

FAQ: 123-serie met Modbus

Het komt voor dat de Modbus communicatie tussen Master en Slave niet tot stand komt, hieronder een aantal mogelijke oorzaken:

Zowel **123-2C** als **123-2Touch** zijn SLAVE displays met RS-485 Modbus-RTU, stel dit in indien nodig.

Stel de juiste parameters in:

- **123-2C**: 1 start bit, 8 data bit, 1 stop bit, no parity, 9600 baud
- **123-2Touch**: 1 start bit, 8 data bit, 1 stop bit, no parity, instelbare baud rate

Stel het juiste adressering in:

- tussen 1 en 247

Houdt er rekening mee dat sommige registers **r/w** (read/write), **r** (read only) of **w** (write only) zijn.

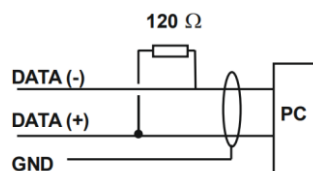
Register = het Modbus register is een 16 bit WORD (2 bytes)

Timestamp = Unix Time, aantal seconden dat verstreken is sinds 1 Januari 1970

Data types:

float = DCBA	twee registers	High word first, high byte first. (bij sommige masters kan de volgorde voor A, B, C en D verschillen)
dword = DCBA	twee registers	High word first, high byte first. (bij sommige masters kan de volgorde voor A, B, C en D verschillen)
word = BA	één register	High byte first
byte = A	één register	-
boolean = A	één register	-

Denk ook aan de afsluitweerstand (120 Ω) bij lange kabellengtes of meerdere displays in lijn.



123-2Touch Modbus**Feb 4 2014**

Notes:

Register = A Modbus register is a 16 bit WORD (2 bytes)

Timestamp = Unix Time, number of seconds that have elapsed since 1 January 1970

Data types:

float = DCBA	two registers	High word first, high byte first.	(at some masters the arrangement for A, B , C and D might differ)
dword = DCBA	two registers	High word first, high byte first.	(at some masters the arrangement for A, B , C and D might differ)
word = BA	one register	High byte first	
byte = A	one register	-	
boolean = A	one register	-	

Coils (read/write boolean)					
Register	Description	Data Type	Access	Value	
1	RELAY_1	BOOLEAN	RW	0 or 1	Relay 1 0 = Off 1 = On
2	RELAY_2	BOOLEAN	RW	0 or 1	Relay 2 0 = Off 1 = On
3	BUZZER_ACTIVE	BOOLEAN	RW	0 or 1	Buzzer active (audio alarm) 0 = No 1 = Yes
4	BUZZER_SNOOZED	BOOLEAN	RW	0 or 1	Buzzer snoozed 0 = Not active or not snoozed 1 = Active but snoozed (no sound)
5	DEVICE_RESTART	BOOLEAN	W	0 or 1	Restart the 123-2Touch 0 = Does nothing 1 = Restarts the device with a 5 second delay

Discrete input registers (read only boolean)					
Register	Description	Data Type	Access	Value	
10001	DIGITAL_1	BOOLEAN	R	0 or 1	Digital Input 1 0 = Low 1 = High
10002	DIGITAL_2	BOOLEAN	R	0 or 1	Digital Input 2 0 = Low 1 = High
10003	DIGITAL_3	BOOLEAN	R	0 or 1	Digital Input 3 0 = Low 1 = High
10004	DIGITAL_4	BOOLEAN	R	0 or 1	Digital Input 4 0 = Low 1 = High
10005	DEVICE_RESTART_REQUIRED	BOOLEAN	R	0 or 1	Device restart is required to apply configuration changes. 0 = No 1 = Yes
10006	CALIBRATION_REQUIRED	BOOLEAN	R	0 or 1	Device requires calibration 0 = No 1 = Yes
10007	CONFIGURATION_REQUIRED	BOOLEAN	R	0 or 1	One or more problems are found in the configuration. 0 = No 1 = Yes

Input registers (read only integer)					
Register	Description	Data Type	Access	Value	
30001	ANALOG_1_MA_NORMALIZED	WORD	R	0 - 4096	Analog input 1 (Jumper on 4-20mA)
30002	ANALOG_2_MA_NORMALIZED	WORD	R	0 - 4096	Analog input 2 (Jumper on 4-20mA)
30003	ANALOG_3_MA_NORMALIZED	WORD	R	0 - 4096	Analog input 3 (Jumper on 4-20mA)
30004	ANALOG_4_MA_NORMALIZED	WORD	R	0 - 4096	Analog input 4 (Jumper on 4-20mA)
30005	ANALOG_1_MA_0_20_HI	FLOAT	R		Analog input 1 (Jumper on 4-20mA)
30006	ANALOG_1_MA_0_20_LO				
30007	ANALOG_2_MA_0_20_HI	FLOAT	R		Analog input 2 (Jumper on 4-20mA)
30008	ANALOG_2_MA_0_20_LO				
30009	ANALOG_3_MA_0_20_HI	FLOAT	R		Analog input 3 (Jumper on 4-20mA)
30010	ANALOG_3_MA_0_20_LO				
30011	ANALOG_4_MA_0_20_HI	FLOAT	R		Analog input 4 (Jumper on 4-20mA)
30012	ANALOG_4_MA_0_20_LO				
30013	ANALOG_1_VDC_NORMALIZED	WORD	R	0 - 4096	Analog input 1 (Jumper on 0-10V)
30014	ANALOG_2_VDC_NORMALIZED	WORD	R	0 - 4096	Analog input 2 (Jumper on 0-10V)
30015	ANALOG_3_VDC_NORMALIZED	WORD	R	0 - 4096	Analog input 3 (Jumper on 0-10V)
30016	ANALOG_4_VDC_NORMALIZED	WORD	R	0 - 4096	Analog input 4 (Jumper on 0-10V)
30017	ANALOG_1_VDC_0_10_HI	FLOAT	R		Analog input 1 (Jumper on 0-10V)
30018	ANALOG_1_VDC_0_10_LO				
30019	ANALOG_2_VDC_0_10_HI	FLOAT	R		Analog input 2 (Jumper on 0-10V)
30020	ANALOG_2_VDC_0_10_LO				
30021	ANALOG_3_VDC_0_10_HI	FLOAT	R		Analog input 3 (Jumper on 0-10V)
30022	ANALOG_3_VDC_0_10_LO				

