thermoscientific

Technical Description DT-029 E

Remote–Control Commands for RadEye

Version_check

Rev.	Rev. version	Responsible Dept.	Name	Rev. Page	Cat. *)	Explanation
	21.05.2013	RM&SI-EH	Pijahn			
A	24.10.2014	RM&SI-EH	Pijahn	cpl.	S	RadEye GN/GN+ added RadEye PRD-CD added RadEye SPRD added
B	04.10.2016	RM&SI-EH	Pijahn	cpl.	S	ECN 80943

*) Category K: editorial correction
V: explanatory improvement
S: substantial change

An explanation is required at least for category S.

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1. Connection to a PC

The RadEye features an infrared interface allowing for direct connection to a PC with RS232 interface when a special adapter cable (42540/29 or 42540/26) is used.

In this manner, transfer of stored measured values and the configuration of the unit are possible.

For these tasks special Windows PC programs are available.

2. Data transmission method

Data transmission is performed in ASCII code using the following parameters:

- 9600 Baud
- Start bit
- 7 data bits
- Parity bit: even
- 2 stop bits

To allow for remote control of the RadEye unit via a PC, the following data transmission procedure has to be observed:

- PC sends <@> (40) without <CR> (0D)/<LF> (0A). to the RadEye
- RadEye replies with the character ">".
- PC waits 500µs and send a remote-control command where the last character must be a line feed character <LF> (0A). Before the line feed character, there may be a carriage return character <CR> (0D):
- The RadEye answers with „#" as positive acknowledgement, or with „?" in case of an unknown command
- If an output was prompted, the output data will follow now.
- The RadEye terminates each transmission with <CR> <LF>.

Following control lines are needed for the power supply of the interface adapter cable with RS232 connector (42506/29) and must be set by the PC:

- RTS (Ready To Send) must always have at positive voltage level! No handshake!
- DTR (Data Terminal Ready) must always have a negative voltage level!

3. General

3.1 HEX-Format

The flags are coded bit-by-bit and are put out hexadecimally.

E.g.: `84`

means:

Hexadezimally	8	4
Binary:	1 0 0 0	0 1 0 0
Bit number	7 6 5 4	3 2 1 0

E.g.: `84DA`

means:

Hexadezimally	8				4				D				A			
Binary	1	0	0	0	0	1	0	0	1	1	0	1	1	0	1	0
Bit number	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

E.g.: `84DA1F50`

means:

Hexadezimally	8				4				D				A				1				F				5				0			
Binary	1	0	0	0	0	1	0	0	1	1	0	1	1	0	1	0	0	0	0	1	1	1	1	1	0	1	0	1	0	0	0	0
Bit number	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

3.2 Date and time as a decimal value

Date and time for history and eventlog comes as a decimal value:

```
value converted to binary:
010101   0101   01010   10101   010101   010101
------   ----   -----   -----   ------   ------
  |       |      |       |       |        |
  |       |      |       |       |        \-----   6 Bit seconds
  |       |      |       |       \--------------   6 Bit minutes
  |       |      |       \----------------------  5 Bit hour
  |       |      \------------------------------- 5 Bit day
  |       \--------------------------------------- 4 Bit month
  \------------------------------------------     6 Bit year
```

4. Common remote-control commands

4.1 History

TR	Read history cycle time Response: Number in seconds e.g. 300 means 300s
TW*Number*	Set history cycle time *Number*: Time in second from 0 to 43200
HI	Initialize history readout Response: --
+	Read next history data set Response: see RadEye specific remote control command
-	Read last history data set Response: see RadEye specific remote control command
ph	Clear history Response: --

4.2 Event log

EI	Initialize readout of event log Response: --
E+	Read next data set Response: see RadEye specific remote control command
E-	Read last data set Response: see RadEye specific remote control command
EC	Clear event log Response: --

4.3 Date and time

ZR	Reading date and time Response in the format: year, month, day, hour, minute, second (JJMMTTHHMMSS).

e.g.: `100927172845`

ZW*Number* Setting date and time
Format: as described above

4.4 EEPROM

EW Store configuration to EEPROM
Response:--

4.5 Configuration

mR Read menu configuration
Response: hexadecimal value
Meaning: see RadEye specific commands

mW*Hex* Write menu configuration
Meaning: see RadEye specific commands

fR Read configuration flag 1
Response: hexadecimal value
Meaning: see RadEye specific commands

fW*Hex* Write configuration flag 1
Meaning: see RadEye specific commands

kR Read configuration flag 2
Response: hexadecimal value
Meaning: see RadEye specific commands

kW*Hex* Write configuration flag 2
Meaning: see RadEye specific commands

KR Read configuration flag 3
Response: hexadecimal value
Meaning: see RadEye specific commands

KW*Hex* Write configuration flag 3
Meaning: see RadEye specific commands

sR Read menu language
Response: Number
0: English
1: German
2: French

sW*Number*	Write menu language Number: see above
ART	Read Timeout of alarm latching Response: Number from 0..255 in seconds
AWT *Number*	Setting Timeout of alarm latching *Number*: Number from 0..255 in seconds

4.6 Serial interface

ARS	Read serial time out Response: Number in seconds. Default 2s
AWS	Write serial time out Description: see above
t	Reading and resetting transfer error counter. Response: 0 – no error n – error number

4.7 Calibration

WR	Read calibration date Response: Date as JJMMDD
$	Read calibration factor Response: see RadEye specific command
#R	Read device serial number Response: Number from 0 to 65535

4.8 RadEye Type

Vx	Read RadEye type Response: RadEye type, firmware version and firmware checksum e.g. RadEye PRD V1.52 AB48

4.9 Automatic sending

X0	Deactivate cyclic sending of the measurement value.
X1	Activate cyclic sending of the measurement value. The dose rate measurement value is sent every second. Format: see RadEye specific remote control command

4.10 Device description

DR	Reading a text stored in the device. This text cannot be displayed Response: Text, up to 200 characters.
DW*Number*Text	Writing a text Number: 0..9 Text: 20 characters
dR*Number*	Reading text info. This text is displayed via menu item “Text info” Number: Representing line number. Range 0…3. 0 means bottom line, 3 means top line Response: Text
dW*Number*Text	Writing text info. This text is displayed via menu item “Text info” Each line contains up to 16 characters Number see above

4.11 Measurement values

Z	Read raw count rates with dead time correction Format: see RadEye specific command
z	Read filtered count rate with dead time correction Format: see RadEye specific command
R	Read measured dose rate see RadEye specific command

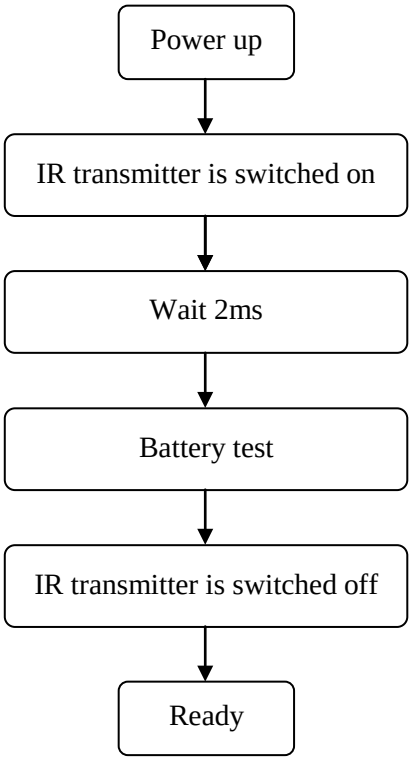
D	Read accumulated dose see RadEye specific command
clr	Clear accumulated dose and reset overload flag
Ux	Read battery voltage Response: Number in 0.1V units
F	Read status Response: see RadEye specific command
tR	Read temperature Response: Temperature in °C

4.11.1 High voltage

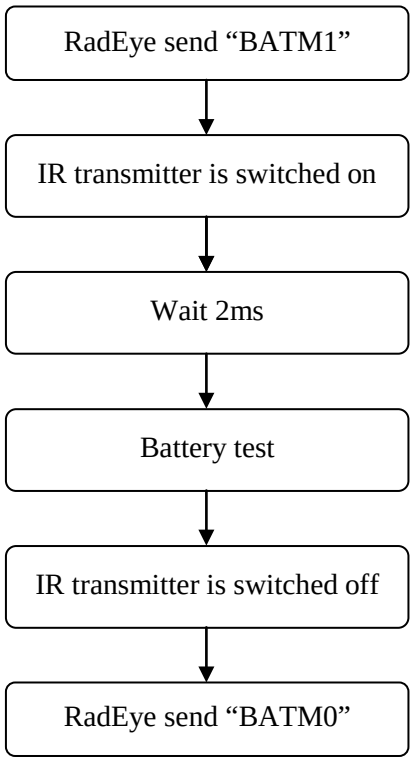
HR	Reading nominal value of high voltage Response: see RadEye specific command

4.12 Battery test

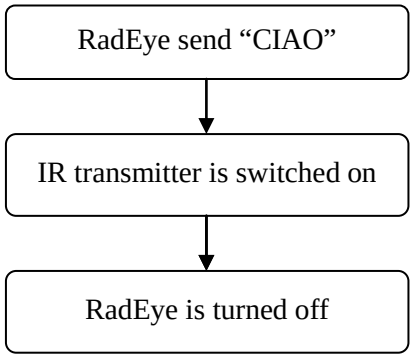
4.12.1 During start up



4.12.2 During operation



4.12.3 Power down



4.12.4 Bluetooth configuration

XRa	Get bluetooth remote address. Return: string with up to 11 characters
XRp	Get bluetooth pin. Return: string with up to 16 characters
XRf	Get bluetooth parameter. Return Hex-value (see below)

XWa *String*	Set bluetooth remote address. *String* with up to 11 characters
XWp *String*	Get bluetooth pin. *String* with up to 16 characters
XWf *hex*	Get bluetooth parameter. *hex*-value see below

Bit number			
0	Mode	0: Remote	1: Master
1	Btcom cover	0: off	1: on
2	BTcom cover off at low battery	0: no	1: yes
3	Use bluetooth pin	0: no	1: yes
4	Use this settings	0: no	1: yes
5	Firewall	0: no	1: yes
6	LED	0: no	1: yes
7	Bluetooth active	0: no	1: yes

BT0	Bluetooth module not available (low Batt)
BT1	Bluetooth adapter is on, but not connected
BT2	Bluetooth adapter is connected
BT3	Bluetooth adapter was connected, now disconnected
BTE	Bluetooth module error

5. RadEye specific remote-control commands

5.1 RadEye PRD / PRD-ER (<V3.00)

Used firmware version: 1.52

5.1.1 Limit values

AR0 — Reading computed sigma alarm threshold 1 .
Response: number in cps.

AR1 — Reading the threshold 1 for level alarm.
Response: number from 2..9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level.

AR2 — Reading the threshold 2 for level alarm.
Response: see command AR1

AR3 — Reading the threshold 1 for count rate alarm.
Response: number in cps.

AR4 — Reading the threshold 2 for count rate alarm.
Response: number in cps.

