large inertia and the internal or external power dump/brake resistor can no longer accumulate the energy. It can also come from connecting a too high AC or DC supply voltage, perhaps by connecting 230VAC to the 120 VAC input on MAC400.
12	IPEAK_ERR	**Peak error, motor overcurrent:** A much too high current was measured in one or more of the motor phases. This can happen if the supply voltage is too low relative to the rotational speed. It can also happen in more extreme short-time overload conditions. This error requires a reset or power cycling of the drive since it cannot be cleared using the normal Clear Errors mechanisms.
13	SPEED_ERR	**Overspeed:** The velocity was measured to be higher than a limit for an average of 16 samples. This limit is normally 3600 RPM for MAC800, MAC1500 and MAC3000, and it is 4300 RPM for MAC400 and MAC402. There is an option in later firmware to increase the speed error limit to 4000 RPM on MAC800 for shorter movements.
14	DIS_P_LIM	**P_LIM Disabeled:** This bit is not an error or status bit, but rather a command bit. When this is set, the motor will stay in an active mode and allow moves even though one of the software position limits defined by Reg28 and Reg30 is exceeded. The bit is automatically cleared once the position gets inside the valid position range.
15	INDEX_ERR	**Internal encoder error:** (Not RM4) The bit is set if an encoder error is detected. This can be a real encoder hardware error or excessive electrical noise. The motor must be reset or power cycled to clear this error.
16	OLDFILTERR	**Invalid filter settings:** This bit is no longer used. It could detect if a previous version of the velocity filters was found, or loaded, that did not work with newer firmware.
17	U24V_ERR	**Control voltage unstable:** This error bit get set if the control voltage, normally at 24VDC, is measured to be below 12 V (9V on MAC402). The motor must be reset or power cycled to clear this error. It is considered unsafe to continue, because the electronics may not work correctly, and may have lost data.
18	SHORT_CIRC	**Short circuit:** This bit is not used with the 400 Watts or higher motors.
19	VAC_ON	Reflects the status of detection of the mains AC input (230 or 120 VAC). This bit is set when AC is detected and cleared when AC is not detected. The motor will refuse to enter an active mode if it detects that AC is not present. It will refuse to activate the power dump/brake resistor if it determines that this bit is set.
20	PWM_LOCKED	**PWM Locked:** A critical error has occurred that makes further motor operation too unsafe to continue. The motor must be reset to clear this error. The cause of this error is one or more of bits IPEAK_ERR, INDEX_ERR, OLDFILTER, U24V_ERR. At least one of these bits will be set when PWM_LOCKED is set. PWM's disabled. Reboot to enable.
21	COMM_ERR	**ModBus Com. Error:** Communications error (master or slave timeout with Modbus-Gear mode).
22	CURLOOP_ERR	**Current loop error:** Less than 2 mA was detected on the 4-20 mA input on the MAC00-P4/P5 module for more than 100 ms.
23	SLAVE_ERR	**Slave error:** One or more error bits were set in an ERR_STAT reading from the Modbus slave or COMM_ERR.
24	Y_ERR	Single bit to make easier on PLCs to check if the motor has any error bits set. Reflect the logical operation of: (**ERR_STAT and ALL_ERROR_BITS**) different from zero).
25	INIT_ERR	**Initialization error:** Set if error was detected during motor startup that could prevent reliable operation. This includes mainly that the shaft moved at the time the encoder Hall information was read, so there is a great risk that the motor will start with an uncontrolled movement and possibly go into error. This bit can also catch some types of internal misconfigurations, like hardware version checks, mainly to

#	Name	Description
		help JVL production employees. **See Reg242, ERR_INFO for details.**
26	FLASH_ERR	**Flash error:** An error was detected related to the internal flash memory during startup. In most cases, this is related to the use of the multi-turn absolute encoder value saved in flash at power down, and restored during power up.
27	STO_ALARM_ERR	**Safe torque off STO:** This bit gets set if the supervisor circuitry of the Safe Torque Off (STO) system detects an error. This will normally indicate an error in the electronics. If you got RM4 hardware, see Reg238 STO_INPUTS and Reg239 STO_VALUES for more information.
28	FPGA_ERROR	**Internal HW fault:** Indicates internal errors in the FPGA interface – may be caused by excessive electrical noise.
29	NOT_USED	This bit is no longer used.
30	OUT1_STATUS	**Out1 status:** Status of the physical pin normally used for the IN_POSITION signal/hardware output. The pin can also be used for user defined purposes and this bit will reflects its state also in this case.
31	OUT2_STATUS	**Out2 status:** Status of the physical pin normally used for the ERROR_OUT signal/hardware output. The pin can also be used for user defined purposes and this bit will reflects its state also in this case.

Number	Mactalk name	Range	Description
36	Control bits	Na	This register contains a number of control and status bits.

Description: This register contains a number of control and status bits.

Firmware Name: CNTRL_BITS

Data Type: uint32

Default Value: 0x20

Type:

#	Name	Description
0	RECORDBIT	Set by the user to start or continue the sampling of register values, using the Classic scope system. This bit will clear itself when the sample buffer has been filled.
1	REWINDBIT	If set, the index into the sample buffer will be zeroed and sampling will continue if in progress. This bit is typically set together with RECORD_BIT above.
2	RECINNERBIT	If set, the samplinG7scope system samples at 100 microseconds between samples instead of the normal 1.3milliseconds. Normally used only for internal JVL development and service purposes.
3	RELPOSPSOLL	NA
4	RELPOSPFNC	These two bits select what happens if one of the general-purpose position registers, P1 through P8 is 'activated' by a FastMac command. If one of these is set, this activates a relative movement rather than the absolute position move that happens if none of these bits are set. If RELPOSPSOLL is set alone, the value of the selected P1-P8 register is added to the target position register Reg3, P_SOLL. Note that these bits also control the movements in Analogue Bi-position mode in similar ways. If RELPOSPFNC is set, the value of the selected P1-P8 is added to an internal variable that will generate the movement, leaving P_SOLL unchanged. This is used for 'endless relative' movements, since it will not cause any overflow of the target position, but note that the actual position will wrap around at +/-2^31 (2,147,483,648 counts) without problems for the movement.
5	SYNCPOSAUTO	If set when switching mode from Passive mode into an active mode. The follow error and the function error are zeroed, and the actual position is transferred to the P_FNC register, to avoid initial movement.
6	SYNCPOSMAN	Set to manually synchronize the position by copying the value of P_NEW, to P_IST, P_SOLL, and P_FNC, with proper scaling. In other words, set: P_IST = P_NEW, P_SOLL = P_NEW, P_FNC = (P_NEW + FLWERR)*16. See also bit 8 below. Note that this operation is performed as an atomic (unbreakable) operation, and is currently the only way to perform this perfect synchronization.
7	MAN_NO_BRAKE	NA
8	SYNCPOSREL	When set, modifies the manual synchronization performed by bit 6 above to use relative synchronization rather than absolute synchronization. In other words, set: P_IST = P_IST + P_NEW, P_SOLL = P_SOLL + P_NEW, P_FNC = P_FNC + (P_NEW + FLWERR)*16.
9	INDEX_HOME	NA
10	FWTRIGBITS	When set, use the advanced sampling with firmware trigger conditions - when 0, use backwards compatible sampling.
11	SAMPLING_BIT	Set when sampling is active after trigger has been detected.

#	Name	Description
12	TRIGGER_ARMED_BIT	Set when sampling is active but trigger has not been detected yet.
13	ADVSAMPLE_BIT	If set, enables div-shift, min/max/avg + bitfield sampling.
14	COMMSAMPLE_BIT	If set, enables logging of reads and writes to/from registers over the main Modbus channel normally used between motor and MAC00-xx modules.
15	SAMPLE_STARTED	Set by firmware when the trigger condition in the advanced scope/sampling system gets satisfied.
16	UART0SAMPLE_BIT	If set, enables logging of reads and writes to/from registers over the Modbus channel normally used for the MacTalk protocol, but which can also be configured for a second Modbus channel in firmwave v2-09 and later.
17	ENCODER_STARTUP0	ENCODER_STARTUP0 & ENCODER_STARTUP1: two bits to define encoder startup system. 00=>zero 01=>ST, 10=>MT
18	ENCODER_STARTUP1	**ENCODER_STARTUP0 & ENCODER_STARTUP1: ** Two bits to define encoder startup system: 00=>zero 01=>ST 10=>MT

Number	Mactalk name	Range	Description
37	Start mode	Na	Startmode after power-down

Description: Determines in what mode the motor should start after power on and after a Zero Search.
This register works closely together with Reg2, "Operating mode".
If bits [15:8] are non-zero the motor will remain in Passive mode at power up regardless of the value in bits [7:0].
The intention is then to wait for a FastMac command 16 + 96. It is also possible to simply write a new value to Reg2, "Operating mode" to change mode.

Firmware Name: START_MODE

Data Type: uint32

Default Value: 0

Type:

#	Name	Description
0-7	PWR_UP_MODE	Select the value to transfer to Reg2, "Operating mode" at motor power up and after a zero search has completed.
8-15	ZERO_SEARCH	Used to select the type of zero search to perform when the FastMac command (16 + 96) is received. This should be one of 12, 13, 14, or zero. If bits [15-8] are non-zero the motor will remain in Passive mode at power up regardless of the value in bits [7-0]. The intention is then to wait for a FastMac command 16 + 96. It is also possible to simply write a new value to Reg2, "Operating mode" to change mode.
16-31	Reserved	Reserved.

Number	Mactalk name	Range	Description
38	Home offset	Na	Value of the home position

Description: The offset value to use to adjust "Actual position"at the end of a Zero Search. "Actual position"will be set to this value(instead of zero) after a zero search.

Firmware Name: P_HOME

Data Type: int32

Default Value: -10000

Number	Mactalk name	Range	Description
39	HW Setup	Na	Hardware setup.

Description: The Hardware setup register is used in many special modes, roary table, Position Compare output, crossfield selection and so on.

Firmware Name: HW_SETUP

Data Type: uint32

Default Value: 9

Type:

#	Name	Description
0	DIRAWR	Selects the basic functions of Pulse In, Serial Data and Pulse out on the Multi-Function RS422 interface 1 (MF1). DIRAWR=0, DIRBWR=0: Pulse-In mode. DIRAWR=1, DIRBWR=1: Pulse-Out mode. DIRAWR=1, DIRBWR=0: Serial interface mode. DIRAWR=0, DIRBWR=2: User defined switchboard/'crossfield' setup for MF1/MF2 signals. This can be configured via Reg230/231 index/data registers, and is only used for special applications. PulseIn and PulseOut are used mainly for applications where two motors follow the same encoder, possibly with a gearing ratio (in firmware). PulseIn will allow the motor to follow a foreign encoder signal, while PulseOut will output the motors own encoder signals for a foreign motor to follow it.
1	DIRBWR	Selects the basic functions of Pulse In, Serial Data and Pulse out on the Multi-Function RS422 interface 1 (MF1). DIRAWR=0, DIRBWR=0: Pulse-In mode. DIRAWR=1, DIRBWR=1: Pulse-Out mode. DIRAWR=1, DIRBWR=0: Serial interface mode. DIRAWR=0, DIRBWR=2: User defined switchboard/'crossfield' setup for MF1/MF2 signals. This can be configured via Reg230/231 index/data registers, and is only used for special applications. PulseIn and PulseOut are used mainly for applications where two motors follow the same encoder, possibly with a gearing ratio (in firmware). PulseIn will allow the motor to follow a foreign encoder signal, while PulseOut will output the motors own encoder signals for a foreign motor to follow it.
2	PULSEOUT	Must also be set to support encoder Pulse-Out on the RS422 interface (MF1).
3	XSEL1	Selects if external encoder pulses are received from the MF1 (0) or MF2 (1) electrical RS422 interfaces.
4	XPRINP	Select encoder external encoder data format Pulse/Direction (1) or Quadrature input type (0).
5	NOFILT	Disable low-pass filtering of external encoder pulses.
6	INVXDIR	Invert the counting direction for incoming encoder pulses from an external encoder when in Pulse-In mode.
7	INVROTDIR	Inverts the logical motor directions from CW to CCW. This works for velocity, position and gear modes.
8	USER_INPOS	Selects if hardware signals OUT1 should be used for standard InPosition and ErrorOut signals (0), or be controlled by the lowest bit in register 207, USER_OUT (1).
9	USER_ERROR	Error output pin OUT2 is controlled by the user via Reg207, USER_OUT bit 1.
10	INV_INPOS_OUT	INV_INPOS_OUT and INV_ERROR_OUT can be set individually to invert the logical state of the InPosition(OUT1) and ErrorOut(OUT2) hardware signals. When the bit is set, a signal will be active low instead of normally active high (PNP- output). Note that this inversion is not active when the ouputs are user controlled by bits 8 and 9 in this register.

#	Name	Description
11	INV_ERROR_OUT	INV_INPOS_OUT and INV_ERROR_OUT can be set individually to invert the logical state of the InPosition(OUT1) and ErrorOut(OUT2) hardware signals. When the bit is set, a signal will be active low instead of normally active high (PNP- output). Note that this inversion is not active when the ouputs are user controlled by bits 8 and 9 in this register.
12	CMP_ERROR_OUT	If set, OUT2_PIN is controlled by (P_IST > CMP_POS0)
13	Reserved	Reserved
14	Reserved	Reserved
15	Reserved	Reserved
16	DIRCDWR	Direction signal for the MultiFuncIo2 A channel (or both A and B?)
17	SELINDEX	Not used - prepared to select between encoder A or Index signal -> MultF.
18	ALWAYS_COOL	Set to have the fan that is mounted on MAC800 run at all times. When this bit is not set, the fan will only run when the temperature is measured to be above a limit.
19	POSITION_CAPTURE_UP	Used to enable SW position capture based on analogue input rising edge
20	POSITION_CAPTURE_DN	Used to enable SW position capture based on analogue input falling edge
21	PULSE_8000	If set, rescale the 8192 encoder pulses to 8000 for MAC800 compatibility and better Vel-filter performance
22	ENC_SCALING	Reserved for freely selectable encoder scaling.
23	SBUF_2048	Set to use a sample buffer length of 2048. Use 512 if not set (backwards compatible).
24	ROTARYTABLE_MODE_0	ROTARYTABLE_MODE_0 & ROTARYTABLE_MODE_1 Selects/enables rotary table modes. 0=none, 1=CW, 2=CCW, 3=Shortest path.
25	ROTARYTABLE_MODE_1	**ROTARYTABLE_MODE_0 & ROTARYTABLE_MODE_1** Selects/enables rotary table modes: 0=none 1=CW 2=CCW 3=Shortest path
26	ROTARYTABLE_MULTI	Set to enable Rotary table multi-turn mode.
27	ROTARYTABLE_SWAP_PIST	No longer used.
28	SBUF_8_CHAN	Set to have the advanced scope/sample system use 8 channels instead of the standard 4 channels.
29	CAPTURE_NO_JITTER	Set to significantly reduce the jitter on a high-speed (50 us) position capture triggered by the analogue input .
30	SWITCH__10KHZ	Set to change from 20 kHz PWM switching frequency to 10 kHz. This is mainly to reduce heating of the motor and electronics. The disadvantage is more audible noise. This is only supported on motor variants that switch at 20 kHz by default. Setting this bit on motors, like MAC1500 and MAC3000, that switch on 5 kHz has no effect.

Number	Mactalk name	Range	Description
40	Home velocity	± 12780	Velocity to use during a zero search operation (Homing operation).

Description: Velocity to use during a zero search operation (Homing operation). After the operation has completed, the drive will go back to using the regular "Velocity" (0.35 count/RPM).
Default: 138(48.59 RPM).

Firmware Name: V_HOME

Data Type: int32

Default Value: 138

Number	Mactalk name	Range	Description
41	Home torque	Na	Torque to use during a zero search operation (Homing operation).

Description: Torque to use during a zero search operation (Homing operation). After the operation has completed, the drive will go back to using the regular "Torque".
Default: 341(100%).

Firmware Name: T_HOME

Data Type: int32

Default Value: 341

Number	Mactalk name	Range	Description
42	Home mode	Na	Defines if the motor should start a zero search immediately after start up.

Description: Defines if the motor should start a zero search immediately after start up, as well as the type of zero search to perform when a FastMac command is received.

Bits 7..0: define the zero search mode the motor should start up in. If this value is zero, the motor will not perform a zero search at startup, but will start up in the mode selected by Reg37, START_MODE. See bits 15..8 below for an exception!
The mode values are identical to Register 2, MODE_REG.

Bits 15..8: define what mode the motor will set when it receives a FastMac command (96+16). NOTE that if all these bits are non-zero the motor will start up in passive mode instead of starting in START_MODE!
The mode values are identical to Register 2, MODE_REG.

Bit 16 :is set after a zero search has completed, and can thus be used to test if the motor has performed a zero search at least once after +24V was last turned on.
After a zero search has completed, the motor will always change into the mode defined by Reg37, START_MODE (unless an error occurs that will stop the motor and set "Error status" bit(s)).

Firmware Name: HOME_MODE

Data Type: uint32

Default Value: 0

Type:

#	Name	Description
0-7	HOME_ZERO	Define the zero search mode the motor should start up in. If this value is zero, the motor will not perform a zero search at startup, but will start up in the mode selected by Reg37, START_MODE. See bits 15..8 below for an exception! The mode values are identical to Register 2, "Operating mode".
8-15	HOME_DONE	Define what mode the motor will set when it receives a FastMac command (96+16). NOTE that if all these bits are non-zero the motor will start up in passive mode instead of starting in START_MODE! The mode values are identical to Register 2, "Operating mode".REG.
16	HOME_DONE_1	Is set after a zero search has completed, and can thus be used to test if the motor has performed a zero search at least once after +24V was last turned on. After a zero search has completed, the motor will always change into the mode defined by Reg37, START_MODE (unless an error occurs that will stop the motor and set ERR_STAT bit(s)).

Number	Mactalk name	Range	Description
43	P_REG_P	0 - 8	When set to 1..8, copies one of "Position Reg 1".."Position Reg 8" to "Requested position", then resets to 0.

Firmware Name: P_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	P_reg_p1	When set to 1 copies one of "Position Reg 1" to P_SOLL, then resets to 0.
2	P_reg_p2	When set to 2 copies one of "Position Reg 2" to P_SOLL, then resets to 0.
3	P_reg_p3	When set to 3 copies one of "Position Reg 3" to P_SOLL, then resets to 0.
4	P_reg_p4	When set to 4 copies one of "Position Reg 4" to P_SOLL, then resets to 0.
5	P_reg_p5	When set to 5 copies one of "Position Reg 5" to P_SOLL, then resets to 0.
6	P_reg_p6	When set to 6 copies one of "Position Reg 6" to P_SOLL, then resets to 0.
7	P_reg_p7	When set to 7 copies one of "Position Reg 7" to P_SOLL, then resets to 0.
8	P_reg_p8	When set to 8 copies one of "Position Reg 8" to P_SOLL, then resets to 0.

Number	Mactalk name	Range	Description
44	V_REG_P	0 - 8	When set to 1..8, copies one of VEL0..VEL7 to "Velocity", then resets to 0.

