

MODBUS TABLE ORGANIZATION

| Starting Address of the Group Registers (Dec) | Starting Address of the Group Registers (Hex) | System Version (Release) | System Version (Build) | Group Name (Text) | Group Code (Hex) | Group Complexity (Hex) | Group Version (Hex) |
|-----------------------------------------------|-----------------------------------------------|--------------------------|------------------------|------------------------------------|------------------|------------------------|---------------------|
| 28672 | 7000 | 1 | 05 | Differential Electric Protection | 73 05 | 10 | 01 00 |
| 20480 | 5000 | 1 | 05 | Three-phase Electric Measurement | 7103 | 10 | 01 00 |
| 32768 | 8000 | 1 | 05 | Single-channel Thermal Measurement | 81 00 | 10 | 01 00 |

MODBUS PROTOCOL DETAILS

| Function Code (Dec) | Exception Codes (Dec) | Data Encoding |
|--------------------------|-----------------------|--------------------------------------------|
| 2 (Read Discrete Inputs) | 1, 2, 3 | "Big Endian" (most significant byte first) |
| 4 (Read Input Registers) | 1, 2, 3 | "Big Endian" (most significant byte first) |

MODBUS OVER SERIAL DETAILS

| Physical Layer | Trasmission Modes | Device Addressing | Baud Rates (bit/s) | Data Bits | Data bits trasmission sequence | Parity | Stop Bits |
|------------------------------------------------------|-------------------|-------------------|-----------------------------------------------------|-----------|--------------------------------|--------|-----------|
| standard EIA/TIA 485 (RS-485) two-wire configuration | RTU | 1-247 | programmable (1200, 2400, 4800, 9600, 19200, 38400) | 8 | Least significant bit first | NONE | 1 |

MASTER/SLAVE COMMUNICATION TIMING

| Timer Description | Timer Value (msec) |
|----------------------------------------------|-----------------------|
| Inter-character time-out | < 1,5 character times |
| Response delay (from master request) | - |
| Delay Time (between two master trasmissions) | - |

REFER ALSO TO: www.modbus.org - MODBUS over serial line specification and implementation guide V1.02
 - MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b

NOTE: File and printed copies of this document are not subject to document change control.



| Register Number | Register Address (Dec) | Register Address (Hex) | Dimension [bit] | Description | Note | Read Function Codes (Dec) | Data Storing |
|-----------------|------------------------|------------------------|-----------------|--------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------|--------------|
| 28673 | 28672 | 7000 | 3 | Differential Electric Protection | | 2 | |
| 28673 | 28672 | 7000 | 1 | Differential pre-alarm (>threshold I Δ 1) | The information reported here "self-resets" when the condition that generated it ends. | 2 | |
| 28674 | 28673 | 7001 | 1 | Differential alarm (>threshold I Δ 2) | The information reported here "self-resets" when the condition that generated it ends. | 2 | |
| 28675 | 28674 | 7002 | 1 | Over-temperature alarm (>threshold T) | The information reported here "self-resets" when the condition that generated it ends. | 2 | |

| Register Number | Register Address (Dec) | Register Address (Hex) | Dimension [bit] | Description | Note | Read Function Codes (Dec) | Write Function Codes (Dec) | Data Storing |
|-----------------|------------------------|------------------------|-----------------|----------------------|------|---------------------------|----------------------------|--------------|
| | | | | (no COILS available) | | | | |

| Register Number | Register Address (Dec) | Register Address (Hex) | Dimension [word] | Bit Position | Description | Type | Scale | Unit | Range | Note | Read Function Code (Dec) | Data Storing |
|-----------------|------------------------|------------------------|------------------|--------------|---------------------------------------------------------------------------------|------------------|-------|--------|-------|------------------------------------------------------------------------------|--------------------------|--------------|
| 20481 | 20480 | 5000 | 6 | | Three-phase Electric Measurement | | | | | | | |
| 20481 | 20480 | 5000 | 5 | | RESERVED (returns 84h error) | | | | | | | |
| 20486 | 20485 | 5005 | 1 | | Differential Current Value | unsigned integer | 1 | mA | | Expressed on "numeric coding"; without mark (fixed more significant bit = 0) | 4 | |
| 28673 | 28672 | 7000 | 7 | | Differential Electric Protection | | | | | | | |
| 28673 | 28672 | 7000 | 2 | | RESERVED (returns 84h error) | | | | | | | |
| 28675 | 28674 | 7002 | 1 | | Last Release data Buffer: "Tripped" type reading only bit reply | | | | | If the value is not available, the value 8000h is returned | 4 | |
| | | | | 0 | Differential P. Relay Tripped Reply | | | | | | 4 | |
| | | | | 1 | Over-temperature P. Relay Tripped Reply | | | | | | 4 | |
| | | | | 15÷2 | RESERVED (returns "0") | | | | | | 4 | |
| 28676 | 28675 | 7003 | 2 | | Last Release data Buffer: interrupted current or temperature ("numeric coding") | | 1 | mA, °C | | If the value is not available, the value 80000000h is returned | 4 | |
| 28678 | 28677 | 7005 | 1 | | G1 "main setting"- differential: levels | | 1 | mA | | | 4 | |
| 28679 | 28678 | 7006 | 1 | | G1 - differential: times | | 1 | msec | | | 4 | |
| 32769 | 32768 | 8000 | 1 | | Single-channel Thermal Measurement | | | | | | | |
| 32769 | 32768 | 8000 | 1 | | Sensor 1 Temperature Value | | 1 | °C | | | 4 | |

| Register Number | Register Address (Dec) | Register Address (Hex) | Dimension [word] | Bit Position | Description | Type | Scale | Unit | Range | Note | Read Function Codes (Dec) | Write Function Codes (Dec) | Data Storing |
|-----------------|------------------------|------------------------|------------------|--------------|----------------------------------|------|-------|------|-------|------|---------------------------|----------------------------|--------------|
| | | | | | (no HOLDING REGISTERS available) | | | | | | | | |