



Bluebox Short Description Configuration Commands

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Contents

1	Introduction	3
1.1	Simple Configuration Commands	3
1.1.1	Replies.....	4
1.2	Example: General Configuration	4
1.2.1	Replies.....	5
1.3	Commands with Configuration Page Address	5
1.4	Example: RF Configuration	6
1.4.1	Configuration address 0x01	6
1.4.2	Configuration address 0x02	7
1.4.3	Configuration address 0x04	7
1.4.4	Configuration address 0x82	8
2	Examples	9
2.1	Change UHF TX Power	9
2.2	Switch on Spontaneous Mode	10
Appendix A – ASCII Characters used in Telegrams.....		11
Appendix B – Common Configuration Page Addresses		11

1 Introduction

1.1 Simple Configuration Commands

Configuration commands without page addresses have 7 bytes of configuration data. These are transferred in 14 bytes payload per telegram. The 7 bytes data are labelled <param 1 h> .. <param 7 l>. For the general configuration, the telegram is set up as follows:

- 6 bytes header of telegram with command code
- 14 bytes configuration data ASCII
- 3 bytes trail of telegram with checksum

SOH <add h> <adda l> STX `2` `F`

1. <param 1 h>
2. <param 1 l>
3. ...
4. ...
5. ...
6. ...
7. <param i h>
8. <param i l>
9. ...
10. ...
11. ...
12. ...
13. <param 7 h>
14. <param 7 l>

ETX <bcc> CR

1.1.1 Replies

Upon success, the addressed BLUEBOX replies with: SOH <add h> <add l> ACK <bcc> CR

In case of an error, the BLUEBOX replies with: SOH <add h> <add l> NAK <bcc> CR

1.2 Example: General Configuration

This table from the manual of the device lists for each configuration field (first line) the meaning (second line) and the default value (third line):

1	2	3	4	5	6	7
Device Address	Serial1	Serial2	0x00	0x00	Filter Time	Flags
0xFF	0x48	0x10	0x00	0x00	0x01	0x80

Here the corresponding configuration telegram:

SOH <add h> <adda l> STX `2` `F`

1. ASCII F = 0x46 (New device address high nibble)
2. ASCII F = 0x46 (New device address low nibble)
3. ASCII 4 = 0x34 (Serial configuration byte 1 high nibble)
4. ASCII 8 = 0x38 (Serial configuration byte 1 low nibble)
5. ASCII 1 = 0x31 (Serial configuration byte 2 high nibble)
6. ASCII 0 = 0x30 (Serial configuration byte 2 low nibble)
7. ASCII 0 = 0x30 (Padding Byte)
8. ASCII 0 = 0x30 (Padding Byte)
9. ASCII 0 = 0x30 (Padding Byte)
10. ASCII 0 = 0x30 (Padding Byte)
11. ASCII 1 = 0x31 (Filter time* high nibble)
12. ASCII 7 = 0x37 (Filter time* low nibble)
13. ASCII 8 = 0x38 (Flags high nibble)
14. ASCII 0 = 0x30 (Flags low nibble)

ETX <bcc> CR

*Examples for filter time: 23 seconds = 23 (decimal) = 0x17 (hexadecimal) = 0001.0111 (binary)

=> "ASCII 1 = 0x31" + "ASCII 7 = 0x37"

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x32 0x46	2F	Command code
6..7	2			New device address
8..9	2			Serial configuration byte 1
10..11	2			Serial configuration byte 2
12..15	4			Padding
16..17	2			Filter time
18..19	2			Flags
20	1	0x03	ETX	End of telegram contents
21	1			BCC
22	1	0x0D	CR	Carriage Return, End of telegram

23 bytes in total

1.2.1 Replies

Upon success, the addressed BLUEBOX replies with: SOH <add h> <add l> ACK <bcc> CR

In case of an error, the BLUEBOX replies with: SOH <add h> <add l> NAK <bcc> CR

1.3 Commands with Configuration Page Address

Configuration page addresses 0x00..0x0F have 7 bytes configuration data, that are transferred in 14 bytes payload per telegram (see **Fehler! Verweisquelle konnte nicht gefunden werden.** for an example).

Configuration page addresses 0x80..0x87 have 14 bytes configuration data, that are transferred in 28 bytes payload per telegram:

- 6 bytes header of telegram with command code
- 2 bytes configuration page address
- 28 bytes configuration data in ASCII
- 3 bytes trail of telegram with checksum

SOH <add h> <adda l> STX `2` `F`

1. <Configuration page address High Nibble>
2. <Configuration page address Low Nibble>
3. <param 1 h>
4. <param 1 l>
5. ...
6. ...
7. ...
8. ...
9. <param i h>
10. <param i l>
11. ...
12. ...
13. ...
14. ...
15. <param 7 h>
16. <param 7 l>
17. <param 8 h>
18. ...
19. ...
20. ...
21. ...
22. ...
23. ...
24. ...
25. ...
26. ...
27. <param 13 h>
28. <param 13 l>
29. <param 14 h>
30. <param 14 l>

ETX <bcc> CR

Reply telegram from BLUEBOX to PC/SPS

Upon success, the addressed BLUEBOX replies with: SOH <add h> <add l> ACK <bcc> CR

In case of an error, the BLUEBOX replies with: SOH <add h> <add l> NAK <bcc> CR

1.4 Example: RF Configuration

Here the settings are distributed among several configuration pages.

