NEXT GENERATION CORESENSE™
MODBUS INTERFACE DESCRIPTION

1   Introduction

Copeland™ Stream with Next Generation CoreSense™ (or Next Gen CoreSense) provides advanced motor protection, diagnostics and Modbus communication as an option. Modbus communication enables reading compressor operating and alarm information from the Next Gen CoreSense module both locally and remotely. By monitoring and analysing data from the compressor, the module can accurately detect the cause of electrical and system-related issues.

The Next Gen CoreSense can be equipped with a Modbus extension module for communication via RS485.

The diagnosis data can be read into system controllers using the standard Modbus RTU Protocol.

The details of the communication are provided in this document.

2   Modbus extension module installation

The Modbus extension module can be ordered under reference N° 5406772.

The Modbus module will be inserted into the slot located on the far right of the CoreSense module as shown in **Figure 2** below. The correct slot for the Modbus extension module is marked with the letter E.

Figure 1: Modbus extension module (E)

Modbus extension module

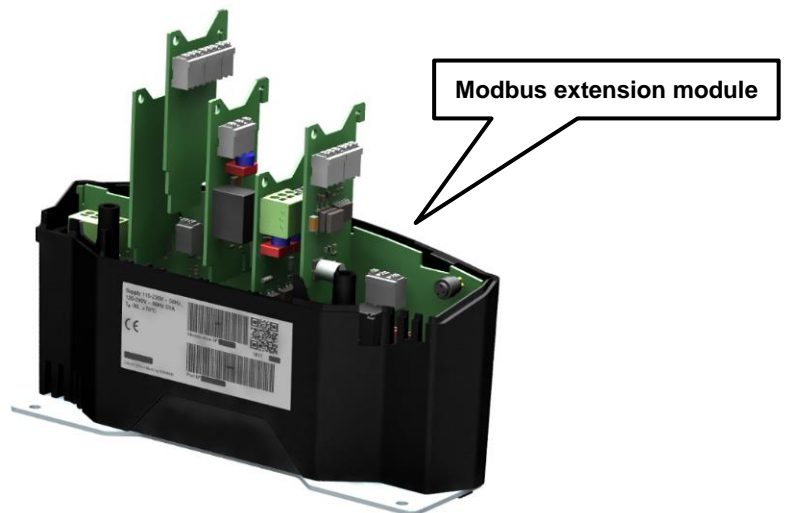**Figure 2: Next Gen CoreSense with modules**

Bus-termination resistors need to be applied to connectors 2,3 or 5,6 if the device is at an end of the Bus line (Resistance ~120-180 Ohm).
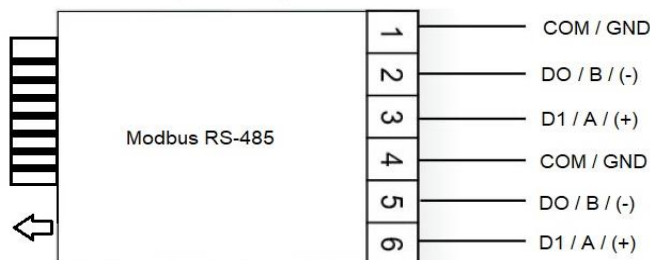

Modbus RS-485

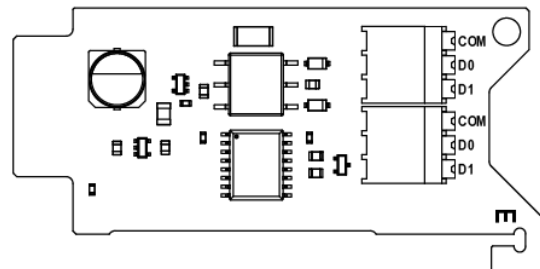| 1 | COM / GND |
2	DO / B / (-)
3	D1 / A / (+)
4	COM / GND
5	DO / B / (-)
6	D1 / A / (+)

Figure 3: Modbus RS-485

Figure 4: Modbus extension module (E)

3 Communication

3.1 Modbus protocol details

Mode: RTU
Modbus slave address: 1
Baud rate: 19200 bps
Start bit: 1
Data bits: 8
Parity: no
Stop bits: 2
Master response timeout: 50 ms

3.2 Transmission details

3.2.1 Modbus register address ranges

Read-only data:	Input registers	Modbus read FCT0x04
Read & write data:	Holding registers	Modbus read FCT0x03, 0x06, 0x10

3.2.2 Read-only data transmission

Available through Modbus function code 04 (0x04) Read input registers.

