Technical specification

Xtender serial protocol

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Contents

1. INTRODUCTION 4

1.1 CONVENTIONS USED IN THIS DOCUMENT 4
1.2 LIST OF ACRONYMS 4

2. PHYSICAL LAYER 5

2.1 CONNECTOR PINNING 5
2.2 CABLE TO USE 5

3. DATA LINK LAYER 6

3.1 USART CONFIGURATION 6
3.2 BYTE ENDIANNESS 6
3.3 FRAME 6
3.4 CHECKSUM ALGORITHM 7
3.5 ADDRESSING THE DEVICES 8
3.6 MULTICAST ADDRESSES 8
3.7 RESPONSE DELAY 8
3.8 HARDWARE WATCHDOG 8
3.9 SCOM WATCHDOG 9
3.10 XTENDER WATCHDOG 9
3.11 DEVICE IDENTIFICATION 9

4. APPLICATION LAYER 10

4.1 SERVICES 10
4.2 OBJECT MODEL 10
4.2.1 READ_PROPERTY service 11
4.2.2 WRITE_PROPERTY service 12
4.2.3 Format 12
4.3 ERROR CODES 13
4.4 USER INFO OBJECTS 14
4.4.1 Properties 14
4.4.2 Available user info 14
4.5 PARAMETER OBJECTS 14
4.5.1 Properties 15
4.5.2 Values of level properties 15
4.5.3 Available parameters on the Xtender Inverter 15
4.5.4 Cyclic write of parameters on the Xtender Inverter 15
4.5.5 Cyclic write of parameters on VarioTrack and VarioString 16
4.5.6 Hours encoding 16
4.5.7 Days of the week encoding 16
4.5.8 Month of the year encoding 16
4.5.9 Date and time encoding 16
4.5.10 Signal encoding 16
4.6 MESSAGE OBJECTS 17
4.6.1 Description of the reading function: 17
4.6.2 Notification of new messages: 17

4.6.3 Sorting the messages *17*
4.6.4 Request frame : *17*
4.6.5 Response frame : *17*
4.6.6 Content of data property *18*
4.7 FILE TRANSFER OBJECT 19
4.7.1 Request frame *19*
4.7.2 Response frame *20*
4.7.3 Transfer sequence *21*

5. EXAMPLES OF FRAMES 22

5.1 C LIBRARY 22
5.2 COMMAND LINE TOOL 22
5.3 READ THE VALUE OF A USER INFO 22
5.4 WRITE THE QSP_VALUE OF A PARAMETER 23

6. APPENDICES 25

6.1 XTENDER PARAMETERS 25
6.2 XTENDER INFOS 32
6.3 RCC PARAMETERS 35
6.4 BSP PARAMETERS 38
6.5 BSP, XCOM-CAN BMS INFOS 39
6.6 XCOM MS PARAMETERS 40
6.7 XCOM MS INFOS 40
6.8 VARIOTRACK PARAMETERS 41
6.9 VARIOTRACK INFOS 47
6.10 VARIOSTRING PARAMETERS 49
6.11 VARIOSTRING INFOS 54
6.12 RCC MESSAGES 57

1. Introduction

This technical specification describes the protocol used to communicate with the Studer Innotec Xcom-232i communication module. It is also valid for the discontinuted RCC-02/-03 special execution ES N° 32 (RCC-02/-03-32).

1.1 Conventions used in this document

- Numbers that start with "0x" are in hexadecimal, like in the C integer litterals.
- Byte streams are represented with hexadecimal separeted by space like "00 01 1F 48"
- constant values are usually represented in UPPER CASE
- field names are in lower_case_with_underscore

1.2 List of acronyms

RCC	The Studer Innotec remote control used to configure the Xtender system
Xcom-232i	The Studer Innotec RS-232 communication module that has the function of a DCE, Data Communications Equipment
DTE	Data Terminal Equipment, the PC or controller system that wants to communicate with the Xcom-232i
SCOM	Naming prefix used for the Studer Innotec serial protocol

2. Physical layer

The physical layer is RS-232. The Xcom-232i is equiped with a DE-9 (also known as DB-9) Female connector which provides this interface.

The serial port is galvanically separated with an isolation of 500 V DC relative to the negative battery potential.

2.1 Connector Pinning

On the female connector of the RCC, only the wires "receive data", "transmitted data" and ground are connected. The other wires are not connected, and the DTE must ignore signals such as CTS, DTR or DCD.

pin number	usage
1	not connected
2	RxD
3	TxD
4	not connected
5	GND
6	not connected
7	not connected
8	not connected
9	not connected

2.2 Cable to use

The cable to be used with a PC is a Female-Male, straight.

3. Data link layer

The data link layer, as defined in the OSI model, is used to send and receive frame on the RS-232.

3.1 USART configuration

The RS-232 is defined with :

- A fixed baudrate of 38400 bps
- 1 start bit
- 8 bit of data, LSB first
- 1 parity bit
- even parity
- 1 stop bit

3.2 Byte Endianness

All values are in little endian, i.e. LSB bytes are sent on the Physical layer first.

3.3 Frame

The Xcom-232i and the DTE exchange frames consist of a header of 14 bytes followed by a variable number of data bytes and 2 bytes of checksum.

start_-byte	frame_-flags	src_-addr	dst_-addr	data_-length	header_-checksum	frame_-data	data_-checksum
1 byte	1 byte	4 bytes	4 bytes	2 bytes = N	2 bytes	N bytes	2 bytes

start_byte

The start byte is always 0xAA

frame_flags:

BIT7-BIT6 : reserved.

BIT5 : is_datalog_supported, 1 if the datalogger is supported.

BIT4 : is_new_datalogger_file_present, 1 if there is a new datalog file on the SD card. This bit is reseted by the datalog read command through the SCOM or by extracting the SD card.

BIT3 : is_sd_card_full, 1 if the SD card is full. This bit is reseted by extracting the SD card.

BIT2 : is_sd_card_present, 1 if the SD card is present

BIT1 : 1 at each start or restart of the RCC, also after a WD Reset. This bit can be cleared with the RCC signal parameter {5104}.

BIT0 : is_message_pending flag, 1 if there are some messages pendings.

src_addr

src_addr is the source address, 32 bit little endian

dst_addr

dest_addr is the destination address, 32 bit little endian

data_length

the length of the frame's data, in byte

The maximum number of frame_data is 240 (so that 14+240+2 = 256)

header_checksum

the checksum of the header, from frame_flags to data_length (included)

frame_data

the data bytes

data_checksum

the checksum of all the data bytes of frame_data

3.4 Checksum algorithm

The checksum is computed with the following algorithm:

```
A = 0xFF
B = 0
For I FROM 0 TO number_of_bytes -1 DO
   A := (A + DATA[I]) mod 0x100;
   B := (B + A) mod 0x100;
END
checksum[0] := A
checksum[1] := B
```

A and B are byte values and the addition is made modulo 256.

After an invalid parity bit, header or data checksum, the data link layer is reseted and waits for an other frame.

3.5 Addressing the devices

address	devices	remarks
0	Broadcast	
100	a virtual address to access all XTH, XTM and XTS	see section "multicast addresses"
101 to 109	a single XTH, XTM or XTS inverter	ordered by the index displayed on the RCC
191 to 193	virtual address to access properties on all inverters on a phase : 191 for L1, 192 for L2 and 193 for L3	a read access return the value of the master of the phase
300	a virtual address to access all VarioTrack	see section "multicast addresses"
301 to 315	VarioTrack	ordered by the index displayed on the RCC
401	Xcom MS	
501	Xcom-232i	alias for the gateway that the DTE uses to communicate (the Xcom-232i to which you speak with RS-232)
601	BSP	
700	a virtual address to access all VarioString	see section "multicast addresses"
701 to 715	VarioString	ordered by the index displayed on the RCC

3.6 Multicast addresses

A WRITE_PROPERTY to this kind of address will have the effect to change the property value on all devices of the same kind. READ_PROPERTY operations are not supported.

3.7 Response delay

The response delay of the Xcom-232i can be up to 2 seconds. This is a good value for a timeout in the DTE implementation.

The reponse delay depends on the bus load (number of devices, number of RCC, values displayed on the RCC). The use of the datalogger on the Xcom-232i or on other RCC can cause a periodic increase of the reponse delay every 60 seconds.

3.8 Hardware Watchdog

The remote control parameter {5103} "Activation of the watchdog hardware (disabling restarts RCC)" allows activation or deactivation of the hardware watchdog, initially disabled. In case the Xcom-232i is not working properly a Reset will be initiated

automatically. The bit 1 of the frame_flags (see 3.3) reflects a start or restart of the Xcom-232i. This bit can be cleared with the RCC parameter {5104} "Clear SCOM alert of reset RCC".

This function reset only the Xcom-232i. For the Xtender, see the parameters {1628} and {1629} in section "XTENDER Watchdog".

3.9 SCOM Watchdog

The RCC parameters {5095} "Enable SCOM watchdog" and {5096} "Delay before system reset" allow configuration of the SCOM watchdog, initially disabled. There is two kind of security activated by this parameter. First, when a request is received a timer is started. If the response is not send after {5096} seconds, for example if an inverter present does not respond, the Xcom-232i is reset. A second timer is also activated when the first request arrives. It is set to zero every time a request is received. When it reaches {5096} seconds the Xcom-232i is reset. Before both kind of reset a message will be sent. Like the hardware watchdog, the bit 1 of the frame_flags (see 3.3) reflects a start or restart of the Xcom-232i and it can be cleared with the RCC parameter {5104} "Clear SCOM alert of reset RCC".

3.10 XTENDER Watchdog

The parameters {1628} and {1629} make possible to set a watchdog function inside the inverter. The watchdog is a monitoring software that restarts the Xtender in case the communication is lost.

This system is active when the parameter {1628} (Xtender watchdog enable) is enabled and the parameter {1550} (parameters saved in flash memory) is disabled. Each time the CAN receives a parameter the counter, whose duration is set in seconds by parameter {1629}, will be restarted. If no parameter is received during this period of time the Xtender will stop and a RESET will take place. The device restarts in the configuration determined by the parameter settings before {1550} was set to "no".

In a multi-unit system, each Xtender will handle this function independently. Each device must therefore receive a parameter within the time-frame set by {1629}.

By default this level is deactivated and the time period is set to 60s, adjustable from 10s to 300s.

3.11 Device identification

The RCC parameter {5119} allows to identify a device with the signaling system by flashing all of its LEDs. The written value corresponds to the Xtender's or VarioTrack' SCOM addresses. Unicast and multicast addresses are supported. For the Xtender, the phase addresses (191, 192 and 193) enable the signalling of all Xtenders on a given phase at the same time. The value 0 disables all signals. Sending a new value disables the previous value. If there is no more writing, all signals turn off after 45 seconds.

4. Application layer

The OSI layers 3 to 6 are not used. The application layer defines a number of « services ». A DTE sends a request frame and waits for a response frame from the Xcom-232i. If an error in the header checksum or data checksum is detected, there is no response from the application layer and the Xcom-232i waits for another request as if nothing has been received.

The Xcom-232i copies the src_addr of the request in the response dst_addr.

4.1 Services

The first two bytes of frame_data define the type of service and different flags for this service.

service_flags	service_id	service_data
1 byte	1 byte	N bytes

service_flags:

BIT7-BIT4 : reserved.

BIT1 : is_response flag, 0 if it is a request from the DTE to the Xcom-232i, 1 if it is response from the Xcom-232i.

BIT0 : error flag, 0 in case of success, 1 if an error occurred. In case of a request, error is always 0.

service_id:

One of the following services, described later in this document:

READ_PROPERTY = 0x01

service_data:

The data specific to the service. In case of a problem the errors are reported in a service-specific way, but the response has to include the error code described in the next section.

4.2 Object model

The different data accessible on each device are organized in object classes. Every object class has a number of properties. The service READ_PROPERTY is used to read the object's properties.

4.2.1 READ_PROPERTY service

This service is used to read an object's property.

The DTE sends a request frame with the following frame_data:

service_flags	service_id	object_type	object_id	property_id
0x00	0x01	2 bytes	4 bytes	2 bytes

service_flags : is_response =0, error=0

service_id : 0x01 for READ_PROPERTY

object_type : the object type identifier, defined later in this document

object_id : the object identifier, specific to each object type, i.e. two objects with different type can have the same id

property_id : identify the property in the object

The RCC responds with a frame with the following frame_data:

service_flags	service_id	object_type	object_id	property_id	property_data
0x02 or 0x03	0x01	2 bytes	4 bytes	2 bytes	N bytes or 2 bytes

service_flags : flags_response = 1, error= 0 or 1

service_id : 0x01 for READ_PROPERTY

object_type : same as the request

object_id : same as the request

property_id : same as the request

property_data : If error in service_flags is 0, the value of the property with the number of bytes of its type. If not, 2 bytes of type ERROR identifying the error code.

4.2.2 WRITE_PROPERTY service

This service is used to write an object's property.

The DTE sends a request frame with the following frame_data:

service_flags	service_id	object_type	object_id	property_id	property_data
0x00	0x02	2 bytes	4 bytes	2 bytes	n byte

service_flags : is_response = 0, error = 0

service_id : 0x02 for WRITE_PROPERTY

object_type : the object type identifier, defined later in this document

object_id : the object identifier, specific to each object type, i.e. two objects with different types can have the same id

property_id : identify the property in the object

property_data : the data in the right data type.

The RCC responds with a frame with the following frame_data:

service_flags	service_id	object_type	object_id	property_id	property_data
0x02 or 0x03	0x02	2 bytes	4 bytes	2 bytes	0 or 2 bytes

service_flags : flags_response = 1, error= 0 or 1

service_id : 0x01 for READ_PROPERTY

object_type : same as the request

object_id : same as the request

property_id : same as the request

property_data : If error in service_flags is 0, 0 byte of data. If not, 2 bytes of type ERROR identifying the error code.

4.2.3 Format

The property data are encoded in different formats described below. Some properties have a format that can be different from one object to an other for the same object_type. For example an the value_qsp of parameter can be an ENUM or a FLOAT depending on the parameter id (identified by the object_id). In this case it is described here as type DYNAMIC. The DTE must then know the exact type of the property for each object to decode it.

BOOL : binary data, 1 byte, 0 = false, 1 = true, other values are invalid

FORMAT : a property what define the format of an other property, 16 bit integer

ENUM : a value that is part of a enumeration of possible values, represented with a 16 bit integer

ERROR : 16 bit error code

INT32 : 32 bit signed value

FLOAT : float in 32 bit IEEE 754 format, little endian

STRING : ISO_8859-15 string of 8 bit characters

DYNAMIC : a property with a different format for each object id

BYTE_STREAM : a stream a byte of abitrary length

example of dynamic property:

for the object type 1 and object id 3000 (XT batery voltage), the format is FLOAT and "value" is a 4 byte IEEE 754 little endian float.

4.3 Error codes

The following error codes of type ERROR can be returned:

name	error_id	meaning
INVALID_FRAME	0x0001	malformed frame
DEVICE_NOT_FOUND	0x0002	wrong dst_addr field
RESPONSE_TIMEOUT	0x0003	no response of the server
SERVICE_NOT_SUPPORTED	0x0011	wrong service_id field
INVALID_SERVICE_ARGUMENT	0x0012	wrong service_data
SCOM_ERROR_GATEWAY_BUSY	0x0013	gateway (for example XCOM-232i) busy
TYPE_NOT_SUPPORTED	0x0021	the object_type requested doesn't exist
OBJECT_ID_NOT_FOUND	0x0022	no object with this object_id was found
PROPERTY_NOT_SUPPORTED	0x0023	the property identified by property_id doesn't exist
INVALID_DATA_LENGTH	0x0024	the field property_data has an invalid number of bytes
PROPERTY_IS_READ_ONLY	0x0025	a writing to this property is not allowed
INVALID_DATA	0x0026	this value is impossible for this property
DATA_TOO_SMALL	0x0027	the value is below the minimum limit
DATA_TOO_BIG	0x0028	the value is above the maximum limit
WRITE_PROPERTY_FAILED	0x0029	writing is possible, but failed
READ_PROPERTY_FAILED	0x002A	readind is possible, but failed
ACCESS_DENIED	0x002B	insufficient user access

SCOM_ERROR_OBJECT_NOT_SUPPORTED	0x002C	this object id, through existant, is not supported by the current implementation of the gateway
SCOM_ERROR_MULTICAST_READ_NOT_SUPPORTED	0x002D	Read operation is not supported when used on multicast adresses.
OBJECT_PROPERTY_INVALID	0x002E	During a file transfer, the use of this property was unexpected
FILE_OR_DIR_NOT_PRESENT	0x002F	Attempt to download a file not present on the sd card
FILE_CORRUPTED	0x0030	A read error ocurred during the download of a file
INVALID_SHELL_ARG	0x0081	the command line tool used received the wrong arguments

4.4 User info objects

These objects are the information about the current state of the system. They cannot be modified and their values change during the operation of the system. Previously known as system states.

object_type = 0x0001

object_id : see the table in next section

4.4.1 Properties

Name	property_id	format	remark
Value	0x0001	DYNAMIC	variable length, see the format in following table

4.4.2 Available user info

The available user information is the same as the values that can be chosen to be displayed on the RCC. The user information is related with the inverter parameters that can be configured with the RCC. The functionalities of each parameter are described in the RCC manual. You can easily find specific parameters by using the parameter index at the end of the manual.

4.5 Parameter objects

All parameters accessible from the remote control can also be modified with the protocol. The behaviour is the same as if a physical person changes the value with the remote control buttons. Currently, only changes at the level qsp are possible.

Values of type FLOAT can take any value between min and max but are rounded to the edition step on the remote control.

object_type = 0x0002

4.5.1 Properties

Name	property_id	format	Remark
value_qsp	0x0005	DYNAMIC	the value that can be entered on the remote control in level qsp or installer.
min_qsp	0x0006	DYNAMIC	Minimum that can be entered on the remote control in level qsp or installer.
max_qsp	0x0007	DYNAMIC	Maximum that can be entered on the remote control in level qsp or installer.
level_qsp	0x0008	ENUM	accessibility level of this parameter modifiable in level qsp or installer.

