OPERATING MANUAL

STATYS

Jbus / Modbus serial link

OPMSTAJB0810-GB_01

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Innovative Power Solutions UPS

ENGLISH

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1. Foreword

Thank you for the trust you have in our Static Transfer System.

This equipment complies with the IEC 62310-2 product standard concerning Static Transfer Systems (STS).

CAUTION : "This is a product for restricted sales distribution to informed partners. Installation restrictions or additional measures may be needed to prevent disturbances".

⚠ ***SOCOMEC UPS reserves the right to modify their specifications at any time as far as this contributes to technical progress.***

2. Safety Requirement

2. 1. Using conditions

Do read carefully these operation instructions before using the JBUS/MODBUS interface.

Whatever the repairs, they must be made only by authorised staffs, which have been suitably trained. It is recommended that the ambient temperature and humidity of the STATYS environment are maintained below the values specified by the manufacturer.

2. 2. STATYS operating reference

Respect the safety requirements.

Do read carefully the operation instructions of STATYS.

For an optimal operation, it is recommended to maintain the ambient temperature and humidity of the STATYS environment below the values specified by the manufacturer.

This equipment meets the requirements of the European directives applied to this product. As a consequence it is labelled as follows: CE

3. Environment

3. 1. Recycling of electrical products and equipment

Provision is made in European countries to break up and recycle materials making up the system. The various components must be disposed of in accordance with the legal provisions in force in the country where the system is installed.

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4. Introduction

4. 1. General purpose

This document provides required information of the JBUS/MODBUS protocol serial link.

Before connecting a supervision equipment or BMS system (Building management system) to the STATYS, it is necessary to install and set up the serial interface.

This interface is located in the STATYS « com-slot », and should be set through the control panel or via the graphic touch screen (optional).

STATYS is able to manage only 1 JBUS/MODBUS serial links.

4. 2. Jbus/Modbus protocol

This document does not explain the JBUS/MODBUS protocol management. Please refer on www.modbus.org web site for more information.

The STATYS JBUS/MODBUS uses the following functions :
- function 3 for reading Input Registers (16 bits),
- function 6 for writing single Registers (to control STATYS).

The data field is composed of words, defined by a MSB (most significant byte) and a LSB (lowest significant byte), and displayed in the following order on the serial link.

1 WORD DATA					
b7	**MSB**	b0	b7	**LSB**	b0
b15					b0

4. 3. Data decoding

Status and alarms Information
This information are coding in bit. This means that 1 word defines 16 information. If the related bit is set to 1, this information is active or true.

Measurements and counters data
1 word defines a measurement or a counter. Some values are numeric decimal signed or unsigned (0 to 65535 or from -32767 to 32767), or in hexadecimal (0x0000 to 0xFFFF).