Request

Function code	1 Byte	0x04
Starting address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	1 to 123 (0x7B)

Response

Function code	1 Byte	0x04
Byte count	1 Byte	2 x N*
Holding registers	N* x 2 Bytes	

*N = Quantity of Input registers

Error

Error code	1 Byte	0x83
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported
02 = Starting address or register count out of range
03 = Register count out of range

3.2.3 Read-&-write data transmission

Available through Modbus function code 03 (0x03) Read holding registers.

Request

Function code	1 Byte	0x03
Starting address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	1 to 123 (0x7B)

Response

Function code	1 Byte	0x03
Byte count	1 Byte	2 x N*
Holding registers	N* x 2 Bytes	

*N = Quantity of Input registers

Error

Error code	1 Byte	0x83
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported
02 = Starting address or register count out of range
03 = Register count out of range

3.2.4 Write data transmission (single register)

Available through Modbus function code 06 (0x06) Write holding register.

Request

Function code	1 Byte	0x06
Starting address	2 Bytes	0x0000 to 0xFFFF
Value	2 Bytes	0x0000 to 0xFFFF

Response

Function code	1 Byte	0x06
Starting address	2 Bytes	0x0000 to 0xFFFF
Value	2 Bytes	0x0000 to 0xFFFF

Error

Error code	1 Byte	0x86
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported
02 = Starting address or register count out of range

3.2.5 Write data transmission (multiple registers)

Available through Modbus function code 16 (0x10) Write holding registers.

Request

Function code	1 Byte	0x10
Start address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	0x0001 to 0x0078
Byte count	1 Byte	2 x N
Registers values	2 x N Bytes	Value

N = register count

Response

Function code	1 Byte	0x10
Starting address	2 Bytes	0x0000 to 0xFFFF
Register count	2 Bytes	0x0001 to 0x0078

Error

Error code	1 Byte	0x90
Exception code	1 Byte	01 or 02 or 03

01 = Function code not supported
02 = Register address invalid
03 = Register value out of range

4 Data description

4.1 Read-only data

Modbus address DEC	HEX	Length	NGCS input: Modbus FCT 0x04 Description	Min	Max	Unit	Res	Remarks
133	0085	2	Total compressor run time	0	4294967295	h		One count means 1 hour
297	0129	1	DLT	-459.4	621.8	°F	1/10	Discharge line (gas) temperature in °F
299	012B	1	Compressor R phase voltage	0.00	655.35	V	1/100	(R Phase compressor voltage/100) L1 to N
300	012C	1	Compressor Y phase voltage	0.00	655.35	V	1/100	(Y Phase compressor voltage/100) L2 to N
301	012D	1	Compressor B phase voltage	0.00	655.35	V	1/100	(B Phase compressor voltage/100) L3 to N
304	0130	1	Compressor current Y phase	0.00	655.35	A	1/100	(Compressor current Y phase/100)
512	0200	1	Compressor status	0	1			0 = standstill; 1 = running
513	516	1	Average AC supply frequency 3-Ph	0	65353	Hz		(Average AC supply frequency 3-Ph/100)
514	0202	2	Regular standstill time	0	4294967295	h		Accumulated regular standstill time
516	0204	1	Module state Motor temperature monitoring					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 12 = Static switch-off Bit 13 = Too high after reset Bit 14 = Short circuit Bit 15 = Open circuit
517	0205	1	Module state DLT monitoring					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 12 = Static switch-off Bit 13 = Too high after reset Bit 14 = Short circuit Bit 15 = Open circuit
518	0206	1	Module state Motor temperature monitoring dynamic					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 12 = Dynamic switch-off Bit 13 = Dynamic 2 switch-off Bit 14 = Warning Dynamic Bit 15 = Warning Dynamic 2
519	0207	1	Module state Relay monitoring					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out