AR5 — Reading the threshold 1 for dose rate alarm.
Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit
e.g. `123` means `123` µR/h resp. 1.23 µSv/h

AR6 — Reading the threshold 2 for dose rate alarm.
Response: see command AR5

AR7 — Reading the threshold 1 for the dose alarm
Response: number in µSv, 100µR or 100µrem units

AR8 — Reading the threshold 2 for the dose alarm
see command AR7

AR9 — Reading sigma value
Response: Number from 2..9

ARM	Reading minimum count rate for sigma alarm Response: Number in cps
ARN	NBR alarm threshold low energy Response: Number in 0.01% units
ARH	NBR alarm threshold high energy Response: Number in 0.01% units
SR3	Reading minimum count rate for NBR alarm Response: Number in cps
AW1*Number*	Setting the threshold 1 for level alarm. *Number* = 2…9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level
AW2*Number*	Setting the threshold 2 for level alarm. *Number* = 2…9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level
AW3*Number*	Setting the threshold 1 for count rate alarm. *Number* = Number in cps.
AW4*Number*	Setting the threshold 2 for count rate alarm. *Number* = see command AW3.
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AW6*Number*	Setting the threshold 2 for dose rate alarm. see command AW3
AW7*Number*	Setting the threshold 1 for dose alarm. *Number* = in 100µR, 100µrem or 1µSv units. e. g. AW7123 means 12.3mR.
AW8*Number*	Setting the threshold 2 for dose alarm. *Number* = see command AW7
AW9*Number*	Setting the sigma value. *Number* = form 2 to 9
AWM*Number*	Setting minimum count rate for sigma alarm Number= value from 0 to 255

AWN*Number*	Setting NBR alarm threshold level low energy Number=value in 0.01% units. From 1.00% to 2.55%
AWH*Number*	Setting NBR alarm threshold level high energy Number=value in 0.01% units. From 0% to 1.00%
SW3 *Number*	Setting minimum count rate for NBR alarm Number= value from 0 to 255

5.1.2 Measurement values

Z	Read raw count rates with dead time correction Response: - Counter 1 in cps - Counter 2 in cps - Counter 3 in cps - HV power in cps
z	Read filtered count rate 1 Response: Number in cps

5.1.3 Configuration flags

5.1.3.1 Configuration flags 1 with kR / kW

Bit number	
0	0x01: Measuring unit: Level
1	0x02: Measuring unit: Count rate
2	0x04: Measuring unit: Dose rate
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	NBR 0: off 1: on
7	Single Pulse 0: off 1: on

5.1.3.2 Configuration flags 2 with fR / fW

Bit number	
0	10: Dose rate Sievert (H*(10))
1	01: Dose rate Roentgen (PRD: Hx, PRD-ER: H*(10))
	11: Dose rate rem (H*(10))
2	not used, write “0”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Temp.display 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	In cps-mode display of dose rate 0: no 1: yes

5.1.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used, write “0”		
7	not used, write “0”		

5.1.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Safety-Alarm	0:off	1:on
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.1.3.5 Menu configuration

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	Level	0: hidden	1:visible
5	Count Rate	0: hidden	1:visible
6	Dose Rate	0: hidden	1:visible
7	Alarm Counter	0: hidden	1:visible
8	Alarm Dose Rate	0: hidden	1:visible
9	Alarm Dose	0: hidden	1:visible
10	Alarm Level	0: hidden	1:visible
11	Autosend	0: hidden	1:visible
12	NBR	0: hidden	1:visible
13	Clear Dose	0: hidden	1:visible
14	Finder	0: hidden	1:visible
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.1.4 High voltage

HR	Reading high voltage bit value Response: Bit value 0…255.
hR	Reading high voltage correction bit date and time of last successful Luthetium check Response: Number 0…255 with offset 128 and date and time as YYMMDDhhmm
hW*Number*	Setting of high voltage correction bit Number from 0…255

5.1.5 Dead time correction

x	Read dead time Response: dead time in ns for - Counter 1 (Rate 1) - Counter 2 (Rate 2) - Counter 3 (Rate 3)

5.1.6 History output

5.1.6.1 History readout

History status for 1. readout and change of history cycle time

```
1073741944 520534610 0 0
---------- --------- ---
     |          |     |
     |          |     \-- Always 0
     |          \-------- Date and Time as a decimal value
     \------------------- History status as a decimal value
```

following readout:

```
15 11 166 105 +19
-- -- --- --- ---
|  |   |   |   |
|  |   |   |   \--- Temperature in °C
|  |   |   \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
|  |   \----------- Rate max in µR/h, µrem/h or 0.01µSv/h units
|  \--------------- Counter 1 mean
\------------------ Counter 1 max
```

End of History:

```
End
```

5.1.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
               last power on without power off
```

5.1.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x01 Level display
9	0x02: Display count rate
10	0x04: Display dose rate
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Power off
27	Power on
28	NBR-alarm
29	Not used
30	Not used
31	Not used

5.1.8 Automatic sending

```
<STX>7 2 0 0 14 FH41PR 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye PRD
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

.

Status

Bit number	
0	Not used
1	1: Overload
2	1: Count rate, dose rate or level-alarm
3	1: Dose alarm
4	1: NBR alarm
5	1: Battery voltage low
6	not used
7	not used

5.1.9 Status information

F Reading status information
Response Number with status information

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	0x01 Level display 0x02: Display count rate 0x04: Display dose rate	
9		
10		
11	not used,	
12	Alarm threshold read-only	0: off 1:on
13	Flag for overload	
14	Temperature display	0: off 1:on
15	In cps-mode display of dose rate	0: no 1: yes

16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.2 RadEye PRD-S / PRD-ER-S (<V3.00)

Used firmware version: V3.05

5.2.1 Limit values

AR0	Reading computed sigma alarm threshold 1. Response: number in cps.
AR3	Reading the threshold 1 for count rate alarm. Response: number in cps.
AR4	Reading the threshold 2 for count rate alarm. Response: number in cps.
AR5	Reading the threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. 123 means 123 µR/h resp. 1.23 µSv/h
AR6	Reading the threshold 2 for dose rate alarm. Response: see command AR5
AR7	Reading the threshold 1 for the dose alarm Response: number in µSv, 100µR or 100µrem units
AR8	Reading the threshold 2 for the dose alarm see command AR7
AR9	Reading sigma value Response: Number from 2..9
ARM	Reading minimum count rate for sigma alarm Response: Number in cps
ARN	Reading: NBR alarm threshold low energy Response: Number in 0.01% units Background preset count Response: Number in counts Background preset time Response: Number in seconds
ARP	Reading scaler parameter: Preset count. Response: Number in counts Preset time. Response: Number in seconds Scaler wait. time Response: Number in seconds
ARB	Reading scaler background values: Background value Response: Number in 0.01 cps units

Used time for background value Response: Number in seconds

ARH — NBR alarm threshold high energy
Response: Number in 0.01% units

SR3 — Reading minimum count rate for NBR alarm
Response: Number in cps

AW3Number — Setting the threshold 1 for count rate alarm.
Number = Number in cps.

AW4Number — Setting the threshold 2 for count rate alarm.
Number = see command AW3.

AW5Number — Setting the threshold 1 for dose rate alarm.
Number = in µR/h, µrem/h or 0.01µSv/h units.
e. g. AW3123 means 123µR/h.

AW6Number — Setting the threshold 2 for dose rate alarm.
see command AW3

AW7Number — Setting the threshold 1 for dose alarm.
Number = in 100µR, 100µrem or 1µSv units.
e. g. AW7123 means 12.3mR.

AW8Number — Setting the threshold 2 for dose alarm.
Number = see command AW7

AW9Number — Setting the sigma value.
Number = form 2 to 9

AWMNumber — Setting minimum count rate for sigma alarm
Number= value from 0 to 255

AWNNumber Number Number
Setting NBR alarm threshold level low energy
Number=value in 0.01% units. From 1.00% to 2.55%
Setting background preset count
Number=counts. From 0 to 9999
Setting background preset time
Number=seconds. From 0 to 9999s

AWHNumber — Setting NBR alarm threshold level high energy
Number=value in 0.01% units. From 0% to 1.00%

AWBNumber Number — Setting background value
Number=0.01 cps units. From 0 to 10000 (100cps)
Setting used time for background value
Number=seconds. From 0 to 9999s

AWPNumber Number — Setting scaler preset count
Number=counts. From 0 to 9999
Setting scaler preset time
Number=seconds. From 0 to 9999s

SW3 Number — Setting minimum count rate for NBR alarm
Number= value from 0 to 255

5.2.2 Measurement values

Z — Read count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- PMT current index

z — Read filtered count rate 1
Response: Number in cps

5.2.3 Configuration flags

5.2.3.1 Configuration flags 1 with kR / kW

Bit number			
0	not used, write “0”		
1			
2			
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	NBR	0: off	1: on
7	Single Pulse	0: off	1: on

5.2.3.2 Configuration flags 2 with fR / fW

Bit number			
0	Disable keylock:	0: no	1:yes
1	not used, write “0”		
2	not used, write “0”		
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (readonly)		
5	Temp.display	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	In cps-mode display of dose rate	0: no	1: yes

5.2.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Use click divider for single pulse	0:off	1:on
7	not used, write “0”		

5.2.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Safety-Alarm	0:off	1:on
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: preset count	1: preset time
4	Scaler “Auto restart”	0:off	1:on
5	Net Scaler	0:off	1:on
6	Net Ratemeter	0:off	1:on
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.2.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number		
0	0x00 Display unit cps	0x05 Display unit Sv/h
1	0x08 Display unit Bq/g	0x06 Display unit R/h
2		0x07 Display unit rem/h
3		
4	0: Ratemeter, 1: Scaler	
5	0x01 Display unit Sv/h	
6	0x02 Display unit R/h	
	0x03 Display unit rem/h	
7	Fixed to “0”	

5.2.3.6 Menu configuration

mR Read menu configuration for
- Main menu
- Submenu “Settings”
- Submenu “Alarm indication”

Response: Hex-values. See below

mW*Hex Hex Hex* Write menu configuration for
- Main menu
- Submenu “Settings”
- Submenu “Alarm indication”

See below

5.2.3.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm dose	0: hidden	1:visible
11	Settings	0: hidden	1:visible
12	Alarm indication	0: hidden	1:visible
13	Show alarm	0: hidden	1:visible
14	Text info	0: hidden	1:visible
15..31	not used, write “0”		

5.2.3.6.2 Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Lu-Test	0: hidden	1:visible
6..15	not used, write “0”		

5.2.3.6.3 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3…8	not used, write “0”		

5.2.4 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

hR — Reading high voltage correction bit date and time of last successful Luthetium check
Response: Number 0…255 with offset 128
and date and time as YYMMDDhhmm

hW*Number* — Setting of high voltage correction bit
Number from 0…255

5.2.5 Dead time correction

x — Read dead time
Response: dead time in ns for
- Counter 1 (Rate 1)
- Counter 2 (Rate 2)
- Counter 3 (Rate 3)
- Counter 4 (Rate 4)

