

DC Power S Manager Modbus Specification

V1.18

Overview

Modbus communication protocol for DC Power S

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Document Management

Document History

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22-Jan-2021	1.17	Antoni Triadó	Added Registers 0x5040, 0x5041, 0x5043
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1.- INTRODUCTION

1.1.- Definitions, Acronyms and Abbreviations

Term	Description
DCS	DC Power Supply

2.- MODBUS PROTOCOL FEATURES FOR THIS SYSTEM.

The Modbus protocol of this system has the following features:

- ☐ Raster format: RTU.
- ☐ Data bit: 8 Bits.
- ☐ Stop bits: 1 Bit.
- ☐ Parity : None.

The RTU raster format is the following:

START	ADDRESS	FUNCTION	DATA	CRC	END
3,5 bytes	8 BITS	8 BITS	n x 8 BITS	16 BITS	3,5 bytes

As above can be checked the start and end of the raster are done with an internal silent of 3,5 bytes, as minimum. This time depends on the transmission baud rate.

If these interval times are not respected between consecutive rasters, they will be understand as only one question, and there will be an error in the reception.

In this case the equipment will not send any answer.

2.1.- Available Modbus functions.

The Modbus protocol for this equipment has the following functions:

Code	Function name
3	Read Holding Registers
16	Preset Multiple Registers

Next there is a brief description of each one of them:

2.2.- Function 3: Read Holding Registers.

This function allows us to see the content of one or several consecutive logs of the memory map.

Address	03 H	Start address (High)	Start address (Low)	Number of logs (High)	Number of logs (Low)	CRC (Low)	CRC (High)
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The meaning of the fields is the following:

Address: Equipment address to which the message is addressed.

03 H: Function code.

Start address (High): High part of the address from we can read the logs.

Start address (Low): Low part of the address from we can read the logs.

Number of logs (High): High part of number of logs to read.

Number of logs (Low): High part of number of logs to read.

Notes:

- The address **n** of a determined log is showed as n-1. So, it means that the log with address 0001 H is showed as 0000 H in the raster, and so forth.
- The maximum number of logs will be 15. If this number were exceeded there would be an error message.

The answer without error would be like:

Address	03	Byte number	Log n (High)	Log n (Low)		Log m (High)	Log m (Low)	CRC (Low)	CRC (High)
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Address: Equipment Address.

03 H : Function code that it corresponds.

Number of bytes: It has the number of log bytes that follows it.

Log n (High) : High part of Log n content.

Log n (Low) : Low part of Log n content.

Log m (High) : High part of Log m content.

Log m (Low) : Low part of Log m content.

Where **n** is the Log with the same address as the start one and **m** is the Address obtained with the formula:

$$\text{Address } m = \text{Start address} + \text{Number of Logs} - 1.$$

Example: We want to read the content of 2 Logs from the Address 10H. Supposing that the equipment address is 01 H, the message format would be:

Address	03 H	Start address (High)	Start address (Low)	Number of Logs (High)	Number of Logs (Low)	CRC (Low)	CRC (High)
01 H	03 H	00 H	0F H	00 H	02 H	F4H	08 H

The answer could be:

Address	03 H	Number of bytes	Log 1 (High)	Log 1 (Low)	Log 2 (High)	Log 2 (Low)	CRC (Low)	CRC (High)
01 H	03 H	04 H	00 H	AE H	00 H	00 H	9B H	D2 H

The field "Number of bytes " shows how many logs have bytes and they are sent in the raster (in this case 4: 00,AE,00 and 00).

Log 1 answers to the address 0010 H and Log 2 to 0011 H (000F and 0010 H in the raster of the question message). So, we have:

The log 0010 H has 00AE H and 0011 H has 0000 H.

2.3.- Function 16: Preset Multiple Logs.

This function allow us writing one or several consecutive memory Logs.

Dir	10 H	Start Address (High)	Start Address (Low)	Nr of Logs (High)	Nr of Logs (Low)	Nr of Bytes	Log n (High)	Log n (Low)		Log m (High)	Log m (Low)	CRC (Low)	CRC (High)
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Dir.: Equipment address to which the message is addressed.

10 H: Function code.

Start address (High): High part of the address from where the Logs are written.

Start address (Low): Low part of the address from where the Logs are written.

Number of Logs (High): High part of the number of Logs to write.

Number of Logs (Low): Low part of number of Logs to write.

Number of Bytes: It means the number of Log data bytes, which are sent.

Log n (High) : High part of the contents to write in the log n.

Log n (Low) : Low part of the contents to write in the log n.

Log m (High) : High part of the contents to write in the log m.

Log m (Low) : Low part of the contents to write in the log m .

Notes:

- The address **n** of a concrete log is showed as **n-1**. It means that the Log with address 0001 H is showed as 0000 H in the raster, and so forth.
- The maximum number of logs will be 10. If this number is overcome, an error will be generated in the reception, so there will not be any answer.
- If the address of the equipment is 0 (General address), there will not be any answer.
- If some of the values to set are wrong the writing is interrupted and the logs before the error will be written only.