30023	ANALOG_4_VDC_0_10_HI	FLOAT	R		Analog input 4 (Jumper on 0-10V)
30024	ANALOG_4_VDC_0_10_LO				
30025	DIGITAL_1	BOOLEAN	R	0 or 1	Digital Input 1 0 = Low 1 = High
30026	DIGITAL_2	BOOLEAN	R	0 or 1	Digital Input 2 0 = Low 1 = High
30027	DIGITAL_3	BOOLEAN	R	0 or 1	Digital Input 3 0 = Low 1 = High
30028	DIGITAL_4	BOOLEAN	R	0 or 1	Digital Input 4 0 = Low 1 = High
30029	DIGITAL_1_TIMESTAMP_HI	DWORD	R	0+	Digital 1 high timestamp
30030	DIGITAL_1_TIMESTAMP_LO				
30031	DIGITAL_2_TIMESTAMP_HI	DWORD	R	0+	Digital 2 high timestamp
30032	DIGITAL_2_TIMESTAMP_LO				
30033	DIGITAL_3_TIMESTAMP_HI	DWORD	R	0+	Digital 3 high timestamp
30034	DIGITAL_3_TIMESTAMP_LO				
30035	DIGITAL_4_TIMESTAMP_HI	DWORD	R	0+	Digital 4 high timestamp
30036	DIGITAL_4_TIMESTAMP_LO				
30037	BUZZER_TIMESTAMP_HI	DWORD	R	0+	Buzzer active timestamp
30038	BUZZER_TIMESTAMP_LO				
30039	RELAY_1_TIMESTAMP_HI	DWORD	R	0+	Relay 1 on timestamp
30040	RELAY_1_TIMESTAMP_LO				
30041	RELAY_2_TIMESTAMP_HI	DWORD	R	0+	Relay 2 on timestamp
30042	RELAY_2_TIMESTAMP_LO				
30043	DEVICE_RESTART_REQUIRED	BOOLEAN	R	0 or 1	Device restart is required to apply configuration changes 0 = No 1 = Yes
30044	CALIBRATION_REQUIRED	BOOLEAN	R	0 or 1	Device requires calibration 0 = No 1 = Yes
30045	CONFIGURATION_REQUIRED	BOOLEAN	R	0 or 1	One or more problems are found in the configuration. 0 = No 1 = Yes
30046	CONFIGURATION_CHANGED	BOOLEAN	R	0 or 1	General or channel configuration has changed 0 = No 1 = Yes
30047	PAGE_CURRENT	WORD	R	0 - 65535	Current page visible on the screen 0 = Unknown n = List below
30048	SYNC_COUNTER	WORD	R	0+	Synchronization counter Everytime a user manually changes the configuration this counter will be increased and the timestamp will be updated
30049	SYNC_TIMESTAMP_HI	DWORD	R	0+	Synchronization timestamp
30050	SYNC_TIMESTAMP_LO				
30051	RANDOM_BYTE	BYTE	R	0 - 255	Returns a random value
30052	RANDOM_WORD	WORD	R	0 - 65535	Returns a random value

Holding registers (read/write integer)					
Register	Description	Data Type	Access	Value	
40001	DEVICE_IDENTIFICATION_CODE	WORD	R	0x1232	Device identification code
40002	DEVICE_SERIAL_NUMBER_HI	DWORD	R	0 - 2^32	Returns the devices serial number
40003	DEVICE_SERIAL_NUMBER_LO				
40004	DEVICE_BIOS_CRC_HI	DWORD	R	0	Not used at the moment
40005	DEVICE_BIOS_CRC_LO				
40006	DEVICE_BIOS_VERSION_HI	DWORD	R	0	Not used at the moment
40007	DEVICE_BIOS_VERSION_LO				
40008	DEVICE_FIRMWARE_CRC_HI	DWORD	R	0 - 2^32	CRC32 checksum of the firmware file (SYS.BIN) on the SD card.
40009	DEVICE_FIRMWARE_CRC_LO				
40010	DEVICE_FIRMWARE_VERSION_HI	DWORD	R	0 - 2^32	Firmware version number
40011	DEVICE_FIRMWARE_VERSION_LO				
40012	PROJECT_NAME_LENGTH	BYTE	RW	0 - 12	Get or set the project name length
40013	PROJECT_NAME_1	WORD	RW	ASCII char (32-255)	Project name used as a prefix for the device name
40014	PROJECT_NAME_2			Two chars per WORD	
40015	PROJECT_NAME_3				
40016	PROJECT_NAME_4				
40017	PROJECT_NAME_5				
40018	PROJECT_NAME_6				
40019	DEVICE_NAME_LENGTH	BYTE	RW	0 - 20	Get or set the device name length
40020	DEVICE_NAME_1	WORD	RW	ASCII char (32-255)	Device name used to identify the controller
40021	DEVICE_NAME_2			Two chars per WORD	in the modbus master slaves list
40022	DEVICE_NAME_3				
40023	DEVICE_NAME_4				
40024	DEVICE_NAME_5				
40025	DEVICE_NAME_6				
40026	DEVICE_NAME_7				
40027	DEVICE_NAME_8				
40028	DEVICE_NAME_9				
40029	DEVICE_NAME_10				
40030	SERIAL_NUMBER_LENGTH	BYTE	RW	0 - 20	Get or set the serial number length

