TRANBERG®

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COMMUNICATION SETTINGS

RS422

Max number of drivers:	1
Max number of receivers:	10
Mode of operation:	half duplex
Network topology	multidrop
Max distance	1200m
Max transmission speed:	38400 baud
Recommended baudrate:	19200 baud
Recommended datawidth:	Databits 8, Even parity, 1 stop bit

DATA ELEMENTS

Holding register		
Byte	**Value**	**Description**
1	1..247	Slave device address
2	3	Function Code
3	0...255	Starting address, high byte
4	0...255	Starting address, low byte
5	0...255	Number of registers, high byte
6	0...255	Number of registers, low byte
7(...8)	LRC/CRC	Error check value

EXAMPLES OF MODBUS COMMANDS

The following examples of Modbus commands are only examples.
Customer must customize the commands to get the relevant data.

READ HOLDING REGISTERS (FC=03)

Request

This command is requesting the content of analog output holding registers # 40108 to 40110 from the slave device with address 17.

11 03 006B 0003 7687

- 11: The Slave Address (17 = 11 hex)
- 03: The Function Code (read Analog Output Holding Registers)
- 006B: The Data Address of the first register requested. (40108-40001 = 107 = 6B hex)
- 0003: The total number of registers requested. (read 3 registers 40108 to 40110)
- 7687: The CRC (cyclic redundancy check) for error checking.

Reponse

11 03 06 AE41 5652 4340 49AD

- 11: The Slave Address (17 = 11 hex)
- 03: The Function Code (read Analog Output Holding Registers)
- 06: The number of data bytes to follow (3 registers x 2 bytes each = 6 bytes)
- AE41: The contents of register 40108
- 5652: The contents of register 40109
- 4340: The contents of register 40110
- 49AD: The CRC (cyclic redundancy check).

PRESET SINGLE REGISTER (FC=06)

Request

This command is writing the contents of analog output holding register # 40002 to the slave device with address 17.

11 06 0001 0003 9A9B

- 11: The Slave Address (17 = 11 hex)
- 06: The Function Code (Preset Single Register)
- 0001: The Data Address of the register. (# 40002 - 40001 = 1)
- 0003: The value to write
- 9A9B: The CRC (cyclic redundancy check) for error checking.

Reponse

The normal response is an echo of the query, returned after the register contents have been written.

11 06 0001 0003 9A9B

- 11: The Slave Address (17 = 11 hex)
- 06: The Function Code (Preset Single Register)
- 0001: The Data Address of the register. (# 40002 - 40001 = 1)
- 0003: The value written
- 9A9B: The CRC (cyclic redundancy check) for error checking.

PRESET MULTIPLE REGISTERS (FC=16)

Request

This command is writing the contents of two analog output holding registers # 40002 & 40003 to the slave device with address 17.

11 10 0001 0002 04 000A 0102 C6F0

- 11: The Slave Address (17 = 11 hex)
- 10: The Function Code (Preset Multiple Registers 16 = 10 hex)
- 0001: The Data Address of the first register. (# 40002 - 40001 = 1)
- 0002: The number of registers to write
- 04: The number of data bytes to follow (2 registers x 2 bytes each = 4 bytes)
- 000A: The value to write to register 40002
- 0102: The value to write to register 40003
- C6F0: The CRC (cyclic redundancy check) for error checking.

Reponse

11 10 0001 0002 1298

- 11: The Slave Address (17 = 11 hex)
- 10: The Function Code (Preset Multiple Registers 16 = 10 hex)
- 0001: The Data Address of the first register. (# 40002 - 40001 = 1)
- 0002: The number of registers written.
- 1298: The CRC (cyclic redundancy check) for error checking.

