

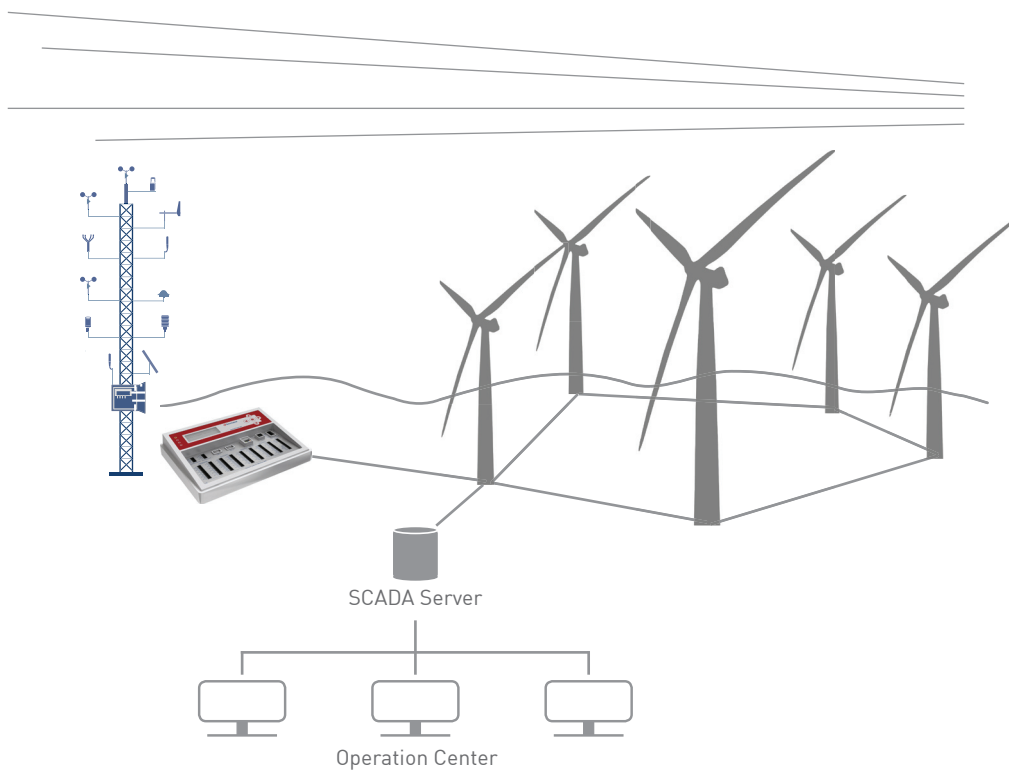
Data Logger Meteo-40 for SCADA

Integrating Meteo-40 in SCADA systems



Once the wind farm is set up and running, its best performance has to be ensured. To do so, it is essential to monitor and check its operation. Meteo-40 can easily be integrated in SCADA (Supervisory Control and Data Acquisition) systems to provide reliable comparative meteorological data. Considering the measurement data recorded by Meteo-40, for example, predictions about the annual production of the wind farm can be verified. Meteo-40 records measurement data which is used by wind farm operators and investors, as well as for forecasting reasons.

With its configurable Modbus Register Map Meteo-40 is designed for operation in most existing SCADA systems. The necessary parameters are configured via the user-friendly Meteo-40 web interface.



Your advantages

- Compatible with most existing SCADA systems
- High accuracy according to industry standard IEEE 754 floating-point values
- User-friendly web interface for configuration
- Powerful Linux™ computer for data evaluation
- Configurable Modbus Register Map for data retrieval
- Communication via Ethernet (TCP/IP) or RS485
- Data transmission via standard protocols Modbus TCP/IP and Modbus RTU
- Restricted data access according to defined client IP address for Modbus TCP security

