

Title: CAN OPEN dictionary for BMM						
Program: G	eneric		Product: Ba	ttery		
Customer: S	SAFT	}	Contract: N	/A		
Scope: CA with new Bh		ect dictionary c	definition for	customer in	nterface	in SAFT project
	Nom / Name	Function	2 20 27	Visa		Date
Writer	LE CANN Yann-Loig	Software engine	Software engineer		Coun	10/12/13
Control	LAFLAQUIERE Philippe	System engineer	System engineer		A TOP TO THE PROPERTY OF THE P	10/12/13 10/12/13
Control GUILLONNEAU Erwan		Software engine	er	4	4	
Approval MAUBERT Software d		Software develo	pment manage	er <i>4</i>		11/12/13
Keywords: Gene	eric software, CA	N Open, BMM, Obje	ct dictionary	V		
Internal distribution:				ternal distribution		
Classification ¹	Confidentiel Defense Secret	Diffusion Restreinte Confidential	Confidentiel Industrie Proprietary	Confidentiel SAFT Internal	Personnel Strictly Personal	Sans Public

¹Griser la case concernée. / Fill the appropriate box.



Revision	Date	Pages or chapter	EVOLUTION/Change
A	16/09/2009	All	Initial Issue
В	10/02/2010	\$5.3 \$6.2.2 \$6.3.2 \$6.7.2	See §7.3.3 instead of §7.2.3 Sub-index 03 _h refers to object 2052 _h instead of 2053 _h Default value of Sub-index 00h is 08 _h instead of 03 _h Mapping of TPD04 changed: Internal battery voltage at Sub-index 01 _h , Battery current at Sub-index 02 _h and Battery system mode at Sub-index 03 _h
_		§7.3.3	PDO mapping to 'Default' for Sub-index 01_h to 06_h
C D	22/02/2010 01/03/2010	All	See modifications with "Marques"
E	07/06/2010	All §6.3.1 §6.6.2 §7.2 §7.3.1 §7.3.15 §7.3.19 §7.3.20 §7.3.26 §7.3.27 §7.3.28 §7.3.29 §7.3.37 §7.3.41 §7.3.42 §7.3.45 §7.3.46 §7.4	Modifications of objects 2028, 2029, 202A, 202B, 202C See modifications with "Marques" Add object 2055 in RPDO2 Add object 2018 in TPDO3 Modify records 0080 and 0081. Add records 0084 and 0085. Modify object 2000 Add object 2018 Add object 2018 Modify object 2027 Modify object 2027 Modify object 2028 Modify object 2030 Modify object 2031 Suppress object 2032 Suppress object 2033 Add object 2046 Add explanation and bit reset Add object 2057 Add object 2058 Update overview table
F	18/11/2010	§ 4.3	Modification of CAN Open state Update of object 2031 : table 11*7 Update of object 2055 : suppression of contactor authorization for opening
G	07/03/2011	\$ 7.3.12 \$ 7.3.41 \$ 7.3.42	Modification of BMU states Modification of fault codes reset principle Modification of self-test request principle
Н	11/05/2011	§ 7.3	Modification Device type object 1000h Modification Object 2018 Modification Object 2023 Modification Object 2024 Modification Object 2028 Addition Object 202D Addition Object 202E Addition Object 202F Modification Object 2034 Modification Object 2035 Modification Object 2042 Modification Object 2042 Modification Object 2054 Modification Object 2055 Addition of Object 2201
I	22/12/2011	\$7.2.2 \$7.2.4 \$7.3.14 \$7.3.20 \$7.3.23 \$7.3.24 \$7.3.25	Correction of temperature coding Correction of temperature coding Correction of current coding Correction of temperature coding Correction of temperature coding Correction of temperature coding Correction of temperature coding

This information contained in this document is SAFT proprietary and shall not be disclosed by the recipient to third persons without the written consent of the Company.



	97.2.26	
		Correction of temperature coding
		Correction of temperature coding
11/04/2012	V	Add information regarding objects 1008h, 1009h, 100Ah, 1018h
	§6.1.4	Add Time Stamp object 1012h
	§6.1.5	
	§6.1.8	
	§6.1.10	
02/07/2012	§7.2.49	Add Sleep mode command object 2059h
	§6.3.2	Add Sleep mode command object 2059h in RPDO2
	§7.3.12	Modification of battery system state
19/07/2012	§7.3.17	Suppression of object 2025h (SOC without SOC no more provided by SOC
		algorithm (SOC_NCA v1.2))
	§7.3.16	SOC_With_SOH renamed SOC
	§6.7.2	Sub-index 5 of TPDO4 forced to 0
24/07/2012	§7.3.48	Object 2058h: BMU reset requested on transition, not on state
	§7.3.49	Object 2059h: Sleep command requested on transition, not on state
24/09/2012	§6.3.2	Sub-index 03 of RPO2 (2059h object) deleted: with K version,
		compatibility is not guaranteed because RDPO2 DLC is different. Now, L
		an J version are compliant.
	§7.4	2059h object modification: RPDO2 to SDO
24/01/2012		Add xBIT results object 2060h (SDO)
01/10/2013	§6.3	Add Customer Toggle bit Object 2061h on RPDO2
		Add Customer Toggle bit Object 2061h
	§7.3.11	Modification of the battery requests object 2018h
	§7.3.45	Change comments for MAIN+/MAIN- contactors bit
	§6.1.8	Add configuration information regarding Time Stamp Object
17/11/2013		Update dictionary version
	-	Remove Customer Toggle bit Object from 2061h on RPDO2
	-	Rename object 2050h in Reserved
	%7.3.41	Rename object 2051h in Reserved
	§7.3.42	Reuse of object 2052h for object 2051h Customer Toggle bit
	-	Removal of object 2061h (previously used for Customer Toggle bit)
	19/07/2012 24/07/2012 24/09/2012 24/01/2012 01/10/2013	\$6.1.4 \$6.1.5 \$6.1.8 \$6.1.10 02/07/2012 \$7.2.49 \$6.3.2 \$7.3.12 19/07/2012 \$7.3.17 \$7.3.16 \$6.7.2 24/07/2012 \$7.3.48 \$7.3.49 24/09/2012 \$6.3.2 \$7.4 24/01/2012 \$6.3.2 \$7.4 17/11/2013 \$6.3 \$1.1.1 \$7.3.11 \$7.3.45 \$6.1.8 17/11/2013 \$6.1.10 \$6.2.2 \$7.3.40



Table of Contents

1.	SCO	OPE	6
2.	REF	FERENCES	7
3.	ABB	BREVIATIONS AND DEFINITIONS	8
3	3.1.	ABBREVIATIONS	8
4.	OPE	ERATING PRINCIPLES	Q
	4.1. 4.2.	GENERAL	
2	4.2. 4.2.1	PHYSICAL LAYER	
	4.2.2		
2			
_		ROR HANDLING	
5.			
	5.1.	PRINCIPLE	
	5.2.	ERROR BEHAVIOUR	
	5.3. 5.4.	ADDITIONAL ERROR CODE MEANINGSHEARTBEAT	
,			
6.	CON	MMUNICATION OBJECT DEFINITIONS	10
6	3.1.	MANDATORY OBJECTS DEFINITION	10
	6.1.1		
	6.1.2	- ·· , · · · · · · · · · · · · · · · · · · ·	
	6.1.3	•	
	6.1.4		
	6.1.5		
	6.1.6 6.1.7	,	
	6.1.8	,	
	6.1.9		
	6.1.1		
6	5.2.		12
	6.2.1		
	6.2.2	.2. Object 1600 _h : Mapping parameter	12
(5.3.	= •	
	6.3.1 6.3.2	,	
6	5.4.	1 ST TPDO	
•	6.4.1		
	6.4.2		
6	3.5.	2 ND TPDO	
	6.5.1		
,	6.5.2		
(6.6. 6.6.1	3 RD TPDO	
	6.6.2		
6	6.0. <u>2</u> 6.7.	4 TH TPDO	
	6.7.1		
	6.7.2		
7.	APP	PLICATION OBJECT DEFINITIONS	26
-	7.1.	INTRODUCTION	26
-	7.2.	COMPLEX DATA TYPE DEFINITION	
•	7.2.1		
	7.2.2	2. Record 0081h: BatteryTemperature	27
	7.2.3	3	
	7.2.4	•	
	7.2.5	.5. Record 0084h: ModuleCyclingSOH	29



7.2.6.	Record 0085n: ModuleCalendarSOH	29
7.2.7.	Record 0086h: SMUConfiguration	32
7.3. DE	TAILED OBJECT DEFINITIONS	
7.3.1.	Object 2000 _h : Global battery status	
7.3.2.	Object 2001 _b : SOC_threshold	
7.3.3.	Object 2002 _h : Battery fault codes status n°1 to 48	
7.3.4.	Object 2011 _b : IMR continuous	
7.3.5.	Object 2012 _b : IMD	
7.3.6.	Object 2013 _n : IMR	
7.3.0. 7.3.7.	Object 2013 _h : NMD	
7.3.7. 7.3.8.	Object 2015 _h : VMR	
7.3.6. 7.3.9.	Object 2016 _h : VMAObject 2016 _h : PMD	
7.3.9. 7.3.10.	Object 2017 _b : PMR	
7.3.10. 7.3.11.	Object 2017 _h . FMNObject 2018 _h : Battery requests	
7.3.12.	Object 2020 _h : Battery system state	
7.3.13.	Object 2021 _h : Internal battery voltage	
7.3.14.	Object 2022 _h : Internal battery current	
7.3.15.	Object 2023 _h : HVDC1 voltage	
7.3.16.	Object 2024 _h : Battery contactors status	
7.3.17.	Deleted in K version	
7.3.18.	Object 2026 _h : SOC	
7.3.19.	Object 2027 _h : Cells voltage	
7.3.20.	Object 2028 _n : Temperatures inside the module	
7.3.21.	Object 2029 _h : Max cell voltage	
7.3.22.	Object 202A _h : Min cell voltage	54
7.3.23.	Object 202B _h : Max battery temperature	55
7.3.24.	Object 202C _h : Min battery temperature	56
7.3.25.	Object 202D _h : Max connection temperature	57
7.3.26.	Object 202E _h : Min connection temperature	58
7.3.27.	Object 202F _h : External temperatures	59
7.3.28.	Object 2030 _h : Module cycling SOH table	
7.3.29.	Object 2031 _n : Module calendar SOH	
7.3.30.	Object 2034 _h : Cumulative total kWh charged	
7.3.31.	Object 2035 _h : Cumulative total kWh discharged	
7.3.32.	Object 2036 _b : SOH	
7.3.33.	Object 2040 _h : Battery Ah capacity	
7.3.34.	Object 2041 _b : Battery system software version	
7.3.35.	Object 2042 _b : BMM serial number	
7.3.36.	Object 2043 _h : Battery ID	
7.3.37.	Object 2044 _h : Number of modules	
7.3.38.	Object 2045 _n : SMU configuration	
7.3.39.	Object 2046 _h : Modules software version	
7.3.39. 7.3.40.	Object 2050 _h : Reserved 1	
7.3.40. 7.3.41.	Object 2001 _h : Reserved 2	
7.3.41. 7.3.42.	Object 2051 _h . Reserved 2 Object 2052 _h : Customer Toggle Bit	
7.3.43.	Object 2053 _h : Battery fault codes n°1 to 48 reset	
7.3.44.	Object 2054 _h : Self-test requested	
7.3.45.	Object 2055 _h : Battery contactors authorization	
7.3.46.	Object 2056 _n : Vcell Min	
7.3.47.	Object 2057 _h : Insulation monitoring authorization	
7.3.48.	Object 2058 _h : BMU reset	
7.3.49.	Object 2059h: Sleep mode command	
7.3.50.	Object 2060h: xBIT results	
7.3.51.	Object 2201h: IMR_C	
7.4. O V	ERVIEW ON APPLICATION OBJECTS	



1. SCOPE

This document describes dictionary object and associated data messages (PDO) for a SAFT battery including a CANopen communication device.

This document is based in respect of CIA 301 [DR1]. The messages, defined in this document, are intended to be sufficient to manage battery charge, discharge and life expectancy. They are completed by data commonly used in the industry to provide enhanced features and reached via SDO protocol.

Battery modules compliant to this standard shall use communication techniques, which conforms to those described in the CANopen application layer and communication profile.



2. REFERENCES

[DR1] CiA Draft Standard 301: Application Layer and Communication Profile

[DR2] CAN Specification 2.0, Part B



3. ABBREVIATIONS AND DEFINITIONS

3.1. ABBREVIATIONS

BIT : Built In Test

BMU : Battery Monitoring Unit
BMM : Battery Management Module
CAN : Controller Area Network

CAN-ID : CAN IDentifier

COB-ID : Communication Object IDentifier

CBIT : Continuous BIT DOD : Depth Of Discharge

IBIT : Initialize BIT

LSB : Less Significant Bit
MSB : Most Significant Bit
N/A : Not Applicable
PDO : Process Data Object

PBIT : Power BIT

RPDO : Receive Process Data Object

SDO : Service Data Object

TBD : To Be Defined

TPDO : Transmit Process Data Object

SOC : State Of Charge SOH : State Of Health



4. OPERATING PRINCIPLES

4.1. GENERAL

The objects listed in this document allow communication during the use of the battery.

Four default TPDO and two default RPDO are defined and shall contain all the information needed by the application.

Saft battery support dynamic PDO mapping in order to be easily adapted for specific needs. Saft battery also provides data for battery maintenance (history, state of health, warranty status, ...) that are not needed in application.

4.2. PHYSICAL LAYER

4.2.1. Connector

The battery module shall have a 4-wire interconnect. The communication bus shall use two of these lines (CAN_L, CAN_H), two others are used for power (+Bat and –Bat). Ground and –Bat are common. The actual connector used and its pin configuration will vary depending on the battery application, and thus is outside of the scope of this document.

Nota: CIA battery profile requires a 5-wire interconnect and indicates that a pilot signal may be used so that battery and charger can detect each other.

4.2.2. CAN transceiver

The CAN bus shall use standard high-speed differential transceivers. The battery module shall support at least the 125 kbit/s default bit-rate. Battery shall be compliant to CAN V2.0B (cf. [DR2]).

As several batteries may be connected on the same bus line and the number should not affect the bus impedance, the termination resistor shall not be included in the default battery module configuration.

4.3. CANOPEN STATE

The boot-up sequence must follow §9.4 of [DR1].

The Transmission mode can be asynchronous or synchronous:

- In asynchronous mode, the BMM sends its TPDO periodically without waiting any request. Transmission period is defined inside each Object description (Event timer)
- In synchronous mode, the BMM sends its TPDO based on the SYNC object received.

<u>Nota</u>: the transmission mode of the BMM is not modifiable via CAN Open. It is configured inside the BMM by a software parameter.

5. ERROR HANDLING

5.1. PRINCIPLE

Emergency messages are triggered by internal errors in the device, and are assigned the highest possible priority to minimize latency on access to the bus. The emergency message contains the emergency error code, and the error register object (cf. [DR1]). Additional data bytes are included in the message, which may be used for manufacturer specific information.



5.2. ERROR BEHAVIOUR

If a serious device failure is detected, the module shall enter the pre-operational state by default. If object 1029h is implemented, the module may be configured to enter the stopped state or remain in the current state as alternatives. Device failures shall include the following communication errors:

- CAN bus-off condition
- Heartbeat event with the state 'occurred'

Device failure may also be caused by internal module failures, e.g. missing the pilot signal. See also §9.2.5 in [DR1].

5.3. ADDITIONAL ERROR CODE MEANINGS

An objet in the dictionary object is used to define battery system error. See §7.3.3. This object doesn't use the CAN Open error handling.

5.4. HEARTBEAT

The heartbeat mechanism for a device is established through cyclically transmitting a message by a heartbeat producer. One or more devices in the network are aware of this heartbeat message. If the heartbeat cycle fails for the heartbeat producer the local application on the heartbeat consumer will be informed about that event.

6. COMMUNICATION OBJECT DEFINITIONS

6.1. MANDATORY OBJECTS DEFINITION

6.1.1. Object 1000h: Device type

31	16	15	0
	Additional information	Device profile number	
MSB		LSI	<u>Б</u>

Device profile number.0x00: reserved

0x01: MBMM 0x02: BMU

0x03 to 0xFF: reserved

Additional information: reserved bits (shall read as 0).

6.1.2. Object 1001h: Error register

Bit	M/O	Meaning
0	М	Generic error
1	0	Current
2	0	Voltage
3	0	Temperature
4	0	Communication error (overrun, error state)
5	0	Device profile specific
6	0	Reserved (always 0)
7	0	Manufacturer specific

An object in the dictionary object is used to define battery system error. See §7.2.3.

6.1.3. Object 1008h: Manufacturer device name

String "SAFT".



6.1.4. Object 1009h: Manufacturer hardware version

String "BMU".

6.1.5. Object 100Ah: Manufacturer software version

String "BMU_Vx.xx-x", with x.xx-x the software revision. Example: 0.62-0.

6.1.6. Object 1010h: Store parameters

6.1.7. Object 1011h: Restore default parameters

6.1.8. Object 1012h: Time Stamp

This object must be sent to the BMM in order to have a time reference. Refer to [DR1] for more detail about this object.

Default value: $80_h 00_h 01_h 00_h$

- BMM consumes Time Stamp sent on 100_h COB-ID

6.1.9. Object 1017h: Producer heartbeat time

Heartbeat time should be 500ms.

6.1.10. Object 1018h: Identity object

Vendor ID (sub-index 1): string "SAFT" (no CIA account).

Product code (sub-index 2): String "0909".

Revision number (sub-index 3): string "74_O".

Serial number (sub-index 4): string with the BMU serial number.

Product code and Revision number strings are representing the CAN open specification number and the revision (09-0974_O).



