INSTRUCTIONS

VCH-1212-P Modbus Protocol

67623 11/16 - (KPA)

Introduction
This protocol contains the Modbus addresses and registers which are avialable in VCH-1212-P. Modbus can access single addresses or several addresses simultaneously, either reading or writing 1-bit or 16-bit values. A Modbus address contains either a 1-bit value or a 16 bit integer.

Modbus connection
VCH-1212-P is equipped with two set of connectors; one for internal Modbus and one for external Modbus.

Internal Modbus
The internal Modbus is used for connecting to other OJ Electronics equipment. The internal Modbus is always activated. The communication parameters are fixed to the following settings. 38.400baud, 8 databits, 0 parity and 1 stopbit.

External Modbus
The external Modbus is used for connecting to other non-OJ Electronics equipment like BMS systems. The external Modbus shall be activated inside the menu under Communication before it can be used.

Communication parameters
The communication parameters can be set inside the menu under Communication.

Table 1			
	Range	**Unit**	**Factory setting**
Address	1-247	n/a	1
Baud rate	9.600, 19.200, 38.400, 57.600, 115.200	bps	38.400
Parity	None, Even, Odd	n/a	None
Stop bit(s)	1, 2	bit(s)	1

Standard Modbus (RTU)

Input Registers: 40 (R)
0x04: Read

Table 2						
Register	**Address [dec]**	**Function**	**Range**	**Unit**	**Scale**	**Comments**
3x0001	0	Input voltage	0 - 10000	mV	1	
3x0002	1	Outdoor temperature	-450 - 700	°C	0.1	
3x0003	2	Digital In "Start" active	0 - 1	-	-	
3x0004	3	Digital In "Motor alarm" active	0 - 1	-	-	
3x0005	4	Digital In "Low speed" active	0 - 1	-	-	
3x0006	5	Digital In "Override" active	0 - 1	-	-	
3x0007	6	Output voltage	0 - 10000	mV	1	
3x0008	7	Digital Out "Alarm relay" active	0 - 1	-	-	
3x0009	8	Digital Out "Motor start" active	0 - 1	-	-	
3x000A	9	VCH software version	100 - 10000	-	0.01	100 = 1.00

Register	Address [dec]	Function	Range	Unit	Scale	Comments
3x000B	10	Fault contenst 0	0 - 65535	-	-	bit 0 = High pressure alarm bit 1 = Low pressure alarm bit 2 = Digital In Motor alarm bit 3 = Analog In Temperature sensor short bit 4 = Analog In Temperature sensor open bit 5 = Not used bit 6 = Modbus temperature sensor out of range bit 7 = PTH communication error bit 8 = Supply voltage error
3x000C	11	Actual operation mode	0 - 3	-	-	0 = OFF / Stopped 1 = ON / High speed 2 = ON / Low speed 3 = ON / Override
3x0011	16	FIFI alarm log 0 (newest alarm)	0 - 9	-	-	0 = No alarm 1 = High pressure alarm 2 = Low pressure alarm 3 = Digital In Motor alarm 4 = Analog In Temperature sensor short 5 = Analog In Temperature sensor open 6 = Not used 7 = Modbus temperature sensor out of range 8 = PTH communication error 9 = Supply voltage error
3x0012	17	FIFO alarm log 1	0 - 9	-	-	As register 0x0011
3x0013	18	FIFO alarm log 2	0 - 9	-	-	As register 0x0011
3x0014	19	FIFO alarm log 3	0 - 9	-	-	As register 0x0011
3x0015	20	FIFO alarm log 4	0 - 9	-	-	As register 0x0011
3x0016	21	FIFO alarm log 5	0 - 9	-	-	As register 0x0011
3x0017	22	FIFO alarm log 6	0 - 9	-	-	As register 0x0011
3x0018	23	FIFO alarm log 7	0 - 9	-	-	As register 0x0011
3x0019	24	FIFO alarm log 8	0 - 9	-	-	As register 0x0011
3x001A	25	FIFO alarm log 9	0 - 9	-	-	As register 0x0011
3x0101	256	Actual pressure	-500 - 5000	Pa	1	Measured pressure
3x0102	257	Pressure setpoint	-500 - 5000	Pa	1	Current pressure setpoint
3x0103	258	Fault contents 1A	0 - 65535	-	-	bit 0 = High pressure alarm bit 1 = Low pressure alarm bit 2 = Digital In Motor alarm (on VCH) bit 3 = Analog In Temperature sensor short bit 4 = Analog In Temperature sensor open bit 5 = Not used bit 6 = Modbus temperature sensor out of range bit 7 = PTH communication error bit 8 = Supply voltage error
3x0104	259	Fault contest 1B (alarms and warnings from OJ-DV)	0 - 65535	-	-	bit 0 = Communication error bit 1 = Over voltage alarm bit 2 = Over current alarm bit 3 = Roter blocked alarm bit 4 = Rotor direction alarm bit 5 = Motor phase alarm bit 6 = Under voltage alarm bit 7 = Overheat warning bit 8 = Input phase warning bit 9 = Brake chopper warning bit 10 = Current limit warning bit 11 = Voltage limit warning bit 12 = Voltage ripple warning bit 13 = EEPROM warning bit 14 = Internal stop alarm
3x0105	260	PTH software version	100 - 10000	-	0.01	100 = 1.00
3x0106	261	OJ-DV software version AOC	100 - 10000	-	0.01	100 = 1.00
3x0107	262	OJ-DV software version MOC	100 - 10000	-	0.01	100 = 1.00
3x0108	263	Actual operation mode	0 - 3	-	-	0 = OFF / Stopped 1 = ON / High speed 2 = ON / Low speed 3 = ON / Override

