

## Modbus Database for MU2300

Table 1

Address		Description	Format code	Note
Dec	Hex			
Read only		Product information	Functions 3 or 4	
0	0000	Relay description 1 & 2	F10	MU
1	0001	Relay description 3 & 4	F10	23
2	0002	Relay description 5 & 6	F10	00
3	0003	Manufacturer 1 & 2	F10	MI
4	0004	Manufacturer 3 & 4	F10	KR
5	0005	Manufacturer 5 & 6	F10	O<space>
6	0006	Firmware version	F10	
7 - 13	0007 – 000D	Reserved		
14	000E	Serial number	F60	
15	000F	Reserved		
Read only		Measurements	Functions 3 or 4	
16	0010	Line-to-line U12 voltage	F11	Unit 0.01V
17	0011	Phase-neutral U1 voltage	F11	Unit 0.01V
18	0012	Line-to-line U23 voltage	F11	Unit 0.01V
19	0013	Phase-neutral U2 voltage	F11	Unit 0.01V
20	0014	Line-to-line U31 voltage	F11	Unit 0.01V
21	0015	Phase-neutral U3 voltage	F11	Unit 0.01V
22	0016	U0 residual voltage	F11	Unit 0.01V
23	0017	U2 negative sequence voltage	F11	Unit 0.01V
24 - 50	0018 – 0032	Reserved		
Read only		Relay output status	Functions 3 or 4	
51	0033	R1 to R5 status	F12	
52 - 60	0034 – 003C	Reserved		
Read/Write		Protection Settings	Functions 3, 4, or 6*	
61	003D	Group A, U < undervoltage low-set	F13	Unit 0.01V
62	003E	Group B, U < undervoltage low-set	F13	Unit 0.01V
63	003F	Group A, tU < TMS, k	F14	
64	0040	Group B, tU < TMS, k	F14	
65	0041	Group A, tU < , definite time	F15	Unit 0.01s
66	0042	Group B, tU < , definite time	F15	Unit 0.01s
67	0043	Group A, U << undervoltage high-set	F13	Unit 0.01V
68	0044	Group B, U << undervoltage high-set	F13	Unit 0.01V
69	0045	Group A, tU >>, definite time	F15	Unit 0.01s
70	0046	Group B, t U >>, definite time	F15	Unit 0.01s
71	0047	Group A, U > overvoltage low-set	F16	Unit 0.01V
72	0048	Group B, U > overvoltage low-set	F16	Unit 0.01V

73	0049	Group A, tU > TMS, k	F14	
74	004A	Group B, tU > TMS, k	F14	
75	004B	Group A, tU >, definite time	F15	Unit 0.01s
76	004C	Group B, tU >, definite time	F15	Unit 0.01s
77	004D	Group A, U >> overvoltage high-set	F17	Unit 0.01V
78	004E	Group B, U >> overvoltage high-set	F17	Unit 0.01V
79	004F	Group A, tU >>, definite time	F15	Unit 0.01s
80	0050	Group B, tU >>, definite time	F15	Unit 0.01s
81	0051	Group A, U2 > negative sequence low-set	F18	Unit 0.01V
82	0052	Group B, U2 > negative sequence low-set	F18	Unit 0.01V
83	0053	Group A, tU2 >, TMS, k	F14	
84	0054	Group B, tU2 >, TMS, k	F14	
85	0055	Group A, tU2 >, definite time	F15	Unit 0.01s
86	0056	Group B, tU2 >, definite time	F15	Unit 0.01s
87	0057	Group A, U0 > zero sequence low-set	F19	Unit 0.01V
88	0058	Group B, U0 > zero sequence low-set	F19	Unit 0.01V
89	0059	Group A, tU0 >, TMS, k	F14	
90	005A	Group B, tU0 >, TMS, k	F14	
91	005B	Group A, tU0 >, definite time	F15	Unit 0.01s
92	005C	Group B, tU0 >, definite time	F15	Unit 0.01s
93 - 255	005D-00FF	Reserved		
<b>Read/Write</b>		<b>Soft-switch Setting</b>	<b>Functions 3, 4, or 6*</b>	
256	0100	Soft-switch 1A	F20	
257	0101	Soft-switch 1B	F21	
258	0102	Soft-switch 2A	F20	
259	0103	Soft-switch 2B	F21	
260	0104	Soft-switch 3A	F20	
261	0105	Soft-switch 3B	F21	
262	0106	Soft-switch 4A	F20	
263	0107	Soft-switch 4B	F21	
264	0108	Soft-switch 5A	F20	
265	0109	Soft-switch 5B	F21	
266	010A	Soft-switch 6A	F22	
267	010B	Soft-switch 6B	F22	
268	010C	Soft-switch 7	F23	
269	010D	Soft-switch 8	F23	
270	010E	Soft-switch 9A	F24	
271	010F	Soft-switch 9B	F25	
272	0110	Soft-switch A	F26	
273	0111	Soft-switch B	F27	