40031 SERIAL_NUMBER_1	WORD	RW	ASCII char (32-255)	Text based serial number, will replace the
40032 SERIAL_NUMBER_2			Two chars per WORD	device serial number in the about screen
40033 SERIAL_NUMBER_3				
40034 SERIAL_NUMBER_4				
40035 SERIAL_NUMBER_5				
40036 SERIAL_NUMBER_6				
40037 SERIAL_NUMBER_7				
40038 SERIAL_NUMBER_8				
40039 SERIAL_NUMBER_9				
40040 SERIAL_NUMBER_10				
40041 TIME_UPTIME_HI	DWORD	R	0 - 2^32	Uptime in seconds
40042 TIME_UPTIME_LO				
40043 TIME_TIMESTAMP_HI	DWORD	RW	0 - 2^32	Unix Time, number of seconds that
40044 TIME_TIMESTAMP_LO				have elapsed since 1 January 1970
40045 TIME_YEAR	WORD	RW	1970-3000	Year
40046 TIME_MON	BYTE	RW	1 - 12	Month
40047 TIME_DAY	BYTE	RW	1 - 31	Day
40048 TIME_HOUR	BYTE	RW	0 - 23	Hour
40049 TIME_MIN	BYTE	RW	0 - 59	Minutes
40050 TIME_SEC	BYTE	RW	0 - 59	Seconds
40051 SERIAL_MODE	BYTE	RW	0 - 2	Modbus mode
				0 = Disabled
				1 = Slave
				2 = Master
40052 SERIAL_PORT	BYTE	RW	0 - 2	Modbus port
				0 = RS232
				1 = RS485
				2 = Ethernet (TCP)
40053 SERIAL_BAUD_RATE	BYTE	RW	0 - 7	Modbus baud rate
				0 = 1200
				1 = 2400
				2 = 4800
				3 = 9600
				4 = 19200
				5 = 38400
				6 = 57600
				7 = 115200
40054 SERIAL_BITS	BYTE	RW	0	Modbus bits
				0 = 8N1 (eight data bits, no parity bit, and one stop bit)
40055 SERIAL_ADDRESS	BYTE	RW	1 - 247	Modbus slave, address
40056 SERIAL_CHARACTER_TIMEOUT	WORD	RW	10 - 100	Modbus character timeout in ms
40057 SERIAL_REQUEST_TIMEOUT	WORD	RW	100 - 2000	Modbus master, request timeout in ms
40058 SERIAL_REQUEST_RETRIALS	BYTE	RW	0 - 5	Modbus master, request retrials
40059 NETWORK_MODE	BYTE	RW	0 - 2	Network mode
				0 = Disabled
				1 = DHCP
				2 = Static
40060 NETWORK_IP_HI	DWORD	RW	0 - 2^32	Network IP address
40061 NETWORK_IP_LO				
40062 NETWORK_NETMASK_HI	DWORD	RW	0 - 2^32	Network netmask address
40063 NETWORK_NETMASK_LO				
40064 NETWORK_GATEWAY_HI	DWORD	RW	0 - 2^32	Network gateway address
40065 NETWORK_GATEWAY_LO				
40066 CONFIG_DEBUG	BOOLEAN	RW	0 or 1	Debug mode
				0 = Disabled
				1 = Enabled
40067 CONFIG_LANGUAGE	BYTE	RW	0 - 2	Language
				0 = Dutch
				1 = German
				2 = English
40068 CONFIG_LCD_BRIGHTNESS	BYTE	RW	10 - 100	LCD Brightness in increments of 10
40069 CONFIG_SOUND_VOLUME	BYTE	RW	20 - 100	Sound Volume (buzzer) in increments of 20
40070 CONFIG_LAYOUT	BYTE	RW	0 - 4	Readout screen layout
				0 = Not set (will go to the menu on boot)
				1 = 1 full
				2 = 1 top, 1 bottom
				3 = 1 top, 2 bottom
				4 = 2 top, 2 bottom
40071 CONFIG_LAYOUT_HIDE_VALUES	BYTE	RW	0 - 2	Readout screen hide values (only display the channel long-unit or unit)
				0 = Value and unit
				1 = Unit only
				2 = Mixed
40072 CONFIG_MENU_LOCKED	BOOLEAN	RW	0 or 1	Configuration menu deactivated
				0 = Unlocked
				1 = Locked
40073 CONFIG_MENU_COUNTER_RESET_LOCKED	BOOLEAN	RW	0 or 1	Counter reset menu deactivated
				0 = Unlocked
				1 = Locked
40074 CONFIG_MENU_BUZZER_RESET_LOCKED	BOOLEAN	RW	0 or 1	Buzzer reset menu deactivated
				0 = Unlocked
				1 = Locked
40075 CONFIG_PIN	WORD	RW	0 - 9999	Four digit PIN number for the configuration menu
40076 CONFIG_PIN_LOCKED	BOOLEAN	RW	0 or 1	PIN number cannot be changed

40077 CONFIG_RESET_PIN_HI	DWORD	RW	10000000 - 99999999	Eight digit PIN number used to reset the users PIN number
40078 CONFIG_RESET_PIN_LO				
40079 CONFIG_RESELLER_PIN_HI	DWORD	RW	10000000 - 99999999	Eight digit PIN number used to access the reseller menu
40080 CONFIG_RESELLER_PIN_LO				
40081 CONFIG_LOAD	BYTE	W	0 - 4	Load the configuration from disk 0 = Load nothing 1 = Load an empty config 2 = Load the demo config 3 = Load the factory config 4 = Load the user config
40082 CONFIG_SAVE	BYTE	W	0 - 2	Save the active configuration to disk 0 = Save nothing 1 = Save as factory settings 2 = Save as user settings
40083 DEVICE_RESTART	BOOLEAN	W	0 or 1	Device restart 0 = do nothing 1 = Restart the device with a five second delay
40084 BUZZER_ACTIVE	BOOLEAN	RW	0 or 1	Buzzer active 0 = No 1 = Yes
40085 BUZZER_SNOOZED	BOOLEAN	RW	0 or 1	Buzzer snoozed 0 = No 1 = Yes
40086 BUZZER_TIMESTAMP_HI	DWORD	R	0 - 2^32	Timestamp when the buzzer was activated (even when snoozed)
40087 BUZZER_TIMESTAMP_LO				
40088 RELAY_1_ACTIVE	BOOLEAN	RW	0 or 1	Relay 1 0 = Off (auto) 1 = On
40089 RELAY_1_TIMESTAMP_HI	DWORD	R	0 - 2^32	Timestamp when relay 1 was activated
40090 RELAY_1_TIMESTAMP_LO				
40091 RELAY_2_ACTIVE	BOOLEAN	RW	0 or 1	Relay 2 0 = Off (auto) 1 = On
40092 RELAY_2_TIMESTAMP_HI	DWORD	R	0 - 2^32	Timestamp when relay 2 was activated
40093 RELAY_2_TIMESTAMP_LO				
40094 BUZZER_LINKED_RELAYS	BYTE	RW	0-3	Relays linked to the buzzer 0 = None 1 = Relay 1 2 = Relay 2 3 = Relay 1 & 2
41001 CH1_ENABLED	BOOLEAN	RW	0 or 1	The channel is active and visible 0 = No 1 = Yes (positions the channel in the first free or last position)
41002 CH1_POSITION	BYTE	RW	0 - 1 (layout 1) 0 - 2 (layout 2) 0 - 3 (layout 3) 0 - 4 (layout 4)	Position on the screen from top left to bottom right 0 = Not visible (disables the channel, reg: 41001) 1 = Top left 2 = Top right 3 = Bottom left 4 = Bottom right
41003 CH1_CONTROL	BYTE	RW	0 - 1	Remote control will let the master control alarms, relays etc 0 = Local 1 = Remote
41004 CH1_SOURCE	WORD	RW	0 - 10	Input source 0 = None 1 = Analog 1 2 = Analog 2 3 = Analog 3 4 = Analog 4 5 = Digital 1 6 = Digital 2 7 = Digital 3 8 = Digital 4 9 = Modbus value 10 = Modbus text
41005 CH1_SOURCE_MODE	BYTE	RW	0 - 3	Input source mode 0 = Raw, no processing 1 = 0 - 20mA 2 = 4 - 20mA 3 = 0 - 10VDC
41006 CH1_NAME_LENGTH	BYTE	RW	0 - 20	Get or set the name length
41007 CH1_NAME_1		RW	ASCII char (32-255)	Channel name, visible on channel selection list
41008 CH1_NAME_2			Two chars per WORD	
41009 CH1_NAME_3				
41010 CH1_NAME_4				
41011 CH1_NAME_5				
41012 CH1_NAME_6				
41013 CH1_NAME_7				
41014 CH1_NAME_8				
41015 CH1_NAME_9				
41016 CH1_NAME_10				
41017 CH1_VALUE_HI	FLOAT	RW		Current value displayed
41018 CH1_VALUE_LO				Register: 41004, value 9: Modbus value
41019 CH1_TEXT_LENGTH	BYTE	RW	0 - 16	Get or set the text length