6.2. 1st RPDO

6.2.1. Object 1400h: External data

OBJECT DESCRIPTION

INDEX	1400 _h
Name	RPDO1 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h

Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	0200 _h + Node ID

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

6.2.2. Object 1600_h: Mapping parameter

OBJECT DESCRIPTION

INDEX	1600 _h
Name	RPDO1 Mapping
Object code	RECORD
Data type	PDO Mapping
Category	Mandatory



ENTRY DESCRIPTION

TI DECORNI HON	•
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	Rw
PDO mapping	No
Value range	see [DR1]
Default value	03 _h
Sub-index	01 _h
Description	Reserved
Entry category	Mandatory
Access	Rw
PDO mapping	No
Value range	see [DR1]
Default value	2050 _h 00 _h 10 _h
Sub-index	02 _h
Description	Reserved
Entry category	Mandatory
Access	Rw
PDO mapping	No
Value range	see [DR1]
	366 [DITT]
Default value	2051, 00, 10,
Default value	2051 _h 00 _h 10 _h
Sub-index	03 _h
Sub-index Description	03 _h Customer Toggle Bit (optional)
Sub-index Description Entry category	03 _h Customer Toggle Bit (optional) Mandatory
Sub-index Description Entry category Access	03 _h Customer Toggle Bit (optional) Mandatory Rw
Sub-index Description Entry category Access PDO mapping	03 _h Customer Toggle Bit (optional) Mandatory Rw No
Sub-index Description Entry category Access	03 _h Customer Toggle Bit (optional) Mandatory Rw



6.3. 2nd RPDO

6.3.1. Object 1401h: External battery control

OBJECT DESCRIPTION

INDEX	1401 _h
Name	RPDO2 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h

Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	0300 _h + Node ID

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

6.3.2. Object 1601_h: Mapping parameter

OBJECT DESCRIPTION

INDEX	1601 _h
Name	RPDO2 Mapping
Object code	RECORD
Data type	PDO Mapping
Category	Mandatory



ENTRY DESCRIPTION

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	03 _h
Sub-index	01 _h
Description	Vcell Min
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	2056 _h 00 _h 10 _h
Delault value	2030h 00h 10h
Sub-index	02 _h
Description	Battery contactors authorization
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	2055 _h 00 _h 08 _h



6.4. 1st TPDO

6.4.1. Object 1800h: Battery alarm and security

OBJECT DESCRIPTION

INDEX	1800 _h
Name	TPDO1 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h
Sub-index	01 _h
Description	CORID

Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	0180 _h + Node ID

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255 if BMM is in asynchronous mode
	1 if BMM is in synchronous mode

Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	100



6.4.2. Object 1A00_h: Mapping parameter

OBJECT DESCRIPTION

INDEX	1A00 _h
Name	TPDO1 Mapping
Object code	RECORD
Data type	PDO Mapping
Category	Mandatory

ENTF

Default value

2002_h 03_h 08_h

RY DESCRIPTION	N
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	08 _h
Sub-index	01 _h
Description	Global battery status
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2000 _h 00 _h 08 _h
Sub-index	02 _h
Description	SOC_threshold
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2001 _h 00 _h 08 _h
Sub-index	03 _h
Description	Battery fault codes status n°1 to 8
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2002 _h 01 _h 08 _h
Sub-index	04 _h
Description	Battery fault codes status n°8 to 16
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2002 _h 02 _h 08 _h
Sub-index	05 _h
Description	Battery fault codes status n°17 to 24
Entry category	Mandatory
	·
Access	ro
PDO mapping Value range	No see [DR1]



Sub-index	06 _h
Description	Battery fault codes status n°25 to 32
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2002 _h 04 _h 08 _h
Sub-index	07 _h
Description	Battery fault codes status n°33 to 40
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2002 _h 05 _h 08 _h
Sub-index	08 _h
Description	Battery fault codes status n°41 to 48
Entry category	Mandatory
	, , , , , , , , , , , , , , , , , , ,
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2002 _h 06 _h 08 _h



6.5. 2nd TPDO

6.5.1. Object 1801h: Battery charge limits

OBJECT DESCRIPTION

INDEX	1801 _h
Name	TPDO2 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

RY DESCRIPTION	
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h
Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
,	j
Access	rw
	· · · · · · · · · · · · · · · · · · ·
Access	rw

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255 if BMM is in asynchronous mode
	1 if BMM is in synchronous mode

Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	100



6.5.2. Object 1A01_h: Mapping parameter

2017_h 00_h 10_h

Default value

OBJECT DESCRIPTION

INDEX	1A01 _h
Name	TPDO2 Mapping
Object code	RECORD
Data type	PDO Mapping
Category	Mandatory

ENTR

' DESCRIPTION Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	04 _h
Default value	U4h
Sub-index	01 _h
Description	IMR Continuous
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2011 _h 00 _h 10 _h
Sub-index	02 _h
Description	IMR
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2013 _h 00 _h 10 _h
Sub-index	03 _h
Description	VMR
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2015 _h 00 _h 10 _h
Sub-index	04 _h
Description	PMR
	Mandatory
Entry category	
Access	ro



6.6. 3rd TPDO

6.6.1. Object 1802h: Battery discharge limits and requests

OBJECT DESCRIPTION

INDEX	1802 _h
Name	TPDO3 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h

Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	0380 _h + Node ID

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255 if BMM is in asynchronous mode
	1 if BMM is in synchronous mode

Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	100

6.6.2. Object 1A02_h: Mapping parameter

OBJECT DESCRIPTION

INDEX	1A02 _h
Name	TPDO3 Mapping
Object code	RECORD
Data type	PDO Mapping
Category	Mandatory



ENTRY DESCRIPTION

TI DESCINII HOI	•
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	04 _h
Sub-index	01 _h
Description	IMD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2012 _h 00 _h 10 _h
Sub-index	02 _h
Description	VMD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2014 _h 00 _h 10 _h
Sub-index	03 _h
Description	PMD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2016 _h 00 _h 10 _h
Sub-index	04 _b
Description	Battery requests
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2018 _h 00 _h 08 _h



6.7. 4th TPDO

6.7.1. Object 1803h: Battery data

OBJECT DESCRIPTION

INDEX	1803 _h
Name	TPDO4 Param
Object code	RECORD
Data type	PDO CommPar
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	Ro
PDO mapping	No
Value range	see [DR1]
Default value	05 _h
	_

Sub-index	01 _h
Description	COB-ID
Entry category	Mandatory
Access	Rw
PDO mapping	No
Value range	see [DR1]
Default value	0480 _h + Node ID

Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	255 if BMM is in asynchronous mode
	1 if BMM is in synchronous mode

Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	0

Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	UNSIGNED16
Default value	100



6.7.2. Object 1A03_h: Mapping parameter

OBJECT DESCRIPTION

INDEX	1A03 _h							
Name	TPDO4 Mapping							
Object code	RECORD							
Data type	PDO Mapping							
Category	Mandatory							

ENT

Default value

0

· · · · · · · · · · · · · · · · · · ·	
RY DESCRIPTION	N
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	see [DR1]
Default value	06 _h
Sub-index	01 _h
Description	Internal battery voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2021 _h 00 _h 10 _h
Sub-index	02 _h
Description	Internal battery current
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2022 _h 00 _h 10 _h
Sub-index	03 _h
Description	Battery system mode
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2020 _h 00 _h 08 _h
Sub-index	04 _b
Description	Battery contactors status
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2024 _h 00 _h 08 _h
Sub-index	05 _h
Description	Reserved
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	0
Value lalige	0



Sub-index	06 _h
Description	SOC
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	see [DR1]
Default value	2026 _h 00 _h 08 _h



7. APPLICATION OBJECT DEFINITIONS

7.1. Introduction

Object description and entry description attributes are specified in [DR1] document. The default value attribute defines the value of an object with access attribute of the value 'rw' and 'wo' after power-on or application reset.

Detailed object description are given in the following sections.

7.2. Complex data type definition

7.2.1. Record 0080h: CellsVoltage

Voltage of one cell or all cells in a module in the battery system. The maximum cells in the module is 18.

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number of the cell voltage(s) returned.

Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

1	3	9	2 8	2 7	2	2 5	2	2	2	2	2	1 9	1 8	1 7	1	1	1	1	1	1	1	9	0	0 7	9 0	0 5	0	0	0	0	0
YY WW XX																															
Unsigned integer 8 bits (0 to 255 since 2000) Unsigned integer 8 bits (0 to 53)									Ur	sigr	ned i	integ	ger 1	l6 bi	its (() to	6553	35)													
-	-					-								MS	SB							LS	В								

<u>Sub-index 03_h: Synchronization. Used to synchronize data between client and server</u> Bit0:

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04h: Number of cells

- 01_h to 12_h = total number of cells per module.

Sub-index 05_h to 14_h: Cell n°x voltage

- 1mV per bit.



Index	Sub-Index	CellsVoltage record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
	01 _h	Module number	UNSIGNED8
	02 _h	SMU serial number	UNSIGNED32
	03 _h	Synchro	UNSIGNED8
	04 _h	Number of cells	UNSIGNED8
	05 _h	Cell n°01 voltage	UNSIGNED16
	06 _h	Cell n°02 voltage	UNSIGNED16
	07 _h	Cell n°03 voltage	UNSIGNED16
	08 _h	Cell n°04 voltage	UNSIGNED16
	09 _h	Cell n°05 voltage	UNSIGNED16
	$0A_h$	Cell n°06 voltage	UNSIGNED16
0080 _h	0B _h	Cell n°07 voltage	UNSIGNED16
	$0C_h$	Cell n°08 voltage	UNSIGNED16
	$0D_h$	Cell n°09 voltage	UNSIGNED16
	0E _h	Cell n°10 voltage	UNSIGNED16
	0F _h	Cell n°11 voltage	UNSIGNED16
	10 _h	Cell n°12 voltage	UNSIGNED16
	11 _h	Cell n°13 voltage	UNSIGNED16
	12 _h	Cell n°14 voltage	UNSIGNED16
	13 _h	Cell n°15 voltage	UNSIGNED16
	14 _h	Cell n°16 voltage	UNSIGNED16
	15 _h	Cell n°17 voltage	UNSIGNED16
	16 _h	Cell n°18 voltage	UNSIGNED16

7.2.2. Record 0081h: BatteryTemperature

One or all temperature in a module in the battery system. The maximum temperature in the module is 4.

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number of the cell temperature(s) returned.

Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
YY									XX																						
Unsigned integer 8 bits (0 to 255 since 2000) Unsigned integer 8 bits (0 to 535) Unsigned integer 16 bits (0 to 65535)																															
-	-				-								MSB LSB																		

<u>Sub-index 03_h: Synchronization. Used to synchronize data between client and server Bit0:</u>

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04_h: Number of sensors

- 01_h to 04_h = total number of temperature sensors per module.

Sub-index 05_h to 08_h: Sensor temperature values

- 1°C per bit (00 h = 0°C, 7F h= 127°C, 80 h= -128°C, FFh = -1°C).



Index	Sub-Index	BatteryTemperature record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
	01 _h	Number of temperature sensors	UNSIGNED8
	02 _h	SMU serial number	UNSIGNED32
	03 _h	Synchro	UNSIGNED8
0081 _h	04 _h	Sensor number	UNSIGNED8
	05 _h	Sensor n°01 temperature	SIGNED8
	06 _h	Sensor n°02 temperature	SIGNED8
	07 _h	Sensor n°03 temperature	SIGNED8
	08 _h	Sensor n°04 temperature	SIGNED8

7.2.3. Record 0082h: MinMaxCellVoltage

Minimum or maximum cell voltage in the battery system.

<u>Sub-index 01_h : Module serial number of the cell concerned by the maximum or minimum</u> voltage.

Four bytes in the following format: YYWWXX:

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.

- XX: less significant bytes (LSB) for the identifier.

3 3 2 2 2 2 2 2 2 1 0 9 8 7 6 5 4	2 2 2 2 1 1 1 1 1 3 2 1 0 9 8 7 6	1 1 1 1 1 1 0								
YY	WW	XX								
Unsigned integer 8 bits (0 to 255 since 2000)	Unsigned integer 8 bits (0 to 53)	Unsigned integer 16 bits (0 to 65535)								
-	=	MSB LSB								

Sub-index 02_h: Cell number

- 01_h to xx_h = cell number concerned by the maximum or minimum voltage (xx is corresponding to the Number of cells per module (object 2045_h)).

Sub-index 03_h: Cell voltage

1mV per bit.

Index	Sub-Index	MinMaxCellsVoltage record	Data type
	00_{h}	Highest sub-index supported	UNSIGNED8
0000	01 _h	SMU serial number	UNSIGNED32
0082 _h	02 _h	Cell number	UNSIGNED8
	03 _h	Cell voltage	UNSIGNED16

7.2.4. Record 0083h: MinMaxTemperature

Minimum or maximum temperature in the module (cells or module terminals).

<u>Sub-index 01_h: SMU serial number concerned by the maximum or minimum temperature.</u> Four bytes in the following format: YYWWXX:

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.

XX: less significant bytes (LSB) for the identifier.

											٠.5	,			-,		\ — –	_,		•••			••••									
	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
L																																
	ΥY								W'	W							ХХ															
			ned nce			8 bit	s (0	to	Ur 53	nsigr)	ned	inte	ger 8	3 bit	s (0	to	Ur	sigr	ned i	nteg	ger 1	6 bi	its (0) to	6553	35)						
	-						-								MS	SB							LS	В								

Sub-index 02_h: Temperature

- 1°C per bit (00 h = 0°C, 7F h= 127°C, 80 h= \cdot 128°C, / FFh = \cdot 1°C).



Index	Sub-Index	MinMaxBatteryTemperature record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
0083 _h	01 _h	SMU serial number	UNSIGNED32
	02 _h	Temperature	SIGNED8

7.2.5. Record 0084h: ModuleCyclingSOH

Gives information about the module cycling condition depending of SOH.

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number

Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

3	3	2 9	2 8	2 7	2	2 5	2 4	2	2	2	2 0	1 9	1 8	1 7	1 6	1 5	1	1	1 2	1	1	9	0	0 7	0 6	0 5	0	0	0	0	0
Ϋ́	Y							W	W							XX	(
					8 bit	:s (0	to	Un 53	ısigr)	ied i	nteg	ger 8	3 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	l6 bi	ts (C) to (6553	35)						
-	Jnsigned integer 8 bits (0 255 since 2000)						-								MS	SB							LS	В							

<u>Sub-index 03_h: Synchronization. Used to synchronize data between client and server Bit0:</u>

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04h to 0Dh: Number of charge/discharge cycles versus SOH

1 cycle per bit.

Index	Sub-Index	ModuleCyclingSOH record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
	01 _h	Module number	UNSIGNED8
	02 _h	SMU serial number	UNSIGNED32
	03 _h	Synchro	UNSIGNED8
	04 _h	SOH < 10% DOD	UNSIGNED16
	05 _h	10% DOD ≤ SOH < 20% DOD	UNSIGNED16
0084 _h	06 _h	20% DOD ≤ SOH < 30% DOD	UNSIGNED16
0004 _h	07 _h	30% DOD ≤ SOH < 40% DOD	UNSIGNED16
	08 _h	40% DOD ≤ SOH < 50% DOD	UNSIGNED16
	09 _h	50% DOD ≤ SOH < 60% DOD	UNSIGNED16
	0A _h	60% DOD ≤ SOH < 70% DOD	UNSIGNED16
	0B _h	70% DOD ≤ SOH < 80% DOD	UNSIGNED16
	0C _h	80% DOD ≤ SOH < 90% DOD	UNSIGNED16
	0D _h	90% DOD ≤ SOH < 100% DOD	UNSIGNED16

7.2.6. Record 0085h: ModuleCalendarSOH

Gives information about the module calendar SOH.

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- $00_h = error$, module not defined in battery system.
- XX_h = module number



Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

3 1	3	9	2 8	2 7	2 6	2 5	2 4	2	2	2	2	1 9	1 8	1 7	1 6	1 5	1 4	1	1 2	1	1	9	0 8	0 7	0 6	0 5	0 4	0 3	0	0	0
Υ	Y						l	W	W							XX	(l .		l										
		ned ince			8 bit	:s (0	to	Un 53	nsigr)	ned i	integ	ger 8	3 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	16 bi	its (() to (6553	35)						
-	255 since 2000)					-								MS	SB							LS	В								

<u>Sub-index 03_h: Synchronization. Used to synchronize data between client and server Bit0:</u>

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04h to 3Fh: time spent inside the considered T°C and SOC classes.

- 1 hour per bit.



Index	Sub-Index	ModuleCalendarSOH record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
	01 _h	Module number	UNSIGNED8
	02 _h	SMU serial number	UNSIGNED32
	03 _h	Synchro	UNSIGNED8
	04 _h	55°C < T°C ≤ 65°C & SOC < 10%	UNSIGNED16
	05 _h	55°C < T°C ≤ 65°C & 10% ≤ SOC < 20%	UNSIGNED16
	06 _h	55°C < T°C ≤ 65°C & 20% ≤ SOC < 30%	UNSIGNED16
	07 _h	55°C < T°C ≤ 65°C & 30% ≤ SOC < 40%	UNSIGNED16
	08 _h	55°C < T°C ≤ 65°C & 40% ≤ SOC < 50%	UNSIGNED16
	09 _h	55°C < T°C ≤ 65°C & 50% ≤ SOC < 60%	UNSIGNED16
	0A _h	55°C < T°C ≤ 65°C & 60% ≤ SOC < 70%	UNSIGNED16
	0B _h	55°C < T°C ≤ 65°C & 70% ≤ SOC < 80%	UNSIGNED16
	0C _h	55°C < T°C ≤ 65°C & 80% ≤ SOC < 90%	UNSIGNED16
	0D _h	55°C < T°C ≤ 65°C & 90% ≤ SOC	UNSIGNED16
	0E	45°C < T°C ≤ 55°C & SOC < 10%	UNSIGNED16
	0F	45°C < T°C ≤ 55°C & 10% ≤ SOC < 20%	UNSIGNED16
	10	45°C < T°C ≤ 55°C & 20% ≤ SOC < 30%	UNSIGNED16
	11	45°C < T°C ≤ 55°C & 30% ≤ SOC < 40%	UNSIGNED16
	12	45°C < T°C ≤ 55°C & 40% ≤ SOC < 50%	UNSIGNED16
	13	45°C < T°C ≤ 55°C & 50% ≤ SOC < 60%	UNSIGNED16
	14	45°C < T°C ≤ 55°C & 60% ≤ SOC < 70%	UNSIGNED16
	15	45°C < T°C ≤ 55°C & 70% ≤ SOC < 80%	UNSIGNED16
	16	45°C < T°C ≤ 55°C & 80% ≤ SOC < 90%	UNSIGNED16
	17	45°C < T°C ≤ 55°C & 90% ≤ SOC	UNSIGNED16
	18	30°C < T°C ≤ 45°C & SOC < 10%	UNSIGNED16
	19	30°C < T°C ≤ 45°C & 10% ≤ SOC < 20%	UNSIGNED16
	1A	30°C < T°C ≤ 45°C & 20% ≤ SOC < 30%	UNSIGNED16
	1B	30°C < T°C ≤ 45°C & 30% ≤ SOC < 40%	UNSIGNED16
	1C	30°C < T°C ≤ 45°C & 40% ≤ SOC < 50%	UNSIGNED16
	1D	30°C < T°C ≤ 45°C & 50% ≤ SOC < 60%	UNSIGNED16
0085_h	1E	30°C < T°C ≤ 45°C & 60% ≤ SOC < 70%	UNSIGNED16
	1F	30°C < T°C ≤ 45°C & 70% ≤ SOC < 80%	UNSIGNED16
		30°C < T°C ≤ 45°C & 80% ≤ SOC < 90%	
	20		UNSIGNED16
	21	30°C < T°C ≤ 45°C & 90% ≤ SOC	UNSIGNED16
	22	25°C < T°C ≤ 30°C & SOC < 10%	UNSIGNED16
	23	25°C < T°C ≤ 30°C & 10% ≤ SOC < 20%	UNSIGNED16
	24	25°C < T°C ≤ 30°C & 20% ≤ SOC < 30%	UNSIGNED16
	25	25°C < T°C ≤ 30°C & 30% ≤ SOC < 40%	UNSIGNED16
	26	25°C < T°C ≤ 30°C & 40% ≤ SOC < 50%	UNSIGNED16
	27	25°C < T°C ≤ 30°C & 50% ≤ SOC < 60%	UNSIGNED16
	28	25°C < T°C ≤ 30°C & 60% ≤ SOC < 70%	UNSIGNED16
	29	25°C < T°C ≤ 30°C & 70% ≤ SOC < 80%	UNSIGNED16
	2A	25°C < T°C ≤ 30°C & 80% ≤ SOC < 90%	UNSIGNED16
	2B	25°C < T°C ≤ 30°C & 90% ≤ SOC	UNSIGNED16
	2C	20°C < T°C ≤ 25°C & SOC < 10%	UNSIGNED16
	2D	20°C < T°C ≤ 25°C & 10% ≤ SOC < 20%	UNSIGNED16
	2E	20°C < T°C ≤ 25°C & 20% ≤ SOC < 30%	UNSIGNED16
	2F	20°C < T°C ≤ 25°C & 30% ≤ SOC < 40%	UNSIGNED16
	30	20°C < T°C ≤ 25°C & 40% ≤ SOC < 50%	UNSIGNED16
	31	20°C < T°C ≤ 25°C & 50% ≤ SOC < 60%	UNSIGNED16
	32	20°C < T°C ≤ 25°C & 60% ≤ SOC < 70%	UNSIGNED16
	33	20°C < T°C ≤ 25°C & 70% ≤ SOC < 80%	UNSIGNED16
	34	20°C < T°C ≤ 25°C & 80% ≤ SOC < 90%	UNSIGNED16
	35	20°C < T°C ≤ 25°C & 90% ≤ SOC	UNSIGNED16
	36	T°C ≤ 20°C & SOC < 10%	UNSIGNED16
	37	T°C ≤ 20°C & 10% ≤ SOC < 20%	UNSIGNED16
	38	T°C ≤ 20°C & 20% ≤ SOC < 30%	UNSIGNED16
	39	T°C ≤ 20°C & 30% ≤ SOC < 40%	UNSIGNED16
	39 3A	T°C ≤ 20°C & 40% ≤ SOC < 40%	UNSIGNED16
	i OH	1 1 0 2 20 0 X 40% 2 300 > 30%	

This information contained in this document is SAFT proprietary and shall not be disclosed by the recipient to third persons without the written consent of the Company.