The answer with no error would be like:

Address	10 H	Start address (High)	Start address (Low)	Number of logs (High)	Number of logs (Low)	CRC (Low)	CRC (High)
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Address: The equipment address that answers.

03 H : Function code to which is answering.

Start address (High): High part of the address from where the logs are written.

Start address (Low): Low part of the address from where the logs are written.

Number of Logs (High): High part of number of written logs.

Number of Logs (Low): Low part of number of written logs.

Example: We want to write 2 logs from the address 3E H of the equipment 01 H. The data to write will be 00E6 H and 00A3 H respectively. The format of the message will be:

Address	10 H	Start address (High)	Start address (Low)	Nr of logs (High)	Nr of logs (Low)	Nr of bytes	Log n (High)	Log n (Low)	Log m (High)	Log m (Low)	CRC (Low)	CRC (High)
01H	10 H	00 H	3D H	00 H	02 H	04 H	00 H	E6 H	00 H	A3 H	90 H	AC H

Where:

Log n: It is the start log, stated by the start address (003E H).

Log m: It is the end log (003F H).

The field "Number of bytes " means how many bytes of log contents are sent in the raster.

The answer could be like:

Address	10 H	Start address (High)	Start address (Low)	Number of logs (High)	Number of logs (Low)	CRC (Low)	CRC (High)
01H	10 H	00 H	3D H	00 H	02 H	D0 H	04 H

2.4.- Error messages.

The error messages have the following format:

Address	Function code	Error code	CRC (Low)	CRC (High)
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Address: It is the address of the equipment that sent the message.

Function code: It is the function code that made the error, with the bit number 7 set to 1.

Error code: It states the made error type. The following table shows all the existent error types.

Code	Name	Meaning
01 H	ILLEGAL FUNCTION	The function is not allowed for this equipment.
02 H	ILLEGAL DATA ADDRESS	The specified address is wrong.
03 H	ILLEGAL DATA VALUE	One or several data field values are wrong.
04 H	SLAVE DEVICE FAILURE	Equipment failure when the function has been executed.
05 H	ACKNOWLEDGE	The equipment is still in process.
06 H	SLAVE DEVICE BUSY	The equipment is occupied processing another function.

Example:

We have sent to the equipment 01 H the function 03 H asking for information with more than 18 logs and it answers this message:

Address	Function code	Error code	CRC (Low)	CRC (High)
01 H	83 H	03 H	01 H	31 H

Address: Equipment address that answers the message.

Function code: It is the result when the bit number 7 of the function code is activated (03 H).

Error code: It shows the made error type. In this case one of the values of the data field is not valid.

2.5.- CRC calculation.

The contents of the CRC field are two Bytes. It is calculated from all the fields of the raster (less itself). A calculation procedure is as follows:

- 1.) Load a log of 16 bits with FFFF H. This log will be called "Log CRC".
- 2.) Make an exclusive OR operation of the low byte from CRC log with the first byte of the message. Put the result in CRC log.
- 3.) Move one bit to right the CRC log, by filling with 0 the bit that it's free on the left.
- 4.) If the moved bit to the right is 0: Repeat the step 3.
If the moved bit to the right is 1: Make an exclusive OR operation between the CRC log and the value A001 H. Put the result in CRC Log.
- 5.) Repeat the steps 3 and 4 till 8 movements have been done now the complete message is proceeded .
- 6.) Repeat the steps 2 to 5 for all the message bytes.
- 7.) The final contents of the CRC log is the value of CRC. The CRC is put in the raster as follows:
 - a). First put the byte with lower weight in CRC.
 - b). Next put the byte with higher weight.

3.- MEMORY SPACE FOR MODBUS.

All registers specified in the following table are 16 bit long.

Hex. Addr.	Dec. Addr.	Contents	Units	Type
4E20	20000	Alarms 1 b0= Discharging battery b1= Low battery b2= End of autonomy b3= System overload b4= Battery overtemperature b5= Safe overload b6= Use overload b7= **Reserved** b8= High battery voltage b9= **Reserved** b10= Low input voltage (mains failure) b11= Digital Input 1 b12= Module URGENT alarm b13= Module NON-URGENT alarm b14= **Reserved** b15= High battery charging current	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
4E21	20001	Alarms 2 b0= High input voltage b1= **Reserved** b2= **Reserved** b3= Low output voltage b4= High output voltage b5= Digital Input 2 b6= Non-critical loads disconnected b7= Isolation fault + b8= Communication fault with DCS module b9= **Reserved** b10= Low Electrolyte level b11= Digital Input 3 b12= Digital Input 4 b13= Isolation fault - b14= Modbus Incorrect Password b15= **Reserved**	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
4E22	20002	Alarms 3 b0= Output voltage High N1 b1= Output voltage High N2 b2= Output voltage Low N1 b3= Output voltage Low N2 b4= **Reserved** b5= **Reserved** b6= **Reserved** b7= **Reserved** b8= **Reserved** b9= **Reserved** b10= **Reserved** b11= **Reserved** b12= **Reserved** b13= **Reserved** b14= **Reserved** b15= **Reserved**	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
4E23 4E83	20003 20099	Reserved		