4.5.2 Values of level properties

The property level_qsp of type ENUM can take the following values:

Name	value
VIEW_ONLY	0x0000
BASIC	0x0010
EXPERT	0x0020
INSTALLER	0x0030
QSP	0x0040

4.5.3 Available parameters on the Xtender Inverter

The change of parameters when the inverters are in operation should be done carefully. The modification of parameters can restart the corresponding algorithm inside the inverter. For example, the change of a delay can restart the timer attached to it.

object_id : a number starting at 1000. See the complete parameter references at the end of the RCC User manual.

4.5.4 Cyclic write of parameters on the Xtender Inverter

The Xtender inverter store the parameter values in a non volatile flash memory. Because of the endurance of this memory, the number of write on a single parameter property is only garanted for 1000 write operations.

To allow the cyclic write of parameters without count limit, the parameter {1550} “Parameters saved in flash memory” as been introduced in the Xtender software.

This parameter has the value “yes” by default. A write of “no” to this parameter value stop the write in the non-volatile flash memory. This operation is written in the flash memory

only the first time, so consecutive writes of the value "no" to {1550} can be repeated without limit.

After parameter {1550} has been set to "no", all other parameters can be written without count limit. Because the values of all other parameters are not stored in flash, the read operation will give the values before {1550} as be changed to "no". Also, after a reset the old values will be taken.

To use the inverter with cyclic write operations you must:

- ensure that all inverters have a firmware version >= 1.4.6
- set the parameter {1550} to "no" on all targeted inverter
- avoid to write cyclically on other devices like BSP, RCC, ...
- ensure that no "reset default/factory settings", "apply configuration file (masterfile)" or modification with the remote control change {1550} to "yes"

It is a good pratice to cyclically write "no" to {1550}.

A write of "yes" to the parameter {1550} reactivate the write in flash. It will be written in the flash every time and should not be used more that 1000 time.

4.5.5 Cyclic write of parameters on VarioTrack and VarioString

The Variotrack and Variostring behave the same way as the Xtender Inverter. The parameter {10058} for the VarioTrack and {14069} for the VarioString allow to desactivate the write in non volatile memory.

4.5.6 Hours encoding

the hours encoding is in minute since 00:00 in INT32. For example 13:41 is 13*60+41 = 821.

4.5.7 Days of the week encoding

The days of the week selection (parameters {1205}, for example) is coded as a bit field in a INT32. A day selected as it bit set to 1.

bit	BIT31-7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
day of the week	undefined	SU	SA	FR	TH	WE	TU	MO

4.5.8 Month of the year encoding

The month of the year selection (parameters {1479}, for example) is coded as a bit field in a INT32. A month selected as it bit set to 1. January is BIT0 and December BIT11. The BIT31 to 12 are undefined.

4.5.9 Date and time encoding

The time of the Real Time Clock of the system is coded as a INT32. The value is the number of second since 1.1.1970 00:00:00. The parameters {5001} (Time) and {5002} (Date) take and return the same value that contains the complete day and hour information.

4.5.10 Signal encoding

The Signal (parameters {1468}, for example) is coded as a INT32. To send a signal, you must write the value 1 to the parameter value.

4.6 Message objects

The Message objects are supported for Xcom-232 with version >= 1.5.0.

The messages sent by the devices on the communication bus are stored by Xcom-232i in its non-volatile flash memory. They can be read on the Xcom-232i (address 501) later.

4.6.1 Description of the reading function:

Reading a message with index 0 will return the last saved message in the flash memory of the Xcom-232i. In the reponse frame from the SCOM the first data indicates the number of remaining messages before attaining the very first message saved in the flash memory (this behaviour is identical with the history of RCC). A pointer is saved in the Xcom-232i when reading the index 0 (SCOM_MSG_IDX).

Reading a message with an index superior to 0 will return the message saved in the SCOM_MSG_IDX index.

Reading a message with index 0 will erase the flag informing that there are new messages.

If a new message is received after the last reading of index 0, the notification flag is reactivated. Then the PC user must make a new index 0 reading in order to update the pointer (SCOM_MSG_IDX).

4.6.2 Notification of new messages:

A notification flag indicating new messages is sent in every response frame from the Xcom.

4.6.3 Sorting the messages

In order to determine whether the PC user has received all messages, he has to create a unique identifier including the address of the source, the time and date.

4.6.4 Request frame :

The server sends a request in the following format :

flags	service_id	object_type	object_id	property_id
0x00	0x01	2 bytes	4 bytes	2 bytes

flags : is_response =0, error=0

service_id : 0x01 for READ_PROPERTY

object_type : 0x0003 (MESSAGE)

object_id : Index desired message

property_id : 0x00

4.6.5 Response frame :

The XCOM-232i responds with the following format :

service_flags	service_id	object_type	object_id	property_id	property_data
0x02 or 0x03	0x01	2 bytes	4 bytes	2 bytes	N bytes

flags : is_response = 1, error= 0 ou 1

service_id : Same value as the query

object_type : Same value as the query

object_id : Same value as the query

property_id : Same value as the query

property_data : If error=0 → the message asked (see 4.6.6)

If error=1 → 2 bytes for the error code

4.6.6 Content of data property

Name	Size	Format	Remark
message_total_number	4 bytes	INT32	The total number of message in the XCOM-232i
message_type	2 byte	ENUM	The number defining the meaning of the message. See the description below.
source_address	4 byte	INT32	Source address of the message. See 3.5 Addressing the devices.
timestamp	4 byte	INT32	The time at which the message occurred in seconds since January 1, 1970.
value	4 byte	DYNAMIC	An optional value of the message. Not yet used currently.

4.7 File transfer object

This object allows to download the files stored on the SD card of the Xcom-232i. The object_type defines the accessed directory. File names are stripped of their directory name. The current version only supports the datalog directory.

4.7.1 Request frame

The server sends a request in the following format:

flags	service_id	object_type	object_id	property_id	property_data
0x00	0x01	2 bytes	4 bytes	2 bytes	N bytes

flags: is_response = 0, error = 0

service_id: 0x01 for READ_PROPERTY

0x02 for WRITE_PROPERTY

object_type: 0x0101 (Datalog Transfer, content of CSVFILES\LOG)

object_id: 0x00000001 → Directory list

0x00000002 → File access

property_id: 0x0000 → Invalid Action

0x0021 → SD_Start

0x0022 → SD_Datablock

0x0023 → SD_Ack_Continue

0x0024 → SD_Nack_Retry

0x0025 → SD_Abort

0x0026 → SD_Finish

property_data: If object_id = Directory list → No data

If property_id = Start → filename "LGYYMMDD.CSV"[1] in Big Endian

If property_id = Ack and Continue → No data

If property_id = Nack and Retry → No data

If property_id = Abort → No data

[1] YY = Year, MM = Month, DD = Day

4.7.2 Response frame

The XCOM-232i responds with the following format:

flags	service_id	object_type	object_id	property_id	property_data
0x02	0x01	2 bytes	4 bytes	2 bytes	N bytes

flags: is_response = 1, error = 0

service_id: 0x01 for READ_PROPERTY

0x02 for WRITE_PROPERTY

object_type: 0x0101 (Datalog Transfer, content of CSVFILES\LOG)

object_id: 0x00000001 → Directory list

0x00000002 → File access

property_id: 0x0000 → Invalid Action

0x0021 → SD_Start

0x0022 → SD_Datablock

0x0023 → SD_Ack_Continue

0x0024 → SD_Nack_Retry

0x0025 → SD_Abort

0x0026 → SD_Finish

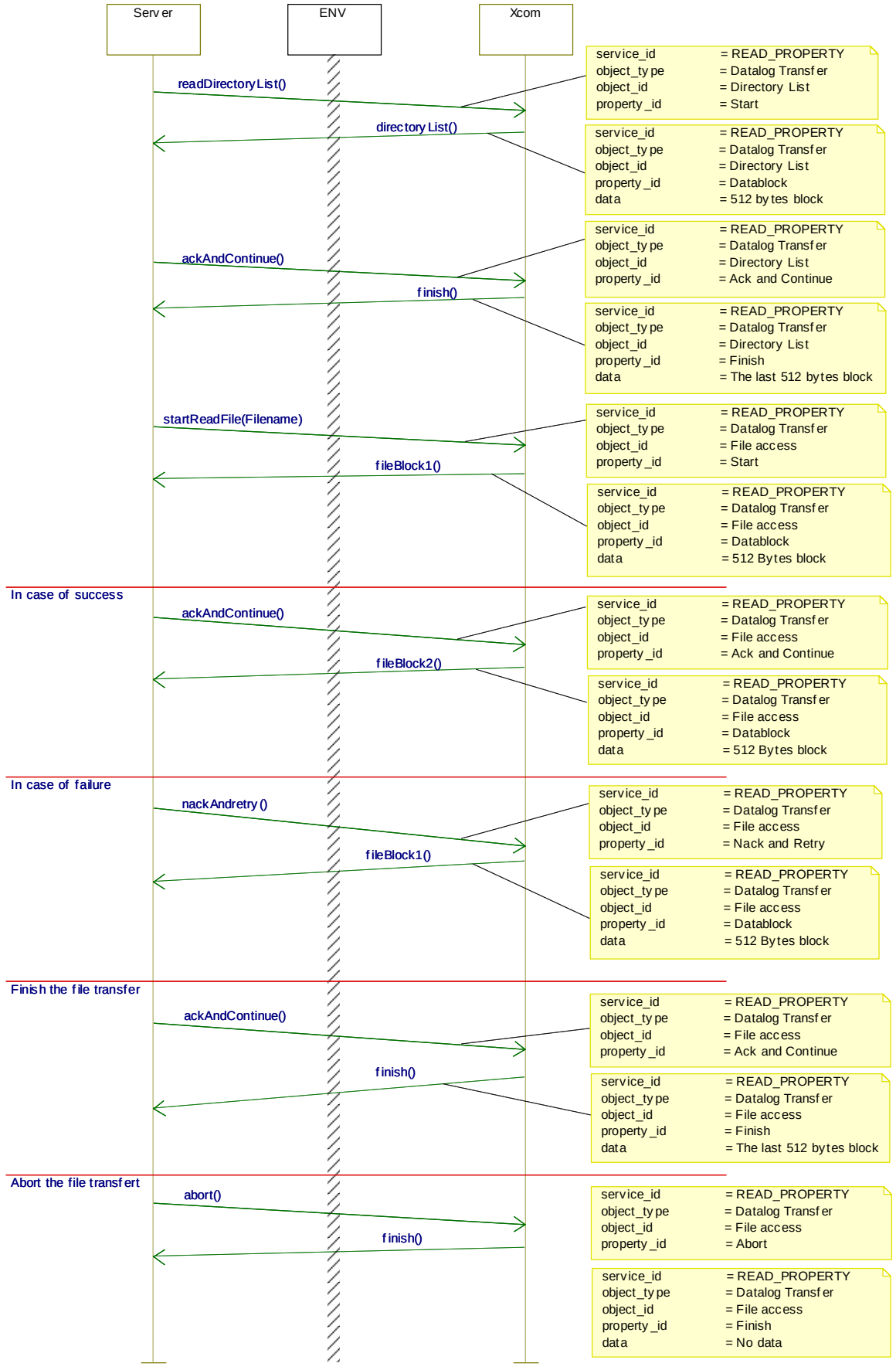
property_data: If object_id = Directory list → Each filename with "CR" for separation

If property_id = Datablock → 512 Bytes / block

If property_id = Finish → No data

If error = 1 → Error number

4.7.3 Transfer sequence



5. Examples of frames

The byte stream is represented in hexadecimal. As specified above, the encoding is little endian.

5.1 C library

A portable C library that implements the protocol is included with this specification on www.studer-innotec.com. See the documentation provided with the library for more detail.

5.2 Command line tool

To help the implementation of the protocol we supply also the command line tool `scom.exe`. It is included with the protocol specification available on www.studer-innotec.com.

5.3 Read the value of a user info

generated by the command:

```
>scom.exe --port=COM3 --verbose=3 read_property src_addr=1 dst_addr=101 object_type=1 object_id=3000 property_id=1 format=FLOAT
```

Request

start_-byte	**frame_-flags**	**src_addr = 1**	**dst_addr = 101 (first inverter)**	**data_length = 10**	**header_-checksum**	**frame_-data**	**data_-checksum**
AA	00	01 00 00 00	65 00 00 00	0A 00	6F 71	10 bytes	C5 90

flags : **is_response = false** **error = false**	**service_id =** **READ_-PROPERTY**	**object_type =** **USER_INFO**	**object_id =** **3000**	**property_id =** **value**
00	01	01 00	B8 0B 00 00	01 00

Total number of bytes: 14+10+2 = 26 bytes

Response

start_-byte	**frame_-flags**	**src_addr =101**	**dst_addr = 1**	**data_length = 14**	**header_-checksum**	**frame_-data**	**data_-checksum**
AA	00	65 00 00 00	01 00 00 00	0E 00	73 09	14 bytes	63 57

flags : **is_response = true** **error = false**	**service_id =** **READ_PROPERTY**	**object_type =** **USER_INFO**	**object_id =** **3000**	**property_id =** **value**	**value=** **23.453125**

02	01	01 00	B8 0B 00 00	01 00	00 A0 BB 41

Total number of bytes: 14+14+2 = 30 bytes

5.4 Write the qsp_value of a parameter

Set the battery charge current at 12.0 A.

generated by the command:

```
>scom.exe --port=COM3 --verbose=3 write_property src_addr=1 dst_addr=101
object_type=2 object_id=1138 property_id=5 format=FLOAT value=12.0
```

Request

start_-byte	**frame_-flags**	**src_-addr=1**	**dst_addr-=101**	**data_-length = 14**	**header_-checksum**	**frame_-data**	**data_-checksum**
AA	00	01 00 00 00	65 00 00 00	0E 00	73 79	14 bytes	FF 9B

flags : **is_response =false** **error =false**	**service_id =** **WRITE_-PROPERTY**	**object_type =** **PARAMETER**	**object_id =** **1138**	**property_id =** **value_qsp**	**property_data = 12.0**
00	02	02 00	72 04 00 00	05 00	00 00 40 41

Total number of bytes: 14+14+2 = 30 bytes

Response

start_-byte	**frame_-flags**	**src_-addr=1**	**dst_addr-=101**	**data_-length = 10**	**header_-checksum**	**frame_-data**	**data_-checksum**
AA	00	65 00 00 00	01 00 00 00	0A 00	6F 01	10 bytes	80 F6

flags : **is_response =true** **error =false**	**service_id =** **WRITE_-PROPERTY**	**object_type =** **PARAMETER**	**object_id =** **1138**	**property_id =** **value_qsp**
02	02	02 00	72 04 00 00	05 00

Total number of bytes: 14+10+2 = 26 bytes

Read Messages

```
>scom --port=COM3 read_property src_addr=1 dst_addr=501 object_type=3
object_id=0 property_id=0 format=BYTE_STREAM
display=message_total_number:32d,message_type:16d,source_address:32d,timest
amp:32d,value:32d

device_addr=501
object_type=0x3
object_id=0
property_id=0
length=18
data=
message_total_number: 208
message_type: 82
source_address: 301
timestamp: 1348069059
value: 0
```

6. Appendices

6.1 Xtender parameters

Level	User ref.	Parameter	Scom format	Increment
Basic	**1100**	**BASIC SETTINGS**	ONLY LEVEL	Menu
Basic	1551	Basic parameters set by means of the potentiomenter in the XTS	BOOL	1
Basic	1107	Maximum current of AC source (Input limit)	FLOAT	1
Basic	1138	Battery charge current	FLOAT	1
Basic	1126	Smart-Boost allowed	BOOL	1
Basic	1124	Inverter allowed	BOOL	1
Basic	1552	Type of detection of the grid loss (AC-In)	ENUM	Only 1 bit 1:Slow 2:Tolerant 4:Fast
Basic	1187	Standby level	FLOAT	10
Basic	1395	Restore default settings	INT32	Signal
Inst.	1287	Restore factory settings	INT32	Signal
Expert	**1137**	**BATTERY MANAGEMENT AND CYCLE**	ONLY LEVEL	Menu
Expert	1125	Charger allowed	BOOL	1
Basic	1138	Battery charge current	FLOAT	1
Expert	1139	Temperature compensation	FLOAT	1
QSP	1615	Fast charge/inject regulation	BOOL	1
Expert	**1568**	**Undervoltage**	ONLY LEVEL	Menu
Expert	1108	Battery undervoltage level without load	FLOAT	0.1
Expert	**1531**	**Battery undervoltage dynamic compensation**	ONLY LEVEL	Menu
Expert	1191	Battery undervoltage dynamic compensation	BOOL	1
Expert	1532	Kind of dynamic compensation	ENUM	Only 1 bit 0:Manual 1:Automatic
QSP	1632	Automatic adaptation of dynamic compensation	FLOAT	1
Expert	1109	Battery undervoltage level at full load	FLOAT	0.1
Expert	1190	Battery undervoltage duration before turn off	FLOAT	1
Expert	1110	Restart voltage after batteries undervoltage	FLOAT	0.1
Expert	1194	Battery adaptive low voltage (B.L.O)	BOOL	1
Expert	1195	Max voltage for adaptive low voltage	FLOAT	0.1
Expert	1307	Reset voltage for adaptive correction	FLOAT	0.1
Expert	1298	Increment step of the adaptive low voltage	FLOAT	0.01
Expert	1121	Battery overvoltage level	FLOAT	0.1
Expert	1122	Restart voltage level after an battery overvoltage	FLOAT	0.1
Expert	1140	Floating voltage	FLOAT	0.1
Expert	1467	Force phase of floating	INT32	Signal
Expert	**1141**	**New cycle menu**	ONLY LEVEL	Menu
Expert	1142	Force a new cycle	INT32	Signal
Inst.	1608	Use dynamic compensation of battery level (new cycle)	BOOL	1
Expert	1143	Voltage level 1 to start a new cycle	FLOAT	0.1
Expert	1144	Time period under voltage level 1 to start a new cycle	FLOAT	1
Expert	1145	Voltage level 2 to start a new cycle	FLOAT	0.1
Expert	1146	Time period under voltage level 2 to start a new cycle	FLOAT	2
Expert	1149	New cycle priority on absorption and equalization phases	BOOL	1
Expert	1147	Cycling restricted	BOOL	1
Expert	1148	Minimal delay between cycles	FLOAT	1
Expert	**1451**	**Absorption phase**	ONLY LEVEL	Menu
Expert	1155	Absorption phase allowed	BOOL	1
Expert	1156	Absorption voltage	FLOAT	0.1
Expert	1157	Absorption duration	FLOAT	0.25
Expert	1158	End of absorption triggered with current	BOOL	1