3C	T°C ≤ 20°C & 60% ≤ SOC < 70%	UNSIGNED16
3D	T°C ≤ 20°C & 70% ≤ SOC < 80%	UNSIGNED16
3E	T°C ≤ 20°C & 80% ≤ SOC < 90%	UNSIGNED16
3F	T°C ≤ 20°C & 90% ≤ SOC	UNSIGNED16

7.2.7. Record 0086h: SMUConfiguration

Gives the configuration of SMU.

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number of the cell voltage(s) returned.

Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

3	3	2 9	2 8	2 7	2	2 5	2 4	2	2 2	2	2 0	1 9	1 8	1 7	1	1 5	1	1	1 2	1	1	0 9	0	0 7	0 6	0 5	0 4	0	0	0	0
Ϋ́	Y							W	W							XX	(
					8 bit	s (0	to	Un 53	nsigr)	ned i	nteg	ger 8	3 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	16 bi	ts (0) to (6553	35)						
-	Insigned integer 8 bits (0 55 since 2000)						-								MS	SB							LS	В							

<u>Sub-index 03_n: Synchronization. Used to synchronize data between client and server Bit0:</u>

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04_h: P: number of branches in parallel in module

Sub-index 05h: S: number of cells in series per branch

Index	Sub-Index	CellsVoltage record	Data type
	00 _h	Highest sub-index supported	UNSIGNED8
	01 _h	Module number	UNSIGNED8
0006	02 _h	SMU serial number	UNSIGNED32
0086 _h	03 _h	Synchro	UNSIGNED8
	04 _h	P	UNSIGNED8
	05 _h	S	UNSIGNED8



7.3. Detailed object definitions

7.3.1. Object 2000_h: Global battery status

This object shall indicate the battery status:

<u>Major error</u>: shall indicate a major error in the battery. Major error can have different causes but means that battery system is out of order. Major error is active as soon as at least one ALARM is present on the BMM.

<u>Minor error</u>: shall indicate a minor error in the battery. The battery system is not out of order but in downgraded mode. Nevertheless, battery system stays in safe perimeter. Minor error is active as soon as at least one WARNING is present on the BMM.

<u>Self-test in progress</u>: shall indicate that a self-test is in progress (PBIT or IBIT).

Battery unbalanced: shall indicate that the a balancing is needed to equalize the cell voltage.

BMU watchdog: shall indicate the battery system software is working properly.

VALUE DEFINITION

The Global battery status has the following format:

7	6	5	4	3	2	1	0
Rese	rved (0)	BMU watchdog	End of charge	Battery unbalanced	Self-test in progress	Minor error	Major error

MSB LSB

Bit 0: Major error

- 0 = no error
- 1 = major error

Bit 1: Minor error

- 0 = no error
- 1 = minor error

Bit 2: Self-test in progress

- 0 = no self-test in progress
- 1 = self-test in progress

Bit 3: Battery unbalanced

- 0 = battery balanced
- 1 = battery unbalanced

Bit 4: End of charge

- 0 = battery in charge
- 1 = battery charge is finished

Bit 5: Watchdog BMU

- Toggle each time the object is sent

OBJECT DESCRIPTION

INDEX	2000 _h
Name	Global battery status
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory



ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	See value definition in this §
Default value	No

7.3.2. Object 2001_h: SOC_threshold

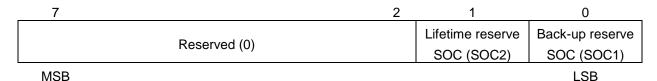
This object shall indicate if the battery SOC has reached some predefined thresholds:

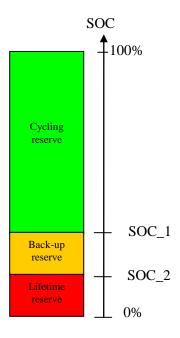
Back-up SOC (SOC1): shall indicate if the battery SOC is below the back-up SOC limit.

<u>Lifetime reserve SOC (SOC2)</u>: shall indicate if the battery SOC is below the Lifetime reserve SOC limit.

VALUE DEFINITION

The SOC_threshold has the following format:





Bit 0: Back-up SOC (SOC_1)

- 0 = the battery SOC is above the Back-up SOC limit.
- 1 = the battery SOC is below the Back-up SOC limit (Back-up reserve is consumed).

Bit 1: Lifetime reserve SOC (SOC_2)

- 0 = the battery SOC is above the Lifetime reserve SOC limit.
- 1 = the battery SOC is below the Lifetime SOC limit (Lifetime reserve is consumed).



OBJECT DESCRIPTION

INDEX	2001 _h
Name	SOC_threshold
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	See value definition in this §
Default value	00 _h

7.3.3. Object 2002_h: Battery fault codes status n°1 to 48

This object shall indicate the fault codes' activation in the battery system.

External system has the possibility to reset the fault code by sending 'Battery fault code $n^{\circ}1$ to 48 reset' object (2053_h).

VALUE DEFINITION

The battery fault codes have the following format:

				b	it					
	7	6	5	4	3	2	1	0		
	8	6	6	5	4	3	2	1	1	
	16	15	14	13	12	11	10	9	2	
fault	24	23	22	21	20	19	18	17	3	buto
code	32	31	30	29	28	27	26	25	4	byte
	34	39	38	37	36	35	34	33	5	
	48	47	46	45	44	43	42	41	6	

MSB LSB

Bit 'x':

- 0 = fault code 'x' is not present
- 1 = fault code 'x' is present

OBJECT DESCRIPTION

INDEX	2002 _h
Name	Battery fault codes status n°1 to 48
Object code	ARRAY
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	06 _h
Default value	06 _h



Sub-index	01 _b
Description	Fault codes n°1 to 8
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	00 _h
0 1 1 1	
Sub-index	02 _h
Description	Fault codes n°9 to 16
Entry category	Mandatory
Access	ro Default
PDO mapping	
Value range	See VALUE DEFINITION in this §
Default value	00 _h
Sub-index	03 _h
Description	Fault codes n°17 to 24
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	00 _h
Sub-index	04,
Sub-index Description	04 _h Fault codes n°25 to 32
Description	Fault codes n°25 to 32
Description Entry category	
Description Entry category Access	Fault codes n°25 to 32 Mandatory
Description Entry category	Fault codes n°25 to 32 Mandatory ro
Description Entry category Access PDO mapping	Fault codes n°25 to 32 Mandatory ro Default
Description Entry category Access PDO mapping Value range Default value	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h
Description Entry category Access PDO mapping Value range Default value Sub-index	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h
Description Entry category Access PDO mapping Value range Default value Sub-index Description	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00 _h 05 _h Fault codes n°33 to 40
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00 _h 05 _h Fault codes n°33 to 40 Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this §
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h 06h Fault codes n°41 to 48 Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h 06h Fault codes n°41 to 48 Mandatory ro Default Default Default codes n°41 to 48 Mandatory ro Default
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Fault codes n°25 to 32 Mandatory ro Default See VALUE DEFINITION in this § 00h 05h Fault codes n°33 to 40 Mandatory ro Default See VALUE DEFINITION in this § 00h 06h Fault codes n°41 to 48 Mandatory ro



7.3.4. Object 2011_h: IMR continuous

This object shall provide to external system the recommended maximum continuous electrical current for the charge.

VALUE DEFINITION

The resolution shall be 0.25A per bit.

OBJECT DESCRIPTION

INDEX	2011 _h
Name	IMR continuous
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.3.5. Object 2012_h: IMD

This object shall indicate the maximum dynamic (peak) discharge current that battery system can admit.

VALUE DEFINITION

The resolution shall be 0.25A per bit.

OBJECT DESCRIPTION

INDEX	2012 _h
Name	IMD
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No

7.3.6. Object 2013_h: IMR

This object shall indicate the maximum dynamic (peak) charge current that battery system can admit.

VALUE DEFINITION

The resolution shall be 0.25A per bit.

OBJECT DESCRIPTION

INDEX	2013 _h
Name	IMR
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.3.7. Object 2014_h: VMD

This object shall indicate the minimum authorized battery voltage in discharge. The battery voltage must not be less than VMD.

VALUE DEFINITION

The resolution shall be 25mV per bit.

OBJECT DESCRIPTION

INDEX	2014 _h
Name	VMD
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	Ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No

7.3.8. Object 2015_h: VMR

This object shall indicate the maximum authorized battery voltage in charge. The battery voltage must not be more than VMR.

VALUE DEFINITION

The resolution shall be 25mV per bit.

OBJECT DESCRIPTION

INDEX	2015 _n
Name	VMR
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.3.9. Object 2016_h: PMD

This object shall indicate the maximum authorized battery power in discharge (long PMD). The battery power must not be more than PMD.

VALUE DEFINITION

The resolution shall be 10W per bit.

OBJECT DESCRIPTION

INDEX	2016 _h
Name	PMD
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No

7.3.10. Object 2017_h: PMR

This object shall indicate the maximum authorized battery power in charge (long PMR). The battery power must not be more than PMR.

VALUE DEFINITION

The resolution shall be 10W per bit.

OBJECT DESCRIPTION

INDEX	2017 _h
Name	PMR
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.3.11. Object 2018_h: Battery requests

This object shall indicate the battery requests:

<u>Self-test required</u>: shall indicate that a self-test will be started [Self-test_time] seconds minimum after sending this object (PBIT). [Self-test_time] is software parameter to configure.

Contactor opening required: shall indicate that contactors must be opened.

<u>Thermal regulation required</u>: shall indicate that a thermal regulation system must be started to cool or heat the battery or to balance the module temperature dispatched in the whole battery. A thermal regulation system produces a fluid flow (air or liquid) that is regulated to a fixed temperature (typical 20°C)

<u>Cooling required</u>: shall indicate that a cooling system must be started to cool the battery <u>Heating required</u>: shall indicate that a heating system must be started to heat the battery

VALUE DEFINITION

The Global battery status has the following format:

7	6	5	4	3	2	1	0
	Reserved (0)		Heating required	Cooling required	Circulation required	Contactor opening required	Self-test required

MSB LSB

Bit 0: Self-test required

- 0 = no self-test needed
- 1 = a self-test is required

Bit 1: Contactor opening required

- 0 = no contactor opening required
- 1 = contactor opening required

Bit 2: Circulation required

- 0 = Circulation not required
- 1 = Circulation required

Bit 3: Cooling required

- 0 = cooling not required
- 1 = cooling required

Bit 4: Heating required

- 0 = cooling not required
- 1 = cooling required

OBJECT DESCRIPTION

INDEX	2018 _n
Name	Battery requests
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	See value definition in this §
Default value	No



7.3.12. Object 2020_h: Battery system state

This object shall indicate in which state the battery system is in.

VALUE DEFINITION

The Battery system state shall have the following coding:

	The Eastern State Original Place and		
00h	Off state	System battery is powered OFF	
01h	Init state	Before pre-charge mode, self-test of the system	
02h	Pre-charge state	Battery system is not connected, electric adaptation period before battery system connection to customer system	
03h	Nominal state	Battery system is connected. Battery system is in a safe perimeter	
04h	Standby state	Battery system is disconnected and wait for authorization to connect	
05h	Not used	Not used	
06h	After run state	Battery system is disconnected but battery system makes some checks and cooling management (if required)	
07h	Sleep SMU state	Battery system is disconnected and SMU are put in sleep state when after-run is finished.	
08h	Safe state	Battery system is disconnected because the battery system went out of safe perimeter	
09h to FFh	Reserved		

Sleep state cannot be displayed because in sleep state, CAN drivers are not supplied, so information is not transmitted between BMM and client.

OBJECT DESCRIPTION

INDEX	2020 _h	
Name	Battery system state	
Object code	VAR	
Data type	UNSIGNED8	
Category	Mandatory	

Sub-index	00 _h	
Access	Ro	
PDO mapping	Default	
Value range	UNSIGNED8	
Default value	No	



7.3.13. Object 2021_h: Internal battery voltage

This object shall provide the instantaneous battery voltage measured by the battery system.

VALUE DEFINITION

The resolution shall be 25mV per bit. The range of value shall be 0000h to FFFFh.

OBJECT DESCRIPTION

INDEX	2021 _h
Name	Internal battery voltage
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No

7.3.14. Object 2022_h: Internal battery current

This object shall provide the instantaneous current measured by the battery system.

VALUE DEFINITION

The resolution shall be 0.25A per bit. The range of value shall be 0000_h to FFFF_h (0000_h = 0A, for -7FFF_h = 8191.75A, 8000_h = -8192A and FFFF_h =-0.25A).

OBJECT DESCRIPTION

INDEX	2022 _h
Name	Internal battery current
Object code	VAR
Data type	SIGNED16
Category	Mandatory

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	No



7.3.15. Object 2023_h: HVDC1 voltage

This object shall provide the instantaneous battery voltage measured by the battery system after contactor.

VALUE DEFINITION

2 cases:

- In case the BMM is equipped with a <u>voltage measurement</u>, the resolution shall be 25mV per bit. The range of value shall be 0000_h to FFFF_h.
- In case the BMM is equipped with a voltage detection :

FFFF = voltage present after contactors

0 = no voltage present after contactors

OBJECT DESCRIPTION

INDEX	2023 _h
Name	HVDC1 voltage
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.3.16. Object 2024_h: Battery contactors status

This object shall indicate the state of battery system contactors (positive pole (+) and negative pole (-)):

Main+: shall indicate the contactor state on charge positive pole.

Optional Main+: shall indicate the contactor state on optional positive pole.

<u>Precharge+</u>: shall indicate the contactor state on precharge positive pole.

Optional Precharge+: shall indicate the contactor state on optional precharge positive pole.

Main -: shall indicate the contactor state on negative pole.

VALUE DEFINITION

The Global battery status has the following format:

7 6	5	4	3	2	1	0
Reserved (0)	Reserved (0)	Main -	Optional Precharge+	Precharge +	Optional Main+	Main+

MSB LSB

Bit 0: Main +

0 = contactor opened

- 1 = contactor closed

Bit 1: Optional Main+

0 = contactor opened

1 = contactor closed

Bit 2: Precharge+

0 = contactor opened

1 = contactor closed

Bit 3: Optional Precharge+

0 = contactor opened

1 = contactor closed

Bit 4: Main -

0 = contactor opened

1 = contactor closed

OBJECT DESCRIPTION

INDEX	2024 _h
Name	Global battery status
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	See value definition in this §
Default value	No



7.3.17. Deleted in K version

7.3.18. Object 2026_h: SOC

This object shall provide the amount of capacity contained in the battery (State Of Charge), expressed as a percentage of the total amount of <u>actual</u> battery capacity. The calculation is done taking SOH into account.

VALUE DEFINITION

The resolution shall be 1% per bit. FF_h shall indicate an invalid value.

OBJECT DESCRIPTION

INDEX	2026 _h						
Name	Remaining battery capacity						
Object code	VAR						
Data type	UNSIGNED8						
Category	Mandatory						

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	No
Value range	00 _h to 64 _h and FF _h
Default value	No

7.3.19. Object 2027_h: Cells voltage

This object shall indicate the voltage of one cell or all cells in a module in the battery system. This object has to be updated by the server when Synchro bit is set by the client.

The client has the possibility to choose the module by writing the module ID in Module number. If the module ID is not found, the server will write 0 in this field.

Number of cells indicates how many cells there are in the module concerned by the request.

The SMU serial number is used to do physically the link with the virtual module ID. This field is updated by server.

The maximum cells in the module is 18.



VALUE DEFINITION

See also § 7.2.1 (Record 0080_h definition)

Module number: (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number of the cell voltage(s) returned (between 1 and Number of modules).

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.
- XX: third and fourth bytes for the identifier.

3	3	2 9	2 8	2 7	2 6	2 5	2 4	2	2	2	2	1 9	1 8	1 7	1 6	1 5	1 4	1	1 2	1 1	1	0 9	0 8	0 7	0 6	0 5	0 4	0	0 2	0 1	0
Y	YY						W	W							XX																
U	Unsigned integer 8 bits (0 to				to	Unsigned integer 8 bits (0 to							Unsigned integer 16 bits (0 to 65535)																		
2	255 since 2000)				53)																										
-	-				ı								M	SB							LS	В									

<u>Synchro:</u> Used to synchronize data between client and server Bit0:

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Cell number:

- 01_h to 12_h = number of cells returned (module cells number).

Cell n°x voltage resolution: 1mV per bit. The range of value shall be 0000_h to FFFF_h.