Modbus address		Length	NGCS input: Modbus FCT 0x04					
DEC	HEX		Description	Min	Max	Unit	Res	Remarks
520	0208	1	Module state Switching frequency monitoring (short cycling)					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Short cycling error Bit 15 = Short cycling warning
521	0209	1	Module state Oil differential pressure monitoring					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 10 = Too low error Bit 11 = Too low warning Bit 12 = Not screwed in Bit 13 = Wrong sensor Bit 14 = Short circuit Bit 15 = Open circuit
522	020A	1	Module state General					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 15 = Internal error
523	020B	1	Actual state of module current sensor					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 9 = Trip point 1 Bit 10 = Trip point 2 Bit 11 = Start-up trip point 1 Bit 12 = Start-up trip point 2 Bit 13 = MOC selection warning Bit 14 = Short circuit Bit 15 = Open circuit
524	020C	1	Module state Phase sequence					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 15 = Incorrect phase sequence
525	020D	1	Module state Phase loss					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Phase failure Bit 15 = Neutral monitoring warning

Modbus address		Length	NGCS input: Modbus FCT 0x04					
DEC	HEX		Description	Min	Max	Unit	Res	Remarks
526	020E	1	Module state Phase imbalance					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Phase asymmetry Bit 15 = Warning phase imbalance
527	020F	1	Module state Line undervoltage					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Line undervoltage Bit 15 = Line undervoltage warning
528	0210	1	Module state Line overvoltage					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Line overvoltage Bit 15 = Line overvoltage warning
529	0211	1	Module state Phase sequence 2nd winding					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 15 = Incorrect phase sequence
530	0212	1	Module state Phase failure 2nd winding					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 15 = Phase failure
531	0213	1	Module state Part-winding					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Part winding Bit 15 = Part winding warning
532	0214	1	Module state Welded contact					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Welded contact Bit 15 = Welded contact warning
533	0215	1	Module state Oil heater					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out ---

Modbus address DEC	Modbus address HEX	Length	NGCS input: Modbus FCT 0x04 Description	Min	Max	Unit	Res	Remarks
534	0216	1	Module state Oil level regulator					**Bit coded** Bit 0 = Active Bit 1 = Warning Bit 2 = Error Bit 3 = Time delay active Bit 4 = Locked out --- Bit 14 = Digital oil level too low Bit 15 = Digital oil level too low warning
8196	2004	1	Motor temperature	0	65353	Ω		Ohmic value
8197	2005	1	Discharge Line Temperature (DLT)	0	65353	Ω		Ohmic value
8198	2006	1	Fault state	0	1			0 = No fault 1 = At least one trip is currently active
8199	2007	1	Operating state	0	62535			**Bit coded** Bit 0 - Run detection phase 1 Bit 1 & 2 - PTC range Bit 3 - Demand Bit 4 - TraxOil Bit 5 - Reset button Bit 6 - Run detection current Bit 7 - Run detection phase 2 --- Bit 12 - MOC selection　0 = Set 1, 1 = Set 2 Bit 13 - VFD mode Bit 14 - Emergency mode Bit 15 - Oil heater
8203	200B	1	DLT	-327.76	327.67	°C	1/100	Discharge gas (line) temperature in °C
8212	2014	2	Total number of trips	0	4294967295			One counter means 1 trip
8214	2016	2	Total number of compressor starts	0	4294967295			Accumulated number of starts
8216	2018	1	Internal hour time counter	0	3599	s		Internal time counter of actual hour, counted in seconds.
8218	201A	1	State of oil differential pressure sensor	0	7			0 = Not in use 1 = Differential pressure bad 2 = Differential pressure good 3 = Short circuit 4 = Sensor disabled 5 = Open circuit 6 = Wrong sensor 7 = Not screwed in
8220	201C	1	Compressor R phase voltage	0	65535	V		Motor voltage L1-L2
8221	201D	1	Compressor Y phase voltage	0	65535	V		Motor voltage L2-L3
8222	201E	1	Compressor B phase voltage	0	65535	V		Motor voltage L3-L1
8224	2020	1	Compressor current Y phase	0.0	6553.5	A	1/10	Current value in Amps
8228	2024	1	Number of hours on current day	0	23	h		Internal time 0-23h
8230	2026	1	Number of compressor starts on current day, internal time	0	255			Current day compressor start times One counter means 1 time
8232	2028	1	Number of starts on current day - 1 day	0	255			Current day - 1 day, internal time
8233	2029	1	Number of starts on current day - 2 days	0	255			Current day - 2 days, internal time
8234	202A	1	Number of starts on current day - 3 days	0	255			Current day - 3 days, internal time