274	0112	Soft-switch C	F28	
275	0113	Soft-switch D	F29	
276	0114	Soft-switch E		Always read as 0. Cannot be written.
277	0115	Soft-switch F	F30	
Read only		Fault Record		Functions 3 or 4
4096	1000	U12 voltage	Record 1	F40
4097	1001	U23 voltage		
4098	1002	U31 voltage		
4099	1003	U1P voltage		
4100	1004	U2P voltage		
4101	1005	U3P voltage		
4102	1006	U0 voltage		
4103	1007	U2 voltage		
4104	1008	Cause of trip		
4105	1009	U12 voltage	Record 2	F40
4106	100A	U23 voltage		
4107	100B	U31 voltage		
4108	100C	U1P voltage		
4109	100D	U2P voltage		
4110	100E	U3P voltage		
4111	100F	U0 voltage		
4112	1010	U2 voltage		
4113	1011	Cause of trip		
4114	1012	U12 voltage	Record 3	F40
4115	1013	U23 voltage		
4116	1014	U31 voltage		
4117	1015	U1P voltage		
4118	1016	U2P voltage		
4119	1017	U3P voltage		
4120	1018	U0 voltage		
4121	1019	U2 voltage		
4122	101A	Cause of trip		
4123	101B	U12 voltage	Record 4	F40
4124	101C	U23 voltage		
4125	101D	U31 voltage		
4126	101E	U1P voltage		
4127	101F	U2P voltage		
4128	1020	U3P voltage		
4129	1021	U0 voltage		
4130	1022	U2 voltage		
4131	1023	Cause of trip		
4132	1024	U12 voltage	Record 5	F40
4133	1025	U23 voltage		

4134	1026	U31 voltage			
4135	1027	U1P voltage			
4136	1028	U2P voltage			
4137	1029	U3P voltage			
4138	102A	U0 voltage			
4139	102B	U2 voltage			
4140	102C	Cause of trip			
4141	102D	U12 voltage	Record 6	F40	
4142	102E	U23 voltage			
4143	102F	U31 voltage			
4144	1030	U1P voltage			
4145	1031	U2P voltage			
4146	1032	U3P voltage			
4147	1033	U0 voltage			
4148	1034	U2 voltage			
4149	1035	Cause of trip			
4150	1036	U12 voltage	Record 7	F40	
4151	1037	U23 voltage			
4152	1038	U31 voltage			
4153	1039	U1P voltage			
4154	103A	U2P voltage			
4155	103B	U3P voltage			
4156	103C	U0 voltage			
4157	103D	U2 voltage			
4158	103E	Cause of trip			
4159	103F	U12 voltage	Record 8	F40	
4160	1040	U23 voltage			
4161	1041	U31 voltage			
4162	1042	U1P voltage			
4163	1043	U2P voltage			
4164	1044	U3P voltage			
4165	1045	U0 voltage			
4166	1046	U2 voltage			
4167	1047	Cause of trip			
4168	1048	U12 voltage	Record 9	F40	
4169	1049	U23 voltage			
4170	104A	U31 voltage			
4171	104B	U1P voltage			
4172	104C	U2P voltage			
4173	104D	U3P voltage			
4174	104E	U0 voltage			
4175	104F	U2 voltage			
4176	1050	Cause of trip			

Read only		Event Code		Functions 3 or 4
8192	2000	Latest event code		
8193	2001			
⋮	⋮	⋮		
8251	203B	Oldest event code		
Read only		Relay Status	F50	Function 7

Note 1: Accessing the Reserved address will return an error.

\*Note 2: Function is enabled by setting the corresponding soft switch in MU2300.