OBJECT DESCRIPTION

INDEX	2027 _h
Name	Cells voltage
Object code	RECORD
Data type	CellsVoltage
Category	Mandatory

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	16 _h
Default value	16 _h

Sub-index	01 _h
Description	Module number
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No

Sub-index	02 _h
Description	Module serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No



0.1.1	
Sub-index	03 _h
Description	Synchro
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	04 _b
Description	Cell number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED8
Default value	No
	·
Sub-index	05 _h
Description	Cell n°01 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	06 _h
Description	Cell n°02 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Doracit value	110
<u> </u>	_
Sub-index	07 _h
Description	Cell n°03 voltage
Description Entry category	
Description Entry category Access	Cell n°03 voltage Mandatory ro
Description Entry category Access PDO mapping	Cell n°03 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range	Cell n°03 voltage Mandatory ro No UNSIGNED16
Description Entry category Access PDO mapping	Cell n°03 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h
Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No O8 _h Cell n°04 voltage Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Cell n°03 voltage Mandatory ro No UNSIGNED16 No O8h Cell n°04 voltage Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage Mandatory ro No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09 _h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage Mandatory ro No UNSIGNED16 No Ooh Cell n°05 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No Cell n°05 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No Only O
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08 _h Cell n°04 voltage Mandatory ro No UNSIGNED16 No O9 _h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No O9h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No Cell n°05 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°06 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No Cell n°05 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°06 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°03 voltage Mandatory ro No UNSIGNED16 No 08h Cell n°04 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°05 voltage Mandatory ro No UNSIGNED16 No 09h Cell n°06 voltage Mandatory ro No UNSIGNED16 No O9h Cell n°05 voltage Mandatory ro No UNSIGNED16 No OAh Cell n°06 voltage Mandatory ro No



Cub in dov	
Sub-index	OB _h
Description	Cell n°07 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No LINGUANEDAG
Value range	UNSIGNED16
Default value	No
Sub-index	0C _h
Description	Cell n°08 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Cub in dov	
Sub-index	OD _h
Description	Cell n°09 voltage
Entry category	Mandatory
Access PDO mapping	ro No
Value range	UNSIGNED16
Default value	No
Delault Value	INO
Sub-index	0E _h
Description	Cell n°10 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	0E.
Sub-index Description	0F _h Cell n°11 voltage
Description	Cell n°11 voltage
Description Entry category	Cell n°11 voltage Mandatory
Description Entry category Access	Cell n°11 voltage Mandatory ro
Description Entry category Access PDO mapping	Cell n°11 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range	Cell n°11 voltage Mandatory ro No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°11 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11 _h
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11 _h Cell n°13 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11 _h Cell n°13 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11 _h Cell n°13 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No Cell n°13 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No Cell n°13 voltage Mandatory ro Cell n°13 voltage Mandatory ro No No 11h Cell n°13 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10 _h Cell n°12 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No 11 _h Cell n°13 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No 12h Cell n°14 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°14 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°14 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No 12h Cell n°14 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Cell n°11 voltage Mandatory ro No UNSIGNED16 No 10h Cell n°12 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°13 voltage Mandatory ro No UNSIGNED16 No 11h Cell n°14 voltage Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No



Sub-index	13 _h
Description	Cell n°15 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	14 _b
Description	Cell n°16 voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	15 _b
Sub-index Description	15 _h Cell n°17 voltage
	15 _h Cell n°17 voltage Mandatory
Description	Cell n°17 voltage
Description Entry category	Cell n°17 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range	Cell n°17 voltage Mandatory ro
Description Entry category Access PDO mapping	Cell n°17 voltage Mandatory ro No
Description Entry category Access PDO mapping Value range Default value	Cell n°17 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°17 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description	Cell n°17 voltage Mandatory ro No UNSIGNED16 No 16 _h Cell n°18 voltage
Description Entry category Access PDO mapping Value range Default value Sub-index	Cell n°17 voltage Mandatory ro No UNSIGNED16 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Cell n°17 voltage Mandatory ro No UNSIGNED16 No 16 _h Cell n°18 voltage Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Cell n°17 voltage Mandatory ro No UNSIGNED16 No 16 _h Cell n°18 voltage Mandatory ro

7.3.20. Object 2028_h: Temperatures inside the module

This object shall indicate the temperature of one sensor or all sensor inside a module in the battery system.

This object has to be updated by the server when Synchro bit is set by the client.

The client has the possibility to choose the module by writing the module ID in Module number. If the module ID is not found, the server will write 0.

Sensor number indicates how many temperature sensors there are in the module concerned by the request.

The SMU serial number is used to do physically the link with the virtual module ID.

The maximum temperature sensors in the module is 4.



VALUE DEFINITION

See also § 7.2.2 (Record 0081_h definition)

Module number: (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system
- XX_h = module number of the cell temperature(s) returned (between 1 and Number of modules).

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.
- XX: third and fourth bytes for the identifier.

3	3	2	2 8	2 7	2	2 5	2	2	2	2	2	1 9	1 8	1 7	1 6	1 5	1	1	1 2	1	1	0 9	0	0 7	0	0 5	0 4	0	0	0	0
Y'	YY										XX	(
U	ารig	ned	inte	ger	8 bit	s (0	to	Ur	nsigr	ned	integ	ger 8	8 bit	s (0	to	Unsigned integer 16 bits (0 to 65535)															
255 since 2000) 53)																															
-						-								MS	SB							LS	B								

<u>Synchro:</u> Used to synchronize data between client and server Bit0:

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sensor number:

- 01_h to 04_h = number of temperature sensor returned

<u>Sensor n°x temperature resolution:</u> 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_{h=}$ -128°C, FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	2028 _h
Name	Battery temperature
Object code	RECORD
Data type	BatteryTemperature
Category	Mandatory

Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	08 _h
Default value	08 _h

Sub-index	01 _h
Description	Module number
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No

Sub-index	02 _h
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No



Sub-index	03 _h
Description	Synchro
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	04 _b
Description	Sensor number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	05
Description	05 _h Sensor n°01 temperature
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	SIGNED8
Default value	No
0 1 1 1	
Sub-index	06 _h
Description	Sensor n°02 temperature
Description Entry category	Sensor n°02 temperature Mandatory
Description Entry category Access	Sensor n°02 temperature Mandatory ro
Description Entry category Access PDO mapping	Sensor n°02 temperature Mandatory ro No
Description Entry category Access PDO mapping Value range	Sensor n°02 temperature Mandatory ro No SIGNED8
Description Entry category Access PDO mapping Value range Default value	Sensor n°02 temperature Mandatory ro No SIGNED8 No
Description Entry category Access PDO mapping Value range Default value Sub-index	Sensor n°02 temperature Mandatory ro No SIGNED8 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8 No 08 _h Sensor n°04 temperature
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8 No 08 _h Sensor n°04 temperature Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8 No 08 _h Sensor n°04 temperature Mandatory ro No No No No No No No No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Sensor n°02 temperature Mandatory ro No SIGNED8 No 07 _h Sensor n°03 temperature Mandatory ro No SIGNED8 No 08 _h Sensor n°04 temperature Mandatory ro

Usually:

Sensor n°01 temperature: cells temperature

Sensor n°02 temperature: module terminals temperature n°1 Sensor n°03 temperature: module terminals temperature n°2

Sensor n°04 temperature: not used

7.3.21. Object 2029_h: Max cell voltage

This object shall indicate the maximum voltage of all cells in battery system and the module concerned by this maximum voltage.



VALUE DEFINITION

See also § 7.2.3 (Record 0082_h definition)

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.
- XX: third and fourth bytes for the identifier.

3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1		0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
7	YY WW									XX																						
ι	Jns	sigr	ned	inte	ger	8 bit	s (0	to	Ur	sigr	ed	inte	ger 8	8 bit	s (0	to	Unsigned integer 16 bits (0 to 65535)															
255 since 2000) 53)																																
-	-						-								MS	SB							LS	B								

Cell number:

 01_h to xx_h = cell number concerned by the maximum voltage (xx is corresponding to the Number of cells per module (object 2045_h)).

Cell voltage: Maximum cell voltage in the battery. The resolution shall be 1mV per bit. The range of value shall be 0000_h to FFFF_h.

OBJECT DESCRIPTION

INDEX	2029 _h
Name	Max cell voltage
Object code	RECORD
Data type	MinMaxCellVoltage
Category	Mandatory

ENTF

RY DESCRIPTION	l								
Sub-index	00 _h								
Description	Highest sub-index supported								
Entry category	Mandatory								
Access	ro								
PDO mapping	No								
Value range	3_{h}								
Default value	3_{h}								
Sub-index	01 _h								
Description	SMU serial number								
	Mandatory								
Entry category Access	ro								
PDO mapping	No								
Value range	UNSIGNED32								
Default value	No								
Delault value	110								
Sub-index	02 _n								
Description	Cell number								
Entry category	Mandatory								
Access	ro								
PDO mapping	No								
Value range	UNSIGNED8								
Default value	No								
Sub-index	03 _h								
Description	Cell voltage								
Entry category	Mandatory								
Access	ro								
PDO mapping	No								
Value range	UNSIGNED16								
Default value	No								
Doladit valdo	110								



7.3.22. Object 202A_h: Min cell voltage

This object shall indicate the minimum voltage of all cells in battery system and the module concerned by this minimum voltage.

VALUE DEFINITION

See also § 7.2.3 (Record 0082_h definition)

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

3 3 2 2 2 2 2 2	2 2 2 2 1 1 1 1	1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0									
1 0 9 8 7 6 5 4	3 2 1 0 9 8 7 6	5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0									
YY	WW	XX									
Unsigned integer 8 bits (0 to	Unsigned integer 8 bits (0 to	Unsigned integer 16 bits (0 to 65535)									
255 since 2000)	53)										
-	-	MSB LSB									

Cell number:

- 01_h to xx_h = cell number concerned by the minimum voltage (xx is corresponding to the Number of cells per module (object 2045_h)).

<u>Cell voltage</u>: Minimum cell voltage. The resolution shall be 1mV per bit. The range of value shall be 0000_h to $FFFF_h$.

OBJECT DESCRIPTION

INDEX	202A _h
Name	Min Cell Voltage
Object code	RECORD
Data type	MinMaxCellVoltage
Category	Mandatory

RY DESCRIPTION	√					
Sub-index	00 _h					
Description	Highest sub-index supported					
Entry category	Mandatory					
Access	ro					
PDO mapping	No					
Value range	3_{h}					
Default value	3_{h}					
Cub inday	01					
Sub-index	O1 _h					
Description	SMU serial number					
Entry category Mandatory						
Access	ro					
PDO mapping	No					
Value range	UNSIGNED32					
Default value	No					
Sub-index	02 _h					
Description	Cell number					
Entry category	Mandatory					
Access	ro					
PDO mapping	No					
Value range	UNSIGNED8					
Default value	No					



Sub-index	03 _h
Description	Cell voltage
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No

7.3.23. Object 202B_h: Max battery temperature

This object shall indicate the maximum temperature in the battery system and the module concerned by this maximum temperature. This temperature is the maximum temperature among the sensor that corresponds to the cell temperature (module terminals temperatures are not included).

VALUE DEFINITION

See also § 7.2.4 (Record 0083_h definition)

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

3	3	3	2	2 8	2 7	2 6	2 5	2	2	2 2	2	2	1 9	1 8	1 7	1	1 5	1	1	1 2	1	1	0	0	0 7	0 6	0 5	0 4	0	0 2	0	0
YY WW									XX																							
	Unsigned integer 8 bits (0 to 255 since 2000)					Unsigned integer 8 bits (0 to 53)								Unsigned integer 16 bits (0 to 65535)																		
									ı								MS	SB							LS	В						

<u>Temperature</u>: Maximum temperature in the battery. The resolution shall be 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_h$ =-128°C, FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	202B _h					
Name Max battery temperature						
Object code	RECORD					
Data type	MinMaxTemperature					
Category	Mandatory					

ENTRY DESCRIPTION

Value range Default value

RY DESCRIPTION								
Sub-index	00 _h							
Description	Highest sub-index supported							
Entry category	Mandatory							
Access ro								
PDO mapping	PDO mapping No							
Value range	2 _h							
Default value	2 _h							
Cub inday	04							
Sub-index	01 _h							
Description	SMU serial number							
Entry category	Mandatory							
Access	ro							
PDO mapping	No							
Value range	UNSIGNED32							
Default value	No							
0.1.1.1								
Sub-index	02 _h							
Description	Temperature							
Entry category	Mandatory							
Access	ro							
PDO mapping	No							

SIGNED8

No



7.3.24. Object 202C_h: Min battery temperature

This object shall indicate the minimum temperature in battery system and the module concerned by this minimum temperature. This temperature is the minimum temperature among the sensor that corresponds to the cell temperature (module terminals temperatures are not included).

VALUE DEFINITION

See also § 7.2.4 (Record 0083_h definition)

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

									~	σ.		-		~,				• .•													
3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
Y	Y							W	W							X>	(
U	nsig	ned	inte	ger 8	8 bit	ts (0	to	Unsigned integer 8 bits (0 to								Unsigned integer 16 bits (0 to 65535)															
2	255 since 2000)						53)																								
Ī-	-						-								MSB LSB																

<u>Temperature</u>: Minimum temperature in the battery. The resolution shall be 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_h$ =-128°C, / FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	202C _h
Name	Min battery temperature
Object code	RECORD
Data type	MinMaxTemperature
Category	Mandatory

Sub-index	00_{h}
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	2 _h
Default value	2 _h

Sub-index	01 _h
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No

Sub-index	02 _h
Description	Temperature
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	SIGNED8
Default value	No



7.3.25. Object 202D_h: Max connection temperature

This object shall indicate the maximum connection temperature in battery system and the module concerned by this maximum temperature. This temperature is the maximum temperature among the sensor that corresponds to the connection temperature (cell temperatures are not included).

VALUE DEFINITION

See also § 7.2.4 (Record 0083_h definition)

SMU serial number: 4 bytes in the following format: YWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
Ϋ́	YY WW								XX																						
Ur	nsig	ned	inte	ger 8	8 bit	ts (0	to	Ur	sigr	ned	integ	ger 8	8 bit	s (0	to	Unsigned integer 16 bits (0 to 65535)															
25	255 since 2000)						53)																								
-						-							MSB LSB																		

<u>Temperature</u>: Minimum temperature in the battery. The resolution shall be 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_h$ =-128°C, / FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	202D _h
Name	Max connection temperature
Object code	RECORD
Data type	MinMaxTemperature
Category	Mandatory

Sub-index	$00_{\rm h}$
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	2 _h
Default value	2 _h

Sub-index	01 _h
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No

Sub-index	02 _h
Description	Temperature
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	SIGNED8
Default value	No



7.3.26. Object 202E_h: Min connection temperature

This object shall indicate the minimum connection temperature in battery system and the module concerned by this minimum temperature. This temperature is the minimum temperature among the sensor that corresponds to the connection temperature (cell temperatures are not included).

VALUE DEFINITION

See also § 7.2.4 (Record 0083_h definition)

SMU serial number: 4 bytes in the following format: YWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

3	3	2	2 8	2 7	2	2 5	2	2	2	2	2	1 9	1 8	1 7	1	1 5	1 4	1	1	1	1	0 9	0	0 7	0	0 5	0	0	0	0	0
Ϋ́	YY								XX																						
Uı	nsig	ned	inte	ger 8	8 bit	ts (0	to	Un	sigr	ned	integ	ger 8	8 bit	s (0	to	Unsigned integer 16 bits (0 to 65535)															
255 since 2000)						53)																									
-						-							MSB LSB																		

<u>Temperature</u>: Minimum temperature in the battery. The resolution shall be 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_h$ =-128°C, / FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	202E _h
Name	Min connection temperature
Object code	RECORD
Data type	MinMaxTemperature
Category	Mandatory

Sub-index	$00_{\rm h}$
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	2 _h
Default value	2 _h

Sub-index	01 _h
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No

Sub-index	02 _h
Description	Temperature
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	SIGNED8
Default value	No



7.3.27. Object 202F_h: External temperatures

This object shall indicate the value of the 2 external temperature sensors of the BMM.

VALUE DEFINITION

The resolution shall be 1°C per bit (00 $_h$ = 0°C, 7F $_h$ = 127°C, 80 $_h$ =-128°C, / FF $_h$ = -1°C).

OBJECT DESCRIPTION

INDEX	202F _h
Name	External temperatures
Object code	ARRAY
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

KI DESCRIPTION	I
Sub-index	00 _h
Access	ro
PDO mapping	No
Value range	02 _h
Default value	02 _h
Sub-index	01 _h
Description	External temperature N°1
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	SIGNED8
Default value	00_{h}
Sub-index	02 _h
Description	External temperature N°2 (optional)
Entry category	Mandatory

Description External temperature N°2 (optional) Entry category Mandatory Access ro PDO mapping No Value range SIGNED8 Default value No

7.3.28. Object 2030_h: Module cycling SOH table

This object shall indicate the module cycling versus DOD variation.

This object has to be updated by the server when Synchro bit is set by the client.

The client has the possibility to choose the module by writing the module ID in Module number. If the module ID is not found, the server will write 0.

The SMU serial number is used to do physically the link with the virtual module ID.



VALUE DEFINITION

See also § 7.2.5 (Record 0084_h definition)

Module number: (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- $XX_h = module number$

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.

XX: third and fourth bytes for the identifier.

3	3	2 9	2 8	2 7	2 6	2 5	2 4	2	2	2	2	1 9	1 8	1 7	1 6	1 5	1 4	1	1 2	1	1	0	0	0 7	0	0 5	0	0	0	0	0
Y	Υ							W	W							XΣ	(
τ	Insig	ned	inte	ger	8 bit	ts (0	to	Ur	nsigr	ned	integ	ger 8	3 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	6 bi	ts (0) to	6553	35)						
2	55 s	ince	200	0)				53	3)								_														
Γ-								-								MS	SB							LS	В						

Synchro: Used to synchronize data between client and server Bit0:

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

xx% DOD ≤ DOD < yy% DOD: number of module charge/discharge cycles versus DOD variation

1 cycle per bit

OBJECT DESCRIPTION

INDEX	2030 _h
Name	Module cycling SOH
Object code	RECORD
Data type	ModuleCyclingSOH
Category	Mandatory

ENTR

RY DESCRIPTION	N .
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	0D _h
Default value	0D _h
Sub-index	01 _b
Description	Module number
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	02 _b
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No