5.2.6 History output

5.2.6.1 History readout

Ratemeter:

```
256 716612088 721 12 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Max value
 |     |       |                Count rate in 0.01 cps, cpm
 |     |       |                Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |       |          Dose rate µR/h, rem/h or 0.01µSv/h
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

Scaler:

```
     15 11 166 105 +19
```

```
-- -- --- --- ---
|  |   |   |   |
|  |   |   |   \--- Temperature in °C
|  |   |   \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
|  |   \----------- Rate max in µR/h, µrem/h or 0.01µSv/h units
|  \--------------- Counter 1 mean
\------------------ Counter 1 max
```

End of History:

```
End
```

5.2.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
               last power on without power off
```

5.2.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x01 Level display
9	0x02: Display count rate
10	0x04: Display dose rate
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Power off
27	Power on
28	NBR-alarm
29	Not used
30	Not used
31	Not used

5.2.8 Automatic sending

```
<STX>7 2 0 0 14 FH41PR 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye PRD
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

.

Status

Bit number	
0	Not used
1	1: Overload
2	1: Count rate, dose rate or level-alarm
3	1: Dose alarm
4	1: NBR alarm
5	1: Battery voltage low
6	not used
7	not used

5.2.9 Status information

F Reading status information
Response Number with status information

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	0x01 Level display 0x02: Display count rate 0x04: Display dose rate	
9		
10		
11	not used,	
12	Alarm threshold read-only	0: off 1:on
13	Flag for overload	
14	Temperature display	0: off 1:on
15	In cps-mode display of dose rate	0: no 1: yes

16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.3 RadEye PRD / PRD-ER / PRD-S / PRD-ER-S (>V3.00)

Used firmware version: 3.05

5.3.1 Limit values

AR0	Reading computed sigma alarm threshold 1 . Response: number in cps.
AR1	Reading the threshold 1 for level alarm. Response: number from 2..9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level.
AR2	Reading the threshold 2 for level alarm. Response: see command AR1
AR3	Reading the threshold 1 for count rate alarm. Response: number in cps.
AR4	Reading the threshold 2 for count rate alarm. Response: number in cps.
AR5	Reading the threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
AR6	Reading the threshold 2 for dose rate alarm. Response: see command AR5
AR7	Reading the threshold 1 for the dose alarm Response: number in µSv, 100µR or 100µrem units
AR8	Reading the threshold 2 for the dose alarm see command AR7
AR9	Reading sigma value Response: Number from 2..9
ARM	Reading minimum count rate for sigma alarm Response: Number in cps
ARN	NBR alarm threshold low energy Response: Number in 0.01% units
ARH	NBR alarm threshold high energy Response: Number in 0.01% units

ARk	Reading user display contrast Return: Number from -15…+15
SR3	Reading minimum count rate for NBR alarm Response: Number in cps
AW1*Number*	Setting the threshold 1 for level alarm. *Number* = 2…9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level
AW2*Number*	Setting the threshold 2 for level alarm. *Number* = 2…9. Number 2 means 32 cps. Each subsequent level has twice as much cps as the preceding level
AW3*Number*	Setting the threshold 1 for count rate alarm. *Number* = Number in cps.
AW4*Number*	Setting the threshold 2 for count rate alarm. *Number* = see command AW3.
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AW6*Number*	Setting the threshold 2 for dose rate alarm. see command AW3
AW7*Number*	Setting the threshold 1 for dose alarm. *Number* = in 100µR, 100µrem or 1µSv units. e. g. AW7123 means 12.3mR.
AW8*Number*	Setting the threshold 2 for dose alarm. *Number* = see command AW7
AW9*Number*	Setting the sigma value. *Number* = form 2 to 9
AWM*Number*	Setting minimum count rate for sigma alarm Number= value from 0 to 255
AWN*Number*	Setting NBR alarm threshold level low energy Number=value in 0.01% units. From 1.00% to 2.55%
AWH*Number*	Setting NBR alarm threshold level high energy Number=value in 0.01% units. From 0% to 1.00%

AWk*Number*	Set user display contrast Number=value from -15 to +15
SW3 *Number*	Setting minimum count rate for NBR alarm Number= value from 0 to 255

5.3.2 Measurement values

Z	Read raw count rates with dead time correction Response: - Counter 1 in cps - Counter 2 in cps - Counter 3 in cps - Counter 4 in cps - HV power in cps - PMT current in 0.1uA units
z	Read filtered count rate 1 Response: Number in cps

5.3.3 Configuration flags

5.3.3.1 Configuration flags 1 with kR / kW

Bit number			
0	Disable key lock	0: no	1: yes
1	Show live graphic	0: no	1: yes
2			
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	NBR	0: off	1: on
7	Single Pulse	0: off	1: on

5.3.3.2 Configuration flags 2 with fR / fW

Bit number			
0	not used, write “0”		
1			
2			
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (read only)		
5	Temp.display	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	In cps-mode display of dose rate	0: no	1: yes

5.3.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Single pulse click divider	0:off	1:on
7	not used, write “0”		

5.3.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Safety-Alarm	0:off	1:on
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: preset count	1: preset time
4	Scaler “Auto restart”	0:off	1:on
5	Net Scaler	0:off	1:on
6	not used, write “0”		
7	Net Ratemeter	0:off	1:on
8	not used, write “0”		
9	Rated alarm	0:off	1:on
10	not used, write “0”		
11	Alarm LCD-LED	0:off	1:on
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.3.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x05 Display unit Sv/h
1	0x02 Display unit Bq 0x06 Display unit R/h
2	0x07 Display unit rem/h
3	
4	0: Ratemeter, 1: Scaler
5	0x01 Dose rate unit Sv/h
6	0x02 Dose rate unit R/h 0x03 Dose rate unit rem/h
7	Fixed to “0”

5.3.3.6 Menu configuration

5.3.3.6.1 Main menu RadEye PRD/PRD-ER

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	Level	0: hidden	1:visible
5	Count Rate	0: hidden	1:visible
6	Dose Rate	0: hidden	1:visible
7	Alarm Counter	0: hidden	1:visible
8	Alarm Dose Rate	0: hidden	1:visible
9	Alarm Dose	0: hidden	1:visible
10	Alarm Level	0: hidden	1:visible
11	Autosend	0: hidden	1:visible
12	Alarm-NBR	0: hidden	1:visible
13	Clear Dose	0: hidden	1:visible
14	Finder	0: hidden	1:visible
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	Bluetooth	0: hidden	1:visible
21..31	not used, write “0”		

5.3.3.6.2 Submenu “Settings” RadEye PRD / PRD-ER

Bit number			
0	Batt. type	0:hidden	1:visible
1	Set Date/Time	0: hidden	1:visible
2	Lu-Test	0: hidden	1:visible
3	Language	0: hidden	1:visible
4	Rated alarm (from V3.05)	0: hidden	1:visible
5	Contrast (from V3.05)	0: hidden	1:visible
7..15	not used, write “0”		

5.3.3.6.3 Main menu RadEye PRD-S/PRD-ER-S

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm-NBR	0: hidden	1:visible
11	Alarm dose	0: hidden	1:visible
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text info	0: hidden	1:visible
17	Bluetooth	0: hidden	1:visible
18..29	not used, write “0”		
30	not used, write “1”		
31	not used, write “0”		

5.3.3.6.4 Submenu “Settings” RadEye PRD-S / PRD-ER-S

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Lu-Test	0: hidden	1:visible
6	Language	0: hidden	1:visible
7	Rated alarm (from V3.05)	0: hidden	1:visible
8	Contrast (from V3.05)	0: hidden	1:visible
9..15	not used, write “0”		

5.3.3.6.5 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	LCD-LED	0: hidden	1:visible
4…8	not used, write “0”		

5.3.4 High voltage

HR Reading high voltage bit value
Response: value in Volt.

hR Reading high voltage correction bit date and time of last successful Lutetium check
Response: Number 0…255 with offset 128
and date and time as YYMMDDhhmm

hW*Number* Set of high voltage correction
Number from 0…255

5.3.5 Dead time correction

x Read dead time
Response: dead time in ns for
- Counter 1 (Rate 1)
- Counter 2 (Rate 2)
- Counter 3 (Rate 3)

5.3.6 History output

5.3.6.1 History readout

Following readout:

```
1536 716612088 1239 1600 30 5 120 23 4
---- --------- ---- ---- -- - --- -- -
 |      |        |     |   |  |  |  |  |
 |      |        |     |   |  |  |  \---- Temperature in °C
 |      |        |     |   |  |  \------- Measuring time in seconds
 |      |        |     |   |  \---------- Max value dose rate
 |      |        |     |   |               µR/h, µrem/h, 0.01µSv/h
 |      |        |     |   \------------- Mean value dose rate
 |      |        |     |                   0.1µR/h, 0.1µrem/h, 0.001µSv/h
 |      |        |     \----------------- Max value
 |      |        |                           Count rate in 0.01 cps
 |      |        |                           Activity in 0.01 Bq
 |      |        \----------------------- Mean value
 |      |                                   Count rate in 0.01 cps
 |      |                                   Activity in 0.01 Bq
 |      \------------------------------- Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                  see below
```

End of History:

```
End
```

5.3.6.2 History status

decimal value converted in HEX:

Bit number			
0	Ratemeter/Scaler net value	0: no	1: yes
1	Operation mode Scaler	0: no	1: yes
2	Not used, read as ‘0’		
3	Not used, read as ‘0’		
4	Background measurement	0: no	1: yes
5	Preset time	0: no	1: yes
6	Not used, read as ‘0’		
7	Not used, read as ‘0’		
8..10	5:Sv/h, 6:R/h, 7:rem/h		
11	Contamination (Bq)		
12..15	Not used, read as ‘0’		

5.3.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x01 Level display
9	0x02: Display count rate
10	0x04: Display dose rate
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Power off
27	Power on
28	NBR-alarm
29	Not used
30	Not used
31	Not used

5.3.8 Nuclide calibration data (from V3.04)

nRNumber	Reading calibration data. Number: consecutive number Response: Data (see below)
nWNumberString	Write calibration data Number: consecutive number String: nuclide data e.g. nW02Co-60 50
nRA	Reading number of stored nuclides. Response: value from 0…15
nWANumber	Write the number of stored nuclides. Number: value from 0…15
nRG	Reading active nuclide. Response: value from 0…15
nWANumber	Write the number of active nuclides. Number: value from 0…15
yR	Read custom measuring unit (e.g. “g” for Bq/g)
yWText	Write custom measuring unit (e.g. “g” for Bq/g)

Nuclide data:

```
Co-60 20
----- --
  |    |
  |    \------------ Factor for activity calculation in (Bq)/cps
  \----------------- Nuclide name. Up to 14 characters. Do not use space (0x20)
```

5.3.9 Automatic sending

```
<STX>7 2 9 5 14 FH41PR 123 AB<ETX><CR><LF>
      | | | | |    |    |   |
      | | | | |    |    |   \- BCC in HEX
      | | | | |    |    \----- Dose in µR/h
      | | | | |    \---------- information RadEye
      | | | | \--------------- Status as Hex-value
      | | | \----------------- „5“ not used
      | | \------------------- Count rate (cps)
      | \--------------------- „2“ not used
      \----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Information RadEye

Reading	
FH41PR	RadEye PRD
PRDER	RadEye PRD-ER
PRDS	RadEye PRD-S
PRDERS	RadEye PRD-ER-S

Status

Bit number	
0	Not used
1	1: Overload
2	1: Count rate, dose rate or level-alarm
3	1: Dose alarm
4	1: NBR alarm
5	1: Battery voltage low
6	not used
7	not used

5.3.10 Status information

F Reading status information

Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x01 Level display
9	0x02: Display count rate
10	0x04: Display dose rate
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	In cps-mode display of dose rate 0: no 1: yes
16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.4 RadEye G/G-10

Used firmware version: V1.52

5.4.1 Limit values

AR5 — Reading the threshold 1 for dose rate alarm.
Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit
e.g. `123` means `123` µR/h resp. 1.23 µSv/h

AR6 — Reading the threshold 2 for dose rate alarm.
Response: see command AR5

AR7 — Reading the threshold 1 for the dose alarm
Response: number in µSv, 100µR or 100µrem units

AR8 — Reading the threshold 2 for the dose alarm
see command AR7

AW5*Number* — Setting the threshold 1 for dose rate alarm.
Number = in µR/h, µrem/h or 0.01µSv/h units.
e. g. AW3123 means 123µR/h.