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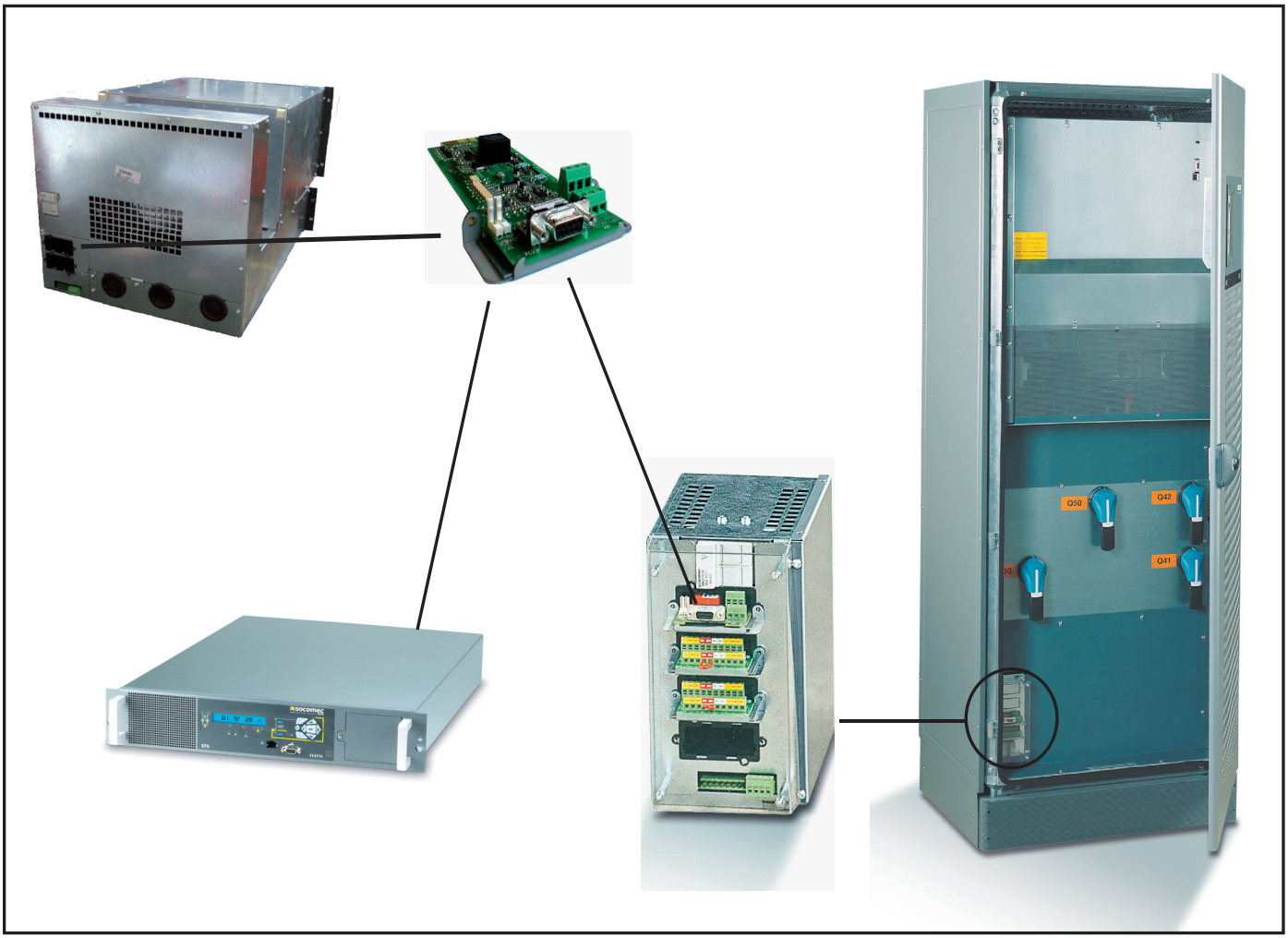
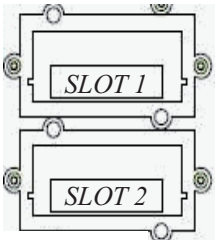
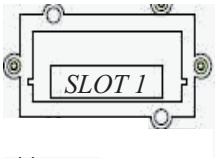
5. JBUS/MODBUS SERIAL INTERFACE INSTALLATION INSIDE STATYS

5.1. 'COM-SLOTS' LOCALISATION



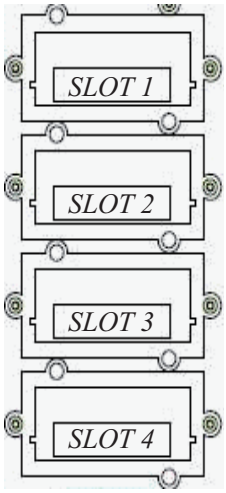


STATYS 63/100A rack:
2 Com-Slots are present at the rear of the fixed unit, the slot 1 receive the serial card.



STATYS 32/63A rack:
only 1 Com-Slots is present at the rear of the products and receive the serial card.

STATYS 200/600A:
4 Com-Slots are present on the rack slot, in front of the cabinet, the slot 1 receive the serial card.



5.2. JBUS/MODBUS SERIAL INTERFACE PLUG IN

The serial interface should be plugged in the corresponding slot, and fixed with 2 crews.
STATYS is able to manage only 1 JBUS/MODBUS interfaces.