Modbus address DEC	HEX	Length	NGCS input: Modbus FCT 0x04 Description	Min	Max	Unit	Res	Remarks
8235	202B	1	Number of starts on current day - 4 days	0	255			Current day - 4 days, internal time
8236	202C	1	Number of starts on current day - 5 days	0	255			Current day - 5 days, internal time
8237	202D	1	Number of starts on current day - 6 days	0	255			Current day - 6 days, internal time
8238	202E	1	Asymmetry value for the 3-phase network	0	100	%		
8240	2030	1	Switching cycles per hour - Current hour	0	255			Number of switching cycles of current hour (internal time)
8241	2031	1	Maximum number of switching cycles per hour – Current day	0	255			Maximum number of switching cycles per hour on current day (internal time)
8242	2032	1	Maximum number of switching cycles per hour – Current day - 1 day	0	255			Maximum number of switching cycles per hour on current day - 1 day (internal time)
8243	2033	1	Maximum number of switching cycles per hour – Current day - 2 days	0	255			Maximum number of switching cycles per hour on current day - 2 days (internal time)
8244	2034	1	Maximum number of switching cycles per hour – Current day - 3 days	0	255			Maximum number of switching cycles per hour on current day - 3 days (internal time)
8245	2035	1	Maximum number of switching cycles per hour – Current day - 4 days	0	255			Maximum number of switching cycles per hour on current day - 4 days (internal time)
8246	2036	1	Maximum number of switching cycles per hour – Current day - 5 days	0	255			Maximum number of switching cycles per hour on current day - 5 days (internal time)
8247	2037	1	Maximum number of switching cycles per hour – Current day - 6 days	0	255			Maximum number of switching cycles per hour on current day - 6 days (internal time)
8276	2054	1	Actual compressor runtime	0	65353	Min		Actual running duration in minutes
8278	2056	1	Number of runtimes <5 min	0	255			Number of runtimes to determine quasi-percentage distribution
8279	2057	1	Number of runtimes 5-9 min	0	255			Number of runtimes to determine quasi-percentage distribution
8280	2058	1	Number of runtimes 10-19 min	0	255			Number of runtimes to determine quasi-percentage distribution
8281	2059	1	Number of runtimes 20-29 min	0	255			Number of runtimes to determine quasi-percentage distribution
8282	205A	1	Number of runtimes 30-59 min	0	255			Number of runtimes to determine quasi-percentage distribution
8283	205B	1	Number of runtimes 60-119 min	0	255			Number of runtimes to determine quasi-percentage distribution
8284	205C	1	Number of runtimes 120-300 min	0	255			Number of runtimes to determine quasi-percentage distribution
8285	205D	1	Number of runtimes > 300 min	0	255			Number of runtimes to determine quasi-percentage distribution
8302	206E	1	LTC of motor PTC open circuit trips	0	65353			Accumulated number of open motor PTC trips
8303	206F	1	LTC of locked rotor trips	0	65353			Accumulated number of locked rotor trips
8304	2070	1	LTC of discharge gas sensor open circuit trips	0	65353			Accumulated number of DLT open circuit trips
8305	2071	1	LTC of discharge gas sensor short circuit trips	0	65353			Accumulated number of DLT short circuit trips
8306	2072	1	LTC of motor temp static trips	0	65353			Accumulated number of motor temp static trips