Hex. Addr.	Dec. Addr.	Contents	Units	Type
4E84	20100	Alarm acknowledgement 1 b0= Discharging battery b1= Low battery b2= End of autonomy b3= System overload b4= Battery overtemperature b5= Safe overload b6= Use overload b7= **Reserved** b8= High battery voltage b9= **Reserved** b10= Low input voltage (mains failure) b11= Digital Input 1 b12= Module URGENT alarm b13= Module NON-URGENT alarm b14= **Reserved** b15= High battery charging current	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing*
4E85	20101	Alarm acknowledgement 2 b0= High input voltage b1= **Reserved** b2= **Reserved** b3= Low output voltage b4= High output voltage b5= Digital Input 2 b6= Non-critical loads disconnected b7= Isolation fault + b8= Communication fault with DCS module b9= **Reserved** b10= Low Electrolyte level b11= Digital Input 3 b12= Digital Input 4 b13= Isolation fault + b14= Modbus Incorrect Password b15= **Reserved**	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing* Reading/Writing*
4E86	20102	Alarm acknowledgement 3 b0= Output voltage High N1 b1= Output voltage High N2 b2= Output voltage Low N1 b3= Output voltage Low N2 b4= **Reserved** b5= **Reserved** b6= **Reserved** b7= **Reserved** b8= **Reserved** b9= **Reserved** b10= **Reserved** b11= **Reserved** b12= **Reserved** b13= **Reserved** b14= **Reserved** b15= **Reserved**	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
4E87	20103	Free		
4E99	20121			
4E9A	20122	Enable User Adjustments Menu	0=NO, 1=YES	Reading/Writing*
4E9B	20123	Enable Temperature Sensor	0=NO, 1=YES	Reading/Writing*
4E9C	20124	Enable Audible alarm	0=NO, 1=YES	Reading/Writing*
4E9D	20125	Isolation Fault detector -	0=NO, 1=YES	Reading/Writing*
4E9E	20126	Isolation Fault detector +	0=NO, 1=YES	Reading/Writing*

Hex. Addr.	Dec. Addr.	Contents	Units	Type
4E9F	20127	Electrolyte Level Detector	0=NO, 1=YES	Reading/Writing*
4EA0	20128	Disable Output alarms	0=NO, 1=YES	Reading/Writing*
4EA1	20129	Maximum time output alarms are disabled	1-99 hours	Reading/Writing*
4EA2	20130	Relay programming: Discharging battery	b0=RL1 b1=RL2 b2=RL3 b3=RL4 b4=RL5 b5=RL6 b6=RL7 b7=RL8 b8=RL9	Reading/Writing*
4EA3	20131	Relay programming: Low battery		Reading/Writing*
4EA4	20132	Relay programming: End of autonomy		Reading/Writing*
4EA5	20133	Relay programming: System overload		Reading/Writing*
4EA6	20134	Relay programming: Battery overtemperature		Reading/Writing*
4EA7	20135	Relay programming: Safety overload		Reading/Writing*
4EA8	20136	Relay programming: Utility overload		Reading/Writing*
4EA9	20137	Reserved		Reading/Writing*
4EAA	20138	Relay programming: Battery voltage High		Reading/Writing*
4EAB	20139	Relay programming: Non-critical loads disconnection		Reading/Writing*
4EAC	20140	Relay programming: Input voltage Low		Reading/Writing*
4EAD	20141	Relay programming: Digital input 1		Reading/Writing*
4EAE	20142	Relay programming: Modules with Urgent alarm		Reading/Writing*
4EAF	20143	Relay programming: Modules with non-Urgent alarm		Reading/Writing*
4EB0	20144	Relay programming: Battery charge current High		Reading/Writing*
4EB1	20145	Relay programming: Input voltage High		Reading/Writing*
4EB2	20146	Relay programming: Output voltage Low		Reading/Writing*
4EB3	20147	Relay programming: Output voltage High		Reading/Writing*
4EB4	20148	Relay programming: Digital Input 2		Reading/Writing*
4EB5	20149	Relay programming: Isolation Fault +		Reading/Writing*
4EB6	20150	Relay programming: Battery Electrolyte Level Low		Reading/Writing*
4EB7	20151	Relay programming: Digital Input 3		Reading/Writing*
4EB8	20152	Relay programming: Digital Input 4		Reading/Writing*
4EB9	20153	Relay programming: Isolation Fault -		Reading/Writing*
4EBA	20154	Relay programming: General Alarm		Reading/Writing*
4EBB	20155	Relay programming: Output voltage High alarm N1		Reading/Writing*
4EBC	20156	Relay programming: Output voltage High alarm N2		Reading/Writing*
4EBD	20157	Relay programming: Output voltage Low alarm N1		Reading/Writing*
4EBE	20158	Relay programming: Output voltage Low alarm N2		Reading/Writing*
4EBF	20159	Relay programming: Float state		Reading/Writing*
4EC0	20160	Relay programming: Fast Charge		Reading/Writing*
4EC1	20161	Relay programming: Exceptional Charge		Reading/Writing*
4EC2	20162	Relay programming: Diode Dropper 1		Reading/Writing*
4EC3	20163	Relay programming: Diode Dropper 2		Reading/Writing*
4EC4	20164	Free		
.....				
4EE7	20199			
4EE8	20200	Output voltage 1	dV	Reading/Writ.**
4EE9	20201	Battery voltage	dV	Reading/Writ.**
4EEA	20202	Input voltage phase to phase R-S	V	Reading/Writ.**
4EEB	20203	Input voltage phase to phase S-T	V	Reading/Writ.**
4EEC	20204	Input voltage phase to phase R-T	V	Reading/Writ.**
4EED	20205	Frequency	Hz	Reading/Writ.**
4EEE	20206	Battery Discharging current 1	A	Reading/Writ.**
4EEF	20207	Battery Charging current 1	A	Reading/Writ.**
4EF0	20208	Current R	A	Reading/Writ.**
4EF1	20209	Current S	A	Reading/Writ.**
4EF2	20210	Current T	A	Reading/Writ.**