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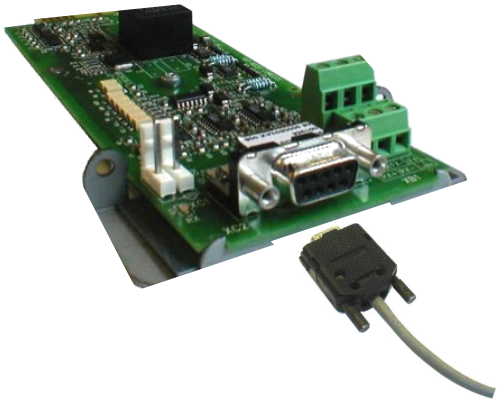
5. 3. CONNECTIONS AND WIRING

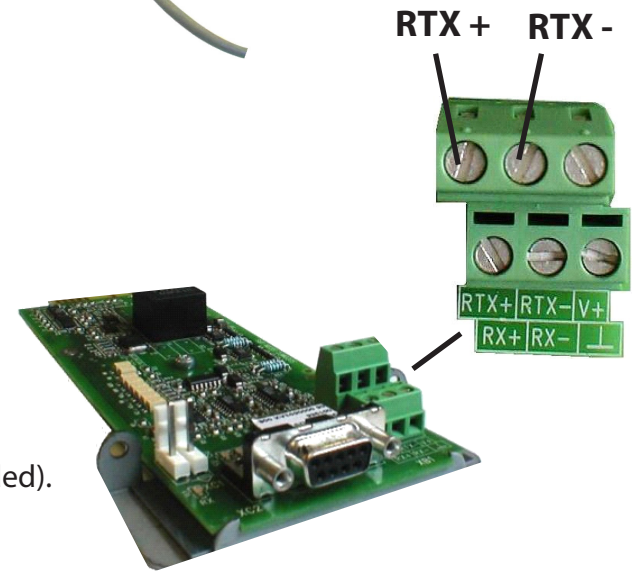
NOTE : there is only one connection per interface (RS232 or RS422 or RS485)

5. 3.1. RS232 connection:



- Standard PC connection
- Sub-D 9 pins connector
- Pin 2 : Rx
- Pin 3 : Tx
- Pin 5 : GND

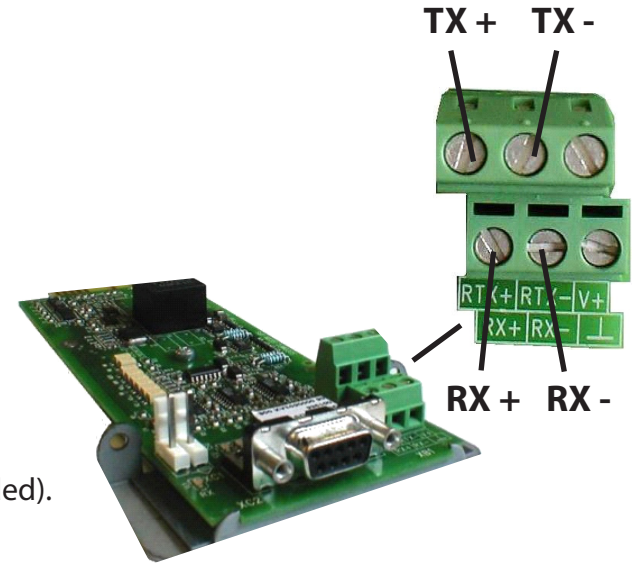
5. 3.2. Isolated RS485 connection



- 2 wires connection
- « dip-switch 1 » allows connecting the terminal resistor
- Isolation via "opto-coupler"
- 2 polarization resistors could be removed easily (if needed).

⚠ ***the shield should be earthing at one point.***

5. 3.3. Isolated RS422 connection



- 4 wires connection
- « dip-switch 1 and 2 » allows connecting the terminal resistor
- Isolation via "opto-coupler"
- 4 polarization resistors could be removed easily (if needed).

⚠ ***the shield should be earthing at one point.***

⚠ ***Before making any connection, please check the cabling. A wrong connection or cabling can damage the serial link interface.***

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6. JBUS/MODBUS LINK

6.1. SERIAL LINK 1 AND 2 DEFAULT SETTINGS

Baud rate: 9600 bauds
Parity: NONE
Data: 8 bits
Stop: 1 bit
Slave: 1

The serial link settings can be set from the control panel or from the graphic touch screen.

