

Appendix)

Monitor & Control Specifications for RS-232C Interface

Rev. 2.3
July 25 2013

1. RS-232C Link Specifications

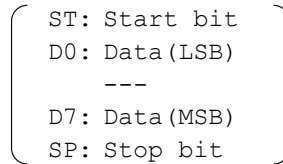
(1) Transmission Protocol

- a. Operation Mode Binary
- b. Transfer Rate 9600 bit/s
- c. Data Format 1 start bit, 8 data bits, 1 stop bit
No Parity



← Transmit

(The least significant bit (LSB) is sent first.)



2. Packet Format

(1) Byte Configuration

- a. Data Packet Length
- b. Byte Configuration

7 Bytes

Byte	Command (IDU to BUC)	Response (BUC to IDU)
1st	BUC Address (*1)	BUC Address (*2)
2nd	Command	Data Byte 1
3rd	Data Byte 1	Data Byte 2
4th	Data Byte 2	Data Byte 3
5th	Data Byte 3	Data Byte 4
6th	Data Byte 4	Data Byte 5
7th	Check Sum (*3)	Check Sum (*3)

- *1: Initial setting of a BUC address is 0x01.
- *2: Responder address is shifted left by 4 bits.
- *3: Algebraic sum of bytes 1 through 6.
Spare bytes are always filled with 0xAA (10101010).

Appendix)

3. Command & Response Message Structure

The last state of the BUC condition is stored to inside memory, so when the BUC is re-turned DC power on again, the state is reproduced last condition.

(1) Command Message Structure (IDU to BUC)

a. Request Status 1

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Request Status 1	0x01
3	Data Byte 1	Not used	0xAA
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

b. Set Transmit On/Off State

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Tx On/Off	0x02
3	Data Byte 1	Tx Control	Off:0x00/On:0x01
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

c. Change BUC Address (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Change Address	0x03
3	Data Byte 1	New Address	0x01 to 0x0F
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicabe (N/A) in this version.

d. Set Carrier Frequency (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Set Carrier Frequency	0x04
3	Data Byte 1	Carrier Frequency	MSbyte
4	Data Byte 2	Carrier Frequency	LSbyte
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

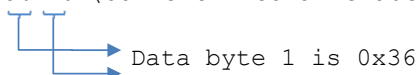
This command is not applicabe (N/A) in this version.

Data Field Definition

Carrier Frequency	Unsigned integer in MHz
-------------------	-------------------------

ex).

14000 MHz : 36 B0 (Convert into a hexadecimal number)



Appendix)

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02 *1
4	Data Byte 2	Setting Att. in 10dB digit	0x00 or 0x01 *2
5	Data Byte 3	Setting Att. in 1dB digit	0x00 to 0x09 *2
6	Data Byte 4	Setting Att. bit in 0.5dB digit	0x00 or 0x05 *2
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Att.1 is available, Att.2 is not available.

*2 Dynamic range and step size of the step attenuator: 15.5dB in 0.5dB step

ex) 12.5dB : Data byte 2 is 0x01
Data byte 3 is 0x02
Data byte 4 is 0x05

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x01 (to 0x0F)
2	Command	Request Status 2	0x06
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

(2) Response Message Structure (BUC to IDU)

a. Request Status 1

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Level Byte 1	MSbyte of Tx Output Power	*1
3	Level Byte 2	LSbyte of Tx Output Power	*1
4	Temperature	Temperature in deg. C	*2
5	Status Byte 1	Bit 0: Temperature Out-of-Range	1:Fail , 0:Normal
		Bit 1: PLL Out-of-Lock	1:Fail , 0:Normal
		Bit 2: Checksum Error	1:Error , 0:Normal
		Bit 3: Tx Status	1:Tx On , 0:Tx Off
		Bits 4 thru 7: BUC Power Class	0x1 to 0xA *3
6	Status Byte 2	Bits 0 - 3: Not used	Fixed 0xA
		Bits 4 - 7: Software Version	0x0 to 0xF
7	Checksum	Algebraic sum of bytes 1 - 6	

*1 Data Field Definition

Output power is the number which changed hexadecimal data into the decimal number and was divided by 100.

ex).

Output Power Data	Output Power
Data byte 1 is 0x10	} 0x1036 → +41.50 dBm
Data byte 2 is 0x36	

*2 Data Field Definition

Temperature data is -128 deg.C to +127 deg.C in two's complement.
(1 deg.C step).

ex).

When BUC Temperature is -40C, Temperature data is

*3 BUC Power Class

Value	0x1	0x2	0x3	0x4	0x5	0x6	0x7	0x8	0x9	0xA
Power	2W	4W	5W	8W	10W	16W	20W	25W	40W	60W

Appendix)

b. Set Transmit

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Tx On/Off	0x02
3	Data Byte 1	Tx Control	Off:0x00/On:0x01
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

c. Change BUC Address (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Change Address	0x03
3	Data Byte 1	New Address	0x01 to 0x0F
4	Data Byte 2	Not used	0xAA
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicable (N/A) in this version.

d. Set Carrier Frequency (N/A)

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Carrier Frequency	0x04
3	Data Byte 1	Carrier Frequency	MSbyte
4	Data Byte 2	Carrier Frequency	LSbyte
5	Data Byte 3	Not used	0xAA
6	Data Byte 4	Not used	0xAA
7	Checksum	Algebraic sum of bytes 1 - 6	

This command is not applicable (N/A) in this version.

e. Set Attenuator

Byte	Name	Description	Value
1	Address	Address of BUC shifted left by 4	0x10 (to 0xF0)
2	Command	Set Attenuator	0x05
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	

f. Request Status 2

Byte	Name	Description	Value
1	Address	Address of BUC	0x10 (to 0xF0)
2	Command	Request Status 2	0x08
3	Data Byte 1	Attenuator Selection 1 or 2	Att.1 0x01 Att.2 0x02
4	Data Byte 2	Set Att. bit in 10 dB digit	0x00 or 0x01
5	Data Byte 3	Set Att. bit in 1 dB digit	0x00 to 0x09
6	Data Byte 4	Set Att. bit in 0.5 dB digit	0x00 or 0x05
7	Checksum	Algebraic sum of bytes 1 - 6	