Hex. Addr.	Dec. Addr.	Contents	Units	Type
4EF3	20211	Output current	A	Reading/Writ.**
4EF4	20212	Battery temperature	°C	Reading/Writ.**
4EF5	20213	Battery discharging current 2	A	Reading/Writ.**
4EF6	20214	Battery charging current 2	A	Reading/Writ.**
4EF7	20215	% Load	%	Reading only
4EF8	20216	Output current 2	A	Reading/Writ.**
4EF9	20217	Total output current of the system	A	Reading only
4EFA	20218	Battery discharging current of the system	A	Reading only
4EFB	20219	Battery charging current of the system	A	Reading only
4EFC	20220	External Isolation Sensor: Leakage current measured	mA	Reading/Writ.**
4EFD 4F4B	20221 20299	Free		
4F4C	20300	Programming Digital Input 1	0=Digital Input 1=No Prio Mag.Contactor 2=EoB Mag.Contactor	Reading/Writ.**
4F4D	20301	Programming Digital Input 2	0=Digital Input 1=No Prio Mag.Contactor 2=EoB Mag.Contactor	Reading/Writ.**
4F4E	20302	Programming Digital Input 3	0=Digital Input 1=No Prio Mag.Contactor 2=EoB Mag.Contactor	Reading/Writ.**
4F4F	20303	Programming Digital Input 4	0=Digital Input 1=No Prio Mag.Contactor 2=EoB Mag.Contactor	Reading/Writ.**
4F50	20304	Contact type of Digital Input 1	0=N.O. 1=N.C.	Reading/Writ.**
4F51	20305	Contact type of Digital Input 2	0=N.O. 1=N.C.	Reading/Writ.**
4F52	20306	Contact type of Digital Input 3	0=N.O. 1=N.C.	Reading/Writ.**
4F53	20307	Contact type of Digital Input 4	0=N.O. 1=N.C.	Reading/Writ.**
4F54 4F55	20308 20309	Free		
4F56 4F5F	20310 20319	Text for Digital Input 1	ASCII	Reading/Writ.**
4F60 4F69	20320 20329	Text for Digital Input 2	ASCII	Reading/Writ.**
4F6A 4F73	20330 20339	Text for Digital Input 3	ASCII	Reading/Writ.**
4F74 4F7D	20340 20349	Text for Digital Input 4	ASCII	Reading/Writ.**