Expert	1159	Current limit to quit the absorption phase	FLOAT	1
Expert	1160	Maximal frequency of absorption control	BOOL	1
Expert	1161	Minimal delay since last absorption	FLOAT	1
Expert	**1452**	**Equalization phase**	ONLY LEVEL	Menu
Expert	1163	Equalization allowed	BOOL	1
Expert	1162	Force equalization	INT32	Signal
Expert	1291	Equalization before absorption phase	BOOL	1
Expert	1290	Equalization current	FLOAT	1
Expert	1164	Equalization voltage	FLOAT	0.1
Expert	1165	Equalization duration	FLOAT	0.25
Expert	1166	Number of cycles before an equalization	FLOAT	1
Expert	1284	Equalization with fixed interval	BOOL	1
Expert	1285	Weeks between equalizations	FLOAT	1
Expert	1168	End of equalization triggered with current	BOOL	1
Expert	1169	Current threshold to end equalization phase	FLOAT	1
Expert	**1453**	**Reduced floating phase**	ONLY LEVEL	Menu
Expert	1170	Reduced floating allowed	BOOL	1
Expert	1171	Floating duration before reduced floating	FLOAT	1
Expert	1172	Reduced floating voltage	FLOAT	0.1
Expert	**1454**	**Periodic absorption phase**	ONLY LEVEL	Menu
Expert	1173	Periodic absorption allowed	BOOL	1
Expert	1174	Periodic absorption voltage	FLOAT	0.1
Expert	1175	Reduced floating duration before periodic absorption	FLOAT	1
Expert	1176	Periodic absorption duration	FLOAT	0.25
Expert	**1186**	**INVERTER**	ONLY LEVEL	Menu
Basic	1124	Inverter allowed	BOOL	1
Expert	1286	AC Output voltage	FLOAT	1
Expert	1548	AC voltage increase according to battery voltage	BOOL	1
Expert	1560	Max AC voltage increase with battery voltage	FLOAT	1
Expert	1112	Inverter frequency	FLOAT	0.1
Expert	1536	Inverter frequency increase when battery full	BOOL	1
Expert	1549	Inverter frequency increase according to battery voltage	BOOL	1
Expert	1546	Max frequency increase	FLOAT	0.1
Expert	1534	Speed of voltage or frequency change in function of battery	FLOAT	1
Expert	**1420**	**Standby and turn on**	ONLY LEVEL	Menu
Basic	1187	Standby level	FLOAT	10
Expert	1189	Time delay between standby pulses	FLOAT	0.2
Expert	1188	Standby number of pulses	FLOAT	1
Expert	1599	Softstart duration	FLOAT	0.25
Expert	1438	Solsafe presence Energy source at AC-Out side	BOOL	1
QSP	1572	Modulator ru_soll	BOOL	1
Expert	**1197**	**AC-IN AND TRANSFER**	ONLY LEVEL	Menu
Expert	1128	Transfer relay allowed	BOOL	1
Expert	1580	Delay before closing transfer relay	FLOAT	0.25
Basic	1126	Smart-Boost allowed	BOOL	1
Inst.	1607	Limitation of the power Boost	FLOAT	5
Basic	1107	Maximum current of AC source (Input limit)	FLOAT	1
Expert	**1471**	**Max input current modification**	ONLY LEVEL	Menu
Expert	1566	Using a secondary value for the maximum current of the AC source	BOOL	1
Expert	1567	Second maximum current of the AC source (Input limit)	FLOAT	1
Expert	1527	Decrease max input limit current with AC-In voltage	BOOL	1
Expert	1554	Decrease of the max. current of the source with input voltage activated by command entry	BOOL	1
Expert	1309	AC input low limit voltage to allow charger function	FLOAT	5
Expert	1433	Adaptation range of the input current according to the input voltage	FLOAT	1
Expert	1553	Speed of input limit increase	FLOAT	2

Expert	1295	Charge current decrease coef. at voltage limit to turn back in inverter mode	FLOAT	5
Expert	1436	Overrun AC source current limit without opening the transfer relay (Input limit)	BOOL	1
Basic	1552	Type of detection of the grid loss (AC-In)	ENUM	Only 1 bit 1:Slow 2:Tolerant 4:Fast
Expert	1510	Tolerance on detection of AC-input loss (tolerant UPS mode)	FLOAT	2
Expert	1199	Input voltage giving an opening of the transfer relay with delay	FLOAT	5
Expert	1198	Time delay before opening of transfer relay	FLOAT	1
Expert	1200	Input voltage giving an immediate opening of the transfer relay (UPS)	FLOAT	5
Inst.	1432	Absolute max limit for input voltage	FLOAT	5
QSP	1500	Standby of the charger allowed	BOOL	1
Expert	1505	Delta frequency allowed above the standard input frequency	FLOAT	0.2
Expert	1506	Delta frequency allowed under the standard input frequency	FLOAT	0.2
Expert	1507	Duration with frequency error before opening the transfer	FLOAT	1
Expert	1575	AC-IN current active filtering	BOOL	1
Inst.	1557	Use an energy quota on AC-input	BOOL	1
Inst.	1559	AC-in energy quota	FLOAT	0.5
Expert	**1201**	**AUXILIARY CONTACT 1**	ONLY LEVEL	Menu
Expert	1202	Operating mode (AUX 1)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	1497	Combination of the events for the auxiliary contact (AUX 1)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**1203**	**Temporal restrictions (AUX 1)**	ONLY LEVEL	Menu
Expert	**1204**	**Program 1 (AUX 1)**	ONLY LEVEL	Menu
Expert	1205	Day of the week (AUX 1)	ENUM	Bit field
Expert	1206	Start hour (AUX 1)	INT32	1
Expert	1207	End hour (AUX 1)	INT32	1
Expert	**1208**	**Program 2 (AUX 1)**	ONLY LEVEL	Menu
Expert	1209	Day of the week (AUX 1)	ENUM	Bit field
Expert	1210	Start hour (AUX 1)	INT32	1
Expert	1211	End hour (AUX 1)	INT32	1
Expert	**1212**	**Program 3 (AUX 1)**	ONLY LEVEL	Menu
Expert	1213	Day of the week (AUX 1)	ENUM	Bit field
Expert	1214	Start hour (AUX 1)	INT32	1
Expert	1215	End hour (AUX 1)	INT32	1
Inst.	**1216**	**Program 4 (AUX 1)**	ONLY LEVEL	Menu
Inst.	1217	Day of the week (AUX 1)	ENUM	Bit field
Inst.	1218	Start hour (AUX 1)	INT32	1
Inst.	1219	End hour (AUX 1)	INT32	1
Inst.	**1220**	**Program 5 (AUX 1)**	ONLY LEVEL	Menu
Inst.	1221	Day of the week (AUX 1)	ENUM	Bit field
Inst.	1222	Start hour (AUX 1)	INT32	1
Inst.	1223	End hour (AUX 1)	INT32	1
Expert	**1269**	**Contact active with a fixed time schedule (AUX 1)**	ONLY LEVEL	Menu
Expert	**1270**	**Program 1 (AUX 1)**	ONLY LEVEL	Menu
Expert	1271	Day of the week (AUX 1)	ENUM	Bit field
Expert	1272	Start hour (AUX 1)	INT32	1
Expert	1273	End hour (AUX 1)	INT32	1
Expert	**1274**	**Program 2 (AUX 1)**	ONLY LEVEL	Menu
Expert	1275	Day of the week (AUX 1)	ENUM	Bit field
Expert	1276	Start hour (AUX 1)	INT32	1

Expert	1277	End hour (AUX 1)	INT32	1
Expert	**1278**	**Program 3 (AUX 1)**	ONLY LEVEL	Menu
Expert	1279	Day of the week (AUX 1)	ENUM	Bit field
Expert	1280	Start hour (AUX 1)	INT32	1
Expert	1281	End hour (AUX 1)	INT32	1
Expert	**1455**	**Contact active on event (AUX 1)**	ONLY LEVEL	Menu
Expert	1225	Xtender is OFF (AUX 1)	BOOL	1
Expert	1518	Xtender ON (AUX 1)	BOOL	1
Expert	1543	Remote entry (AUX 1)	BOOL	1
Expert	1226	Battery undervoltage alarm (AUX 1)	BOOL	1
Expert	1227	Battery overvoltage (AUX 1)	BOOL	1
Expert	1228	Inverter or Smart- Boost overload (AUX 1)	BOOL	1
Expert	1229	Overtemperature (AUX 1)	BOOL	1
Expert	1520	No overtemperature (AUX 1)	BOOL	1
Expert	1231	Active charger (AUX 1)	BOOL	1
Expert	1232	Active inverter (AUX 1)	BOOL	1
Expert	1233	Active Smart-Boost (AUX 1)	BOOL	1
Expert	1234	AC input presence but with fault (AUX 1)	BOOL	1
Expert	1235	AC input presence (AUX 1)	BOOL	1
Expert	1236	Transfer relay ON (AUX 1)	BOOL	1
Expert	1237	AC out presence (AUX 1)	BOOL	1
Expert	1238	Bulk charge phase (AUX 1)	BOOL	1
Expert	1239	Absorption phase (AUX 1)	BOOL	1
Expert	1240	Equalization phase (AUX 1)	BOOL	1
Expert	1242	Floating (AUX 1)	BOOL	1
Expert	1243	Reduced floating (AUX 1)	BOOL	1
Expert	1244	Periodic absorption (AUX 1)	BOOL	1
Inst.	1601	AC-in energy quota (AUX1)	BOOL	1
Expert	**1245**	**Contact active according to battery voltage (AUX 1)**	ONLY LEVEL	Menu
Expert	1288	Use dynamic compensation of battery level (AUX 1)	BOOL	1
Expert	1246	Battery voltage 1 activate (AUX 1)	BOOL	1
Expert	1247	Battery voltage 1 (AUX 1)	FLOAT	0.1
Expert	1248	Delay 1 (AUX 1)	FLOAT	1
Expert	1249	Battery voltage 2 activate (AUX 1)	BOOL	1
Expert	1250	Battery voltage 2 (AUX 1)	FLOAT	0.1
Expert	1251	Delay 2 (AUX 1)	FLOAT	1
Expert	1252	Battery voltage 3 activate (AUX 1)	BOOL	1
Expert	1253	Battery voltage 3 (AUX 1)	FLOAT	0.1
Expert	1254	Delay 3 (AUX 1)	FLOAT	1
Expert	1255	Battery voltage to deactivate (AUX 1)	FLOAT	0.1
Expert	1256	Delay to deactivate (AUX 1)	FLOAT	5
Expert	1516	Deactivate if battery in floating phase (AUX 1)	BOOL	1
Expert	**1257**	**Contact active with inverter power or Smart-Boost (AUX 1)**	ONLY LEVEL	Menu
Expert	1258	Inverter power level 1 activate (AUX 1)	BOOL	1
Expert	1259	Power level 1 (AUX 1)	FLOAT	10
Expert	1260	Time delay 1 (AUX 1)	FLOAT	1
Expert	1261	Inverter power level 2 activate (AUX 1)	BOOL	1
Expert	1262	Power level 2 (AUX 1)	FLOAT	10
Expert	1263	Time delay 2 (AUX 1)	FLOAT	1
Expert	1264	Inverter power level 3 activate (AUX 1)	BOOL	1
Expert	1265	Power level 3 (AUX 1)	FLOAT	10
Expert	1266	Time delay 3 (AUX 1)	FLOAT	1
Expert	1267	Inverter power level to deactivate (AUX 1)	FLOAT	10
Expert	1268	Time delay to deactivate (AUX 1)	FLOAT	5
Inst.	**1503**	**Contact active according to battery temperature (AUX 1) With BSP or BTS**	ONLY LEVEL	Menu
Inst.	1446	Contact activated with the temperature of battery (AUX 1)	BOOL	1
Inst.	1447	Contact activated over (AUX 1)	FLOAT	1

Inst.	1448	Contact deactivated below (AUX 1)	FLOAT	1
Expert	**1501**	**Contact active according to SOC (AUX 1) Only with BSP**	ONLY LEVEL	Menu
Expert	1439	Contact activated with the SOC 1 of battery (AUX 1)	BOOL	1
Expert	1440	Contact activated below SOC 1 (AUX 1)	FLOAT	5
Expert	1581	Delay 1 (AUX 1)	FLOAT	0.25
Expert	1582	Contact activated with the SOC 2 of battery (AUX 1)	BOOL	1
Expert	1583	Contact activated below SOC 2 (AUX 1)	FLOAT	5
Expert	1584	Delay 2 (AUX 1)	FLOAT	0.25
Expert	1585	Contact activated with the SOC 3 of battery (AUX 1)	BOOL	1
Expert	1586	Contact activated below SOC 3 (AUX 1)	FLOAT	5
Expert	1587	Delay 3 (AUX 1)	FLOAT	0.25
Expert	1441	Contact deactivated over SOC (AUX 1)	FLOAT	5
Expert	1588	Delay to deactivate (AUX 1)	FLOAT	0.25
Expert	1589	Deactivate if battery in floating phase (AUX 1)	BOOL	1
Expert	1512	Security, maximum time of contact (AUX 1)	BOOL	1
Expert	1514	Maximum time of operation of contact (AUX 1)	FLOAT	10
Expert	1569	Reset all settings (AUX 1)	INT32	Signal
Expert	**1310**	**AUXILIARY CONTACT 2**	ONLY LEVEL	Menu
Expert	1311	Operating mode (AUX 2)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	1498	Combination of the events for the auxiliary contact (AUX 2)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**1312**	**Temporal restrictions (AUX 2)**	ONLY LEVEL	Menu
Expert	**1313**	**Program 1 (AUX 2)**	ONLY LEVEL	Menu
Expert	1314	Day of the week (AUX 2)	ENUM	Bit field
Expert	1315	Start hour (AUX 2)	INT32	1
Expert	1316	End hour (AUX 2)	INT32	1
Expert	**1317**	**Program 2 (AUX 2)**	ONLY LEVEL	Menu
Expert	1318	Day of the week (AUX 2)	ENUM	Bit field
Expert	1319	Start hour (AUX 2)	INT32	1
Expert	1320	End hour (AUX 2)	INT32	1
Expert	**1321**	**Program 3 (AUX 2)**	ONLY LEVEL	Menu
Expert	1322	Day of the week (AUX 2)	ENUM	Bit field
Expert	1323	Start hour (AUX 2)	INT32	1
Expert	1324	End hour (AUX 2)	INT32	1
Inst.	**1325**	**Program 4 (AUX 2)**	ONLY LEVEL	Menu
Inst.	1326	Day of the week (AUX 2)	ENUM	Bit field
Inst.	1327	Start hour (AUX 2)	INT32	1
Inst.	1328	End hour (AUX 2)	INT32	1
Inst.	**1329**	**Program 5 (AUX 2)**	ONLY LEVEL	Menu
Inst.	1330	Day of the week (AUX 2)	ENUM	Bit field
Inst.	1331	Start hour (AUX 2)	INT32	1
Inst.	1332	End hour (AUX 2)	INT32	1
Expert	**1378**	**Contact active with a fixed time schedule (AUX 2)**	ONLY LEVEL	Menu
Expert	**1379**	**Program 1 (AUX 2)**	ONLY LEVEL	Menu
Expert	1380	Day of the week (AUX 2)	ENUM	Bit field
Expert	1381	Start hour (AUX 2)	INT32	1
Expert	1382	End hour (AUX 2)	INT32	1
Expert	**1383**	**Program 2 (AUX 2)**	ONLY LEVEL	Menu
Expert	1384	Day of the week (AUX 2)	ENUM	Bit field
Expert	1385	Start hour (AUX 2)	INT32	1
Expert	1386	End hour (AUX 2)	INT32	1
Expert	**1387**	**Program 3 (AUX 2)**	ONLY LEVEL	Menu
Expert	1388	Day of the week (AUX 2)	ENUM	Bit field
Expert	1389	Start hour (AUX 2)	INT32	1