Firmware Name: V_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_reg_p1	When set to 1 copies one of VEL0 to V_SOLL, then resets to 0.
2	V_reg_p2	When set to 2 copies one of VEL1 to V_SOLL, then resets to 0.
3	V_reg_p3	When set to 3 copies one of VEL2 to V_SOLL, then resets to 0.
4	V_reg_p4	When set to 4 copies one of VEL3to V_SOLL, then resets to 0.
5	V_reg_p5	When set to 5 copies one of VEL4 to V_SOLL, then resets to 0.
6	V_reg_p6	When set to 6 copies one of VEL5 to V_SOLL, then resets to 0.
7	V_reg_p7	When set to 7 copies one of VEL6 to V_SOLL, then resets to 0.
8	V_reg_p8	When set to 8 copies one of VEL7 to V_SOLL, then resets to 0.

Number	Mactalk name	Range	Description
45	A_REG_P	0 - 4	When set to 1..4, copies one of ACC0..ACC3 to "Acceleration", then resets to 0.

Firmware Name: A_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	A_reg_p1	When set to 1 copies one of ACC0 to A_SOLL, then resets to 0.
2	A_reg_p2	When set to 2 copies one of ACC1 to A_SOLL, then resets to 0.
3	A_reg_p3	When set to 3 copies one of ACC2 to A_SOLL, then resets to 0.
4	A_reg_p4	When set to 4 copies one of ACC3 to A_SOLL, then resets to 0.

Number	Mactalk name	Range	Description
46	T_REG_P	0 - 4	When set to 1..4, copies one of TQ0..TQ3 to "Torque", then resets to 0.

Firmware Name: T_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	T_reg_p1	When set to 1 copies one of TQ0 to T_SOLL, then resets to 0.
2	T_reg_p2	When set to 2 copies one of TQ1 to T_SOLL, then resets to 0.
3	T_reg_p3	When set to 3 copies one of TQ2 to T_SOLL, then resets to 0.
4	T_reg_p4	When set to 4 copies one of TQ3 to T_SOLL, then resets to 0.

Number	Mactalk name	Range	Description
47	L_REG_P	0 - 4	When set to 1..4, copies one of LOAD0..LOAD3 to KVOUT then resets to 0

Firmware Name: L_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	L_reg_p1	When set to 1 copies one of LOAD0 to KVOUT, then resets to 0.
2	L_reg_p2	When set to 2 copies one of LOAD1 to KVOUT, then resets to 0.
3	L_reg_p3	When set to 3 copies one of LOAD2 to KVOUT, then resets to 0.
4	L_reg_p4	When set to 4 copies one of LOAD3 to KVOUT, then resets to 0.

Number	Mactalk name	Range	Description
48	Z_REG_P	Na	When set to 1..4, copies one of ZERO0..ZERO3 to INPOSWIN, then resets to 0.

Firmware Name: Z_REG_P

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	Z_reg_p1	When set to 1 copies one of ZERO0 to INPOSWIN, then resets to 0.
2	Z_reg_p2	When set to 2 copies one of ZERO1 to INPOSWIN, then resets to 0.
3	Z_reg_p3	When set to 3 copies one of ZERO2 to INPOSWIN, then resets to 0.
4	Z_reg_p4	When set to 4 copies one of ZERO3 to INPOSWIN, then resets to 0.

Number	Mactalk name	Range	Description
49	Position Reg 1	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Description: Can be activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers. Can also be used for general-purpose or with the HWIxx registers.

Firmware Name: POS0

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
50	CAPCOM0	Na	Used for position capture.

Firmware Name: CAPCOM0

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
51	Position Reg 2	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
52	CAPCOM1	Na	Used to control the advanced scope/sampling system.

Firmware Name: CAPCOM1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
53	Position Reg 3	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS2

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
54	CAPCOM2	Na	Used to control the advanced scope/sampling system.

Firmware Name: CAPCOM2

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
55	Position Reg 4	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS3

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
56	CAPCOM3	Na	Used to control the advanced scope/sampling system.

Firmware Name: CAPCOM3

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
57	Position Reg 5	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS4

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
58	CAPCOM4	Na	Used to control the advanced scope/sampling system.

Firmware Name: CAPCOM4

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
59	Position Reg 6	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS5

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
60	CAPCOM5	Na	Used for setting a logical digital inut depending on a register comparison.

Firmware Name: CAPCOM5

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
61	Position Reg 7	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS6

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
62	CAPCOM6	Na	Used for setting a logical digital inut depending on a register comparison.

Firmware Name: CAPCOM6

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
63	Position Reg 8	Na	Activated with some FastMac commands to be copied to the "Requested position" or P_FNC registers.

Firmware Name: POS7

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
64	CAPCOM7	Na	Used for position capture.

Firmware Name: CAPCOM7

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
65	Velocity Reg 1	Na	Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Description: Velocity register V1 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module. See also "Velocity" (register 5) which have the same scaling. Can also be used for general-purpose or with the HWIxx registers.
Default: 277 (97.54 RPM).

Firmware Name: VEL0

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
66	Velocity Reg 2	Na	Velocity register V2 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL1

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
67	Velocity Reg 3	Na	Velocity register V3 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL2

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
68	Velocity Reg 4	Na	Velocity register V4 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL3

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
69	Velocity Reg 5	Na	Velocity register V5 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL4

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
70	Velocity Reg 6	Na	Velocity register V6 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL5

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
71	Velocity Reg 7	Na	Velocity register V7 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL6

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
72	Velocity Reg 8	Na	Velocity register V8 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: VEL7

Data Type: int32

Default Value: 277

Number	Mactalk name	Range	Description
73	Acceleration Reg 1	Na	Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).

Description: Acceleration 1 - Can be activated with some FastMac commands to be copied to the "Acceleration" register. Can also be used for general-purpose or with the HWIxx registers.
Default: 18 (4875 RPM/s^2).

Firmware Name: ACC0

Data Type: int32

Default Value: 18

Number	Mactalk name	Range	Description
74	Acceleration Reg 2	Na	Acceleration 2 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).

Firmware Name: ACC1

Data Type: int32

Default Value: 18

Number	Mactalk name	Range	Description
75	Acceleration Reg 3	Na	Acceleration 3 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).

Firmware Name: ACC2

Data Type: int32

Default Value: 18

Number	Mactalk name	Range	Description
76	Acceleration Reg 4	Na	Acceleration 4 - Activated with some FastMac commands to be copied to the "Acceleration" register. Default: 18 (4875 RPM/s²).

Firmware Name: ACC3

Data Type: int32

Default Value: 18

Number	Mactalk name	Range	Description
77	Torque Reg 1	0 - 1023	Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Description: Torque register T1 -Used with the fastmac protocol or
by the MAC00-R1/3/4 nanoPLC module.
See also "Torque" (register 7). Can also be used for general-purpose or with the HWIxx registers.
Default: 1023 (300%).

Firmware Name: TQ0

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
78	Torque Reg 2	0 - 1023	Torque register T2 -Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: TQ1

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
79	Torque Reg 3	0 - 1023	Torque register T3 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: TQ2

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
80	Torque Reg 4	0 - 1023	Torque register T4 - Used with the fastmac protocol or by the MAC00-R1/3/4 nanoPLC module.

Firmware Name: TQ3

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
81	Load Reg 1	0 - 1023	Activated with some FastMac commands.

Description: Load 1- Can be activated with some FastMac commands. Can also be used for general-purpose or with the HWIxx registers. Default: 1023 (300%).

Firmware Name: LOAD0

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
82	Load Reg 2	0 - 1023	Load 2- Activated with some FastMac commands.

Firmware Name: LADO1

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
83	Load Reg 3	0 - 1023	Load 3- Activated with some FastMac commands.

Firmware Name: LOAD2

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
84	Load Reg 4	0 - 1023	Load 4- Activated with some FastMac commands.

Firmware Name: LOAD3

Data Type: int32

Default Value: 1023

Number	Mactalk name	Range	Description
85	In position window 1	0 - 65535	Activated with some FastMac commands.

Description: In position window 1 - Can be activated with some FastMac commands. Can also be used for general-purpose or with the HWIxx registers.

Firmware Name: ZERO0

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
86	In position window 2	0 - 65535	In position window 2- Activated with some FastMac commands.

Firmware Name: ZERO1

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
87	In position window 3	0 - 65535	In position window 3 - Activated with some FastMac commands.

Firmware Name: ZERO2

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
88	In position window 4	0 - 65535	In position window 4 - Activated with some FastMac commands.

Firmware Name: ZERO3

Data Type: int32

Default Value: 100

Number	Mactalk name	Range	Description
89	Mode 1	0 - 21	Can be used with the HWI functions to change mode.

Description: Mode 1 - Can be used with the HWI functions to change mode (See register 2) depending hardware input signal or a logical comparison.

Firmware Name: MODE0

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_MODE	Velocity mode - The drive will attempt to run the motor at a constant velocity selected by Reg5, V_SOLL, without violating the maximum torque or acceleration.
2	P_MODE	Position mode - The drive will at all times attempt to move the actual motor position to the position selected by Reg3, P_SOLL, without violating the maximum velocity, torque or acceleration.
3	GP_MODE	Gear Position mode - With safe distance to prevent overshoot
4	AT_MODE	Analogue torque mode.
5	AV_MODE	Analogue velocity mode.
6	AVG_MODE	Analog Velocity Gear mode.
7	MANI_MODE	Manual current mode.
8	TESTU_MODE	Step response test mode - For internal use to find the transfer function for the current loop
9	TESTA_MODE	Internal test mode.
10	BRAKE_MODE	Brake mode.
11	STOP_MODE	Stop mode.
12	THOME_MODE	Torque based Homing/Zero-search mode.
13	FHOME_MODE	Forward Home/zero-search mode.
14	FBHOME_MODE	Forward + backward zero search mode.
15	SAFE_MODE	Safe mode - Used when flashing and possibly other states.
16	AVZ_MODE	Analogue velocity with dead-band mode.
17	VAT_MODE	Velocity limited Analog Torque mode.
18	AG_MODE	Analogue gear mode.
19	COIL_MODE	Coil mode - For winding applications.
20	A2POS_MODE	Analogue bi-position mode - Change between two fixed positions based on the analog input voltage.
21	APOS_MODE	Analogue to position mode.
22	TESTKI_MODE	Internal test mode -Adjustment of KIA and KIB for current measurement scaling/balancing.
23	TESTTQ_MODE	Internal test mode.
24	GF_MODE	Gear follow mode - No safe distance - will overshoot if pulses stop suddenly
25	IHOME_MODE	IHOME mode - Index homing using slower but accurate technique
26	IIHOME_MODE	IIHOME mode - Index homing using fast but less accurate method

#	Name	Description
256	LOAD_FW_DEFAULT	Load default values from Firmware.
257	RELOAD_REG_VAL	Reload defalt register vaules.
258	SAVE_REG_IN_FLASH	Save registers in flash.

Number	Mactalk name	Range	Description
90	Mode 2	0 - 21	Can be used with the HWI functions to change mode.

Description: Mode 2 - Can be used with the HWI functions to change mode (See register 2) depending hardware input signal or a logical comparison.

Firmware Name: MODE1

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_MODE	Velocity mode - The drive will attempt to run the motor at a constant velocity selected by Reg5, V_SOLL, without violating the maximum torque or acceleration.
2	P_MODE	Position mode - The drive will at all times attempt to move the actual motor position to the position selected by Reg3, P_SOLL, without violating the maximum velocity, torque or acceleration.
3	GP_MODE	Gear Position mode - With safe distance to prevent overshoot
4	AT_MODE	Analogue torque mode.
5	AV_MODE	Analogue velocity mode.
6	AVG_MODE	Analog Velocity Gear mode.
7	MANI_MODE	Manual current mode.
8	TESTU_MODE	Step response test mode - For internal use to find the transfer function for the current loop
9	TESTA_MODE	Internal test mode.
10	BRAKE_MODE	Brake mode.
11	STOP_MODE	Stop mode.
12	THOME_MODE	Torque based Homing/Zero-search mode.
13	FHOME_MODE	Forward Home/zero-search mode.
14	FBHOME_MODE	Forward + backward zero search mode.
15	SAFE_MODE	Safe mode - Used when flashing and possibly other states.
16	AVZ_MODE	Analogue velocity with dead-band mode.
17	VAT_MODE	Velocity limited Analog Torque mode.
18	AG_MODE	Analogue gear mode.
19	COIL_MODE	Coil mode - For winding applications.
20	A2POS_MODE	Analogue bi-position mode - Change between two fixed positions based on the analog input voltage.
21	APOS_MODE	Analogue to position mode.
22	TESTKI_MODE	Internal test mode -Adjustment of KIA and KIB for current measurement scaling/balancing.
23	TESTTQ_MODE	Internal test mode.
24	GF_MODE	Gear follow mode - No safe distance - will overshoot if pulses stop suddenly
25	IHOME_MODE	IHOME mode - Index homing using slower but accurate technique
26	IIHOME_MODE	IIHOME mode - Index homing using fast but less accurate method

#	Name	Description
256	LOAD_FW_DEFAULT	Load default values from Firmware.
257	RELOAD_REG_VAL	Reload defalt register vaules.
258	SAVE_REG_IN_FLASH	Save registers in flash.

Number	Mactalk name	Range	Description
91	Mode 3	0 - 21	Can be used with the HWI functions to change mode.

Description: Mode 3 - Can be used with the HWI functions to change mode (See register 2) depending hardware input signal or a logical comparison.

Firmware Name: MODE2

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_MODE	Velocity mode - The drive will attempt to run the motor at a constant velocity selected by Reg5, V_SOLL, without violating the maximum torque or acceleration.
2	P_MODE	Position mode - The drive will at all times attempt to move the actual motor position to the position selected by Reg3, P_SOLL, without violating the maximum velocity, torque or acceleration.
3	GP_MODE	Gear Position mode - With safe distance to prevent overshoot
4	AT_MODE	Analogue torque mode.
5	AV_MODE	Analogue velocity mode.
6	AVG_MODE	Analog Velocity Gear mode.
7	MANI_MODE	Manual current mode.
8	TESTU_MODE	Step response test mode - For internal use to find the transfer function for the current loop
9	TESTA_MODE	Internal test mode.
10	BRAKE_MODE	Brake mode.
11	STOP_MODE	Stop mode.
12	THOME_MODE	Torque based Homing/Zero-search mode.
13	FHOME_MODE	Forward Home/zero-search mode.
14	FBHOME_MODE	Forward + backward zero search mode.
15	SAFE_MODE	Safe mode - Used when flashing and possibly other states.
16	AVZ_MODE	Analogue velocity with dead-band mode.
17	VAT_MODE	Velocity limited Analog Torque mode.
18	AG_MODE	Analogue gear mode.
19	COIL_MODE	Coil mode - For winding applications.
20	A2POS_MODE	Analogue bi-position mode - Change between two fixed positions based on the analog input voltage.
21	APOS_MODE	Analogue to position mode.
22	TESTKI_MODE	Internal test mode -Adjustment of KIA and KIB for current measurement scaling/balancing.
23	TESTTQ_MODE	Internal test mode.
24	GF_MODE	Gear follow mode - No safe distance - will overshoot if pulses stop suddenly
25	IHOME_MODE	IHOME mode - Index homing using slower but accurate technique
26	IIHOME_MODE	IIHOME mode - Index homing using fast but less accurate method

#	Name	Description
256	LOAD_FW_DEFAULT	Load default values from Firmware.
257	RELOAD_REG_VAL	Reload defalt register vaules.
258	SAVE_REG_IN_FLASH	Save registers in flash.

Number	Mactalk name	Range	Description
92	Mode 4	Na	Can be used with the HWI functions to change mode.

Description: Mode 4 - Can be used with the HWI functions to change mode (See register 2) depending hardware input signal or a logical comparison.

Firmware Name: MODE3

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NOP_MODE	Passive mode - The axis is not controlled by the drive, and can easily be moved by hand or external mechanics.
1	V_MODE	Velocity mode - The drive will attempt to run the motor at a constant velocity selected by Reg5, V_SOLL, without violating the maximum torque or acceleration.
2	P_MODE	Position mode - The drive will at all times attempt to move the actual motor position to the position selected by Reg3, P_SOLL, without violating the maximum velocity, torque or acceleration.
3	GP_MODE	Gear Position mode - With safe distance to prevent overshoot
4	AT_MODE	Analogue torque mode.
5	AV_MODE	Analogue velocity mode.
6	AVG_MODE	Analog Velocity Gear mode.
7	MANI_MODE	Manual current mode.
8	TESTU_MODE	Step response test mode - For internal use to find the transfer function for the current loop
9	TESTA_MODE	Internal test mode.
10	BRAKE_MODE	Brake mode.
11	STOP_MODE	Stop mode.
12	THOME_MODE	Torque based Homing/Zero-search mode.
13	FHOME_MODE	Forward Home/zero-search mode.
14	FBHOME_MODE	Forward + backward zero search mode.
15	SAFE_MODE	Safe mode - Used when flashing and possibly other states.
16	AVZ_MODE	Analogue velocity with dead-band mode.
17	VAT_MODE	Velocity limited Analog Torque mode.
18	AG_MODE	Analogue gear mode.
19	COIL_MODE	Coil mode - For winding applications.
20	A2POS_MODE	Analogue bi-position mode - Change between two fixed positions based on the analog input voltage.
21	APOS_MODE	Analogue to position mode.
22	TESTKI_MODE	Internal test mode -Adjustment of KIA and KIB for current measurement scaling/balancing.
23	TESTTQ_MODE	Internal test mode.
24	GF_MODE	Gear follow mode - No safe distance - will overshoot if pulses stop suddenly
25	IHOME_MODE	IHOME mode - Index homing using slower but accurate technique
26	IIHOME_MODE	IIHOME mode - Index homing using fast but less accurate method

#	Name	Description
256	LOAD_FW_DEFAULT	Load default values from Firmware.
257	RELOAD_REG_VAL	Reload defalt register vaules.
258	SAVE_REG_IN_FLASH	Save registers in flash.

Number	Mactalk name	Range	Description
93	HW function 1	Na	Allow the digital inputs from Reg106 to control the values of other motor registers.

Description:

HardWare Inputs Regs 93-104, HWI0-11, allow the digital inputs from Reg106 to control the values of other motor registers.

The most common use is to copy one of two values to a target register. This can be used to switch between two velocities, positions or modes. For instance to switch between two target positions, set Reg49, "Position Reg 1" to 1000 and Reg51, "Position Reg 2" to 2000 and set the motor into position mode. Then "Requested position" can be set to receive either the value 1000 or 2000 depending on the voltage on the digital input (the Input State)

The copying is executed every 1.0 or 1.3 ms. The digital inputs can thus be considered level-triggered rather than edge-triggered.
Each of the HWI0-11 registers have the same bitfields.

When the value of bits [3:0] are one of 1..6, the two source registers are implicitly fixed to the corresponding group of register, and the value of bits [23:16] and bits [15:8] are used as an index into that group of registers. For instance if bits [3:0] equals 3, the values of bits [23:16] and bits [15:8] must be in the range 1..8 to select "Position Reg 1" .."Position Reg 8" for source registers to copy into "Requested position".
When the value of bits [3:0] equals 7, the values of bits [23:16] and [15:8] hold the full register numbers in the range 1-254.