| Modbus address | | Length | NGCS input: Modbus FCT 0x04 | | | | | |
DEC	HEX		Description	Min	Max	Unit	Res	Remarks
8307	2073	1	LTC of motor temp static lockouts	0	65353			Accumulated number of motor temp static lockouts
8308	2074	1	LTC of motor temp dynamic alarms	0	65353			Accumulated number of motor temp dynamic trips
8309	2075	1	LTC of locked rotor lockouts	0	65353			Accumulated number of locked rotor lockouts
8310	2076	1	LTC of high discharge line temperature trips	0	65353			Accumulated number of high DLT trips
8311	2077	1	LTC of high discharge temperature lockouts	0	65353			Accumulated number of high DLT lockouts
8312	2078	1	LTC of insufficient oil pressure warnings	0	65353			Accumulated number of low oil pressure warnings
8313	2079	1	LTC of insufficient oil pressure lockouts	0	65353			Accumulated number of low oil pressure lockouts
8316	207C	1	LTC of missing phase trips	0	65353			Accumulated number of missing phase trips
8317	207D	1	LTC of miss phase lockouts	0	65353			Accumulated number of missing phase lockouts
8318	207E	1	LTC of switching frequency limit trips	0	65353			Accumulated number of switching frequency trips
8319	207F	1	LTC of relay bridged messages	0	65353			Accumulated number of relay bridged messages
8322	2082	1	LTC of sensor OPS3 not screwed in	0	65353			Accumulated number of OPS3 sensor not mounted trips
8323	2083	1	LTC of oil differential pressure sensor faults	0	65353			Accumulated number of differential pressure sensor trips
8330	208A	1	LTC of wrong phase sequence alarms	0	65353			Accumulated number of wrong phase sequence trips
8331	208B	1	LTC of wrong phase sequence lockouts	0	65353			Accumulated number of wrong phase sequence lockouts
8332	208C	1	Compressor run time without oil pressure (OPS3)	0	1088.83	h	1/6	Accumulated runtime without oil pressure in hours
8333	208D	1	Compressor run time deactivated oil differential pressure sensor (OPS3)	0	65353	h		Accumulated runtime without oil pressure sensor (OPS3) in hours
8334	208E	1	Residual delay time compressor restart delay	0	65353	s		Time until next possible compressor start counted in seconds
8336	2090	2	Time since last trip	0	4294967295	min		Time counted in minutes
8338	2092	1	Compressor runtime during the "relay bridging" was recognized	0	1088.83	h	1/6	Compressor runtime with bridged relay counted in hours
8342	2096	1	LTC of phase asymmetry warnings	0	65353			Accumulated number of phase asymmetry warnings
8344	2098	1	LTC of voltage imbalance trips	0	65353			Accumulated number of voltage imbalanced trips
8345	2099	1	LTC of phase asymmetry lockouts	0	65353			Accumulated number of phase asymmetry trips
8348	209C	1	LTC of internal error warnings	0	65353			Accumulated number of internal error warnings
8349	209D	1	LTC of internal error trips	0	65353			Accumulated number of internal error trips
8350	209E	1	LTC of module supply under voltage warnings	0	65353			Accumulated number of module supply undervoltage warnings
8351	209F	1	LTC of module supply under voltage trips	0	65353			Accumulated number of module supply undervoltage trips
8352	20A0	1	Event history: number of the last event					

Modbus address		Length	NGCS input: Modbus FCT 0x04					
DEC	HEX		Description	Min	Max	Unit	Res	Remarks
8353	20A1	1	Event history: time since previous event	0	65535	Min		Time since previous event counted in minutes
8356	20A4	1	Event history: number of the last event index - 1	0	255			Event number
8357	20A5	1	Event history: time since previous event index - 1	0	65535	Min		Time since previous event counted in minutes
8360	20A8	1	Event history: number of the last event index - 2	0	255			Event number
8361	20A9	1	Event history: time since previous event index - 2	0	65535	Min		Time since previous event counted in minutes
8364	20AC	1	Event history: number of the last event index - 3	0	255			Event number
8365	20AD	1	Event history: time since previous event index - 3	0	65535	Min		Time since previous event counted in minutes
8368	20B0	1	Event history: number of the last event index - 4	0	255			Event number
8369	20B1	1	Event history: time since previous event index - 4	0	65535	Min		Time since previous event counted in minutes
8372	20B4	1	Event history: number of the last event index - 5	0	255			Event number
8373	20B5	1	Event history: time since previous event index - 5	0	65535	Min		Time since previous event counted in minutes
8376	20B8	1	Event history: number of the last event index - 6	0	255			Event number
8377	20B9	1	Event history: time since previous event index - 6	0	65535	Min		Time since previous event counted in minutes
8380	20BC	1	Event history: number of the last event index - 7	0	255			Event number
8381	20BD	1	Event history: time since previous event index - 7	0	65535	Min		Time since previous event counted in minutes
8384	20C0	1	Event history: number of the last event index - 8	0	255			Event number
8385	20C1	1	Event history: time since previous event index - 8	0	65535	Min		Time since previous event counted in minutes
8388	20C4	1	Event history: number of the last event index - 9	0	255			Event number
8389	20C5	1	Event history: time since previous event index - 9	0	65535	Min		Time since previous event counted in minutes
8392	20C8	1	Event history: number of the last event index - 10	0	255			Event number
8393	20C9	1	Event history: time since previous event index - 10	0	65535	Min		Time since previous event counted in minutes
8396	20CC	1	Event history: number of the last event index - 11	0	255			Event number
8397	20CD	1	Event history: time since previous event index - 11	0	65535	Min		Time since previous event counted in minutes
8400	20D0	1	Event history: number of the last event index - 12	0	255			Event number
8401	20D1	1	Event history: time since previous event index - 12	0	65535	Min		Time since previous event counted in minutes
8404	20D4	1	Event history: number of the last event index - 13	0	255			Event number
8405	20D5	1	Event history: time since previous event index - 13	0	65535	Min		Time since previous event counted in minutes
8408	20D8	1	Event history: number of the last event index - 14	0	255			Event number