Register	Address [dec]	Function	Range	Unit	Scale	Comments
3x0111	272	FIFO alarm log 0 (newest alarm)	0 - 31	-	-	0 = No alarm 1 = High pressure alarm 2 = Low pressure alarm 3 = Digital In Motor alarm 4 = Analog In Temperature sensor short 5 = Analog In Temperature sensor open 6 = Not used 7 = Modbus temperature sensor out of range 8 = PTH communication error 9 = Supply voltage error .. 17 = Communication error with OJ-DV controller 18 = Over voltage alarm from OJ-DV controller 19 = Over current alarm from OJ-DV controller 20 = Rotor blovked alarm from OJ-DV controller 21 = Rotor direction alarm from OJ-DV controller 22 = Motor phase alarm from OJ-DV controller 23 = Under voltage alarm from OJ-DV controller 24 = Overheat warning from OJ-DV controller 25 = Input phase warning from OJ-DV controller 26 = Brake chopper warning from OJ-DV controller 27 = Current limit warning from OJ-DV controller 28 = Voltage limit warning from OJ-DV controller 29 = Voltage ripple warning from OJ-DV controller 30 = EEPROM warning from OJ-DV controller 31 = Internal stop alarm from OJ-DV controller
3x0112	273	FIFO alarm log 1	0 - 32	-	-	As register 3x0111
3x0113	274	FIFO alarm log 2	0 - 32	-	-	As register 3x0111
3x0114	275	FIFO alarm log 3	0 - 32	-	-	As register 3x0111
3x0115	276	FIFO alarm log 4	0 - 32	-	-	As register 3x0111
3x0116	277	FIFO alarm log 5	0 - 32	-	-	As register 3x0111
3x0117	278	FIFO alarm log 6	0 - 32	-	-	As register 3x0111
3x0118	279	FIFO alarm log 7	0 - 32	-	-	As register 3x0111
3x0119	280	FIFO alarm log 8	0 - 32	-	-	As register 3x0111
3x011A	281	FIFO alarm log 9 (oldest alarm)	0 - 32	-	-	As register 3x0111