For more advanced use, any of the source register or index values can be set to zero, which means DoNothing. This effectively means that in one of the Input States a source register will be copied to the target register, while in the other Input State no copying will happen so the target register will not be modified by the digital input.

The 12 HWI functions are executed every 1.3 ms in the order from HWI0 to HWI11. NO other operations happen in between regardless of communications and other parallel operations. It is therefore safe to rely on stable register values and consistent digital input values during the execution of the 12 HWI functions.
This implies that HWI function with higher numbers have higher priority because they are executed later, and that it is safe to change the same target register several times during the HWI evaluation.

Note that each of the HWI function can use any of the digital inputs, and that more than one HWI function can use the same digital input.

A typical HWI application is Jogging, where two pushbuttons connected to two separate digital inputs are used to move the motor position manually.
This can be realized with a HWI setup like:

HWI0 uses Digital Input 1:
ON => MODE_REG=1 (velocity mode)
OFF => MODE_REG=3 (gear mode)

HWI1 also uses Digital Input 1:
ON => "Velocity"=+100RPM
OFF => "Velocity" = 3000 RPM

HWI2 uses Digital Input 2:
ON => MODE_REG=1 (velocity mode)
OFF => MODE_REG=3 (gear mode)

HWI3 also uses Digital Input 2:
ON => "Velocity"=-100RPM
OFF => "Velocity" = 3000 RPM

This will keep the motor in Gear mode with a maximum velocity of 3000 RM when none of the pushbuttons are activated, and change to Velocity mode wit either +100 or -100 RPM as long as one of the pushbuttons are held active. In this setup Digital Input 2 will have higher priority than Digital Input 1, because it is evaluated later and overwrites "Velocity" in case both buttons are held down.

Firmware Name: HWI0

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0=None, 1="Operating mode", 2=V_SOLL, 3=P_SOLL, 4=A_SOLL, 5=T_SOLL, 6=INPOSWIN, 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
94	HW function 2	Na	HW function 2 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI1

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
95	HW function 3	Na	HW function 3 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI2

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
96	HW function 4	Na	HW function 4 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI3

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
97	HW function 5	Na	HW function 5 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI4

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
98	HW function 6	Na	HW function 6 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI5

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
99	HW function 7	Na	HW function 7 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI6

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
100	HW function 8	Na	HW function 8 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI7

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
101	HW function 9	Na	HW function 9 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI8

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
102	HW function 10	Na	HW function 10 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI9

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
103	HW function 11	Na	HW function 11 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI10

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
104	HW function 12	Na	HW function 12 - Allow the digital inputs from Reg106 to control the values of other motor registers.

Firmware Name: HWI11

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	TARGET_REG_SEL	Target register selection. 0 = None, 1 = "Operating mode", 2= "Velocity", 3="Requested position", 4="Acceleration", 5="Torque", 6="In position window", 7=Register number from DES_REG.
4-7	INPUT_BIT	Select digital input bit number in Reg106.:4
8-15	S_REG_NR_D0	Source register number 0..254 for D=0.
16-23	S_REG_NR_D1	Source register number 0..254 for DI=1.
24-31	DES_REG	Destination register used (only) when TARGET_REG_SEL equals 7.

Number	Mactalk name	Range	Description
105	MAC00 module type	Na	Identifies the Generation-2 module type autodetected at startup.

Description: Identifies the Generation-2 module type autodetected at startup. 0 = No Gen2 module found, 1=MAC00-B41, 2=MAC00-P4 or MAC00-P5, 3= MAC00-B42 found.

Firmware Name: MAC00_TYPE

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	NO_GEN2_MODULE	No Gen2 module found.
1	MAC00_B41	MAC00-B41 module found.
2	MAC00_P4_5	MAC00-P4 or MAC00-P5 module found.
3	MAC00_B42	MAC00-B42 module found.

Number	Mactalk name	Range	Description
106	MAC00 module inputs	0 - 65535	The registers from 106 to 120 are used to support different interface modules with the Generation-2 connectors.

Description:

MAC00 module inputs –The registers from 106 to 120 are used to support different interface modules with the Generation-2 connectors. The function of these registers will be different depending on which module is mounted in the motor. The Gen.2 module type is detected automatically by the motor at start up.
Reg106, Digital inputs, is a bitmapped value where bits [15:8] show the status of hardware signals in the basic motor as described below, while bits [7:0] show the status of the digital inputs from the MAC00-B41 module.

Be aware that bits [15:0] in Reg215, IO_POLARITY, can be set to invert the value of the corresponding bits [15:0] in this register.
Bits [15:12] show the values of the four RS-422 signals. These are intended mostly for serial communications to some modules or to use Modbus RS485, but they can be used as digital inputs provided that the input voltage is kept within -7 to +12 volts. These are differential signals, so to use them as single-ended inputs, one of the differential lines must be kept at a constant voltage in between the high and low thresholds for the single-ended line.
At the time of this writing, bits [15:12] are supported on MAC400, but not yet on MAC800.

Bits 5…0: The digital inputs from the B41 an B42 modules.

To use ANINP2 as a signal conditioned input, use a similar trick so IOSETUP is set to make ANINP reflect the signal conditioned value of ANINP2 in bit 8.
Bits 6, 7: Can be configured using CAPCOM5 and CAPCOM& to reflect the logical result of a register comparison – except for the MAC00-B42 module, where these simply are inputs 7 and 8.

Bits [10:8] show the status of the analogue inputs ANINP2, ANINP1 and ANINP. Status will be high (logic 1) when the value of the analogue line is above 5.0 volts. This threshold can be adjusted by modifying the corresponding ANINPx_OFFSET registers. This way it is possible to use the analogue inputs as digital inputs with adjustable thresholds in the range -10V to +10V.
Bit 10: ANINP2 (not signal conditioned)
Bit 9: ANINP1 (not signal conditioned)
Bit 8: ANINP (signal conditioned)
To use ANINP3 (available on the MAC00-P4 and MAC00-P5 modules as analogue current loop 4-20 mA) use Reg222, IOSETUP to make ANINP reflect the (signal conditioned) value of this input, so the digital status will be shown in Bit 8.

Bit 11 is unused at this time.

Bit 12: Multifunction 2, channel A

Bit 13: Multifunction 2, channel B

Bit 14: Multifunction 1, channel A

Bit 15: Multifunction 1, channel B

Firmware Name: MAC00_1/Dig.Inputs

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-5	DI_0_5	The digital inputs from the B41 an B42 modules.
6-7	DI_6_7	Can be configured using CAPCOM5 and CAPCOM& to reflect the logical result of a register comparison – except for the MAC00-B42 module, where these simply are inputs 7 and 8.
8	ANINP	Analog input (signal conditioned)
9	ANINP1	Analog input (signal conditioned)
10	ANINP2	Analog input (signal conditioned)
11	-	…
12	M2_CA	Multifunction 2, channel A.

#	Name	Description
13	M2_CB	Multifunction 2, channel B.
14	M1_CA	Multifunction 1, channel A.
15	M1_CB	Multifunction 1, channel B.

Number	Mactalk name	Range	Description
107	MAC00 module status	Na	Shows various status bits for the currently mounted Gen2 module.

Description: MAC00 module status - Shows various status bits for the currently mounted Gen2 module.

For the MAC00-B41 and –B42:
Bit 0: CVO voltage detected. This bit reflects if the voltage at the CVO terminal is above a hardwired default value. CVO is the supply voltage for the digital outputs.

Bit1: Digital Output overload. This shows the status of the output driver chip that controls the six or eight digital outputs. The overload status can be set if either an overcurrent condition or a too high temperature is detected. This status bit is not automatically cleared when these conditions are no longer present but requires a supply voltage off/on cycle.

Firmware Name: MAC00_2/Mod.stat

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	DO_OVERLOAD	**Digital Output overload:** For the MAC00-B41 and –B42, this register shows the status of the output driver chip that controls the six or eight digital outputs. The overload status can be set if either an overcurrent condition or a too high temperature is detected. This status bit is not automatically cleared when these conditions are no longer present, but requires a supply voltage off/on cycle.
1	CVO_DETECTED	**CVO voltage detected:** This bit reflects if the voltage at the CVO terminal is above a hardwired default value. CVO is the supply voltage for the digital outputs.

Number	Mactalk name	Range	Description
108	MAC00_3	Na	MAC00_3 - Not in use.

Firmware Name: MAC00_3

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
109	MAC00_4	Na	MAC00_4 - Not in use.

Firmware Name: MAC00_4

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
110	MAC00_5	Na	MAC00_5 - Not in use.

Firmware Name: MAC00_5

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
111	MAC00_6	Na	MAC00_6 - Not in use.

Firmware Name: MAC00_6

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
112	Ext. Counter inp.	Na	Counts the number of pulses received from an external encoder.

Description: Counts the number of pulses received from an external encoder, usually in Pulse In mode, but also possible to use with special switchboard setup. Can be preset at any time.

Firmware Name: MAC00_7

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
113	B41 digital outputs	Na	Controls the digital outputs O6..O1 on the MAC00-B41 module.

Description: Bits [5:0] of this register controls the digital outputs O6..O1 on the MAC00-B41 module. Each bit that is set here will enable the corresponding PNP output.

It is possible to overwrite these bits by using Registers 115-120, see below.

Also Reg215, IO_POLARITY, will invert the value of these bits before there are written to the hardware.

Firmware Name: MAC00_8

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	B41_DO1	Controls the digital output 1 on B41 modul.
1	B41_DO2	Controls the digital output 2 on B41 modul.
2	B41_DO3	Controls the digital output 3 on B41 modul.
3	B41_DO4	Controls the digital output 4 on B41 modul.
4	B41_DO5	Controls the digital output 5 on B41 modul.
5	B41_DO6	Controls the digital output 6 on B41 modul.

Number	Mactalk name	Range	Description
114	B41 digital output status	Na	Shows the status of each of the six digital outputs actually written to the hardware.

Description: Shows the status of each of the six digital outputs actually written to the hardware.
This value will be Reg113, possibly modified by Regs115-120 and finally possibly having some bits inverted by Reg215.

Firmware Name: MAC00_9

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	B41_STATUS_DO1	Shows B41 digital output 1 status.
1	B41_STATUS_DO2	Shows B41 digital output 2 status.
2	B41_STATUS_DO3	Shows B41 digital output 3 status.
3	B41_STATUS_DO4	Shows B41 digital output 4 status.
4	B41_STATUS_DO5	Shows B41 digital output 5 status.
5	B41_STATUS_DO6	Shows B41 digital output 6 status.

Number	Mactalk name	Range	Description
115	B41 output 1 configure	Na	Controls IO1 on MAC00-B41 (bit 0 in B41_DO).

Description:

B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 0 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_10

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
116	B41 output 2 configure	Na	Controls IO1 on MAC00-B41 (bit 1 in B41_DO).

Description:

B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 1 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_11

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
117	B41 output 3 configure	Na	Controls IO1 on MAC00-B41 (bit 2 in B41_DO).

Description:

B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 2 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_12

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
118	B41 output 4 configure	Na	Controls IO1 on MAC00-B41 (bit 3 in B41_DO).

Description: B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 3 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_13

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
119	B41 output 5 configure	Na	Controls IO1 on MAC00-B41 (bit 4 in B41_DO).

Description:

B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 4 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_14

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
120	B41 output 6 configure	Na	Controls IO1 on MAC00-B41 (bit 5 in B41_DO).

Description: B41 Output1 configure - Controls IO1 on MAC00-B41 (bit 5 in B41_DO).

Each of the B41_CONF5..CONF0 registers can be used to modify the corresponding digital outputs by effectively overwriting bits [5:0] in Reg113, B41_DO.

They can be set to replace the corresponding bit in B41_DO with any bit from any motor register in the range 1..254, typically status bits from Reg35, "Error status", for instance bits INPOS or ANY_ERR.

Bits [4:0]: Bit number in source register to use.
Bits [15:5]: Reserved
Bits [23:16]: Source register number, 1..254.
Bits [31:24]: reserved

Reg215, IO_POLARITY, will be applied after these registers to allow general inversion of each digital output bit.

Firmware Name: MAC00_15

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-4	BIT_IN_SOURCE	Bit number in source register to use.
5-14	RESERVED	Reserved.
15-22	SOURCE_REG	Source register number, 1..254.
23-30	RESERVED	Reserved.

Number	Mactalk name	Range	Description
121	KFF5	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF5

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
122	KFF4	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF4

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
123	KFF3	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF3

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
124	KFF2	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF2

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
125	KFF1	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF1

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
126	KFF0	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KFF0

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
127	KVFX6	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX6

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
128	KVFX5	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX5

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
129	KVFX4	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX4

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
130	KVFX3	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX3

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
131	KVFX2	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX2

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
132	KVFX1	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFX1

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
133	KVFY5	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY5

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
134	KVFY4	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY4

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
135	KVFY3	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY3

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
136	KVFY2	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY2

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
137	KVFY1	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY1

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
138	KVFY0	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVFY

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
139	KVB4	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVB4

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
140	KVB3	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVB3

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
141	KVB2	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVB2

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
142	KVB1	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVB1

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
143	KVB0	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KVB0

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
144	KIFX2/FOC_PIDQ_KP	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFX2/PIDQ_KP

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
145	KIFX1/FOC_PIDQ_KI	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFX1/PIDQ_KI

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
146	KIFY1/FOC_PIDQ_KD	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFY1/PIDQ_KD

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
147	KIFY0/FOC_PIDD_KP	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFY0/PIDD_KP

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
148	KIB1/FOC_PIDD_KI	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFB1/PIDD_KI

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
149	KIB0/FOC_PIDD_KD	Na	Filter coefficients used by the velocity and position regulator loops.

Description: Filter coefficients used by the velocity and position regulator loops. These values should be loaded only from MacTalk, and not modified by the user, since this can have dangerous effects.

Firmware Name: KIFB0/PIDD_KD

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
150-154	not present	Na	AI0-4 used (temporarily) for Artificial Intelligence for current loop optimization.

Firmware Name: AI0

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
155	ID_RESERVED	Na	Contains the last ID of the velocity filter written by MacTalk.

Firmware Name: ID_RESERVED

Data Type: uint32

Default Value: Na

Number	Mactalk name	Range	Description
156	S-Profile setup	Na	Modify/smooth the acceleration at the beginning and end of a change in velocity.

Description: An S-profile can be used to modify/smooth the acceleration at the beginning and end of a change in velocity. This is useful to prevent overshoot.
The value of zero disables the S-profile so the normal "Acceleration" is used. Values 1..8 can be used to select a progressively smoother S-profile, with 8 being the smoothest (and slowest).
The value of S_ORDER may not be changed unless the motor is in Passive mode (MODE_REG=0).

Firmware Name: S_ORDER

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	DISABLED	S-Profile is disabled.
1	S_PROFILE_1	1 out of 8 smoothening S-profile (the least smoothest).
2	S_PROFILE_2	2 out of 8 smoothening S-profile.
3	S_PROFILE_3	3 out of 8 smoothening S-profile.
4	S_PROFILE_4	4 out of 8 smoothening S-profile.
5	S_PROFILE_5	5 out of 8 smoothening S-profile.
6	S_PROFILE_6	6 out of 8 smoothening S-profile.
7	S_PROFILE_7	7 out of 8 smoothening S-profile.
8	S_PROFILE_8	8 out of 8 smoothening S-profile (The smoothest and slowest).

Number	Mactalk name	Range	Description
157	Sample time divider	Na	Divider value for the velocity loop.

Description: Divider value for the velocity loop. With the standard value of 1, the velocity loop is recalculated every 1.3 ms. With a value of 2, the loop is recalculated every 2.6 ms, which can give better performance for slow movements and/or large inertia.
In firmware v2-09 and later, it will also switch between 1.0 and 2.0 ms. if configured in Reg236, SETUP_BITS, to run 1.0 ms base.

It is absolutely necessary to use a different set of filters in Regs121-142 when changing this value.

To change this value from MacTalk, and gain access to the extended filters, open the Filter Setup window, then hold down both the Control and Shift keys and double-click on the text ‘More’ to the left of the ‘Stability’ slider (at the green end). After entering the correct password, Sample Frequency can be selected and MacTalk will use the appropriate filter set. Note that the units of all velocity-related register, measured in counts/sample will now be doubled, and all acceleration-related registers, measured in Counts/sample2, will be four times larger.

Firmware Name: OUTLOOPDIV

Data Type: int32

Default Value: 1

Number	Mactalk name	Range	Description
158	Sample 1	Na	Register number, bit field and min/max/average sample type for the first value in each sample.

Description: SAMPLE1..4 controls the scope/sample function.

Register number, bit field and min/max/average sample type for the first value in each sample.

Firmware Name: SAMPLE1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
159	Sample 2	Na	Register number, bit field and min/max/average sample type for the second value in each sample.

Description: SAMPLE1..4 controls the scope/sample function.

Register number, bit field and min/max/average sample type for the first value in each sample.

Firmware Name: SAMPLE2

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
160	Sample 3	Na	Register number, bit field and min/max/average sample type for the third value in each sample.

Description: SAMPLE1..4 controls the scope/sample function.

Register number, bit field and min/max/average sample type for the first value in each sample.

Firmware Name: SAMPLE3

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
161	Sample 4	Na	Register number, bit field and min/max/average sample type for the fourth value in each sample.

Description: SAMPLE1..4 controls the scope/sample function.

Register number, bit field and min/max/average sample type for the first value in each sample.

Firmware Name: SAMPLE4

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
162	Actual index - scope	Na	Index into the sample buffer used for scope functionality.

Description: Index into the sample buffer used for scope functionality. The length of the sample buffer, and thus the range of this parameter if determined by bit 23, SBUF_2048, in Reg39, HW_SETUP. See document/section “YY” for further information on the sample system.
Default : 511 or 2047.

Firmware Name: REC_CNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
163	Ext. encoder velocity	Na	Unscaled/Raw velocity of external encoder input in pulses per 1.3ms.

Description: Unscaled/Raw velocity of external encoder input in pulses per 1.3ms.

Firmware Name: V_EXT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
164	Ext. encoder velocity, geared	Na	Velocity of external encoder input V_EXT, after being scaled.

Description: Velocity of external encoder input V_EXT, after being scaled by the ratio GEARF1/GEARF2

Firmware Name: GV_EXT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
165	Not executed geared pulses	Na	Actual target velocity generated from the Gear mode function blocks.

Description: Actual target velocity generated from the Gear mode function blocks (that may be optimized for position or follow error depending on which gear mode is used).
With the VelAccHiRes option selected, this register holds only the lowest 32 bits of the 64-bit G_FNC value.

Firmware Name: G_FNC

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
166	FNC_OUT	Na	Output from the currently active function block.

Description: Output from the currently active function block. Acts as input to the velocity filter.

Firmware Name: FNC_OUT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
167	FF_OUT	Na	Output from the Feed Forward part of the velocity filter.

Description: Output from the Feed Forward part of the velocity filter.

Firmware Name: FF_OUT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
168	VB_OUT	Na	Value from the backwards calculation part of the velocity filter.

Description: Value from the backwards calculation part of the velocity filter.

Firmware Name: VB_OUT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
169	Actual torque	± 300	Actual torque. +/- 1023 means +/- 300 percent.

Description: Actual torque. +/- 1023 means +/- 300 percent.

