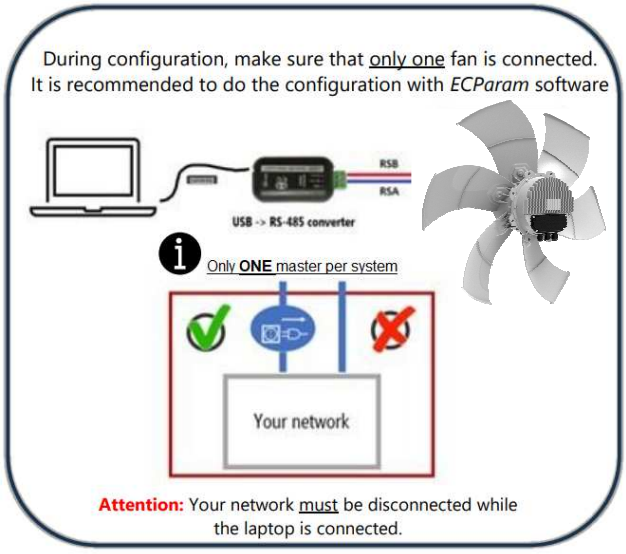
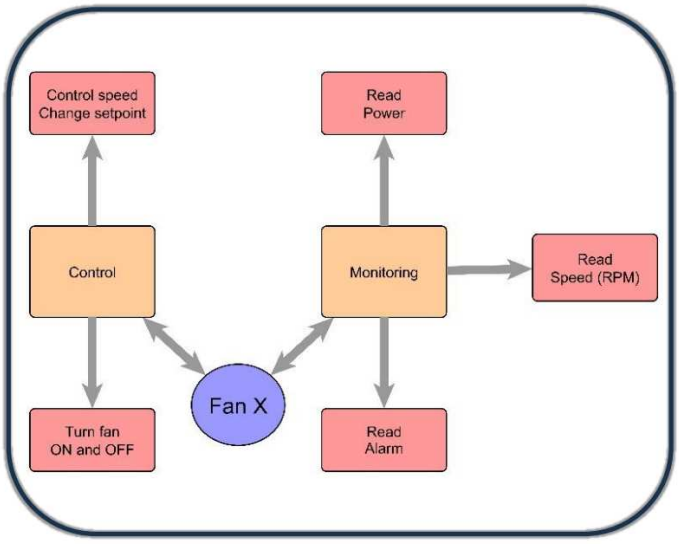
# Quick-Start Guide Modbus: BA604

**Configuration**




**Control**




## Quick reminder

All Modbus devices need the same Baudrate and parity + unique address.

The Modbus signal is divided into 5 Key points: Address, FC, Register, Data, CRC.
Each command should have the following order.

| Adress | FC | Register 1 | Register 0 | Data 1 | Data 0 | CRC | CRC |
|---|---|---|---|---|---|---|---|

A quick example would be the change of the Baudrate.

| 01 | 06 | 00 | 16 | 00 | 01 | A9 | CE |
|---|---|---|---|---|---|---|---|

The signal contains the address 1 with the FC06 for the register 16 and writes the value 01 in it.
After that the CRC (cycle redundancy check) finishes the signal.

**Attention:** On every Modbus network, only ONE Master is allowed. While configuring with a laptop, it is important to disconnect your BMS network.

**Default Modbus parameters are:**

*Baud rate:* 19200
*Parity:* EVEN
*Stop bit:* 1
*Address:* 1



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# Quick Start configuration

| register type | Register Dez Hex | name | unit | description | read /write |
|---|---|---|---|---|---|
| coil | 1050<br>0x041A | *control mode setpoint* | 0 = setpoint via modbus ;<br>1 = setpoint via 0-10V | control possibility of the fan | **R/W** |
| coil | 1051<br>0x041B | *control mode Enable* | 0 = Enable via modbus ;<br>1 = Enable via DigInput | control possibility of the fan | **R/W** |
| Holding register | 1050<br>0x041A | *modbus address* | 1-247 | unit in the system | **R/W** |
| Holding register | 1051<br>0x041B | *communication rate* | 0 = 9600 ;<br>1 = 19200 ;<br>2 = 38400;<br>3 = 57600;<br>4 = 115200 | baudrate of the system | **R/W** |
| Holding register | 1052<br>0x041C | *parity* | 0 = none ;<br>1 = odd ;<br>2 = even | parity of the system | **R/W** |
| Holding register | 1053<br>0x041D | *stop bits* | 1 = 1 stoppbit ;<br>2 = 2 stoppbit | stoppbit of the system | **R/W** |