Format	Type	Description
F10	Product info	ASCII character
F11	Voltage measurement	Unsigned integer from 0 to 65535. The value is expressed as 1/100V. e.g. 100 means 1.00V
F12	Output contact status	1xxx x000 0000 0000 = R1 ON x1xx x000 0000 0000 = R2 ON xx1x x000 0000 0000 = R3 ON xxx1 x000 0000 0000 = R4 ON xxxx 1000 0000 0000 = R5 ON
F13	Undervoltage low-set or high-set setting	Unsigned integer from 500 to 13000. The value is expressed as 1/100V. The valid setting range: 500 to 999 step 1 1000 to 9990 step 10 10000 to 13000 step 100
F14	Time multiplier setting	Unsigned integer from 50 to 10000. E.g. 50 = TMS 0.5
F15	Delay time setting	Unsigned integer from 0 to 60000. The value is expressed as 1/100s i.e. 0.01s. The valid setting range: 0 to 999 step 1 1000 to 9990 step 10 10000 to 60000 step 100
F16	Overvoltage low-set setting	Unsigned integer from 500 to 20000. The value is expressed as 1/100V. The valid setting range: 500 to 999 step 1 1000 to 9990 step 10 10000 to 20000 step 100
F17	Overvoltage high-set setting	Unsigned integer from 500 to 26000. The value is expressed as 1/100V. The valid setting range: 500 to 999 step 1 1000 to 9990 step 10 10000 to 26000 step 100
F18	Negative sequence low-set setting	Unsigned integer from 500 to 20000. The value is expressed as 1/100V. The valid setting range: 500 to 999 step 1 1000 to 9990 step 10 10000 to 20000 step 100

F19	Zero sequence low-set setting	Unsigned integer from 50 to 13000. The value is expressed as 1/100V. The valid setting range: 50 to 999 step 1 1000 to 9990 step 10 10000 to 13000 step 100
F20	Soft switch xA settings ( x = 1 to 5 )	When reading, the higher byte of this 2-byte value always read as zero (0). The lower byte can have value from 0 to 255. When writing, the higher byte value is ignored.
F21	Soft switch xB settings ( x = 1 to 5 )	When reading, the higher byte of this 2-byte value always read as zero (0). Both the upper and lower nibbles of the lower byte can have value from 0 to 3. When writing, the higher byte value is ignored.
F22	Soft switches 6A & 6B settings	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The lower byte can have value from 0 to 127.
F23	Soft switches 7 & 8 settings	When reading, the higher byte of this 2-byte value always read as zero (0). The lower byte can have value from 0 to 255. When writing, the higher byte value is ignored.
F24	Soft switch 9A setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The valid hexadecimal values are: 0 to 0x10, 0x20, 0x40, and 0x80.
F25	Soft switch 9B setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The lower byte can have value from 0 to 63.
F26	Soft switch A setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The valid hexadecimal values are: 0 to 0x10, 0x20, 0x40, and 0x80.

F27	Soft switch B setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The valid values for the upper nibble of the lower byte are: 1 to 4. The valid values for the lower nibble of the lower byte are: 1 to 7.																		
F28	Soft switch C setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. This is the Modbus unit address with valid setting from 1 to 127.																		
F29	Soft switch D setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. This switch is to enable or disable remote programming by host. The valid setting is either 1 or 0.																		
F30	Soft switch F setting	When reading, the higher byte of this 2-byte value always read as zero (0). When writing, the higher byte value is ignored. The valid setting is either 1 or 0.																		
F40	Fault record	<p>This record consists of 9 fields. Each field consists of 2 bytes in the following format. If the Cause of fault is digital input, all the fault values will be read as zero (0).</p> <table border="1"> <tr> <td>U12 line voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U23 line voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U31 line voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U1 phase voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U2 phase voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U3 phase voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>U0 residual voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>Negative sequence voltage</td> <td>Unsigned integer</td> </tr> <tr> <td>Cause of fault</td> <td>Unsigned integer Refer table 2 for fault code</td> </tr> </table>	U12 line voltage	Unsigned integer	U23 line voltage	Unsigned integer	U31 line voltage	Unsigned integer	U1 phase voltage	Unsigned integer	U2 phase voltage	Unsigned integer	U3 phase voltage	Unsigned integer	U0 residual voltage	Unsigned integer	Negative sequence voltage	Unsigned integer	Cause of fault	Unsigned integer Refer table 2 for fault code
U12 line voltage	Unsigned integer																			
U23 line voltage	Unsigned integer																			
U31 line voltage	Unsigned integer																			
U1 phase voltage	Unsigned integer																			
U2 phase voltage	Unsigned integer																			
U3 phase voltage	Unsigned integer																			
U0 residual voltage	Unsigned integer																			
Negative sequence voltage	Unsigned integer																			
Cause of fault	Unsigned integer Refer table 2 for fault code																			
F41	Event Code	Refer to Table 3.																		