AW6*Number* — Setting the threshold 2 for dose rate alarm.
see command AW3

AW7*Number* — Setting the threshold 1 for dose alarm.
Number = in 100µR, 100µrem or 1µSv units.
e. g. AW7123 means 12.3mR.

AW8*Number* — Setting the threshold 2 for dose alarm.
Number = see command AW7

5.4.2 Measurement values

Z — Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- TTP value
- HV power in cps

5.4.3 Configuration flags

5.4.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “1”
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	not used, write “0”
7	Single Pulse 0: off 1: on

5.4.3.2 Configuration flags 2 with fR / fW

Bit number	
0	0x01: RadEye G, measuring unit R/h 0x10. RadEye G-10, measuring unit Sv/h 0x11: RadEye G-10, measuring unit rem/h
1	
2	Fixed to “1”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Temp.display 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	not used, write “0”

5.4.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Fixed to “1”		
7	not used, write “0”		

5.4.3.4 Configuration flags 4 with jR / jW

Bit number			
0	not used, write “0”		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.4.3.5 Menu configuration

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	Alarm Dose Rate	0: hidden	1:visible
9	Alarm Dose	0: hidden	1:visible
10	not used, write “0”		
11	Autosend	0: hidden	1:visible
12	not used, write “0”		
13	Clear Dose	0: hidden	1:visible
14	Finder	0: hidden	1:visible
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.4.4 High voltage

HR Reading high voltage bit value
Response: Bit value 0…255.

5.4.5 Dead time correction

x Read dead time
Response: dead time in ns

5.4.6 History output

5.4.6.1 History readout

History status for 1. readout and change of history cycle time

```
1073741944 520534610
---------- ---------
     |          |
     |          |
     |          \-------- Date and Time as a decimal value
     \------------------- History status as a decimal value
```

following readout:

```
15 11 +19
-- -- ---
|  |   |
|  |   \--- Temperature in °C
|  \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
\---------- Rate max in µR/h, µrem/h or 0.01µSv/h units
```

End of History:

```
End
```

5.4.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
            last power on without power off
```

5.4.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Fixed to “0”
9	Fixed to “0”
10	Fixed to “1”
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Alarm dose rate
17	1: Alarm dose
18	Not used
19	Not used
20	Dose rate > alarm threshold 1
21	Dose rate > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.4.8 Automatic sending

```
<STX>7 2 0 0 14 FH41B2 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye G
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm dose rate
3	1: Alarm dose
4	not used
5	1: Battery voltage low
6	not used
7	not used

5.4.9 Status information

F Reading status information
Response Number with status information

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	0x04: Display dose rate	
9		
10		
11	not used	
12	Alarm threshold read-only	0: off 1:on
13	Flag for overload	
14	Temperature display	0: off 1:on
15	Fixed to “0”	

16	1: Alarm dose rate
17	1: Alarm dose
18	Fixed to “0”
19	Not used
20	Dose rate > alarm threshold 1
21	Dose rate > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.5 RadEye N

Used firmware version: 1.53

5.5.1 Limit values

AR3	Reading the threshold 1 for count rate alarm. Response: number in cps.
AR4	Reading the threshold 2 for count rate alarm. Response: number in cps.
AR5	Reading the threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
AR6	Reading the threshold 2 for dose rate alarm. Response: see command AR5
AR7	Reading the threshold 1 for the dose alarm Response: number in µSv, 100µR or 100µrem units
AR8	Reading the threshold 2 for the dose alarm see command AR7
AW3*Number*	Setting the threshold 1 for count rate alarm. *Number* = Number in cps.
AW4*Number*	Setting the threshold 2 for count rate alarm. *Number* = see command AW3.
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AW6*Number*	Setting the threshold 2 for dose rate alarm. see command AW3
AW7*Number*	Setting the threshold 1 for dose alarm. *Number* = in 100µR, 100µrem or 1µSv units. e. g. AW7123 means 12.3mR.
AW8*Number*	Setting the threshold 2 for dose alarm. *Number* = see command AW7

5.5.2 Measurement values

Z	Read raw count rates with dead time correction Response: - Counter 1 in cps - Counter 2 in cps - Counter 3 in cps - HV power in cps
z	Read filtered count rate 1 Response: Number in 0.01 cps units
A	Read display value and status Response: - display value in 0.1 cps or µR/h, µrem/h or 0.01µSv/h units - Status (see 5.5.6.2)

5.5.3 Configuration flags

5.5.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “0”
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Fixed to “0”
7	Single Pulse 0: off 1: on

5.5.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	not used, write “0”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Temp.display 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Fixed to “0”

5.5.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used, write “0”		
7	not used, write “0”		

5.5.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Fixed to “0”		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Scaler display	0: mean value	1: accumulated counts
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.5.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number		
0	0x00 Display unit cps	0x05 Display unit Sv/h
1	0x01 Display unit cpm	0x06 Display unit R/h
2		0x07 Display unit rem/h
3		
4	0: Ratemeter, 1: Scaler	
5	Fixed to “0”	
6	Fixed to “0”	
7	Fixed to “0”	

5.5.3.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

5.5.3.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Select DR factor	0: hidden	1:visible
8	Alarm Count Rate	0: hidden	1:visible
9	Alarm Dose Rate	0: hidden	1:visible
10	not used, write “0”		
11	Alarm Dose	0: hidden	1:visible
12	Clear Dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17..31	not used, write “0”		

5.5.3.6.2 Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5..15	not used, write “0”		

5.5.3.6.3 Submenu “Alarm indication”

Bit number	

0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3…8	not used, write “0”		

5.5.4 High voltage

HR	Reading high voltage bit value Response: Bit value 0…255.
hR	Reading high voltage correction bit Response: Number 0…255 with offset 128 and date and time as YYMMDDhhmm
hW*Number*	Setting of high voltage correction bit Number from 0…255

5.5.5 Dead time correction

x Read dead time
Response: dead time in ns for
- Counter 1 (Rate 1)
- Counter 2 (Rate 2)
- Counter 3 (Rate 3)

5.5.6 History output

5.5.6.1 History readout

```
256 716612088 1 1 120 23
--- --------- - - --- --
 |     |      | |  |  |
 |     |      | |  |  \---- Temperature in °C
 |     |      | |  \------- Measuring time in seconds
 |     |      | \---------- Rate max in µR/h, µrem/h, 0.01µSv/h or
 |     |      |              or 0.1 cps units
 |     |      \------------ mean in µR/h, µrem/h or 0.01µSv/h units
 |     |                    or accumulated counts in cps-mode
 |     \------------------- Date and Time as a decimal value
 \------------------------- History status as a decimal value see below
```

End of History:
End

5.5.6.2 History status

decimal value converted in HEX:

```
0101 0101   0101 0101
|||| ||||   |||| ||||
```

```
|||| ||||   |||| |||\-- Nulleffektabzug 0: Nein 1:Ja
|||| ||||   |||| ||\--- 1: Scaler
|||| ||||   |||\------- Nulleffektmessung 0: Nein    1:Ja
|||| ||||   ||\-------- 0: Preset Counts  1: Preset Time
|||| ||||   |\--------- --
|||| ||||   \---------- 1: Accumulated counts
|||| ++++-------------- gewähltes Nuklid max.15.
++++------------------- 0:cps, 1:cpm, 5:Sv/h, 6;R/h, 7:rem/h
```

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	not used		
3	not used		
4	Background measurement	0:No	1:Yes
5	Scaler with	0: Preset Counts	1: Preset Time
6	not used		
7	Accumulated counts	0:No	1:Yes
8	Number of used calibration factor		
9			
10			
11			
12	0x00 Display unit cps	0x05 Display unit Sv/h	
13	0x01 Display unit cpm	0x06 Display unit R/h	
14		0x07 Display unit rem/h	
15			

5.5.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Count rate or dose rate -alarm
17	1: Dose alarm
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on count rate or dose rate display)
21	Value > alarm threshold 2 (depending on count rate or dose rate display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	1: Scaler or Background parameter changed
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Not used

