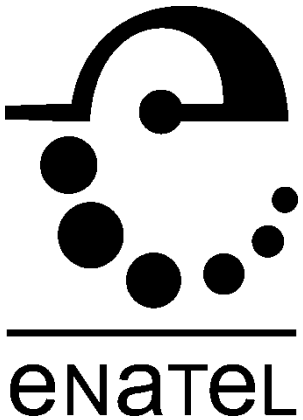

Enatel SM3x Modbus Interface

Revision 1.0

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1. MODBUS TCP

Connection: 10/100BaseT RJ45 Ethernet connection.
Default IP Address: 10.10.5.10 (DHCP supported)
Default Port: 502

2. Modbus Functions Supported

Function	Code
Read Coils*	01
Read Discrete Inputs	02
Reading Holding Registers	03
Read Input Register*	04
Write Single Coil*	05
Write Single Register	06
Write Multiple Coils*	15
Write Multiple Registers	16
Read/Write Multiple Registers	23

* These functions are supported but have no currently defined addresses available so will always return the Illegal Data Address exception code (2). They are included for future development purposes only.

3. Discrete Input Map

Description	Address
User Alarm 1	10001
User Alarm 2	10002
User Alarm 3	10003
User Alarm 4	10004
User Alarm 5	10005
User Alarm 6	10006
User Alarm 7	10007
User Alarm 8	10008
User Alarm 9	10009
User Alarm 10	10010
User Alarm 11	10011
User Alarm 12	10012
User Alarm 13	10013
User Alarm 14	10014
User Alarm 15	10015
User Alarm 16	10016
User Alarm 17	10017
User Alarm 18	10018
User Alarm 19	10019
User Alarm 20	10020
User Alarm 21	10021
User Alarm 22	10022
User Alarm 23	10023
User Alarm 24	10024
User Alarm 25	10025
User Alarm 26	10026
User Alarm 27	10027
User Alarm 28	10028
User Alarm 29	10029
User Alarm 30	10030
User Alarm 31	10031
User Alarm 32	10032
Rectifier Mains Fail	10033
	10034
Rectifier Over Temperature	10035

Rectifier Fan Fail	10036
Rectifier Current Limit	10037
Rectifier Over Voltage	10038
Rectifier Brownout	10039
Rectifier Postmate Open	10040
	10041
Rectifier Temperature Sense Fail	10042
	10043
	10044
	10045
Rectifier Shutdown	10046
Rectifier EEPROM Fail	10047
Rectifier Soft Starting	10048
Converter Input Fail	10049
	10050
Converter Over Temperature	10051
Converter Fan Fail	10052
Converter Current Limit	10053
Converter Over Voltage	10054
Converter Brownout	10055
Converter Postmate Open	10056
	10057
Converter Temperature Sense Fail	10058
	10059
	10060
	10061
Converter Shutdown	10062
Converter EEPROM Fail	10063
Converter Soft Starting	10064
Inverter Communication Fail	10065
	10066
Inverter Over Temp	10067
Inverter Fan Fail	10068
Inverter Power Limit	10069
Inverter Input Volts High	10070
Inverter Input Volts Low	10071
Inverter Emergency Power Off	10072
Inverter Output Voltage High	10073
Inverter Output Voltage Low	10074
Inverter Negative Power Protection	10075
Inverter Output Volts Abnormal	10076
Inverter Sync Pulse Fault	10077
Inverter Shutdown	10078
Inverter EEPROM Fail	10079
Inverter Soft Start Fail	10080

Rectifier Non-Urgent Fail	10081
Rectifier Urgent Fail	10082
All Rectifiers Failed	10083
Urgent Rectifier Missing	10084
Non-Urgent Rectifier Missing	10085
Converter Non-Urgent Fail	10086
Converter Urgent Fail	10087
All Converters Failed	10088
Converter Missing	10089
	10090
Inverter Non-Urgent Fail	10091
Inverter Urgent Fail	10092
All Inverters Fail	10093
Inverter Missing	10094
	10095
	10096
Low Voltage Bus 1	10097
Low Float Bus 1	10098
High Voltage Bus 1	10099
High Float Bus 1	10100
Low Voltage Bus 2	10101
Low Float Bus 2	10102
High Voltage Bus 2	10103
High Float Bus 2	10104
LVD 1 Operate	10105
LVD 2 Operate	10106
Battery Cell Voltage Symmetry	10107
LVD 3 Operate	10108
	10109
	10110
	10111
	10112
System Load Current High	10113
	10114
Battery Current High	10115
Battery String Current High	10116
Battery String Current Imbalance	10117
Battery String Open	10118
Battery Temperature Low	10119
Battery Temperature High	10120
Battery Temperature Sensor Fault	10121
Ambient Temperature Low	10122
Ambient Temperature High	10123
Ambient Temperature Sensor Fault	10124
Battery MCB 1 open	10125
Battery MCB 2 open	10126
Battery MCB 3 open	10127

Battery MCB 4 open	10128
Power Save Active	10129
Periodic Equalise	10130
Manual Equalise	10131
Fast Charge	10132
Battery Test	10133
Battery Discharge	10134
Battery Test Fail	10135
Battery Current Limit Active	10136
System Current Limit Active	10137
Peripheral Missing	10138
LVD Fail	10139
Monitor ADC Fail	10140
Logic Error	10141
Monitor Fan Fail	10142
System Power Limit Active	10143
	10144
AC Voltage High	10145
AC Voltage Low	10146
AC Phase Lost	10147
AC Current High	10148
AC Frequency High	10149
AC Frequency Low	10150
	10151
	10152
	10153
	10154
	10155