Description Synchro	Cub index	02
Entry category	Sub-index	03 _h
Access No		
PDO mapping		
Value range UNSIGNED8		
Default value		
Sub-index DoD < 10% DOD		
Description DÖD < 10% DOD	Default value	NO NO
Entry category	Sub-index	04 _b
Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 10% DOD ≤ DOD < 20% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 20% DOD ≤ DOD < 30% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 20% DOD ≤ DOD < 30% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 30% DOD ≤ DOD < 40% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16	Description	DOD < 10% DOD
Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 10% DOD ≤ DOD < 20% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 20% DOD ≤ DOD < 30% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 20% DOD ≤ DOD < 30% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 30% DOD ≤ DOD < 40% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Entry category Mandatory Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16 Default value No Sub-index OSh Description Entry category Access To PDO mapping No Value range UNSIGNED16	Entry category	Mandatory
Value range UNSIGNED16 Default value No Sub-index 05h Description 10% DOD ≤ DOD < 20% DOD		ro
Value range Default value No Sub-index Description 10% DOD ≤ DOD < 20% DOD	PDO mapping	No
Sub-index 05h Description 10% DOD ≤ DOD < 20% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 06h Description Entry category Mandatory Access PDO mapping No No Sub-index 07h OSCESTIPION PDO mapping No No Sub-index 07h OSCESTIPION Entry category Mandatory Access PDO mapping No No Sub-index 08h OSCESTIPION PDO mapping No No Sub-index 08h OSCESTIPION PDO mapping No No Value range UNSIGNED16 Default value No Sub-index OSCESTIPION No PDO mapping No No Value range UNSIGNED16		UNSIGNED16
Description	Default value	No
Description	Code Seeders	
Entry category Access ro PDO mapping Value range Default value No Sub-index Description Entry category Access ro PDO mapping Value range Default value No Sub-index Description Entry category Access ro PDO mapping Value range Default value No Sub-index Description Entry category Access Ro PDO mapping Value range Default value No Sub-index Description Entry category Access Ro PDO mapping Value range Default value No Sub-index Description Default value No Sub-index Description Default value No Sub-index Description Entry category Access Ro PDO mapping Value range Default value No Sub-index Description Entry category Access Ro PDO mapping Value range Default value No Sub-index Description Entry category Access Ro PDO mapping Value range Default value No Sub-index Description Description Entry category Access Ro PDO mapping No Value range Default value No Sub-index Description Description Entry category Access Ro PDO mapping No Value range Default value No Sub-index Description Default value No Sub-index Description Description Entry category Access Ro PDO mapping No Value range UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 Description Entry category Access Ro PDO mapping No Value range UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16 UNSIGNED16		
Access FO PDO mapping No Value range Default value No		
PDO mapping Value range Default value No Sub-index Description Entry category Access PDO mapping Value range Default value No Sub-index Oor, Description Oor, Description Oor, Description Oor, Description Value range Default value No Sub-index Description Default value No Sub-index Description Oor, Description Oor, Description Oor, Description Oor, Description Oor, Oor, Description Oor, Oor, Description Oor, Oor, Oor, Oor, Oor, Oor, Oor, Oor,		•
Value range UNSIGNED16 Default value No Sub-index 06h Description 20% DOD ≤ DOD < 30% DOD		
Default value No Sub-index 06h Description 20% DOD ≤ DOD < 30% DOD		
Sub-index 06h Description 20% DOD ≤ DOD < 30% DOD		
Description 20% DOD ≤ DOD < 30% DOD	Delault value	INU
Description 20% DOD ≤ DOD < 30% DOD	Sub-index	06 _h
Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index O7h Description 30% DOD ≤ DOD < 40% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index O8h Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index O8h Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index O9h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index O9h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index OAh Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Description	20% DOD ≤ DOD < 30% DOD
PDO mapping No Value range UNSIGNED16 Default value No Sub-index 07h Description 30% DOD ≤ DOD < 40% DOD	Entry category	Mandatory
Value range UNSIGNED16 Default value No Sub-index 07h Description 30% DOD ≤ DOD < 40% DOD		ro
Value range UNSIGNED16 Default value No Sub-index 07h Description 30% DOD ≤ DOD < 40% DOD	PDO mapping	No
Sub-index 07h Description 30% DOD ≤ DOD < 40% DOD		UNSIGNED16
Description 30% DOD ≤ DOD < 40% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 08h Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Default value	No
Description 30% DOD ≤ DOD < 40% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 08h Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16		
Entry category Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index Description Entry category Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index Description Sub-index No Sub-index Default value No Sub-index Description Entry category Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index Description Entry category Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index Description Sub-index Description Sub-index OAh Description OAh Description Default value No Sub-index No No Sub-index No Sub-index No No No Sub-index No	Cub inday	07
AccessroPDO mappingNoValue rangeUNSIGNED16Default valueNoSub-index 08_h Description 40% DOD ≤ DOD < 50% DODEntry categoryMandatoryAccessroPDO mappingNoValue rangeUNSIGNED16Default valueNoSub-index 09_h Description 50% DOD ≤ DOD < 60% DODEntry categoryMandatoryAccessroPDO mappingNoValue rangeUNSIGNED16Default valueNoSub-index $0A_h$ Description 60% DOD ≤ DOD < 70% DODEntry categoryMandatoryAccessroPDO mappingNoValue rangeUNSIGNED16PDO mappingNoValue rangeUNSIGNED16		
PDO mapping No Value range UNSIGNED16 Default value No Sub-index 08h Description 40% DOD ≤ DOD < 50% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No	Description	30% DOD ≤ DOD < 40% DOD
Value range UNSIGNED16 Default value No Sub-index 08h Description 40% DOD ≤ DOD < 50% DOD	Description Entry category	30% DOD ≤ DOD < 40% DOD Mandatory
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Description Entry category Access	30% DOD ≤ DOD < 40% DOD Mandatory ro
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Description Entry category Access PDO mapping	30% DOD ≤ DOD < 40% DOD Mandatory ro No
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16
Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16
Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Value range UNSIGNED16 Default value No	Description Entry category Access PDO mapping Value range Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No
PDO mapping No Value range UNSIGNED16 Default value No Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Description Entry category Access PDO mapping Value range Default value Sub-index Description	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro
Sub-index 09h Description 50% DOD ≤ DOD < 60% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No
Description 50% DOD ≤ DOD < 60% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No
Description 50% DOD ≤ DOD < 60% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16
Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0A _h Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No
AccessroPDO mappingNoValue rangeUNSIGNED16Default valueNoSub-index0AhDescription60% DOD ≤ DOD < 70% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 08 _h
PDO mapping No Value range UNSIGNED16 Default value No Sub-index 0A _h Description 60% DOD ≤ DOD < 70% DOD Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09 _h 50% DOD ≤ DOD < 60% DOD
$ \begin{array}{c cccc} Value & range & UNSIGNED16 \\ \hline Default \ value & No \\ \hline \\ Sub-index & 0A_h \\ \hline Description & 60\% \ DOD \leq DOD < 70\% \ DOD \\ \hline Entry \ category & Mandatory \\ \hline Access & ro \\ \hline PDO \ mapping & No \\ \hline Value \ range & UNSIGNED16 \\ \hline \end{array} $	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08 _h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09 _h 50% DOD ≤ DOD < 60% DOD Mandatory
	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro
Sub-index 0Ah Description 60% DOD ≤ DOD < 70% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No No O9h 50% DOD ≤ DOD < 60% DOD
Description 60% DOD ≤ DOD < 70% DOD	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16
Entry category Mandatory Access ro PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16
Access ro PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD
PDO mapping No Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 70% DOD
Value range UNSIGNED16	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 70% DOD
	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No O9h 50% DOD ≤ DOD < 70% DOD Mandatory ro No UNSIGNED16 No UNSIGNED16 No OAh 60% DOD ≤ DOD < 70% DOD Mandatory ro
Default value No	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Description Entry category Access PDO mapping	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 0Ah 60% DOD ≤ DOD < 70% DOD Mandatory ro No
	Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range	30% DOD ≤ DOD < 40% DOD Mandatory ro No UNSIGNED16 No 08h 40% DOD ≤ DOD < 50% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No 09h 50% DOD ≤ DOD < 60% DOD Mandatory ro No UNSIGNED16 No UNSIGNED16 No UNSIGNED16 No OAh 60% DOD ≤ DOD < 70% DOD Mandatory ro No UNSIGNED16



Sub-index	$0B_{h}$
Description	70% DOD ≤ DOD < 80% DOD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	0C _b
Description	80% DOD ≤ DOD < 90% DOD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	0D _h
Description	90% DOD ≤ DOD < 100% DOD
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No

7.3.29. Object 2031_h: Module calendar SOH

This object shall indicate the time spent by the module at different temperature and SOC.

This object has to be updated by the server when Synchro bit is set by the client.

The client has the possibility to chose the module by writing the module ID in Module number. If the module ID is not found, the server will write 0.

The SMU serial number is used to do physically the link with the virtual module ID.

VALUE DEFINITION

See also § 7.2.6 (Record 0085_h definition)

Module number: (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- $-XX_h = module number$

SMU serial number: 4 bytes in the following format: YYWWXX

- YY: first byte for the year.
- WW: second byte for the week.
- XX: third and fourth bytes for the identifier.

3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
Υ	Υ							W	W							XX	(
U	nsig	ned	inte	ger 8	8 bit	ts (0	to	Ur	nsigr	ned	integ	ger 8	8 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	6 bi	ts (0) to (6553	35)						
2	55 s	ince	200	0)		-		53)								_														
—								-								MS	SB							LS	B						

Synchro: Used to synchronize data between client and server Bit0:

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

 $xx^{\circ}C < T^{\circ}C \le yy^{\circ}C$ & aa% $\le SOC < bb\%$: time spent by the module versus temperature and SOC.

1 hour per bit

This information contained in this document is SAFT proprietary and shall not be disclosed by the recipient to third persons without the written consent of the Company.



OBJECT DESCRIPTION

INDEX	2031 _h
Name	Module calendar SOH
Object code	RECORD
Data type	ModuleCalendarSOH
Category	Mandatory

ENT

	•
RY DESCRIPTION	1
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	0D _h
Default value	0D _h
Sub-index	01 _h
Description	Module number
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	02 _h
Description	SMU serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No
Sub-index	03 _h
Description	Synchro
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	04 _h
Description	T°C ≤ T0 & SOC =< S0 (T[0][0])
Entry category	Mandatory
Access	ro
7100000	1 10
PDO manning	No
PDO mapping Value range	No LINSIGNED16
PDO mapping Value range Default value	No UNSIGNED16 No
Value range Default value	UNSIGNED16 No
Value range Default value Sub-index	UNSIGNED16 No 05 _h
Value range Default value Sub-index Description	UNSIGNED16 No 05_h $T^{\circ}C \leq T0 \& S0 < SOC = < S1 (T[0][1])$
Value range Default value Sub-index Description Entry category	UNSIGNED16 No 05_h $T^{\circ}C \leq T0 \& S0 < SOC = < S1 (T[0][1])$ Mandatory
Value range Default value Sub-index Description Entry category Access	UNSIGNED16 No 05_h $T^{\circ}C \leq T0 \& S0 < SOC = < S1 (T[0][1])$ Mandatory ro
Value range Default value Sub-index Description Entry category Access PDO mapping	
Value range Default value Sub-index Description Entry category Access	UNSIGNED16 No 05_h $T^{\circ}C \leq T0 \& S0 < SOC = < S1 (T[0][1])$ Mandatory ro



O. de Seedan	00
Sub-index	06 _h
Description	T°C ≤ T0 & S1 <soc (t[0][2])<="" =<="" s2="" td=""></soc>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	07 _b
Description	T°C ≤ T0 & S2 <soc (t[0][3])<="" =<="" s3="" td=""></soc>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	08 _h
Description	T°C ≤ T0 & S3 <soc (t[0][4])<="" =<="" s4="" td=""></soc>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	09 _b
Description	T°C ≤ T0 & S4 <soc (t[0][5])<="" =<="" s5="" td=""></soc>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Delault value	110
Sub-index	0A _h
Description	T°C ≤ T0 & S5 <soc (t[0][6])<="" td=""></soc>
Description Entry category	$0A_h$ $T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory
Description Entry category Access	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro
Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro No
Description Entry category Access PDO mapping Value range	T°C ≤ T0 & S5 <soc (t[0][6])="" mandatory="" no="" ro="" td="" unsigned16<=""></soc>
Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro No
Description Entry category Access PDO mapping Value range Default value	T°C ≤ T0 & S5 <soc (t[0][6])="" mandatory="" no="" no<="" ro="" td="" unsigned16=""></soc>
Description Entry category Access PDO mapping Value range Default value Sub-index	T°C ≤ T0 & S5 <soc (t[0][6])="" 0b<sub="" mandatory="" no="" ro="" unsigned16="">h</soc>
Description Entry category Access PDO mapping Value range Default value Sub-index Description	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro No UNSIGNED16 No OB_h $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro No UNSIGNED16 No OB_h $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$ Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ Mandatory ro No UNSIGNED16 No OB_h $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$ Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$ $Mandatory$ ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T°C ≤ T0 & S5 <soc (t[0][6])="" mandatory="" no="" ob<sub="" ro="" unsigned16="">h T0<t°c &="" (t[1][0])="" mandatory="" no="" no<="" ro="" s0="" soc="<" t1="" td="" unsigned16="" ≤=""></t°c></soc>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$ \begin{array}{l} T^{\circ}C \leq T0 \;\&\; S5 < SOC \; (T[0][6]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ OB_h \\ \hline T0 < T^{\circ}C \leq T1 \;\&\; SOC = <\; S0 \; (T[1][0]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ OC_h \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$T^{\circ}C \leq T0 \& S5 < SOC (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T^{\circ}C \leq T0 \;\&\; S5 < SOC \; (T[0][6]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ OB_h \\ \hline T0 < T^{\circ}C \leq T1 \;\&\; SOC = <\; S0 \; (T[1][0]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ OC_h \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No OB_{h} $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No OC_{h} $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No OB_{h} $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No OC_{h} $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No OC_{h} $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} T^{\circ}C \leq T0 \;\&\; S5 < SOC \; (T[0][6]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline OB_h \\ \\ T0 < T^{\circ}C \leq T1 \;\&\; SOC = <\; S0 \; (T[1][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline OC_h \\ \\ T0 < T^{\circ}C \leq T1 \;\&\; S0 < SOC = <\; S1(T[1][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline OD_h \\ \\ T0 < T^{\circ}C \leq T1 \;\&\; S0 < SOC = <\; S1(T[1][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline OD_h \\ \\ T0 < T^{\circ}C \leq T1 \;\&\; S1 < SOC = <\; S2 \; (T[1][2]) \\ \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $0U_{h}$ $UNSIGNED16$ No $0D_{h}$ $T0 < T^{\circ}C \leq T1 \& S1 < SOC = < S2 \ (T[1][2])$ $Mandatory$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $UNSIGNED16$ No $0D_{h}$ $T0 < T^{\circ}C \leq T1 \& S1 < SOC = < S2 \ (T[1][2])$ $Mandatory$ ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value Sub-index Description Entry category Access PDO mapping	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_h$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_h$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $0UNSIGNED16$ No $UNSIGNED16$ No $UNSIGNED16$ No $0D_h$ $T0 < T^{\circ}C \leq T1 \& S1 < SOC = < S2 \ (T[1][2])$ $Mandatory$ ro No $UNSIGNED16$ No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$T^{\circ}C \leq T0 \& S5 < SOC \ (T[0][6])$ $Mandatory$ ro No $UNSIGNED16$ No $0B_{h}$ $T0 < T^{\circ}C \leq T1 \& SOC = < S0 \ (T[1][0])$ $Mandatory$ ro No $UNSIGNED16$ No $0C_{h}$ $T0 < T^{\circ}C \leq T1 \& S0 < SOC = < S1(T[1][1])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $UNSIGNED16$ No $0D_{h}$ $T0 < T^{\circ}C \leq T1 \& S1 < SOC = < S2 \ (T[1][2])$ $Mandatory$ ro



Cub in dov	١٥٢
Sub-index	0E _h
Description	T0 <t°c &="" (t[1][3])<="" s2<soc="<" s3="" t1="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	0F _b
Description	T0 <t°c &="" (t[1][4])<="" s3<soc="<" s4="" t1="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	10 _h
Description	T0 <t°c &="" (t[1][5])<="" s4<soc="<" s5="" t1="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	11 _h
Description	T0 <t°c &="" (t[1][6])<="" s5<soc="" t1="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No No
Delault value	110
Sub-index	12 _h
Description	T1 <t°c &="" (t[2][0])<="" s0="" soc="<" t2="" td="" ≤=""></t°c>
Description Entry category	
Description Entry category Access	T1 <t°c &="" (t[2][0])="" mandatory="" ro<="" s0="" soc="<" t2="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping	T1 <t°c &="" (t[2][0])="" mandatory="" no<="" ro="" s0="" soc="<" t2="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range	T1 <t°c &="" (t[2][0])="" mandatory="" no="" ro="" s0="" soc="<" t2="" td="" unsigned16<="" ≤=""></t°c>
Description Entry category Access PDO mapping	T1 <t°c &="" (t[2][0])="" mandatory="" no<="" ro="" s0="" soc="<" t2="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value	T1 <t°c &="" (t[2][0])="" mandatory="" no="" no<="" ro="" s0="" soc="<" t2="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h</t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][1])<="" s0<soc="<" s1="" t2="" td="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 13_{h} \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$T1 < T^{\circ}C \le T2 \& SOC = < SO (T[2][0])$ Mandatory ro No UNSIGNED16 No 13_h $T1 < T^{\circ}C \le T2 \& SO < SOC = < S1 (T[2][1])$ Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 13_{h} \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T1 Mandatory ro No UNSIGNED16 No 13_{h} T1 Mandatory ro No UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][1])="" mandatory="" no="" no<="" ro="" s0<soc="<" s1="" t2="" td="" unsigned16="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][1])="" 14<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t2="" unsigned16="" ≤="">h</t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 13_h \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][1])="" 14<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t2="" unsigned16="" ≤="">h</t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline 14_h \\ \\ \hline T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline \\ 14_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ UNSIGNED16 \\ \\ No \\ \\ \hline \\ 14_h \\ \\ \hline \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ 14_h \\ \\ \hline \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ UNSIGNED16 \\ \\ \\ \\ UNSIGNED16 \\ \\ \\ \\ UNSIGNED16 \\ \\ \\ \\ UNSIGNED16 \\ \\ UNSIGNED16 \\ \\ \\ UNSIGNED16 \\ \\ \\ UNSIGNED16 \\ \\ \\ UNSIGNED16 \\ \\ UNSIGNED16 \\ \\ \\ UNSIGNED16 \\ \\$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \\ 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline \\ 14_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 13_h \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \\ \hline 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline \\ 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline \\ 14_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ No \\ \\ \hline \\ UNSIGNED16 \\ No \\ \\ \hline \\ 14_h \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline \\ 10 \\ \\ 10 \\ \\ 10 \\ \\ 10 \\ \\ 10 \\ \\ 10 \\ \\ \\ 10 \\ \\ \\ 10 \\ \\ \\ \\$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline \\ 13_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline \\ 14_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \hline \\ 15_h \\ \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T1 <t°c &="" (t[2][0])="" 13<sub="" mandatory="" no="" ro="" s0="" soc="<" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][1])="" 14<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][2])="" 14<sub="" mandatory="" no="" ro="" s1<soc="<" s2="" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][2])="" 15<sub="" mandatory="" no="" ro="" s1<soc="<" s2="" t2="" unsigned16="" ≤="">h T1<t°c &="" (t[2][3])="" mandatory<="" s2<soc="<" s3="" t2="" td="" ≤=""></t°c></t°c></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 13_h \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 15_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ Mandatory \\ ro \\ No \\ \hline \\ 15_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ Mandatory \\ ro \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 13_h \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 15_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access Description Entry category Access	$ \begin{array}{c} T1 < T^{\circ}C \leq T2 \;\&\; SOC = <\; SO\; (T[2][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 13_h \\ T1 < T^{\circ}C \leq T2 \;\&\; SO < SOC = <\; S1\; (T[2][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 14_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S1 < SOC = <\; S2\; (T[2][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 15_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ Mandatory \\ ro \\ No \\ \hline \\ 15_h \\ T1 < T^{\circ}C \leq T2 \;\&\; S2 < SOC = <\; S3\; (T[2][3]) \\ Mandatory \\ ro \\ \end{array} $