5.5.8 Automatic sending

```
<STX>7 2 0 0 14 FH41PR 123 AB<ETX><CR><LF>
     | | | | |    |    |   |
     | | | | |    |    |   \- BCC in HEX
     | | | | |    |    \----- Dose in µR/h
     | | | | |    \---------- information RadEye PRD
     | | | | \--------------- Status as Hex-value
     | | | \----------------- Fixed to “0“
     | | \------------------- Fixed to “0“
     | \--------------------- Fixed to “2“
     \----------------------- Dose rate in µR/h, µrem/h or 0.01µSv/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Count rate, dose rate or level-alarm
3	1: Dose alarm
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.5.9 Status information

F Reading status information

Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Count rate or dose rate-alarm
17	1: Dose alarm
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on count rate or dose rate display)
21	Value > alarm threshold 2 (depending on count rate or dose rate display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.6 RadEye AB100 (V1.52)

Used firmware version: 1.52

5.6.1 Limit values

AR1	Reading the threshold 1 for activity alarm. Alpha/Beta channel Response: number in 0.01 Bq units.
AR2	Reading the threshold 1 for activity alarm. Alpha/Beta channel Response: number in 0.01 Bq units
AR3	Reading the threshold 1 for activity alarm. Alpha channel. Response: number in 0.01 Bq units.
AR4	Reading the threshold 2 for activity alarm. Alpha channel. Response: number in 0.01 Bq units.
AR5	Reading the threshold 1 for count rate alarm. Alpha/Beta channel. Response: number in cps
AR6	Reading the threshold 2 for count rate alarm. Alpha/Beta channel. Response number in cps
AR7	Reading the threshold 1 for count rate alarm. Alpha channel. Response: number in cps
AR8	Reading the threshold 2 for count rate alarm. Alpha channel. Response number in cps
AW1*Number*	Setting the threshold 1 for activity alarm. Alpha/Beta channel *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 1 for activity alarm. Alpha/Beta channel *Number*: value in 0.01 Bq units
AW3*Number*	Setting the threshold 1 for activity alarm. Alpha channel. *Number:* value in 0.01 Bq units.
AW4*Number*	Setting the threshold 2 for activity alarm. Alpha channel. *Number*: value in 0.01 Bq units.
AW5*Number*	Setting the threshold 1 for count rate alarm. Alpha/Beta channel. *Number*: value in cps

AW6*Number* Setting the threshold 2 for count rate alarm. Alpha/Beta channel.
Number: value in cps

AW7*Number* Setting the threshold 1 for count rate alarm. Alpha channel.
Number: value in cps

AW8*Number* Setting the threshold 2 for count rate alarm. Alpha channel.
Number: value in cps

5.6.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- HV power in cps
- filtered HV power in cps

z Read filtered count rate alpha/beta and alpha channel
Response:
- Number in 0.01 cps units, alpha/beta channel
- Number in 0.01 cps units, alpha channel

A Read display value and status
Response:
- display value in 0.01 cps, 1µR/h, 1µrem/h, 0.01µSv/h or 0.01 Bq units
- Status (see 5.5.6.2)

5.6.3 Configuration flags

5.6.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “0”
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Fixed to “0”
7	Single Pulse 0: off 1: on

5.6.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “1”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Display of temperature 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Fixed to “0”

5.6.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used		
5	not used		
6	not used		
7	not used		

5.6.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Scaler display	0: mean value	1: accumulated counts
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha LED	0:No	1:yes
9	Alpha pulse	0:No	1:yes
10	Beta only	0:No	1:yes
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.6.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x03 Display unit dps 0x01 Display unit cpm 0x04 Display unit dpm 0x02 Display unit Bq 0x08 Display unit Bq/cm²
1	
2	
3	
4	0: Ratemeter, 1: Scaler
5	0x00 Display alpha/beta channel 0x01 Display alpha channel 0x02 Dual display
6	
7	Fixed to “0”

5.6.3.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm alpha/beta	0: hidden	1:visible
9	Alarm alpha/beta	0: hidden	1:visible
10	Alarm activity alpha/beta	0: hidden	1:visible
11	Alarm activity alpha	0: hidden	1:visible
12	not used, write “0”		
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible

2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Alpha LED	0: hidden	1:visible
5	Alpha Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Display alpha/beta or beta	0: hidden	1:visible
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.6.4 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

hR — Reading high voltage correction bit
Response: Number 0…255 with offset 128
and date and time as YYMMDDhhmm

hW*Number* — Setting of high voltage correction bit
Number from 0…255

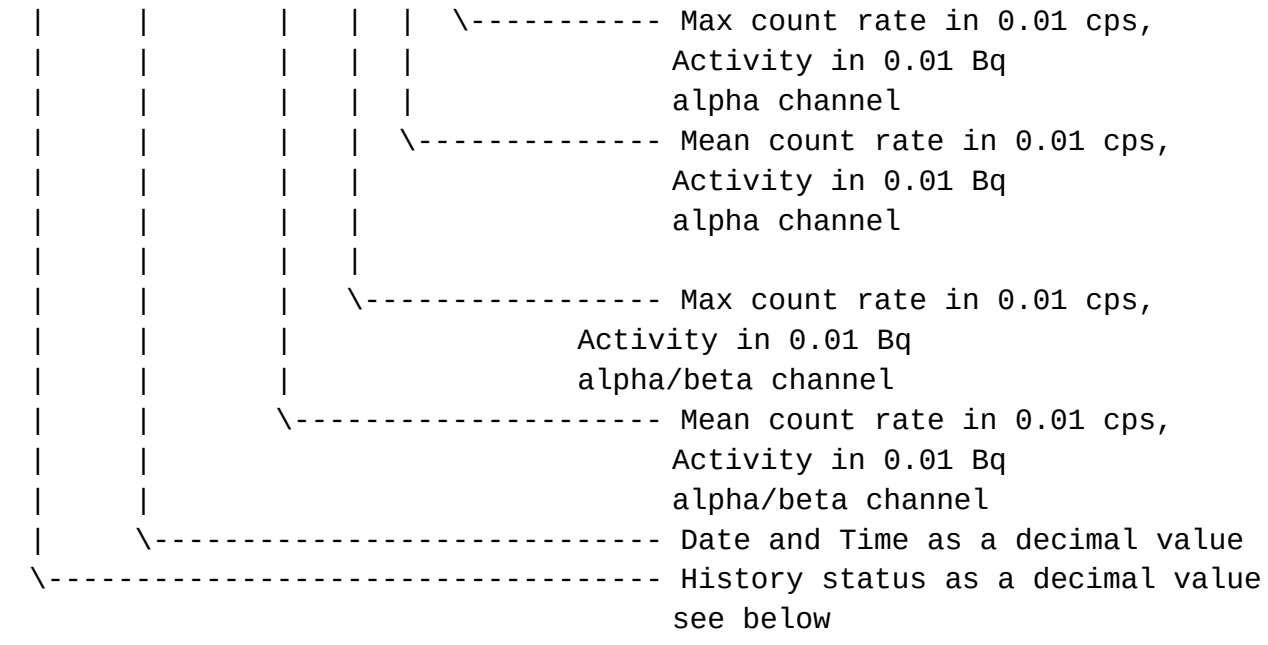
5.6.5 Dead time correction

x — Read dead time
Response: dead time in ns for
- Counter 1 (Rate 1)
- Counter 2 (Rate 2)
- Counter 3 (Rate 3)

5.6.6 History output

5.6.6.1 History readout

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
```



End of History:

End

5.6.6.2 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Beta channel: display	0: Gross	1: Beta
3	not used		
4	Background measurement	0:No	1:Yes
5	Scaler with	0: Preset Counts	1: Preset Time
6	not used		
7	Accumulated counts	0:No	1:Yes
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x03 Display unit dps	
13	0x01 Display unit cpm	0x04 Display unit dpm	
14	0x02 Display unit Bq	0x08 Display unit Bq/cm²	
15			

5.6.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Not used
15	1: Alarm threshold changed
16	1: Count rate or activity -alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1
21	Value > alarm threshold 2
22	Not used
23	Not used
24	1: Scaler or Background parameter changed
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Not used

5.6.8 Automatic sending

```
<STX>721   0 1 0 14 READ10 123 AB<ETX><CR><LF>
       |   | | | |    |     |   |
       |   | | | |    |     |   \- BCC in HEX
       |   | | | |    |     \----- Dose in µR/h
       |   | | | |    \----------- information RadEye AB100
       |   | | | \---------------- Status as Hex-value
       |   | | \------------------ Fixed to “0“
       |   | \-------------------- Display value alpha channel
       |   \---------------------- Fixed to “o“
       \------------------------- Display value alpha/beta channel
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.6.9 Status information

F Reading status information

Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on count rate or dose rate display)
21	Value > alarm threshold 2 (depending on count rate or dose rate display)
22	Not used
23	Not used
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.7 RadEye B20/G20/G20-10

Used firmware version: 1.52

5.7.1 Limit values

AR1	Reading the threshold 1 for activity alarm. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for count rate alarm. Response: number in 0.01 cps units.
AR4	Reading the threshold 2 for count rate alarm. Response: number in 0.01 cps units.
AR5	Reading the threshold 1 dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR6	Reading the threshold 2 for count rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR7	Reading the threshold 1 for dose alarm. Response: number in µR, µrem or 0.01µSv units
AR8	Reading the threshold 2 for dose alarm. Response number in µR, µrem or 0.01µSv units
ARP	Reading scaler parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
AW1*Number*	Setting the threshold 1 for activity alarm *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 2 for activity alarm *Number*: value in 0.01 Bq units
AW3*Number*	Setting the threshold 1 for count rate alarm Number: value in 0.01 cps units.
AW4*Number*	Setting the threshold 2 for count rate alarm *Number*: value in 0.01 cps units

AW5*Number* Setting the threshold 1 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW6*Number* Setting the threshold 2 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW7*Number* Setting the threshold 1 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

AW8*Number* Setting the threshold 2 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

5.7.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- HV power in cps

z Read filtered count rate
Response: Number in 0.01 cps units

A Read display value and status
Response:
- display value Dose rate in 1µR/h, 1µrem/h, 0.01µSv/h units or 0.01 cps, cpm, Bq, dps, dpm, Bq/cm² units
- Status (see 5.5.6.2)

5.7.3 Configuration flags

5.7.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Not used
7	Single Pulse 0: off 1: on

5.7.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Not used
1	Not used
2	Not used, write “1”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Display of temperature 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Not used

5.7.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		
7	not used		

5.7.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Not used		
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Not used		
9	Not used		
10	Not used		
11	Not used		
12	Not used		
13	Not used		
14	Not used		
15	Not used		

5.7.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x04 Display unit dpm
1	0x01 Display unit cpm 0x05 Display unit Sv/h
2	0x02 Display unit Bq 0x06 Display unit R/h
3	0x03 Display unit dps 0x07 Display unit rem/h
	0x08 Display unit Bq/cm²
4	0: Ratemeter, 1: Scaler
5	Last used display unit (dose rate)
6	0x00 Sv/h 0x01 R/h 0x02 rem/h
7	Not used

5.7.3.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm activity	0: hidden	1:visible
11	Alarm dose	0: hidden	1:visible
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.7.4 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

5.7.5 Dead time correction

x — Read dead time
Response: dead time in ns

5.7.6 History output

5.7.6.1 History readout ratemeter

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Max value
 |     |       |                Count rate in 0.01 cps, cpm
 |     |       |                Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |       |           Dose rate µR/h, rem/h or 0.01µSv/h
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

5.7.6.2 History readout scaler

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Background in 0.01 cps
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

End of History:

```
End
```

5.7.6.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Not used		
3	not used		
4	Background measurement	0:No	1:Yes
5	Scaler with	0: Preset Counts	1: Preset Time
6	Used filter		
7	0: No filter 1: Alpha blocker, 2:H*(10), 3:Hx		
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x04 Display unit dpm	
13	0x01 Display unit cpm	0x05 Display unit Sv/h	
14	0x02 Display unit Bq	0x06 Display unit R/h	
15	0x03 Display unit dps	0x07 Display unit rem/h	
		0x08 Display unit Bq/cm²	

5.7.7 Nuclide table

nR*Number*	Reading nuclide data. *Number*: consecutive number Response: Nuclide data (see below)
nW*NumberString*	Write nuclide data *Number*: consecutive number *String*: nuclide data e.g. `nW02Sr-90 500 555 3333`
nRA	Reading number of stored nuclides. Response: value from 0…15
nWA*Number*	Write the number of stored nuclides. *Number*: value from 0…15
nRG	Reading active nuclide. Response: value from 0…15
nWA*Number*	Write the number of active nuclides. *Number*: value from 0…15

Nuclide data:

```
Sr-90 500 555 3333
----- --- --- ----
  |     |   |   |
  |     |   |   \----  Factor for activity calculation with gamma filter
  |     |   \--------  Factor for activity calculation with alpha blocker
  |     \------------  Factor for activity calculation without filter
  \-----------------  Nuclide name. Up to 6 characters. Do not use space (0x20)
```

Activity calculation:

F=1/Eeff

Ar=Cr*F

F:	Factor for Efficiency calculation
Eeff	Efficiency for this nuclide
Ar	Activity
Cr	Measured count rate

For example:
Count rate is 67.3 cps without filter and efficiency for Sr-90 is

- 29% without filter.
- 25% with alpha blocker
- 10% with gamma filter

Factor F is 1/0.29=3.448.

- 1/0.29 = 3.448 without filter.
- 1/0.25 = 4.0 with alpha blocker
- 1/0.10 = 10.0 with gamma filter

To set the parameter, sent: `nW00Sr-90 345 400 1000`.
The activity is 67.3*3.45=232.18 Bq

5.7.8 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	Not used	
9		
10		
11	Sound	0: off 1:on
12	LED	0: off 1:on
13	Vibration alarm	0: off 1:on
14	Clear dose	0: no 1:yes
15	1: Alarm threshold changed	
16	1: Dose rate, count rate or activity -alarm	
17	1: Alarm dose	
18	Not used	
19	Not used	
20	Dose rate, count rate or activity > alarm threshold 1	
21	Dose rate, count rate or activity > alarm threshold 2	
22	Dose > alarm threshold 1	
23	Dose > alarm threshold 2	
24	1: Scaler or Background parameter changed	
25	Not used	
26	Power off	
27	Power on	
28	Not used	
29	Not used	
30	Not used	
31	Not used	

5.7.9 Automatic sending

```
<STX>721  2 0 0 14 B20ER 1234 AB<ETX><CR><LF>
      |   | | | |    |     |   |
      |   | | | |    |     |   \- BCC in HEX
      |   | | | |    |     \----- Dose in µR/h
      |   | | | |    \----------- information RadEye *)
      |   | | | \---------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Fixed to “2“
      \------------------------- Dose rate in µR/h
```

*) Information RadEye:

B20	RadEye B20
B20ER	RadEye B20-ER
G20	RadEye G20
G20ER	RadEye G20-ER
G2010	RadEye G20-10
G20ER1	RadEye G20-ER10

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.7.10 Status information

F Reading status information

Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.8 RadEye DW

Used firmware version: V1.53

5.8.1 Limit values

AR5	Reading threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
AR7	Reading threshold 1 for dose alarm Response: number in µSv, 100µR or 100µrem units. 0...10.000.000
AR8	Reading threshold 2 for dose alarm Response: see command AR7
ARK	Reading threshold 3 for dose alarm Response: see command AR7
ARL	Reading threshold 4 for dose alarm Response: see command AR7
AR0	Reading initial threshold Response: value 0 or 1
ARP	Reading test pulses Response: number from 0 to 9999
aD	Read active threshold Response: number from 0 to 3, representing threshold 1…4
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AW7*Number*	Setting the threshold 1 for dose alarm. *Number* = in 100µR, 100µrem or 1µSv units. e. g. AW7123 means 12.3mR.
AW8*Number*	Setting the threshold 2 for dose alarm. *Number* = see command AW7
AWK*Number*	Set threshold 3 for dose alarm Response: see command AR7

AWL*Number* Set threshold 4 for dose alarm
Response: see command AR7

AW0*Number* Set initial threshold
Response: value 0 or 1

AWP*Number* Set test pulses
Number: value from 0 to 9999

5.8.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- HV power in cps

5.8.3 Configuration flags

5.8.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “1”
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	not used, write “0”
7	Single Pulse 0: off 1: on

5.8.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Measuring unit: 0: Sievert 1: Roentgen
1	Fixed to “0”
2	Fixed to “1”
3	Not used
4	Flag for overload (readonly)
5	Temp.display 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Not used

5.8.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Fixed to “1”		
7	not used, write “0”		

5.8.3.4 Configuration flags 4 with jR / jW

Bit number			
0	not used, write “0”		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Show positions after decimal point (from 1Sv)	0:No	1:yes
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.8.3.5 Menu configuration

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	Change alarm dose	0: hidden	1:visible
10	Pre dose		
11	Autosend	0: hidden	1:visible
12	Test mode		
13	not used, write “0”		
14	not used, write “0”		
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.8.4 High voltage

HR Reading high voltage bit value
Response: Bit value 0…255.

5.8.5 Dead time correction

x	Read dead time Response: dead time in ns
&	Read dead time coefficient

5.8.6 History output

5.8.6.1 History readout

History status for 1. readout and change of history cycle time

```
1073741944 520534610
---------- ---------
     |          |
     |          |
     |          \-------- Date and Time as a decimal value
     \-------------------- History status as a decimal value
```

following readout:

```
15 11 +19
-- -- ---
|  |   |
|  |   \--- Temperature in °C
|  \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
\---------- Rate max in µR/h, µrem/h or 0.01µSv/h units
```

End of History:

```
End
```

5.8.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
            last power on without power off
```

5.8.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Fixed to “0”
9	Fixed to “0”
10	Fixed to “1”
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Alarm dose rate
17	1: Alarm dose
18	Not used
19	Not used
20	Dose rate > alarm threshold 1
21	Not used
22	Dose > alarm threshold 1
23	Not used
24	Not used
25	Not used
26	Power off
27	Power on
28	Pre dose enabled
29	Pre dose disabled
30	Not used
31	Fixed to “0”

5.8.8 Automatic sending

```
<STX>7 2 0 0 14 REGDW 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye DW
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm dose rate
3	1: Alarm dose
4	not used
5	1: Battery voltage low
6	not used
7	not used

5.8.9 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Measuring unit: 0: Sievert 1: Roentgen
9	Fixed to “0”
10	Fixed to “1”
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Fixed to “0”
16	1: Alarm dose rate
17	1: Alarm dose
18	Fixed to “0”
19	Not used
20	Dose rate > alarm threshold 1
21	Not used
22	Dose > alarm threshold 1
23	Not used
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.8.10 Miscellaneous

vRs Read preset dose
Response: number from 1 to 250,000

vWs*Number* Set preset dose
Number: value from 1 to 250,000

DT	Read time to alarm Response: value in minutes.

5.9 RadEye DLW

Used firmware version: V1.53

5.9.1 Limit values

AR5	Reading threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
ARP*Number*	Read test pulses Response: number from 0 to 9999
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AWP*Number*	Set test pulses *Number*: value from 0 to 9999

5.9.2 Measurement values

Z	Read raw count rates with dead time correction Response: - Counter 1 in cps - HV power in cps

5.9.3 Configuration flags

5.9.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Fixed to “0”
1	Fixed to “0”
2	Fixed to “1”
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	not used, write “0”
7	Single Pulse 0: off 1: on

5.9.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Measuring unit: 0: Sievert 1: Roentgen
1	Fixed to “0”
2	Fixed to “1”
3	Not used
4	Flag for overload (read-only)
5	Temp.display 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Not used

5.9.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Fixed to “1”		
7	not used, write “0”		

5.9.3.4 Configuration flags 4 with jR / jW

Bit number			
0	not used, write “0”		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.9.3.5 Menu configuration

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	Change alarm dose	0: hidden	1:visible
10	not used, write “0”		
11	Autosend	0: hidden	1:visible
12	Test mode		
13	not used, write “0”		
14	not used, write “0”		
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.9.4 High voltage

HR Reading high voltage bit value
Response: Bit value 0…255.

5.9.5 Dead time correction

x Read dead time
Response: dead time in ns

5.9.6 History output

5.9.6.1 History readout

History status for 1. readout and change of history cycle time

```
1073741944 520534610
---------- ---------
     |          |
     |          |
     |          \-------- Date and Time as a decimal value
     \-------------------- History status as a decimal value
```

following readout:

```
15 11 +19
-- -- ---
|  |   |
|  |   \--- Temperature in °C
|  \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
\---------- Rate max in µR/h, µrem/h or 0.01µSv/h units
```

End of History:

```
End
```

5.9.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
            last power on without power off
```