Hex. Addr.	Dec. Addr.	Contents	Units	Type
4F7E 5011	20350 20497	Free		
5012	20498	Input Current Sensor Available	0=NO, 1=YES	Reading/Writ.**
5013	20499	Input type	1=single phase, 2=Three phase	Reading/Writ.**
5014	20500	Quantity of active modules	1-32	Reading/Writ.**
5015	20501	Quantity of redundant modules	0-31	Reading/Writ.**
5016	20502	Nominal power per module	W	Reading/Writ.**
5017	20503	Battery quantity		Reading/Writ.**
5018	20504	Battery: Nominal voltage per cell	dV	Reading/Writ.**
5019	20505	Battery: End of autonomy level	dV	Reading/Writ.**
501A	20506	Floating voltage of the system	dV	Reading/Writ.**
501B	20507	Nominal output current of the system	A	Reading/Writ.**
501C	20508	Nominal battery current of the system	A	Reading/Writ.**
501D	20509	Temperature compensation	0=NO, 1=YES	Reading/Writ.**
501E	20510	Compensation: mV/°C	mV/°C	Reading/Writ.**
501F	20511	Compensation: Minimum temperature compensation	°C	Reading/Writ.**
5020	20512	Compensation: Maximum temperature compensation	°C	Reading/Writ.**
5021	20513	Compensation: Limit voltage compensation	dV	Reading/Writ.**
5022	20514	Low input voltage level alarm	V	Reading/Writ.**
5023	20515	High input voltage level alarm	V	Reading/Writ.**
5024	20516	Low output voltage level alarm	dV	Reading/Writ.**
5025	20517	Output overvoltage level alarm	dV	Reading/Writ.**
5026	20518	Low battery voltage level alarm	dV	Reading/Writ.**
5027	20519	High battery voltage level alarm	dV	Reading/Writ.**
5028	20520	High battery temperature level alarm	°C	Reading/Writ.**
5029	20521	Output overload level alarm (Utilization)	A	Reading/Writ.**
502A	20522	High battery charging current level alarm	A	Reading/Writ.**
502B	20523	End of autonomy contactor Installed	0=NO, 1=YES	Reading/Writ.**
502C	20524	Non-critical loads contactor Installed	0=NO, 1=YES	Reading/Writ.**
502D	20525	Non-critical loads disconnection level	dV	Reading/Writ.**
502E	20526	Reserved		
502F	20527	Parameter recalculation	0=NO, 1=YES	Writing only**
5030	20528	Contactor type for end of autonomy	0=Normal, 1=Magnetic lock	Reading/Writ.**
5031	20529	Contactor type for non-critical loads	0=Normal, 1=Magnetic lock	Reading/Writ.**
5032	20530	Battery capacity	Ah	Reading/Writ.**
5033	20531	Quantity of battery strings	0-99	Reading/Writ.**
5034	20532	Battery charging factor (Ibat charging limit)	0.XX C	Reading/Writ.**
5035	20533	Alarm delay high input voltage (AC failure)	1-999 sec.	Reading/Writ.**
5036	20534	Nominal Input Voltage	V	Reading/Writ.**
5037	20535	AC Fail Threshold (% from Nominal)	%	Reading/Writ.**
5038 5037	20536 20535	Free		
5038	20536	External Isolation Sensor: Sensor Installed	0=NO, 1=YES	Reading/Writing*
5039	20537	External Isolation Sensor: Polarity	0=Negative 1=Positive	Reading/Writing*
503A	20538	External Isolation Sensor: Sensor Threshold	mA	Reading/Writing*
503B	20539	Output Voltage High level alarm N1	dV	Reading/Writing*
503C	20540	Output Voltage High level alarm N2	dV	Reading/Writing*

Hex. Addr.	Dec. Addr.	Contents	Units	Type
503D	20541	Output Voltage Low level alarm N1	dV	Reading/Writing*
503E	20542	Output Voltage Low level alarm N2	dV	Reading/Writing*
5040	20544	Delayed Startup Enabled	0=No 1=Yes	Reading/Writing*
5041	20545	Delayed Startup Time	Minutes	Reading/Writing*
5042	20546	Reserved		
5043	20547	Delayed Coldstart Enabled	0=No 1=Yes	Reading/Writing*
5044 5090	20548 20624	Free		
5091	20625	Modules: Voltage setpoint	dV	Reading
5092	20626	Modules: Nominal current	dA	Reading
5093 5097	20627 20631	Reserved		
5098 50DB	20632 20699	Free		
50DC	20700	(Date and Hour) Year	00-99 Years	Reading/Writing*
50DD	20701	(Date and Hour) H->Month L-> Day	H->Months, L->Days	Reading/Writing*
50DE	20702	(Date and Hour) H-> Hour L-> Minutes	H->Hours, L->Min.	Reading/Writing*
50DF 52C5	20703 21189	Free		
52C6	21190	System Modbus address	1-254	Reading/Writing*
52C7 52CF	21191 21199	Free		
52D0	21200	Module communications: Activated	0=NO, 1=YES	Reading/Writing*
52D1	21201	Module communications: Baud rate	0=1200, 1=2400, 2=4800, 3=9600, 4=14400, 5=19200, 6=38400, 7=57600, 8=115000	Reading/Writing*
52D2	21202	Reserved		
52D3	21203	External communications 1: Activated	0=NO, 1=YES	Reading/Writing*
52D4	21204	External communications 1: Baud rate	0=1200, 1=2400, 2=4800, 3=9600, 4=14400, 5=19200, 6=38400, 7=57600, 8=115000	Reading/Writing*
52D5 52D8	21205 21208	Reserved		
52D9	21209	External communications 2: Activated	0=NO, 1=YES	Reading/Writing*
52DA	21210	External communications 2: Baud rate	0=1200, 1=2400, 2=4800, 3=9600, 4=14400, 5=19200, 6=38400, 7=57600, 8=115000	Reading/Writing*
52DB 52E0	21211 21216	Reserved		
52E1 5301	21217 21249	Free		
5302	21250	Cycling and economy mode: Economy mode activated	0=NO, 1=YES	Reading/Writing*
5303	21251	Cycling and economy mode: Maximum module load	%	Reading/Writing*

