Modbus Functions Supported

Table 1

Function code (hex)	Description	Note
03 (0x03)	Read Holding Registers	Group request not enabled
16 (0x10)	Write Multiple Registers	Group request not enabled
08 (0x08)	Serial line diagnostic	Only sub-function 0 supported - Return Query Data

Modbus Exception Codes

Table 2

Code	Name	Meaning
01	ILLEGAL FUNCTION	Function not supported
02	ILLEGAL DATA ADDRESS	Invalid register number (not used)
03	ILLEGAL DATA VALUE	Invalid data: - Value out of range - Response is longer than the size of communication buffer - Number of data bytes does not match the declared one
04	SLAVE DEVICE FAILURE	Command cannot be executed

Modbus Registers

Table 3

Parameter name	Description	Address (hex)	Data format	Decimal places
Function 0x03, read only				
StAt	Status Register (see Table 5)	0x0000	Binary	–
Pv1	CH1 Process value	0x0001	INT16	*
Pv2	CH2 Process value	0x0002	INT16	**
LUPv1	LU1 Input value	0x0003	INT16	*
LUPv2	LU2 Input value	0x0004	INT16	**
Function 0x03/0x10, read/write				
SP1	Setpoint 1	0x0005	INT16	*
SP2	Setpoint 2	0x0006	INT16	**
r-L1	CH1 Network control	0x0007	UINT16	0
r-L2	CH2 Network control	0x0008	UINT16	0
r.oUt1	CH1 Network output signal	0x0009	UINT16	3
r.oUt2	CH2 Network output signal	0x000A	UINT16	3
Function 0x03, read only				
DEv	Device name	0x1000…0x1003	Char[8]	–
vEr	Firmware version	0x1004…0x1007	Char[8]	–
StAt	Status Register (see Table 5)	0x1008	Binary	–
Pv1	CH1 Process value	0x1009…0x100A	Float32	–
Pv2	CH2 Process value	0x100B…0x100C	Float32	–
LUPv1	LU1 Input value	0x100D…0x100E	Float32	–
LUPv2	LU2 Input value	0x100F…0x1010	Float32	–
SP1	Setpoint 1	0x1011…0x1012	Float32	–
SP2	Setpoint 2	0x1013…0x1014	Float32	–
Function 0x03/0x10, read/write				
Prot	Protocol	0x0100	UINT16	0
bPS	Baud rate	0x0101	UINT16	0
A.LEn	Address bits	0x0102	UINT16	0
Addr	Address	0x0103	UINT16	0
rSdL	Response delay	0x0104	UINT16	0
LEn	Data bits	0x0105	UINT16	0
PrtY	Parity	0x0106	UINT16	0
Sbit	Stop bits	0x0107	UINT16	0
PrtL	Apply new network protocol (command)	0x0109	UINT16	–
APLY	Apply new network settings (command)	0x010A	UINT16	–
init	Device restart (command)	0x010B	UINT16	–
in.t1	CH1 Sensor	0x0200	UINT16	0
dPt1	CH1 Decimal point displayed	0x0201	UINT16	0
dP1	CH1 Decimal point	0x0202	UINT16	0
in.L1	CH1 Signal lower limit	0x0203	INT16	*
in.H1	CH1 Signal upper limit	0x0204	INT16	*
SH1	CH1 Offset	0x0205	INT16	*
KU1	CH1 Slope	0x0206	UINT16	3
Fb1	CH1 Filter bandwidth	0x0207	UINT16	*
inF1	CH1 Filter time constant	0x0208	UINT16	0
Sqr1	CH1 Square root	0x0209	UINT16	0
iLU1	LU1 Input	0x020A	UINT16	0
in.t2	CH2 Sensor	0x020B	UINT16	0
dPt2	CH2 Decimal point displayed	0x020C	UINT16	0
dP2	CH2 Decimal point	0x020D	UINT16	0
in.L2	CH2 Signal lower limit	0x020E	INT16	**
in.H2	CH2 Signal upper limit	0x020F	INT16	**
SH2	CH2 Offset	0x0210	INT16	**
KU2	CH2 Slope	0x0211	UINT16	3
Fb2	CH2 Filter bandwidth	0x0212	UINT16	**
inF2	CH2 Filter time constant	0x0213	UINT16	0
Sqr2	CH2 Square root	0x0214	UINT16	0
iLU2	LU2 Input	0x0215	UINT16	0