5.9.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Fixed to “0”
9	Fixed to “0”
10	Fixed to “1”
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Alarm dose rate
17	1: Alarm dose
18	Not used
19	Not used
20	Dose rate > alarm threshold 1
21	Not used
22	Not used
23	Not used
24	Not used
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.9.8 Automatic sending

```
<STX>7 2 0 0 14 REGDLW 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye DLW
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm dose rate
3	1: Alarm dose
4	not used
5	1: Battery voltage low
6	not used
7	not used

5.9.9 Status information

F Reading status information

Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Measuring unit: 0: Sievert 1: Roentgen
9	Fixed to “0”
10	Fixed to “1”
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Fixed to “0”
16	1: Alarm dose rate

17	1: Alarm dose
18	Fixed to “0”
19	Not used
20	Dose rate > alarm threshold 1
21	Not used
22	Not used
23	Not used
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.10 RadEye AB100 (from V1.67)

Used firmware version: 1.75

5.10.1 Limit values

AR0 Reading parametrs for sigma threshold.
Response:
- Sigma value 0 (=off), 2…9.
- Min. count rate for sigma alarm in cps
- Max. background value in cps
- Min. background value in cps
- Actual sigma alarm threshold in 0.01 cps units

AR1 Reading the threshold 1 for activity alarm β threshold.
Response: number in 0.01 Bq units.

AR2 Reading the threshold 2 for activity alarm β threshold.
Response: number in 0.01 Bq units.

AR3 Reading the threshold 1 for activity alarm α threshold.
Response: number in 0.01 Bq units.

AR4 Reading the threshold 2 for activity alarm α threshold.
Response: number in 0.01 Bq units.

AR5 Reading the threshold 1 for count rate alarm β threshold.
Response: number in 0.01 cps units

AR6 Reading the threshold 2 for count rate alarm β threshold.
Response: number in 0.01 cps units

AR7 Reading the threshold 1 for count rate alarm α threshold.
Response: number in 0.01 cps units

AR8 Reading the threshold 2 for count rate alarm α threshold.
Response: number in 0.01 cps units

AR9 Reading alarm thresholds for dose rate and dose
Response:
- threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
- threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
- threshold 1 for dose alarm in µR, µrem or 0.01µSv units
- threshold 2 for dose alarm in µR, µrem or 0.01µSv units

ARP Reading scaler parameter:

- Preset count threshold 1. Response: Number in counts
- Preset count threshold 3. Response: Number in counts
- Preset time. Response: Number in seconds

ARN — Reading background parameter:
- Preset count threshold 1. Response: Number in counts
- Preset count threshold 3. Response: Number in counts
- Preset time. Response: Number in seconds

ARB — Reading background values:
- Background value threshold 1. Response: Value in 0.01 cps
- Background value threshold 3. Response: Value in 0.01 cps

AW0*Number Number*… Writing parametrs for sigma threshold.
Number: Sigma value 0 (=off), 2…9.
Number: Min. count rate for sigma alarm in cps
Number: Max. background value in cps
Number: Min. background value in cps

AW1*Number* Setting the threshold 1 for activity alarm β threshold.
Number: value in 0.01 Bq units.

AW2*Number* Setting the threshold 2 for activity alarm β threshold
Number: value in 0.01 Bq units

AW3*Number* Setting the threshold 1 for activity alarm α threshold
Number: value in 0.01 Bq units.

AW4*Number* Setting the threshold 2 for activity alarm α threshold
Number: value in 0.01 Bq units

AW5*Number* Setting the threshold 1 for count rate alarm β threshold..
Number: value in 0.01 cps units.

AW6*Number* Setting the threshold 2 for count rate alarm β threshold.
Number: value in 0.01 cps units.

AW7*Number* Setting the threshold 1 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW8*Number* Setting the threshold 2 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW9 *Number Number…* Setting alarm thresholds for dose rate and dose
Number: threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units

Number: threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
Number: threshold 1 for dose alarm in µR, µrem or 0.01µSv units
Number: threshold 2 for dose alarm in µR, µrem or 0.01µSv units

AWP*Number Number*.. Set scaler parameter:
Number: Preset count threshold 1 in counts (from 0 to 65000 counts)
Number: Preset count threshold 3 in counts (from 0 to 65000 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWN*Number Number*.. Set background parameter:
Number: Preset count threshold 1 in counts (from 0 to 65000 counts)
Number: Preset count threshold 3 in counts (from 0 to 65000 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWB*Number Number* Set background value:
Number: Background value threshold 1 in 0.01 cps (from 0 to 65000 cps)
Number: Background value threshold 3 in 0.01 cps (from 0 to 65000 cps)

5.10.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- HV power index
- Probe current in 0.1 µA units

z Read filtered count rate β and α threshold
Response:
- Value β threshold 0.01 cps
- Value α threshold in 0.01 cps

A Read display value and status
Response:
- display value β threshold in 0.01 cps, cpm, Bq, dps, dpm or Bq/cm² units
- display value α threshold in 0.01 cps, cpm, Bq, dps dpm or Bq/cm² units
or in µR, µrem or 0.01µSv units in dose rate mode
- Status (see 5.5.6.2)

5.10.3 Scaler remote control (from V1.73)

CG Start scaler with parameter prevoisly set
CS Stop scaler

CI Scaler information

Response:

- 0: Scaler stopped, 1: Scaler active
- Scaler counting time
- accumulated counts threshold 1 or window 1
- accumulated counts threshold 3 or window 2
- accumulated counts threshold 1
- accumulated counts threshold 2
- accumulated counts threshold 3
- accumulated counts threshold 4

5.10.4 Configuration flags

5.10.4.1 Configuration flags 1 with kR / kW

Bit number			
0	Keylock	0: enable	1: disable
1	Not used		
2	Not used		
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	Not used		
7	Single Pulse	0: off	1: on

5.10.4.2 Configuration flags 2 with fR / fW

Bit number			
0	Show Gamma Symbol	0: no	1:yes
1	Not used		
2	Not used		
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (read-only)		
5	Display of temperature	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	Not used		

5.10.4.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	not used		
6	not used		
7	not used		

5.10.4.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Accumulated counts	0:no	1:yes
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha-LED	0:No	1:yes
9	Alpha-Sound	0:No	1:yes
10	Not used		
11	Alarm acknowledge (from 1.75)	0:No	1:yes
12	Set Alarm1 to 3xBackground (from 1.75)	0:no	1:yes
13	Ratemeter Tau active	0:No	1:yes
14	Not used		
15	Not used		

5.10.4.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x04 Display unit dpm 0x01 Display unit cpm 0x08 Display unit Bq/cm² 0x02 Display unit Bq 0x03 Display unit dps
1	
2	
3	
4	0: Ratemeter (Tau or ADF), 1: Scaler
5	Display mode: 00: measurement value β threshold 01: measurement value α threshold 02: dual display 03: graphic display
6	
7	0: two decimal places 1: one decimal place

5.10.4.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

5.10.4.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Select counter tube	0: hidden	1:visible
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm β Alarm act. β Alarm dose rate	0: hidden	1:visible
9	Alarm α Alarm act. α Alarm dose	0: hidden	1:visible
10	not used		
11	not used		
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.10.4.6.2 Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Alpha-LED	0: hidden	1:visible
5	Alpha Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Display αβ / β	0: hidden	1:visible
8	Not used		
9	Set HV	0: hidden	1:visible
10	Not used		
11	Language (from V1.75)	0: hidden	1:visible
12	Edit Tau (from V1.75)	0: hidden	1:visible
13	Contrast (from V1.75)	0: hidden	1:visible
14, 15	not used, write “0”		

5.10.4.6.3 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3…8	not used, write “0”		

5.10.4.6.4 Submenu “Operation mode”

Bit number			
0	Ratemeter ADF	0:hidden	1:visible
1	Scaler	0: hidden	1:visible
2	Ratemeter Tau	0: hidden	1:visible

5.10.5 High voltage

HR Reading high voltage
Response: value in Volt.

5.10.6 History output

5.10.6.1 History readout ratemeter

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Max value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  |               Activity in 0.01 Bq
 |     |       |   |  |               Dose rate in 1 µR/h
 |     |       |   |  \-------------- Mean value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   |                  Dose rate in 1 µR/h
 |     |       |   \----------------- Max value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       |                      Activity in 0.01 Bq
 |     |       \--------------------- Mean value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

5.10.6.2 History readout scaler

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Background value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  \-------------- Measuring value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   |                  Dose rate in 1 µR/h
 |     |       |   \----------------- Background value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       \--------------------- Measuring value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

End of History:

End

5.10.6.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Number of used probe		
3			
4			
5			
6	Background measurement	0:No	1:Yes
7	Display of	0:αβ	1: β
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps 0x08 Display unit Bq/cm²		
13	0x01 Display unit cpm		
14	0x02 Display unit Bq		
15	0x03 Display unit dps		
	0x04 Display unit dpm		
16	Probe style		
17	000: αβ-Probe		
18	001: α-Probe		
	010: β-Probe		
19	Not used		
20	Accumulated counts	0:No	1:Yes
21	Not used		
22	Not used		
23	Not used		
24	Not used		
25	Not used		
26	Not used		
27	Not used		
28	Not used		
29	Not used		
30	Not used		
31	Not used		

5.10.7 Nuclide table

nR*Number* Reading nuclide data.
Number: number of probe
Response: Nuclide data (see below)

nW*NumberString* Write nuclide data
Number: number of probe
String: nuclide data (see below)

Nuclide data: every string contains up to 16 nuclide data of the corresponding probe
For example:

```
00 01 Sr-90 471 999 Am-241 330 123 usw. 0815
-- -- ----- --- --- ------ --- ---       ----
|     |   |   |    |    |     |    |        |
|     |   |   |    |    |     |    |        \--   Checksum (in HEX)
|     |   |   |    |    |     |    \-----------   Factor for α threshold
|     |   |   |    |    |     \----------------   Factor for β threshold
|     |   |   |    |    \----------------------   Name of nuclide 2 (do not use space)
|     |   |   |    \---------------------------   Factor for α threshold
|     |   |   \--------------------------------   Factor for β threshold
|     |   \-----------------------------------   Name of nuclide 1 (do not use space)
|     \---------------------------------------   Active nuclide number
\-------------------------------------------   Number of nuclides in this string
```

Activity calculation:
F=1/Eeff
Ar=Cr*F

For example:
Count rate is 67.3 cps and efficiency for Sr-90 is 29%. Factor F is 1/0.29=3.448.
The activity is 67.3*3.45=232.18 Bq.
Write “0” for null efficiency. In this case the RadEye displays “### Bq”.

Checksum calculation: Checksum starts from the beginning of the message to the end, with the checksum. Checksum is modulo 256.

5.10.8 Probe data

zR*Number*	Reading probe data. *Number*: consecutive number Response: probe data (see below)
zW*NumberString*	Write probe data *Number*: consecutive number *String*: probe data
zRA	Read the number of stored probes. Response: value from 0…15
zWA*Number*	Read the number of stored probes. *Number*: value from 0…15
zRG	Reading active probe. Response: value from 0…15
zWG*Number*	Write active probe. *Number*: value from 0…15

For example:

```
HP-380AB 10000 5 5 5 5 600 100 100 30 100 10 1 3 5 8 30 225 1000 1250 1234
```

1 Probe name. Max. 11 characters. Do not use space
2 Calibration factor in (nSv/h)/cps
3 Dead time Rate 1 µs
4 Dead time Rate 2 µs
5 Dead time Rate 3 µs
6 Dead time Rate 4 µs
7 High voltage in Volt
8 Overload Rate 1 in kcps
9 Overload Rate 3 in kcps
A Overload probe current µA
B Area of this probe
C Timeout for detector error in seconds
D Factor Rate 1 for dose rate calculation. Range: -128…+127
E Factor Rate 2 for dose rate calculation. Range: -128…+127
F Factor Rate 3 for dose rate calculation. Range: -128…+127

G	Factor Rate 4 for dose rate calculation. Range: -128…+127
H	Threshold Rate 1 in mV. Range: 30..1220mV
I	Threshold Rate 2 in mV. Range: 30..1220mV
J	Threshold Rate 3 in mV. Range: 30..1220mV
K	Threshold Rate 4 in mV. Range: 30..1220mV
L	Flags

Flags

<table>
<tr><td>Bit number</td><td></td></tr>
<tr><td>0</td><td rowspan="2">Window:
00: No window. Display of Rate 1 Rate 3
01: β window. Display Rate 1 – Rate 2 and Rate 3
10: α window. Display of Rate 1 and Rate 3 – Rate 4
11: β and α window. Display of Rate 1 – Rate 2 and Rate 3 – Rate 4</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Pulse fade out 0: off 1: on</td></tr>
<tr><td>3</td><td>Probe style</td></tr>
<tr><td>4</td><td rowspan="2"><table><tr><td>000: αβ-Probe</td><td>011: Dose rate probe</td></tr><tr><td>001: α-Probe</td><td>100: Gamma probe multi channel</td></tr><tr><td>010: β-Probe</td><td></td></tr></table></td></tr>
<tr><td>5</td></tr>
<tr><td>6</td><td>Reserved, write “0”</td></tr>
<tr><td>7</td><td>Reserved, write “0”</td></tr>
<tr><td>8</td><td>Single Pulse 0: every Count, 1: with Divide Ratio (see Command ARC)</td></tr>
<tr><td>9</td><td>Not used</td></tr>
<tr><td>10</td><td>Display Rate 4 in place of Rate 3 (from V2.00)</td></tr>
<tr><td>11..15</td><td>Not used</td></tr>
</table>

Dead time correction:

$$C1 = \frac{C1raw}{1 - \tau 1 * C1raw}$$

$\tau 1$ Dead time

C1raw: raw count rate

1- τ1*C1raw is limited to min. 0.1

Dose rate calculation:

DR=Cf * (D *Rate1+ E *Rate2+ F *Rate3+ G *Rate4)

DR: Dose rate in nSv/h

Cf: Calibration factor in nSv/h/cps

Rate 1..4 Count rate of threshold 1..4 in cps

5.10.9 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \-------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Probe Type Part 1
7	
8	Operation mode 0: Ratemeter 1:Scaler
9	Probe Type Part 2
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Not used
15	1: Mode activity
16	1: count rate or activity -alarm
17	Not used
18	Not used
19	
20	Count rate or activity > alarm threshold 1
21	Count rate or activity > alarm threshold 2
22	Not used
23	Not used
24	Not used
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	1: Window Beta
31	Not used

5.10.10 Automatic sending