41020 CH1_TEXT_1	WORD	RW	ASCII char (32-255)	Current text displayed instead of value
41021 CH1_TEXT_2			Two chars per WORD	Register: 41004, value 10: Modbus text
41022 CH1_TEXT_3				
41023 CH1_TEXT_4				
41024 CH1_TEXT_5				
41025 CH1_TEXT_6				
41026 CH1_TEXT_7				
41027 CH1_TEXT_8				
41028 CH1_UNIT_ONLY	BOOLEAN	RW	0 or 1	Display short or long unit 0 = Value and short unit are visible, text is aligned right 1 = Long unit is visbible, value isn't, text is centered
41029 CH1_UNIT_LENGTH	BYTE	RW	0 - 3	Get or set the unit length
41030 CH1_UNIT_1	WORD	RW	ASCII char (32-255)	Unit displayed at the right of value
41031 CH1_UNIT_2			Two chars per WORD	
41032 CH1_UNIT_LONG_LENGTH	BYTE	RW	0 - 16	Get or set the unit-long length
41033 CH1_UNIT_LONG_1	WORD	RW	ASCII char (32-255)	Unit displayed when values are hidden (register: 40042)
41034 CH1_UNIT_LONG_2			Two chars per WORD	
41035 CH1_UNIT_LONG_3				
41036 CH1_UNIT_LONG_4				
41037 CH1_UNIT_LONG_5				
41038 CH1_UNIT_LONG_6				
41039 CH1_UNIT_LONG_7				
41040 CH1_UNIT_LONG_8				
41041 CH1_LABEL1_LENGTH	BYTE	RW	0 - 16	Get or set the label1 length
41042 CH1_LABEL1_1	WORD	RW	ASCII char (32-255)	Text label displayed top left
41043 CH1_LABEL1_2			Two chars per WORD	
41044 CH1_LABEL1_3				
41045 CH1_LABEL1_4				
41046 CH1_LABEL1_5				
41047 CH1_LABEL1_6				
41048 CH1_LABEL1_7				
41049 CH1_LABEL1_8				
41050 CH1_LABEL2_LENGTH	BYTE	RW	0 - 16	Get or set the label2 length
41051 CH1_LABEL2_1	WORD	RW	ASCII char (32-255)	Text label displayed top right
41052 CH1_LABEL2_2			Two chars per WORD	
41053 CH1_LABEL2_3				
41054 CH1_LABEL2_4				
41055 CH1_LABEL2_5				
41056 CH1_LABEL2_6				
41057 CH1_LABEL2_7				
41058 CH1_LABEL2_8				
41059 CH1_OVERWRITE_ENABLED	BOOLEAN	RW	0 or 1	Overwrite enabled (will suppress all alarms for this channel when active) 0 = No 1 = Yes
41060 CH1_OVERWRITE_SOURCE	WORD	RW	1 - 4	Overwrite input source 1 = Digital 1 2 = Digital 2 3 = Digital 3 4 = Digital 4
41061 CH1_OVERWRITE_COLOR	BYTE	RW	0 - 1	Background color when overwrite is active 0 = Green 1 = Red
41062 CH1_OVERWRITE_TEXT1_LENGTH	BYTE	RW	0 - 8	Get or set the text1 length
41063 CH1_OVERWRITE_TEXT1_1	WORD	RW	ASCII char (32-255)	Text displayed when overwrite is active (top line)
41064 CH1_OVERWRITE_TEXT1_2			Two chars per WORD	
41065 CH1_OVERWRITE_TEXT1_3				
41066 CH1_OVERWRITE_TEXT1_4				
41067 CH1_OVERWRITE_TEXT2_LENGTH	BYTE	RW	0 - 8	Get or set the text2 length
41068 CH1_OVERWRITE_TEXT2_1	WORD	RW	ASCII char (32-255)	Text displayed when overwrite is active (bottom line)
41069 CH1_OVERWRITE_TEXT2_2			Two chars per WORD	
41070 CH1_OVERWRITE_TEXT2_3				
41071 CH1_OVERWRITE_TEXT2_4				
41072 CH1_OVERWRITE_ACTIVE	BOOLEAN	RW	0 or 1	Overwrite is active (for local and remote control) 0 = No 1 = Yes
41073 CH1_OVERWRITE_TIMESTAMP_HI	DWORD	R	0 or TS	Overwrite is active since timestamp
41074 CH1_OVERWRITE_TIMESTAMP_LO				
41075 CH1_RANGE_PRECISION	BYTE	RW	0 - 3	Value precision (number of decimals visible)
41076 CH1_RANGE_MIN_HI	FLOAT	RW		Range min
41077 CH1_RANGE_MIN_LO				
41078 CH1_RANGE_MAX_HI	FLOAT	RW		Range max
41079 CH1_RANGE_MAX_LO				
41080 CH1_RANGE_OFFSET_HI	FLOAT	RW		Offset
41081 CH1_RANGE_OFFSET_LO				Default: 0
41082 CH1_RANGE_GAIN_HI	FLOAT	RW		Gain
41083 CH1_RANGE_GAIN_LO				Default: 1
41084 CH1_ALARM_HIGH_ENABLED	BOOLEAN	RW	0 or 1	High alarm 0 = Disabled 1 = Enabled
41085 CH1_ALARM_HIGH_VALUE_HI	FLOAT	RW		High alarm threshold value
41086 CH1_ALARM_HIGH_VALUE_LO				
41087 CH1_ALARM_HIGH_HYSTERESIS_HI	FLOAT	RW		High alarm hysteresis value
41088 CH1_ALARM_HIGH_HYSTERESIS_LO				
41089 CH1_ALARM_HIGH_DELAY	WORD	RW	0 +	High alarm delay in seconds