F50	Status of relay	Bit 7	Relay trip status. Trip = 1
		Bit 6	Relay start status. Start = 1
		Bit 5	Not used
		Bit 4	Not used
		Bit 3	Not used
		Bit 2	Not used
		Bit 1	IRF. Relay failed = 1
		Bit 0	Digital input status. Input closed = 1
F60	Serial number	Unsigned integer. 0 and 0xFFFF (65535) are not valid serial numbers.	

Table 2

Code for cause of tripping	Description
1	Undervoltage low-set trip – U1 phase or U12 line voltage
2	Undervoltage low-set trip – U2 phase or U23 line voltage
3	Undervoltage low-set trip – U3 phase or U31 line voltage
4	Undervoltage high-set trip – U1 phase or U12 line voltage
5	Undervoltage high-set trip – U2 phase or U23 line voltage
6	Undervoltage high-set trip – U3 phase or U31 line voltage
7	Overvoltage low-set trip – U1 phase or U12 line voltage
8	Overvoltage low-set trip – U2 phase or U23 line voltage
9	Overvoltage low-set trip – U3 phase or U31 line voltage
10	Overvoltage high-set trip – U1 phase or U12 line voltage
11	Overvoltage high-set trip – U2 phase or U23 line voltage
12	Overvoltage high-set trip – U3 phase or U31 line voltage
13	Residual overvoltage low-set trip
14	Negative sequence overvoltage low-set trip
15	Trip by external digital input

Table 3

Event code	Description
00	U1P/U12 undervoltage U < start
01	U2P/U23 undervoltage U < start
02	U3P/U31 undervoltage U < start
03	U1P/U12 undervoltage U < trip
04	U2P/U23 undervoltage U < trip
05	U3P/U31 undervoltage U < trip
06	U1P/U12 undervoltage U << start
07	U2P/U23 undervoltage U << start
08	U3P/U31 undervoltage U << start
09	U1P/U12 undervoltage U << trip
10	U2P/U23 undervoltage U << trip
11	U3P/U31 undervoltage U << trip
40	U1P/U12 undervoltage U < start reset
41	U2P/U23 undervoltage U < start reset
42	U3P/U31 undervoltage U < start reset
43	U1P/U12 undervoltage U < trip reset
44	U2P/U23 undervoltage U < trip reset
45	U3P/U31 undervoltage U < trip reset
46	U1P/U12 undervoltage U << start reset
47	U2P/U23 undervoltage U << start reset
48	U3P/U31 undervoltage U << start reset
49	U1P/U12 undervoltage U << trip reset
50	U2P/U23 undervoltage U << trip reset
51	U3P/U31 undervoltage U << trip reset
12	U1P/U12 overvoltage U > start
13	U2P/U23 overvoltage U > start
14	U3P/U31 overvoltage U > start
15	U1P/U12 overvoltage U > trip
16	U2P/U23 overvoltage U > trip
17	U3P/U31 overvoltage U > trip
18	U1P/U12 overvoltage U >> start
19	U2P/U23 overvoltage U >> start
20	U3P/U31 overvoltage U >> start
21	U1P/U12 overvoltage U >> trip
22	U2P/U23 overvoltage U >> trip
23	U3P/U31 overvoltage U >> trip
52	U1P/U12 overvoltage U > start reset
53	U2P/U23 overvoltage U > start reset
54	U3P/U31 overvoltage U > start reset

55	U1P/U12 overvoltage U > trip reset
56	U2P/U23 overvoltage U > trip reset
57	U3P/U31 overvoltage U > trip reset
58	U1P/U12 overvoltage U >> start reset
59	U2P/U23 overvoltage U >> start reset
60	U3P/U31 overvoltage U >> start reset
61	U1P/U12 overvoltage U >> trip reset
62	U2P/U23 overvoltage U >> trip reset
63	U3P/U31 overvoltage U >> trip reset
24	Negative sequence overvoltage U2 > start
25	Negative sequence overvoltage U2 > trip
64	Negative sequence overvoltage U2 > start reset
65	Negative sequence overvoltage U2 > trip reset
26	Residual overvoltage U0 > start
27	Residual overvoltage U0 > trip
66	Residual overvoltage U0 > start reset
67	Residual overvoltage U0 > trip reset
A0	R1 activated
A1	R1 reset
A2	R2 activated
A3	R2 reset
A4	R3 activated
A5	R3 reset
A6	R4 activated
A7	R4 reset
A8	R5 activated
A9	R5 reset
B1	Digital input activated
B2	Digital input reset
E1	Tripped by external digital input
FE	Relay is powered up