Cub index	40
Sub-index	16 _h
Description	T1 <t°c &="" (t[2][4])<="" s3<soc="<" s4="" t2="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No Line Control of the Control of th
Value range	UNSIGNED16
Default value	No
Sub-index	17 _h
Description	T1 <t°c &="" (t[2][5])<="" s4<soc="<" s5="" t2="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	18 _h
Description	T1 <t°c &="" (t[2][6])<="" s5<soc="" t2="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	19 _h
Description	T2 <t°c &="" (t[3][0])<="" s0="" soc="<" t3="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Default value	INO
Sub-index	1A _h
Sub-index Description	1A _h T2 <t°c &="" (t[3][1])<="" s0<soc="<" s1="" t3="" td="" ≤=""></t°c>
Description	T2 <t°c &="" (t[3][1])="" mandatory="" ro<="" s0<soc="<" s1="" t3="" td="" ≤=""></t°c>
Description Entry category	T2 <t°c &="" (t[3][1])="" mandatory<="" s0<soc="<" s1="" t3="" td="" ≤=""></t°c>
Description Entry category Access	T2 <t°c &="" (t[3][1])="" mandatory="" ro<="" s0<soc="<" s1="" t3="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping	T2 <t°c &="" (t[3][1])="" mandatory="" no<="" ro="" s0<soc="<" s1="" t3="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value	T2 <t°c &="" (t[3][1])="" mandatory="" no="" no<="" ro="" s0<soc="<" s1="" t3="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index	T2 <t°c &="" (t[3][1])="" 1b<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t3="" unsigned16="" ≤="">h</t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description	$T2 Mandatory ro No UNSIGNED16 No 1B_h T2$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ 1B_{h} \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ Mandatory \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$T2 < T^{\circ}C \le T3 \& S0 < SOC = < S1 (T[3][1])$ Mandatory ro No UNSIGNED16 No $1B_h$ $T2 < T^{\circ}C \le T3 \& S1 < SOC = < S2 (T[3][2])$ Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T2 < T^{\circ}C \le T3 \& S0 < SOC = < S1 (T[3][1])$ $Mandatory$ ro No $UNSIGNED16$ No $1B_{h}$ $T2 < T^{\circ}C \le T3 \& S1 < SOC = < S2 (T[3][2])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T2 < T^{\circ}C \le T3 \& S0 < SOC = < S1 (T[3][1])$ $Mandatory$ ro No $UNSIGNED16$ No $1B_{h}$ $T2 < T^{\circ}C \le T3 \& S1 < SOC = < S2 (T[3][2])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ T2 < T^{\circ}C \le T3 \& S0 < SOC = < S1 (T[3][1]) $ Mandatory $ ro $ No $ UNSIGNED16 $ No $ 1B_{h} $ $ T2 < T^{\circ}C \le T3 \& S1 < SOC = < S2 (T[3][2]) $ Mandatory $ ro $ No $ UNSIGNED16 $ No $ UNSIGNED16 $ No $ UNSIGNED16 $ No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1C_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$T2 < T^{\circ}C \le T3 \& S0 < SOC = < S1 (T[3][1])$ $Mandatory$ ro No $UNSIGNED16$ No $1B_{h}$ $T2 < T^{\circ}C \le T3 \& S1 < SOC = < S2 (T[3][2])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $1C_{h}$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1C_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ \\ Mandatory \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ UNSIGNED16 \\ \\ No \\ \\ \hline 1C_h \\ \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ \\ \\ Mandatory \\ ro \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC \; = <\; S1 \; (T[3][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1B_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC \; = <\; S2 \; (T[3][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC \; = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1 \; (T[3][1]) \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \ \& \ SO < SOC = < \ S1 \ (T[3][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \ \& \ S1 < SOC = < \ S2 \ (T[3][2]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1C_h \\ T2 < T^{\circ}C \leq T3 \ \& \ S2 < SOC = < \ S3 \ (T[3][3]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1D_h \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC = <\; S1\; (T[3][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1B_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2\; (T[3][2]) \\ \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ \hline 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3\; (T[3][3]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3\; (T[3][3]) \\ \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ \hline 1D_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S3 < SOC = <\; S4\; (T[3][4]) \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \ \& \ SO < SOC = < \ S1 \ (T[3][1]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1B_h \\ \\ T2 < T^{\circ}C \leq T3 \ \& \ S1 < SOC = < \ S2 \ (T[3][2]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1C_h \\ T2 < T^{\circ}C \leq T3 \ \& \ S2 < SOC = < \ S3 \ (T[3][3]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 1D_h \\ \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; S0 < SOC \; = <\; S1 \; (T[3][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1B_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC \; = <\; S2 \; (T[3][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC \; = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S3 < SOC \; = <\; S4 \; (T[3][4]) \\ Mandatory \\ ro \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S3 < SOC \; = <\; S4 \; (T[3][4]) \\ Mandatory \\ ro \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; SO < SOC = <\; S1 \; (T[3][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1B_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S3 < SOC = <\; S4 \; (T[3][4]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T2 < T^{\circ}C \leq T3 \& SO < SOC = < S1 \ (T[3][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1B_h \\ T2 < T^{\circ}C \leq T3 \& S1 < SOC = < S2 \ (T[3][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \& S2 < SOC = < S3 \ (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \& S3 < SOC = < S4 \ (T[3][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \& S3 < SOC = < S4 \ (T[3][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ \hline \\ \\ \\ UNSIGNED16 \\ \hline \\ \\ \\ \\ UNSIGNED16 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Default value	$ \begin{array}{l} T2 < T^{\circ}C \leq T3 \;\&\; SO < SOC = <\; S1 \; (T[3][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1B_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S1 < SOC = <\; S2 \; (T[3][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1C_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S2 < SOC = <\; S3 \; (T[3][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 1D_h \\ T2 < T^{\circ}C \leq T3 \;\&\; S3 < SOC = <\; S4 \; (T[3][4]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $



Cub inday	45
Sub-index	1E _h T2 <t°c &="" (t[3][5])<="" s4<soc="<" s5="" t3="" td="" ≤=""></t°c>
Description	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Entry category	Mandatory
Access	ro No
PDO mapping	
Value range	UNSIGNED16
Default value	No
Sub-index	1F _h
Description	T2 <t°c &="" (t[3][6])<="" s5<soc="" t3="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	20 _h
Description	T3 <t°c &="" (t[4][0])<="" s0="" soc="<" t4="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	21 _h T3 <t°c &="" (t[4][1])<="" s0<soc="<" s1="" t4="" td="" ≤=""></t°c>
Description	\ L 1L 1/
Entry category	Mandatory
Access	ro No
PDO mapping	UNSIGNED16
	LUNSIGNEDID
Value range	
Default value	No No
Default value Sub-index	No 22 _h
Default value Sub-index Description	No 22 _h T3 <t°c &="" (t[4][2])<="" s1<soc="<" s2="" t4="" td="" ≤=""></t°c>
Default value Sub-index Description Entry category	No 22 _h
Default value Sub-index Description Entry category Access	No
Default value Sub-index Description Entry category Access PDO mapping	No
Default value Sub-index Description Entry category Access PDO mapping Value range	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping	No
Default value Sub-index Description Entry category Access PDO mapping Value range Default value	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$ \begin{array}{c} \text{No} \\ \hline 22_h \\ \hline T3 < T^{\circ}C \leq T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ \hline \text{Mandatory} \\ \hline \text{ro} \\ \hline \text{No} \\ \hline \text{UNSIGNED16} \\ \hline \text{No} \\ \hline \hline 23_h \\ \hline T3 < T^{\circ}C \leq T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ \hline \text{Mandatory} \\ \hline \end{array} $
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$ \begin{array}{c} \text{No} \\ \hline 22_h \\ \hline T3 < T^{\circ}C \leq T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ \hline \text{Mandatory} \\ \hline \text{ro} \\ \hline \text{No} \\ \hline \text{UNSIGNED16} \\ \hline \text{No} \\ \hline \hline 23_h \\ \hline T3 < T^{\circ}C \leq T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ \hline \text{Mandatory} \\ \hline \text{ro} \\ \hline \end{array} $
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$\begin{array}{c} 22_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline 23_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline 24_h \\ \end{array}$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	No $ 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$\begin{array}{c} 22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$\begin{array}{c} 22_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 23_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ \\ 24_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S3 < SOC = < \ S4 \ (T[4][4]) \\ Mandatory \\ ro \\ \end{array}$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$\begin{array}{c} 22_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ \hline 23_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline 24_h \\ T3 < T^{\circ}C \leq T4 \ \& \ S3 < SOC = < \ S4 \ (T[4][4]) \\ Mandatory \\ ro \\ No \\ \hline \end{array}$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Value range POO mapping Value range	$\begin{array}{c} 22_h \\ T3 < T^{\circ}C \le T4 \ \& \ S1 < SOC = < \ S2 \ (T[4][2]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 23_h \\ T3 < T^{\circ}C \le T4 \ \& \ S2 < SOC = < \ S3 \ (T[4][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 24_h \\ T3 < T^{\circ}C \le T4 \ \& \ S3 < SOC = < \ S4 \ (T[4][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 24_h \\ T3 < T^{\circ}C \le T4 \ \& \ S3 < SOC = < \ S4 \ (T[4][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ UNSIGNED16 \\ \\ UNSIGNED$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$\begin{array}{c} 22_h \\ T3$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value	No $ 22_h \\ T3$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value Sub-index Default value	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	No $22_h \\ T3$
Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	No $ 22_h \\ T3$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	No $22_h \\ T3$



Cub inday	
Sub-index	26 _h T3 <t°c &="" (t[4][6])<="" s5<soc="" t4="" td="" ≤=""></t°c>
Description	(1 11 1/
Entry category	Mandatory
Access	ro No
PDO mapping	UNSIGNED16
Value range Default value	No
Default value	INO
Sub-index	27 _h
Description	T4 <t°c &="" (t[5][0])<="" s0="" soc="<" t5="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No No
Sub-index	28 _h
Description	T4 <t°c &="" (t[5][1])<="" s0<soc="<" s1="" t5="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	29 _h
Description	T4 <t°c &="" (t[5][2])<="" s1<soc="<" s2="" t5="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No No
Value range	UNSIGNED16
Default value	No
Default value Sub-index	2A _h
	2A _h T4 <t°c &="" (t[5][3])<="" s2<soc="<" s3="" t5="" td="" ≤=""></t°c>
Sub-index	2A _h
Sub-index Description Entry category Access	2A _h T4 <t°c &="" (t[5][3])="" mandatory="" ro<="" s2<soc="<" s3="" t5="" td="" ≤=""></t°c>
Sub-index Description Entry category	$ 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range	2A _h T4 <t°c &="" (t[5][3])="" mandatory="" no="" ro="" s2<soc="<" s3="" t5="" td="" unsigned16<="" ≤=""></t°c>
Sub-index Description Entry category Access PDO mapping	$ 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value	2A _h T4 <t°c &="" (t[5][3])="" mandatory="" no="" no<="" ro="" s2<soc="<" s3="" t5="" td="" unsigned16="" ≤=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range	2A _h T4 <t°c &="" (t[5][3])="" mandatory="" no="" ro="" s2<soc="<" s3="" t5="" td="" unsigned16<="" ≤=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	2A _h T4 <t°c &="" (t[5][3])="" 2b<sub="" mandatory="" no="" ro="" s2<soc="<" s3="" t5="" unsigned16="" ≤="">h</t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ ro \\ \\ 14 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ ro \\ \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \hline \\ \\ UNSIGNED16 \\ \\ \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \hline \\ \\ UNSIGNED16 \\ \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \hline \\ \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \\ UNSIGNED16 \\ \hline \\ UNSIGNED16 \\ \hline$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < \ S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < \ S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < \ S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2D_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S5 < SOC \ (T[5][6]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Company category Access Description Entry category Access PDO mapping	$ \begin{array}{c} 2A_h \\ T4$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 2A_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S2 < SOC = < S3 \ (T[5][3]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2B_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S3 < SOC = < S4 \ (T[5][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2C_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S4 < SOC = < S5 \ (T[5][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 2D_h \\ T4 < T^{\circ}C \leq T5 \ \& \ S5 < SOC \ (T[5][6]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $



Cub in dov	٥٢
Sub-index	ZE _h
Description	T5 <t°c &="" (t[6][0])<="" s0="" soc="<" t6="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	2F _b
Description	T5 <t°c &="" (t[6][1])<="" s0<soc="<" s1="" t6="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	30 _h
Description	T5 <t°c &="" (t[6][2])<="" s1<soc="<" s2="" t6="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	31 _h
Description	T5 <t°c &="" (t[6][3])<="" s2<soc="<" s3="" t6="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Delault value	110
Sub-index	32 _h
Description	T5 <t°c &="" (t[6][4])<="" s3<soc="<" s4="" t6="" td="" ≤=""></t°c>
Description Entry category Access	T5 <t°c &="" (t[6][4])="" mandatory="" ro<="" s3<soc="<" s4="" t6="" td="" ≤=""></t°c>
Description Entry category	T5 <t°c &="" (t[6][4])="" mandatory="" no<="" ro="" s3<soc="<" s4="" t6="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range	T5 <t°c &="" (t[6][4])="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" td="" unsigned16<="" ≤=""></t°c>
Description Entry category Access PDO mapping	T5 <t°c &="" (t[6][4])="" mandatory="" no<="" ro="" s3<soc="<" s4="" t6="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value	T5 <t°c &="" (t[6][4])="" mandatory="" no="" no<="" ro="" s3<soc="<" s4="" t6="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h</t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])<="" s4<soc="<" s5="" t6="" td="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 (T[6][4])$ Mandatory ro No UNSIGNED16 No 33 _h $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 (T[6][5])$ Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" mandatory="" ro<="" s4<soc="<" s5="" t6="" td="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" mandatory="" no<="" ro="" s4<soc="<" s5="" t6="" td="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" mandatory="" no="" ro="" s4<soc="<" s5="" t6="" td="" unsigned16<="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" mandatory="" no="" no<="" ro="" s4<soc="<" s5="" t6="" td="" unsigned16="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" 34<sub="" mandatory="" no="" ro="" s4<soc="<" s5="" t6="" unsigned16="" ≤="">h</t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" 34<sub="" mandatory="" no="" ro="" s4<soc="<" s5="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][6])c<="" s5<soc="" t6="" td="" ≤=""></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" 34<sub="" mandatory="" no="" ro="" s4<soc="<" s5="" t6="" unsigned16="" ≤="">h</t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	T5 <t°c &="" (t[6][4])="" (t[6][5])="" (t[6][6])c="" 33h="" 34h="" mandatory="" no="" ro="" ro<="" s3<soc="<" s4="" s4<soc="<" s5="" s5<soc="" t5<t°c="" t6="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 \ (T[6][4])$ $Mandatory$ ro No $UNSIGNED16$ No 33_{h} $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 \ (T[6][5])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 \ (T[6][4])$ $Mandatory$ ro No $UNSIGNED16$ No 33_{h} $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 \ (T[6][5])$ $Mandatory$ ro No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 \ (T[6][4])$ $Mandatory$ ro No $UNSIGNED16$ No 33_{h} $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 \ (T[6][5])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 \ (T[6][4])$ $Mandatory$ ro No $UNSIGNED16$ No 33_{h} $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 \ (T[6][5])$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No $UNSIGNED16$ No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$T5 < T^{\circ}C \le T6 \& S3 < SOC = < S4 \ (T[6][4])$ $Mandatory$ ro No $UNSIGNED16$ No 33_{h} $T5 < T^{\circ}C \le T6 \& S4 < SOC = < S5 \ (T[6][5])$ $Mandatory$ ro No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No $UNSIGNED16$ No 34_{h} $T5 < T^{\circ}C \le T6 \& S5 < SOC \ (T[6][6])c$ $Mandatory$ ro No $UNSIGNED16$ No $UNSIGNED16$ No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	T5 <t°c &="" (t[6][4])="" 33<sub="" mandatory="" no="" ro="" s3<soc="<" s4="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][5])="" 34<sub="" mandatory="" no="" ro="" s4<soc="<" s5="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][6])c="" 34<sub="" mandatory="" no="" ro="" s5<soc="" t6="" unsigned16="" ≤="">h T5<t°c &="" (t[6][6])c="" 35<sub="" mandatory="" no="" ro="" s5<soc="" t6="" unsigned16="" ≤="">h T6<t°c &="" (t[7][0])<="" s0="" soc="<" t7="" td="" ≤=""></t°c></t°c></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T5 <t°c &="" (t[6][4])="" (t[6][5])="" (t[6][6])c="" (t[7][0])="" 33h="" 34h="" 35h="" mandatory="" mandatory<="" no="" ro="" s0="" s3<soc="<" s4="" s4<soc="<" s5="" s5<soc="" soc="<" t5<t°c="" t6="" t6<t°c="" t7="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T5 <t°c &="" (t[6][4])="" (t[6][5])="" (t[6][6])c="" (t[7][0])="" 33h="" 34h="" 35h="" mandatory="" mo="" no="" ro="" ro<="" s0="" s3<soc="<" s4="" s4<soc="<" s5="" s5<soc="" soc="<" t5<t°c="" t6="" t6<t°c="" t7="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} T5 < T^{\circ}C \leq T6 \ \& \ S3 < SOC = < \ S4 \ (T[6][4]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 33_h \\ T5 < T^{\circ}C \leq T6 \ \& \ S4 < SOC = < \ S5 \ (T[6][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 34_h \\ T5 < T^{\circ}C \leq T6 \ \& \ S5 < SOC \ (T[6][6])c \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 34_h \\ T5 < T^{\circ}C \leq T6 \ \& \ S5 < SOC \ (T[6][6])c \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 35_h \\ T6 < T^{\circ}C \leq T7 \ \& \ SOC = < \ S0 \ (T[7][0]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	T5 <t°c &="" (t[6][4])="" (t[6][5])="" (t[6][6])c="" (t[7][0])="" 33h="" 34h="" 35h="" mandatory="" mo="" no="" ro="" ro<="" s0="" s3<soc="<" s4="" s4<soc="<" s5="" s5<soc="" soc="<" t5<t°c="" t6="" t6<t°c="" t7="" td="" unsigned16="" ≤=""></t°c>



Culp in day	20
Sub-index	36 _h
Description	T6 <t°c &="" (t[7][1])<="" s0<soc="<" s1="" t7="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro Na
PDO mapping	No LINGUANEDAG
Value range	UNSIGNED16
Default value	No
Sub-index	37 _b
Description	T6 <t°c &="" (t[7][2])<="" s1<soc="<" s2="" t7="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	38 _h
Description	T6 <t°c &="" (t[7][3])<="" s2<soc="<" s3="" t7="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	39 _h
Description	75h T6 <t°c &="" (t[7][4])<="" s3<soc="<" s4="" t7="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Dolault Value	110
Sub-index	3A _h
	3A _h T6 <t°c &="" (t[7][5])<="" s4<soc="<" s5="" t7="" td="" ≤=""></t°c>
Sub-index	3A _h
Sub-index Description Entry category Access	3A _h T6 <t°c &="" (t[7][5])="" mandatory="" ro<="" s4<soc="<" s5="" t7="" td="" ≤=""></t°c>
Sub-index Description Entry category	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access	3A _h T6 <t°c &="" (t[7][5])="" mandatory="" ro<="" s4<soc="<" s5="" t7="" td="" ≤=""></t°c>
Sub-index Description Entry category Access PDO mapping	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value	3A _h T6 <t°c &="" (t[7][5])="" mandatory="" no="" no<="" ro="" s4<soc="<" s5="" t7="" td="" unsigned16="" ≤=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	3A _h T6 <t°c &="" (t[7][5])="" 3b<sub="" mandatory="" no="" ro="" s4<soc="<" s5="" t7="" unsigned16="" ≤="">h</t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$ \begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$3A_h$ $T6 Mandatory ro No UNSIGNED16 No 3B_h T6 Mandatory ro$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$3A_h$ $T6 Mandatory ro No UNSIGNED16 No 3B_h T6 Mandatory ro No UNSIGNED16$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$3A_h$ $T6 Mandatory ro No UNSIGNED16 No 3B_h T6 Mandatory ro No UNSIGNED16$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ Mandatory \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ Mandatory \\ ro \\ \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S4 < SOC = < \ S5 \ (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S5 < SOC \ (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SOC = < \ SO \ (T[8][0]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$\begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \end{array}$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{l} 3A_h \\ T6 < T^{\circ}C \le T7 \ \& \ S4 < SOC = < \ S5 \ (T[7][5]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \le T7 \ \& \ S5 < SOC \ (T[7][6]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \le T8 \ \& \ SOC = < \ S0 \ (T[8][0]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ 3D_h \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{l} 3A_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S4 < SOC = <\; S5 \; (T[7][5]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline 3B_h \\ T6 < T^{\circ}C \leq T7 \;\&\; S5 < SOC \; (T[7][6]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline \hline 3C_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SOC = <\; S0 \; (T[8][0]) \\ \hline Mandatory \\ ro \\ No \\ \hline UNSIGNED16 \\ No \\ \hline \hline 3D_h \\ T7 < T^{\circ}C \leq T8 \;\&\; SO< SOC = <\; S1 \; (T[8][1]) \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	$ \begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S4 < SOC = < \ S5 \ (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S5 < SOC \ (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SOC = < \ S0 \ (T[8][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SOC = < \ S0 \ (T[8][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3D_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SO < SOC = < \ S1 \ (T[8][1]) \\ Mandatory \\ ro \\ No \\ \hline \\ 3D_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SO < SOC = < \ S1 \ (T[8][1]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$\begin{array}{c} 3A_h \\ T6$
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} 3A_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S4 < SOC = < \ S5 \ (T[7][5]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3B_h \\ T6 < T^{\circ}C \leq T7 \ \& \ S5 < SOC \ (T[7][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SOC = < \ S0 \ (T[8][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3C_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SOC = < \ S0 \ (T[8][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 3D_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SO < SOC = < \ S1 \ (T[8][1]) \\ Mandatory \\ ro \\ No \\ \hline \\ 3D_h \\ T7 < T^{\circ}C \leq T8 \ \& \ SO < SOC = < \ S1 \ (T[8][1]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $



Cub inday	25
Sub-index	3E _h
Description	T7 <t°c &="" (t[8][2])<="" s1<soc="<" s2="" t8="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	Ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	3F _h
Description	T7 <t°c &="" (t[8][3])<="" s2<soc="<" s3="" t8="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	40 _h
Description	T7 <t°c &="" (t[8][4])<="" s3<soc="<" s4="" t8="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	41 _h
Description	T7 <t°c &="" (t[8][5])<="" s4<soc="<" s5="" t8="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No No
Delault value	INO
Sub-index	42 _h
Sub-index Description	42 _h T7 <t°c &="" (t[8][6])<="" s5<soc="" t8="" td="" ≤=""></t°c>
Description Entry category Access	T7 <t°c &="" (t[8][6])="" mandatory="" ro<="" s5<soc="" t8="" td="" ≤=""></t°c>
Description Entry category	T7 <t°c &="" (t[8][6])="" mandatory="" no<="" ro="" s5<soc="" t8="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range	T7 <t°c &="" (t[8][6])="" mandatory="" ro<="" s5<soc="" t8="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping	T7 <t°c &="" (t[8][6])="" mandatory="" no<="" ro="" s5<soc="" t8="" td="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value	T7 <t°c &="" (t[8][6])="" mandatory="" no="" no<="" ro="" s5<soc="" t8="" td="" unsigned16="" ≤=""></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h</t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description	T7 <t°c &="" (t[8][6])="" <math="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">43_h T8<t°c &="" (t[9][0])<="" s0="" soc="<" t9="" td="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	$T7 < T^{\circ}C \le T8 \& S5 < SOC (T[8][6])$ Mandatory ro No UNSIGNED16 No 43_h $T8 < T^{\circ}C \le T9 \& SOC = < S0 (T[9][0])$ Mandatory
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	$T7 Mandatory ro No UNSIGNED16 No 43h T8 Mandatory ro$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T7 < T^{\circ}C \leq T8 \;\&\; S5 < SOC\; (T[8][6]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 43_h \\ \\ T8 < T^{\circ}C \leq T9 \;\&\; SOC = <\; SO\; (T[9][0]) \\ \\ Mandatory \\ ro \\ No \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T7 < T^{\circ}C \leq T8 \& S5 < SOC (T[8][6])$ $Mandatory$ ro No $UNSIGNED16$ No 43_{h} $T8 < T^{\circ}C \leq T9 \& SOC = < SO (T[9][0])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$ \begin{array}{l} T7 < T^{\circ}C \leq T8 \;\&\; S5 < SOC\; (T[8][6]) \\ \\ Mandatory \\ ro \\ No \\ \\ UNSIGNED16 \\ No \\ \\ \hline 43_h \\ \\ T8 < T^{\circ}C \leq T9 \;\&\; SOC = <\; SO\; (T[9][0]) \\ \\ Mandatory \\ ro \\ No \\ \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	$T7 < T^{\circ}C \leq T8 \& S5 < SOC (T[8][6])$ $Mandatory$ ro No $UNSIGNED16$ No 43_{h} $T8 < T^{\circ}C \leq T9 \& SOC = < SO (T[9][0])$ $Mandatory$ ro No $UNSIGNED16$
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h T8<t°c &="" (t[9][0])="" mandatory="" no="" ro="" s0="" soc="<" t9="" td="" unsigned16="" unsigned16<="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h T8<t°c &="" (t[9][0])="" mandatory="" no="" no<="" ro="" s0="" soc="<" t9="" td="" unsigned16="" ≤=""></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	T7 <t°c &="" (t[8][6])="" <math="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">43_h <math>T8<t°c &="" (t[9][0])<="" math="" so="" soc="<" t9="" ≤=""> Mandatory ro No UNSIGNED16 No 44_h 44_h</t°c></math></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T7 < T^{\circ}C \leq T8 \;\&\; S5 < SOC\; (T[8][6]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ 43_h \\ \hline T8 < T^{\circ}C \leq T9 \;\&\; SOC = <\; S0\; (T[9][0]) \\ \hline Mandatory \\ ro \\ \hline No \\ \hline UNSIGNED16 \\ \hline No \\ \hline \\ 44_h \\ \hline T8 < T^{\circ}C \leq T9 \;\&\; SO< = <\; S1\; (T[9][1]) \\ \hline Mandatory \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h T8<t°c &="" (t[9][0])="" 44<sub="" mandatory="" no="" ro="" s0="" soc="<" t9="" unsigned16="" ≤="">h T8<t°c &="" (t[9][1])="" mandatory="" ro<="" s1="" so<soc="<" t9="" td="" ≤=""></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	$T7 < T^{\circ}C \le T8 \& S5 < SOC (T[8][6])$ Mandatory ro No UNSIGNED16 No 43h $T8 < T^{\circ}C \le T9 \& SOC = < SO (T[9][0])$ Mandatory ro No UNSIGNED16 No UNSIGNED16 No 44h $T8 < T^{\circ}C \le T9 \& SOC = < SO (T[9][1])$ Mandatory ro No UNSIGNED16 No A4h T8 < T^{\circ}C \le T9 & SO < SOC = < SO (T[9][1]) Mandatory ro No No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Description Entry category Access PDO mapping Value range Default value	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h T8<t°c &="" (t[9][0])="" 44<sub="" mandatory="" no="" ro="" s0="" soc="<" t9="" unsigned16="" ≤="">h T8<t°c &="" (t[9][1])="" mandatory="" no="" ro="" s0<soc="<" s1="" t9="" td="" unsigned16="" unsigned16<="" ≤=""></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	$ \begin{array}{l} T7 < T^{\circ}C \leq T8 \ \& \ S5 < SOC \ (T[8][6]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline 43_h \\ \\ T8 < T^{\circ}C \leq T9 \ \& \ SOC = < S0 \ (T[9][0]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline 44_h \\ \\ T8 < T^{\circ}C \leq T9 \ \& \ SO < SOC = < S1 \ (T[9][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline 44_h \\ \\ T8 < T^{\circ}C \leq T9 \ \& \ SO < SOC = < S1 \ (T[9][1]) \\ \\ Mandatory \\ ro \\ \\ No \\ \\ \hline UNSIGNED16 \\ \\ No \\ \\ \hline 45_h \\ \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	$ \begin{array}{l} T7 < T^{\circ}C \leq T8 \;\&\; S5 < SOC\; (T[8][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 43_h \\ T8 < T^{\circ}C \leq T9 \;\&\; SOC = <\; S0\; (T[9][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \;\&\; S0 < SOC = <\; S1\; (T[9][1]) \\ Mandatory \\ ro \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \;\&\; S0 < SOC = <\; S1\; (T[9][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \;\&\; S1 < SOC = <\; S2\; (T[9][2]) \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	T7 <t°c &="" (t[8][6])="" 43<sub="" mandatory="" no="" ro="" s5<soc="" t8="" unsigned16="" ≤="">h T8<t°c &="" (t[9][0])="" 44<sub="" mandatory="" no="" ro="" s0="" soc="<" t9="" unsigned16="" ≤="">h T8<t°c &="" (t[9][1])="" 44<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t9="" unsigned16="" ≤="">h T8<t°c &="" (t[9][1])="" 45<sub="" mandatory="" no="" ro="" s0<soc="<" s1="" t9="" unsigned16="" ≤="">h T8<t°c &="" (t[9][2])="" mandatory<="" s1<soc="<" s2="" t9="" td="" ≤=""></t°c></t°c></t°c></t°c></t°c>
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T7 < T^{\circ}C \leq T8 \& S5 < SOC \ (T[8][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 43_h \\ T8 < T^{\circ}C \leq T9 \& SOC = < S0 \ (T[9][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \& S0 < SOC = < S1 \ (T[9][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \& S1 < SOC = < S2 \ (T[9][2]) \\ Mandatory \\ ro \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \& S1 < SOC = < S2 \ (T[9][2]) \\ Mandatory \\ ro \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Pofault value	$ \begin{array}{c} T7 < T^{\circ}C \leq T8 \ \& \ S5 < SOC \ (T[8][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 43_h \\ T8 < T^{\circ}C \leq T9 \ \& \ SOC = < S0 \ (T[9][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \ \& \ SO < SOC = < S1 \ (T[9][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \ \& \ SO < SOC = < S1 \ (T[9][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \ \& \ S1 < SOC = < S2 \ (T[9][2]) \\ Mandatory \\ ro \\ No \\ \hline \end{array} $
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	$ \begin{array}{c} T7 < T^{\circ}C \leq T8 \& S5 < SOC \ (T[8][6]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 43_h \\ T8 < T^{\circ}C \leq T9 \& SOC = < S0 \ (T[9][0]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ 44_h \\ T8 < T^{\circ}C \leq T9 \& S0 < SOC = < S1 \ (T[9][1]) \\ Mandatory \\ ro \\ No \\ UNSIGNED16 \\ No \\ \hline \\ UNSIGNED16 \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \& S1 < SOC = < S2 \ (T[9][2]) \\ Mandatory \\ ro \\ No \\ \hline \\ 45_h \\ T8 < T^{\circ}C \leq T9 \& S1 < SOC = < S2 \ (T[9][2]) \\ Mandatory \\ ro \\ \hline \end{array} $



	
Sub-index	46 _h
Description	T8 <t°c &="" (t[9][3])<="" s2<soc="<" s3="" t9="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	0
PDO mapping	No LINGUALEDAG
Value range	UNSIGNED16
Default value	No
Sub-index	47 _b
Description	T8 <t°c &="" (t[9][4])<="" s3<soc="<" s4="" t9="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	48 _h
Description	T8 <t°c &="" (t[9][5])<="" s4<soc="<" s5="" t9="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	49 _h
Description	T8 <t°c &="" (t[9][6])<="" s5<soc="" t9="" td="" ≤=""></t°c>
Entry category	Mandatory
Access	ro No
PDO mapping Value range	UNSIGNED16
Default value	No
Boladit Valdo	
Sub-index	4A _h
Sub-index Description	4A _h T9 <t°c &="" (t[10][0])<="" s0="" soc="<" td=""></t°c>
Sub-index Description Entry category	4A _h T9 <t°c &="" (t[10][0])="" mandatory<="" s0="" soc="<" td=""></t°c>
Sub-index Description Entry category Access	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" ro<="" s0="" soc="<" td=""></t°c>
Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" no<="" ro="" s0="" soc="<" td=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" no="" ro="" s0="" soc="<" td="" unsigned16<=""></t°c>
Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" no<="" ro="" s0="" soc="<" td=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" no="" ro="" s0="" soc="<" td="" unsigned16<=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" mandatory="" no="" no<="" ro="" s0="" soc="<" td="" unsigned16=""></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h</t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" ro<="" s0<="" s1="" soc="<" td=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no<="" ro="" s0<="" s1="" soc="<" td=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no="" ro="" s0<="" s1="" soc="<" td="" unsigned16<=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no<="" ro="" s0<="" s1="" soc="<" td=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no="" no<="" ro="" s1="" so<="" soc="<" td="" unsigned16=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no="" no<="" ro="" s1="" so<="" soc="<" td="" unsigned16=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" so="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s1="" so<="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])<="" s1<="" s2="" soc="<" td=""></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" mandatory="" no="" no<="" ro="" s1="" so<="" soc="<" td="" unsigned16=""></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory<="" s1<="" s2="" soc="<" td=""></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" ro<="" s1<="" s2="" soc="<" td=""></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s1="" so<="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" no<="" ro="" s1<="" s2="" soc="<" td=""></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s1="" so<="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" no="" no<="" ro="" s1<="" s2="" soc="<" td="" unsigned16=""></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s1="" so<="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" no="" no<="" ro="" s1<="" s2="" soc="<" td="" unsigned16=""></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" no="" no<="" ro="" s1<="" s2="" soc="<" td="" unsigned16=""></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" (t[10][3])="" ho="" hoh="" mandatory="" mandatory<="" no="" ro="" s1<="" s2="" s2<="" s3="" soc="<" t9<t°c="" td="" unsigned16=""></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value Sub-index Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4d<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][3])="" mandatory="" no="" ro="" s2<="" s3="" soc="<" td="" unsigned16<=""></t°c></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value Sub-index Description Entry category Access PDO mapping	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s1="" so<="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" mandatory="" mo="" no="" ro="" ro<="" s1<="" s2="" soc="<" td="" unsigned16=""></t°c></t°c></t°c></t°c>
Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Default value Sub-index Default value Sub-index Default value	4A _h T9 <t°c &="" (t[10][0])="" 4b<sub="" mandatory="" no="" ro="" s0="" soc="<" unsigned16="">h T9<t°c &="" (t[10][1])="" 4c<sub="" mandatory="" no="" ro="" s0<="" s1="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4c<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][2])="" 4d<sub="" mandatory="" no="" ro="" s1<="" s2="" soc="<" unsigned16="">h T9<t°c &="" (t[10][3])="" mandatory="" no="" ro="" s2<="" s3="" soc="<" td="" unsigned16<=""></t°c></t°c></t°c></t°c></t°c>



Sub-index	4E _h
Description	T9 <t°c &="" (t[10][4])<="" s3<="" s4="" soc="<" td=""></t°c>
Entry category	Mandatory
Access	Ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	4F _b
	T9 <t°c &="" (t[10][5])<="" s4<="" s5="" soc="<" td=""></t°c>
Description	(
Entry category	Mandatory
Access	Ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
Sub-index	50 _h
Description	T9 <t°c &="" (t[10][6])<="" s5<="" soc="" td=""></t°c>
Entry category	Mandatory
Access	Ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No

7.3.30. Object 2034_h: Cumulative total kWh charged

This object shall provide the cumulative of kWh received by the battery over its life.

VALUE DEFINITION

The resolution shall be 10kWh per bit.

OBJECT DESCRIPTION

INDEX	2034 _h
Name	Cumulative total kWh charged
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00_{h}
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No



 $\textbf{7.3.31. Object 2035}_{h} \textbf{: Cumulative total kWh discharged}$ This object shall provide the cumulative of kW-hours delivered by the battery to the external system over the life of the battery.

VALUE DEFINITION

The resolution shall be 10kWh per bit.

OBJECT DESCRIPTION

INDEX	2035 _h
Name	Cumulative total kWh discharged
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00_{h}
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No



7.3.32. Object 2036_h: SOH

This object shall indicate the State Of Health of the battery capacity.

VALUE DEFINITION

The resolution shall be 1% per bit. FF_h shall indicate an invalid value.

OBJECT DESCRIPTION

INDEX	2036 _h
Name	SOH
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	No
Value range	00 _h to 64 _h and FF _h
Default value	No

7.3.33. Object 2040_h: Battery Ah capacity

This object shall indicate the rated capacity in Ampere-hours as provided by the battery manufacturer.

VALUE DEFINITION

The resolution shall be 1Ah per bit.

OBJECT DESCRIPTION

INDEX	2040 _h
Name	Battery Ah capacity
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No



7.3.34. Object 2041_h: Battery system software version

This object shall indicate the software version in battery system which communicates with customer software. It is composed with a major version and a minor version. Battery system software version = MajorVersion.MinorVersion.

VALUE DEFINITION

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Major Version						Minor Version									
Unsigned integer 8 bits (0 to 99) Unsigned integer 8 bits (0 to 99)															
-						-									

Be careful: if MajorVersion = 1 and MinorVersion = 5 then Battery system software version = 1.05 (not 1.5)

OBJECT DESCRIPTION

INDEX	2041 _h
Name	Battery system software version
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No

7.3.35. Object 2042_h: BMM serial number

This object shall provide a serial number UNSIGNED32 associated with a battery pack, usually applied by the battery manufacturer to identify the battery. It shall be packed into UNSIGNED32 object to allow them to be transferred using expedited SDO services.

VALUE DEFINITION

Four bytes in the following format: YYWXX

YY: most significant bytes (MSB). Represent the year.

- WW: represent the week.

XX: less significant bytes (LSB) for the identifier.

7 to 1000 digital to 1000 (=									\ — –	_,		• • • • •			••••																
3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
YY WW													XX	(
U	nsig	ned	inte	ger	8 bit	ts (0	to	Ur	sigr	ned	integ	ger 8	8 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	16 b	its (() to	6553	35)						
255 since 2000) 53)							-																								
-							-								MSB LSB																

OBJECT DESCRIPTION

INDEX	2042 _h
Name	BMM serial number
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED32
Default value	No



7.3.36. Object 2043_h: Battery ID

This object shall provide a UNSIGNED associated with a battery pack that uniquely identifies it to the owner. The Battery ID correspond to the Node_ID of the BMM on the customer CAN bus (1 to 40).

VALUE DEFINITION

N.A.

OBJECT DESCRIPTION

INDEX	2043 _h
Name	Battery ID
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED8
Default value	No

7.3.37. Object 2044_h: Number of modules

This object shall indicate the number of modules in battery system (1 to 40).

VALUE DEFINITION

The resolution shall be 1 module per bit.

OBJECT DESCRIPTION

INDEX	2044 _h
Name	Number of modules
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	No
Value range	UNSIGNED8
Default value	No



7.3.38. Object 2045_h: SMU configuration

This object shall indicate the configuration of each module in the battery system. Number of cells for each module can be different. This number depends of P and S (P x S).

This object has to be updated by the server when Synchro bit is set by the client.

The client has the possibility to choose the module by writing the module ID in Module number. If the module ID is not found, the server will write 0 in this field.

P indicates how many cells in parallel there are in the module concerned by the request.

S indicates how many <u>cells in series</u> there are per branches in the module concerned by the request.

The SMU serial number is used to do physically the link with the virtual module ID. This field is updated by server.

VALUE DEFINITION

See also § 7.2.7 (Record 0086_h definition)

Sub-index 01_h: Module number (virtual ID between 1 and Number of modules)

- 00_h = error, module not defined in battery system.
- XX_h = module number of the cell voltage(s) returned.

Sub-index 02_h: SMU serial number. Four bytes in the following format: YYWWXX

- YY: most significant byte (MSB). Represent the year.
- WW: represent the week.
- XX: less significant bytes (LSB) for the identifier.