Parameter name	Description	Address (hex)	Data format	Decimal places
Function 0x03/0x10, read/write				
rESt	Rest time.	0x0300	UINT16	0
diSP	Display mode	0x0301	UINT16	0
SL.L1	LU1 Setpoint lower limit	0x0400	INT16	*
SL.H1	LU1 Setpoint upper limit	0x0401	INT16	*
CmP1	LU1 Digital function	0x0402	UINT16	0
HYS1	LU1 Hysteresis	0x0403	UINT16	*
don1	LU1 ON-state minimum duration	0x0404	UINT16	0
doF1	LU1 OFF-state minimum duration	0x0405	UINT16	0
ton1	LU1 Turn-on delay	0x0406	UINT16	0
toF1	LU1 Turn-off delay	0x0407	UINT16	0
oEr1	LU1 Output safe state	0x0408	UINT16	0
dAC1	LU1 Analog mode	0x0409	UINT16	0
An.L1	LU1 Retransmission lower limit	0x040A	INT16	*
An.H1	LU1 Retransmission upper limit	0x040B	INT16	*
CtL1	LU1 Analog function	0x040C	UINT16	0
XP1	LU1 Proportional band	0x040D	UINT16	*
SL.L2	LU2 Setpoint lower limit	0x040E	INT16	**
SL.H2	LU2 Setpoint upper limit	0x040F	INT16	**
CmP2	LU2 Digital function	0x0410	UINT16	0
HYS2	LU2 Hysteresis	0x0411	UINT16	**
don2	LU2 ON-state minimum duration	0x0412	UINT16	0
doF2	LU2 OFF-state minimum duration	0x0413	UINT16	0
ton2	LU2 Turn-on delay	0x0414	UINT16	0
toF2	LU2 Turn-off delay	0x0415	UINT16	0
oEr2	LU2 Output safe state	0x0416	UINT16	0
dAC2	LU2 Analog mode	0x0417	UINT16	0
An.L2	LU2 Retransmission lower limit	0x0418	INT16	**
An.H2	LU2 Retransmission upper limit	0x0419	INT16	**
CtL2	LU2 Analog function	0x041A	UINT16	0
XP2	LU2 Proportional band	0x041B	UINT16	**
oAPt	Read access	0x0700	UINT16	0
wtPt	Write access	0x0701	UINT16	0

Note:
* – *see* ***dP1***
** – *see* ***dP2***

Data format

Table 4

Data format	Description
UINT16	2-byte integer Format X*10-n is used for transmission, where X – integer value n – power of 10 (specified in the column "Decimal point" for each parameter)
INT16	2-byte signed integer Format X*10-n is used for transmission, where X – integer value n – power of 10 (specified in the column "Decimal point" for each parameter)
Float32	4-byte floating-point “Big-endian”
Char[8]	String of 8 symbols each 1 byte, direct order
Hex word	2-byte integer in hexadecimal format
Binary	2-byte numbers in binary format When transmitting, the bit numbering starts at zero for the most significant bit (MSB 0)

Parameter “StAt” – bit assignment

Table 5

Bit No.	Assignment
0	CH1 Input error
1	CH2 Input error
2	0
3	Other error (e.g. **Er.Ad**, **Er.64**)
4	Relay 1 on
5	Relay 2 on
6	CH1 Network control (**r-L1**)
7	CH2 Network control (**r-L2**)
8 - 15	0