Hex. Addr.	Dec. Addr.	Contents	Units	Type
5304	21252	Cycling and economy mode: Cycling time	0-9999 Hours	Reading/Writing*
5305	21253	Cycling and economy mode: Cycling mode activated	0=NO, 1=YES	Reading/Writing*
5306 531A	21254 21274	Free		
531B	21275	Battery management: Current charge time	minutes	Reading only
531C	21276	Battery management, Fast Charge: Status	0: OFF, 1: ON (MAN), 2: ON (AUTO), 3: ON-HOLD	Reading/Writing*
531D	21277	Battery management, Fast Charge: Charge voltage	dV	Reading/Writ.**
531E	21278	Battery management, Fast Charge: Minimum current	A	Reading/Writ.**
531F	21279	Battery management, Fast Charge: Charge factor		Reading/Writ.**
5320	21280	Battery management, Fast Charge: Minimum time	0-9999 Minutes	Reading/Writ.**
5321	21281	Battery management, Fast Charge: Maximum time	0-9999 Minutes	Reading/Writ.**
5322	21282	Battery management, Fast Charge: Threshold start	dV	Reading/Writ.**
5323	21283	Battery management, Fast Charge: Enable	0=NO, 1=YES	Reading/Writ.**
5324 5329	21284 21289	Free		
532A	21290	Battery management, periodical charge: Status	0: OFF, 1: ON (MAN), 2: ON (AUTO), 3: ON-HOLD	Reading/Writing*
532B	21291	Battery management, periodical charge: Charge voltage	dV	Reading/Writ.**
532C	21292	Battery management, periodical charge: Maximum time	0-9999 Minutes	Reading/Writ.**
532D	21293	Battery management, periodical charge: Periodical interval	0-999 Days	Reading/Writ.**
532E	21294	Battery management, periodical charge: Next charge (Day)	1-31	Reading/Writ.**
532F	21295	Battery management, periodical charge: Next charge (Month)	1-12	Reading/Writ.**
5330	21296	Battery management, periodical charge: Next charge (Year)	00-99	Reading/Writ.**
5331	21297	Battery management, periodical charge: Enable	0=NO, 1=YES	Reading/Writ.**
5332	21298	Free		
5333	21299	Battery management, exceptional charge: Enable	0=NO, 1=YES	Reading/Writ.**
5334	21300	Battery management, exceptional charge: Status	0: OFF, 1: ON (MAN), 2: ON (AUTO), 3: ON-HOLD	Reading/Writing*
5335	21301	Battery management, exceptional charge: Charge voltage	dV	Reading/Writ.**
5336	21302	Battery management, exceptional charge: Maximum time	0-9999 Minutes	Reading/Writ.**
5337	21303	Start Test	0=NO, 1=YES	Reading/Writing*
5338	21304	Test status	0=Running, 1=Test Not available, 2=Ready	Reading only
5339	21305	Battery charging status	%	Reading/Writ.**
533A	21306	Maximum test deviation	0-999	Reading/Writ.**
533B	21307	Discharge pending		Reading/Writ.**
533C	21308	Test result	0=----, 1=Test Ok, 2=Bat Mal, 3=Cancel	Reading only
533D 53FB	21309 21499	Free		

Hex. Addr.	Dec. Addr.	Contents	Units	Type
53FC	21500	Voltage Reducer 1 : Enable (Y/N)	0=NO, 1=YES	Reading/Writ.**
53FD	21501	Voltage Reducer 1 : Activation Threshold	dV	Reading/Writ.**
53FE	21502	Voltage Reducer 1 : Activation Delay	s	Reading/Writ.**
53FF	21503	Voltage Reducer 1 : Deactivation Threshold	dV	Reading/Writ.**
5400	21504	Voltage Reducer 1 : Deactivation Delay	s	Reading/Writ.**
5401	21505	Voltage Reducer 1 : Reducer Status	0=Disconnected 1=Connected	Reading only
5402 5405	21506 21509	Free		
5406	21510	Voltage Reducer 2 : Enable (Y/N)	0=NO, 1=YES	Reading/Writ.**
5407	21511	Voltage Reducer 2 : Activation Threshold	dV	Reading/Writ.**
5408	21512	Voltage Reducer 2 : Activation Delay	s	Reading/Writ.**
5409	21513	Voltage Reducer 2 : Deactivation Threshold	dV	Reading/Writ.**
540A	21514	Voltage Reducer 2 : Deactivation Delay	s	Reading/Writ.**
540B	21515	Voltage Reducer 2 : Reducer Status	0=Disconnected 1=Connected	Reading only
540C 59D7	21516 22999	Free		
59D8	23000	Discharging module alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59D9	23001	Discharging module alarm (module 17 to 32) b0~b15 = Module 17~32	0=False/1=True	Reading only
59DA	23002	Reserved		
59DB	23003	Reserved		
59DC	23004	Low battery alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59DD	23005	Low battery alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59DE	23006	Reserved		
59DF	23007	Reserved		
59E0	23008	End of autonomy alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59E1	23009	End of autonomy alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59E2	23010	Reserved		
59E3	23011	Reserved		
59E4	23012	Overload alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59E5	23013	Overload alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59E6	23014	Reserved		
59E7	23015	Reserved		
59E8	23016	MCB output (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59E9	23017	MCB output (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59EA	23018	Reserved		