Firmware Name: VF_OUT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
170	Analogue input	± 2047	Voltage (including applied ANINP_OFFSET) .

Description: Voltage (including applied ANINP_OFFSET) on the primary analogue input. +/- 2047 means +/- 10Vdc.

Firmware Name: ANINP

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
171	Analogue input offset	± 2047	Offset to the analogue input. Same scaling as Reg170, ANINP.

Description: Offset to be added or subtracted (in direct torque mode) to the hardware value of the analogue input. Same scaling as Reg170, ANINP.

Firmware Name: ANINP_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
172	ELDEG_OFFSET	Na	<used with motor current loop>

Firmware Name: ELDEG_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
173	PHASE_COMP	Na	<used with motor current loop>

Firmware Name: PHASE_COMP

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
174	AMPLITUDE	Na	<used with motor current loop>

Firmware Name: AMPLITUDE

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
175	MAN_I_NOM	Na	<used with motor current loop>

Firmware Name: MAN_I_NOM

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
176	MAN_ALPHA	Na	<used with motor current loop>

Firmware Name: MAN_ALPHA

Data Type: uint32

Default Value: Na

Number	Mactalk name	Range	Description
177	UMEAS	Na	<used with motor current loop>

Firmware Name: UMEAS

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
178	I_NOM/FOC_ANGLE	Na	<used with motor current loop>

Firmware Name: I_NOM/FOC_ANGLE

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
179	PHI_SOLL/FOC_IQ	Na	<used with motor current loop>

Firmware Name: PHI_SOLL/FOC_IQ

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
180	IA_SOLL/FOC_ID	Na	<used with motor current loop>

Firmware Name: IA_SOLL/FOC_ID

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
181	IB_SOLL/FOC_IQ_ERR	Na	<used with motor current loop>

Firmware Name: IB_SOLL/FOC_IQ_ERR

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
182	IC_SOLL/FOC_ID_ERR	Na	<used with motor current loop>

Firmware Name: IC_SOLL/FOC_ID_ERR

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
183	IA_IST	Na	<used with motor current loop>

Firmware Name: IA_IST

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
184	IB_IST	Na	<used with motor current loop>

Firmware Name: IB_IST

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
185	IC_IST	Na	<used with motor current loop>

Firmware Name: IC_IST

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
186	IA_OFFSET	Na	<used with motor current loop>

Firmware Name: IA_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
187	IB_OFFSET	Na	<used with motor current loop>

Firmware Name: IB_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
188	KIA	Na	<used with motor current loop>

Firmware Name: KIA

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
189	KIB	Na	<used with motor current loop>

Firmware Name: KIB

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
190	ELDEG_IST	Na	<used with motor current loop>

Firmware Name: ELDEG_IST

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
191	V_ELDEG	Na	<used with motor current loop>

Firmware Name: V_ELDEG

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
192	UA_VAL	Na	<used with motor current loop>

Firmware Name: UA_VAL

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
193	UB_VAL	Na	<used with motor current loop>

Firmware Name: UB_VAL

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
194	UC_VAL	Na	<used with motor current loop>

Firmware Name: UC_VAL

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
195	EMK_A/FOC_VQ	Na	<used with motor current loop>

Firmware Name: EMK_A/FOC_VQ

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
196	EMK_B/FOC_VD	Na	<used with motor current loop>

Firmware Name: EMK_B/FOC_VD

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
197	EMK_C	Na	<used with motor current loop>

Firmware Name: EMK_C

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
198	Bus voltage	Na	The actual voltage of the internal DC bus.

Description: The actual voltage of the internal DC bus, updated every 100 or 200 us. One count corresponds to ~0.888V.

Firmware Name: U_BUS

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
199	U_BUS_OFFSET	Na	Factory offset used to calibrate the measurement of Reg198, U_BUS.

Firmware Name: U_BUS_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
200	TC0_CV1	Na	<used by JVL only to monitor internal timing´>

Firmware Name: TC0_CV1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
201	TC0_CV2	Na	<used by JVL only to monitor internal timing´>

Firmware Name: TC0_CV2

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
202	Motor address	Na	The motor address used for the MacTalk protocol.

Description: The motor address used for the MacTalk protocol. The motor will respond to telegrams with this address or the broadcast address 255.

MY_ADDR can also be used for the Modbus protocol if selected in Reg212 and Reg213, UART1_SETUP:

Further, MY_ADDR can be read and used by the fieldbus modules for CANopen, DeviceNet and Profibus to define their address on the fieldbus, if not selected by DIP-switches on the MAC00-xx module.

Firmware Name: MY_ADDR

Data Type: int32

Default Value: 254

Number	Mactalk name	Range	Description
203	Motor type	Na	Type of JVL motor.

Description: Value read from factory flash memory to identify the type of motor.

Firmware Name: MOTOR_TYPE

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	Nope	
1	MAC50	## 46W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
2	MAC95	## 92W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
42	MAC50F	## 46W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
43	MAC50FB	## 46W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
38	MAC083F	## 83W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
39	MAC083FB	## 83W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules

#	Name	Description
44	MAC95F	## 92W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
45	MAC95FB	## 92W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
3	MAC140	## 134W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
46	MAC140F	## 134W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
47	MAC140FB	## 134W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
4	MAC141	## 134W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
48	MAC141F	## 134W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
49	MAC141FB	## 134W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
60	(MAC252F)	## 252W DC motor. * **Optional:** Battery free absolute multiturn

#	Name	Description
		#### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
61	MAC352	## 352W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
62	MAC352B	## 352W DC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
63	MAC320F	## 320W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
12	MAC400	## 400W VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
13	MAC400B	## 400W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
16	MAC402	## 400W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
17	MAC402B	## 400W DC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1040	MAC402G3	## 400W DC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules

#	Name	Description
1041	MAC402G3B	## 400W DC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1036	MAC404G3	## 400W VAC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1037	MAC404G3B	## 400W VAC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
40	MAC700	## 700W VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
41	MAC700B	## 700W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
14	MAC800	## 746W VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
15	MAC800B	## 746W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1038	MAC800G3	## 746W VAC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1039	MAC800G3B	## 746W VAC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules

#	Name	Description
		* Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
50	MAC802	#Not in production yet. ## 746W DC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
51	MAC802B	#Not in production yet. ## 746W DC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
52	MAC804	## 746W VAC motor. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
53	MAC804B	## 746W VAC motor with brake. * **Optional:** Battery free absolute multiturn #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
54	MAC806	#Not in production yet.
55	MAC806B	#Not in production yet.
56	MAC1000	## 1000W VAC motor #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
57	MAC1000B	## 1000W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1080	MAC1004G3	## 1000W 1x230VAC motor. * **Optional:** Battery free absolute multiturn
1081	MAC1004G3B	## 1000W 1x230VAC motor with brake. * **Optional:** Battery free absolute multiturn
58	MAC1200	## 1182W VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules

#	Name	Description
		* Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
59	MAC1200B	## 1182W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1082	MAC1200G3	## 1182W VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
1083	MAC1200G3B	## 1182W VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
18	MAC1500	## 1.5kW 3x400-480 VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
22	MAC1500B	## 1.5kW 3x400-480 VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
24	MAC3000	## 3.0kW 3x400-480 VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
25	MAC3000B	## 3.0kW 3x400-480 VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
34	MAC3000G	## 3.0kW 3x400-480 VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
35	MAC3000GB	## 3.0kW 3x400-480 VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules

#	Name	Description
		* High Speed Multi-Axis Modules * Wireless Modules
32	MAC4500	## 4.5kW 3x400-480 VAC motor. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules
33	MAC4500B	## 4.5kW 3x400-480 VAC motor with brake. #### Expansion module you can choose between: * Basic Modules * Programmable Modules * Field Bus Modules * High Speed Multi-Axis Modules * Wireless Modules

Number	Mactalk name	Range	Description
204	Serial number	Na	JVL serial number of the motor.

Description: Value read from factory flash memory to show the JVL serial number of the motor.

Firmware Name: SERIAL_NUMBER

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
205	HW Version	Na	JVL Hardware Version of the motor.

Description: Value read from resistor kombination on PCB to show the JVL Hardware version of the motor.

Firmware Name: HW_VERSION

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-3	Minor_hw	Value read from factory flash memory to identify the Minor version of the PCB controller board hardware.
4-7	Main_hw	Value read from factory flash memory to identify the Main version of the PCB controller board hardware.
8-15	RESERVED	Reserved.
16-19	Minor_bl	Value read from factory flash memory to identify the Minor version of the bootloader.
20-23	Main_bl	Value read from factory flash memory to identify the Main version of the bootloader.

Number	Mactalk name	Range	Description
206	Check sum	Na	Checksums of the firmware and the bootloader.

Description: Value read from factory flash memory to show the checksums of the firmware and the bootloader.

Firmware Name: CHKSUM

Data Type: uint32

Default Value: Na

Number	Mactalk name	Range	Description
207	Basic motor output 1 + 2	Na	User motor output 1 & 2.

Description: The values of bits [1:0] are output to the standard InPosition and ErrorOut hardware signals if the corresponding bits [9:8], USER_INPOS and USER_ERROR, in Reg39, HW_SETUP are set.

Firmware Name: USEROUTVAL

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0	BASIC_MOTOR_OUTPUT_1	The values of bits [1:0] are output to the standard InPosition and ErrorOut hardware signals.
1	BASIC_MOTOR_OUTPUT_2	The values of bits [1:0] are output to the standard InPosition and ErrorOut hardware signals.
2-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
208	Serial interface com. errors	0 - 2147483648	Number of communication errors on the MacTalk serial interface.

Description: Counts the number of communication errors that have occurred on the MacTalk serial interface. Errors can be framing errors and protocol data errors.

Firmware Name: COMM_ERRS

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
209	Single turn position	0 - 8191	Actual single-turn position of the internal encoder. (0-8191 or 0-7999)

Description: Actual single-turn position of the internal encoder, valid for both incremental and absolute encoders.
Max Default 8191 or 7999.

Firmware Name: INDEX_IST

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
210	Hardware Position limits - FSx	Na	Hardware position limits.

Description: Hardware position limits – used by the MAC00-FSx module.

Firmware Name: HW_PLIM

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	HWPLIM_NEG	Negative hardware position limit bit.
1	HWPLIM_POS	Positive hardware position limit bit.
2	HW_PLIM_MASK	Mask for any limit active in HW_PLIM.

Number	Mactalk name	Range	Description
211	Special Command	Na	Should be used with caution, as commands can change motor preformance.

Description:

Command register should be used with caution, as commands can change motor preformance.
1=Reset,
2=Save to flash and reset,
128..255 = Execute FastMac commands.

Other selected commands are described below. There are also several undocumented commands used internally for JVL factory and service. Please do not use undocumented commands, since this can lead to dangerous situations.
Commands are described with the hexadecimal numbers, like 0x1000 hex equal to 4096 decimal.

0x200, CMD_PMULTITURN_TO_POFFSET:
Copies the position from the absolute multi-turn encoder into its offset register with inverted sign. This can be used to set a new zero position for the absolute encoder. Please note a save in flash operation is required to use the new value.

0x1000: CMD_AUTO_ENC_ADJUST:
Will find the correct offset for an incremental encoder by turning the shaft rather slowly until the encoder index position is found. Please note the value will not be saved in flash, so if the offset is found to be wrong, compared to the flash value, the motor will have to be serviced by JVL. A wrong value can indicate that the encoder is defective or has slipped on the shaft.

0x100B, CMD_RXDUMP_ON:
0x100C, CMD_RXDUMP_OFF:
These two commands turn ON/OFF a debug function that writes each byte received in a Modbus telegram into registers 350 onwards. (In earlier firmwares register 49 onwards). This is used to see what data bytes the motor actually receives between two pauses in the communications.

0x1015, CMD_PID_OFF:
0x1016, CMD_PID_ON:
0x1017, CMD_PID_ON_DEBUG2:
0x1018, CMD_PID_ON_DEBUG3:
These can be used to activate/deactivate a general-purpose PID (Proportional/Integral/Derivate) closed loop function. This can be useful to control motor velocity or torque using an external sensor. Please contact JVL for more information, if needed.

0x101A, CMD_SET_REG_SCALE:
This sets on-the-fly scaling factors for one register from values in registers 158 through 162.
0x101B, CMD_GET_REG_SCALE:
This reads on-the-fly scaling factors for one register into values in registers 158 through 162.
0x101C, CMD_SET_REG_SCALE_DEFAULT:
Sets the scaling of all registers to 1.00.

On-the-fly scaling won't change the scaling of the registers inside the motor, but only scale during read/write operations on the MacTalk, Modbus or eRxP interfaces, as individually selected.

0x101F, CMD_COMM_LOG_ON:
0x1020, CMD_COMM_LOG_OFF:
Enables/disables logging of each register number and value (not byte) received/sent on the Modbus serial interface into the sample buffer. This is used to debug communications between the basic motor and interface modules or user Modbus communications. The data can be read using special tools from JVL, or accessed via the eRxP interface.

0x1026, CMD_SAFE_RESET:
This command will begin the process of saving in flash and reset. It is different than command value 2, since value 2 will abort without doing anything if the motor is not in passive mode at the time the command was received.
Command 0x1026 will first switch the motor into passive mode, wait for the shaft to reach a safe low speed, then save in flash and reset. In other words, this command can be given at any time.

0x1029, CMD_MACTALK_9600:
0x102A, CMD_MACTALK_19200:
0x102B, CMD_MACTALK_38400:
0x102C, CMD_MACTALK_57600:
0x102D, CMD_MACTALK_115200
0x102E, CMD_MACTALK_230400:
0x102F, CMD_MACTALK_444444:
0x1030, CMD_MACTALK_1MEGA:
The commands perform on-the-fly change of the baudrate on the MacTalk protocol. The reply to the telegram that writes this command will be with the old baudrate, and after the last bit of the reply has been transmitted, the motor will change to the new baudrate selected.

0x1032, CMD_MB0_RXDUMP_ON:
0x1033, CMD_MB0_RXDUMP_OFF:
Enable/disable dump of bytes received in Modbus0 to "Position Reg 1"..MODE3

0x1034, CMD_UART0_LOG_ON:
0x1035, CMD_UART0_LOG_OFF:
Enable/disable logging of fastmac/modbus communications on UART0 into the sample buffer, like command value 0x101F/0x1020 (that uses UART1).
This is used when running Modbus on the RS232 interface.

0x1038, CMD_SAVE2FLASH_CONTINUE:
This will save all 512 register in flash memory, but NOT reset afterwards. This can be used both when the motor is in Passive mode and also in active modes even while running.
This also means that the registers used for basic configuration during startup will not have effect before the next restart/reset.
This command is intended to save user registers (not directly used by the firmware), like positions found during machine learning.
The register range 350 through 499 are intended for this purpose. Other user registers, like the eight "Position Reg x", VELx, four ACCx, ZEROx, MODEx can also be used.

Firmware Name: COMMAND_REG

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0		
1	RESET	Resets motor Firmware.
2	SAVE_TO_FLASH_AND_RESET	Save all data to flash, and resets motor.
128-255	FASTMAC	Execute FastMac commands.
512	CMD_PMULTITURN_TO_POFFSET	Copies the position from the absolute multi-turn encoder into its offset register with inverted sign. This can be used to set a new zero position for the absolute encoder. Please note a save in flash operation is required to use the new value.
4096	CMD_AUTO_ENC_ADJUST	Will find the correct offset for an incremental encoder by turning the shaft rather slowly until the encoder index position is found. Please note the value will not be saved in flash, so if the offset is found to be wrong, compared to the flash value, the motor will have to be serviced by JVL. A wrong value can indicate that the encoder is defective or has slipped on the shaft.
4107	CMD_RXDUMP_ON	Turn ON a debug function that writes each byte received in a Modbus telegram into registers 350 onwards. (In earlier firmwares register 49 onwards). This is used to see what data bytes the motor actually receives between two pauses in the communications
4108	CMD_RXDUMP_OFF	Turn OFF a debug function that writes each byte received in a Modbus telegram into registers 350 onwards. (In earlier firmwares register 49 onwards). This is used to see what data bytes the motor actually receives between two pauses in the communications
4117	CMD_PID_OFF	Disables the general-purpose PID function.
4118	CMD_PID_ON	Enables the general-purpose PID function.
4119	CMD_PID_ON_DEBUG2	Enables the general-purpose PID function with medium debug (POSx).
4120	CMD_PID_ON_DEBUG3	Enables the general-purpose PID function with heavy debug (POSx+VELx).
4122	CMD_SET_REG_SCALE	This sets on-the-fly scaling factors for one register from values in registers 158 through 162.
4123	CMD_GET_REG_SCALE	This reads on-the-fly scaling factors for one register into values in registers 158 through 162.
4124	CMD_SET_REG_SCALE_DEFAULT	Sets the scaling of all registers to 1.00. On-the-fly scaling won't change the scaling of the registers inside the motor,

#	Name	Description
		but only scale during read/write operations on the MacTalk, Modbus or eRxP interfaces, as individually selected.
4127	CMD_COMM_LOG_ON	Enables logging of each register number and value (not byte) received/sent on the Modbus serial interface into the sample buffer. This is used to debug communications between the basic motor and interface modules or user Modbus communications. The data can be read using special tools from JVL, or accessed via the eRxP interface.
4128	CMD_COMM_LOG_OFF	Disables logging of each register number and value (not byte) received/sent on the Modbus serial interface into the sample buffer. This is used to debug communications between the basic motor and interface modules or user Modbus communications. The data can be read using special tools from JVL, or accessed via the eRxP interface.
4134	CMD_SAFE_RESET	This command will begin the process of saving in flash and reset. It is different than command value 2, since value 2 will abort without doing anything if the motor is not in passive mode at the time the command was received. Command 0x1026 will first switch the motor into passive mode, wait for the shaft to reach a safe low speed, then save in flash and reset. In other words, this command can be given at any time.
4137	CMD_MACTALK_9600	Changing MacTalk baud rate to 9600 bits per second. The CMD_MACTALK_xxxxx commands perform on-the-fly change of the baudrate on the MacTalk protocol. The reply to the telegram that writes this command will be with the old baudrate, and after the last bit of the reply has been transmitted, the motor will change to the new baudrate selected.
4138	CMD_MACTALK_19200	Changing MacTalk baud rate to 19200 bits per second.
4139	CMD_MACTALK_38400	Changing MacTalk baud rate to 38400 bits per second.
4140	CMD_MACTALK_57600	Changing MacTalk baud rate to 57600 bits per second.
4141	CMD_MACTALK_115200	Changing MacTalk baud rate to 115200 bits per second.
4142	CMD_MACTALK_230400	Changing MacTalk baud rate to 230400 bits per second.
4143	CMD_MACTALK_444444	Changing MacTalk baud rate to 444444 bits per second.
4144	CMD_MACTALK_1MEGA	Changing MacTalk baud rate to 1 Mbit per second.
4146	CMD_MB0_RXDUMP_ON	Enable dump of bytes received in Modbus0 to "Position Reg 1"..MODE3
4147	CMD_UART0_LOG_OFF	Disable dump of bytes received in Modbus0 to "Position Reg 1"..MODE3
4148	CMD_UART0_LOG_ON	Enable logging of fastmac/modbus communications on UART0 into the sample buffer, like command value 0x101F/0x1020 (that uses UART1). This is used when running Modbus on the RS232 interface.
4149	CMD_UART0_LOG_OFF	Disable logging of fastmac/modbus communications on UART0 into the sample buffer, like command value 0x101F/0x1020 (that uses UART1). This is used when running Modbus on the RS232 interface.
4152	CMD_SAVE2FLASH_CONTINUE	This will save all 512 register in flash memory, but NOT reset afterwards. This can be used both when the motor is in Passive mode and also in active modes even while running. This also means that the registers used for basic configuration during startup will not have effect before the next restart/reset. This command is intended to save user registers (not directly used by the firmware), like positions found during machine learning. The register range 350 through 499 are intended for this purpose. Other user registers, like the eight POSx, VELx, four ACCx, ZEROx, MODEx can also be used.