# Quick Start operation

| register type | register | name | unit | resolution | description | read/ write |
|---|---|---|---|---|---|---|
| coil | 1001<br>0x03E9 | *motor on / off* | 1 = motor is on ;<br>0 = motor is off | 0-1 | 1 = motor is on ;<br>0 = motor is off | **R/W** |
| Holding register | 1000<br>0x03E8 | *setpoint* | 0,01 | 0-10000 | set the rpm in % for the fan | **R/W** |
| Input register | 1050<br>0x041A | *speed* | 1 | - | current speed rpm | **R** |
| Input register | 1103<br>0x044F | *Current Power* | 1 | - | Current power use in W | **R** |
| Input register | 1104<br>0x0450 | *Energy consumption kWh* | 1 | - | Used Energy<br>Only possible in GD150 Motorsize 6 | **R** |
| Input register | 1105<br>0x0451 | *Energy consumption MWh* | 1 | - | Used Energy<br>Only possible in GD150 Motorsize 6 | **R** |
| Discrete input | 1000<br>0x03E8 | *internal stop* | 0/1 | 0-1 | 0 = no failure;<br>1 = failure<br>For more details connect with ECParam | **R** |

# Typical used settings

**Setup modbus network**

In this example multiple fans are set to 19200 baudrate with even parity and 1 stop bit.
The control mode gets changed to bus control.
These settings need to be changed on every fan.
After the changes the Fan needs to be power cycled and turned off for minimum 30sec.
**We recommend using our Software ECParam for configuration.**

| **fan 1** | | | | |
|---|---|---|---|---|
| Nr | description | type | register Dez | value Dez |
| 1 | Modbus address | holding | 1050 | 4 |
| 2 | communication rate | holding | 1051 | 1 |
| 3 | parity | holding | 1052 | 2 |
| 4 | stop bits | holding | 1053 | 1 |
| 5 | control mode setpoint | coil | 1050 | 0 |
| 6 | control mode enable | coil | 1051 | 0 |
| **fan 2** | | | | |
| 1 | Modbus address | holding | 1050 | 5 |
| 2 | communication rate | holding | 1051 | 1 |
| 3 | parity | holding | 1052 | 2 |
| 4 | stop bits | holding | 1053 | 1 |
| 5 | control mode setpoint | coil | 1050 | 0 |
| 6 | control mode enable | coil | 1051 | 0 |
| **fan x** | | | | |
| 1 | Modbus address | holding | 1050 | X |
| 2 | communication rate | holding | 1051 | 1 |
| 3 | parity | holding | 1052 | 2 |
| 4 | stop bits | holding | 1053 | 1 |
| 5 | control mode setpoint | coil | 1050 | 0 |
| 6 | control mode enable | coil | 1051 | 0 |

**1.** Define YOUR Modbus address. Each number is unique and should not be multiple times in one network.

**2.** Define the speed of the communication (baudrate). Each device needs the same communication speed.
Higher communication speed means a shorter bus wire length maximum.

**3.** Define your parity. This is for error detection in the bus. Each device needs the same parity.

**4.** Define your stop bits. Each device needs the same amount of stop bits.

**5.** Set the control mode register to bus control.

**Control the Fan**

In this example the fan gets controlled over Modbus.
With the following commands it gets turned ON and set to 50% of its maximum speed.
Additionally, the rotation speed gets read out.

| Nr | description | type | register Dez | value Dez |
|---|---|---|---|---|
| 1 | motor on / off | coil | 1001 | 1 = on / 0 = off |
| 2 | setpoint | holding | 1000 | 4505 = ~50% |
| 3 | speed of the motor | input | 1050 | read value in rpm |
| 4 | internal stop | discrete input | 1000 | 0 = no failure<br>1 = failure |

**1.** Control the fan by turning it ON or OFF
Attention: When the fan is set to Modbus control and gets turned on the fan will start spinning even when setpoint is 0.
To turn the fan off you need to do it in this register.

**2.** Define the speed of the fan. This is a percent-based control.
means 0 = 0% and 10000 = 100%

**3.** Returns the measured speed of the motor. The value is the measured speed of the motor in RPM.

**4.** Check for a failure of the motor (only read function).
It can only be read, if the register value is 1 the motor has stopped and needs to be restarted overpower cycled. To see what caused the motor to stop, the software ECParam and a USB to RS-485 converter is required.

**For the more detailed Modbus Instruction Guide use the "Complete Instruction Guide" for the ID: BA604.**