Hex. Addr.	Dec. Addr.	Contents	Units	Type
59EB	23019	Reserved		
59EC	23020	Heatsink overtemperature alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59ED	23021	Heatsink overtemperature alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59EE	23022	Reserved		
59EF	23023	Reserved		
59F0	23024	Rectifier fault alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59F1	23025	Rectifier fault alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59F2	23026	Reserved		
59F3	23027	Reserved		
59F4	23028	Remote stop alarm -ShutDown- (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59F5	23029	Remote stop alarm -ShutDown- (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59F6	23030	Reserved		
59F7	23031	Reserved		
59F8	23032	Output overvoltage alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59F9	23033	Output overvoltage alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59FA	23034	Reserved		
59FB	23035	Reserved		
59FC	23036	PB fault alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
59FD	23037	PB fault alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
59FE	23038	Reserved		
59FF	23039	Reserved		
5A00	23040	Mains fault alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
5A01	23041	Mains fault alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
5A02	23042	Reserved		
5A03	23043	Reserved		
5A04	23044	Fan failure alarm (module 1 to 16) b0~b15 = Module 1~16	0=False/1=True	Reading only
5A05	23045	Fan failure alarm (module 17 to 32) b0~b13 = Module 17~30 b14= Reserved b15= Reserved	0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only
5A06	23046	Reserved		
5A07	23047	Reserved		

Hex. Addr.	Dec. Addr.	Contents	Units	Type
5A08 5BCB	23048 23489	Free		
5BC2	23490	Modules Present 1-16	Bits	Reading only
5BC3	23491	Modules Present 17-30	Bits	Reading only
5BC4	23492	Reserved	Bits	Reading only
5BC5	23493	Reserved	Bits	Reading only
5BCC 5BE9	23500 23529	Output voltage (module 1 to 30)	dV	Reading only
5BEA 5C0B	23530 23563	Reserved		
5C0C 5CF7	23564 23799	Free		Reading only
5CF8 5D15	23800 23829	Output current (module 1 to 30)	dA	Reading only
5D16 5D37	23830 23863	Reserved		
5D38 5E23	23864 24099	Free		Reading only
5E24 5E41	24100 24129	Temperature (module 1 to 30)	°C	Reading only
5E42 5E63	24130 24163	Reserved		
5E64 5F4F	24164 24399	Free		
5F50 5F72	24400 24434	Reserved		
5F73 61A7	24435 24999	Free		
61A8	25000	System data logger: Reading position	0-199 (0=most recent)	Reading/Writing*
61A9	25001	System data logger: Alarm year	Years	Reading only
61AA	25002	System data logger: Alarm H->Month L-> day	H->Months, L-> Days	Reading only
61AB	25003	System data logger: Alarm H-> Hour L-> minute	H->Hours, L->Min.	Reading only
61AC	25004	System data logger: Acknowledgement year	Years	Reading only
61AD	25005	System data logger: Acknowledgement H->Month L-> day	H->Months, L-> Days	Reading only
61AE	25006	System data logger: Acknowledgement H-> Hour L-> minute	H->Hours, L->Min.	Reading only
61AF	25007	System data logger: End year	Years	Reading only
61B0	25008	System data logger: End H->Month L-> day	H->Months, L-> Days	Reading only
61B1	25009	System data logger: End H-> Hour L-> minute	H->Hours, L->Min.	Reading only
61B2	25010	System data logger: Alarms 1 b0= Discharging battery b1= Low battery b2= End of autonomy	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only