Number	Mactalk name	Range	Description
212	UART0: Setup serial MacTalk	Na	Setup for MacTalk serial communication.

Description: Setup of basic UART use - BaudRate, Protocol, Bitlength, Parity, Stopbits, TimeGuard, other Options..
Uses same bit-fields as reg213, UART1_SETUP, with the following exceptions:
Bits [7:4]: The value 0 means the MacTalk protocol (default)
Bits [31:16]: These are not used at all, and have no function.

Firmware Name: UART0_SETUP

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-3	UARTX_BAUDRATE_MASK	Basic Baud rate in bits per second. 0 = 9600, 1 = 19200 (Default), 2 = 38400, 3 = 57600, 4 = 115200, 5 = 230400, 6 = 444444, 7 = 1000000, 8 = 2000000.
4-7	UARTX_PROTOCOL_MASK	Protocol to use – select 1 for Modbus. The option to use Modbus address 254 (instead of the motor address) is intended for use with the JVL. 0 = MacTalk protocol (Default), 1 = Modbus (motor address), 2 = Modbus (address 254), 3 = OMRON(subset) .
8-9	UARTX_BITSNO_MASK	Number of data bits in a byte. Modbus always uses 8 bits per byte. 3=8 data bits.
10	UARTX_SYNC_MASK	USART works in 0=Asynch mode 1=Synchr mode - only Asynch mode supported.
11-13	UARTX_PARITY_MASK	Parity scheme. Modbus should use other Even or Odd parity for maximum error checking. 0 = Even, 1 = Odd, 2 = Space, 3 = Mark, 4 = None, 5 = None, 6 = Multidrop, 7 = Multidrop Parity. Multi drop parity is not supported by Modbus, but a non-standard multi-drop operation is supported, see bit 20 and 21.
14-15	UARTX_STOPBITS_MASK	Number of stop bits to use. 0 = 1 stop bit, 1 = 1.5 stop bits, 2 = 2 stop bits.
16-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
213	UART1: Setup serial RS422/MF1	Na	Setup for RS422/MF1 serial communication.

Description: Setup of basic UART use - BaudRate, Protocol, Bitlength, Parity, Stopbits, TimeGuard, other Options..
This register selects the type of protocol to use on the Serial Data interface.

Firmware Name: UART1_SETUP

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-3	UARTX_BAUDRATE_MASK	Basic Baud rate in bits per second. 0 = 9600, 1 = 19200 (Default), 2 = 38400, 3 = 57600, 4 = 115200, 5 = 230400, 6 = 444444, 7 = 1000000, 8 = 2000000.
4-7	UARTX_PROTOCOL_MASK	Protocol to use – select 1 for Modbus. The option to use Modbus address 254 (instead of the motor address) is intended for use with the JVL. 0=FastMac *, 1=Modbus (motor address), 2=Modbus (address 254), 3=OMRON(subset) .
8-9	UARTX_BITSNO_MASK	Number of data bits in a byte. Modbus always uses 8 bits per byte. 3=8 data bits.
10	UARTX_SYNC_MASK	USART works in 0=Asynch mode 1=Synchr mode - only Asynch mode supported.
11-13	UARTX_PARITY_MASK	Parity scheme. Modbus should use other Even or Odd parity for maximum error checking. 0 = Even, 1 = Odd, 2 = Space, 3 = Mark, 4 = None, 5 = None, 6 = Multidrop, 7 = Multidrop Parity. Multi drop parity is not supported by Modbus, but a non-standard multi-drop operation is supported, see bit 20 and 21.
14-15	UARTX_STOPBITS_MASK	Number of stop bits to use. 0 = 1 stop bit, 1 = 1.5 stop bits, 2 = 2 stop bits.
16-19	UARTX_GUARDTIME_MASK	Guard –time. Number of idle bit times between bytes during transmission. These can be seen as additional stop bits. Normally this value is set to zero, but with some UARTs that have trouble synchronising when long telegrams, this value can be set to non-zero. Setting this value non-zero may help visually separating bytes on an oscilloscope. Value can be 0..15.
20	UARTX_TRISTATE	bit-20 enables Tx tranceiver tri-stating after any Modbus, +sometimes MacTalk, transmission has completed (DIRA signal).

#	Name	Description
21	UARTX_FULLDUPLEX	if set, does NOT disable the UART receiver during transmission (default is to do so, to support 2-wire RS485).
22-23	UARTX_reserved	reserved for future use - (further option bits).
24	UARTX_OPT_SLAVE_MASK	UARTX_OPT_SLAVE_MASK and UARTX_OPT_MST_MASK For normal operation where a PC or PLC talks to one or more motors, set these bits to zero. Following settings exist: 0=Passive server, 1=Active server with timeout monitoring, 2=Client (bus master) operation to transfer, 3 = value to mean that embedded nanoPLC RxP is modbus master.
25	UARTX_OPT_MST_MASK	UARTX_OPT_SLAVE_MASK and UARTX_OPT_MST_MASK For normal operation where a PC or PLC talks to one or more motors, set these bits to zero. Following settings exist: 0=Passive server, 1=Active server with timeout monitoring, 2=Client (bus master) operation to transfer, 3 = value to mean that embedded nanoPLC RxP is modbus master.
26-29	UARTX_OPT_MS_MASK	For Modbus: Timeout in MilliSeconds before COMM_ERR and slave goes passive.

Example:

Modbus with MacTalk channel RS232 or RS485

This document describes how to set up hardware and software to use Modbus on the MacTalk with on any module mounted in a BigMac motor.

Hardware
This setup is for an RS485 connection with two wires plus ground.

To use Modbus, connect the three wires from the Modbus master to the “IO” M12 8-pin male connector on the MAC00-B4 as follows:

RS485+ must be connected to both pins 1 and 3.
RS485- must be connected to both pins 2 and 4.
Ground must be connected to pin 7.

Set DIP switches 1 and 4 to ON. Set DIP switches 2 and 3 to OFF.
Set DIP switch 6 to ON on the module at the end of the RS485 cable or set it OFF on modules that are not at the end of the RS485 cable.

Note that Modbus can only be used with the “IO” connector – it can not be used with the “COM1” or “COM2” connectors. Modbus can not be used over RS232.

Software
Modbus uses another physical connection to the motor than regular MacTalk. Both MacTalk and Modbus can be used simultaneously.

None of the released versions of MacTalk gives access to the complete Modbus setup at the time of this writing. It is therefore necessary to use MacReglo:

The Modbus master and slaves must be configured to the same values for: Baudrate, Parity and Number of stop bits. The Modbus standard recommends to use Even parity and one stop bit. The node address is normally the same address as the motors MacTalk address.

1. Write one of the values 0x310 ..0x317 to register 213.
2. Write the wanted node address to register 202.
3. Press the “Enter Safemode” button
4. Press the “Write To Flash” button.

The motor will then reset and will respond to valid Modbus telegrams of types 3 (Read Holding Registers) and type 16 (Write Registers)

Number	Mactalk name	Range	Description
214	Signal Setup Label app.	Na	Supports setup for label dispenser functionality with the MAC00-B41 module.

Description: Supports setup of signals used for label dispenser functionality with the MAC00-B41 module.

Firmware Name: EXTENC_BITS

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	NACHLAUF_MASK	itmask to isolate index to Px register used for nachlauf.
4-6	DISP_STARTINPUT_MASK	selects input 1..6 on B41 for the dispenser start signal.
7	DISPSTART_EDGE	Disp start edge.
8	DISP_STOPINPUT_MASK	selects input 1..6 on B41 for the dispenser stop signal.
9	DISPSTOP_EDGE	Disp stop edge.
10	DISPENS_ENABLED	When this bit is set, the extenc signal is gated.
11	DISPENS_WAIT_JITTER	When this bit is set, FW will busy-wait (!) to reduce start/stop signal jitter.
12-13	RESERVED	Reserved.
14	FORLAUF_MASK	Bitmask to isolate index to Px register used for forlauf in gear/dispenser mode.
15-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
215	IO_POLARITY	Na	Invert logical state of hardware inputs in Reg106, DIGITAL_INPUTS

Description: Can be used to individually invert logical state of hardware inputs in Reg106, DIGITAL_INPUTS

Firmware Name: IO_POLARITY

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
216	Analog input 1	± 2047	The input of hardware analogue input 1.

Description: The input of hardware analogue input 1 (primary, available on all modules).
This value can be read at all times, also if the analogue input selected for motor control is selected to be one of ANINP2 or ANINP3.

Firmware Name: ANINP1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
217	Analog input 1 offset	± 2047	Offset for Reg216 analogue input 1.

Description: Offset for Reg216 analogue input 1.

Firmware Name: ANINP1_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
218	Analog input 2	± 2047	The input of hardware analogue input 2.

Description: The input of hardware analogue input 2 (secondary, available on B41 and Ex41, more to come)
This value can be read at all times, also if the analogue input selected for motor control is selected to be one of ANINP1 or ANINP3.

Firmware Name: ANINP2

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
219	Analog input 2 offset	± 2047	Offset for Reg218 analogue input 2.

Description: Offset for Reg218 analogue input 2.

Firmware Name: ANINP2_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
220	Analog input 3	± 2047	The input of hardware analogue input 3 .

Description: The input of hardware analogue input 3 (tertiary, available on P4 and P5 only, as a 4-20 mA current).
This value can be read at all times, also if the analogue input selected for motor control is selected to be one of ANINP1 or ANINP2.

Firmware Name: ANINP3

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
221	Analog input 3 offset	Na	Offset for Reg220 analogue input 3 .

Description: Offset for Reg220 analogue input 3 .

Firmware Name: ANINP3_OFS

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
222	Analog input selector	Na	Changes analogue input 1 with analogue input X.

Description: Selects which hardware analogue input signal that goes to the main ANINP register 170 that controls the analogue modes of the motor.

Bits 3:0 values supported:
0: ANINP = Reg216_ANINP1 + Reg171_ANINP_OFFSET
1: ANINP = Reg216_ANINP1 + Reg217_ANINP1_OFFSET
2: ANINP = Reg218_ANINP2 + Reg219_ANINP2_OFFSET
3: ANINP = Reg220_ANINP3 + Reg221_ANINP3_OFFSET

Bits 31:4 are reserved for future use, keep them zeroed.

Firmware Name: IOSETUP

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	REG216_PLUS_REG171	ANINP = Reg216_ANINP1 + Reg171_ANINP_OFFSET
1	REG216_PLUS_REG217	ANINP = Reg216_ANINP1 + Reg217_ANINP1_OFFSET
2	REG218_PLUS_REG218	ANINP = Reg218_ANINP2 + Reg219_ANINP2_OFFSET
3	REG220_PLUS_REG221	ANINP = Reg220_ANINP3 + Reg221_ANINP3_OFFSET

Number	Mactalk name	Range	Description
223	Analog output	Na	Analog output to the 4-20 mA hardware output on the MAC00-P5/P4 modules.

Description: The value written here by the user, or by the firmware, will be output to the 4-20 mA hardware output on the MAC00-P5/P4 modules.

Firmware Name: ANOUT1

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
224	Analog output offset	Na	Offset that is added to ANOUT1 before writing to hardware.

Firmware Name: ANOUT1_OFS

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
225	Abs Enc. offset	± 2147483648	Used to adjust the zero position for absolute multi-turn encoders.

Description: Register only available and functional at motors with absolute multiturn encoder in generation 1 and 2 motors. These are MAC400, 402, 800, 1000, 1200, 1500, 3000 and 4500.

Firmware Name: P_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
226	Abs. Enc. Pos.	Na	The full multi-turn position read directly from the absolute encoder, if mounted.

Description: Register only available and functional at motors with absolute multiturn encoder in generation 1 and 2 motors. These are MAC400, 402, 800, 1000, 1200, 1500, 3000 and 4500.

Firmware Name: P_MULTITURN

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
227	Analog input filter slope	Na	limit the rise time on the currently selected analogue input.

Description: Can limit the rise time on the currently selected analogue input a this number of samples per cycle time.

Firmware Name: AIFILT_SLOPE

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
228	Analog input filter factor	Na	Can be set to filter the currently selected analogue input.

Description: Can be set to filter the currently selectd analogue input by taking 1/X of each new value plus the remaining part from the old value, instead of just replacing the valid value with 100 percent of the new value.

Firmware Name: AIFILT_FILTER

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
229	Fast act. pos. 100uS	Na	The fast actual position of the internal encoder.

Description: The actual position of the internal encoder. Much like P_IST, but updated every 100us. "Actual position"is updated only once every 1.3ms (or 2.6 ms for OUTLOOPDIV=2).

Firmware Name: P_QUICK

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
230	Indirect register addr	Na	Address of extended registers, XREGs.

Description: Address of extended registers, XREGs.
A positive value will write the contents of Reg231, XREG_DATA, to that register.
A negative value will cause the value of that XREG to be writen to XREG_DATA.
After the reading or writing operation has completed, XREG_ADDR will be set to zero.
The first NN XREGs are used for configuration of the switchboard for hardware signals that can be routed in several ways through the FPGA in MAC800 HW 1.8 and later or MAC400 HW1.

Firmware Name: XREG_ADDR

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
231	Indirect register data	Na	Data to or from extended registers.

Description: Data to or from extended registers. See XREG_ADDR for description

Firmware Name: XREG_DATA

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
232	Fieldbus address	Na	Can be used to override DIP switches for bus address on some modules, like MAC00-FCx.

Description: Can be used to override DIP switches for bus address on some modules, like MAC00-FCx.

Firmware Name: FIELDBUS_ADDR

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
233	Fieldbus Speed	Na	Can be used to override DIP switches for bus speed on some modules, like MAC00-FCx

Description: Can be used to override DIP switches for bus speed on some modules, like MAC00-FCx

Firmware Name: FIELDBUS_SPEED

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
234	ePLC setup	Na	Controls operation of the built-in nanoPLC/eRxP.

Description: Controls operation of the built-in nanoPLC/eRxP.
Controls basic operation mode and the option to don't start program after power up.

Firmware Name: RXP_SETUP

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0-3	RXP_RUN_MODE	0=do not run at all, 1=run one instruction every 100us , 2=run til (200?) timer ticks.
4		If this bit is set, the PxP program won't start.
5	RXP_OPTION_A	Not in use.
6	RXP_OPTION_B	Not in use.
7	RXP_OPTION_C	Not in use.
8-10	RESERVED.	Reserved.
11	RXP_B41_TO_RXP	Convert B41 to virtual RxP for testing with old MacTalks.
12	RXP_FORCED_NOT_USED	Execute RxP for all module types (override auto detect).
13-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
235	Error Status register 2	Na	Expansion of Reg35, "Error status".

Firmware Name: ERR_STAT_2

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	P_MULTI_UPDATE_ERR2	This bit is set, when having absolutemultiturn with Wiegand sensor, and the communication to PMX fails.
1	RXP_DONT_START_PROGRAM	

Number	Mactalk name	Range	Description
236	Setup Bits special	Na	Various setup bits to enable special functions:

Description:

Bit 0: ZUP_PID_ON
Enable general-purpose PID mode.

Bit 1: ZUP_PID_DEBUG
Enable debug outputs for PID mode.

Bit 2: ZUP_MODBUS_SCALE
Enable on-the-fly scaling on the main Modbus interface.

Bit 3: ZUP_MACTALK_SCALE
Enable on-the-fly scaling on the MacTalk interface – also works when this is configured for Modbus operation.

Bit 4: ZUP_NANOPLC_SCALE
Enable on-the-fly scaling in the eRxP system.

Bit 5: ZUP_MAX_SPEED_4000
Increase the limit for over speed error. Only for special very short-run applications.

Bit 6: ZUP_PWM0_IN_PASSIVE
Enable braking of the motor shaft in Passive mode instead of fully releasing the shaft. This is done by a short-circuiting of the motor windings.

Bit 7: ZUP_ABSENC_FLASH_BACKUP
Enable the system to store actual position and absolute multi-turn encoder value at power down or reset, then restore actual position based on this information on the following power up.

Bit 8: ZUP_Px_OFFSET
In paired Modbus mode, add an offset to the actual position before sending.

Bit 9: ZUP_PSOLL_PAIR
In paired Modbus mode, send target position instead of actual position (still with a possible offset above)

Bit 10: ZUP_VSOLL_PAIR
In paired Modbus mode, send the target velocity instead of a position.

Bit 11: RESERVED
Reserved.

Bit 12: ZUP_MEM_READ_WRITE
Enable the system to translate reads and writes to V8 into reads/writes to memory in scope memory or base data.

Bit 13: ZUP_MS1_0
Set the basic cycle time to 1-.0 ms instead of classic 1.3 ms. Must save to flash before it will work.

Bit 14: ZUP_LFLASH
Option to overwrite the flash memory size on hardware where this cannot be reliably detected.

Bit 15: ZUP_CLASSIC_ERROR_MASK
Backwards compatibility option to use fewer bits in Reg35, ERR_STAT to set an error and the ANY_ERR bit.

Bit 16: ZUP_DISABLE_CURLOOP_ERR
Option to disable errors from the 4-20 mA current input on MAC00-P4/5 modules (if the input is not used).

Bit 17: ZUP_VFOUT_PASSIVE
Option to keep the actual torque updated also in Passive mode.

Bit 18: ZUP_ZUP_USER_ANINP.
Prevents the firmware update of register 170, ANINP. This allows the user to provide the value directly, which can be useful for modes controlled by the analogue input.

Bit 19: ZUP_INPOS_PASSIVE
Set to keep the InPosition bit updated also in Passive mode. Please note this uses a simpler algorithm than in the active modes, in that it simply uses the difference between the actual position and the target position in comparison to the InPositionWindow and InPositonCount. It does not compensate for follow error etc.

Bit 20: ZUP_CLEAR_MODECHANGE
When this bit is set, any data in the velocity filters is zeroed during a switch between two active modes, like when going

from Position mode into Velocity mode. This can be used as a special case quick anti-windup mechanism, but it is not recommended in most applications.

Bit 21: ZUP_PWM0_ON_ERROR
Enable braking of the motor shaft instead of fully releasing the shaft when motor error is detected. This is done by a short-circuiting of the motor windings. Will not activate when peak error is detected. This is similar to setting ZUP_PWM0_IN_PASSIVE, except braking is only activated when error is detected.

Bit 22: ZUP_PDTYPE_68OHM
This is to explicitly override the type of built-in brake resistor.

Bit 23: ZUP_PDTYPE_150OHM
This is to explicitly override the type of built-in brake resistor.