41090	CH1_ALARM_HIGH_BUZZER	BOOLEAN	RW	0 or 1	Sound buzzer on high alarm 0 = No 1 = Yes
41091	CH1_ALARM_HIGH_RELAY_1	BOOLEAN	RW	0 or 1	Enable relay 1 on high alarm 0 = No 1 = Yes
41092	CH1_ALARM_HIGH_RELAY_2	BOOLEAN	RW	0 or 1	Enable relay 2 on high alarm 0 = No 1 = Yes
41093	CH1_ALARM_HIGH_ACTIVE	BOOLEAN	R or RW	0 or 1	High alarm is active (can be written on remote control) 0 = No 1 = Yes
41094	CH1_ALARM_HIGH_TIMESTAMP_HI	DWORD	R	0 or TS	High alarm is active since timestamp
41095	CH1_ALARM_HIGH_TIMESTAMP_LO	BOOLEAN	RW	0 or 1	Low alarm 0 = Disabled 1 = Enabled
41096	CH1_ALARM_LOW_ENABLED				
41097	CH1_ALARM_LOW_VALUE_HI				
41098	CH1_ALARM_LOW_VALUE_LO	FLOAT	RW		Low alarm threshold value
41099	CH1_ALARM_LOW_HYSTERESIS_HI				
41100	CH1_ALARM_LOW_HYSTERESIS_LO				
41101	CH1_ALARM_LOW_DELAY	WORD	RW	0+	Low alarm delay in seconds
41102	CH1_ALARM_LOW_BUZZER	BOOLEAN	RW	0 or 1	Sound buzzer on low alarm 0 = No 1 = Yes
41103	CH1_ALARM_LOW_RELAY_1	BOOLEAN	RW	0 or 1	Enable relay 1 on low alarm 0 = No 1 = Yes
41104	CH1_ALARM_LOW_RELAY_2	BOOLEAN	RW	0 or 1	Enable relay 2 on low alarm 0 = No 1 = Yes
41105	CH1_ALARM_LOW_ACTIVE	BOOLEAN	R or RW	0 or 1	Low alarm is active (can be written on remote control) 0 = No 1 = Yes
41106	CH1_ALARM_LOW_TIMESTAMP_HI	DWORD	R	0 or TS	Low alarm is active since timestamp
41107	CH1_ALARM_LOW_TIMESTAMP_LO	BOOLEAN	RW	0 or 1	Error alarm 0 = Disabled 1 = Enabled
41108	CH1_ALARM_ERROR_ENABLED				
41109	CH1_ALARM_ERROR_DELAY				
41110	CH1_ALARM_ERROR_OVERWRITE	WORD	RW	0+	Error alarm delay in seconds
41111	CH1_ALARM_ERROR_BUZZER	BOOLEAN	RW	0 or 1	Sound buzzer on error alarm 0 = No 1 = Yes
41112	CH1_ALARM_ERROR_RELAY_1	BOOLEAN	RW	0 or 1	Enable relay 1 on error alarm 0 = No 1 = Yes
41113	CH1_ALARM_ERROR_RELAY_2	BOOLEAN	RW	0 or 1	Enable relay 2 on error alarm 0 = No 1 = Yes
41114	CH1_ALARM_ERROR_ACTIVE	BOOLEAN	R or RW	0 or 1	Error alarm is active (can be written on remote control) 0 = No 1 = Yes
41115	CH1_ALARM_ERROR_TIMESTAMP_HI	DWORD	R	0 or TS	Error alarm is active since timestamp
41116	CH1_ALARM_ERROR_TIMESTAMP_LO	BOOLEAN	RW	0 or 1	Sound alarm has been snoozed for this channel 0 = Not snoozed 1 = Snoozed
41117	CH1_BUZZER_SNOOZED				
41118	CH1_COUNTER_RESET	BOOLEAN	W		Resets the counter if the channel source is a digital port 0 = Do nothing 1 = Reset to zero

Channel 1 - 8

Channel #	Register Offset	Visible and active
Channel 1	41000	Maximal four channels can be active and visible depending on the layout used.
Channel 2	42000	
Channel 3	43000	
Channel 4	44000	Local control 123-2Touch monitors inputs and triggers alarms, changes the background, switches relays and buzzer.
Channel 5	45000	
Channel 6	46000	
Channel 7	47000	Remote control Modbus master monitors inputs and triggers the alarms, Alarm value, hysteresis and delay have no effect.
Channel 8	48000	

Custom Functions

66	Change slave address (serial only, broadcast)
Request	

Function code	1 Byte	0x42
Device serial number	4 Byte	0x00000000 - 0xFFFFFFFF
New slave address	1 Byte	1 - 247

No Response or Exception**67 Get Text****Request**

Function code	1 Byte	0x43
Text ID	1 Byte	0 to 66

Response

Function code	1 Byte	0x43
Text ID	1 Byte	0 to 66
Text Max Length	1 Byte	0 to 252
Text Length	1 Byte	0 to 252
Text Value	n Byte	32 to 255

Error

Function code	1 Byte	Function code + 0x80
Exception code	1 Byte	01 or 02 or 03 or 04

68 Set Text**Request**

Function code	1 Byte	0x44
Text ID	1 Byte	0 to 66
Text Length	1 Byte	0 to 250
Text Value	n Byte	32 to 255

Response

Function code	1 Byte	0x44
Text ID	1 Byte	0 to 66
Text Max Length	1 Byte	0 to 250
Text Length	1 Byte	0 to 250
Text Value	n Byte	32 to 255

Error

Function code	1 Byte	Function code + 0x80
Exception code	1 Byte	01 or 02 or 03 or 04

69 Get file**DEVELOPMENT VERSION ONLY****Request**

Function code	1 byte	0x45
File name length	1 byte	1 to 79
File name data	n byte	1 to 79 bytes
Request	1 byte	what do we want
Offset	4 bytes	offset in the file
Length	1 byte	1 to 200 Number of bytes we want