	10156
	10157
	10158
	10159
	10160
Static Bypass Control Power Fail	10161
Static Bypass Unavailable	10162
Static Bypass Over Temperature	10163
Static Bypass Fan Fail	10164
Static Bypass Power Limit	10165
Static Bypass Switch Fail	10166
Static Bypass Priority Alarm	10167
Static Bypass Back-Feed Relay Open	10168
Static Bypass SCR Short Circuit	10169
Static Bypass Output Short Circuit	10170
Static Bypass Running In Fault Mode	10171
Static Bypass Mode Alarm	10172
Static Bypass Inverter Unavailable	10173
Static Bypass Mains Unavailable	10174
Static Bypass EEPROM Fail	10175
Static Bypass Manual Bypass Switch Abnormal Position	10176

Note: Entries with no description listed are unassigned currently. They will always return a value of 0. They are included for future development purposes only.

4. Holding Register Map

Description	Address	Length	Format	Properties	Units/Scaling
Bus Voltage 1	40001	1	INT16	Read Only	(Hundredths) Volts
Number Of Rectifiers	40002	1	INT16	Read Only	-
Rectifier Output Current	40003	1	INT16	Read Only	Amps
Load Current	40004	1	INT16	Read Only	Amps
Battery Current	40005	1	INT16	Read Only	Amps (Positive for charging)
Battery Capacity Remaining	40006	1	INT16	Read Only	%
Battery Discharge Time Remaining	40007	1	INT16	Read Only	Minutes (32767 if battery is not discharging)
Battery Temperature	40008	1	INT16	Read Only	(Tenths) °C (32767 if sensor is not fitted)
Ambient Temperature	40009	1	INT16	Read Only	(Tenths) °C (32767 if sensor is not fitted)
Number of 12V Converters	40010	1	INT16	Read Only	-
12V Converter Output Voltage	40011	1	INT16	Read Only	(Hundredths) Volts
12V Converter Output Current	40012	1	INT16	Read Only	Amps
Number of 24V Converters	40013	1	INT16	Read Only	-
24V Converter Output Voltage	40014	1	INT16	Read Only	(Hundredths) Volts
24V Converter Output Current	40015	1	INT16	Read Only	Amps
Number of 48V Converters	40016	1	INT16	Read Only	-
48V Converter Output Voltage	40017	1	INT16	Read Only	(Hundredths) Volts
48V Converter Output Current	40018	1	INT16	Read Only	Amps
Number of 60V Converters	40019	1	INT16	Read Only	-
60V Converter Output Voltage	40020	1	INT16	Read Only	(Hundredths) Volts
60V Converter Output Current	40021	1	INT16	Read Only	Amps
Number of Inverters	40022	1	INT16	Read Only	-
Inverter Output AC Voltage	40023	1	INT16	Read Only	(Tenths) Volts
Inverter Output AC Current	40024	1	INT16	Read Only	(Hundredths) Amps
Fan Speed 1	40025	1	INT16	Read Only	(Tenths) %
Fan Speed 2	40026	1	INT16	Read Only	(Tenths) %
Custom Variable 1	40027	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 2	40028	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 3	40029	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 4	40030	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 5	40031	1	INT16	Read Only	User Setting (32767 if

					unassigned)
Custom Variable 6	40032	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 7	40033	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 8	40034	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 9	40035	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 10	40036	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 11	40037	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 12	40038	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 13	40039	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 14	40040	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 15	40041	1	INT16	Read Only	User Setting (32767 if unassigned)
Custom Variable 16	40042	1	INT16	Read Only	User Setting (32767 if unassigned)
Mains Monitor 1 AC Voltage 1	40101	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 1 AC Voltage 2	40102	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 1 AC Voltage 3	40103	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 1 AC Current 1	40104	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 1 AC Current 2	40105	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 1 AC Current 3	40106	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 1 Frequency	40107	1	INT16	Read Only	Hertz (32767 if mains monitor not fitted)
Mains Monitor 2 AC Voltage 1	40108	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 2 AC Voltage 2	40109	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 2 AC Voltage 3	40110	1	INT16	Read Only	(Tenths) Volts (32767 if mains monitor not fitted)
Mains Monitor 2 AC Current 1	40111	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 2 AC Current 2	40112	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 2 AC Current 3	40113	1	INT16	Read Only	(Tenths) Amps (32767 if mains monitor not fitted)
Mains Monitor 2 Frequency	40114	1	INT16	Read Only	Hertz (32767 if mains

					monitor not fitted)
Float Voltage	40201	1	INT16	Read/Write	(Hundredths) Volts
Fast Charge Voltage	40202	1	INT16	Read/Write	(Hundredths) Volts
Periodic Equalise Voltage	40203	1	INT16	Read/Write	(Hundredths) Volts
Manual Equalise Voltage	40204	1	INT16	Read/Write	(Hundredths) Volts
Battery Test Voltage	40205	1	INT16	Read/Write	(Hundredths) Volts

Note: All unused addresses between 40001 and 40205 will report as 0 to allow a single transaction to request all holding registers.