6.2. HOW TO CHANGE THE SERIAL LINK SETTINGS ?

Available baud rate: 4800 - 9600 - 19200 bauds
Parity: EVEN - ODD - NONE
Slave number: 1 to 255

Settings menu of the LCD mimic panel type D20 (see the operating manual):

Modbus link configuration (user access)
Display: mod bus

Slave number
Display: sla nb
Default value: 1
Possible choice: 1 to 255

Link speed
Display: bds
Default value: 9600
Possible choice: 2400, 4800, 9600 or 19200

Link parity
Display: par
Default value: no
Possible choice: odd, eve (even) or no

Settings screen of the Graphic mimic panel type ADICOM (see the operating manual):

6.2-1

⚠ ***«Type» should be setup at Modbus mode.***

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7. JBUS/MODBUS PROTOCOL

Reminder:
The JBUS/MODBUS protocol available on STATYS is slave and in RTU mode.
It uses the function 3 as 'read registers' and the function 6 as 'write register'.
The slave number is set via the control panel or via the graphic touch screen.

Conventions:
The table addresses are written in hexadecimal, beginning with '0x'.
Some PLC systems request a relative address starting from 400 (0x0190) or 40001 (0x9C41), on this address it's necessary to add the first address of the JBUS/MODBUS table.

Frame errors management:
In case of wrong data request, the STATYS answers with the following frame error :

Error function code	Error code	Cause
80 + code function	1	Function error
80 + code function	2	Addresses error
80 + code function	3	Wrong data
80 + code function	6	busy
80 + code function	8	Write register error

8. STATYS JBUS/MODBUS TABLES

§	TABLE	Start addresses	Table length in words	JBUS/MODBUS FUNCTION
1	States	0x0140	4	3 READ
2	Alarms	0x0148	2	3 READ
3	Measurements	0x0220	64	3 READ
4	Permissions	0x0150	1	3 READ
5	Commands	0x0190	1	6 WRITE

8.1. HOW TO READ DATA:

The identification, status and alarms tables should be read completely (this means the number of word to read is equal to the table length).
The measurements table should be read word by word or per group, without exceed the length of the table. (from 0x0220 to 0x025F).

8.2. INCOMING DATA STRUCTURE:

Example of 6 words

1	2	3	4	5	6	7	8	9	10	11	12
MSB 0	LSB 0	MSB 1	LSB 1	MSB 2	LSB 2	MSB 3	LSB 3	MSB 4	LSB 4	MSB 5	LSB 5
WORD 0		WORD 1		WORD 2		WORD 3		WORD 4		WORD 5	
b15	b0	b15	b0	b15	b0	b15	b0	b15	b0	b15	b0
S15	S00	S31	S16	S47	S32	S63	S48				
A15	A00	A31	A16								
M00		M01		M02		M03		M04		M05	

8. 3. STATES TABLES: STARTING ADDRESS 0X0140, 4 WORDS

CODE	DESCRIPTION	BIT	ADDRESS	Remarks
S00	Source 1 OK	0	0x0140	
S01	Source 1 critical	1	0x0140	
S02	Source 1 out of tolerance	2	0x0140	
S03	Source 1 absent	3	0x0140	
S04	PowerPath 1 OK	4	0x0140	
S05		5	0x0140	
S06	Source 2 OK	6	0x0140	
S07	Source 2 critical	7	0x0140	
S08	Source 2 out of tolerance	8	0x0140	
S09	Source 2 absent	9	0x0140	
S10	PowerPath 2 OK	10	0x0140	
S11		11	0x0140	
S12	Srcs perm. Synchronised	12	0x0140	
S13	Sliding Sources	13	0x0140	
S14	Srcs perm. Not Synchron.	14	0x0140	
S15	Srcs Instant. Synchron.	15	0x0140	
S16	S1 is preferred source	0	0x0141	
S17	Load on preferred source	1	0x0141	
S18	Load on auxiliary source	2	0x0141	
S19	Load not supplied	3	0x0141	
S20	Load on manual by-pass1	4	0x0141	
S21	Load on manual by-pass2	5	0x0141	
S22		6	0x0141	
S23	Load on S1	7	0x0141	
S24	Load on S2	8	0x0141	
S25		9	0x0141	
S26	Transfer locked ext.	10	0x0141	
S27		11	0x0141	
S28	Output OK	12	0x0141	
S29	Output out of tolerance	13	0x0141	
S30	Output absent	14	0x0141	
S31		15	0x0141	