Response

Function code	1 byte	0x45
Status	1 byte	0 = internal error, 1 = file not found, 2 = access denied,
File Size	4 bytes	
File CRC	4 bytes	
Data CRC	4 bytes	
Data Offset	4 bytes	offset in the file
Data Length	1 byte	0 to 200 Number of bytes we want
Data	n bytes	

Error

Function code	1 Byte	Function code + 0x80
Exception code	1 Byte	01 or 02 or 03 or 04

70 Put file**DEVELOPMENT VERSION ONLY****Request**

Function code	1 byte	0x46
File name length	1 byte	1 to 79
File name data	n byte	1 to 79 bytes
Size	4 bytes	Final file size
CRC	4 bytes	Final file CRC32
Offset	4 bytes	Offset
Length	1 byte	1 to 200
Data	n bytes	1 to 200 Data

Response

Function code	1 byte	0x46
Response code	1 byte	

Error

Function code	1 Byte	Function code + 0x80
Exception code	1 Byte	01 or 02 or 03 or 04

Name	ID	Max Length
Device: Project Name	0	12
Device: Device Name	1	20
Device: Serial Number	2	20
Channel 1: Name	3	20
Channel 1: Text	4	16
Channel 1: Unit	5	3
Channel 1: Unit Long	6	16
Channel 1: Overwrite Text 1	7	8
Channel 1: Overwrite Text 2	8	8
Channel 1: Label top left	9	16
Channel 1: Label top right	10	16
Channel 2: Name	11	20
Channel 2: Text	12	16
Channel 2: Unit	13	3
Channel 2: Unit Long	14	16
Channel 2: Overwrite Text 1	15	8
Channel 2: Overwrite Text 2	16	8
Channel 2: Label top left	17	16
Channel 2: Label top right	18	16
Channel 3: Name	19	20
Channel 3: Text	20	16
Channel 3: Unit	21	3
Channel 3: Unit Long	22	16
Channel 3: Overwrite Text 1	23	8
Channel 3: Overwrite Text 2	24	8
Channel 3: Label top left	25	16
Channel 3: Label top right	26	16
Channel 4: Name	27	20
Channel 4: Text	28	16
Channel 4: Unit	29	3
Channel 4: Unit Long	30	16
Channel 4: Overwrite Text 1	31	8
Channel 4: Overwrite Text 2	32	8
Channel 4: Label top left	33	16
Channel 4: Label top right	34	16
Channel 5: Name	35	20
Channel 5: Text	36	16
Channel 5: Unit	37	3
Channel 5: Unit Long	38	16
Channel 5: Overwrite Text 1	39	8
Channel 5: Overwrite Text 2	40	8
Channel 5: Label top left	41	16
Channel 5: Label top right	42	16
Channel 6: Name	43	20
Channel 6: Text	44	16
Channel 6: Unit	45	3
Channel 6: Unit Long	46	16
Channel 6: Overwrite Text 1	47	8
Channel 6: Overwrite Text 2	48	8
Channel 6: Label top left	49	16
Channel 6: Label top right	50	16
Channel 7: Name	51	20
Channel 7: Text	52	16
Channel 7: Unit	53	3
Channel 7: Unit Long	54	16
Channel 7: Overwrite Text 1	55	8
Channel 7: Overwrite Text 2	56	8
Channel 7: Label top left	57	16
Channel 7: Label top right	58	16
Channel 8: Name	59	20
Channel 8: Text	60	16
Channel 8: Unit	61	3
Channel 8: Unit Long	62	16
Channel 8: Overwrite Text 1	63	8
Channel 8: Overwrite Text 2	64	8
Channel 8: Label top left	65	16
Channel 8: Label top right	66	16

Text Ids for function 67 and 68

Page name	ID
Config Progress	10
Config Check	11
Readout	30
Alarm Reset	31
Door Menu	32
Door Alarm Reset	33
Door Counter Reset	34
PIN	50

Page Ids for input register "PAGE_CURRENT"

PIN Reset	51
Reseller	70
Calibration	71
Menu	90
Layout	91
Channel Select	92
General	93
Date and Time	94
Network	95
Modbus	96
Change PIN	97
Factory Reset	98
About	99
Channel Menu	110
Channel Position	111
Channel Source	112
Channel Labels	113
Channel Range	114
Channel Alarm	115
Channel Save Question	116
Modbus Slaves	130
Modbus Slave	131
Keyboard	150



7. RS485 – ModBus device interface

Interface parameter - 1 start bit, 8 data bit, 1 stop bit, no parity, **9600** baud

Compatibility – the interface is compatible to ModBus protocol of the company „Modicon“. This means that all register have a size of 16 bit. Higher data types can be realised by occupying several register in series. A not-Modicon-compatible-mode is supported, too. In this mode each data type occupies only one register which corresponds to the size of data type (Minimum is always 16 Bit).

(Info: „Modicon“ - company, that produced the first SPS, now „Schneider-Electric“)

Advice: An access to data types that occupy several register, must always be carried out in one write/read access and may not be distributed into several write/read access!

Device address – Use a value between 1 and 247 as device address. On address 0 several devices can be addressed simultaneously (broadcast), if the necessary function is supported (no reception for e.g. reset of the device).

Transmission mode – The devices support the RTU-mode (binary data, default) and the ASCII-mode (alphanumeric characters – hexadecimal). The RTU-mode is faster as less bytes need to be transferred, but more critical in terms of time. The ASCII-mode is suited for the communication with PC-based systems, as they cannot fulfill the time-critical requirements for the RTU-mode.

Advice: The device configuration via the PM-Tool is only possible in ASCII-mode.

Supported data types:

Name	Number range	Memory size	Number of register in modicon-compatible mode	Number of register in not-modicon-compatible mode
INT08	-128...127	2 Byte	1	1
UINT08	0...255	2 Byte	1	1
INT16	-32768...32767	2 Byte	1	1
UINT16	0...65535	2 Byte	1	1
INT32	-2147843648... 2147843647	2 Byte	2	1
UINT32	0...4294967295	4 Byte	2	1
INT64	-9223372036854775808... 9223372036854775807	8 Byte	4	1
FLOAT	± 3.402823466e±38	4 Byte	2	1

Supported function codes:

Code	Function	Note
0x03	READ HOLDING REGISTERS	e.g. readout measuring values and alarm status
0x04	READ INPUT REGISTER	same function as code 0x03
0x08	DIAGNOSTIC	device diagnostic
0x10	WRITE MULTIPLE REGISTERS	e.g. transfer measuring values and alarm status to the device

Register description:

Advice: The display range is limited from -1999 to 9999. A measurand of -2000 or 10000 signalises an underflow or overflow of the measuring range.

