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MID Energy Meter

EMD 485 Series

Modbus address list

The device fronts may deviate!

Doc No. 2.100.145.1.b 03/2025

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Table of Contents

Modbus

Modbus functions

The EMD 485 supports the following Modbus functions as a slave:

02 Read Input Status

This function code is used to read from 1 to 2000 contiguous status of discrete inputs in a remote device. The Request PDU specifies the starting address, i.e. the address of the first input specified, and the number of inputs. In the PDU Discrete Inputs are addressed starting at zero. Therefore Discrete inputs numbered 1-16 are addressed as 0-15.

The discrete inputs in the response message are packed as one input per bit of the data field.

03 Read Holding Registers

Reads the binary contents of holding registers (4X references) in the slave.

04 Read Input Registers

Reads the binary contents of input registers (3X references) in the slave.

06 Preset Single Register

Presets a value into a single holding register (4X reference). When broadcast, the function presets the same register reference in all attached slaves.

08 Diagnostic function

MODBUS function code 08 provides a series of tests for checking the communication system between a client (Master) device and a server (Slave), or for checking various internal error conditions within a server.
The function uses a two–byte sub-function code field in the query to define the type of test to be performed.

The following diagnostic functions are dedicated to serial line devices. The normal response to the Return Query Data request is to loopback the same data. The function code and sub-function codes are also echoed.

Sub-function code		Name
Hex	Dec	
00	00	Return Query Data
01	01	Restart Communications Option
0A	10	Clear Counters and Diagnostic Register
0B	11	Return Bus Message Count
0C	12	Return Bus Communication Error Count
0D	13	Return Bus Exception Error Count
0E	14	Return Slave Message Count
0F	15	Return Slave No Response Count
10	16	Return Slave NAK Count
11	17	Return Slave Busy Count

16 (10Hex) Preset Multiple Registers

Presets values into a sequence of holding registers (4X references). When broadcast, the function presets the same register references in all attached slaves.

23 (17Hex) Read/Write 4X Registers

Performs a combination of one read and one write operation in a single Modbus transaction. The function can write new contents to a group of 4XXXX registers, and then return the contents of another group of 4XXXX registers. Broadcast is not supported.

Transfer parameters

The EMD 485 supports the following transfer parameters:

Baud rate : 9600, 19200, 38400, 57600 and 115200 Baud
Data bits : 8
Framing: : 1 stop bit & no parity
1 stop bit & parity even
1 stop bit & parity odd
2 stop bits & no parity

Byte sequence

The data in the modbus address list can be called up in the

- Big-Endian (high-Byte before low-Byte) and in the
- Little-Endian (low-byte before high-byte)

format.
The addresses described in this address list supply the data in the „Big-Endian“ format.
If you require the data in the „Little-Endian“ format, you must add the value 32768 to the address.

Measured values

- Measured values in the **short** format do not take into account the set transformer ratio, i.e. these measured values have to be multiplied by the corresponding transformer factor!
- Measured values in **float or integer format** take into account the corresponding transformer factors!

Number formats

Type	Size	Minimum	Maximum
char	8 bit	0	255
byte	8 bit	-128	127
short	16 bit	-2^{15}	$2^{15}-1$
ushort	16 bit	0	$2^{16}-1$
int	32 bit	-2^{31}	$2^{31}-1$
uint	32 bit	0	$2^{32}-1$
long	64 bit	-2^{63}	$2^{63}-1$
ulong	64 bit	0	$2^{64}-1$
float	32 bit	IEEE 754	IEEE 754
double	64 bit	IEEE 754	IEEE 754

Adress list EMD 485-CT3-A, EMD 485-P3

Frequently required readings

Adress	Format	RD/WR	Unit	Note
19000	float	RD	V	Voltage L1-N
19002	float	RD	V	Voltage L2-N
19004	float	RD	V	Voltage L3-N
19006	float	RD	V	Voltage L1-L2
19008	float	RD	V	Voltage L2-L3
19010	float	RD	V	Voltage L3-L1
19012	float	RD	A	Current, L1
19014	float	RD	A	Current, L2
19016	float	RD	A	Current, L3
19018	float	RD	A	Vector sum; IN=I1+I2+I3
19020	float	RD	W	Real power L1
19022	float	RD	W	Real power L2
19024	float	RD	W	Real power L3
19026	float	RD	W	Sum; Psum3=P1+P2+P3
19028	float	RD	VA	Apparent power S L1
19030	float	RD	VA	Apparent power S L2
19032	float	RD	VA	Apparent power S L3
19034	float	RD	VA	Sum; Ssum3=S1+S2+S3
19036	float	RD	var	Fund. reactive power (mains frequ.) Q L1
19038	float	RD	var	Fund. reactive power (mains frequ.) Q L2
19040	float	RD	var	Fund. reactive power (mains frequ.) Q L3
19042	float	RD	var	Sum; Qsum3=Q1+Q2+Q3
19044	float	RD	-	Fund. power factor, CosPhi; U L1-N IL1
19046	float	RD	-	Fund. power factor, CosPhi; U L2-N IL2
19048	float	RD	-	Fund. power factor, CosPhi; U L3-N IL3
19050	float	RD	Hz	Measured frequency
19052	float	RD	-	Rotation field; 1=right, 0=none, -1=left
19054	float	RD	Wh	Real energy L1
19056	float	RD	Wh	Real energy L2
19058	float	RD	Wh	Real energy L3
19060	float	RD	Wh	Real energy L1..L3
19062	float	RD	Wh	Real energy L1, consumed
19064	float	RD	Wh	Real energy L2, consumed
19066	float	RD	Wh	Real energy L3, consumed
19068	float	RD	Wh	Real energy L1..L3, consumed, rate 1
19070	float	RD	Wh	Real energy L1, delivered
19072	float	RD	Wh	Real energy L2, delivered
19074	float	RD	Wh	Real energy L3, delivered
19076	float	RD	Wh	Real energy L1..L3, delivered
19078	float	RD	VAh	Apparent energy L1
19080	float	RD	VAh	Apparent energy L2
19082	float	RD	VAh	Apparent energy L3
19084	float	RD	VAh	Apparent energy L1..L3
19086	float	RD	var	Reaktive energy L1
19088	float	RD	var	Reaktive energy L2
19090	float	RD	var	Reaktive energy L3
19092	float	RD	var	Reaktive energy L1..L3
19094	float	RD	var	Reactive energy, inductive, L1
19096	float	RD	var	Reactive energy, inductive, L2
19098	float	RD	var	Reactive energy, inductive, L3
19100	float	RD	var	Reactive energy L1..L3, ind.
19102	float	RD	var	Reactive energy, capacitive, L1
19104	float	RD	var	Reactive energy, capacitive, L2
19106	float	RD	var	Reactive energy, capacitive, L3
19108	float	RD	var	Reactive energy L1..L3, cap.