Expert	1390	End hour (AUX 2)	INT32	1
Expert	**1456**	**Contact active on event (AUX 2)**	ONLY LEVEL	Menu
Expert	1333	Xtender is OFF (AUX 2)	BOOL	1
Expert	1519	Xtender ON (AUX 2)	BOOL	1
Expert	1544	Remote entry (AUX 2)	BOOL	1
Expert	1334	Battery undervoltage alarm (AUX 2)	BOOL	1
Expert	1335	Battery overvoltage (AUX 2)	BOOL	1
Expert	1336	Inverter or Smart-Boost overload (AUX 2)	BOOL	1
Expert	1337	Overtemperature (AUX 2)	BOOL	1
Expert	1521	No overtemperature (AUX 2)	BOOL	1
Expert	1339	Active charger (AUX 2)	BOOL	1
Expert	1340	Active inverter (AUX 2)	BOOL	1
Expert	1341	Active Smart-Boost (AUX 2)	BOOL	1
Expert	1342	AC input presence but with fault (AUX 2)	BOOL	1
Expert	1343	AC input presence (AUX 2)	BOOL	1
Expert	1344	Transfer contact ON (AUX 2)	BOOL	1
Expert	1345	AC out presence (AUX 2)	BOOL	1
Expert	1346	Bulk charge phase (AUX 2)	BOOL	1
Expert	1347	Absorption phase (AUX 2)	BOOL	1
Expert	1348	Equalization phase (AUX 2)	BOOL	1
Expert	1350	Floating (AUX 2)	BOOL	1
Expert	1351	Reduced floating (AUX 2)	BOOL	1
Expert	1352	Periodic absorption (AUX 2)	BOOL	1
Inst.	1602	AC-in energy quota (AUX2)	BOOL	1
Expert	**1353**	**Contact active according to battery voltage (AUX 2)**	ONLY LEVEL	Menu
Expert	1354	Use dynamic compensation of battery level (AUX 2)	BOOL	1
Expert	1355	Battery voltage 1 activate (AUX 2)	BOOL	1
Expert	1356	Battery voltage 1 (AUX 2)	FLOAT	0.1
Expert	1357	Delay 1 (AUX 2)	FLOAT	1
Expert	1358	Battery voltage 2 activate (AUX 2)	BOOL	1
Expert	1359	Battery voltage 2 (AUX 2)	FLOAT	0.1
Expert	1360	Delay 2 (AUX 2)	FLOAT	1
Expert	1361	Battery voltage 3 activate (AUX 2)	BOOL	1
Expert	1362	Battery voltage 3 (AUX 2)	FLOAT	0.1
Expert	1363	Delay 3 (AUX 2)	FLOAT	1
Expert	1364	Battery voltage to deactivate (AUX 2)	FLOAT	0.1
Expert	1365	Delay to deactivate (AUX 2)	FLOAT	5
Expert	1517	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	**1366**	**Contact active with inverter power or Smart-Boost (AUX 2)**	ONLY LEVEL	Menu
Expert	1367	Inverter power level 1 activate (AUX 2)	BOOL	1
Expert	1368	Power level 1 (AUX 2)	FLOAT	10
Expert	1369	Time delay 1 (AUX 2)	FLOAT	1
Expert	1370	Inverter power level 2 activate (AUX 2)	BOOL	1
Expert	1371	Power level 2 (AUX 2)	FLOAT	10
Expert	1372	Time delay 2 (AUX 2)	FLOAT	1
Expert	1373	Inverter power level 3 activate (AUX 2)	BOOL	1
Expert	1374	Power level 3 (AUX 2)	FLOAT	10
Expert	1375	Time delay 3 (AUX 2)	FLOAT	1
Expert	1376	Inverter power level to deactivate (AUX 2)	FLOAT	10
Expert	1377	Time delay to deactivate (AUX 2)	FLOAT	5
Inst.	**1504**	**Contact active according to battery temperature (AUX 2) With BSP or BTS**	ONLY LEVEL	Menu
Inst.	1457	Contact activated with the temperature of battery (AUX 2)	BOOL	1
Inst.	1458	Contact activated over (AUX 2)	FLOAT	1
Inst.	1459	Contact deactivated below (AUX 2)	FLOAT	1
Expert	**1502**	**Contact active according to SOC (AUX 2) Only with BSP**	ONLY LEVEL	Menu
Expert	1442	Contact activated with the SOC 1 of battery (AUX 2)	BOOL	1
Expert	1443	Contact activated below SOC 1 (AUX 2)	FLOAT	5

Expert	1590	Delay 1 (AUX 2)	FLOAT	0.25
Expert	1591	Contact activated with the SOC 2 of battery (AUX 2)	BOOL	1
Expert	1592	Contact activated below SOC 2 (AUX 2)	FLOAT	5
Expert	1593	Delay 2 (AUX 2)	FLOAT	0.25
Expert	1594	Contact activated with the SOC 3 of battery (AUX 2)	BOOL	1
Expert	1595	Contact activated below SOC 3 (AUX 2)	FLOAT	5
Expert	1596	Delay 3 (AUX 2)	FLOAT	0.25
Expert	1444	Contact deactivated over SOC (AUX 2)	FLOAT	5
Expert	1597	Delay to deactivate (AUX 2)	FLOAT	0.25
Expert	1598	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	1513	Security, maximum time of contact (AUX 2)	BOOL	1
Expert	1515	Maximum time of operation of contact (AUX 2)	FLOAT	10
Expert	1570	Reset all settings (AUX 2)	INT32	Signal
Expert	**1489**	**AUXILIARY CONTACTS 1 AND 2 EXTENDED FUNCTIONS**	ONLY LEVEL	Menu
Expert	1491	Generator control active	BOOL	1
Expert	1493	Number of starting attempts	FLOAT	1
Expert	1492	Starter pulse duration (with AUX2)	FLOAT	1
Expert	1494	Time before a starter pulse	FLOAT	1
Expert	1574	Main contact hold/interrupt time	FLOAT	1
Expert	**1101**	**SYSTEM**	ONLY LEVEL	Menu
Expert	**1537**	**Remote entry (Remote ON/OFF)**	ONLY LEVEL	Menu
Expert	1545	Remote entry active	ENUM	Only 1 bit 0:Closed 1:Open
Expert	1538	Prohibits transfert relay	BOOL	1
Expert	1539	Prohibits inverter	BOOL	1
Expert	1540	Prohibits charger	BOOL	1
Expert	1541	Prohibits Smart-Boost	BOOL	1
Expert	1542	Prohibits grid feeding	BOOL	1
Expert	1566	Using a secondary value for the maximum current of the AC source	BOOL	1
Expert	1567	Second maximum current of the AC source (Input limit)	FLOAT	1
Expert	1554	Decrease of the max. current of the source with input voltage activated by command entry	BOOL	1
Expert	1576	ON/OFF command	BOOL	1
Expert	1578	Activated by AUX1 state	BOOL	1
Expert	1579	Prohibits battery priority	BOOL	1
Inst.	1600	Disable minigrid mode	BOOL	1
Expert	1296	Batteries priority as energy source	BOOL	1
Expert	1297	Battery priority voltage	FLOAT	0.1
Expert	1565	Buzzer alarm duration	FLOAT	1
Expert	**1129**	**Auto restarts**	ONLY LEVEL	Menu
Expert	1130	After battery undervoltage	BOOL	1
Expert	1304	Number of batteries undervoltage allowed before definitive stop	FLOAT	1
Expert	1404	Time period for batteries undervoltages counting	FLOAT	60
Expert	1305	Number of batteries critical undervoltage allowed before definitive stop	FLOAT	1
Expert	1405	Time period for critical batteries undervoltages counting	FLOAT	5
Expert	1131	After battery overvoltage	BOOL	1
Expert	1132	After inverter or Smart-Boost overload	BOOL	1
Expert	1533	Delay to restart after an overload	FLOAT	1
Expert	1134	After overtemperature	BOOL	1
Expert	1111	Autostart to the battery connection	BOOL	1
Expert	**1484**	**System earthing (Earth - Neutral)**	ONLY LEVEL	Menu
Expert	1485	Prohibited ground relay	BOOL	1
Expert	1486	Continuous neutral	BOOL	1
Inst.	1628	Xtender watchdog enabled	BOOL	1
Inst.	1629	Xtender watchdog delay	FLOAT	10

QSP	1616	Use of functions limited to a number of days	BOOL	1
QSP	1391	Number of days without functionalitie's restrictions	FLOAT	1
QSP	1617	Transfer relay disabled after timeout	BOOL	1
QSP	1618	Inverter disabled after timeout	BOOL	1
QSP	1619	Charger disabled after timeout	BOOL	1
QSP	1620	Smart-Boost disabled after timeout	BOOL	1
QSP	1621	Grid feeding disabled after timeout	BOOL	1
Inst.	1550	Parameters saved in flash memory	BOOL	1
Inst.	1415	ON of the Xtenders	INT32	Signal
Inst.	1399	OFF of the Xtenders	INT32	Signal
Expert	1468	Reset of all the inverters	INT32	Signal
Expert	**1282**	**MULTI XTENDER SYSTEM**	ONLY LEVEL	Menu
Expert	1283	Integral mode	BOOL	1
Expert	1461	Multi inverters allowed	BOOL	1
Expert	1462	Multi inverters independents. Need reset {1468}	BOOL	1
Expert	1555	Battery cycle synchronized by the master	BOOL	1
Expert	1547	Allow slaves standby in multi-Xtender system	BOOL	1
Expert	1571	Splitphase: L2 with 180 degrees phaseshift	BOOL	1
QSP	1558	Separated Batteries	BOOL	1
Inst.	1437	Minigrid compatible	BOOL	1
Inst.	1577	Minigrid with shared battery energy	BOOL	1
Inst.	1556	is central inverter in distributed minigrid	BOOL	1
Expert	**1522**	**GRID-FEEDING**	ONLY LEVEL	Menu
Expert	1127	Grid feeding allowed	BOOL	1
Expert	1523	Max grid feeding current	FLOAT	0.2
Expert	1524	Battery voltage target for forced grid feeding	FLOAT	0.1
Expert	1525	Forced grid feeding start time	INT32	1
Expert	1526	Forced grid feeding stop time	INT32	1
Inst.	1610	Use of the defined phase shift curve for injection	BOOL	1
Inst.	1622	Cos phi at P = 0%	FLOAT	0.01
Inst.	1623	Cos phi at the power defined by param {1613}	FLOAT	0.01
Inst.	1613	Power of the second cos phi point in % of Pnom	FLOAT	5
Inst.	1624	Cos phi at P = 100%	FLOAT	0.01
Inst.	1627	ARN4105 frequency control enabled	BOOL	1
Inst.	1630	Delta from user frequency to start derating	FLOAT	0.1
Inst.	1631	Delta from user frequency to reach 100% derating	FLOAT	0.1

The cos phi parameter range goes from -0.1 (Capacitive 0.9) to +0.1 (Inductive 0.9) by 0.01 steps.

6.2 Xtender infos

Info. no.	Description	Unit on the RCC	Unit	Format	Related parameter or description
3000	Battery voltage	Vdc	V	FLOAT	
3001	Battery temperature	°C	°C no sensor : return ~32767 °C	FLOAT	Value given by the external battery temperature sensor BTS-01
3002	Temperature compensation of battery voltage	Ctmp	Ctmp	FLOAT	
3003	Dynamic compensation of battery voltage	Cdyn	Cdyn	FLOAT	
3004	Wanted battery charge current	Ausr	A	FLOAT	
3005	Battery charge current	Adc	A	FLOAT	
3006	Battery voltage ripple	Vrip	V	FLOAT	
3007	State of charge	%	%	FLOAT	
3008	Low Voltage Disconect	LVD	V	FLOAT	

3010	Battery cycle phase		0:Invalid value 1:Bulk 2:Absorpt. 3:Equalise 4:Floating 5:R.float. 6:Per.abs. 7:Mixing 8:Forming	ENUM	See parameter {1137}
3011	Input voltage	Vac	V	FLOAT	See parameter {1197}
3012	Input current	Aac	A	FLOAT	
3013	Input power	kVA	kVA	FLOAT	
3017	Input limit value	ILim	A	FLOAT	
3018	Input limite reached		0:Off 1:On	ENUM	L*, see parameter {1107}
3019	Boost active		0:Off 1:On	ENUM	B*, see parameter {1126}
3020	State of transfer relay		0:Opened 1:Closed	ENUM	
3021	Output voltage	Vac	V	FLOAT	See parameter {1286}
3022	Output current	Aac	A	FLOAT	
3023	Output power	kVA	kVA	FLOAT	
3028	Operating state		0:Invalid value 1:Inverter 2:Charger 3:Boost 4:Injection	ENUM	Give the current working mode of the inverter. See {1107} for Boost, {1522} for Injection (grid-feeding), charger and inverter mode are oblivious. Only in CSV file, the value 6 indicate that the xtender is off.
3030	State of output relay		0:Opened 1:Closed	ENUM	
3031	State of auxiliary relay I		0:Opened 1:Closed	ENUM	See parameter {1201}
3032	State of auxiliary relay II		0:Opened 1:Closed	ENUM	See parameter {1201}
3045	Nbr. of overloads			FLOAT	
3046	Nbr. overtemperature			FLOAT	
3047	Nbr. batterie overvoltage			FLOAT	
3049	State of the inverter		0:Off 1:On	ENUM	
3050	Number of battery elements			FLOAT	
3051	Search mode state		0:Off 1:On	ENUM	See parameter {1187}
3054	Relay aux I mode		0:Invalid value 1:A 2:I 3:M 4:M 5:G	ENUM	
3055	Relay aux II mode		0:Invalid value 1:A 2:I 3:M 4:M 5:G	ENUM	

3056	Lockings flag			FLOAT	Bit 0: forbidden inverter Bit 1: forbidden charger Bit 2: forbidden boost Bit 3: forbidden transfert Bit 4: forbidden injection Bit 8: mode integral Bit 9: forbidden multi Bit 10: multi independants Bit 11: standy slave allowed
3074	State of the ground relay		0:Opened 1:Closed	ENUM	
3075	State of the neutral transfer relay		0:Opened 1:Closed	ENUM	
3076	Discharge of battery of the previous day	kWh	kWh	FLOAT	
3078	Discharge of battery of the current day	kWh	kWh	FLOAT	
3080	Energy AC-In from of the previous day	kWh	kWh	FLOAT	
3081	Energy AC-In from of the current day	kWh	kWh	FLOAT	
3082	Consumers energy of the previous day	kWh	kWh	FLOAT	
3083	Consumers energy of the current day	kWh	kWh	FLOAT	
3084	Input frequency	Hz	Hz	FLOAT	Replace info 3014
3085	Output frequency	Hz	Hz	FLOAT	Replace info 3024
3086	Remote entry state		0:RM EN 0 1:RM EN 1	ENUM	
3087	Output active power	W	W	FLOAT	
3088	Input active power	W	W	FLOAT	
3089	Defined phase			FLOAT	1=L1, 2=L2, 4=L3
3090	Battery voltage (minute min)	Vdc	V	FLOAT	1 minute minimum
3091	Battery voltage (minute max)	Vdc	V	FLOAT	1 minute maximum
3092	Battery voltage (minute avg)	Vdc	V	FLOAT	1 minute average
3093	Battery charge current (minute min)	Adc	A	FLOAT	1 minute minimum
3094	Battery charge current (minute max)	Adc	A	FLOAT	1 minute maximum
3095	Battery charge current (minute avg)	Adc	A	FLOAT	1 minute average
3096	Output power min (minute min)	kVA	kVA	FLOAT	1 minute minimum
3097	Output power (minute max)	kVA	kVA	FLOAT	1 minute maximum
3098	Output power (minute avg)	kVA	kVA	FLOAT	1 minute average
3099	Output active power (minute min)	kW	kW	FLOAT	1 minute minimum
3100	Output active power (minute max)	kW	kW	FLOAT	1 minute maximum
3101	Output active power (minute avg)	kW	kW	FLOAT	1 minute average
3102	Dev 1 (minute min)			FLOAT	1 minute minimum
3103	Dev 1 (minute max)			FLOAT	1 minute maximum
3104	Dev 1 (minute avg)			FLOAT	1 minute average
3105	Dev 2 (minute min)			FLOAT	1 minute minimum
3106	Dev 2 (minute max)			FLOAT	1 minute maximum
3107	Dev 2 (minute avg)			FLOAT	1 minute average
3108	Output frequency (minute min)	Hz	Hz	FLOAT	1 minute minimum
3109	Output frequency (minute max)	Hz	Hz	FLOAT	1 minute maximum
3110	Output frequency (minute avg)	Hz	Hz	FLOAT	1 minute average
3111	Input voltage (minute min)	Vac	V	FLOAT	1 minute minimum
3112	Input voltage (minute max)	Vac	V	FLOAT	1 minute maximum
3113	Input voltage (minute avg)	Vac	V	FLOAT	1 minute average
3114	Input current (minute min)	Aac	A	FLOAT	1 minute minimum
3115	Input current (minute max)	Aac	A	FLOAT	1 minute maximum
3116	Input current (minute avg)	Aac	A	FLOAT	1 minute average

3117	Input active power (minute min)	kW	kW	FLOAT	1 minute minimum
3118	Input active power (minute max)	kW	kW	FLOAT	1 minute maximum
3119	Input active power (minute avg)	kW	kW	FLOAT	1 minute average
3120	Input frequency (minute min)	Hz	Hz	FLOAT	1 minute minimum
3121	Input frequency (minute max)	Hz	Hz	FLOAT	1 minute maximum
3122	Input frequency (minute avg)	Hz	Hz	FLOAT	1 minute average
3124	ID type			FLOAT	XTH family = 1, XTM family = 256 et XTS family = 512
3125	ID Power	VA	VA	FLOAT	
3126	ID Uout	Vac	V	FLOAT	
3127	ID batt voltage	Vdc	V	FLOAT	
3128	ID Iout nom	Aac	A	FLOAT	
3129	ID HW			FLOAT	
3130	ID SOFT msb			FLOAT	
3131	ID SOFT lsb			FLOAT	
3132	ID HW PWR			FLOAT	
3133	Parameter number (in code)			FLOAT	
3134	Info user number			FLOAT	
3135	ID SID			FLOAT	
3136	Output active power	kW	kW	FLOAT	
3137	Input active power	kW	kW	FLOAT	
3138	Input power	kVA	kVA	FLOAT	
3139	Output power	kVA	kVA	FLOAT	
3140	System debug 1			FLOAT	
3141	System debug 2			FLOAT	
3142	System state machine			FLOAT	
3154	Input frequency	Hz	Hz	FLOAT	
3155	Desired AC injection current	Aac	A	FLOAT	
3156	ID FID msb			FLOAT	
3157	ID FID lsb			FLOAT	
3158	AC injection current limited (ARN4105)	Aac		FLOAT	
3159	AC injection current, type of limitation (ARN4105)		0:No limit 1:Freeze 2:No freeze	ENUM	Injection limitation source is : Bit 0: I is not at maximum Bit 1: I is frozen due to frequency
3160	Source de limitation des fct chargeur ou injecteur		0:Ubatt 1:Ubattp 2:Ubattpp 3:Ibatt 4:Pchar 5:Iinj 6:Imax 7:Ilim	ENUM	limitation source is : Bit 0: U batt Bit 1: U batt peak Bit 2: U batt peak peak Bit 3: I batt Bit 4: P charger Bit 8: I injection Bit 9: I max Bit 10: I input limit
3161	Battery priority active		0:Off 1:On	ENUM	Target voltage for charge/inject is battery priotrity
3162	Forced grid feeding active		0:Off 1:On	ENUM	Target voltage for charge/inject is forced injection