3 1	3	9	2 8	2 7	2	2 5	2 4	2	2	2	2	9	1 8	1 7	1	1 5	1	1	1	1	1	00	8	0 7	9 0	0 5	0 4	0	0 2	0	0
Υ	Y						l	W	W							XX	(l										
		ned ince			8 bit	s (0	to	Un 53	nsigr)	ned	integ	ger 8	3 bit	s (0	to	Ur	nsigr	ned i	integ	ger 1	16 b	its (0) to (6553	35)						
-								-								MS	SB							LS	В						

<u>Sub-index 03_h: Synchronization. Used to synchronize data between client and server Bit0:</u>

- 0 = server reset bit to 0 to warn the client that data requested are available
- 1 = client set bit to 1 to ask data about one module

Sub-index 04_h: P: number of branches in parallel in module

Sub-index 05_h: S: number of cells in series per branch

OBJECT DESCRIPTION

INDEX	2045 _h
Name	SMU Configuration
Object code	RECORD
Data type	SMUConfiguration
Category	Mandatory



Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	05 _h
Default value	05 _h
Sub-index	01 _h
Description	Module number
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	UNSIGNED8
Default value	No
Sub-index	02 _h
Description	Module serial number
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	No
Sub-index	03 _h
Sub-index Description	03 _h Synchro
Description Entry category Access	Synchro Mandatory rw
Description Entry category Access PDO mapping	Synchro Mandatory rw No
Description Entry category Access PDO mapping Value range	Synchro Mandatory rw No UNSIGNED8
Description Entry category Access PDO mapping	Synchro Mandatory rw No
Description Entry category Access PDO mapping Value range	Synchro Mandatory rw No UNSIGNED8
Description Entry category Access PDO mapping Value range Default value	Synchro Mandatory rw No UNSIGNED8 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category	Synchro Mandatory rw No UNSIGNED8 No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8 No UNSIGNED8
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description	Synchro Mandatory rw No UNSIGNED8 No 04 _h P Mandatory ro No UNSIGNED8 No 05 _h S
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8 No 05h S Mandatory ro No
Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access PDO mapping Value range Default value Sub-index Description Entry category Access	Synchro Mandatory rw No UNSIGNED8 No 04h P Mandatory ro No UNSIGNED8 No 05h S Mandatory ro



7.3.39. Object 2046_h: Modules software version

This object shall indicate the module software version (in SMU board). It is composed with a major version and a minor version. Battery system software version = MajorVersion.MinorVersion. Each module has the same software version (alarm if it is not the case): only one version is available.

VALUE DEFINITION

15	15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00														
Majo	Major Version Minor Version														
Unsi	gned ir	nteger	8 bits ((0 to 99	9)			Unsi	gned ir	nteger	8 bits (0 to 99	9)		

<u>Be careful: if MajorVersion = 1 and MinorVersion = 5 then Module software version = 1.05 (not 1.5)</u>

OBJECT DESCRIPTION

INDEX	2046 _h
Name	Module software version
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00_{h}
Access	ro
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	No

7.3.40. Object 2050_h: Reserved 1

This object is reserved.

VALUE DEFINITION

N/A.

OBJECT DESCRIPTION

-		
Γ	INDEX	2050 _h
Γ	Name	Reserved 1
	Object code	VAR
I	Data type	UNSIGNED16
ſ	Category	Mandatory

Sub-index	00 _h
Access	Rw
PDO mapping	RPDO1
Value range	UNSIGNED16
Default value	No



7.3.41. Object 2051_h: Reserved 2

This object is reserved.

VALUE DEFINITION

N/A.

OBJECT DESCRIPTION

INDEX	2051 _h
Name	Reserved 2
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	Rw
PDO mapping	RPDO1
Value range	UNSIGNED16
Default value	No

7.3.42. Object 2052_h: Customer Toggle Bit

This object contains a toggle Bit sent by the Customer. This toggle bit could be used to detect loss of Customer Communication.

VALUE DEFINITION

The insulation monitoring authorization has the following format:

/		1	0
	Reserved (0)		Customer Toggle Bit
MSB			LSB

Bit 0: Customer Toggle Bit: 0 to 1

Shall be updated at each frame reception

OBJECT DESCRIPTION

INDEX	2052 _h	
Name	Customer Toggle Bit	
Object code	VAR	
Data type	UNSIGNED8	
Category	Mandatory	

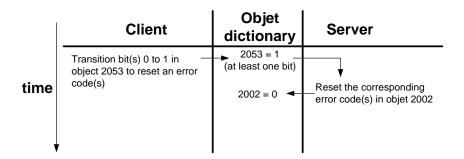
Sub-index	00 _h
Access	r/w
PDO mapping	RPDO1
Value range	0 to 1
Default value	0



7.3.43. Object 2053_h: Battery fault codes n°1 to 48 reset

This object shall indicate the fault codes in the battery system to reset.

When the client set one or several bit to 1 in this object, the BMU update the object 'Battery fault codes $n^{\circ}1$ to 48' (2002_h) (reset the corresponding error codes). The fault are <u>reset on transition from 0 to 1 of the bit from Object 2053h</u>.



VALUE DEFINITION

The battery fault codes have the following format:

				b	oit					
	7	6	5	4	3	2	1	0		
	8	6	6	5	4	3	2	1	1	
	16	15	14	13	12	11	10	9	2	
fault	24	23	22	21	20	19	18	17	3	byto
code	32	31	30	29	28	27	26	25	4	byte
	34	39	38	37	36	35	34	33	5	
	48	47	46	45	44	43	42	41	6	
	MSB								LSB	

Bit 'x':

Transition 0 to 1 = request to reset the fault code(s)

OBJECT DESCRIPTION

INDEX	2053 _h
Name	Battery fault code n°1 to 48 reset
Object code	ARRAY
Data type	UNSIGNED8
Category	Mandatory

VI DESCRIPTION	•	
Sub-index	00 _h	
Description Highest sub-index supported		
Entry category Mandatory		
Access rw		
PDO mapping	g No	
Value range		
Default value	06 _n	
Sub-index	01 _h	
Sub-index Description	01 _h Fault code n°1 to 8 reset	
	"	
Description	Fault code n°1 to 8 reset	
Description Entry category	Fault code n°1 to 8 reset Mandatory	
Description Entry category Access	Fault code n°1 to 8 reset Mandatory rw	



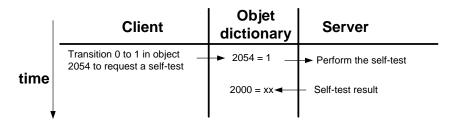
Sub-index 02 _h Description Fault code n°9 to 16 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 03 _h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h Description Fault code n°33 to 40 reset	F	<u></u>					
Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 03 _h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No							
Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 03h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No							
PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 03 _h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No		Mandatory					
Value range See VALUE DEFINITION in this § Default value No Sub-index 03 _h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this §							
Default value No Sub-index 03h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05h							
Sub-index 03 _h Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No	Value range	See VALUE DEFINITION in this §					
Description Fault code n°17 to 24 reset Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05h	Default value	No					
Entry category Mandatory Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Sub-index	03 _h					
Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Description	Fault code n°17 to 24 reset					
Access rw PDO mapping Default Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Entry category	Mandatory					
Value range See VALUE DEFINITION in this § Default value No Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Access	rw					
Default value No Sub-index 04h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05h	PDO mapping	Default					
Sub-index 04 _h Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Value range	See VALUE DEFINITION in this §					
Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Default value	No					
Description Fault code n°25 to 32 reset Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h	Sub-index	04,					
Entry category Mandatory Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h							
Access rw PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h							
PDO mapping No Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h							
Value range See VALUE DEFINITION in this § Default value No Sub-index 05 _h							
Default value No Sub-index 05 _h							
"							
"	Cub inday	l or					
I DECLIDATION I FAIT COUR D. 33 to 111 LECT							
'							
Entry category Mandatory							
Access rw PDO mapping Default							
Value range See VALUE DEFINITION in this §	U						
Default value No	Default value	NO					
Sub-index 06 _h	Sub-index						
Description Fault code n°41 to 48 reset	Description	Fault code n°41 to 48 reset					
Entry category Mandatory	Entry category	Mandatory					
Access rw	Access	1					
PDO mapping Default	PDO mapping	Default					
Value range See VALUE DEFINITION in this §	Value range	See VALUE DEFINITION in this §					
Default value No							



7.3.44. Object 2054_h: Self-test requested

This object shall indicate if external system (client) requests for a self-test of battery system (server).

When the client set bit from 0 to 1 in this object (i.e. on transition 0 to 1), the server will perform a self-test. The status of the self-test is given in bit 2 of object 2000_h . The result of the self-test is given by a fault code on the object 2002_h



VALUE DEFINITION

The Self-test request shall have the following format:

7	1	0
	Reserved (0)	Bit 0
MSB		LSB

Bit 0:

_

Transition 0 to 1 = self-test requested

OBJECT DESCRIPTION

INDEX	2054 _h
Name	Self-test request
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00_{h}
Access	rw
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	No



7.3.45. Object 2055_h: Battery contactors authorization

This object indicates:

- the authorization to close contactors when value is 1 (BMU is authorized to close the contactor)
- the command to open contactors when value is 0 (BMU must open the contactor)

This object concerns:

- the positive pole (main+)
- the optional positive pole (optional main+).

NB: main - is not driven by customer but depends of Main + and/or optional main + authorization.

VALUE DEFINITION

The Battery contactors closing demand has the following format:

7	4	3	2	1	0
Rese	rved (0)			Authorization for	Authorization for
				optional Main+	contactors
MSB			•		I SR

When the authorization value is 0, the battery system goes in Standby mode (or remains in Standby mode if already in Standby). Contactors are opened.

When the authorization value is 1, the battery system goes in Nominal mode and contactors are closed. The authorization must be kept at 1 in order to keep the battery system in Nominal mode.

<u>Bit 0:</u> Authorization for Main contactors (Main+ and Main- if available and precharge if available)

- 0 = not authorized to close Main contactors or command to open Main contactors (Main+ and Main- if available and precharge if available)
- 1 = authorized to close Main contactors (Main+ and Main- if available and precharge if available)

Bit 1: Authorization for optional Main +

- 0 = not authorized to close optional Main+ or command to open optional Main+
- 1 = authorized to close optional Main+

OBJECT DESCRIPTION

INDEX	2055 _h
Name	Battery contactors authorization
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00 _h
Access	rw
PDO mapping	Default
Value range	See value definition in this §
Default value	00 _h



7.3.46. Object 2056_h: Vcell Min

This object shall indicate the minimum cell voltage in a macro battery in order to equalize the cell voltage.

VALUE DEFINITION

The resolution shall be 1mV per bit.

OBJECT DESCRIPTION

INDEX	2056 _h
Name	Vcell Min
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	rw
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	No

7.3.47. Object 2057_h: Insulation monitoring authorization

This object shall indicate if external system authorizes the battery system to do the insulation monitoring.

VALUE DEFINITION

The insulation monitoring authorization has the following format:

1		1	0	
	Reserved (0)		Authorization to do insulation monitoring	
MSB				LSB

Bit 0: Authorization to do insulation monitoring

0 = not authorized to do insulation monitoring

1 = authorized to do insulation monitoring

OBJECT DESCRIPTION

INDEX	2057 _h
Name	Insulation monitoring authorization
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

Sub-index	00 _h
Access	rw
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	No



7.3.48. Object 2058_h: BMU reset

This object shall is used to reset the BMU by external.

After the reset BMU reset bit should be set to 0.

VALUE DEFINITION

The BMU reset has the following format:

7	7 1	0
	Reserved (0)	BMU reset
M	SB	LSB

Bit 0: BMU reset

Transition 0 to 1 = BMU reset requested

OBJECT DESCRIPTION

INDEX	2058 _h
Name	BMU reset
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	rw
PDO mapping	Default
Value range	See VALUE DEFINITION in this §
Default value	0

7.3.49. Object 2059h: Sleep mode command

This object allows to sleep the battery group (MBMM + BMMs + SMUs)

VALUE DEFINITION

Sleep mode command Transition 0 to 1 = Sleep command requested

OBJECT DESCRIPTION

INDEX	2059 _h
Name	Sleep mode command
Object code	VAR
Data type	UNSIGNED8
Category	Mandatory

ENTRY DESCRIPTION

Sub-index	00 _h
Access	r/w
PDO mapping	Default
Value range	0 to 1
Default value	0

7.3.50. Object 2060h: xBIT results

This object contains the results of the PBIT, CBIT, IBIT and POffBIT.

Each sub-index contains a bit field composed of the test listed below.

Bitfield	Test	PBIT	CBIT	IBIT	POffBIT
bit0	Not used				
bit1	Not used				
bit2	TEST_SOFTWARE_CRC	Χ	Χ		



bit3	TEST_PARAMETERS_CRC	Χ	Х		
bit4	TEST_CHECK_MEMORY	Х			
bit5	TEST_NEGATIVE_CONTACTOR_CLOSING				
bit6	TEST_POSITIVE_CONTACTORS_CLOSING	Х			
bit7	TEST_NEGATIVE_CONTACTOR_OPENING	Χ		Х	Χ
bit8	TEST_POSITIVE_CONTACTORS_OPENING	Χ		X	Χ
bit9	Not used				
bit10	TEST_AUTOTEST_SMU	Χ	Х		
bit11	TEST_REDUNDANT_CHANNEL_ACTIVATION		Х		
bit12	TEST_REDUNDANT_CHANNEL_FULL			X	Χ
bit13	TEST_CURRENT_SENSORS_CALIBRATION	Χ		Х	
bit14	TEST_CHECK_FUSE_STATUS	Χ			
bit15	Not used				
bit16	Not used				
bit17	TEST_SMU_ALLOCATION	Χ			
bit18	TEST_SMU_CONFIGURATION	Χ			
bit19	Not used				
bit20	Not used				
bit21	Not used				
bit22	TEST_CONTACTORS_OPENED	Χ			
bit23	TEST_INIT_LIB_SOC	Χ			
bit24	TEST_INIT_LIB_SOH	Χ			
bit25	TEST_INIT_LIB_IMD_IMR	Χ			
bit26	TEST_INIT_LIB_SET_CYCLIC_COUNTER	Χ			
bit27	TEST_BALANCING_SMU		Х		
bit28	Not used				
bit29	Not used				
bit30	Not used				
bit31	Not used				

PBIT: From bit32 to bit0? 00 04 20 08

The following tests failed:

TEST_PARAMETERS_CRC

TEST_CURRENT_SENSORS_CALIBRATION

TEST_SMU_CONFIGURATION

CBIT: From bit32 to bit0? 08 00 00 08

The following tests failed: TEST_PARAMETERS_CRC TEST_BALANCING_SMU

OBJECT DESCRIPTION

INDEX	2060 _h
Name	xBIT results
Object code	ARRAY
Data type	UNSIGNED32
Category	Mandatory

Sub-index 00 _h	



Description	Highest sub-index supported
Access	ro
PDO mapping	No
Value range	04 _h
Default value	04 _h
Sub-index	01 _h
Description	PBIT result
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	0
Delault value	
Sub-index	02 _h
Description	CBIT result
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	0
Sub-index	03 _h
Description	IBIT result
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	0
Sub-index	04 _h
Description	POffBIT result
Access	ro
PDO mapping	No
Value range	UNSIGNED32
Default value	0



7.3.51. Object 2201h: IMR_C

This object shall provide to external system the recommended maximum continuous electrical current for the charge. The value of this object is equal to the 0x2011 object (IMR Continuous) defined in this document but the resolution is different.

The MBMM dictionary has the same object at the same address.

VALUE DEFINITION

The resolution shall be 1A per bit.

OBJECT DESCRIPTION

INDEX	2011 _h
Name	IMR_C
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

Sub-index	00 _h
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No



7.4. Overview on application objects

Index	Name	Object code	Data type	Access	PDO
2000	Global battery status	VAR	Unsigned8	ro	TPDO1
2001	SOC_threshold	VAR	Unsigned8	ro	TPDO1
2002	Battery fault codes status n°1 to 48	ARRAY	6 * Unsigned8	ro	TPDO1
2011	IMR Continuous	VAR	Unsigned16	ro	TPDO2
2012	IMD	VAR	Unsigned16	ro	TPDO3
2013	IMR	VAR	Unsigned16	ro	TPDO2
2014	VMD	VAR	Unsigned16	ro	TPDO3
2015	VMR	VAR	Unsigned16	ro	TPDO2
2016	PMD	VAR	Unsigned16	ro	TPDO3
2017	PMR	VAR	Unsigned16	ro	TPDO2
2018	Battery requests	VAR	Unsigned8	ro	TPDO3
2020	Battery system mode	VAR	Unsigned8	ro	TPDO4
2021	Internal battery voltage	VAR	Unsigned16	ro	TPDO4
2022	Internal battery current	VAR	Signed16	ro	TPDO4
2023	HVDC1 voltage	VAR	Unsigned16	ro	SDO
2024	Battery contactors status	VAR	Unsigned8	ro	TPDO4
2026	SOC	VAR	Unsigned8	ro	TPDO4
2027	Cells voltage	RECORD	-	rw	SDO
2028	Battery temperature	RECORD	_	rw	SDO
2029	Max cell voltage	RECORD	_	ro	SDO
202A	Min cell voltage	RECORD	_	ro	SDO
202B	Max battery temperature	RECORD	_	ro	SDO
202C	Min battery temperature	RECORD	_	ro	SDO
202D	Max connection temperature	RECORD	_	ro	SDO
202E	Min connection temperature	RECORD	_	ro	SDO
202F	External temperatures	ARRAY	2*Signed8	ro	SDO
2030	Module cycling SOH table	RECORD	2 Oigricuo	rw	SDO
2031	Module calendar SOH table	RECORD	_	rw	SDO
2034	Cumulative total kWh charged	VAR	Unsigned16	ro	SDO
2035	Cumulative total kWh discharged	VAR	Unsigned16	ro	SDO
2036	SOH	VAR	Unsigned8	ro	SDO
2040	Battery Ah capacity	VAR	Unsigned16	ro	SDO
2041	Battery system software version	ARRAY	3 * Unsigned32	ro	SDO
2042	BMM serial number	ARRAY	3 * Unsigned32	ro	SDO
2043	Battery ID	ARRAY	5 * Unsigned32	ro	SDO
2044	Number of modules	VAR	Unsigned8	ro	SDO
2045	Number of modules Number of cells per module	VAR	Unsigned8	ro	SDO
2046	Module software version	ARRAY	3 * Unsigned32	ro	SDO
2050	Reserved	VAR	Unsigned16	rw	RPDO1
2051	Reserved	VAR	Unsigned16	rw	RPDO1
2052	Customer Toggle Bit	VAR	Unsigned8	rw	RPDO1
2052	Battery fault codes n°1 to 48 reset	ARRAY	6 * Unsigned8	rw	SDO
2053	Self-test requested	VAR	Unsigned8	rw	SDO
2055	Battery contactors authorization	VAR	Unsigned8	rw	RPDO2
2056	Vcell Min	VAR	Unsigned16	rw	RPDO2
2057	Insulation monitoring authorization	VAR	Unsigned8	rw	SDO
2058	BMU reset	VAR	Unsigned8	rw	SDO
2201	IMR_C	VAR	Unsigned16	ro	SDO
2059	Sleep mode command	VAR	Unsigned8	rw	SDO
2060	xBIT Results	ARRAY	Unsigned32	ro	SDO
2000	VDI I LEGUIS	ARRAT	Unaigneusz		300