CODE	DESCRIPTION	BIT	ADDRESS	Remarks
S32	ESD input active	0	0x0142	
S33	Q41 closed	1	0x0142	
S34	Q42 closed	2	0x0142	
S35	SS1 closed	3	0x0142	
S36	SS2 closed	4	0x0142	
S37	Q30 closed	5	0x0142	
S38	Q51 closed	6	0x0142	
S39	Q52 closed	7	0x0142	
S40		8	0x0142	
S41		9	0x0142	
S42		10	0x0142	
S43		11	0x0142	
S44		12	0x0142	
S45	Remote controls enabled	13	0x0142	
S46	Maintenance alert	14	0x0142	
S47	User mode	15	0x0142	
S48	Board 1 input 1 active	0	0x0143	
S49	Board 1 input 2 active	1	0x0143	
S50	Board 1 input 3 active	2	0x0143	
S51	Board 2 input 1 active	3	0x0143	
S52	Board 2 input 2 active	4	0x0143	
S53	Board 2 input 3 active	5	0x0143	
S54	Board 3 input 1 active	6	0x0143	
S55	Board 3 input 2 active	7	0x0143	
S56	Board 3 input 3 active	8	0x0143	
S57	Board 4 input 1 active	9	0x0143	
S58	Board 4 input 2 active	10	0x0143	
S59	Board 4 input 3 active	11	0x0143	
S60		12	0x0143	
S61		13	0x0143	
S62		14	0x0143	
S63		15	0x0143	

8. 4. ALARMS TABLES: STARTING ADDRESS 0X0148, 2 WORDS

CODE	DESCRIPTION	BIT	ADDRESS	Remarks
A00	Imminent stop	0	0x0148	
A01	Output Isc detection	1	0x0148	
A02	Manual By-Pass	2	0x0148	
A03	Overload	3	0x0148	
A04		4	0x0148	
A05	Consecutive Detections	5	0x0148	
A06	Switchback impossible	6	0x0148	
A07	Transfer impossible	7	0x0148	
A08		8	0x0148	
A09	PowerPath1 deteriorated	9	0x0148	
A10	PowerPath1 short circuit	10	0x0148	
A11	PowerPath1 in failure	11	0x0148	
A12		12	0x0148	
A13	PowerPath2 deteriorated	13	0x0148	
A14	PowerPath2 short circuit	14	0x0148	
A15	PowerPath2 in failure	15	0x0148	
A16	Backfeed1 protection open	0	0x0149	
A17	Backfeed2 protection open	1	0x0149	
A18	Ambient temperature max	2	0x0149	
A19		3	0x0149	
A20	Insufficient resources	4	0x0149	
A21		5	0x0149	
A22		6	0x0149	
A23		7	0x0149	
A24		8	0x0149	
A25		9	0x0149	
A26	Configuration Alarm	10	0x0149	
A27	HMI Alarm	11	0x0149	
A28	Electronics	12	0x0149	
A29	Custom input alarm	13	0x0149	
A30	Preventive alarm	14	0x0149	
A31	General Alarm	15	0x0149	