Bit 24: ZUP_AUTO_START_MODE
Selects to switch mode to the value in the START_MODE register when AC supply or STO inputs come back after beginning absent.

Bit 25: ZUP_DELAYED_AC_OK
Makes the motor start in the mode selected in the START_MODE register also in the start up case where +24Vdc control voltage is present before AC supply is present. If this bit is not set, the motor will stay in Passive mode in this condition.

Bit 26:ZUP_VSOLL_HIRES
Selects VelAccHiRes mode. In this mode, the scaling and accuracy of both Velocity and Acceleration setpoints V_SOLL and A_SOLL is 64 times higher than normal.
This allows a more accurate setting of target velocity, especially useful at low speeds, like 20 RPM. It provides a resolution of better than 0.01 RPM per count.
The Acceleration can also be made much more smoothly.
Please request a separate document from JVL if you need tables of RPM or RPM/S per count for the different sample times and encoder resolutions.

Bit 27: RESERVED
Must be written as zero.

Bit 28: RESERVED
Must be written as zero.

Bit 29: RESERVED
Must be written as zero.

Bit 30: RESERVED
Must be written as zero.

Bit 31: RESERVED
Must be written as zero.

Firmware Name: SETUP_BITS

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	ZUP_PID_ON	Enable general-purpose PID mode.
1	ZUP_PID_DEBUG	Enable debug outputs for PID mode.
2	ZUP_MODBUS_SCALE	Enable on-the-fly scaling on the main Modbus interface.
3	ZUP_MACTALK_SCALE	Enable on-the-fly scaling on the MacTalk interface – also works when this is configured for Modbus operation.
4	ZUP_NANOPLC_SCALE	Enable on-the-fly scaling in the eRxP system.
5	ZUP_MAX_SPEED_4000	Increase the limit for over speed error on MAC800 (only) for special very short-run applications.
6	ZUP_PWM0_IN_PASSIVE	Enable braking of the motor shaft in Passive mode instead of fully releasing the shaft. This is done by a hard short-circuiting of the motor windings, that also means no braking energy will be returned to the DC bus.
7	ZUP_ABSENC_FLASH_BACKUP	Enable the system to store actual position and absolute multi-turn encoder value at power down or reset, then restore actual position based on this information on the following power up.

#	Name	Description
8	ZUP_Px_OFFSET	In paired Modbus mode, add an offset to the actual position before sending.
9	ZUP_PSOLL_PAIR	In paired Modbus mode, send target position instead of actual position (still with a possible offset above)
10	ZUP_VSOLL_PAIR	In paired Modbus mode, send the target velocity instead of a position.
11	RESERVED	Reserved.
12	ZUP_MEM_READ_WRITE	Enable the system to translate reads and writes to V8 into reads/writes to memory in scope memory or base data.
13	ZUP_MS1_0	Set the basic cycle time to 1-.0 ms instead of classic 1.3 ms. Must save to flash before it will work.
14	ZUP_LFLASH	Option to overwrite the flash memory size on hardware where this cannot be reliably detected.
15	ZUP_CLASSIC_ERROR_MASK	Backwards compatibility option to use fewer bits in Reg35, ERR_STAT to set an error and the ANY_ERR bit.
16	ZUP_DISABLE_CURLOOP_ERR	Option to disable errors from the 4-20 mA current input on MAC00-P4/5 modules (if the input is not used).
17	ZUP_VFOUT_PASSIVE	Option to keep the actual torque updated also in Passive mode.
18	ZUP_ZUP_USER_ANINP.	Prevents the firmware update of register 170, ANINP. This allows the user to provide the value directly, which can be useful for modes controlled by the analogue input.
19	ZUP_INPOS_PASSIVE	Set to keep the InPosition bit updated also in Passive mode. Please note this uses a simpler algorithm than in the active modes, in that it simply uses the difference between the actual position and the target position in comparison to the InPositionWindow and InPositonCount. It does not compensate for follow error etc.
20	ZUP_CLEAR_MODECHANGE	When this bit is set, any data in the velocity filters is zeroed during a switch between two active modes, like when going from Position mode into Velocity mode. This can be used as a special case quick anti-windup mechanism, but it is not recommended in most applications.
21	ZUP_BRAKE_IN_PASSIVE	Enable braking of the motor shaft in Passive mode instead of fully releasing the shaft. This is done by a soft short-circuiting of the motor windings. This will result in braking energy being returned to the DC bus, causing increasing voltage.
22	ZUP_PDTYPE_68OHM	This is to explicitly override the type of built-in brake resistor.
23	ZUP_PDTYPE_150OHM	This is to explicitly override the type of built-in brake resistor.
24	ZUP_AUTO_START_MODE	Selects to switch mode to the value in the START_MODE register when AC supply or STO inputs come back after beginning absent.
25	ZUP_DELAYED_AC_OK	Makes the motor start in the mode selected in the START_MODE register also in the start up case where +24Vdc control voltage is present before AC supply is present. If this bit is not set, the motor will stay in Passive mode in this condition.
26	ZUP_VSOLL_HIRES	Selects VelAccHiRes mode. In this mode, the scaling and accuracy of both Velocity and Acceleration setpoints V_SOLL and A_SOLL is 64 times higher than normal. This allows a more accurate setting of target velocity, especially useful at low speeds, like 20 RPM. It provides a resolution of better than 0.01 RPM per count. The Acceleration can also be made much more smoothly. Please request a separate document from JVL if you need tables of RPM or RPM/S per count for the different sample times and encoder resolutions.
27	RESERVED	Must be written as zero.
28	RESERVED	Must be written as zero.
29	RESERVED	Must be written as zero.
30	RESERVED	Must be written as zero.
31	RESERVED	Must be written as zero.

Number	Mactalk name	Range	Description
237	STATUS_BITS	Na	Bits to indicate internal status, not otherwise visible:

Firmware Name: STATUS_BITS

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	SB_IN_SYNC	The Ethernet option Synchronized Clock is working and has synchronized.
1	SB_BIG_FLASH	The microcontroller has been detected to have large enough flash to enable saving eRxP, Scaling values, switchboard setup, and the position flash backup system.
2	SB_MB_UART0	Modbus has been actually enabled on the serial channel normally used for MacTalk.
3	SB_SYNC_ENAB	Motor received the command to enable synchronized clock.
4	SB_RXP_PW_LOCK	The ePLC/eRxP password lock is active because of mismatch between user and program passwords). This means the program cannot be read from the motor until the correct password is given. It is still possible to send a new program to the motor.
5		When using the Industrial Ethernet protocols with a SYNC0 signal, this bit indicates which of two sample points is used.
6	SB_BRAKE_RES_ON	ON Status of the brake resistor. Useful for high-resolution scope/sampling.
7	RESERVED	Reserved.
8	RESERVED	Reserved.
9	RESERVED	Reserved.
10	RESERVED	Reserved.
11	RESERVED	Reserved.
12	RESERVED	Reserved.
13	RESERVED	Reserved.
14	RESERVED	Reserved.
15	RESERVED	Reserved.
16	RESERVED	Reserved.
17	RESERVED	Reserved.
18	RESERVED	Reserved.
19	RESERVED	Reserved.
20	RESERVED	Reserved.
21	RESERVED	Reserved.
22	RESERVED	Reserved.
23	RESERVED	Reserved.
24	RESERVED	Reserved.
25	RESERVED	Reserved.
26	RESERVED	Reserved.
27	RESERVED	Reserved.
28	RESERVED	Reserved.
29	RESERVED	Reserved.

#	Name	Description
30	RESERVED	Reserved.
31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
238	STO INPUTS	Na	RM4 only Safe Torque Off Input register.

Description: RM4 only and only when STO installed.
STO (Safe Torque Off) is a mechanism that prevents the drive from restarting unexpectedly.

Bit 0: STO-A below threshold
Bit 1: STO-B below threshold
Bit 2: STO-ALARM set
Bit 3: STO is enabled

If bit 3 is high, bit 0:2 will show status of STO input pins

Firmware Name: STO_INPUTS

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	STO_A	STO-A below threshold (Only If bit 3 is set, bit 0:2 will show status of STO input pins) RM4 Only.
1	STO_B	STO-B below threshold (Only If bit 3 is set, bit 0:2 will show status of STO input pins) RM4 Only.
2	STO_ALARM	STO-ALARM set (Only If bit 3 is set, bit 0:2 will show status of STO input pins RM4 Only).
3	STO_ENABLED	STO is enabled (Only If this is set, bit 0:2 will show status of STO input pins) RM4 Only.
4	RESERVED	Reserved.
5	RESERVED	Reserved.
6	RESERVED	Reserved.
7	RESERVED	Reserved.
8	RESERVED	Reserved.
9	RESERVED	Reserved.
10	RESERVED	Reserved.
11	RESERVED	Reserved.
12	RESERVED	Reserved.
13	RESERVED	Reserved.
14	RESERVED	Reserved.
15	RESERVED	Reserved.
16	RESERVED	Reserved.
17	RESERVED	Reserved.
18	RESERVED	Reserved.
19	RESERVED	Reserved.
20	RESERVED	Reserved.
21	RESERVED	Reserved.
22	RESERVED	Reserved.
23	RESERVED	Reserved.
24	RESERVED	Reserved.
25	RESERVED	Reserved.

#	Name	Description
26	RESERVED	Reserved.
27	RESERVED	Reserved.
28	RESERVED	Reserved.
29	RESERVED	Reserved.
30	RESERVED	Reserved.
31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
239	STO VALUES	Na	RM4 only Safe Torque Off values register.

Description: RM4 only and only when STO installed.
STO (Safe Torque Off) is a mechanism that prevents the drive from restarting unexpectedly.

Bit 15-0 : STO sense A ADC value (11:0)
Bit 31-16 : STO sense B ADC value (27:0)

STO SENSE A and B values
Note: only 12 bit used

Firmware Name: STO_VALUES

Data Type: uint32

Default Value: 0

Type:

#	Name	Description
0-11	STO_SENSE_A	STO sense A ADC value
12-15	RESERVED	Always Zero
16-27	STO_SENSE_B	STO sense B ADC value
28-31	RESERVED	Always Zero

Number	Mactalk name	Range	Description
240	Modbus frmn/Par. err. cnt.	0 - 4294967296	Counter of Modbus framing and parity errors.

Description: Counter of Modbus framing and parity errors – may be useful to debug Modbus communications problems.

Firmware Name: FRAME_ERRORS

Data Type: uint16

Default Value: 0

Number	Mactalk name	Range	Description
241	ModBus CRC err. cnt.	Na	Counter of Modbus CRC errors.

Description: Counter of Modbus CRC errors – may be useful to debug Modbus communications problems.

Firmware Name: CRC_ERRORS

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
242	Error Info - Special	Na	NOTE: This is intended only for JVL technicians.

Description:

NOTE: This is intended only for JVL technicians.
Additional information on the type of the last error. Some bits in register 35, "Error status", can have multiple causes; this register helps to pinpoint the exact cause. Values supported in FW v2.12:

0 = No information.

1 = ERR_INFO_LATE_PWM :
PWM values were delivered too late to the FPGA.
Register ERR_VALUE contains the time PWM was written (> 833 == error)

2 = ERR_INFO_HISPEED:
Overspeed measured in OUT_PWM.
Register ERR_VALUE contains the measured speed

3 = ERR_INFO_MISS_INDEX
Encoder count too large measured in OUT_PWM.
Register ERR_VALUE contains number of misses
Probably electrical noise or encoder hardware error.

4 = ERR_INFO_HISPEED_SLOW:
Overspeed measured over the last 1.x ms OUTLOOP.
Register ERR_VALUE contains the measured speed.

5 = ERR_INFO_IA:
CHECK_IAB failed check of IA, too high/low.
Register ERR_VALUE contains the measured current.

6 = ERR_INFO_IB:
CHECK_IAB failed check of IB, too high/low.
Register ERR_VALUE contains the measured current

7 = ERR_INFO_IC:
CHECK_IC failed check of IC, too high/low.
Register ERR_VALUE contains the measured current

8 = ERR_INFO_ICNT:
Current filter output clipped for too long.
ALIM_CNT found too many limited current requests in a row.
Register ERR_VALUE contains number of counts.

9 = ERR_INFO_FPGA_INDEX: (Not RM4)
FPGA detected an encoder index error more than N times in a row.
Register "Error value - Special" contains data read from FPGA.

10 = ERR_INFO_ADC_INIT:
Analog input hardware error during power up, most
likely the +5.0V reference voltage is missing.

11 = ERR_INFO_PROD_VERS:
Presence of the internal 125kHz signal does not match the factory flashed hardware version.

12 = ERR_INFO_ENC_OVER_35RPM: (Not RM4)
The encoder velocity detected during early startup was above approximately 35 RPM. This will set an INIT_ERROR, because the commutation angle is unsafe.

13 = ERR_INFO_CAI_TAIL:
Encoder index error detected in inner lop tail.

14 = ERR_INFO_CA_M806_TAIL:
(index error special tor MAC80x).

15 = ERR_INFO_DMA_AREA: (RM4 only)
DMA area too large at startup.

16 = ERR_INFO_MHM_CAL: (RM4 only)
MHM encoder calibration failed.

17 = ERR_INFO_MHM_INIT: (RM4 only)
MHM encoder initialization failed.
Register ERR_VALUE contains the status register value of the MHM chip.

18 = ERR_INFO_MHM_STATUS: (RM4 only)
MHM claimed error when reading position through SPI.

19 = ERR_INFO_MHM_POSITION: (RM4 only)
Internal quadrature encoder is not in line with value read from SPI.

20 = ERR_INFO_STO_SENSEA:
STOA below threshold.

21 = ERR_INFO_STO_SENSEB:
STOB below threshold.

22 = ERR_INFO_STO_ALARM:
STO ALARM pin set.

23 = ERR_INFO_BISS: (RM4 only)
Biss encoder was expected but not found during initialization.
This is a major error. Motor will not run when this is encountered.

24 = ERR_INFO_PRODUCTIONDATA: (RM4 only)
Production data header not found during initialization.
This is a major error. Motor will not run when this is encountered.

25 = ERR_INFO_MOTORTYPE: (RM4 only)
The motortype defined in production data was not known.

26 = ERR_INFO_FPGA: (RM4 only)
FPGA image failed to load.

27 = ERR_INFO_ENCODER: (RM4 only)
Encoder not found during initialization. See ERR_VALUE for type found.

28 = ERR_INFO_MU_INIT: (RM4 only)
MU Encoder initialization failed.

29 = ERR_INFO_HW_OC_LATCH: (RM4 only) Overcurrent trigger latched in hardware, powercycle to disable.

30 = ERR_INFO_MU_CAL_DATA: (RM4 only)
Calibration data not found for MU encoder.

31 = ERR_INFO_MU_POS_RD: (RM4 only)
MU encoder Error reading position during init.

32 = ERR_INFO_I2C: (RM4 only)
I2C error during startup.

33+: reserved for future use.

NOTE: Max current limits are different between motor types. Also, the trip limits for phases A and B may not always match the limit for phase C.

Firmware Name: ERR_INFO

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	NO_ERROR_INFO	No error info.
1	ERR_INFO_LATE_PWM	PWM values were delivered too late to the FPGA.
2	ERR_INFO_HISPEED	Overspeed measured in OUT_PWM
3	ERR_INFO_MISS_INDEX	Encoder count too large
4	ERR_INFO_HISPEED_SLOW	Overspeed measured in normal 1.x ms OUTLOOP.
5	ERR_INFO_IA	CHECK_IAB failed check of IA, too high/low.
6	ERR_INFO_IB	CHECK_IAB failed check of IB, too high/low

#	Name	Description
7	ERR_INFO_IC	CHECK_IC failed check of IC, too high/low.
8	ERR_INFO_ICNT	ALIM_CNT found too many limited current requests in a row.
9	ERR_INFO_FPGA_INDEX	FPGA detected an encoder index error more than N times in a row.
10	ERR_INFO_ADC_INIT	The initial ADC conversion did not cpolmplete - HW +5V VCCAD missing?
11	ERR_INFO_PROD_VERS	Presence of the 125 kHz signal does not match the BigDefEdit HW version.
12	ERR_INFO_ENC_OVER_35RPM	Encoder velocity during startup over 35 RPM (or encoder invalid response).
13	ERR_INFO_CAI_TAIL	Index error detected in CALC_ALL_INNER tail.
14	ERR_INFO_CA_M806_TAIL	
15	ERR_INFO_DMA_AREA	The combined size of DMA data is too large for the PMU xKB windows.
16	ERR_INFO_MHM_CAL	MHM encoder calibration failed. (Only RM4)
17	ERR_INFO_MHM_INIT	MHM encoder initialization failed.
18	ERR_INFO_MHM_STATUS	MHM claimed error when reading position through SPI. (Only RM4)
19	ERR_INFO_MHM_POSITION	Internal quadrature encoder is not in line with value read from SPI. (Only RM4)
20	ERR_INFO_STO_SENSEA	STOA below threshold.
21	ERR_INFO_STO_SENSEB	STOB below threshold.
22	ERR_INFO_STO_ALARM	STO ALARM pin set.
23	ERR_INFO_BISS	BISS encoder error. (Only RM4)
24	ERR_INFO_PRODUCTIONDATA	Production data header not found. (Only RM4)
25	ERR_INFO_MOTORTYPE	The motortype defined in production data was not known. (Only RM4)
26	ERR_INFO_FPGA	FPGA failed to load. (Only RM4)
27	ERR_INFO_ENCODER	Encoder not found during initialization. See ERR_VALUE for type found. (Only RM4)
28	ERR_INFO_MU_INIT	MU Encoder initialization failed. (Only RM4)
29	ERR_INFO_HW_OC_LATCH	Overcurrent trigger latched in hardware, powercycle to disable. (Only RM4)
30	ERR_INFO_MU_CAL_DATA	Calibration data not found for MU encoder. (Only RM4)
31	ERR_INFO_MU_POS_RD	MU encoder Error reading position during init. (Only RM4)
32	ERR_INFO_I2C	I2C error during startup. (Only RM4)

Number	Mactalk name	Range	Description
243	Error value - Special	Na	NOTE: This is intended only for JVL technicians.

Description: NOTE: This is intended only for JVL technicians.

For some, but only some, values of "Error Info - Special" above, this register gives more information n the error. For ERR_INFO values X, the value Y in this register means:
0 = No information.
1 = FPGA hardware timer value for late writing > 833.
2 = Number of encoder pulses over the last 100/200 us.
3 = The single-turn encoder count that triggered the error.
4 = The velocity measured, same scaling as "Actual velocity".
5 = The measured A current value in HW units (0..3200).
6 = The measured B current value in HW units (0..3200).
7 = The measured C current value in units of 13 mA.
8 = Number of consecutive times the current was clipped.
9 = Bitmask of FPGA encoder status register, including bits:
Bit-7: IndexDetectedThisPeriod
Bit-6: IndexDetectedTooEarly
Bit-5: ExpectedÍndexNotDetected.
10+: reserved for future use.

Firmware Name: ERR_VALUE

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
244	Reserved 244	Na	Only RM4 ETHERNET_STATUS and ETHERNET_INFO.