HOLDING REGISTRY OVERVIEW (READ)

16 bit Integer		
Register Adress	**Description**	**Information**
40001	Q1 Load	Measured load from last test
40002	Q2 Load	Measured load from last test
40003	Q3 Load	Measured load from last test
40004	Q4 Load	Measured load from last test
40005	Q5 Load	Measured load from last test
40006	Q6 Load	Measured load from last test
40007	Q7 Load	Measured load from last test
40008	Q8 Load	Measured load from last test
40009	Q9 Load	Measured load from last test
40010	Q10 Load	Measured load from last test
40011	Q11 Load	Measured load from last test
40012	Q12 Load	Measured load from last test
40013	Q13 Load	Measured load from last test
40014	Q14 Load	Measured load from last test
40015	Q15 Load	Measured load from last test
40016	Q16 Load	Measured load from last test
40017	Q17 Load	Measured load from last test
40018	Q18 Load	Measured load from last test
40019	Q19 Load	Measured load from last test
40020	Q20 Load	Measured load from last test
40021	Q21 Load	Measured load from last test
40022	Q22 Load	Measured load from last test
40023	Q23 Load	Measured load from last test
40024	Q24 Load	Measured load from last test
40025	Q25 Load	Measured load from last test
40026	Q26 Load	Measured load from last test
40027	Q27 Load	Measured load from last test
40028	Q28 Load	Measured load from last test
40029	Q29 Load	Measured load from last test
40030	Q30 Load	Measured load from last test
40031	Q31 Load	Measured load from last test
40032	Q32 Load	Measured load from last test
40033	Q33 Load	Measured load from last test
40034	Q34 Load	Measured load from last test
40035	Q35 Load	Measured load from last test
40036	Q36 Load	Measured load from last test
40037	Q1 Earth Leak	Measured earth leakage from last test
40038	Q2 Earth Leak	Measured earth leakage from last test
40039	Q3 Earth Leak	Measured earth leakage from last test
40040	Q4 Earth Leak	Measured earth leakage from last test

HOLDING REGISTRY OVERVIEW (READ)

16 bit Integer continued		
Register Adress	**Description**	**Information**
40041	Q5 Earth Leak	Measured earth leakage from last test
40042	Q6 Earth Leak	Measured earth leakage from last test
40043	Q7 Earth Leak	Measured earth leakage from last test
40044	Q8 Earth Leak	Measured earth leakage from last test
40045	Q9 Earth Leak	Measured earth leakage from last test
40046	Q10 Earth Leak	Measured earth leakage from last test
40047	Q11 Earth Leak	Measured earth leakage from last test
40048	Q12 Earth Leak	Measured earth leakage from last test
40049	Q13 Earth Leak	Measured earth leakage from last test
40050	Q14 Earth Leak	Measured earth leakage from last test
40051	Q15 Earth Leak	Measured earth leakage from last test
40052	Q16 Earth Leak	Measured earth leakage from last test
40053	Q17 Earth Leak	Measured earth leakage from last test
40054	Q18 Earth Leak	Measured earth leakage from last test
40055	Q19 Earth Leak	Measured earth leakage from last test
40056	Q20 Earth Leak	Measured earth leakage from last test
40057	Q21 Earth Leak	Measured earth leakage from last test
40058	Q22 Earth Leak	Measured earth leakage from last test
40059	Q23 Earth Leak	Measured earth leakage from last test
40060	Q24 Earth Leak	Measured earth leakage from last test
40061	Q25 Earth Leak	Measured earth leakage from last test
40062	Q26 Earth Leak	Measured earth leakage from last test
40063	Q27 Earth Leak	Measured earth leakage from last test
40064	Q28 Earth Leak	Measured earth leakage from last test
40065	Q29 Earth Leak	Measured earth leakage from last test
40066	Q30 Earth Leak	Measured earth leakage from last test
40067	Q31 Earth Leak	Measured earth leakage from last test
40068	Q32 Earth Leak	Measured earth leakage from last test
40069	Q33 Earth Leak	Measured earth leakage from last test
40070	Q34 Earth Leak	Measured earth leakage from last test
40071	Q35 Earth Leak	Measured earth leakage from last test
40072	Q36 Earth Leak	Measured earth leakage from last test
40073	L1 Load	Ampere
40074	L2 Load	Ampere
40075	L3 Load	Ampere
40076	L1 Hz	Hz
40077	L2 Hz	Hz
40078	L3 Hz	Hz
40079	L1 Volt	Volt
40080	L2 Volt	Volt

HOLDING REGISTRY OVERVIEW (READ)

