

## A. BACS MODBUS Parameter

### Standard BACS – Address Description

Note: the max. number of BACS Modules requestable through MODBUS is 256.

Note: “Type U/S”: this defines whether the answer has an algebraic sign (math. +/-) or not. U means “unsigned”. S means “signed”, this answer may be positive or negative.

Name	Type	Input Register	Holding Register	Description	# of Reg	Scale	Notes/Units
BACS_STATE	U	11000	41000	BACS State	1		Note 4
BACS_STATE	U	11001	41001	BACS State Continue	1		Note 5
BACS_ALARM_...	U	11002	41002	BACS Alarm Flags	1		Note 6
<RESERVED>	U	11003	41003	Reserved, do not use	1		-
...	...	...	...	...	...	...	
STRING_01_CUR	S	11010	41010	String 1 current	1	/10	Unit:A
<RESERVED>	S	11011	41011	Reserved, do not use	1		-
...	...	...	...	...	...	...	-
STRING_02_CUR	S	11015	41015	String 2 current	1	/10	Unit:A
...	...	...	...	...	...	...	-
STRING_10_CUR	S	11055	41055	String 10 current	1	/10	Unit:A
...	...	...	...	...	...	...	-
MODULE_001_TEMP	S	11060	41060	Module 1 Temperature	1		Note 1
MODULE_001_VOLT	S	11061	41061	Module 1 Voltage	1	/1000	Note 2 Units:V
MODULE_001_IMPC	S	11062	41062	Module 1 Impedance	1	/100	Note 3 Units:mΩ
MODULE_001_ALARM	U	11063	41063	Module 1 Alarm flags	1		Note 7
MODULE_001_EQ	S	11064	41064	Module 1 Equalizing	1		Unit: %
MODULE_002_TEMP	S	11065	41065	Module 2 Temperature	1		Note 1
MODULE_x until No. 256.	...	...	...	...	...	...	
MODULE_256_TEMP	S	12335	42335	Module 256 Temperature	1		Note 1
MODULE_256_VOLT	S	12336	42336	Module 256 Voltage	1	/1000	Note 2 Units:V
MODULE_256_IMPC	S	12337	42337	Module 256 Impedance	1	/100	Note 3 Units: mΩ
MODULE_256_ALARM	U	12338	42338	Module 256 Alarm flags	1		Note 6
MODULE_256_EQ	S	12339	42339	Module 256 Equalizing	1		Unit:%

**Note:** A value of -1 or -9999 means: This value is currently “Not available” (“N/A”).

**Note 1 - Temperature value definition:**

**Temperature T in °C/°F selected in BACS configuration**

$$T = \frac{X-78}{2} \quad \text{Example} \quad T = \frac{128-78}{2} = 25$$

0xXX → 0 bis 255  
0x7F 127 => 24,5°C  
0x80 128 => 25°C  
0x81 129 => 25,5°C

**Note 2 - Voltage value definition:**

**Voltage U in V**                      Value / 1000

*Example: Voltage U in V = 12825 / 1000 = 12.825 V*

**Note 3 - Impedance value definition:**

**Impedance Z in mΩ**    Value / 100

*Example: Impedance Z in mΩ = 4372 / 100 = 43.72 mΩ*

**Note 4 – Address 1000 MODBUS**

Name	Holding Register	Input Register	Bit
BACS_STATE_RUNNING	11000	41000	0
BACS_STATE_CONNECTED	11000	41000	1
BACS_STATE_MODULE_LOST	11000	41000	2
BACS_STATE_DISCHARGING	11000	41000	3
BACS_STATE_CHARGING	11000	41000	4
BACS_STATE_DISCHARGING_STOPPED	11000	41000	5
BACS_STATE_FLOAT_CHARGING	11000	41000	6
BACS_STATE_EQUALISATION	11000	41000	7
BACS_STATE_SYSTEM_FAILURE	11000	41000	8
BACS_STATE_VOLTAGE_OUTOFRANGE	11000	41000	9
BACS_STATE_TEMPERATURE_OUTOFRANGE	11000	41000	10
BACS_STATE_RESISTANCE-OUTOFRANGE	11000	41000	11
BACS_STATE_MODULE-ADDRESSING	11000	41000	12
BACS_STATE_MODULE-SEARCHING	11000	41000	13
BACS_STATE_MODULE-INITIALIZING	11000	41000	14
BACS_STATE_MODULE-POLLING	11000	41000	15

**Note 5 – Address 1001 MODBUS/SNMP**

<b>NAME</b>	<b>Input Register</b>	<b>Holding Register</b>	<b>Bit</b>
BACS_STATE-GENERAL-ALARM	11001	41001	0
BACS_STATE-VOLTAGE-DIFF-HIGH	11001	41001	1
BACS_STATE-BATTERY-BREAKER-OPEN	11001	41001	2
BACS_STATE_THERMAL_RUNAWAY	11001	41001	3

**Note 6 – Address 1002 Alarm Flags MODBUS/SNMP**

<b>NAME</b>	<b>Input Register</b>	<b>Holding Register</b>	<b>Bit</b>
BACS_ALARM_GENERAL_ALARM	11002	41002	0
BACS_ALARM_COMMUNICATION_LOST	11002	41002	1
BACS_ALARM_VOLTAGE_HIGH	11002	41002	2
BACS_ALARM_VOLTAGE_LOW	11002	41002	3
BACS_ALARM_TEMPERATURE_HIGH	11002	41002	4
BACS_ALARM_TEMPERATURE_LOW	11002	41002	5
BACS_ALARM_RESISTANCE_HIGH	11002	41002	6
BACS_ALARM_RESISTANCE_LOW	11002	41002	7
BACS_ALARM_EQUALISATION_ERR	11002	41002	8
BACS_ALARM_VOLTAGE_WARN_HIGH	11002	41002	9
BACS_ALARM_VOLTAGE_WARN_LOW	11002	41002	10
BACS_ALARM_TEMPERATURE_WARN_HIGH	11002	41002	11
BACS_ALARM_TEMPERATURE_WARN_LOW	11002	41002	12
BACS_ALARM_RESISTANCE_WARN_HIGH	11002	41002	13
BACS_ALARM_RESISTANCE_WARN_LOW	11002	41002	14
BACS_ALARM_MODREV_INCOMPATIBLE	11002	41002	15

## Note 7 – BACS Module Alarm

*Example: BACS Module 1 Holding Register 41063 Bit 7 BACS High Resistance Alarm*

*000000001000000*

0	BACS_ALARM_GENERAL_ALARM
1	BACS_ALARM_COMMUNICATION_LOST
2	BACS_ALARM_VOLTAGE_HIGH
3	BACS_ALARM_VOLTAGE_LOW
4	BACS_ALARM_TEMPERATURE_HIGH
5	BACS_ALARM_TEMPERATURE_LOW
6	BACS_ALARM_RESISTANCE_HIGH
7	BACS_ALARM_RESISTANCE_LOW
8	BACS_ALARM_EQUALISATION_ERR
9	BACS_ALARM_VOLTAGE_WARN_HIGH
10	BACS_ALARM_VOLTAGE_WARN_LOW
11	BACS_ALARM_TEMPERATURE_WARN_HIGH
12	BACS_ALARM_TEMPERATURE_WARN_LOW
13	BACS_ALARM_RESISTANCE_WARN_HIGH
14	BACS_ALARM_RESISTANCE_WARN_LOW
15	BACS_ALARM_MODREV_INCOMPATIBLE