Modbus address		Length	NGCS input: Modbus FCT 0x04					
DEC	HEX		Description	Min	Max	Unit	Res	Remarks
8409	20D9	1	Event history: time since previous event index - 14	0	65535	Min		Time since previous event counted in minutes
8412	20DC	1	Event history: number of the last event index - 15	0	255			Event number
8413	20DD	1	Event history: time since previous event index - 15	0	65535	Min		Time since previous event counted in minutes
8416	20E0	1	Event history: number of the last event index - 16	0	255			Event number
8417	20E1	1	Event history: time since previous event index - 16	0	65535	Min		Time since previous event counted in minutes
8420	20E4	1	Event history: number of the last event index - 17	0	255			Event number
8421	20E5	1	Event history: time since previous event index - 17	0	65535	Min		Time since previous event counted in minutes
8424	20E8	1	Event history: number of the last event index - 18	0	255			Event number
8425	20E9	1	Event history: time since previous event index - 18	0	65535	min		Time since previous event counted in minutes
8428	20EC	1	Event history: number of the last event index - 19	0	255			Event number
8429	20ED	1	Event history: time since previous event index - 19	0	65535	min		Time since previous event counted in minutes
8472	2118	2	Total energy consumption	0	4294967295	kWh		
8502	2136	1	LTC of compressor low voltage trips	0	65535			Accumulated number of AC voltage low trips
8503	2137	1	LTC of compressor low voltage lockouts	0	65535			Accumulated number of AC voltage low lockouts
8504	2138	1	LTC of line overvoltage trips	0	65535			Accumulated number of AC overvoltage trips
8505	2139	1	LTC of line overvoltage lockouts	0	65535			Accumulated number of AC overvoltage lockouts
8506	213A	1	Current sensor trip point value	0	6553.5	A	1/10	
8618	21AA	1	LTC of low oil pressure trips	0	65535			Accumulated number of low oil pressure trips
8622	21AD	1	LTC of automatic MOC selection warnings	0	65535			Accumulated number of automatic MOC selection warnings
8626	21B2	1	LTC of phase sequence error at the 2nd winding trips	0	65535			Accumulated number of phase sequence 2nd winding trips
8627	21B3	1	LTC of phase sequence error at the 2nd winding lockouts	0	65535			Accumulated number of phase sequence 2nd winding lockouts
8628	21B4	1	LTC of phase loss at the 2nd winding trips	0	65535			Accumulated number of phase loss 2nd winding trips
8629	21B5	1	LTC of phase loss at the 2nd winding lockouts	0	65535			Accumulated number of phase loss 2nd winding lockouts
8632	21B8	1	LTC of lack of voltage at the 2nd winding trips	0	65535			Accumulated number of low voltage at 2nd winding trips
8633	21B9	1	LTC of missing voltage at the 2nd winding warnings	0	65535			Accumulated number of no voltage at 2nd winding trips
8634	21BA	1	LTC of welded contacts trips	0	65535			Accumulated number of welded contacts trips
8635	21BB	1	LTC of welded contacts warnings	0	65535			Accumulated number of welded contacts warnings

4.2 Read-&-write data

Password needed for access.