Adress	Format	RD/WR	Unit	Note
19110	float	RD	%	Harmonic, THD, U L1-N
19112	float	RD	%	Harmonic, THD, U L2-N
19114	float	RD	%	Harmonic, THD, U L3-N
19116	float	RD	%	Harmonic, THD, I L1
19118	float	RD	%	Harmonic, THD, I L2
19120	float	RD	%	Harmonic, THD, I L3

Adress list EMD 485-P1

Frequently required readings

Adress	Format	RD/WR	Unit	Note
19000	float	RD	V	Voltage
19012	float	RD	A	Current
19020	float	RD	W	Real power
19028	float	RD	VA	Apparent power S
19036	float	RD	var	Fund. reactive power (mains frequ.) Q
19044	float	RD	-	Fund.power factor, CosPhi; U L-N IL
19050	float	RD	Hz	Measured frequency
19054	float	RD	Wh	Real energy
19062	float	RD	Wh	Real energy, consumed
19070	float	RD	Wh	Real energy, delivered
19078	float	RD	VAh	Apparent energy
19086	float	RD	var	Reaktive energy
19094	float	RD	var	Reactive energy, inductive
19102	float	RD	var	Reactive energy, capacitive
19110	float	RD	%	Harmonic, THD, U
19116	float	RD	%	Harmonic, THD, I

Further addresses - Complete EMD 485 Series

Configuration addresses - Function Code 03 (Offset 40001)

Adress	Format	RD/WR	Parameter	Note
2	Float	RD/WR	Averaging time	0~60 minutes, Default 60. Range: 0~60, 0 = function closed
10	Float	RD/WR	Grid system	1 = 1p2w 2 = 3p3w 3 = 3p4w Requires password, see parameter 13
14	Float	RD/WR	Password lock	0 = locked 1 = unlocked. Reading will also reset the password timeout back to one minute.
18	Float	RD/WR	Parity stop bits	0 = One stop bit and no parity, default. 1 = One stop bit and even parity. 2 = One stop bit and odd parity. 3 = Two stop bits and no parity.
20	Float	RD/WR	Modbus address	1 to 247, default 1. Note, both the MODBUS node addresses can be changed via the display setup menus.
24	Float	RD/WR	Password	Default 1000
28	Float	RD/WR	Baud Rate	0 = 2400 baud. 1 = 4800 baud. 2 = 9600 baud, default. 3 = 19200 baud. 4 = 38400 baud. 6 = 115200 baud.
46	Float (KPPAis asked)	RD/WR	Voltage transformer primary side	100- 500000V, Default 230
48	Float (KPPAis asked)	RD/WR	Voltage transformer secondary side	100- 480V, Default 230
56	Float (KPPAis asked)	RD/WR	Correction of the current transfor-mers	0 = L1 Frd, L2 Frd, L3 Frd (default) 1 = L1 Rev, L2 Frd, L3 Frd 2 = L1 Frd, L2 Rev, L3 Frd 3 = L1 Rev, L2 Rev, L3 Frd 4 = L1 Frd, L2 Frd, L3 Rev 5 = L1 Rev, L2 Frd, L3 Rev 6 = L1 Frd, L2 Rev, L3 Rev 7 = L1 Rev, L2 Rev, L3 Rev
768	unsigned int16	RD/WR	DI filter time	0-255, Default 100ms
770	unsigned int32	RD/WR	DI-1 count	Write 0 to reset the count. No response if write other value.
772	unsigned int32	RD/WR	DI-2 count	Write 0 to reset the count. No response if write other value

*Only for EMD 485-CT3-A

Input status - Function Code 02 (Offset 10001)

Adress	Format	RD/WR	Parameter	Note
0	Binary	RD	DI-1 status	1=ON 0=OFF
1	Binary	RD	DI-2 status	1=ON 0=OFF

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Doc. no. 2.100.145.1.b | 03/2025 | Subject to technical alterations.
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