Hex. Addr.	Dec. Addr.	Contents	Units	Type
		b3= System overload b4= Battery overtemperature b5= Safe overload b6= Use overload b7= **Reserved** b8= High battery voltage b9= **Reserved** b10= Low input voltage (mains failure) b11= Digital Input 1 b12= Module URGENT alarm b13= Module NON-URGENT alarm b14= **Reserved** b15= High battery charging current	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
61B3	25011	System data logger: Alarms 2 b0= High input voltage b1= **Reserved** b2= **Reserved** b3= Low output voltage b4= High output voltage b5= Digital Input 2 b6= Non-critical loads disconnected b7= Isolation fault (+) b8= Communication fault with DCS module b9= **Reserved** b10= Low Electrolyte level b11= Digital Input 3 b12= Digital Input 4 b13= Isolation fault (-) b14= Incorrect password b15= **Reserved**	0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True 0=False/1=True	Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only Reading only
61B4	25012	System data logger: Alarm code	0-22	Reading only
61B5	25013	System data logger: Output voltage	dV	Reading only
61B6	25014	System data logger: Battery voltage	dV	Reading only
61B7	25015	System data logger: Frequency	Hz	Reading only
61B8	25016	System data logger: Battery temperature	°C	Reading only
61B9	25017	System data logger: Voltage phase to phase R and S	V	Reading only
61BA	25018	System data logger: Voltage phase to phase S and T	V	Reading only
61BB	25019	System data logger: Voltage phase to phase R and T	V	Reading only
61BC	25020	System data logger: Battery discharging current 1	A	Reading only
61BD	25021	System data logger: Battery charging current 1	A	Reading only
61BE	25022	System data logger: Phase current R	A	Reading only
61BF	25023	System data logger: Phase current T	A	Reading only
61C0	25024	System data logger: Phase current S	A	Reading only
61C1	25025	System data logger: Output current 1	A	Reading only
61C2	25026	System data logger: Output current 2	A	Reading only
61C3	25027	System data logger: Battery charging current 2	A	Reading only
61C4	25028	System data logger: Battery discharging current 2	A	Reading only
61C5	25029	System data logger: Total system current	A	Reading only
61C6	25030	System data logger: Total system charging current	A	Reading only
61C7	25031	System data logger: Total system discharging current	A	Reading only
61C8	25032	Free		
.....				
620B	25099			
620C	25100	Module data logger: Reading position	0-199 (0=most recent)	Reading/Writing*
620D	25101	Module data logger: Alarm year	Years	Reading only
620E	25102	Module data logger: Alarm H->Month L->Day	H->Months, L-> Days	Reading only
620F	25103	Module data logger: Alarm H-> Hour L-> Minute	H->Hours, L->Min.	Reading only

Hex. Addr.	Dec. Addr.	Contents	Units	Type
6210	25104	Module data logger: End year	Years	Reading only
6211	25105	Module data logger: End H->Month L->Day	H->Months, L->Days	Reading only
6212	25106	Module data logger: End H-> Hour L-> Minute	H->Hours, L->Min.	Reading only
6213	25107	Module data logger: Alarms	0=False/1=True	Reading only
		b0= Output Off	0=False/1=True	Reading only
		b1= Low battery	0=False/1=True	Reading only
		b2= End of autonomy	0=False/1=True	Reading only
		b3= Overload	0=False/1=True	Reading only
		b4= MCB output	0=False/1=True	Reading only
		b5= High heatsink temperature	0=False/1=True	Reading only
		b6= Rectifier fault	0=False/1=True	Reading only
		b7= Remote stop -ShutDown-	0=False/1=True	Reading only
		b8= Overvoltage	0=False/1=True	Reading only
		b9= PB fault	0=False/1=True	Reading only
		b10= Mains failure	0=False/1=True	Reading only
		b11= Fan failure	0=False/1=True	Reading only
		b12=	0=False/1=True	Reading only
		b13=	0=False/1=True	Reading only
		b14=	0=False/1=True	Reading only
		b15=	0=False/1=True	Reading only
6214	25108	Module data logger: Alarm code	0-11	Reading only
6215	25109	Module data logger: Module address	1-64	Reading only
6216	25110	Module data logger: Output voltage	dV	Reading only
6217	25111	Module data logger: Output current	dA	Reading only
6218	25112	Module data logger: Temperature	°C	Reading only
6219	25113	Free		
.....				
623D	25149			
623E	25150	Reserved		
.....				
6247	25159			
6248	25160	Free		
.....				
752F	29999			
7530	30000	Reserved		
.....				
7593	30099			
7594	30100	Externals digitals input (0-16)	Bits	Reading only
7595	30101	Free		
.....				
9C3F	39999			
9C40	40000	Serial Number (1)	ASCII	Reading only
.....				
9C45	40005			
9C46	40006	Free		
.....				
9C53	40019			
9C54	40020	Version (1)	ASCII	Reading only
.....				
9C5A	40026			
9C5B	40027	Reserved		
9C5C	40028	Firmware Version ID		Reading only
9C5D	40029	Firmware Revision ID		Reading only
9C5E	40030	Free		
.....				
9C67	40039			

Hex. Addr.	Dec. Addr.	Contents	Units	Type
9C68 9C6C	40040 40044	Reserved		
9C6D 9C76	40045 40054	Free		
9C77 9CA4	40055 40100	Reserved		
9CA5 A027	40101 40999	Free		
A028	41000	Modbus Address	1-99	
A029	41001	Language	0=Spanish, 1=English 2=French	Reading/Writing*
A02A A03F	41002 41023	Reserved		
A040	41024	Setting password	Programming 0500 Setting 2020	Reading/Writing
A041	41025	Reserved		
A042 A474	41026 42100	Reserved R&D		

- * In order to be able to write into these logs, the "Programming password" must be written previously in the log. This log is cleared after every writing operation meanwhile the last written log is not the same one.
- ** In order to be able to write into these logs, the "Calibration password" must be written previously in the log. This log is cleared after every writing operation meanwhile the last written log is not the same one.
- (1) These Logs have information in ASCII code. Every Log has 2 characters. Connecting the different logs with the same name we have all the information. The information ends with the code 0.
- (2) Content expressed in complement A2.