6.3 RCC parameters

Level	User ref.	Parameter	Scom format	Increment

Basic	5000	Language	INT32	1
Expert	**5036**	**OTHER LANGUAGES**	ONLY LEVEL	Menu
Basic	5038	Choice of the second language	ENUM	Only 1 bit 1:English 2:French 4:German 8:Spanish 16:Dutch 32:Latinoellinika 64:Italian
Basic	5039	Choice of the third language	ENUM	Only 1 bit 1:English 2:French 4:German 8:Spanish 16:Dutch 32:Latinoellinika 64:Italian
Basic	5040	Choice of the fourth language	ENUM	Only 1 bit 1:English 2:French 4:German 8:Spanish 16:Dutch 32:Latinoellinika 64:Italian
Basic	5001	Time	INT32	1
Basic	5002	Date	INT32	1
V.O.	5012	User level	Not supported	
Expert	5019	Force remote control to user BASIC level	INT32	Signal
Expert	**5057**	**DATALOGGER**	ONLY LEVEL	Menu
Expert	5101	Datalogger enabled	ENUM	Only 1 bit 1:Automatic 2:Yes 4:No
Expert	5059	Save today's datas	INT32	Signal
Inst.	5120	Erase the 30 oldest log files from the SD card	INT32	Signal
Expert	5123	Editable datalogger Track	BOOL	1
QSP	5076	Track 1: device	ENUM	Only 1 bit 1:XT 2:BSP 4:VarioTrack 8:Xcom-MS 16:VarioString
QSP	5077	Track 1: reference	FLOAT	1
QSP	5078	Track 2: device	ENUM	Only 1 bit 1:XT 2:BSP 4:VarioTrack 8:Xcom-MS 16:VarioString
QSP	5079	Track 2: reference	FLOAT	1
QSP	5080	Track 3: device	ENUM	Only 1 bit 1:XT 2:BSP 4:VarioTrack 8:Xcom-MS 16:VarioString
QSP	5081	Track 3: reference	FLOAT	1

QSP	5082	Track 4: device	ENUM	Only 1 bit 1:XT 2:BSP 4:VarioTrack 8:Xcom-MS 16:VarioString
QSP	5083	Track 4: reference	FLOAT	1
Basic	**5013**	**SAVE AND RESTORE FILES**	ONLY LEVEL	Menu
Basic	5041	Save all files (system backup)	INT32	Signal
Basic	5068	Restore all files (system recovery)	INT32	Signal
Basic	5070	Apply configuration files (masterfile)	INT32	Signal
Expert	5032	Separator of the .csv files	ENUM	Only 1 bit 1:Automatic 2:; 4:,
Expert	**5069**	**Advanced backup functions**	ONLY LEVEL	Menu
Expert	5030	Save messages	INT32	Signal
Expert	**5049**	**Save and restore RCC files**	ONLY LEVEL	Menu
Expert	5015	Save RCC parameters	INT32	Signal
Expert	5016	Load RCC parameters	INT32	Signal
Inst.	5097	Create RCC configuration file (masterfile)	INT32	Signal
Expert	5098	Load RCC configuration file (masterfile)	INT32	Signal
Expert	**5050**	**Save and restore Xtender files**	ONLY LEVEL	Menu
Expert	5017	Save Xtender parameters	INT32	Signal
Expert	5018	Load Xtender parameters	INT32	Signal
Inst.	5033	Create Xtender configuration file (masterfile)	INT32	Signal
Expert	5034	Load Xtender configuration file (masterfile)	INT32	Signal
Expert	5045	Load Xtender parameters preset	Not supported	
Expert	**5051**	**Save and restore BSP files**	ONLY LEVEL	Menu
Expert	5052	Save BSP parameters	INT32	Signal
Expert	5053	Load BSP parameters	INT32	Signal
Inst.	5054	Create BSP configuration file (masterfile)	INT32	Signal
Expert	5055	Load BSP configuration file (masterfile)	INT32	Signal
Expert	**5084**	**Save and restore VarioTrack files**	ONLY LEVEL	Menu
Expert	5085	Save VarioTrack parameters	INT32	Signal
Expert	5086	Load VarioTrack parameters	INT32	Signal
Inst.	5087	Create VarioTrack configuration file (masterfile)	INT32	Signal
Expert	5088	Load VarioTrack configuration file (masterfile)	INT32	Signal
Expert	**5114**	**Save and restore VarioString files**	ONLY LEVEL	Menu
Expert	5115	Save VarioString parameters	INT32	Signal
Expert	5116	Load VarioString parameters	INT32	Signal
Inst.	5117	Create VarioString configuration file (masterfile)	INT32	Signal
Expert	5118	Load VarioString configuration file (masterfile)	INT32	Signal
Expert	**5063**	**Save and restore MPPT Tristar files**	ONLY LEVEL	Menu
Expert	5064	Save MPPT Tristar parameters	INT32	Signal
Expert	5065	Load MPPT Tristar parameters	INT32	Signal
Inst.	5066	Create MPPT Tristar configuration file (masterfile)	INT32	Signal
Expert	5067	Load MPPT Tristar configuration file (masterfile)	INT32	Signal
Inst.	5047	Format the SD card	INT32	Signal
Expert	5061	Start update	INT32	Signal
Inst.	**5042**	**MODIFICATION OF ACCESS LEVELS OF MANY PARAMETERS**	ONLY LEVEL	Menu
Inst.	5043	Change all parameters access level to:	ENUM	Only 1 bit 1:Choose 2:BASIC 4:EXPERT 8:INSTALLER
Inst.	5044	Restore default access level of all parameters	INT32	Signal
Basic	**5007**	**BACKLIGHT**	ONLY LEVEL	Menu

Basic	5093	Backlight mode	ENUM	Only 1 bit 1:Delayed 2:OFF 4:ON
Basic	5009	Backlight switch off after	FLOAT	5
Expert	5026	Red backlight flashing on Xtender off and faulty	BOOL	1
Basic	**5021**	**EXTENDED AND SPECIAL FUNCTIONS**	ONLY LEVEL	Menu
Basic	5006	Display contrast	FLOAT	5
Expert	5073	Choice of standard display	ENUM	Only 1 bit 1:Clock 2:Xtender 4:BSP 8:VarioTrack 16:VarioString
Expert	5010	Come back to standard display after	FLOAT	5
Expert	5011	Visibility of the transitory messages	FLOAT	5
Basic	5027	Acoustic alarm active	BOOL	1
Expert	5031	Remote control acoustic alarm duration	FLOAT	5
Expert	5056	Switching ON and OFF of system on level "VIEW ONLY"	BOOL	1
Expert	5071	Reset of all the remotes control	INT32	Signal
Expert	5121	Reset all devices of the system	INT32	Signal
QSP	**5090**	**Update FID (only 1 device)**	ONLY LEVEL	Menu
QSP	5091	Choose device type	ENUM	Only 1 bit 1:XT 2:BSP 4:VarioTrack 8:Xcom-MS 16:VarioString
QSP	5092	Choose device id (UID)	FLOAT	1
QSP	5062	Update device FID (only 1 device)	INT32	Signal
Expert	**5094**	**SCOM**	ONLY LEVEL	Menu
Expert	5105	Test of the modem's GPRS signal level	INT32	Signal
Inst.	5119	Device identification (LEDs) with the SCOM address	FLOAT	1
Inst.	5095	Enable SCOM watchdog	BOOL	1
Inst.	5096	SCOM watchdog delay before reset of Xcom-232i	FLOAT	10
QSP	5103	Activation of the watchdog hardware (deactivation restarts the RCC)	BOOL	1
QSP	5104	Clears the restart flag of RCC	INT32	Signal
QSP	5035	Erase messages	INT32	Signal

6.4 BSP parameters

Level	User ref.	Parameter	Scom format	Increment
Basic	**6000**	**BASIC SETTINGS**	ONLY LEVEL	Menu
Basic	6057	Voltage of the system	ENUM	Only 1 bit 1:Automatic 2:12V 4:24V 8:48V
Basic	6001	Nominal capacity	FLOAT	10
Basic	6002	Nominal discharge duration (C-rating)	FLOAT	1
Basic	6017	Nominal shunt current	FLOAT	10
Basic	6018	Nominal shunt voltage	FLOAT	10
Expert	6003	Reset of battery history	INT32	Signal
Basic	6004	Restore default settings	INT32	Signal
Inst.	6005	Restore factory settings	INT32	Signal
Expert	**6016**	**ADVANCED SETTINGS**	ONLY LEVEL	Menu

Expert	6031	Reset of user counters	INT32	Signal
Expert	6055	Manufacturer SOC for 0% diplayed	FLOAT	5
Expert	6056	Manufacturer SOC for 100% displayed	FLOAT	5
Expert	6042	Activate the end of charge synchronization	BOOL	1
Expert	6024	End of charge voltage level	FLOAT	0.1
Expert	6025	End of charge current level	FLOAT	1
Expert	6026	Minimum duration before end of charge	FLOAT	5
Expert	6048	Temperature correction of the end of charge voltage	FLOAT	1
Expert	6044	Activate the state of charge correction by the open circuit voltage	BOOL	1
Expert	6058	Battery current limitation activated	BOOL	1
Expert	6059	Max battery charge current	FLOAT	10
Expert	6019	Self-discharge rate	FLOAT	0.1
Expert	6020	Nominal temperature	FLOAT	1
Expert	6021	Temperature coefficient	FLOAT	0.0999756
Expert	6022	Charge efficiency factor	FLOAT	1
Expert	6023	Peukert's exponent	FLOAT	0.0100098
Expert	6049	Use C20 Capacity as reference value	BOOL	1

6.5 BSP, Xcom-CAN BMS infos

Info. no.	Description	Unit on the RCC	Unit	Format	Related parameter or description
7000	Battery voltage	Vdc	V	FLOAT	
7001	Battery current	Adc	Adc	FLOAT	
7002	State of Charge	%	%	FLOAT	
7003	Power	W	W	FLOAT	
7004	Remaining autonomy		minutes	FLOAT	in discharge, number of minutes before 0 % between -60000 and 0, in charge, always NAN
7006	Relative capacity	%	%	FLOAT	deprecated, return 100 % in version >= 1.5.6
7007	Ah charged today	Ah	Ah	FLOAT	
7008	Ah discharged today	Ah	Ah	FLOAT	
7009	Ah charged yesterday	Ah	Ah	FLOAT	
7010	Ah discharged yesterday	Ah	Ah	FLOAT	
7011	Total Ah charged	kAh	kAh	FLOAT	
7012	Total Ah discharged	kAh	kAh	FLOAT	
7013	Total time	days	days	FLOAT	
7017	Custom charge Ah counter	Ah	Ah	FLOAT	
7018	Custom discharge Ah counter	Ah	Ah	FLOAT	
7019	Custom counter duration	h	h	FLOAT	
7029	Battery temperature	°C	°C	FLOAT	
7030	Battery voltage (minute avg)	Vdc	V	FLOAT	
7031	Battery current (minute avg)	Adc	Adc	FLOAT	
7032	State of Charge (minute avg)	%	%	FLOAT	
7033	Battery temperature (minute avg)	°C	°C	FLOAT	
7034	ID type			FLOAT	BSP500 and BSP1200 = 10241d (0x2801)
7035	ID batt voltage	Vdc	V	FLOAT	
7036	ID HW			FLOAT	
7037	ID SOFT msb			FLOAT	
7038	ID SOFT lsb			FLOAT	
7039	Parameter number (in code)			FLOAT	
7040	Info user number			FLOAT	

7041	ID SID			FLOAT	
7047	SOC manufacturer	%	%	FLOAT	
7048	ID FID msb			FLOAT	
7049	ID FID lsb			FLOAT	
7053	Battery Type. With Xcom-CAN			FLOAT	
7054	BMS Version. With Xcom-CAN			FLOAT	
7055	Battery Capacity. With Xcom-CAN	Ah	Ah	FLOAT	
7056	Reserved Manufacturer ID. With Xcom-CAN			FLOAT	
7057	State Of Health. With Xcom-CAN	%		FLOAT	
7058	High resolution State of Charge. With Xcom-CAN	%		FLOAT	
7059	Local daily communication error counter			FLOAT	
7060	Number of parameters (in flash)			FLOAT	

6.6 XCOM MS parameters

Level	User ref.	Parameter	Scom format	Increment
Basic	**8000**	**BASIC SETTINGS**	ONLY LEVEL	Menu
Expert	8014	Address of the MPPT selected for the display	FLOAT	1
Basic	8001	Charge cycles synchronization activated	BOOL	1
Expert	8002	Change the RS-485 identifier	FLOAT	1
Basic	8015	Restore default settings	INT32	Signal
Inst.	8016	Restore factory settings	INT32	Signal
Basic	**8003**	**BATTERY MANAGEMENT WITHOUT SYNCHRONIZATION**	ONLY LEVEL	Menu
Basic	8004	Battery floating level	FLOAT	0.1
Basic	8005	Maximum delay in floating	FLOAT	0.25
Basic	8006	Battery voltage level to start a new cycle	FLOAT	0.1
Basic	8009	Battery absorption voltage	FLOAT	0.1
Basic	8010	Absorption time	FLOAT	0.25
Basic	8011	Battery temperature compensation	FLOAT	1
Basic	8017	Equalization allowed	BOOL	1
Basic	8018	Equalization voltage	FLOAT	0.1
Basic	8019	Equalization time	FLOAT	0.25
Basic	8020	Equalization interval	FLOAT	1
Basic	8021	Equalization timeout	FLOAT	1

6.7 XCOM MS infos

Info. no.	Description	Unit on the RCC	Unit	Format	Related parameter or description
9000	Battery voltage of the selected MPPT	Vdc	V	FLOAT	
9001	Battery current of the selected MPPT	Adc	A	FLOAT	
9002	Array voltage of the selected MPPT	Vdc	V	FLOAT	
9004	Output power of the selected MPPT	W	W	FLOAT	
9006	Daily charge of the selected MPPT	Ah	Ah	FLOAT	
9007	Daily energy of the selected MPPT	kWh	kWh	FLOAT	
9010	Sum of battery currents	A	A	FLOAT	
9011	Sum of of the output powers	kW	kW	FLOAT	
9012	Sum of daily charges	Ah	Ah	FLOAT	
9013	Sum of daily energy	kWh	kWh	FLOAT	
9014	Number of MPPT			FLOAT	
9017	Average battery voltage	Vdc	V	FLOAT	
9018	Sum of of the output powers (minute avg)	kW	kW	FLOAT	
9019	ID type			FLOAT	Xcom-MS = 9217d (0x2401)
9020	ID batt voltage	Vdc	V	FLOAT	

9021	ID HW			FLOAT	
9022	ID SOFT msb			FLOAT	
9023	ID SOFT lsb			FLOAT	
9024	Parameter number (in code)			FLOAT	
9025	Info user number			FLOAT	
9026	ID SID			FLOAT	

6.8 VarioTrack parameters

Level	User ref.	Parameter	Scom format	Increment
Basic	**10000**	**BASIC SETTINGS**	ONLY LEVEL	Menu
Expert	10054	Block manual programming (dip-switch)	BOOL	1
Basic	10001	Voltage of the system	ENUM	Only 1 bit 1:Automatic 2:12V 4:24V 8:48V
Basic	10037	Synchronisation battery cycle with Xtender	BOOL	1
Basic	10005	Floating voltage	FLOAT	0.1
Basic	10009	Absorption voltage	FLOAT	0.1
Basic	10017	Equalization allowed	BOOL	1
Basic	10021	Equalization voltage	FLOAT	0.1
Basic	10056	Restore default settings	INT32	Signal
Inst.	10057	Restore factory settings	INT32	Signal
Expert	**10003**	**BATTERY MANAGEMENT AND CYCLE**	ONLY LEVEL	Menu
Basic	10037	Synchronisation battery cycle with Xtender	BOOL	1
Expert	10002	Battery charge current	FLOAT	2
Expert	10334	Battery undervoltage	FLOAT	0.1
Expert	10036	Temperature compensation	FLOAT	1
Expert	**10004**	**Floating phase**	ONLY LEVEL	Menu
Basic	10005	Floating voltage	FLOAT	0.1
Expert	10006	Force phase of floating	INT32	Signal
Expert	**10007**	**Absorption phase**	ONLY LEVEL	Menu
Expert	10008	Absorption phase allowed	BOOL	1
Basic	10009	Absorption voltage	FLOAT	0.1
Expert	10010	Force absorption phase	INT32	Signal
Expert	10011	Absorption duration	FLOAT	5
Expert	10012	End of absorption triggered by the current	BOOL	1
Expert	10013	Current threshold to end absorption phase	FLOAT	2
Expert	**10016**	**Equalization phase**	ONLY LEVEL	Menu
Basic	10017	Equalization allowed	BOOL	1
Expert	10018	Force equalization	INT32	Signal
Basic	10021	Equalization voltage	FLOAT	0.1
Expert	10020	Equalization current	FLOAT	2
Expert	10022	Equalization duration	FLOAT	5
Expert	10052	Equalization with fixed interval	BOOL	1
Expert	10025	Days between equalizations	FLOAT	1
Expert	10026	End of equalization triggered by the current	BOOL	1
Expert	10027	Current threshold to end equalization phase	FLOAT	1
Expert	10019	Equalization before absorption phase	BOOL	1
Expert	**10028**	**New cycle**	ONLY LEVEL	Menu
Expert	10029	Force a new cycle	INT32	Signal
Expert	10030	Voltage level 1 to start a new cycle	FLOAT	0.1
Expert	10031	Time period under voltage level 1 to start a new cycle	FLOAT	1
Expert	10032	Voltage level 2 to start a new cycle	FLOAT	0.1
Expert	10033	Time period under voltage level 2 to start a new cycle	FLOAT	1