Description: ETHERNET info and status.
uint16_t ETHERNET_STATUS; // Reg244
uint16_t ETHERNET_INFO; // Reg244

Firmware Name: ETHERNET_INFO_AND_STATUS

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	ES_CRC_ERROR	Ethernet CRC error in frame
1	ES_SPI_NOT_VALID	Ethernet SPI Data not valied.
2	ES_SPI_LENGHT	Ethernet SPI Length mismatch.
3	ES_SPI_SEQ	Ethernet SPI-Sequence mismatch
4-15	ES	ETHERNET_STATUS reserved:12
16-31	ETHERNET_INFO	ETHERNET_INFO reserved:16

Number	Mactalk name	Range	Description
245	Reserved 245	Na	Only RM4 ETHERNET_CRC_ERROR and ETHERNET_SEQ_ERROR.

Description: ETHERNET_SEQ_ERROR is the number of ETHERNET sequence errors.
uint16_t ETHERNET_CRC_ERROR;// Reg245
uint16_t ETHERNET_SEQ_ERROR;// Reg245

Firmware Name: ETHERNET_SEQ_ERROR_AND_CRC_ERROR

Data Type: uint32

Default Value: Na

Type:

#	Name	Description

Number	Mactalk name	Range	Description
246	Scope/Samp.bits	Na	Individual bits enable and trigger options.

Description: Individual bits enable options:
Bit 0: Option to modify the classic scope/sampling system to sample only every other time.

Bit 1:Enable position capture to "Position Reg 6" (P6) when ANINP2 is/rises above +5.00 Volts

Bit 2:Enable position capture to CAPCOM5 when ANINP2 is/drops below +5.00 Volts

Bit 3: Select edge trigged position capture for both ANINP1 And ANINP2 functions when set to one. Select level triggered position capture when cleared to zero.

Bits 7...4: Low-noise option. 0=most noise and strongest movement, 15 = lowest noise and weakest movement.

Bits 8 through 31: Reserved for future use – must be written as zero.

Firmware Name: ZUP2_BITS

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0	ZUP2_USE_REC_DIV	Option to modify the classic scope/sampling system to sample only every other time.
1	ZUP2_POS_CAPTURE_UP2	Enable position capture to "Position Reg 6" (P6) when ANINP2 is/rises above +5.00 Volt.
2	ZUP2_POS_CAPTURE_DN2	Enable position capture to CAPCOM5 when ANINP2 is/drops below +5.00 Volt.
3	ZUP2_EDGE_POS_CAPTURE	Select edge trigged position capture for both ANINP1 And ANINP2 functions when set to one. Select level triggered position capture when cleared to zero.
4-7	ZUP2_IFILT_FACT_MASK	Low-noise option. 0 = most noise and strongest movement, 15 = lowest noise and weakest movement.
8-31	RESERVED	Reserved

Number	Mactalk name	Range	Description
247	Reserved 247	Na	

Firmware Name: RESERVED_247

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
248	Reserved 248	Na	

Firmware Name: RESERVED_248

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
249	Reserved 249	Na	

Firmware Name: RESERVED_249

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
250	Extended Program Version	Na	Extended program version.

Description: VERSION_CODE_EXTENDED =
(EXT_VER_MAIN <<24) +
(EXT_VER_SUB << 16) +
(EXT_VER_BUGFIX << 8) + EXT_VER_BETA

Firmware Name: EX_PROG_VERSION

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-7	BETA	Beta verision number.
8-15	BUGFIX	Bugfix verision number.
16-23	MINOR	Minor verision number.
24-31	MAJOR	Major verision number.

Number	Mactalk name	Range	Description
251	Reserved 251	Na	Hardware Revision

Description: HW Rev. Each byte is a number X.Y.Z.W.
X alway 0, Y always 1.
Z is determined by PCBV6:PCBV1 pins
W us determined by analog value of PCBV0 pin.

Firmware Name: HW_PCB_REVISON

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0-7	ANALOG_VALUE	Analog value of PCBV0.
8-15	PINS	PCBV6:PCBV1 pins.
16	HW_ZERO	Always 0x01.
17	HW_ONE	Always 0x00.

Number	Mactalk name	Range	Description
252	Reserved 252	Na	Only RM4, Bootloader version

Description: Only RM4, Bootloader version

Firmware Name: BOOTLOADER_VERSION

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0-7	BETA	Beta verision number.
8-15	BUGFIX	Bugfix verision number.
16-23	MINOR	Minor verision number.
24-31	MAJOR	Major verision number.

Number	Mactalk name	Range	Description
253	Reserved 253	Na	Build number as a unique time stamp.

Description: Build number as a unique time stamp.
The value reflects the time of firmware compilation in seconds since the beginning of 1st January 1970. This is standard UNIX time.

Firmware Name: BUILD_NO

Data Type: uint32

Default Value: Na

Number	Mactalk name	Range	Description
254	Reserved 254	Na	Version code of the FPGA image.

Description: Version code of the FPGA image.
Not valid for all motor types.
Can be used to verify if a firmware update completed successfully.

Firmware Name: FPGA_VERSION

Data Type: uint32

Default Value: Na

Type:

#	Name	Description
0-7	BETA	Beta verision number.
8-15	BUGFIX	Bugfix verision number.
16-23	MINOR	Minor verision number.
24-31	MAJOR	Major verision number.

Number	Mactalk name	Range	Description
255	Reserved 255	± 2147483648	Free running counter that ticks every 100 us.

Description: Free running counter that ticks every 100 us.

Firmware Name: COUNTER_100US

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
256	SAMPLE5	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.

Description: SAMPLE5..8 controls the advanced scope/sample function.

Register number, bit field and min/max/average sample type for the fifth value in each sample.

Firmware Name: SAMPLE5

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
257	SAMPLE6	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.

Description: SAMPLE5..8 controls the advanced scope/sample function.

Register number, bit field and min/max/average sample type for the fifth value in each sample.

Firmware Name: SAMPLE6

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
258	SAMPLE7	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.

Description: SAMPLE5..8 controls the advanced scope/sample function.

Register number, bit field and min/max/average sample type for the fifth value in each sample.

Firmware Name: SAMPLE7

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
259	SAMPLE8	± 2147483648	Register number, bit field and min/max/average sample type for the fifth value in each sample.

Description: SAMPLE5..8 controls the advanced scope/sample function.

Register number, bit field and min/max/average sample type for the fifth value in each sample.

Firmware Name: SAMPLE8

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
260	Analog input 4	± 2047	The input of hardware analogue input 4 .

Description: The input of hardware analogue input 4 (avaliable on MAC generation 3 only)
This value can be read at all times, also if the analogue input selected for motor control is selected to be one of ANINP1 or ANINP2.

Firmware Name: ANINP4

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
261	Analog input 4 offset	Na	Offset for Reg260 analogue input 4 .

Description: Offset for Reg260 analogue input 4 .

Firmware Name: ANINP4_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
262	Reserved 262	Na	Last register number read over the Modbus interface.

Description: Last register number read over the Modbus interface.
This is useful mainly for monitoring values on the Scope/sampling system to get accurate timing information between register read/write, I/O signals and motor operation.

Firmware Name: LAST_MB_RD_REG

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
263	Reserved 263	Na	Last register Value read over the Modbus interface.

Description: Last register Value read over the Modbus interface.
Note this only shows single register writes – not the up to 8 cyclic register blocks used by earlier versions of the Ethernet modules. See also register 262 above.

Firmware Name: LAST_MB_RD_DATA

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
264	Reserved 264	Na	Last register Number written over the Modbus interface.

Description: Last register Number written over the Modbus interface.
Note this only shows single register writes – not the up to 8 cyclic register blocks used by earlier versions of the Ethernet modules. See also register 262 above.

Firmware Name: LAST_MB_WR_REG

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
265	Reserved 265	Na	Last register Value written over the Modbus interface.

Description: Last register Number written over the Modbus interface.
Note this only shows single register writes – not the up to 8 cyclic register blocks used by earlier versions of the Ethernet modules. See also register 262 above.

Firmware Name: LAST_MB_WR_DATA

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
266	EPLC_COMM_STATUS	0 - 4	Result of the communications operation ordered from the eRxP system.

Description: Result of the presently executing or latest executed communications operation ordered from the eRxP system.
0 = Idle – last operation completed successfully.
1 = Busy – execution in progress, and hasn't yet timed out or used all retries.
2 = Failure – last operation could not be completed even after using all retries.

Firmware Name: RXP_COMM_STATUS

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	IDLE	Last operation completed successfully.
1	BUSY	Execution in progress, and hasn't yet timed out or used all retries.
2	FAILURE	Last operation could not be completed even after using all retries.

Number	Mactalk name	Range	Description
267	EPLC_COMM_ERRCNT	Na	Error counter for eRxP communications operations.

Description: Error counter for eRxP communications operations.
Increments by one every time a timeout to a telegram is experienced, including retries.

Firmware Name: RXP_COMM_ERRCNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
268	Reserved 268	Na	This register can be configured so each bit is a copy of a bit in another register.

Description: This register can be configured so each bit is a copy of a bit in another register.
This is used by the Ethernet modules to transfer more data in internal telegrams between motor and module.
The configuration of bits is done by a proprietary Modbus telegram sent to the motor.

Firmware Name: FLEX_REG

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
269	Reserved 269	Na	Hold values of actual mode, velocity and torque.

Description: This register contains three bit-fields to hold values of actual mode, velocity and torque.
Bits 11 - 0 : Actual torque (signed)
Bits 23 - 12: Actual Velocity (signed)
Bits 31 - 24: Mode register (unsigned, requested mode)

Firmware Name: MODE_VIST_TQIST

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-11	TORQUE	Actual torque (signed).
12-23	VELOCITY	Actual Velocity (signed).
24-31	MODE	Mode register (unsigned, requested mode).

Number	Mactalk name	Range	Description
270	Reserved 270	Na	Selects a timer and reload value to monitor timeouts on received Modbus telegrams.

Description: Selects a timer and reload value to monitor timeouts on received Modbus telegrams, intended mainly for eRxP commanded communications.
One of the four general-purpose timers in the eRxP User Defined Variables system will be reloaded with the reload value in the lower bits in this register whenever a valid Modbus telegram is received.
The timers decrement by one count every 1.0 ms.
This can be used to detect timeouts and measure communications delays and transmission times.
Bits 15-0: Timer reload count.
Bits 18-16: Timer number 1-4 or 0 to disable.
Bits 31-19: Reserved – must be written as zero.

Firmware Name: COMM_ALIVE_TIMER

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-15	TIMER_RELOAD_CNT	Timer reload count.
16-18	TIMER_NUMBER	Timer number 1-4 or 0 to disable.
19-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
271	Reserved 271	Na	Memory area and byte offset for GIMPREAD and GIMPWRITE telegrams.

Description: Selects memory area and byte offset for GIMPREAD and GIMPWRITE telegrams on the MacTalk communications channel.
Bits 15-0: Byte offset into the memory area.
Bits 23-16: Memory area to work on:
0 = eRxP area (16 KB).
1= on-the-fly register scaling READ tables (4 KB).
2= on-the-fly register scaling WRITE tables (4 KB).
3 = Scope/Sampling buffer (32 KB).
4 = BaseData area (10 bytes).

Firmware Name: GIMP_RW_AREA

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-15	OFFSET	Byte offset into the memory area.
16-23	WORK_AREA	0 = eRxP area (16 KB) 1 = on-the-fly register scaling READ tables (4 KB) 2 = on-the-fly register scaling WRITE tables (4 KB) 3 = Scope/Sampling buffer (32 KB) 4 = BaseData area (10 bytes).
24-31	RESERVED	Reserved.

Number	Mactalk name	Range	Description
272	Minimum Velocity	Na	Velocity limit for low-speed load factor KVOUT_LO.

Description: Velocity value for automatic load factor scaling – low end of velocity range. The load factor will equal KVOUT_LO when Reg12, "Actual velocity", is at, or below, this value.

The high end of the velocity range is defined by register 273, KVOUT_MAX_VEL , see below.

If in the mid range, do linear interpolation.
KVOUT = KVOUT_LO + 64 * ((VIST - VIST_LO) * ((KVOUT_HI - KVOUT_LO) / 64) / (VIST_HI - VIST_LO))

Firmware Name: KVOUT_V_MIN

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
273	Maximum Velocity	Na	Velocity limit for high-speed load factor KVOUT_HI.

Description: Velocity value for automatic load factor scaling – high end of velocity range. The load factor will equal KVOUT_LO when Reg12, "Actual velocity", is at, or above, this value.

Firmware Name: KVOUT_V_MAX

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
274	Low Speed Factor	Na	Load factor for velocities below KVOUT_MIN_VEL.

Firmware Name: KVOUT_LO

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
275	Velocity Selector	Na	choose which VEL reg to use.

Description: 0=Use V_IST_16 for KVOUT auto-scaling, 1-8: use VEL0...VEL7

Firmware Name: KVOUT_SELECT

Data Type: int32

Default Value: 0

Type:

#	Name	Description
0	USE_V_IST_16	Use V_IST16 for KVOUT auto-scaling.
1	USE_VEL0	Use VEL0 for KVOUT auto-scaling.
2	USE_VEL1	Use VEL1 for KVOUT auto-scaling.
3	USE_VEL2	Use VEL2 for KVOUT auto-scaling.
4	USE_VEL3	Use VEL3 for KVOUT auto-scaling.
5	USE_VEL4	Use VEL4 for KVOUT auto-scaling.
6	USE_VEL5	Use VEL5 for KVOUT auto-scaling.
7	USE_VEL6	Use VEL6 for KVOUT auto-scaling.
8	USE_VEL7	Use VEL7 for KVOUT auto-scaling.

Number	Mactalk name	Range	Description
276	Reserved 276	Na	Used when "Velocity" hires enabled to make room for 64-bit P_FNC.

Firmware Name: INDEX_OFFSET_HIRES

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
277	High Resolution Index Offset	± 2147483648	Hiword of G_FNC_LO - used only in VSOLL_HIRES mode.

Firmware Name: HIGHRES_INDEX_OFFSET

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
278	Reserved 278	Na	Prepared for multi-tasking in the ePLC system.

Firmware Name: TASK_TIMES

Data Type: int32

Default Value: 1

Number	Mactalk name	Range	Description
279	Reserved 279	Na	

Firmware Name: RESERVED_279

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
280	Reserved 280	Na	Voltage threshold for power dump to activate (in UBUS units)

Firmware Name: PWR_DMP_VOLTAGE

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
281	Reserved 281	Na	Outer loop counts 'dead time' between internal brake resistor activations.

Firmware Name: PWR_DMP_PAUSE_10

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
282	Reserved 282	Na	Outer loop counts 'dead time' between internal brake resistor activations.

Firmware Name: PWR_DMP_PAUSE_13

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
283	Reserved 283	Na	Encoder type for rotary shaft rotation.

Firmware Name: ENC_TYPE_PAR

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0	ENCTYPE_SUMTAK_KOMOTEK	standard encoder may be Sumtak/komotek or absolute multiturn autodetected.
1	ENCTYPE_QUANTUM	NOTE different Quantum encoder for M8H and the other BigMacs.
2	ENCTYPE_HENGSTLER	Standard JVL Hengstler Optical absolute multiturn.
3	ENCTYPE_ECI1118	Haidenhain 18 bit singleturn absolute EnDat encoder.
4	ENCTYPE_EQI1130	Haidenhain 18ST + 12MT bit multiturn absolute EnDat encoder.
5	ENCTYPE_POSITAL	Posital 17ST + 16MT bit multiturn absolute Wiegand encoder.
6	ENCTYPE_MHM_WIEGAND	WIEGAND 13ST MHM + 24MT bit multiturn absolute Wiegand encoder.
7	ENCTYPE_MHM	13 bit ST MHM chip. No MT.
8	ENCTYPE_MU_WIEGAND	WIEGAND 13ST MU + 24MT bit multiturn absolute Wiegand encoder.
9	ENCTYPE_MU	13 bit ST MU chip.No MT

Number	Mactalk name	Range	Description
284	Reserved 284	Na	(Only RM4) Raw encoder value read from QEP counter.

Description: (Only RM4) Raw encoder value read from QEP counter.
This is the value before linearization table (if used).
Only usable if using MHM or MU chipset.
Available from FW v.2.26.17.01.

Firmware Name: ENCODER_RAW

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
285	Reserved 285	Na	(Only RM4) Linearization table offset.

Description: (Only RM4) Linearization table offset only on magnetic absolute encoder.
Available from FW v.2.26.17.01.

Firmware Name: LIN_OFFSET

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
286	Connector option	Na	Connector option on MACxxx_G3 motor

Description:
0: unknown
1: QA: 2xRS485 + 8pin(3IA/1O RS485)
2: Q5: 2xRS485 + 17pin(8xIOA/RS422+485)
3: EC: Ethercatx2 + 17pin(8xIOA/RS422/485)
4: EL: Powerlinkx2 + 17pin(8xIOA/RS422/485)
5: EI: EtherNet/IPx2 + 17pin(8xIOA/RS422/485)
6: EP: Profinetx2 + 17pin(8xIOA/RS422/485)
7: EM: ModbusTCP/UDPx2 + 17pin(8xIOA/RS422/485)
8: ES: SercosIIIx2 + 17pin(8xIOA/RS422/485)
9: DC: Ethercatx2 + 8pin RS485
10: DL: Powerlinkx2 + 8pin RS485
11: DI: EtherNet/IPx2 + 8pin RS485
12: DP: Profinet x2 + 8pin RS485
13: DM: ModbusTCP/UDPx2 + 8pin RS485
14: DS: SercosIIIx2 + 8pin RS485
15: E2: EtherCAT + SSI + 17pin(8xIOA/RS422/485)
16: E3: EtherNet/IP + SSI + 17pin(8xIOA/RS422/485)
17: E4: Powerlink + SSI + 17pin(8xIOA/RS422/485)
18: E5: ModbusTCP/UDP + SSI + 17pin(8xIOA/RS422/485)
19: E6: Profinet + SSI + 17pin(8xIOA/RS422/485)
20: E7: SercosIII + SSI + 17pin(8xIOA/RS422/485)
21: WB: Wireless WLAN or Bluetooth serial MODBUS RTU or MACTALK protocol + 17pin(8xIOA/RS422/485)
22: WM: Wireless MODBUS TCP/UDP. WLAN + 17pin(8xIOA/RS422/485)
23: WP: Wireless Profinet. WLAN + 17pin(8xIOA/RS422/485)

Firmware Name: CONNECTOR_CONFIG

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
287	Reserved 287	Na	

Firmware Name: RESERVED_287

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
288	Reserved 288	Na	

Firmware Name: RESERVED_288

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
289	Reserved 289	Na	

Firmware Name: RESERVED_289

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
290	Reserved 290	Na	

Firmware Name: RESERVED_290

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
291	Reserved 291	Na	

Firmware Name: RESERVED_291

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
292	Reserved 292	Na	

Firmware Name: RESERVED_292

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
293	Reserved 293	Na	

Firmware Name: RESERVED_293

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
294	Reserved 294	Na	

Firmware Name: RESERVED_294

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
295	Reserved 295	Na	Maxium torque and torque-option

Description: structure: | 31 – 18: resv | 17 – 16: torque_option | 15 – 0: max_torque |

Firmware Name: MAX_T_SOLL

Data Type: int32

Default Value: Na

Type:

#	Name	Description
0-15	MAX_T_SOLL_VALUE	valid values between 0 and 1024, others are discarded.
16-17	MAX_T_SOLL_OPTION	Torque option code 0-3.

