System Models – Overview and Modbus Mapping
Introduction

This document provides a comprehensive overview of all available Modbus communication models implemented in the system. Each model describes a defined set of data points, including their respective Modbus register addresses, units, data types, and functional codes. The configuration structure follows a uniform approach for simplified integration and interoperability within multi-device environments such as PV systems, battery storage, CHP units, and sensor networks. All models are based on ModbusTCP/ModbusRTU communication and utilize Big Endian byte order. Each device must be activated under OpenGateway – Version2 within the configuration menu, and its logical address (UnitID/SlaveID) must be assigned in the Device Mapping section.

This register documentation serves as a technical reference for developers and integrators implementing data acquisition or control logic through Modbus. It enables unified access across all connected components within the energy management system, ensuring consistent communication, diagnostics, and performance monitoring.

Datamodell: System

In Configuration menu, open OpenGateway, set Version 2 as active, Modell is available under UnitID/ SlaveID: 0 or 253

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Active Power at Generating Units (Sum of all Units)	kW	Float	x3 Holding (R)	0	
Total Daily Energy (Sum of all Units)	kWh	Float	x3 Holding (R)	2	
Total Energy (Sum of all Units)	kWh	Double	x3 Holding (R)	4	
Active Power Consumption	kW	Float	x3 Holding (R)	8	
Total Daily Energy Consumption	kWh	Float	x3 Holding (R)	10	
Total Energy Consumption	kWh	Double	x3 Holding (R)	12	
Active Power at Grid Connection Point	kW	Float	x3 Holding (R)	16	negativ = feedin, positiv = purchase
Active Power at BatteryESS (Sum of all Units)	kW	Float	x3 Holding (R)	18	negativ = charge, positiv = discharge
State of Charge at BatteryESS (Avg of all Units)	%	Float	x3 Holding (R)	20	
Active Alarms Count (all Units)		Float	x3 Holding (R)	22	
Current Electricity Price (Tariff Zone Defined in Basic Configuration)	Cent	Float	x3 Holding (R)	24	

Datamodell: Inverter

In Configuration menu, open OpenGateway, set Version 2 as active, and assign the corresponding logical address under Device Mapping

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Active Power	kW	Float	x3 Holding (R)	0	
Reactive Power	kvar	Float	x3 Holding (R)	2	
AC Voltage L-N	V	Float	x3 Holding (R)	4	
Cabinet Temperature	°C	Float	x3 Holding (R)	6	
Insulation Resistance	MOhm	Float	x3 Holding (R)	8	
Battery Power	kW	Float	x3 Holding (R)	10	
Battery SOC	%	Float	x3 Holding (R)	12	
DC Power 1	kW	Float	x3 Holding (R)	50	
DC Voltage 1	V	Float	x3 Holding (R)	52	
DC Power 2	kW	Float	x3 Holding (R)	54	
DC Voltage 2	V	Float	x3 Holding (R)	56	
...	kW	Float	x3 Holding (R)	...	
...	V	Float	x3 Holding (R)	...	
DC Power 32	kW	Float	x3 Holding (R)	174	
DC Voltage 32	V	Float	x3 Holding (R)	176	

Datamodell: Meter

In Configuration menu, open OpenGateway, set Version 2 as active, and assign the corresponding logical address under Device Mapping

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Active Power	kW	Float	x3 Holding (R)	0	
Active Power L1	kW	Float	x3 Holding (R)	2	
Active Power L2	kW	Float	x3 Holding (R)	4	
Active Power L3	kW	Float	x3 Holding (R)	6	
Voltage L1-N	V	Float	x3 Holding (R)	8	
Voltage L2-N	V	Float	x3 Holding (R)	10	
Voltage L3-N	V	Float	x3 Holding (R)	12	
Voltage L-L	V	Float	x3 Holding (R)	14	
Voltage L1-L2	V	Float	x3 Holding (R)	16	
Voltage L2-L3	V	Float	x3 Holding (R)	18	
Voltage L3-L1	V	Float	x3 Holding (R)	20	
Current L1	A	Float	x3 Holding (R)	22	
Current L2	A	Float	x3 Holding (R)	24	
Current L3	A	Float	x3 Holding (R)	26	
Current LN	A	Float	x3 Holding (R)	28	
Reactive Power	kvar	Float	x3 Holding (R)	30	
Reactive Power L1	kvar	Float	x3 Holding (R)	32	
Reactive Power L2	kvar	Float	x3 Holding (R)	34	
Reactive Power L3	kvar	Float	x3 Holding (R)	36	
Apparent Power	kVA	Float	x3 Holding (R)	38	
Apparent Power L1	kVA	Float	x3 Holding (R)	40	
Apparent Power L2	kVA	Float	x3 Holding (R)	42	
Apparent Power L3	kVA	Float	x3 Holding (R)	44	
cos (φ)	φ	Float	x3 Holding (R)	46	
Frequence	Hz	Float	x3 Holding (R)	48	
THD Harmonic U L1-N	%	Float	x3 Holding (R)	50	
THD Harmonic U L2-N	%	Float	x3 Holding (R)	52	
THD Harmonic U L3-N	%	Float	x3 Holding (R)	54	
THD Harmonic I L1	%	Float	x3 Holding (R)	56	
THD Harmonic I L2	%	Float	x3 Holding (R)	58	
THD Harmonic I L3	%	Float	x3 Holding (R)	60	

Datamodell: Sensors

In Configuration menu, open OpenGateway, set Version 2 as active, and assign the corresponding logical address under Device Mapping

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Irradiation Sensor Power	W/m^2	Float	x3 Holding (R)	0	
Irradiation Sensor Cell Temperature	°C	Float	x3 Holding (R)	2	
Irradiation Sensor External Temperature	°C	Float	x3 Holding (R)	4	
Temperature Sensor	°C	Float	x3 Holding (R)	6	
Humidity Sensor	%	Float	x3 Holding (R)	8	

Datamodell: BatteryESS

In Configuration menu, open OpenGateway, set Version 2 as active, and assign the corresponding logical address under Device Mapping

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Active Power	kW	Float	x3 Holding (R)	0	negativ = charge, positiv = discharge
Reactive Power	kvar	Float	x3 Holding (R)	2	
State of Charge	%	Float	x3 Holding (R)	4	
State of Health	%	Float	x3 Holding (R)	6	
DC Current	A	Float	x3 Holding (R)	8	
DC Voltage	V	Float	x3 Holding (R)	10	

Datamodell: CHP

In Configuration menu, open OpenGateway, set Version 2 as active, and assign the corresponding logical address under Device Mapping

Datapoint	Unit	Datatype	FC	Register/Bit (Dec)	Info
Active Power	kW	Float	x3 Holding (R)	0	
Flow Temperature	°C	Float	x3 Holding (R)	2	
Return Temperature	°C	Float	x3 Holding (R)	4	
Exhaust Gas Temperature	°C	Float	x3 Holding (R)	6	
F1 Temperatur	°C	Float	x3 Holding (R)	8	
F2 Temperatur	°C	Float	x3 Holding (R)	10	
Ambient Temperature	°C	Float	x3 Holding (R)	12	
Buffer Tank Top Temperatur	°C	Float	x3 Holding (R)	14	
Buffer Tank Buttom Temperatur	°C	Float	x3 Holding (R)	16	
Inlet Temperature	°C	Float	x3 Holding (R)	18	
Outlet Temperature	°C	Float	x3 Holding (R)	20	