Expert	10034	Cycling restricted	BOOL	1
Expert	10035	Minimal delay between cycles	FLOAT	1
Expert	**10038**	**SYSTEM**	ONLY LEVEL	Menu
Expert	10054	Block manual programming (dip-switch)	BOOL	1
Expert	10060	Check Earthing	ENUM	Only 1 bit 1:No control 2:Negative Grounding 4:Bat Pos Grounding 8:Floating system
Inst.	10087	Disabling of the display button	BOOL	1
Expert	**10312**	**Remote entry (Remote ON/OFF)**	ONLY LEVEL	Menu
Expert	10313	Remote entry active	ENUM	Only 1 bit 1:Closed 2:Open 4:Edge
Expert	10314	ON/OFF command	BOOL	1
Expert	10315	Activated by AUX1 state	BOOL	1
Expert	10316	Start equalization	BOOL	1
Expert	10317	Send a message when remote entry changes state	BOOL	1
QSP	10075	Type of MPP tracking	ENUM	Only 1 bit 1:P&O 2:OC ratio 4:Upv fixed
QSP	10053	Open circuit ratio -> MPP	FLOAT	1
QSP	10103	PV voltage fixed -> MPP	FLOAT	1
Expert	10200	Reset PV energy meter	INT32	Signal
QSP	10201	Reset total produced PV energy meter	INT32	Signal
Expert	10043	Reset daily solar production meters	INT32	Signal
Expert	10044	Reset daily min-max	INT32	Signal
Basic	10056	Restore default settings	INT32	Signal
Inst.	10057	Restore factory settings	INT32	Signal
Inst.	10058	Parameters saved in flash memory	BOOL	1
Expert	10039	ON of the VarioTrack	INT32	Signal
Expert	10040	OFF of the VarioTrack	INT32	Signal
Expert	10051	Reset of all VarioTrack	INT32	Signal
Expert	**10088**	**AUXILIARY CONTACT 1**	ONLY LEVEL	Menu
Expert	10089	Operating mode (AUX 1)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	10090	Combination of the events for the auxiliary contact (AUX 1)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**10092**	**Contact activated in night mode (AUX 1)**	ONLY LEVEL	Menu
Expert	10093	Activated in night mode (AUX 1)	BOOL	1
Expert	10094	Delay of activation after entering night mode (AUX 1)	FLOAT	1
Expert	10095	Activation time for the auxiliary relay in night mode (AUX 1)	FLOAT	1
Expert	**10318**	**Contact active with a fixed time schedule (AUX 1)**	ONLY LEVEL	Menu
Expert	10319	Contact activated with fixed time schedule (AUX 1)	BOOL	1
Expert	10320	Start hour (AUX 1)	INT32	1
Expert	10321	End hour (AUX 1)	INT32	1
Expert	**10096**	**Contact active on event (AUX 1)**	ONLY LEVEL	Menu
Expert	10198	VarioTrack is ON (AUX 1)	BOOL	1
Expert	10091	VarioTrack is OFF (AUX 1)	BOOL	1
Expert	10308	Remote entry (AUX 1)	BOOL	1
Expert	10097	Battery undervoltage (AUX 1)	BOOL	1
Expert	10334	Battery undervoltage	FLOAT	0.1
Expert	10098	Battery overvoltage (AUX 1)	BOOL	1

Expert	10099	Earth fault (AUX 1)	BOOL	1
Expert	10100	PV error (48h without charge) (AUX 1)	BOOL	1
Expert	10102	Overtemperature (AUX 1)	BOOL	1
Expert	10104	Bulk charge phase (AUX 1)	BOOL	1
Expert	10105	Absorption phase (AUX 1)	BOOL	1
Expert	10106	Equalization phase (AUX 1)	BOOL	1
Expert	10107	Floating (AUX 1)	BOOL	1
Expert	10108	Reduced floating (AUX 1)	BOOL	1
Expert	10109	Periodic absorption (AUX 1)	BOOL	1
Expert	**10110**	**Contact active according to battery voltage (AUX 1)**	ONLY LEVEL	Menu
Expert	10111	Battery voltage 1 activate (AUX 1)	BOOL	1
Expert	10112	Battery voltage 1 (AUX 1)	FLOAT	0.1
Expert	10113	Delay 1 (AUX 1)	FLOAT	1
Expert	10114	Battery voltage 2 activate (AUX 1)	BOOL	1
Expert	10115	Battery voltage 2 (AUX 1)	FLOAT	0.1
Expert	10116	Delay 2 (AUX 1)	FLOAT	1
Expert	10117	Battery voltage 3 activate (AUX 1)	BOOL	1
Expert	10118	Battery voltage 3 (AUX 1)	FLOAT	0.1
Expert	10119	Delay 3 (AUX 1)	FLOAT	1
Expert	10120	Battery voltage to deactivate (AUX 1)	FLOAT	0.1
Expert	10121	Delay to deactivate (AUX 1)	FLOAT	5
Expert	10122	Deactivate if battery in floating phase (AUX 1)	BOOL	1
Expert	**10123**	**Contact active according to battery temperature (AUX 1) With BSP or BTS**	ONLY LEVEL	Menu
Expert	10124	Contact activated with the temperature of battery (AUX 1)	BOOL	1
Expert	10125	Contact activated over (AUX 1)	FLOAT	1
Expert	10126	Contact deactivated below (AUX 1)	FLOAT	1
Expert	10127	Only activated if the battery is not in bulk phase (AUX 1)	BOOL	1
Expert	**10128**	**Contact active according to SOC (AUX 1) Only with BSP**	ONLY LEVEL	Menu
Expert	10129	Contact activated with the SOC 1 of battery (AUX 1)	BOOL	1
Expert	10130	Contact activated below SOC 1 (AUX 1)	FLOAT	5
Expert	10131	Delay 1 (AUX 1)	FLOAT	0.25
Expert	10132	Contact activated with the SOC 2 of battery (AUX 1)	BOOL	1
Expert	10133	Contact activated below SOC 2 (AUX 1)	FLOAT	5
Expert	10134	Delay 2 (AUX 1)	FLOAT	0.25
Expert	10135	Contact activated with the SOC 3 of battery (AUX 1)	BOOL	1
Expert	10136	Contact activated below SOC 3 (AUX 1)	FLOAT	5
Expert	10137	Delay 3 (AUX 1)	FLOAT	0.25
Expert	10138	Contact deactivated over SOC (AUX 1)	FLOAT	5
Expert	10139	Delay to deactivate (AUX 1)	FLOAT	0.25
Expert	10140	Deactivate if battery in floating phase (AUX 1)	BOOL	1
Expert	10141	Reset all settings (AUX 1)	INT32	Signal
Expert	**10142**	**AUXILIARY CONTACT 2**	ONLY LEVEL	Menu
Expert	10143	Operating mode (AUX 2)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	10144	Combination of the events for the auxiliary contact (AUX 2)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**10146**	**Contact activated in night mode (AUX 2)**	ONLY LEVEL	Menu
Expert	10147	Activated in night mode (AUX 2)	BOOL	1
Expert	10148	Delay of activation after entering night mode (AUX 2)	FLOAT	1
Expert	10149	Activation time for the auxiliary relay in night mode (AUX 2)	FLOAT	1
Expert	**10322**	**Contact active with a fixed time schedule (AUX 2)**	ONLY LEVEL	Menu
Expert	10323	Contact activated with fixed time schedule (AUX 2)	BOOL	1
Expert	10324	Start hour (AUX 2)	INT32	1
Expert	10325	End hour (AUX 2)	INT32	1

Expert	**10150**	**Contact active on event (AUX 2)**	ONLY LEVEL	Menu
Expert	10199	VarioTrack is ON (AUX 2)	BOOL	1
Expert	10145	VarioTrack is OFF (AUX 2)	BOOL	1
Expert	10309	Remote entry (AUX 2)	BOOL	1
Expert	10151	Battery undervoltage (AUX 2)	BOOL	1
Expert	10334	Battery undervoltage	FLOAT	0.1
Expert	10152	Battery overvoltage (AUX 2)	BOOL	1
Expert	10153	Earth fault (AUX 2)	BOOL	1
Expert	10154	PV error (48h without charge) (AUX 2)	BOOL	1
Expert	10156	Overtemperature (AUX 2)	BOOL	1
Expert	10158	Bulk charge phase (AUX 2)	BOOL	1
Expert	10159	Absorption phase (AUX 2)	BOOL	1
Expert	10160	Equalization phase (AUX 2)	BOOL	1
Expert	10161	Floating (AUX 2)	BOOL	1
Expert	10162	Reduced floating (AUX 2)	BOOL	1
Expert	10163	Periodic absorption (AUX 2)	BOOL	1
Expert	**10164**	**Contact active according to battery voltage (AUX 2)**	ONLY LEVEL	Menu
Expert	10165	Battery voltage 1 activate (AUX 2)	BOOL	1
Expert	10166	Battery voltage 1 (AUX 2)	FLOAT	0.1
Expert	10167	Delay 1 (AUX 2)	FLOAT	1
Expert	10168	Battery voltage 2 activate (AUX 2)	BOOL	1
Expert	10169	Battery voltage 2 (AUX 2)	FLOAT	0.1
Expert	10170	Delay 2 (AUX 2)	FLOAT	1
Expert	10171	Battery voltage 3 activate (AUX 2)	BOOL	1
Expert	10172	Battery voltage 3 (AUX 2)	FLOAT	0.1
Expert	10173	Delay 3 (AUX 2)	FLOAT	1
Expert	10174	Battery voltage to deactivate (AUX 2)	FLOAT	0.1
Expert	10175	Delay to deactivate (AUX 2)	FLOAT	5
Expert	10176	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	**10177**	**Contact active according to battery temperature (AUX 2) With BSP or BTS**	ONLY LEVEL	Menu
Expert	10178	Contact activated with the temperature of battery (AUX 2)	BOOL	1
Expert	10179	Contact activated over (AUX 2)	FLOAT	1
Expert	10180	Contact deactivated below (AUX 2)	FLOAT	1
Expert	10181	Only activated if the battery is not in bulk phase (AUX 2)	BOOL	1
Expert	**10182**	**Contact active according to SOC (AUX 2) Only with BSP**	ONLY LEVEL	Menu
Expert	10183	Contact activated with the SOC 1 of battery (AUX 2)	BOOL	1
Expert	10184	Contact activated below SOC 1 (AUX 2)	FLOAT	5
Expert	10185	Delay 1 (AUX 2)	FLOAT	0.25
Expert	10186	Contact activated with the SOC 2 of battery (AUX 2)	BOOL	1
Expert	10187	Contact activated below SOC 2 (AUX 2)	FLOAT	5
Expert	10188	Delay 2 (AUX 2)	FLOAT	0.25
Expert	10189	Contact activated with the SOC 3 of battery (AUX 2)	BOOL	1
Expert	10190	Contact activated below SOC 3 (AUX 2)	FLOAT	5
Expert	10191	Delay 3 (AUX 2)	FLOAT	0.25
Expert	10192	Contact deactivated over SOC (AUX 2)	FLOAT	5
Expert	10193	Delay to deactivate (AUX 2)	FLOAT	0.25
Expert	10194	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	10195	Reset all settings (AUX 2)	INT32	Signal
Expert	**10202**	**AUXILIARY CONTACT 3**	ONLY LEVEL	Menu
Expert	10203	Operating mode (AUX 3)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	10204	Combination of the events for the auxiliary contact (AUX 3)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**10205**	**Contact activated in night mode (AUX 3)**	ONLY LEVEL	Menu

Expert	10206	Activated in night mode (AUX 3)	BOOL	1
Expert	10207	Delay of activation after entering night mode (AUX 3)	FLOAT	1
Expert	10208	Activation time for the auxiliary relay in night mode (AUX 3)	FLOAT	1
Expert	**10326**	**Contact active with a fixed time schedule (AUX 3)**	ONLY LEVEL	Menu
Expert	10327	Contact activated with fixed time schedule (AUX 3)	BOOL	1
Expert	10328	Start hour (AUX 3)	INT32	1
Expert	10329	End hour (AUX 3)	INT32	1
Expert	**10209**	**Contact active on event (AUX 3)**	ONLY LEVEL	Menu
Expert	10210	VarioTrack is ON (AUX 3)	BOOL	1
Expert	10211	VarioTrack is OFF (AUX 3)	BOOL	1
Expert	10310	Remote entry (AUX 3)	BOOL	1
Expert	10212	Battery undervoltage (AUX 3)	BOOL	1
Expert	10213	Battery overvoltage (AUX 3)	BOOL	1
Expert	10214	Earth fault (AUX 3)	BOOL	1
Expert	10215	PV error (48h without charge) (AUX 3)	BOOL	1
Expert	10216	Overtemperature (AUX 3)	BOOL	1
Expert	10217	Bulk charge phase (AUX 3)	BOOL	1
Expert	10218	Absorption phase (AUX 3)	BOOL	1
Expert	10219	Equalization phase (AUX 3)	BOOL	1
Expert	10220	Floating (AUX 3)	BOOL	1
Expert	10221	Reduced floating (AUX 3)	BOOL	1
Expert	10222	Periodic absorption (AUX 3)	BOOL	1
Expert	**10223**	**Contact active according to battery voltage (AUX 3)**	ONLY LEVEL	Menu
Expert	10224	Battery voltage 1 activate (AUX 3)	BOOL	1
Expert	10225	Battery voltage 1 (AUX 3)	FLOAT	0.1
Expert	10226	Delay 1 (AUX 3)	FLOAT	1
Expert	10227	Battery voltage 2 activate (AUX 3)	BOOL	1
Expert	10228	Battery voltage 2 (AUX 3)	FLOAT	0.1
Expert	10229	Delay 2 (AUX 3)	FLOAT	1
Expert	10230	Battery voltage 3 activate (AUX 3)	BOOL	1
Expert	10231	Battery voltage 3 (AUX 3)	FLOAT	0.1
Expert	10232	Delay 3 (AUX 3)	FLOAT	1
Expert	10233	Battery voltage to deactivate (AUX 3)	FLOAT	0.1
Expert	10234	Delay to deactivate (AUX 3)	FLOAT	5
Expert	10235	Deactivate if battery in floating phase (AUX 3)	BOOL	1
Expert	**10236**	**Contact active according to battery temperature (AUX 3) With BSP or BTS**	ONLY LEVEL	Menu
Expert	10237	Contact activated with the temperature of battery (AUX 3)	BOOL	1
Expert	10238	Contact activated over (AUX 3)	FLOAT	1
Expert	10239	Contact deactivated below (AUX 3)	FLOAT	1
Expert	10240	Only activated if the battery is not in bulk phase (AUX 3)	BOOL	1
Expert	**10241**	**Contact active according to SOC (AUX 3) Only with BSP**	ONLY LEVEL	Menu
Expert	10242	Contact activated with the SOC 1 of battery (AUX 3)	BOOL	1
Expert	10243	Contact activated below SOC 1 (AUX 3)	FLOAT	5
Expert	10244	Delay 1 (AUX 3)	FLOAT	0.25
Expert	10245	Contact activated with the SOC 2 of battery (AUX 3)	BOOL	1
Expert	10246	Contact activated below SOC 2 (AUX 3)	FLOAT	5
Expert	10247	Delay 2 (AUX 3)	FLOAT	0.25
Expert	10248	Contact activated with the SOC 3 of battery (AUX 3)	BOOL	1
Expert	10249	Contact activated below SOC 3 (AUX 3)	FLOAT	5
Expert	10250	Delay 3 (AUX 3)	FLOAT	0.25
Expert	10251	Contact deactivated over SOC (AUX 3)	FLOAT	5
Expert	10252	Delay to deactivate (AUX 3)	FLOAT	0.25
Expert	10253	Deactivate if battery in floating phase (AUX 3)	BOOL	1
Expert	10254	Reset all settings (AUX 3)	INT32	Signal
Expert	**10255**	**AUXILIARY CONTACT 4**	ONLY LEVEL	Menu

Expert	10256	Operating mode (AUX 4)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	10257	Combination of the events for the auxiliary contact (AUX 4)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**10258**	**Contact activated in night mode (AUX 4)**	ONLY LEVEL	Menu
Expert	10259	Activated in night mode (AUX 4)	BOOL	1
Expert	10260	Delay of activation after entering night mode (AUX 4)	FLOAT	1
Expert	10261	Activation time for the auxiliary relay in night mode (AUX 4)	FLOAT	1
Expert	**10330**	**Contact active with a fixed time schedule (AUX 4)**	ONLY LEVEL	Menu
Expert	10331	Contact activated with fixed time schedule (AUX 4)	BOOL	1
Expert	10332	Start hour (AUX 4)	INT32	1
Expert	10333	End hour (AUX 4)	INT32	1
Expert	**10262**	**Contact active on event (AUX 4)**	ONLY LEVEL	Menu
Expert	10263	VarioTrack is ON (AUX 4)	BOOL	1
Expert	10264	VarioTrack is OFF (AUX 4)	BOOL	1
Expert	10311	Remote entry (AUX 4)	BOOL	1
Expert	10265	Battery undervoltage (AUX 4)	BOOL	1
Expert	10266	Battery overvoltage (AUX 4)	BOOL	1
Expert	10267	Earth fault (AUX 4)	BOOL	1
Expert	10268	PV error (48h without charge) (AUX 4)	BOOL	1
Expert	10269	Overtemperature (AUX 4)	BOOL	1
Expert	10270	Bulk charge phase (AUX 4)	BOOL	1
Expert	10271	Absorption phase (AUX 4)	BOOL	1
Expert	10272	Equalization phase (AUX 4)	BOOL	1
Expert	10273	Floating (AUX 4)	BOOL	1
Expert	10274	Reduced floating (AUX 4)	BOOL	1
Expert	10275	Periodic absorption (AUX 4)	BOOL	1
Expert	**10276**	**Contact active according to battery voltage (AUX 4)**	ONLY LEVEL	Menu
Expert	10277	Battery voltage 1 activate (AUX 4)	BOOL	1
Expert	10278	Battery voltage 1 (AUX 4)	FLOAT	0.1
Expert	10279	Delay 1 (AUX 4)	FLOAT	1
Expert	10280	Battery voltage 2 activate (AUX 4)	BOOL	1
Expert	10281	Battery voltage 2 (AUX 4)	FLOAT	0.1
Expert	10282	Delay 2 (AUX 4)	FLOAT	1
Expert	10283	Battery voltage 3 activate (AUX 4)	BOOL	1
Expert	10284	Battery voltage 3 (AUX 4)	FLOAT	0.1
Expert	10285	Delay 3 (AUX 4)	FLOAT	1
Expert	10286	Battery voltage to deactivate (AUX 4)	FLOAT	0.1
Expert	10287	Delay to deactivate (AUX 4)	FLOAT	5
Expert	10288	Deactivate if battery in floating phase (AUX 4)	BOOL	1
Expert	**10289**	**Contact active according to battery temperature (AUX 4) With BSP or BTS**	ONLY LEVEL	Menu
Expert	10290	Contact activated with the temperature of battery (AUX 4)	BOOL	1
Expert	10291	Contact activated over (AUX 4)	FLOAT	1
Expert	10292	Contact deactivated below (AUX 4)	FLOAT	1
Expert	10293	Only activated if the battery is not in bulk phase (AUX 4)	BOOL	1
Expert	**10294**	**Contact active according to SOC (AUX 4) Only with BSP**	ONLY LEVEL	Menu
Expert	10295	Contact activated with the SOC 1 of battery (AUX 4)	BOOL	1
Expert	10296	Contact activated below SOC 1 (AUX 4)	FLOAT	5
Expert	10297	Delay 1 (AUX 4)	FLOAT	0.25
Expert	10298	Contact activated with the SOC 2 of battery (AUX 4)	BOOL	1
Expert	10299	Contact activated below SOC 2 (AUX 4)	FLOAT	5
Expert	10300	Delay 2 (AUX 4)	FLOAT	0.25
Expert	10301	Contact activated with the SOC 3 of battery (AUX 4)	BOOL	1
Expert	10302	Contact activated below SOC 3 (AUX 4)	FLOAT	5