Number	Mactalk name	Range	Description
296	Reserved 296	Na	

Firmware Name: RESERVED_296

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
297	Reserved 297	Na	

Firmware Name: TEMPERATURE_DRIVER

Data Type: int32

Default Value: Na

Number	Mactalk name	Range	Description
298	Reserved 298	Na	(Only RM4) Temperature in driver.

Description: (Only RM4) Temperature in driver.
Available from FW v.2.26.17.02.

Firmware Name: INL_BISS_WAR_CNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
299	Reserved 299	Na	(Only RM4)Counts up when a BISS reading in inner-loop has the WARNING bit set.

Description: (Only RM4)Counts up when a BISS reading in inner-loop has the WARNING bit set.
Available from FW v.2.26.17.02.

Firmware Name: INL_BISS_ERR_CNT

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
300	Reserved 300		(Only RM4) Counts up when a BISS reading in inner-loop has the ERROR bit set.

Description: (Only RM4) Counts up when a BISS reading in inner-loop has the ERROR bit set.
Available from FW v.2.26.17.02.

Firmware Name: RESERVED_300

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
301	Reserved 301		

Firmware Name: RESERVED_301

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
302	Reserved 302		

Firmware Name: RESERVED_302

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
303	Reserved 303		

Firmware Name: RESERVED_303

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
304	Reserved 304		

Firmware Name: RESERVED_304

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
305	Reserved 305		

Firmware Name: RESERVED_305

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
306	Reserved 306		

Firmware Name: RESERVED_306

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
307	Reserved 307		

Firmware Name: RESERVED_307

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
308	Reserved 308		

Firmware Name: RESERVED_308

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
309	Reserved 309		

Firmware Name: RESERVED_309

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
310	Reserved 310		

Firmware Name: RESERVED_310

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
311	Reserved 311		

Firmware Name: RESERVED_311

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
312	Reserved 312		

Firmware Name: RESERVED_312

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
313	Reserved 313		

Firmware Name: RESERVED_313

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
314	Reserved 314		

Firmware Name: RESERVED_314

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
315	Reserved 315		

Firmware Name: RESERVED_315

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
316	Reserved 316		

Firmware Name: RESERVED_316

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
317	Reserved 317		

Firmware Name: RESERVED_317

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
318	Reserved 318		

Firmware Name: RESERVED_318

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
319	Reserved 319		

Firmware Name: RESERVED_319

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
320	Reserved 320		

Firmware Name: RESERVED_320

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
321	Reserved 321		

Firmware Name: RESERVED_321

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
322	Reserved 322		

Firmware Name: RESERVED_322

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
323	Reserved 323		

Firmware Name: RESERVED_323

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
324	Reserved 324		

Firmware Name: RESERVED_324

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
325	Reserved 325		

Firmware Name: RESERVED_325

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
326	Reserved 326		

Firmware Name: RESERVED_326

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
327	Reserved 327		

Firmware Name: RESERVED_327

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
328	Reserved 328		

Firmware Name: RESERVED_328

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
329	Reserved 329		

Firmware Name: RESERVED_329

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
330	Reserved 330		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write.
uint16_t CYCLIC_SPI_RD_PTR_0; //reg330
uint16_t CYCLIC_SPI_WR_PTR_0;

Firmware Name: CYCLIC_SPI_PTR_0

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
331	Reserved 331		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write.
uint16_t CYCLIC_SPI_RD_PTR_1; //reg331
uint16_t CYCLIC_SPI_WR_PTR_1;

Firmware Name: CYCLIC_SPI_PTR_1

Data Type: uint16 CYCLIC_SPI_RD_PTR_1;
uint16 CYCLIC_SPI_WR_PTR_1;

Default Value: 0

Number	Mactalk name	Range	Description
332	Reserved 332		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write.
uint16_t CYCLIC_SPI_RD_PTR_2; //reg 332
uint16_t CYCLIC_SPI_WR_PTR_2;

Firmware Name: CYCLIC_SPI_PTR_2

Data Type: uint16 CYCLIC_SPI_RD_PTR_2;
uint16 CYCLIC_SPI_WR_PTR_2;

Default Value: 0

Number	Mactalk name	Range	Description
333	Reserved 333		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write.
uint16_t CYCLIC_SPI_RD_PTR_3; //reg 333
uint16_t CYCLIC_SPI_WR_PTR_3;

Firmware Name: CYCLIC_SPI_PTR_3

Data Type: uint16 CYCLIC_SPI_RD_PTR_3;
uint16 CYCLIC_SPI_WR_PTR_3;

Default Value: 0

Number	Mactalk name	Range	Description
334	Reserved 334		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_4

Data Type: uint16 CYCLIC_SPI_RD_PTR_4;
uint16 CYCLIC_SPI_WR_PTR_4;

Default Value: 0

Number	Mactalk name	Range	Description
335	Reserved 335		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_5

Data Type: uint16 CYCLIC_SPI_RD_PTR_5;
uint16 CYCLIC_SPI_WR_PTR_5;

Default Value: 0

Number	Mactalk name	Range	Description
336	Reserved 336		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_6

Data Type: uint16 CYCLIC_SPI_RD_PTR_6;
uint16 CYCLIC_SPI_WR_PTR_6;

Default Value: 0

Number	Mactalk name	Range	Description
337	Reserved 337		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_7

Data Type: uint16 CYCLIC_SPI_RD_PTR_7;
uint16 CYCLIC_SPI_WR_PTR_7;

Default Value: 0

Number	Mactalk name	Range	Description
338	Reserved 338		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_8

Data Type: uint16 CYCLIC_SPI_RD_PTR_8;
uint16 CYCLIC_SPI_WR_PTR_8;

Default Value: 0

Number	Mactalk name	Range	Description
339	Reserved 339		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_9

Data Type: uint16 CYCLIC_SPI_RD_PTR_9;
uint16 CYCLIC_SPI_WR_PTR_9;

Default Value: 0

Number	Mactalk name	Range	Description
340	Reserved 340		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_10

Data Type: uint16 CYCLIC_SPI_RD_PTR_10;
uint16 CYCLIC_SPI_WR_PTR_10;

Default Value: 0

Number	Mactalk name	Range	Description
341	Reserved 341		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_11

Data Type: uint16 CYCLIC_SPI_RD_PTR_11;
uint16 CYCLIC_SPI_WR_PTR_11;

Default Value: 0

Number	Mactalk name	Range	Description
342	Reserved 342		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_12

Data Type: uint16 CYCLIC_SPI_RD_PTR_12;
uint16 CYCLIC_SPI_WR_PTR_12;

Default Value: 0

Number	Mactalk name	Range	Description
343	Reserved 343		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_13

Data Type: uint16 CYCLIC_SPI_RD_PTR_13;
uint16 CYCLIC_SPI_WR_PTR_13;

Default Value: 0

Number	Mactalk name	Range	Description
344	Reserved 344		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_14

Data Type: uint16 CYCLIC_SPI_RD_PTR_14;
uint16 CYCLIC_SPI_WR_PTR_14;

Default Value: 0

Number	Mactalk name	Range	Description
345	Reserved 345		Cyclic SPI pointer register.

Description: cyclic spi configuration registers upper 16 bit for rm4 read addr, bottom 16 bit for rm4 write

Firmware Name: CYCLIC_SPI_PTR_15

Data Type: uint16 CYCLIC_SPI_RD_PTR_15;
uint16 CYCLIC_SPI_WR_PTR_15;

Default Value: 0

Number	Mactalk name	Range	Description
346	Reserved 346		Counts progressive encoder errors

Description: Count number of progressive encoder errors. From FW 2.26.20.00.

Firmware Name: INL_ENC_ERR_CNT_CONS

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
347	Reserved 347		Counts consecutive CRC erros.

Description: Only RM4 From FW 2.26.20.00.
Counts on encoder error in inner loop.
For MT this is CRC error
For ST this is index error

Firmware Name: INL_ENC_ERR_CNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
348	Reserved 348		Counts on encoder error in inner loop.

Description: Counts if an invalid velocity is detected in inner loop. From FW 2.26.20.00.

Firmware Name: INL_INVALID_VEL_CNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
349	Reserved 349		Counts if an invalid velocity is detected in inner loop.

Description: Counts on encoder error in outer loop. From FW 2.26.17.01.
This can be CRC or velocity error. From FW 2.26.17.01.

Firmware Name: OUTL_ENC_ERR_CNT

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
350	Reserved 350		

Firmware Name: RESERVED_350

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
351	Reserved 351		

Firmware Name: RESERVED_351

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
352	Reserved 352		

Firmware Name: RESERVED_352

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
353	Reserved 353		

Firmware Name: RESERVED_353

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
354	Reserved 354		

Firmware Name: RESERVED_354

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
355	Reserved 355		

Firmware Name: RESERVED_355

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
356	Reserved 356		

Firmware Name: RESERVED_356

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
357	Reserved 357		

Firmware Name: RESERVED_357

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
358	Reserved 358		

Firmware Name: RESERVED_358

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
359	Reserved 359		

Firmware Name: RESERVED_359

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
360	Reserved 360		

Firmware Name: RESERVED_360

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
361	Reserved 361		

Firmware Name: RESERVED_361

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
362	Reserved 362		

Firmware Name: RESERVED_362

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
363	Reserved 363		

Firmware Name: RESERVED_363

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
364	Reserved 364		

Firmware Name: RESERVED_364

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
365	Reserved 365		

Firmware Name: RESERVED_365

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
366	Reserved 366		

Firmware Name: RESERVED_366

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
367	Reserved 367		

Firmware Name: RESERVED_367

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
368	Reserved 368		

Firmware Name: RESERVED_368

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
369	Reserved 369		

Firmware Name: RESERVED_369

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
370	Reserved 370		

Firmware Name: RESERVED_370

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
371	Reserved 371		

Firmware Name: RESERVED_371

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
372	Reserved 372		

Firmware Name: RESERVED_372

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
373	Reserved 373		

Firmware Name: RESERVED_373

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
374	Reserved 374		

Firmware Name: RESERVED_374

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
375	Reserved 375		

Firmware Name: RESERVED_375

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
376	Reserved 376		

Firmware Name: RESERVED_376

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
377	Reserved 377		

Firmware Name: RESERVED_377

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
378	Reserved 378		

Firmware Name: RESERVED_378

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
379	Reserved 379		

Firmware Name: RESERVED_379

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
380	Reserved 380		

Firmware Name: RESERVED_380

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
381	Reserved 381		

Firmware Name: RESERVED_381

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
382	Reserved 382		

Firmware Name: RESERVED_382

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
383	Reserved 383		

Firmware Name: RESERVED_383

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
384	Reserved 384		

Firmware Name: RESERVED_384

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
385	Reserved 385		

Firmware Name: RESERVED_385

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
386	Reserved 386		

Firmware Name: RESERVED_386

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
387	Reserved 387		

Firmware Name: RESERVED_387

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
388	Reserved 388		

Firmware Name: RESERVED_388

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
389	Reserved 389		

Firmware Name: RESERVED_389

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
390	Reserved 390		

Firmware Name: RESERVED_390

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
391	Reserved 391		

Firmware Name: RESERVED_391

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
392	Reserved 392		

Firmware Name: RESERVED_392

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
393	Reserved 393		

Firmware Name: RESERVED_393

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
394	Reserved 394		

Firmware Name: RESERVED_394

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
395	Reserved 395		

Firmware Name: RESERVED_395

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
396	Reserved 396		

Firmware Name: RESERVED_396

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
397	Reserved 397		

Firmware Name: RESERVED_397

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
398	Reserved 398		

Firmware Name: RESERVED_398

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
399	Reserved 399		

Firmware Name: RESERVED_399

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
400	Reserved 400		

Firmware Name: RESERVED_400

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
401	Reserved 401		

Firmware Name: RESERVED_401

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
402	Reserved 402		

Firmware Name: RESERVED_402

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
403	Reserved 403		

Firmware Name: RESERVED_403

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
404	Reserved 404		

Firmware Name: RESERVED_404

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
405	Reserved 405		

Firmware Name: RESERVED_405

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
406	Reserved 406		

Firmware Name: RESERVED_406

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
407	Reserved 407		

Firmware Name: RESERVED_407

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
408	Reserved 408		

Firmware Name: RESERVED_408

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
409	Reserved 409		

Firmware Name: RESERVED_409

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
410	Reserved 410		

Firmware Name: RESERVED_410

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
411	Reserved 411		

Firmware Name: RESERVED_411

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
412	Reserved 412		

Firmware Name: RESERVED_412

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
413	Reserved 413		

Firmware Name: RESERVED_413

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
414	Reserved 414		

Firmware Name: RESERVED_414

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
415	Reserved 415		

Firmware Name: RESERVED_415

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
416	Reserved 416		

Firmware Name: RESERVED_416

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
417	Reserved 417		

Firmware Name: RESERVED_417

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
418	Reserved 418		

Firmware Name: RESERVED_418

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
419	Reserved 419		

Firmware Name: RESERVED_419

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
420	Reserved 420		

Firmware Name: RESERVED_420

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
421	Reserved 421		

Firmware Name: RESERVED_421

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
422	Reserved 422		

Firmware Name: RESERVED_422

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
423	Reserved 423		

Firmware Name: RESERVED_423

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
424	Reserved 424		

Firmware Name: RESERVED_424

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
425	Reserved 425		

Firmware Name: RESERVED_425

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
426	Reserved 426		

Firmware Name: RESERVED_426

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
427	Reserved 427		

Firmware Name: RESERVED_427

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
428	Reserved 428		

Firmware Name: RESERVED_428

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
429	Reserved 429		

Firmware Name: RESERVED_429

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
430	Reserved 430		

Firmware Name: RESERVED_430

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
431	Reserved 431		

Firmware Name: RESERVED_431

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
432	Reserved 432		

Firmware Name: RESERVED_432

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
433	Reserved 433		

Firmware Name: RESERVED_433

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
434	Reserved 434		

Firmware Name: RESERVED_434

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
435	Reserved 435		

Firmware Name: RESERVED_435

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
436	Reserved 436		

Firmware Name: RESERVED_436

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
437	Reserved 437		

Firmware Name: RESERVED_437

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
438	Reserved 438		

Firmware Name: RESERVED_438

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
439	Reserved 439		

Firmware Name: RESERVED_439

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
440	Reserved 440		

Firmware Name: RESERVED_440

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
441	Reserved 441		

Firmware Name: RESERVED_441

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
442	Reserved 442		

Firmware Name: RESERVED_442

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
443	Reserved 443		

Firmware Name: RESERVED_443

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
444	Reserved 444		

Firmware Name: RESERVED_444

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
445	Reserved 445		

Firmware Name: RESERVED_445

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
446	Reserved 446		

Firmware Name: RESERVED_446

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
447	Reserved 447		

Firmware Name: RESERVED_447

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
448	Reserved 448		

Firmware Name: RESERVED_448

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
449	Reserved 449		

Firmware Name: RESERVED_449

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
450	Reserved 450		

Firmware Name: RESERVED_450

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
451	Reserved 451		

Firmware Name: RESERVED_451

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
452	Reserved 452		

Firmware Name: RESERVED_452

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
453	Reserved 453		

Firmware Name: RESERVED_453

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
454	Reserved 454		

Firmware Name: RESERVED_454

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
455	Reserved 455		

Firmware Name: RESERVED_455

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
456	Reserved 456		

Firmware Name: RESERVED_456

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
457	Reserved 457		

Firmware Name: RESERVED_457

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
458	Reserved 458		

Firmware Name: RESERVED_458

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
459	Reserved 459		

Firmware Name: RESERVED_459

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
460	Reserved 460		

Firmware Name: RESERVED_460

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
461	Reserved 461		

Firmware Name: RESERVED_461

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
462	Reserved 462		

Firmware Name: RESERVED_462

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
463	Reserved 463		

Firmware Name: RESERVED_463

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
464	Reserved 464		

Firmware Name: RESERVED_464

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
465	Reserved 465		

Firmware Name: RESERVED_465

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
466	Reserved 466		

Firmware Name: RESERVED_466

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
467	Reserved 467		

Firmware Name: RESERVED_467

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
468	Reserved 468		

Firmware Name: RESERVED_468

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
469	Reserved 469		

Firmware Name: RESERVED_469

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
470	Reserved 470		

Firmware Name: RESERVED_470

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
471	Reserved 471		

Firmware Name: RESERVED_471

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
472	Reserved 472		

Firmware Name: RESERVED_472

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
473	Reserved 473		

Firmware Name: RESERVED_473

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
474	Reserved 474		

Firmware Name: RESERVED_474

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
475	Reserved 475		

Firmware Name: RESERVED_475

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
476	Reserved 476		

Firmware Name: RESERVED_476

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
477	Reserved 477		

Firmware Name: RESERVED_477

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
478	Reserved 478		

Firmware Name: RESERVED_478

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
479	Reserved 479		

Firmware Name: RESERVED_479

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
480	Reserved 480		

Firmware Name: RESERVED_480

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
481	Reserved 481		

Firmware Name: RESERVED_481

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
482	Reserved 482		

Firmware Name: RESERVED_482

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
483	Reserved 483		

Firmware Name: RESERVED_483

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
484	Reserved 484		

Firmware Name: RESERVED_484

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
485	Reserved 485		

Firmware Name: RESERVED_485

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
486	Reserved 486		

Firmware Name: RESERVED_486

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
487	Reserved 487		

Firmware Name: RESERVED_487

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
488	Reserved 488		

Firmware Name: RESERVED_488

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
489	Reserved 489		

Firmware Name: RESERVED_489

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
490	Reserved 490		

Firmware Name: RESERVED_490

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
491	Reserved 491		

Firmware Name: RESERVED_491

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
492	Reserved 492		

Firmware Name: RESERVED_492

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
493	Reserved 493		

Firmware Name: RESERVED_493

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
494	Reserved 494		

Firmware Name: RESERVED_494

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
495	Reserved 495		

Firmware Name: RESERVED_495

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
496	Reserved 496		

Firmware Name: RESERVED_496

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
497	Reserved 497		

Firmware Name: RESERVED_497

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
498	Reserved 498		

Firmware Name: RESERVED_498

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
499	Reserved 499		

Firmware Name: RESERVED_499

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
500	Reserved 500		

Firmware Name: RESERVED_500

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
501	Reserved 501		

Firmware Name: RXP_PARAMETER

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
502	Reserved 502		

Firmware Name: RXP_COMMAND

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
503	Reserved 503		

Firmware Name: RXP_STATUS_A

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
504	Reserved 504		

Firmware Name: RXP_STATUS_B

Data Type: uint32

Default Value: 0

Number	Mactalk name	Range	Description
505	Reserved 505		

Firmware Name: RESERVED_505

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
506	Reserved 506		

Firmware Name: RESERVED_506

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
507	Reserved 507		

Firmware Name: RESERVED_507

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
508	Reserved 508		

Firmware Name: RESERVED_508

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
509	Reserved 509		

Firmware Name: RESERVED_509

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
510	Reserved 510		

Firmware Name: RESERVED_510

Data Type: int32

Default Value: 0

Number	Mactalk name	Range	Description
511	Reserved 511		

Firmware Name: RESERVED_511

Data Type: int32

Default Value: 0