16 bit Integer continued		
Register Adress	Description	Information
40081	L3 Volt	Volt
40082	L1 Power	kW
40083	L2 Power	kW
40084	L3 Power	kW
40085	Total Power	kW
40086	Test Interval	hrs
40087	Ambient Temperature	C°
40088	Cabinet Temperature	C°
40089	Manual Override	Power level 0-100%
40090	Start temperature	C°
40091	Full power temperature	C°

HOLDING REGISTRY OVERVIEW (WRITE)

Register Adress	Description	Information
41000	Write Flag	External Control System to set high when writing (High = int value 1, low = int value 0)
40089	Manual Override	Power level 0-100%

Digital register -16 coils for each register		
Byte	Value	Description
1	1...247	Slave device address
2	1	Function Code
3	0...255	Starting address, high byte
4	0...255	Starting address, low byte
5	0...255	Number of coils, high byte
6	0...255	Number of coils, low byte
7(...8)	LRC/CRC	Error check value

EXAMPLES OF MODBUS COMMANDS

The following examples of Modbus commands are only examples.
Customer must customize the commands to get the relevant data.

READ COIL STATUS (FC=01)

Request
This command is requesting the ON/OFF status of discrete coils # 20 to 56
from the slave device with address 17.

11 01 0013 0025 0E84

- 11: The Slave Address (17 = 11 hex)
- 01: The Function Code (read Coil Status)
- 0013: The Data Address of the first coil to read. (Coil 20 - 1 = 19 = 13 hex)
- 0025: The total number of coils requested. (coils 20 to 56 = 37 = 25 hex)
- 0E84: The CRC (cyclic redundancy check) for error checking.

Reponse
11 01 05 CD6BB20E1B 45E6

- 11: The Slave Address (17 = 11 hex)
- 01: The Function Code (read Coil Status)
- 05: The number of data bytes to follow (37 Coils / 8 bits per byte = 5 bytes)
- CD: Coils 27 - 20 (1100 1101)
- 6B: Coils 35 - 28 (0110 1011)
- B2: Coils 43 - 36 (1011 0010)
- 0E: Coils 51 - 44 (0000 1110)
- 1B: 3 space holders & Coils 56 - 52 (0001 1011)
- 45E6: The CRC (cyclic redundancy check).

FORCE SINGLE COIL (FC=05)

Request
This command is writing the contents of discrete coil # 173 to ON
in the slave device with address 17.

11 05 00AC FF00 4E8B

- 11: The Slave Address (17 = 11 hex)
- 05: The Function Code (Force Single Coil)
- 00AC: The Data Address of the coil. (coil# 173 - 1 = 172 = AC hex)
- FF00: The status to write (FF00 = ON, 0000 = OFF)
- 4E8B: The CRC (cyclic redundancy check) for error checking.

Reponse
The normal response is an echo of the query, returned after the coil has been written.

11 05 00AC FF00 4E8B

- 11: The Slave Address (17 = 11 hex)
- 05: The Function Code (Force Single Coil)
- 00AC: The Data Address of the coil. (coil# 173 - 1 = 172 = AC hex)
- FF00: The status written (FF00 = ON, 0000 = OFF)
- 4E8B: The CRC (cyclic redundancy check) for error checking.

DIGITAL REGISTRY OVERVIEW (READ)