Expert	10303	Delay 3 (AUX 4)	FLOAT	0.25
Expert	10304	Contact deactivated over SOC (AUX 4)	FLOAT	5
Expert	10305	Delay to deactivate (AUX 4)	FLOAT	0.25
Expert	10306	Deactivate if battery in floating phase (AUX 4)	BOOL	1
Expert	10307	Reset all settings (AUX 4)	INT32	Signal

6.9 VarioTrack infos

Info. no.	Description	Unit on the RCC	Unit	Format	Related parameter or description
11000	Battery voltage	Vdc	V	FLOAT	
11001	Battery current	Adc	A	FLOAT	
11002	Voltage of the PV generator	Vdc	V	FLOAT	
11004	Power of the PV generator	kW	kW	FLOAT	
11005	Battery temperature	°C	°C	FLOAT	
11006	Production in (Ah) for the current day	Ah	Ah	FLOAT	
11007	Production in (kWh) for the current day	kWh	kWh	FLOAT	
11008	Produced energy resettable counter	kWh	kWh	FLOAT	
11009	Total produced energy	MWh	MWh	FLOAT	
11010	Production in (Ah) for the previous day	Ah	Ah	FLOAT	
11011	Production in (Wh) for the previous day	kWh	kWh	FLOAT	
11012	Number of parameters (in code)			FLOAT	
11013	Number of parameters (in flash)			FLOAT	
11014	Number of infos users			FLOAT	
11015	Model of VarioTrack		0:VT-80 1:VT-65	ENUM	
11016	Operating mode		0:Night 1:StartUp 2:--- 3:Charger 4:--- 5:Security 6:OFF 7:--- 8:Charge 9:Charge V 10:Charge I 11:Charge T 12:Ch. Ibsp	ENUM	See the VarioTrack user manual for a description of the modes. Mode 3: is available up to VT code version 1.5.8. Modes 8: to 11: are available from VT code version 1.5.10.
11017	Max PV voltage for the current day	Vdc	V	FLOAT	
11018	Max battery current of the current day	Adc	A	FLOAT	
11019	Max power production for the current day	kW	kW	FLOAT	
11020	Max battery voltage for the current day	Vdc	V	FLOAT	
11021	Min battery voltage for the current day	Vdc	V	FLOAT	
11025	Number of irradiation hours for the current day	h	h	FLOAT	
11026	Number of irradiation hours for the previous day	h	h	FLOAT	

11034	Type of error		0:No Error 1:BatoverV 2:Earth 3:No Batt 4:OverTemp 5:BatOverV 6:PvOverV 7:Others 8:--- 9:--- 10:--- 11:--- 12:HardErr	ENUM	See the VarioTrack user manual for a description of these errors
11037	Number of days before next equalization	days	days	FLOAT	
11038	Battery cycle phase		0:Bulk 1:Absorpt. 2:Equalize 3:Floating 4:--- 5:--- 6:R.float. 7:Per.abs. 8:--- 9:--- 10:--- 11:---	ENUM	
11039	Battery voltage (minute avg)	Vdc	V	FLOAT	
11040	Battery current (minute avg)	Adc	A	FLOAT	
11041	PV voltage (minute avg)	Vdc	V	FLOAT	
11043	PV power (minute avg)	kW	kW	FLOAT	
11044	Battery temperature (minute avg)	°C	°C	FLOAT	
11045	Dev 1 (minute avg)			FLOAT	
11046	Dev 2 (minute avg)			FLOAT	
11047	ID type			FLOAT	VT65 and VT80 = 9079d (0x2601)
11048	ID batt voltage	Vdc	V	FLOAT	
11049	ID HW			FLOAT	
11050	ID SOFT msb			FLOAT	
11051	ID SOFT lsb			FLOAT	
11052	ID SID			FLOAT	
11061	State of auxiliary relay 1		0:Opened 1:Closed	ENUM	
11062	State of auxiliary relay 2		0:Opened 1:Closed	ENUM	
11063	Relay aux 1 mode		0:--- 1:A 2:I 3:M 4:M 5:G	ENUM	
11064	Relay aux 2 mode		0:--- 1:A 2:I 3:M 4:M 5:G	ENUM	

11066	Synchronisation state		0:--- 1:--- 2:--- 3:--- 4:XTslave 5:VTslave 6:--- 7:--- 8:VTmaster 9:Autonom. 10:VSslave 11:VSmaster	ENUM	
11067	ID FID msb			FLOAT	
11068	ID FID lsb			FLOAT	
11069	State of the VarioTrack		0:Off 1:On	ENUM	
11076	Local daily communication error counter			FLOAT	
11077	State of auxiliary relay 3		0:Opened 1:Closed	ENUM	
11078	State of auxiliary relay 4		0:Opened 1:Closed	ENUM	
11079	Relay aux 3 mode		0:--- 1:A 2:I 3:M 4:M 5:G	ENUM	
11080	Relay aux 4 mode		0:--- 1:A 2:I 3:M 4:M 5:G	ENUM	

6.10 VarioString parameters

Level	User ref.	Parameter	Scom format	Increment
Basic	**14000**	**BASIC SETTINGS**	ONLY LEVEL	Menu
Expert	14174	Block manual programming (dip-switch)	BOOL	1
Expert	14001	Battery charge current (VS-120)	FLOAT	2
Expert	14217	Battery charge current (VS-70)	FLOAT	1
Basic	14002	Configuration of PV modules (VS-120)	ENUM	Only 1 bit 1:Automatic 2:Independent 4:Serial 8:Parallel
Basic	14067	Restore default settings	INT32	Signal
Inst.	14068	Restore factory settings	INT32	Signal
Expert	**14003**	**BATTERY MANAGEMENT AND CYCLE**	ONLY LEVEL	Menu
Basic	14036	Synchronisation battery cycle with Xtender	BOOL	1
Expert	14001	Battery charge current (VS-120)	FLOAT	2
Expert	14217	Battery charge current (VS-70)	FLOAT	1
Expert	14216	Battery undervoltage	FLOAT	0.1
Expert	14035	Temperature compensation	FLOAT	1
Expert	**14004**	**Floating phase**	ONLY LEVEL	Menu
Expert	14005	Floating voltage	FLOAT	0.1

Expert	14006	Force phase of floating	INT32	Signal
Expert	**14007**	**Absorption phase**	ONLY LEVEL	Menu
Expert	14008	Absorption phase allowed	BOOL	1
Expert	14009	Absorption voltage	FLOAT	0.1
Expert	14010	Force absorption phase	INT32	Signal
Expert	14011	Absorption duration	FLOAT	5
Expert	14012	End of absorption triggered by the current	BOOL	1
Expert	14013	Current threshold to end absorption phase	FLOAT	2
Expert	**14016**	**Equalization phase**	ONLY LEVEL	Menu
Expert	14017	Equalization allowed	BOOL	1
Expert	14018	Force equalization	INT32	Signal
Expert	14021	Equalization voltage	FLOAT	0.1
Expert	14020	Equalization current	FLOAT	2
Expert	14022	Equalization duration	FLOAT	5
Expert	14023	Equalization with fixed interval	BOOL	1
Expert	14024	Days between equalizations	FLOAT	1
Expert	14025	End of equalization triggered by the current	BOOL	1
Expert	14026	Current threshold to end equalization phase	FLOAT	1
Expert	14019	Equalization before absorption phase	BOOL	1
Expert	**14027**	**New cycle**	ONLY LEVEL	Menu
Expert	14028	Force a new cycle	INT32	Signal
Expert	14029	Voltage level 1 to start a new cycle	FLOAT	0.1
Expert	14030	Time period under voltage level 1 to start a new cycle	FLOAT	1
Expert	14031	Voltage level 2 to start a new cycle	FLOAT	0.1
Expert	14032	Time period under voltage level 2 to start a new cycle	FLOAT	1
Expert	14033	Cycling restricted	BOOL	1
Expert	14034	Minimal delay between cycles	FLOAT	1
Expert	**14037**	**SYSTEM**	ONLY LEVEL	Menu
Expert	14174	Block manual programming (dip-switch)	BOOL	1
Expert	14040	Type of battery grounding	ENUM	Only 1 bit 1:No control 2:Bat+ grounded 4:Bat- grounded 8:Bat floating
Expert	**14194**	**Configuration for VS-120**	ONLY LEVEL	Menu
Expert	14041	Type of PV grounding	ENUM	Only 1 bit 1:No control 2:PV+ grounded 4:PV- grounded 8:PV floating
Expert	14175	Type of PV1 grounding	ENUM	Only 1 bit 1:No control 2:PV+ grounded 4:PV- grounded 8:PV floating
Expert	14042	Type of PV2 grounding	ENUM	Only 1 bit 1:No control 2:PV+ grounded 4:PV- grounded 8:PV floating
Expert	**14180**	**Type of MPPT algorithm**	ONLY LEVEL	Menu
Expert	14043	Type of MPP tracking algorithm PV	ENUM	Only 1 bit 1:P&O 2:OC ratio 4:Upv fixed 8:LSF
Expert	14044	PV voltage fixed (for PV in series)	FLOAT	10
Expert	14179	PV voltage fixed (for PV in //)	FLOAT	10
Expert	14045	Ratio of PV open circuit voltage	FLOAT	0.010009766

Expert	14176	Type of MPP tracking algorithm PV1	ENUM	Only 1 bit 1:P&O 2:OC ratio 4:Upv fixed 8:LSF
Expert	14177	PV1 voltage fixed	FLOAT	10
Expert	14178	Ratio of PV1 open circuit voltage	FLOAT	0.010009766
Expert	14046	Type of MPP tracking algorithm PV2	ENUM	Only 1 bit 1:P&O 2:OC ratio 4:Upv fixed 8:LSF
Expert	14047	PV2 voltage fixed	FLOAT	10
Expert	14048	Ratio of PV2 open circuit voltage	FLOAT	0.010009766
Inst.	14192	Establishment time (Algo MPPT)	FLOAT	1
Inst.	14193	Averaging time (algo MPPT)	FLOAT	1
Inst.	14190	PV wiring type erased from memory	INT32	Signal
Expert	**14195**	**Configuration for VS-70**	ONLY LEVEL	Menu
Expert	14196	Type of PV grounding	ENUM	Only 1 bit 1:No control 2:PV+ grounded 4:PV- grounded 8:PV floating
Expert	**14180**	**Type of MPPT algorithm**	ONLY LEVEL	Menu
Expert	14197	Type of MPP tracking algorithm PV	ENUM	Only 1 bit 1:P&O 2:OC ratio 4:Upv fixed 8:LSF
Expert	14198	PV voltage fixed	FLOAT	10
Expert	14199	Ratio of PV open circuit voltage	FLOAT	0.010009766
Inst.	14192	Establishment time (Algo MPPT)	FLOAT	1
Inst.	14193	Averaging time (algo MPPT)	FLOAT	1
Expert	**14200**	**Remote entry (Remote ON/OFF)**	ONLY LEVEL	Menu
Expert	14201	Remote entry active	ENUM	Only 1 bit 1:Closed 2:Open 4:Edge
Expert	14202	ON/OFF command	BOOL	1
Expert	14203	Activated by AUX1 state	BOOL	1
Expert	14204	Start equalization	BOOL	1
Expert	14205	Send a message when remote entry changes state	BOOL	1
Expert	14182	Reset PV energy meter	INT32	Signal
QSP	14183	Reset total produced PV energy meter	INT32	Signal
Expert	14051	Reset daily solar production meters	INT32	Signal
Expert	14052	Reset daily min-max	INT32	Signal
Basic	14067	Restore default settings	INT32	Signal
Inst.	14068	Restore factory settings	INT32	Signal
Inst.	14069	Parameters saved in flash memory	BOOL	1
Expert	14038	ON of the VarioString	INT32	Signal
Expert	14039	OFF of the VarioString	INT32	Signal
Expert	14059	Reset of all VarioString	INT32	Signal
Expert	**14070**	**AUXILIARY CONTACT 1**	ONLY LEVEL	Menu
Expert	14071	Operating mode (AUX 1)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF

Expert	14072	Combination of the events for the auxiliary contact (AUX 1)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**14073**	**Contact activated in night mode (AUX 1)**	ONLY LEVEL	Menu
Expert	14074	Activated in night mode (AUX 1)	BOOL	1
Expert	14075	Delay of activation after entering night mode (AUX 1)	FLOAT	1
Expert	14076	Activation time for the auxiliary relay in night mode (AUX 1)	FLOAT	1
Expert	**14206**	**Contact active with a fixed time schedule (AUX 1)**	ONLY LEVEL	Menu
Expert	14207	Contact activated with fixed time schedule (AUX 1)	BOOL	1
Expert	14208	Start hour (AUX 1)	INT32	1
Expert	14209	End hour (AUX 1)	INT32	1
Expert	**14077**	**Contact active on event (AUX 1)**	ONLY LEVEL	Menu
Expert	14188	VarioString is ON (AUX 1)	BOOL	1
Expert	14078	VarioString is OFF (AUX 1)	BOOL	1
Expert	14214	Remote entry (AUX 1)	BOOL	1
Expert	14079	Battery undervoltage (AUX 1)	BOOL	1
Expert	14216	Battery undervoltage	FLOAT	0.1
Expert	14080	Battery overvoltage (AUX 1)	BOOL	1
Expert	14081	Earth fault (AUX 1)	BOOL	1
Expert	14082	PV error (48h without charge) (AUX 1)	BOOL	1
Expert	14083	Overtemperature (AUX 1)	BOOL	1
Expert	14084	Bulk charge phase (AUX 1)	BOOL	1
Expert	14085	Absorption phase (AUX 1)	BOOL	1
Expert	14086	Equalization phase (AUX 1)	BOOL	1
Expert	14087	Floating (AUX 1)	BOOL	1
Expert	14088	Reduced floating (AUX 1)	BOOL	1
Expert	14089	Periodic absorption (AUX 1)	BOOL	1
Expert	**14090**	**Contact active according to battery voltage (AUX 1)**	ONLY LEVEL	Menu
Expert	14091	Battery voltage 1 activate (AUX 1)	BOOL	1
Expert	14092	Battery voltage 1 (AUX 1)	FLOAT	0.1
Expert	14093	Delay 1 (AUX 1)	FLOAT	1
Expert	14094	Battery voltage 2 activate (AUX 1)	BOOL	1
Expert	14095	Battery voltage 2 (AUX 1)	FLOAT	0.1
Expert	14096	Delay 2 (AUX 1)	FLOAT	1
Expert	14097	Battery voltage 3 activate (AUX 1)	BOOL	1
Expert	14098	Battery voltage 3 (AUX 1)	FLOAT	0.1
Expert	14099	Delay 3 (AUX 1)	FLOAT	1
Expert	14100	Battery voltage to deactivate (AUX 1)	FLOAT	0.1
Expert	14101	Delay to deactivate (AUX 1)	FLOAT	5
Expert	14102	Deactivate if battery in floating phase (AUX 1)	BOOL	1
Expert	**14103**	**Contact active according to battery temperature (AUX 1) With BSP or BTS**	ONLY LEVEL	Menu
Expert	14104	Contact activated with the temperature of battery (AUX 1)	BOOL	1
Expert	14105	Contact activated over (AUX 1)	FLOAT	1
Expert	14106	Contact deactivated below (AUX 1)	FLOAT	1
Expert	14107	Only activated if the battery is not in bulk phase (AUX 1)	BOOL	1
Expert	**14108**	**Contact active according to SOC (AUX 1) Only with BSP**	ONLY LEVEL	Menu
Expert	14109	Contact activated with the SOC 1 of battery (AUX 1)	BOOL	1
Expert	14110	Contact activated below SOC 1 (AUX 1)	FLOAT	5
Expert	14111	Delay 1 (AUX 1)	FLOAT	0.25
Expert	14112	Contact activated with the SOC 2 of battery (AUX 1)	BOOL	1
Expert	14113	Contact activated below SOC 2 (AUX 1)	FLOAT	5
Expert	14114	Delay 2 (AUX 1)	FLOAT	0.25
Expert	14115	Contact activated with the SOC 3 of battery (AUX 1)	BOOL	1
Expert	14116	Contact activated below SOC 3 (AUX 1)	FLOAT	5
Expert	14117	Delay 3 (AUX 1)	FLOAT	0.25
Expert	14118	Contact deactivated over SOC (AUX 1)	FLOAT	5
Expert	14119	Delay to deactivate (AUX 1)	FLOAT	0.25
Expert	14120	Deactivate if battery in floating phase (AUX 1)	BOOL	1