Address range 0x4000...0x4FFF – 16 bit register					
Name	Index (hex/ dec)	Access mode	min/max-value data type	Note	
Device number	0x4400 /17408	r/w	0...65535 UNIT16	user defined identification	
Digin1	0x4401 /17409	r	0/1 UNIT16	Bit 0 1	Function Digin 1 low Digin 1 high
Digin2	0x4402 /17410	r	0/1 UNIT16	Bit 0 1	Function Digin 2 low Digin 2 high
Measured value High-word	0x4501 /17665	r/w	-20000..100000 FLOAT	Current scaled measurand	
Measured value Low-word	0x4502 /17666				
Decimal point	0x4503 /17667	r/w	0...3 UNIT16	Value 0 1 2 3	Display 0 0,0 0,00 0,000
Signal name (byte 0:1)	0x4608 /17928	r/w	CHAR	Signal name (fill up unimplemented bytes with zeros)	
Signal name (byte 2:3)	0x4609 /17929				
Signal name (byte 4:5)	0x460A /17930				
Signal name (byte 6:7)	0x460B /17931				
Signal name (byte 8:9)	0x460C /17932				
Signal name (byte 10:11)	0x460D /17933				
Signal name (byte 12:13)	0x460E /17934				
Signal name (byte 14:15)	0x460F /17935				

Register description:

Advice: The display range is limited from -1999 to 9999. A measurand of -2000 or 10000 signalises an underflow or overflow of the measuring range.

Address range 0x4000...0x4FFF – 16 bit register				
Name	Index (hex/dec)	Access mode	min/max-value data type	Note
Area name (byte 0:1)	0x4610 /17936	r/w	CHAR	Area name (fill up unimplemented bytes with zeros)
Area name (byte 2:3)	0x4611 /17937			
Area name (byte 4:5)	0x4612 /17938			
Area name (byte 6:7)	0x4613 /17939			
Area name (byte 8:9)	0x4614 /17940			
Area name (byte 10:11)	0x4615 /17941			
Area name (byte 12:13)	0x4616 /17942			
Area name (byte 14:15)	0x4617 /17943			
Dimension (byte 0:1)	0x4618 /17944	r/w	CHAR	Dimension (fill up unimplemented bytes with zeros)
Dimension (byte 2:3)	0x4619 /17945			

Address range 0x4000...0x4FFF – 16 bit register					
Name	Index (hex/dec)	Access mode	Min/Max-value Data type	Note	
Display brightness	0x461A /17946	r/w	0..8 UINT16	Value 0	Function Min. brightness
				... 8	Max. brightness
Digital background color	0x461B /17947	r/w	0..6 UNIT16	Value 0	Colour Red
				1	Green
				2	Blue
				3	White
				4	Yellow
				5	Petrol
				6	Teal

Address range 0x4000...0x4FFF – 16 bit register					
Name	Index (hex/ dec)	Access mode	min/max-value Data type	Note	
Alarm 1 limit high-word	0x4720 /18208	r/w	-20000..100000 FLOAT	Limit alarm 1	
Alarm 1 limit low-word	0x4721 /18209				
Alarm 1 hysteresis high-word	0x4722 /18210	r/w	-20000..100000 FLOAT	Hysteresis alarm 1	
Alarm 1 hysteresis low-word	0x4723 /18211				
Alarm 1 limit max high-word	0x4724 /18212	r/w	-20000..100000 FLOAT	max. alarm 1 (Range)	
Alarm 1 limit max low-word	0x4725 /18213				
Alarm 1 limit min high-word	0x4726 /18214	r/w	-20000..100000 FLOAT	min. alarm 1 (Range)	
Alarm 1 limit min low-word	0x4727 /18215				
Alarm 1 on time	0x4728 /18216	r/w	0..5999 sec UINT	switch-on delay	
Alarm 1 off time	0x4729 /18217	r/w	0..5999 sec UINT	switch-off delay	
Alarm 1 active	0x472A /18218	r/w	0/1	Value 0 1	Function inactive active
Alarm 2 limit high-word	0x4730 /18224	r/w	-20000..100000 FLOAT	Limit alarm 2	
Alarm 2 limit low-word	0x4731 /18225				
Alarm 2 hysteresis high-word	0x4732 /18226	r/w	-20000..100000 FLOAT	Hysteresis alarm 2	
Alarm 2 hysteresis low-word	0x4733 /18227				
Alarm 2 limit max high-word	0x4734 /18228	r/w	-20000..100000 FLOAT	max alarm 2 (Range)	
Alarm 2 limit max low-word	0x4735 /18229				
Alarm 2 limit min high-word	0x4736 /18230	r/w	-20000..100000 FLOAT	min alarm 2 (Range)	
Alarm 2 limit min low-word	0x4737 /18231				
Alarm 2 on time	0x4738 /18232	r/w	0..5999 sec UINT	switch-on delay	

Address range 0x4000...0x4FFF – 16 bit register					
Name	Index (hex/ dec)	Access mode	min/max-value Data type	Note	
Alarm 2 off time	0x4739 /18233	r/w	0..5999 sec UINT	switch-off delay	
Alarm 2 active	0x473A /18234	r/w	0/1	Value 0 1	Function inactive active
Relay 1 active	0x4740 /18240	R	0/1 UINT16	Value 0 1	Function inactive active
Relay 2 active	0x4741 /18241	R	0/1 UINT16	Value 0 1	Function inactive active
Buzzer active	0x4742 /18242	R	0/1 UINT16	Value 0 1	Function inactive active

Relay 1, 2 and the buzzer cannot be triggered directly. An activation works only via the corresponding alarm. There are two possibilities of the indirect alarm control, via a change of the limit values or if „Ax function“ is set on „ModBus“ by the register „Alarm x Active“ (in the menu of the device).

Protocol

General form of the telegrams:

ModBus-RTU

Device address	Function	Data	CRC-value
1 Byte	1 Byte	n Bytes	2 signs

ModBus-ASCII

Start	Device address	Function	Data	LRC-value	End
‘:’	2 signs	2 signs	n x 2 signs	2 signs	,Irln’

Information: In ASCII-mode a byte with 2 signs in hexadecimal coding (‘00...FF’) is shown.