16 bit Integer	
Register Adress	Description
3001	Q1 Enabled/Disabled
3002	Q2 Enabled/Disabled
3003	Q3 Enabled/Disabled
3004	Q4 Enabled/Disabled
3005	Q5 Enabled/Disabled
3006	Q6 Enabled/Disabled
3007	Q7 Enabled/Disabled
3008	Q8 Enabled/Disabled
3009	Q9 Enabled/Disabled
3010	Q10 Enabled/Disabled
3011	Q11 Enabled/Disabled
3012	Q12 Enabled/Disabled
3013	Q13 Enabled/Disabled
3014	Q14 Enabled/Disabled
3015	Q15 Enabled/Disabled
3016	Q16 Enabled/Disabled
3017	Q17 Enabled/Disabled
3018	Q18 Enabled/Disabled
3019	Q19 Enabled/Disabled
3020	Q20 Enabled/Disabled
3021	Q21 Enabled/Disabled
3022	Q22 Enabled/Disabled
3023	Q23 Enabled/Disabled
3024	Q24 Enabled/Disabled
3025	Q25 Enabled/Disabled
3026	Q26 Enabled/Disabled
3027	Q27 Enabled/Disabled
3028	Q28 Enabled/Disabled
3029	Q29 Enabled/Disabled
3030	Q30 Enabled/Disabled
3031	Q31 Enabled/Disabled
3032	Q32 Enabled/Disabled
3033	Q33 Enabled/Disabled
3034	Q34 Enabled/Disabled
3035	Q35 Enabled/Disabled
3036	Q36 Enabled/Disabled
3037	Q1 Alarm state
3038	Q2 Alarm state
3039	Q3 Alarm state
3040	Q4 Alarm state

16 bit Integer	
Register Adress	Description
3041	Q5 Alarm state
3042	Q6 Alarm state
3043	Q7 Alarm state
3044	Q8 Alarm state
3045	Q9 Alarm state
3046	Q10 Alarm state
3047	Q11 Alarm state
3048	Q12 Alarm state
3049	Q13 Alarm state
3050	Q14 Alarm state
3051	Q15 Alarm state
3052	Q16 Alarm state
3053	Q17 Alarm state
3054	Q18 Alarm state
3055	Q19 Alarm state
3056	Q20 Alarm state
3057	Q21 Alarm state
3058	Q22 Alarm state
3059	Q23 Alarm state
3060	Q24 Alarm state
3061	Q25 Alarm state
3062	Q26 Alarm state
3063	Q27 Alarm state
3064	Q28 Alarm state
3065	Q29 Alarm state
3066	Q30 Alarm state
3067	Q31 Alarm state
3068	Q32 Alarm state
3069	Q33 Alarm state
3070	Q34 Alarm state
3071	Q35 Alarm state
3072	Q36 Alarm state
3100	Manual Control Active

DIGITAL REGISTRY OVERVIEW (WRITE)

16 bit Integer	
Register Adress	**Description**
3200	Flag for writing Digital Values (1 = write, 0 = read)
3201	Toggle Q1 Enabled/Disabled
3202	Toggle Q2 Enabled/Disabled
3203	Toggle Q3 Enabled/Disabled
3204	Toggle Q4 Enabled/Disabled
3205	Toggle Q5 Enabled/Disabled
3206	Toggle Q6 Enabled/Disabled
3207	Toggle Q7 Enabled/Disabled
3208	Toggle Q8 Enabled/Disabled
3209	Toggle Q9 Enabled/Disabled
3210	Toggle Q10 Enabled/Disabled
3211	Toggle Q11 Enabled/Disabled
3212	Toggle Q12 Enabled/Disabled
3213	Toggle Q13 Enabled/Disabled
3214	Toggle Q14 Enabled/Disabled
3215	Toggle Q15 Enabled/Disabled
3216	Toggle Q16 Enabled/Disabled
3217	Toggle Q17 Enabled/Disabled
3218	Toggle Q18 Enabled/Disabled
3219	Toggle Q19 Enabled/Disabled
3220	Toggle Q20 Enabled/Disabled
3221	Toggle Q21 Enabled/Disabled
3222	Toggle Q22 Enabled/Disabled
3223	Toggle Q23 Enabled/Disabled
3224	Toggle Q24 Enabled/Disabled
3225	Toggle Q25 Enabled/Disabled
3226	Toggle Q26 Enabled/Disabled
3227	Toggle Q27 Enabled/Disabled
3228	Toggle Q28 Enabled/Disabled
3229	Toggle Q29 Enabled/Disabled
3230	Toggle Q30 Enabled/Disabled
3231	Toggle Q31 Enabled/Disabled
3232	Toggle Q32 Enabled/Disabled
3233	Toggle Q33 Enabled/Disabled
3234	Toggle Q34 Enabled/Disabled
3235	Toggle Q35 Enabled/Disabled
3236	Toggle Q36 Enabled/Disabled
3300	Activate Manual Control