These tables from the manual of the device lists for each configuration field (first line) the meaning (second line) and the default value (third line):

1.4.1 Configuration address 0x01

7 bytes configuration data, 14 bytes of telegram payload

1	2	3	4	5	6	7
RF Input Sensitivity	Flags	0x00	0x00	0x00	0x00	0x00
0x4C	0x00	0x00	0x00	0x00	0x00	0x00

SOH <add h> <adda l> STX `3` `D`

1. 0x30 <Configuration page address High Nibble>
2. 0x31 <Configuration page address Low Nibble>
3. 0x34 <param 1 h, Input sensitivity>
4. 0x43 <param 1 l, Input sensitivity>
5. 0x30 <Flags High Nibble>
6. 0x30 <Flags Low Nibble>
7. ...
8. ...
9. <param i h>
10. <param i l>
11. ...
12. ...
13. ...
14. ...
15. <param 7 h>
16. <param 7 l>

ETX <bcc> CR

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x44	3D	Command code
6..7	2	0x30 0x31	0x01	Configuration page address
8..9	2	0x34 0x43	0x4C = 76	Input Sensitivity: -76 dBm
10..11	2	0x30 0x30	0x00	Flags
12..21	10	0x30 0x30 0x30 0x30	0x00 0x00	Padding

		0x30 0x30 0x30 0x30 0x30 0x30	0x00 0x00 0x00	
22	1	0x03	ETX	End of telegram contents
23	1			BCC
24	1	0x0D	CR	Carriage Return, End of telegram

25 bytes in total

1.4.2 Configuration address 0x02

7 bytes configuration data, 14 bytes payload in telegram

1	2	3	4	5	6	7
RF Region	RF Output Power	RF Channel	Antennas Activation	EPC C1G2	RF Maximum Allocation Time	RF Minimum Pause Time
0x02	0x14	0x00	0x01	0x30	0x00	0x00

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x44	3D	Command code
6..7	2	0x30 0x32	0x02	Configuration page address
8..9	2	0x30 0x32	0x02	Region where the device is operating, ETSI
10..11	2	0x31 0x45	0x1E = 30	RF TX Power: +30 dBm
12..13	2	0x30 0x30	0x00 = 0	What channels are used
14..15	2	0x30 0x31	0x01 = 1	What antennas are used
16..17	2	0x33 0x30	0x30 = 48	EPC settings
18..19	2	0x30 0x30	0x00 = 0	Maximum timeslot allocation time
20..21	2	0x30 0x30	0x00 = 0	Minimum timeslot pause time
22	1	0x03	ETX	End of telegram contents
23	1			BCC
24	1	0x0D	CR	Carriage Return, End of telegram

25 Bytes in total

1.4.3 Configuration address 0x04

7 bytes configuration data, 14 bytes payload in telegram

1	2	3	4	5	6	7
Inventory Mode	Link Frequency	Bit Coding	0x00	EPC Size	0x00	0x00
0x02	0x02	0x01	0x00	0x00	0x00	0x00

1.4.4 Configuration address 0x82

14 bytes configuration data, 28 bytes payload in telegram

1	2	3	4	5	6	7
ReadAfterDetect Password0	ReadAfterDetect Password1	ReadAfterDetect Password2	ReadAfterDetect Password3	ReadAfterDetect Bank	ReadAfterDetect Address0	ReadAfterDetect Address1
0x00	0x00	0x00	0x00	0x00	0x00	0x00

8	9	10	11	12	13	14
ReadAfterDetect Address2	ReadAfterDetect Address3	ReadAfterDetect Length	ReadAfterDetect EPC Bank Info	Q	Q Adjust Rounds	Inventory Cycles
0x00	0x00	0x00	0x03	0x05	0x03	0x03

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x44	3D	Command code
6..7	2	0x38 0x32	0x82	Configuration page address
8..9	2			ReadAfterDetect Password0
10..11	2			ReadAfterDetect Password1
12..13	2			ReadAfterDetect Password2
14..15	2			ReadAfterDetect Password3
16..17	2			ReadAfterDetectBank
18..19	2			ReadAfterDetect Address0
20..21	2			ReadAfterDetect Address1
22..23	2			ReadAfterDetect Address2
24..25	2			ReadAfterDetect Address3
26..27	2			ReadAfterDetect Length
28..29	2			ReadAfterDetect EPC Bank Info
30..31	2			Q start value
32..33	2			Q adjust rounds
34..35	2			Inventory cycles
36	1	0x03	ETX	End of telegram contents
37	1			BCC
38	1	0x0D	CR	Carriage Return, End of telegram