Holding registers: 35 (R/W)
0x03: Read
0x06: Write single
0x10: Write multiple

Table 3							
Register	Address [dec]	Function	Range	Default	Unit	Scale	Comments
4x0001	0	Operation mode (only if value is higher than the one selected by digital inputs on hardware)	0 - 3	0	-	-	0 = OFF / Stopped 1 = ON / High speed 2 = ON / Low speed 3 = ON / Override
4x0003	2	Pressure sensor type	0 - 1	0	-	-	0 = 0 - 10V 1 = Modbus (PTH)
4x0004	3	Pressure sensor range	0 - 9	5	-	-	0 = -50 - 50 Pa 1 = -500 - 500 Pa 2 = 0 - 100 Pa 3 = 0 - 150 Pa 4 = 0 - 300 Pa 5 = 0 - 500 Pa 6 = 0 - 1000 Pa 7 = 0 - 1600 Pa 8 = 0 - 2500 Pa 9 = 0 - 5000 Pa
4x0005	4	Temperature sensor type	0 - 4	0	-	-	0 = None 1 = NTC 10 kOhm 2 = NTC 12 kOhm 3 = NTC 22 kOhm 4 = External Modbus value (register 4x0005)
4x0006	5	Modbus temperature	-450 - 700	250	°C	0.1	
4x0007	6	Temperature compensation Enable	0 - 1	0	-	-	0 = OFF 1 = ON
4x0008	7	Temperature compensation High	-100 - 150	50	°C	0.1	
4x0009	8	Temperature compensation Low	-450 - 0	-100	°C	0.1	
4x000A	9	Temperature compensation Reduce	0 - 500	50	Pa	1	

Register	Address	Function	Range	Default	Unit	Scale	Comments
4x000B	10	Temperature sensor adjustment	-300 - 300	0	°C	0.1	
4x000C	11	Motor controller type	0 - 1	0	-	-	0 = 0 - 10V 1 = Modbus (OJ-DV)
4x000D	12	Hardware test enable	0 - 1	0	-	-	0 = OFF 1 = ON
4x000E	13	Test alarm relay	0 - 1	0	-	-	0 = OFF 1 = ON (only if 4x000D = 1)
4x000F	14	Test motor start	0 - 1	0	-	-	0 = OFF 1 = ON (only if 4x000D = 1)
4x0010	15	Test output voltage	0 - 1000	0	mV	10	Only if 4x000D = 1
4x0011	16	Alarm reset	0 - 1	0	-	-	0 = OFF 1 = Reset
4x0012	17	Clear alarm log	0 - 1	0	-	-	0 = OFF 1 = Clear
4x0013	18	Factory reset	0 - 1	0	-	-	0 = OFF 1 = Reset (set 4x1001 to '1234' first)
4x0014	19	Store settings	0 - 1	0	-	-	0 = OFF 1 = Store
4x0101	256	Pressure setpoint High	0 - 5000	200	Pa	1	
4x0102	257	Pressure setpoint Low	0 - 5000	150	Pa	1	
4x0103	258	Pressure setpoint Override	0 - 5000	400	Pa	1	
4x0104	259	Regulator ti	1 - 9999	100	Sec	1	
4x0105	260	Regulator P-band	10 - 1000	100	%	1	
4x0106	261	Output % max	50 - 100	100	%	1	
4x0107	262	Output % min	0 - 50	0	%	1	
4x0108	263	Output inverted	0 - 1	0	-	-	0 = OFF 1 = Invert
4x0109	264	Pressure alarm enable	0 - 1	1	-	-	0 = OFF 1 = Enable
4x010A	265	Pressure alarm limit	0 - 5000	100	Pa	1	
4x010B	266	Pressure alarm delay	0 - 1000	300	Sec	1	
4x010C	267	Calibrate pressure sensor	0 - 1	0	-	-	0 = OFF 1 = Calibrate (set 4x1001 to '1234' first)
4x010D	268	Operation mode for duct (only if value is higher than selected by hardware or register 4x0001)	0 - 3	0	-	-	0 = OFF / Stopped 1 = ON / High speed 2 = ON / Low speed 3 = ON / Override
4x010E	269	Regulator deadband	1 - 50	3	%	1	
4x0111	272	Alarm reset	0 - 1	0	-	-	0 = OFF 1 = Reset
4x0110	273	Clear alarm log	0 - 1	0	-	-	0 = OFF 1 = Clear