Modbus address Dec	Modbus address Hex	Length	NGCS configuration: Modbus FCT 0x03, 0x06, 0x16 Contents	Min. value	Max. value	Unit	Scale	Default value	Remarks
0	0000	4	Compressor Ident Number 8 characters in total	0x0000	0xFFFF	ASCII	8.8		Registers 0 to 3 Each word represents 2 ASCII characters of 8 Bit, eg, 0x4556 > 0x45 = "E", 0x56 = "V"
4	0004	15	Compressor model 30 characters in total	0x0000	0xFFFF	ASCII	8.8		Registers 4 to 18 Each word represents 2 ASCII characters of 8 Bits
19	0013	6	Compressor Serial Number 12 characters in total	0x0000	0xFFFF	ASCII	8.8		Registers 19 to 24 Each word represents 2 ASCII characters of 8 Bits
512	0200	1	Reset	0	1			0	Reset NGCS module
515	0203	1	Password entry	0	0xFFFF				Enter password to access configuration
8341	2095	1	Motor temperature dynamic monitoring state	0	3			1	0 = OFF 1 = only 1st order 2 = both 3 = both, only warning
8352	20A0	1	Motor temperature dynamic reset delay	10	65535	s		300	
8392	20C8	1	Current monitoring sensor 1 state	0	1			0	0 = OFF 1 = Active
8406	20D6	1	Automatic reset delay time for current trip point 1	10	65535	s		300	Automatic reset delay time in sec. If set to 65535 manual reset is active.
8408	20D8	1	Current sensor critical level	0	100	%		85	Proportional current from MOC from which critical current is stated
8409	20D9	1	Current sensor increased level	0	100	%		80	Proportional current from MOC from which increased current is stated
8868	22A4	1	DLT automatic reset delay time or manual reset	10	65535	s		120	Automatic reset delay time in sec. If set to 65535 manual reset is active.
8910	22CE	1	Phase monitoring state	0	1			1	0 = OFF 1 = Active
8918	22D6	1	Phase loss monitoring state	0	1			1	0 = OFF 1 = Active
8927	22DF	1	Phase asymmetry monitoring state	0	1			1	0 = OFF 1 = Active
8928	22E0	1	Phase asymmetry trip point	2	8	%		5	
8929	22E1	1	Phase asymmetry warning point	2	8	%		3	
9025	2341	1	Oil heater applied	0	1				0 = NO 1 = Yes
9026	2342	1	Digital oil monitoring state (DOM/TraxOil)	0	1			0	0= OFF 1= ON
9027	2343	1	Select DOM alarm reaction	1	2			1	1 = Warning 2 = Trip
9028	2344	1	Select DOM HW state	0	1			0	0 = Open circuit 1 = Short circuit
9029	2345	1	DLT trip temperature	0	154	°C	1/100	154	
9030	2346	1	DLT reset point value	0	50	K	1/100	20	Temperature range for foldback hysteresis in Kelvin.

Modbus address		Length	NGCS configuration: Modbus FCT 0x03, 0x06, 0x16						
Dec	Hex		Contents	Min. value	Max. value	Unit	Scale	Default value	Remarks
9042	2352	1	Modbus address Changes active after NGCS reset	1	247			1	Node address of serial communication
9043	2353	1	Modbus Baud rate Changes active after NGCS reset	0	3			1	0 = 9600 Baud 1 = 19200 Baud 2 = 38400 Baud 3 = 76800 Baud
9044	2354	1	Modbus parity Changes active after NGCS reset	0	2			0	0 = No 1 = Even 2 = Odd
9045	2355	1	Modbus stop bits Changes active after NGCS reset	0	1			1	0 = 1 Stop Bit 1 = 2 Stop Bits
9058	2362	1	Phase failure monitoring state	0	1			1	0 = OFF 1 = Active
9063	2367	1	Phase monitoring second winding state	0	1			1	0 = OFF 1 = Active
9069	236D	1	Part-winding monitoring state	0	1			1	0 = OFF 1 = Active
9070	236E	1	Part-winding monitoring Trip delay	0.1	6553.5	s	1/10	2.0	
9071	236F	1	Part-winding monitoring Reset delay	0	65535	s		120	
9072	2370	1	Part-winding monitoring Trip or warning	1	2			2	1 = Warning 2 = Trip
9073	2371	1	Welded contact monitoring active	0	1			1	0 = Inactive 1 = Active
9076	2374	1	Welded contact monitoring Trip or warning	1	2			2	1 = Warning 2 = Trip
9078	2376	1	Switching frequency overstepping Reaction on alarm (short cycling)	0	1			1	0 = Warning 1 = Trip
9080	2378	1	Welded contact monitoring Number of trips to lockout	0	65535			10	0 = Inactive
9081	2379	1	Password for 1st level	0	0xFFFF			0x2345	User access level password
9083	237B	1	DLT sensor type	0	1			1	0 = Inactive 1 = PT1000
9088	2380	1	Undervoltage limit 1	1	100	%		15	
9091	2383	1	Overvoltage limit 1	1	100	%		15	
9095	2387	1	Emergency mode state	0	1			0	0 = EM OFF, 1 = EM ON EM ON will deactivate all protection modules except oil pressure and motor temperature protection