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8. 5. MEASUREMENTS TABLES: STARTING ADDRESS 0X0220, 64 WORDS

CODE	DESCRIPTION	Unit	ADDRESS	Remarks
M00	S1 voltage L1N	V	0x0220	
M01	S1 voltage L2N	V	0x0221	
M02	S1 voltage L3N	V	0x0222	
M03	S1 voltage U12	V	0x0223	
M04	S1 voltage U23	V	0x0224	
M05	S1 voltage U31	V	0x0225	
M06	S1 frequency	Hz	0x0226	
M07	SS1 temperature	°C	0x0227	
M08	S2 voltage L1	V	0x0228	
M09	S2 voltage L2	V	0x0229	
M10	S2 voltage L3	V	0x022A	
M11	S2 voltage U12	V	0x022B	
M12	S2 voltage U23	V	0x022C	
M13	S2 voltage U31	V	0x022D	
M14	S2 frequency	Hz	0x022E	
M15	SS2 temperature	°C	0x022F	
M16	Output voltage L1	V	0x0230	
M17	Output voltage L2	V	0x0231	
M18	Output voltage L3	V	0x0232	
M19	Output voltage U12	V	0x0233	
M20	Output voltage U23	V	0x0234	
M21	Output voltage U31	V	0x0235	
M22	Output frequency	Hz	0x0236	
M23			0x0237	
M24	Output current I1	A	0x0238	
M25	Output current I2	A	0x0239	
M26	Output current I3	A	0x023A	
M27	Output current IN	A	0x023B	
M28			0x023C	
M29	Output load rate	%	0x023D	
M30			0x023E	
M31	S1-S2 phase shift	°	0x023F	
M32	Output Apparent P. L1	KVA	0x0240	

CODE	DESCRIPTION	Unit	ADDRESS	Remarks
M33	Output Apparent P. L2	KVA	0x0241	
M34	Output Apparent P. L3	KVA	0x0242	
M35	Output Power factor L1		0x0243	
M36	Output Power factor L2		0x0244	
M37	Output Power factor L3		0x0245	
M38			0x0246	
M39			0x0247	
M40	Output crest factor L1		0x0248	
M41	Output crest factor L2		0x0249	
M42	Output crest factor L3		0x024A	
M43	Output crest factor N		0x024B	
M44			0x024C	
M45			0x024D	
M46			0x024E	
M47	Ambient temperature	°C	0x024F	
M48	Output Active Power L1	KW	0x0250	
M49	Output Active Power L2	KW	0x0251	
M50	Output Active Power L3	KW	0x0252	
M51	Global Active Power	KW	0x0253	
M52			0x0254	
M53			0x0255	
M54			0x0256	
M55			0x0257	
M56	Output load rate L1	%	0x0258	
M57	Output load rate L2	%	0x0259	
M58	Output load rate L3	%	0x025A	
M59	Output load rate N	%	0x025B	
M60			0x025C	
M61			0x025D	
M62			0x025E	
M63			0x025F	

8.6. PERMISSIONS TABLES: STARTING ADDRESS 0X0150, 1 WORDS

CODE	DESCRIPTION	BIT	ADDRESS	Remarks
P00	Close SSP	0	0x0150	
P01	Close SSA	1	0x0150	
P02	Close SS1	2	0x0150	
P03	Close SS2	3	0x0150	
P04	S1 is preferred source	4	0x0150	
P05	S2 is preferred source	5	0x0150	
P06		6	0x0150	
P07	Lock transfer ext.	7	0x0150	
P08	Unlock transfer ext.	8	0x0150	
P09		9	0x0150	
P10	Allows remote controls	10	0x0150	
P11	Forbid remote controls	11	0x0150	
P12	Trsf Asynchro Forced	12	0x0150	
P13	Trsf OnFly Abort	13	0x0150	
P14		14	0x0150	
P15	Load off	15	0x0150	

8.7. COMMANDS TABLES: STARTING ADDRESS 0X0190, WRITE 1 WORDS

To modify a parameter, write 1 in the corresponding bit.

CODE	DESCRIPTION	BIT to write	ADDRESS	Remarks
C00	Close SSP	0	0x0190	
C01	Close SSA	1	0x0190	
C02	Close SS1	2	0x0190	
C03	Close SS2	3	0x0190	
C04	S1 is preferred source	4	0x0190	
C05	S2 is preferred source	5	0x0190	
C06		6	0x0190	
C07	Lock transfer ext.	7	0x0190	
C08	Unlock transfer ext.	8	0x0190	
C09		9	0x0190	
C10	Allows remote controls	10	0x0190	
C11	Forbid remote controls	11	0x0190	
C12	Force Asynchro Trsf	12	0x0190	
C13	Abort OnFly Trsf	13	0x0190	
C14		14	0x0190	
C15	Load off	15	0x0190	

⚠ ***It is advised to modify only one parameter per request.***

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