Expert	14121	Reset all settings (AUX 1)	INT32	Signal
Expert	**14122**	**AUXILIARY CONTACT 2**	ONLY LEVEL	Menu
Expert	14123	Operating mode (AUX 2)	ENUM	Only 1 bit 1:Automatic 2:Reversed automatic 4:Manual ON 8:Manual OFF
Expert	14124	Combination of the events for the auxiliary contact (AUX 2)	ENUM	Only 1 bit 0:Any (Function OR) 1:All (Function AND)
Expert	**14125**	**Contact activated in night mode (AUX 2)**	ONLY LEVEL	Menu
Expert	14126	Activated in night mode (AUX 2)	BOOL	1
Expert	14127	Delay of activation after entering night mode (AUX 2)	FLOAT	1
Expert	14128	Activation time for the auxiliary relay in night mode (AUX 2)	FLOAT	1
Expert	**14210**	**Contact active with a fixed time schedule (AUX 2)**	ONLY LEVEL	Menu
Expert	14211	Contact activated with fixed time schedule (AUX 2)	BOOL	1
Expert	14212	Start hour (AUX 2)	INT32	1
Expert	14213	End hour (AUX 2)	INT32	1
Expert	**14129**	**Contact active on event (AUX 2)**	ONLY LEVEL	Menu
Expert	14189	VarioString is ON (AUX 2)	BOOL	1
Expert	14130	VarioString is OFF (AUX 2)	BOOL	1
Expert	14215	Remote entry (AUX 2)	BOOL	1
Expert	14131	Battery undervoltage (AUX 2)	BOOL	1
Expert	14216	Battery undervoltage	FLOAT	0.1
Expert	14132	Battery overvoltage (AUX 2)	BOOL	1
Expert	14133	Earth fault (AUX 2)	BOOL	1
Expert	14134	PV error (48h without charge) (AUX 2)	BOOL	1
Expert	14135	Overtemperature (AUX 2)	BOOL	1
Expert	14136	Bulk charge phase (AUX 2)	BOOL	1
Expert	14137	Absorption phase (AUX 2)	BOOL	1
Expert	14138	Equalization phase (AUX 2)	BOOL	1
Expert	14139	Floating (AUX 2)	BOOL	1
Expert	14140	Reduced floating (AUX 2)	BOOL	1
Expert	14141	Periodic absorption (AUX 2)	BOOL	1
Expert	**14142**	**Contact active according to battery voltage (AUX 2)**	ONLY LEVEL	Menu
Expert	14143	Battery voltage 1 activate (AUX 2)	BOOL	1
Expert	14144	Battery voltage 1 (AUX 2)	FLOAT	0.1
Expert	14145	Delay 1 (AUX 2)	FLOAT	1
Expert	14146	Battery voltage 2 activate (AUX 2)	BOOL	1
Expert	14147	Battery voltage 2 (AUX 2)	FLOAT	0.1
Expert	14148	Delay 2 (AUX 2)	FLOAT	1
Expert	14149	Battery voltage 3 activate (AUX 2)	BOOL	1
Expert	14150	Battery voltage 3 (AUX 2)	FLOAT	0.1
Expert	14151	Delay 3 (AUX 2)	FLOAT	1
Expert	14152	Battery voltage to deactivate (AUX 2)	FLOAT	0.1
Expert	14153	Delay to deactivate (AUX 2)	FLOAT	5
Expert	14154	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	**14155**	**Contact active according to battery temperature (AUX 2) With BSP or BTS**	ONLY LEVEL	Menu
Expert	14156	Contact activated with the temperature of battery (AUX 2)	BOOL	1
Expert	14157	Contact activated over (AUX 2)	FLOAT	1
Expert	14158	Contact deactivated below (AUX 2)	FLOAT	1
Expert	14159	Only activated if the battery is not in bulk phase (AUX 2)	BOOL	1
Expert	**14160**	**Contact active according to SOC (AUX 2) Only with BSP**	ONLY LEVEL	Menu
Expert	14161	Contact activated with the SOC 1 of battery (AUX 2)	BOOL	1
Expert	14162	Contact activated below SOC 1 (AUX 2)	FLOAT	5
Expert	14163	Delay 1 (AUX 2)	FLOAT	0.25
Expert	14164	Contact activated with the SOC 2 of battery (AUX 2)	BOOL	1
Expert	14165	Contact activated below SOC 2 (AUX 2)	FLOAT	5

Expert	14166	Delay 2 (AUX 2)	FLOAT	0.25
Expert	14167	Contact activated with the SOC 3 of battery (AUX 2)	BOOL	1
Expert	14168	Contact activated below SOC 3 (AUX 2)	FLOAT	5
Expert	14169	Delay 3 (AUX 2)	FLOAT	0.25
Expert	14170	Contact deactivated over SOC (AUX 2)	FLOAT	5
Expert	14171	Delay to deactivate (AUX 2)	FLOAT	0.25
Expert	14172	Deactivate if battery in floating phase (AUX 2)	BOOL	1
Expert	14173	Reset all settings (AUX 2)	INT32	Signal

6.11 VarioString infos

Info. no.	Description	Unit on the RCC	Unit	Format	Related parameter or description
15000	Battery voltage	Vdc	V	FLOAT	
15001	Battery current	Adc	A	FLOAT	
15002	Battery cycle phase		0:Bulk 1:Absorpt. 2:Equalize 3:Floating 4:--- 5:--- 6:R.float. 7:Per.abs. 8:--- 9:--- 10:--- 11:---	ENUM	
15003	PV type of wiring		0:Unknown 1:Independ. 2:Series 3:Parallel 4:Error	ENUM	
15004	PV voltage	Vdc	V	FLOAT	
15005	PV1 voltage	Vdc	V	FLOAT	
15006	PV2 voltage	Vdc	V	FLOAT	
15007	PV current	Adc	A	FLOAT	
15008	PV1 current	Adc	A	FLOAT	
15009	PV2 current	Adc	A	FLOAT	
15010	PV power	kW	kW	FLOAT	
15011	PV1 power	kW	kW	FLOAT	
15012	PV2 power	kW	kW	FLOAT	
15013	PV operating mode		0:Night 1:Security 2:OFF 3:Charge 4:ChargeV 5:Charge I 6:ChargeP 7:ChargeIpv 8:ChargeT 9:--- 10:Ch.Ibsp	ENUM	

15014	PV1 operating mode		0:Night 1:Security 2:OFF 3:Charge 4:ChargeV 5:Charge I 6:ChargeP 7:ChargeIpv 8:ChargeT 9:--- 10:Ch.Ibsp	ENUM	
15015	PV2 operating mode		0:Night 1:Security 2:OFF 3:Charge 4:ChargeV 5:Charge I 6:ChargeP 7:ChargeIpv 8:ChargeT 9:--- 10:Ch.Ibsp	ENUM	
15016	Production PV in (Ah) for the current day	Ah	Ah	FLOAT	
15017	Production PV in (kWh) for the current day	kWh	kWh	FLOAT	
15018	Production PV1 in (kWh) for the current day	kWh	kWh	FLOAT	
15019	Production PV2 in (kWh) for the current day	kWh	kWh	FLOAT	
15020	Produced PV energy resettable counter	kWh	kWh	FLOAT	
15021	Produced PV1 energy resettable counter	kWh	kWh	FLOAT	
15022	Produced PV2 energy resettable counter	kWh	kWh	FLOAT	
15023	Total PV produced energy	MWh	MWh	FLOAT	
15024	Total PV1 produced energy	MWh	MWh	FLOAT	
15025	Total PV2 produced energy	MWh	MWh	FLOAT	
15026	Production PV in (Ah) for the previous day	Ah	Ah	FLOAT	
15027	Production PV in (Wh) for the previous day	kWh	kWh	FLOAT	
15028	Production PV1 in (Wh) for the previous day	kWh	kWh	FLOAT	
15029	Production PV2 in (Wh) for the previous day	kWh	kWh	FLOAT	
15030	Number of irradiation hours for the current day	h	h	FLOAT	
15031	Number of irradiation hours for the previous day	h	h	FLOAT	
15032	Battery temperature	°C	°C	FLOAT	
15033	Max PV voltage for the current day	Vdc	V	FLOAT	
15034	Max PV1 voltage for the current day	Vdc	V	FLOAT	
15035	Max PV2 voltage for the current day	Vdc	V	FLOAT	
15036	Max battery current of the current day	Adc	A	FLOAT	
15037	Max PV power for the current day	kW	kW	FLOAT	
15038	Max PV1 power for the current day	kW	kW	FLOAT	
15039	Max PV2 power for the current day	kW	kW	FLOAT	
15040	Max battery voltage for the current day	Vdc	V	FLOAT	
15041	Min battery voltage for the current day	Vdc	V	FLOAT	
15042	Time in absorption of the current day	h	h	FLOAT	
15043	BAT- and Earth voltage	Vdc	V	FLOAT	
15044	PV- and Earth voltage	Vdc	V	FLOAT	
15045	PV1- and Earth voltage	Vdc	V	FLOAT	
15046	PV2- and Earth voltage	Vdc	V	FLOAT	

15049	Type of error		0:None 1:OverV_B 2:OverV_PV 3:OverV_PV1 4:OverV_PV2 5:OverI_PV 6:OverI_PV1 7:OverI_PV2 8:GroundBat 9:GroundPV 10:GroundPV1 11:GroundPV2 12:OverTemp 13:UnderV_B 14:Cabling 15:Other	ENUM	
15050	Synchronized with Xtender battery cycle		0:No 1:Yes	ENUM	
15051	Synchronisation state		0:--- 1:--- 2:--- 3:--- 4:XTslave 5:VTslave 6:--- 7:--- 8:VTmaster 9:Autonom 10:VSslave 11:VSmaster	ENUM	
15052	Number of days before next equalization	days	days	FLOAT	
15053	Battery set point	Vdc	V	FLOAT	
15054	Battery voltage (minute avg)	Vdc	V	FLOAT	
15055	Battery voltage (minute max)	Vdc	V	FLOAT	
15056	Battery voltage (minute min)	Vdc	V	FLOAT	
15057	Battery current (minute avg)	Adc	A	FLOAT	
15058	PV voltage (minute avg)	Vdc	V	FLOAT	
15059	PV1 voltage (minute avg)	Vdc	V	FLOAT	
15060	PV2 voltage (minute avg)	Vdc	V	FLOAT	
15061	PV power (minute avg)	kW	kW	FLOAT	
15062	PV1 power (minute avg)	kW	kW	FLOAT	
15063	PV2 power (minute avg)	kW	kW	FLOAT	
15064	Battery temperature (minute avg)	°C	°C	FLOAT	
15065	Dev 1 (minute avg)			FLOAT	
15066	Dev 1 (minute max)			FLOAT	
15067	Dev 1 (minute min)			FLOAT	
15068	Dev 2 (minute avg)			FLOAT	
15069	Dev 2 (minute max)			FLOAT	
15070	Dev 2 (minute min)			FLOAT	
15071	Number of parameters (in code)			FLOAT	
15072	Number of parameters (in flash)			FLOAT	
15073	Number of infos users			FLOAT	
15074	ID type			FLOAT	
15075	ID bat voltage	Vdc	V	FLOAT	
15076	ID HW			FLOAT	
15077	ID SOFT msb			FLOAT	
15078	ID SOFT lsb			FLOAT	
15079	ID SID			FLOAT	
15088	State of auxiliary AUX1		0:Opened 1:Closed	ENUM	

15089	State of auxiliary AUX2		0:Opened 1:Closed	ENUM	
15090	Relay AUX1 mode		0:--- 1:A 2:I 3:M 4:M	ENUM	
15091	Relay AUX2 mode		0:--- 1:A 2:I 3:M 4:M	ENUM	
15102	ID FID msb			FLOAT	
15103	ID FID lsb			FLOAT	
15108	State of the VarioString		0:Off 1:On	ENUM	
15109	Local daily communication error counter			FLOAT	

6.12 RCC messages

User ref.	Description
0	Warning (000): Battery low
1	Warning (001): Battery too high
2	Warning (002): Bulk charge too long
3	(003): AC-In synchronization in progress
4	Warning (004): Input frequency AC-In wrong
5	Warning (005): Input frequency AC-In wrong
6	Warning (006): Input voltage AC-In too high
7	Warning (007): Input voltage AC-In too low
8	Halted (008): Inverter overload SC
9	Halted (009): Charger short circuit
10	(010): System start-up in progress
11	Warning (011): AC-In Energy quota
12	(012): Use of battery temperature sensor
13	(013): Use of additional remote control
14	Halted (014): Over temperature EL
15	Halted (015): Inverter overload BL
16	Warning (016): Fan error detected
17	(017): Programing mode
18	Warning (018): Excessive battery voltage ripple
19	Halted (019): Battery undervoltage
20	Halted (020): Battery overvoltage
21	(021): Transfer not authorized, ACout current is higher than {1107}
22	Halted (022): Voltage presence on AC-Out
23	Halted (023): Phase not defined
24	Warning (024): Change the clock battery
25	Halted (025): Unknown Command board. Software upgrade needed
26	Halted (026): Unknown Power board. Software upgrade needed
27	Halted (027): Unknown extension board. Software upgrade needed
28	Halted (028): Voltage incompatibility Power - Command
29	Halted (029): Voltage incompatibility Ext. - Command
30	Halted (030): Power incompatibility Power - Command
31	Halted (031): Command board software incompatibility
32	Halted (032): Power board software incompatibility
33	Halted (033): Extension board software incompatibility
34	Halted (034): FID corruption, call factory
35	(035): Memory structure modified

36	Halted (036): Parameter file lacking
37	Warning (037): Message file lack. SW upgrade advised
38	Warning (038): Upgrade of the device software advised
39	Warning (039): Upgrade of the device software advised
40	Warning (040): Upgrade of the device software advised
41	Warning (041): Over temperature TR
42	Halted (042): Unauthorized energy source at the output
43	(043): Start of monthly test
44	(044): End of successfully monthly test
45	Warning (045): Monthly autonomy test failed
46	(046): Start of weekly test
47	(047): End of successfully weekly test
48	Warning (048): Weekly autonomy test failed
49	(049): Transfer opened because ACin max current exceeded {1107}
50	Error (050): Incomplete data transfer
51	(051): The update is finished
52	(052): Your installation is already updated
53	Halted (053): Devices not compatible, software update required
54	(054): Please wait. Data transfer in progress
55	Error (055): No SD card inserted
56	Warning (056): Upgrade of the RCC software advised
57	(057): Operation finished successfully
58	Halted (058): Master synchronization missing
59	Halted (059): Inverter overload HW
60	Warning (060): Time security 1512 AUX1
61	Warning (061): Time security 1513 AUX2
62	Warning (062): Genset, no AC-In coming after AUX command
63	(063): Save parameter XT
64	(064): Save parameter BSP
65	(065): Save parameter MPPT
71	Error (071): Insufficient disk space on SD card
72	Halted (072): COM identification incorrect
73	(073): Datalogger is enabled on this RCC
74	(074): Save parameter Xcom-MS
75	(075): MPPT MS address changed successfully
76	Error (076): Error during change of MPPT MS address
77	Error (077): Wrong MPPT MS DIP Switch position
78	(078): SMS or email sent
79	Halted (079): More than 9 XTs in the system
80	Halted (080): No battery (or reverse polarity)
81	Warning (081): Earthing fault
82	Halted (082): PV overvoltage
83	Warning (083): No solar production in the last 48h
84	(084): Equalization performed
85	Error (085): Modem not available
86	Error (086): Incorrect PIN code, unable to initiate the modem
87	Error (087): Insufficient Signal from GSM modem
88	Error (088): No connection to GSM network
89	Error (089): No server access
90	(090): Server connected
91	Error (091): Update software of other RCC or Xcom-232i
92	Error (092): More than 3 RCC or Xcom-232i in the system
93	Error (093): More than 1 BSP in the system
94	Error (094): More than 1 Xcom MS in the system
95	Error (095): More than 15 VarioTrack in the system
121	Error (121): Impossible communication with target device
122	Error (122): SD card corrupted
123	Error (123): SD card not formatted

124	Error (124): SD card not compatible
125	Error (125): SD card format not recognized. Should be FAT
126	Error (126): SD card write protected
127	Error (127): SD card, file(s) corrupted
128	Error (128): SD card file or directory could not be found
129	Error (129): SD card has been prematurely removed
130	Error (130): Update directory is empty
131	(131): The VarioTrack is configured for 12V batteries
132	(132): The VarioTrack is configured for 24V batteries
133	(133): The VarioTrack is configured for 48V batteries
134	(134): Reception level of the GSM signal
137	Error (137): VarioTrack master synchronization lost
138	Error (138): XT master synchronization lost
139	(139): Synchronized on VarioTrack master
140	(140): Synchronized on XT master
141	Error (141): More than 1 Xcom SMS in the system
142	Error (142): More than 15 VarioString in the system
143	(143): Save parameter Xcom SMS
144	(144): Save parameter VarioString
145	Error (145): SIM card blocked, PUK code required
146	Error (146): SIM card missing
147	Error (147): Install R532 firmware release prior to install an older release
148	(148): Datalogger function interrupted (SD card removed)
149	Error (149): Parameter setting incomplete
150	Error (150): Cabling error between PV and VarioString
162	Error (162): Communication loss with RCC or Xcom232i
163	Error (163): Communication loss with Xtender
164	Error (164): Communication loss with BSP
165	Error (165): Communication loss with Xcom MS
166	Error (166): Communication loss with VarioTrack
167	Error (167): Communication loss with VarioString
168	(168): Synchronized with VarioString master
169	(169): Synchronization with VarioString master lost
170	Warning (170): No solar production in the last 48h on PV1
171	Warning (171): No solar production in the last 48h on PV2
175	Halted (175): Critical undervoltage
176	(176): Calibration setting lost
177	(177): An Xtender has started up
178	(178): No BSP. Necessary for programming with SOC
179	(179): No BTS or BSP. Necessary for programming with temperature
180	(180): Command entry activated
181	Error (181): Disconnection of BTS
182	(182): BTS/BSP battery temperature measurement used by a device
183	Halted (183): An Xtender has lost communication with the system
184	Error (184): Check phase orientation or circuit breakers state on AC-In
185	Warning (185): AC-In voltage level with delay too low
186	Halted (186): Critical undervoltage (fast)
187	Halted (187): Critical overvoltage (fast)
188	(188): CAN stage startup
189	Error (189): Incompatible configuration file
190	(190): The Xcom-SMS is busy
191	(191): Parameter not supported
192	(192): Unknown reference
193	(193): Invalid value
194	(194): Value too low
195	(195): Value too high
196	(196): Writing error
197	(197): Reading error

198	(198): User level insufficient
199	(199): No data for the report
200	Error (200): Memory full
202	Warning (202): External alarm arrives
203	(203): External alarm leaves
204	Halted (204): External stop arrives
205	(205): External stop leaves
206	Halted (206): Board hardware incompatibility
207	(207): AUX1 relay activation
208	(208): AUX1 relay deactivation
209	(209): AUX2 relay activation
210	(210): AUX2 relay deactivation
211	(211): Command entry deactivated
212	Error (212): VarioTrack software incompatibility. Upgrade needed
213	(213): Battery current limitation by the BSP stopped
214	Warning (214): Half periode RMS voltage limit exceeded, transfer opened
215	Warning (215): UPS limit reached, transfer opened
216	Warning (216): Scom watchdog caused the reset of Xcom-232i
217	Warning (217): CAN problem at Xtender declaration
218	Warning (218): CAN problem while writing parameters
222	(222): Front ON/OFF button pressed
223	(223): Main OFF detected
224	(224): Delay before closing transfer relay in progress {1580}