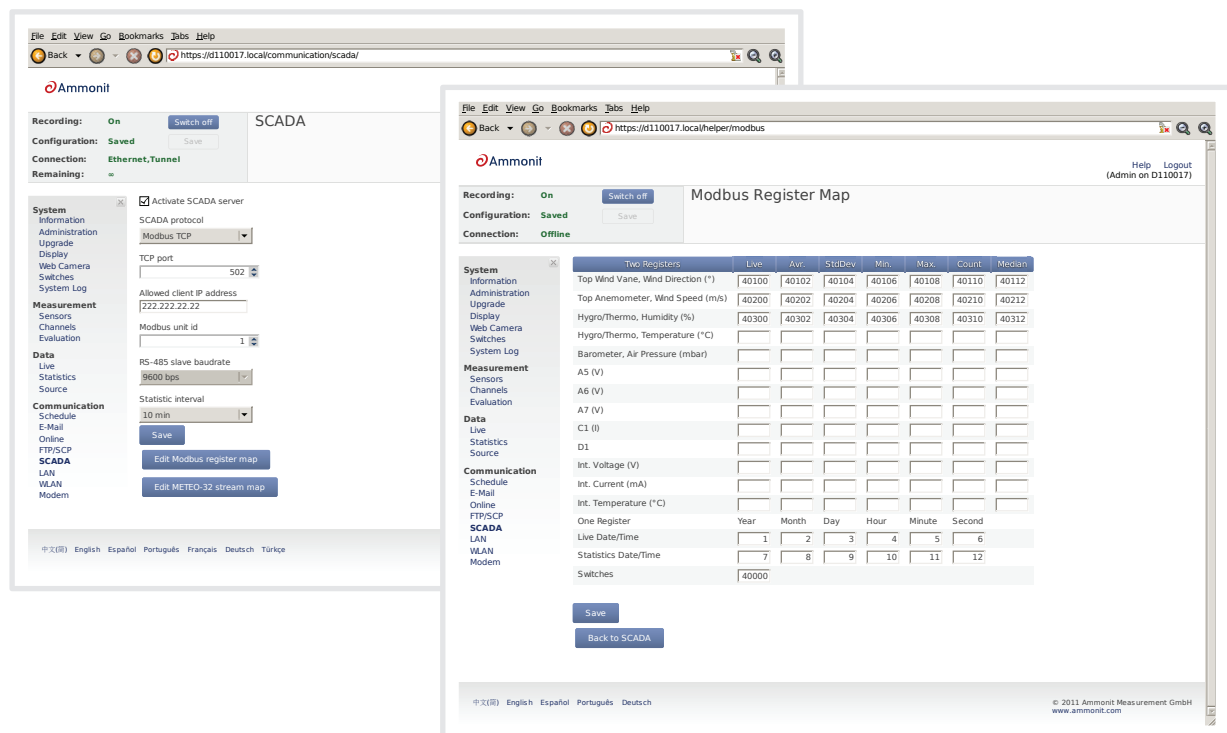
Data Logger Meteo-40 for SCADA

Implementing Meteo-40 in your SCADA system

In order to install the data logger in a SCADA system, it has to be connected via RS485 or Ethernet (TCP/IP) to the wind farm network. Meteo-40 uses the standard protocols Modbus TCP/IP and Modbus RTU for data transmission. The measurement data can be retrieved via the Modbus Register Map. During SCADA operation the Linux™ processor of Meteo-40 has to be permanently switched on.



SCADA details are entered over the Meteo-40 web interface. After having selected the SCADA protocol and entering the required parameters, the Modbus Register Map has to be configured. All active channels and evaluated data can be accessed. By editing the Modbus register map, you can assign register numbers to each value. All entries are checked for plausibility. For the SCADA client, only the values with assigned register number are available.



The image shows two overlapping screenshots of the Ammonit web interface. The left screenshot displays the 'SCADA' configuration page, and the right screenshot displays the 'Modbus Register Map' configuration page.

SCADA Configuration Page:

- Recording: On (Switch off)
- Configuration: Saved (Save)
- Connection: Ethernet, Tunnel
- Remaining: =
- System: Activate SCADA server
- SCADA protocol: Modbus TCP
- TCP port: 502
- Allowed client IP address: 222.222.22.22
- Modbus unit id: 1
- RS-485 slave baudrate: 9600 bps
- Statistic interval: 10 min
- Buttons: Save, Edit Modbus register map, Edit METEO-32 stream map

Modbus Register Map Page:

- Recording: On (Switch off)
- Configuration: Saved (Save)
- Connection: Offline
- Table with columns: Two Registers, Live, Avr, StdDev, Min., Max., Count, Median
- Buttons: Save, Back to SCADA

Two Registers	Live	Avr	StdDev	Min.	Max.	Count	Median
Top Wind Vane, Wind Direction (°)	40100	40102	40104	40106	40108	40110	40112
Top Anemometer, Wind Speed (m/s)	40200	40202	40204	40206	40208	40210	40212
Hygro/Thermo, Humidity (%)	40300	40302	40304	40306	40308	40310	40312
Hygro/Thermo, Temperature (°C)							
Barometer, Air Pressure (mbar)							
A5 (V)							
A6 (V)							
A7 (V)							
C1 (I)							
D1							
Int. Voltage (V)							
Int. Current (mA)							
Int. Temperature (°C)							
One Register	Year	Month	Day	Hour	Minute	Second	
Live Date/Time	1	2	3	4	5	6	
Statistics Date/Time	7	8	9	10	11	12	
Switches	40000						

Meteo-40 and Modbus

Measurement values are represented as single precision IEEE 754 floating-point numbers, which are stored in two subsequent 16-bit Modbus registers. Date/time values, i.e. year, month, day, hour, minute, and second, are represented as decimal values, which are stored in one 16-bit Modbus register each.

With regard to the editable Modbus register map, live data of all active channels and switches as well as statistical data can be collected. The following statistics are available: average (scalar or vectorial), minimum, maximum, standard deviation, median and count.