Telegram types:

Function 0x03 (read register) - request

Address	Function	Data				Check sum	
		Start address		Number of register			
		High-Byte	Low-Byte	High-Byte	Low-Byte	Low-Byte	High-Byte
0xnn	0x03	0xnn	0xnn	0xnn	0xnn	0xnn	0xnn

Function 0x03 (read register) - answer

Address	Function	Data						Check sum	
		Number of bytes nn = number of register x 2	Register n+0		...	Register n+X			
			High-Byte	Low-Byte	...	High-Byte	Low-Byte	Low-Byte	High-Byte
0xnn	0x03	0xnn	0xnn	0xnn	...	0xnn	0xnn	0xnn	0xnn

Function 0x10 (write register) - request

Address	Function	Data										Check sum	
		Start address		Number of register		Number of bytes = number of register x2	Register n+0		...	Register n+X			
		High Byte	Low Byte	High Byte	Low Byte		High Byte	Low Byte	...	High Byte	Low Byte	Low Byte	High Byte
0xnn	0x10	0xnn	0xnn	0xnn	0xnn	0xnn	0xnn	0xnn	...	0xnn	0xnn	0xnn	0xnn

Function 0x10 (write register) - answer

Address	Func- tion	Data				Check sum	
		Start address		Number of register			
		High-Byte	Low-Byte	High-Byte	Low-Byte	Low-Byte	High-Byte
0xnn	0x10	0xnn	0xnn	0xnn	0xnn	0xnn	0xnn

Example of telegram:**Reading a 32-bit value**

ModBus device address 1, register index 0x6000, number of register 2, return value 250000 (0x0003D090)

Protocol: ModBus-RTU**Request**

Address	Function	Data				Check sum	
		Start address		Number of register			
		High-Byte	Low-Byte	High-Byte	Low-Byte	Low-Byte	High-Byte
0x01	0x03	0x60	0x00	0x00	0x02	0xnn	0xnn

Response

Address	Function	Data					Check sum	
		Number of bytes	Low-Word		High-Word			
			High-Byte	Low-Byte	High-Byte	Low-Byte	Low-Byte	High-Byte
0x01	0x03	0x04	0xD0	0x90	0x00	0x03	0xnn	0xnn

Protocol: MODBUS-ASCII**Request**

Start	Function		Data								Check sum		End	
			Start address				Number of register							
			High-Byte		Low-Byte		High-Byte		Low-Byte					
':'	'0'	'3'	'6'	'0'	'0'	'0'	'0'	'0'	'0'	'2'	'n'	'n'	CR	LF
0x3A	0x30	0x33	0x36	0x30	0x30	0x30	0x30	0x30	0x30	0x32	0xnn	0xnn	0x0D	0x0A

Response

Start	Function		Data										Check sum		End	
			Number of bytes	Low-Word				High-Word								
				High-Byte		Low-Byte		High-Byte		Low-Byte						
':'	'0'	'3'	'0'	'4'	'D'	'0'	'9'	'0'	'0'	'0'	'0'	'3'	'n'	'n'	CR	LF
0x3A	0x30	0x33	0x30	0x34	0x44	0x30	0x39	0x30	0x30	0x30	0x30	0x33	0xnn	0xnn	0x0D	0x0A

Write a 32-bit value

ModBus device address 1, register index 0x6002, number of register 2, return value 190000 (0x0002E630)

Protocol: ModBus-RTU**Request**

Address	Function	Data										Check sum	
		Start address		Number of register		Number of bytes	Low-Word		High-Word				
		High-Byte	Low-Byte	High-Byte	Low-Byte		High-Byte	Low-Byte	High-Byte	Low-Byte			
		Low-Byte	High-Byte										
0x01	0x10	0x60	0x02	0x00	0x02	0x04	0xE6	0x30	0x00	0x02	0xnn	0xnn	

Response

Address	Func- tion	Data				Check sum	
		Start address		Number of register			
		High-Byte	Low-Byte	High-Byte	Low-Byte	Low-Byte	High-Byte
0x01	0x10	0x60	0x02	0x00	0x02	0xnn	0xnn

Advice: Please note that in the modicon-compatible mode, the high-byte will always be transferred first for the 16-bit values of the register addresses (index), number of register and register content. In contrast to this the low-byte-values will be transferred first for the 32-bit-values. The same goes for data type FLOAT.

Error codes:

The ModBus-protocol provides a transfer of error codes in certain cases.

Error code	Description
0x01	function code is unsupported
0x02	register address / register index incorrect
0x03	data value incorrect (e.g. number of register or telegram size incorrect)
0x04	general device error (e.g. undercut of minimum/maximum value)

If the check sum is faulty, then the device sends no answer to the request. This behaviour shall create a timeout on the opposite side.

Response – error telegram

Address	Function	Error number	Check sum	
			Low-Byte	High-Byte
0x01	0x83	0x04	0xnn	0xnn

An error will be signalled in the answer by a set bit 7 in function code.

Device diagnostics

Diagnostic functions

Subfunction	Data	Description
0x0000	0x0000	answers with equal data (echo function – connection test)
0x0001	0x0000	starts device initialization
	0x0001	starts device reset
0x0002	0x0000	calls up the content of the diagnostic register (see below)
0x000A	0x0000	zeroizes all error counters and the diagnostic register
0x000B	0x0000	calls up the counter value for all received requests
0x000C	0x0000	calls up the counter value for all received requests with check sum error
0x000D	0x0000	calls up the counter value for all sent faulty answers
0x000E	0x0000	calls up the counter value for all received requests with concordant device address or device address zero (broadcast)
0x000F	0x0000	calls up the counter value for all received requests device address zero (broadcast)
0x0010	0x0000	equals subfunction 0x000D
0x0012	0x0000	calls up the counter value for occurred buffer overflows
0x0014	0x0000	calls up the counter value for occurred buffer overflows onto zero

Request / Response – diagnostic function

Address	Function	Data				Check sum	
		Subfunction		Data		Low-Byte	High-Byte
		High-Byte	Low-Byte	High-Byte	Low-Byte		
0x01	0x08	0x00	0x00	0x00	0x00	0xnn	0xnn

Diagnostic register

Bit number	Description
0...15	reserved

Advice: The bits in the diagnostic register remain set as long as they will be reset by sending the subfunction 0x000A.

Char set of characters for signal and area name

Code	...0	...1	...2	...3	...4	...5	...6	...7	...8	...9	...A	...B	...C	...D	...E	...F
0...																
1...																
2...	SP	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
3...	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4...	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5...	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6...	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7...	p	q	r	s	t	u	v	w	x	y	z	{		}	~	