39 Bytes in total

2 Examples

It is not possible to change individual values. All 7 or 14 bytes are written in a configuration. Therefore, following approach is recommended:

- Read current values from the device
- Save current values
- Change the desired value(s)
- Write the new values
- Check the new values

2.1 Change UHF TX Power

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x45	3E	Command code, Read ROM Configuration
6..7	2	0x30 0x32	0x02	Configuration page address
8	1	0x03	ETX	End of telegram contents
9	1	0x74		BCC
10	1	0x0D	CR	Carriage Return, End of telegram

11 Bytes in total

Telegram from BLUEBOX to PC/SPS

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x45	3E	Command code, Read ROM Configuration
6..7	2	0x30 0x32	0x02	Region where the device is operating, ETSI
8..9	2	0x30 0x43	0x0C = 12	Tx Power: +12 dBm
10..11	2	0x30 0x30	0x00 = 0	Used channels
12..13	2	0x30 0x31	0x01 = 1	Used antennas
14..15	2	0x33 0x30	0x30 = 48	EPC-Settings
16..17	2	0x30 0x30	0x00 = 0	Maximum timeslot allocation time
18..19	2	0x30 0x30	0x00 = 0	Minimum timeslot pause time
20	1	0x03	ETX	End of telegram contents
21	1			BCC
22	1	0x0D	CR	Carriage Return, End of telegram

23 Bytes in total

Telegram from PC/SPS to BLUEBOX with new TX Power

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address

3	1	0x02	STX	Start of telegram contents
4..5	2	0x33 0x44	3D	Command code, Write ROM Configuration
6..7	2	0x30 0x32	0x02	Configuration address
8..9	2	0x30 0x32	0x02	Region where the device is operating, ETSI
10..11	2	0x31 0x34	0x14 = 20	TX Power: +20 dBm
12..13	2	0x30 0x30	0x00 = 0	Used channels
14..15	2	0x30 0x31	0x01 = 1	Used antennas
16..17	2	0x33 0x30	0x30 = 48	EPC-Settings
18..19	2	0x30 0x30	0x00 = 0	Maximum timeslot allocation time
20..21	2	0x30 0x30	0x00 = 0	Minimum timeslot pause time
22	1	0x03	ETX	End of telegram contents
23	1	0x70		BCC
24	1	0x0D	CR	Carriage Return, End of telegram

25 Bytes in total

Notes

Tx power: 0x31 0x45 = 0x1E = 30 = +30 dBm

You can change the region, where the device is operating, for a short test run, however the setting will not be permanent.

2.2 Switch on Spontaneous Mode

Telegram from PC/SPS to BLUEBOX

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x32 0x41	2A	Command code, Read RAM General Parameters
6	1	0x03	ETX	End of telegram contents
7	1	0x74		BCC
8	1	0x0D	CR	Carriage Return, End of telegram

9 Bytes in total

Reply telegram from BLUEBOX to PC/SPS

Byte #	Number of Bytes	Data	Value	Description
0	1	0x01	SOH	Start of Header
1..2	2	0x46 0x46	0xFF (255)	Device address
3	1	0x02	STX	Start of telegram contents
4..5	2	0x32 0x41	2A	Command code
6..7	2	0x46 0x46	0xFF (255)	Current device address
8..9	2	0x34 0x38		Serial 1
10..11	2	0x31 0x30		Serial 2
12..13	2	0x30 0x30		Always Zero
14..15	2	0x30 0x30		Always Zero
16..17	2	0x30 0x31	0x01	Filter Time = 1 second
18..19	2	0x30 0x38	0x08*	Flags*
20	1	0x03	ETX	End of telegram contents
21	1			BCC

22	1	0x0D	CR	Carriage Return, End of telegram
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23 Bytes in total

*0x08 = 0b0000.1000 = Spontaneous Mode On + Continuous Mode ON

Continuous Mode is coded inverted in bit 0, meaning Bit 0 = 0 -> Continuous mode on

Appendix A – ASCII Characters used in Telegrams

SOH	01h (0x01)
STX	02h (0x02)
ETX	03h (0x03)
EOT	04h (0x04)
ENQ	05h (0x05)
ACK	06h (0x06)
NAK	15h (0x15)
SYN	16h (0x16)
CR	0Dh (0x0D)
`0`...`9`	30h..39h (0x30..0x39)
`A`...`F`	41h..46h (0x41..0x46)
<...>	30h..39h (0x30..0x39), 41h..46h (0x41..0x46)
<bcc>	Checksum

Appendix B – Common Configuration Page Addresses

0x01	RF Configuration 1
0x02	RF Configuration 2
0x04	EPC
0x05	IO Configuration
0x07	Dynamic TX Power
0x09	Spontaneous Message Configuration
0x0A	Auto Connection
0x0B	Bluetooth Connection
0x0C	Data Bus Interface (Wiegand)
0x0D	Antenna Tuning
0x80	Ethernet Configuration
0x81	Remote Server
0x82	Read After Detect
0x83	Can Bus
0xC1	HTTP Post Page
0xC2	Auto LAN http Post Page