```
<STX>721  5 0 0 14 SX 1234 AB<ETX><CR><LF>
      |   | | |  |  |   |   |
      |   | | |  |  |   |   \---- BCC in HEX
      |   | | |  |  |   \-------- Dose in µR/h
      |   | | |  |  \------------ information RadEye GX
      |   | | |  \--------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Fixed to “5“
      \------------------------- Count rate 1 in 0.01cps
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.10.11 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold (read-only) 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.10.12 Miscellaneous

ARC Read single pulse divider
Response: number for single pulse divider

ARt	Read fixed time constant (from V1.75) Response: time in 0.1s units
AWC*Number*	Write single pulse divider Number: value from 1 to 65535
AWt	Write fixed time constant (from V1.75) Number: value from 10 to 65535

5.11 RadEye GX

Used firmware version: 1.62

5.11.1 Limit values

AR0	Reading sigma parameter: - Sigma value (0…9) - min. count rate for sigma alarm (cps) - max. Background (cps) - min. Background (cps)
AR1	Reading the threshold 1 for activity alarm. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for count rate alarm. Response: number in 0.01 cps units.
AR4	Reading the threshold 2 for count rate alarm. Response: number in 0.01 cps units.
AR5	Reading the threshold 1 dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR6	Reading the threshold 2 for count rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR7	Reading the threshold 1 for dose alarm. Response: number in µR, µrem or 0.01µSv units
AR8	Reading the threshold 2 for dose alarm. Response number in µR, µrem or 0.01µSv units
ARP	Reading scaler parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
ARN	Reading background parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds

ARB	Reading background value: Response: Number in 0.01 cps
AW0	Set sigma parameter: - Sigma value (0…9) - min. count rate for sigma alarm - max. Background - min. Background
AW1*Number*	Setting the threshold 1 for activity alarm *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 2 for activity alarm *Number*: value in 0.01 Bq units
AW3*Number*	Setting the threshold 1 for count rate alarm Number: value in 0.01 cps units.
AW4*Number*	Setting the threshold 2 for count rate alarm *Number*: value in 0.01 cps units
AW5*Number*	Setting the threshold 1 dose rate alarm. *Number:* value in µR/h, µrem/h or 0.01µSv/h units.
AW6*Number*	Setting the threshold 2 dose rate alarm. *Number*: value in µR/h, µrem/h or 0.01µSv/h units.
AW7*Number*	Setting the threshold 1 for dose alarm. *Number*: value in µR, µrem or 0.01µSv units
AW8*Number*	Setting the threshold 2 for dose alarm. *Number*: value in µR, µrem or 0.01µSv units
AWP*Number Number*	Set scaler parameter: *Number:* Preset count in counts (from 0 to 9999 counts) *Number:* Preset time in seconds (from 0 to 9999 seconds)
AWN*Number Number*	Set background parameter: *Number:* Preset count in counts (from 0 to 9999 counts) *Number:* Preset time in seconds (from 0 to 9999 seconds)
AWB*Number*	Set background value: *Number:* Value in 0.01 cps (from 0 to 100.00 cps)

5.11.2 Measurement values

Z — Read raw count rates with dead time correction

Response:

- Counter 1 in cps
- HV power index
- Counter 1 in cps without dead time
- HV power index

A — Read display value and status

Response:

- display value in 1µR/h, 1µrem/h, 0.01µSv/h units or 0.01 cps, cpm, Bq, dps, dpm, Bq/cm² units
- Status (see 5.5.6.2)

5.11.3 Scaler remote control (from V1.66)

CG — Start scaler with parameter prevoisly set

CS — Stop scaler

CI — Scaler information

Response:

- 0: Scaler stopped, 1: Scaler active
- Scaler counting time
- accumulated counts

5.11.4 Configuration flags

5.11.4.1 Configuration flags 1 with kR / kW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Not used
7	Single Pulse 0: off 1: on

5.11.4.2 Configuration flags 2 with fR / fW

Bit number	
0	Show Gamma symbol 0: off 1:on
1	Not used

2	Not used	
3	Alarm threshold read-only	0: off 1:on
4	Flag for overload (read-only)	
5	Display of temperature	0: off 1:on
6	Temperature unit	0: °C 1: °F
7	Not used	

5.11.4.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		
7	not used		

5.11.4.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Accumulated counts	0:No	1:yes
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha LED	0:No	1:yes
9	Alpha Sound	0:No	1:yes
10	Not used		
11	Not used		
12	Not used		
13	Not used		
14	Not used		
15	Not used		

5.11.4.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number		
0	0x00 Display unit cps	0x05 Display unit Sv/h
1	0x01 Display unit cpm	0x06 Display unit R/h
2	0x02 Display unit Bq	0x07 Display unit rem/h
3	0x03 Display unit dps	0x08 Display unit Bq/cm²
	0x04 Display unit dpm	0x09 Display unit Gy/h
4	0: Ratemeter, 1: Scaler	
5	Not used	
6	Not used	
7	Not used	

5.11.4.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

mR*Hex HexHex* Write configuration for main menu, submenu “Settings” and submenu “Alarm indication” (from V1.64) See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Select counter tube	0: hidden	1:visible
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm activity	0: hidden	1:visible
11	Alarm dose	0: hidden	1:visible
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible

1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Set HV	0: hidden	1:visible
6	Bluetooth	0: hidden	1:visible
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		

5.11.5 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

5.11.6 Dead time correction

x — Read dead time
Response: dead time in ns

5.11.7 History output

5.11.7.1 History readout ratemeter

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Max value
 |     |       |               Count rate in 0.01 cps, cpm
 |     |       |               Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |       |               Dose rate µR/h, rem/h or 0.01µSv/h
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate 0.01 µR/h, rem/h or 0.1nSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

5.11.7.2 History readout scaler

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Background in 0.01 cps
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

End of History:

End

5.11.7.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Number of used probe		
3			
4			
5			
6	Background measurement	0:No	1:Yes
7	Accumulated counts	0:No	1:Yes
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x04 Display unit dpm	
13	0x01 Display unit cpm	0x05 Display unit Sv/h	
14	0x02 Display unit Bq	0x06 Display unit R/h	
15	0x03 Display unit dps	0x07 Display unit rem/h	
		0x08 Display unit Bq/cm²	

5.11.8 Nuclide table

nR*Number*	Reading nuclide data. *Number*: consecutive number Response: Nuclide data (see below)
nW*NumberString*	Write nuclide data *Number*: consecutive number *String*: nuclide data e.g. `nW02Sr-90 321`
nRA	Reading number of stored nuclides. Response: value from 0…15
nWA*Number*	Write the number of stored nuclides. *Number*: value from 0…15
nRG	Reading active nuclide. Response: value from 0…15
nWA*Number*	Write the number of active nuclides. *Number*: value from 0…15

Nuclide data:
For example:

```
Sr-90 321
----- ---
  |     |
  |     \------------ Factor for activity calculation with factor 100
  \------------------ Nuclide name. Up to 6 characters. Do not use space (0x20)
```

Activity calculation:
F=1/Eeff
Ar=Cr*F

For example:
Count rate is 67.3 cps and efficiency for Sr-90 is 29%. Factor F is 1/0.29=3.448. To set the parameter, sent: `nW00Sr-90 345`.
The activity is 67.3*3.45=232.18 Bq.

5.11.9 Probe data

zR*Number*	Reading probe data. *Number*: consecutive number Response: probe data (see below)
zW*NumberString*	Write probe data *Number*: consecutive number *String*: probe data
zRA	Read the number of stored probes. Response: value from 0…15
zWA*Number*	Read the number of stored probes. *Number*: value from 0…15
zRG	Reading active probe. Response: value from 0…15
zWG*Number*	Write active probe. *Number*: value from 0…15

For example:

```
HP-270 510 90 900 10 600 20 60 -40 00
  1    2  3  4   5  6   7  8  9  10
```

1	Probe name. Max. 11 characters. Do not use space
2	Calibration factor in (nSv/h)/cps
3	Dead time µs
4	High voltage in Volt
5	Overload counter in kcps
6	Overload high voltage power indicator
7	Area of this probe
8	Timeout for detector error in seconds
9	Dead time correction in 0.1 µs
10	Flags

Flags

Bit number	
0	Not used
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	Reserved

Dead time correction:

$$C1 = \frac{C1raw}{1 - \tau 1 * C1raw - \tau 2 * C1raw^2}$$

$\tau 1$ Dead time

$\tau 2$ Dead time correction

C1raw: raw count rate

$\tau 2 * C1raw^2$ is limited to min. -0.8

$1 - \tau 1 * C1raw - \tau 2 * C1raw^2$ limited to min. 0.15

5.11.10 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Operation mode 0: Ratemeter 1:Scaler
9	Not used
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Clear dose 0: no 1:yes
15	1: Alarm threshold changed
16	1: Dose rate, count rate or activity -alarm
17	1: Alarm dose
18	1: Overload
19	Not used
20	Dose rate, count rate or activity > alarm threshold 1
21	Dose rate, count rate or activity > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	1: Scaler or Background parameter changed
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Not used

5.11.11 Automatic sending

```
<STX>721  5 0 0 14 GX 1234 AB<ETX><CR><LF>
      |   | | |  |  |   |   |
      |   | | |  |  |   |   \---- BCC in HEX
      |   | | |  |  |   \-------- Dose in µR/h
      |   | | |  |  \------------ information RadEye GX
      |   | | |  \--------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Fixed to “5“
      \------------------------- Count rate in 0.01cps
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.11.12 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold (read-only) 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.12 RadEye SX

Used firmware version: 2.00

5.12.1 Limit values

AR0 Reading parameters for sigma threshold.
Response:
- Sigma value 0 (=off), 2…9.
- Min. count rate for sigma alarm in cps
- Max. background value in cps
- Min. background value in cps
- Actual sigma alarm threshold in 0.01 cps units

AR1 Reading the threshold 1 for activity alarm β threshold.
Response: number in 0.01 Bq units.

AR2 Reading the threshold 2 for activity alarm β threshold.
Response: number in 0.01 Bq units.

AR3 Reading the threshold 1 for activity alarm α threshold.
Response: number in 0.01 Bq units.

AR4 Reading the threshold 2 for activity alarm α threshold.
Response: number in 0.01 Bq units.

AR5 Reading the threshold 1 for count rate alarm β threshold.
Response: number in 0.01 cps units

AR6 Reading the threshold 2 for count rate alarm β threshold.
Response: number in 0.01 cps units

AR7 Reading the threshold 1 for count rate alarm α threshold.
Response: number in 0.01 cps units

AR8 Reading the threshold 2 for count rate alarm α threshold.
Response: number in 0.01 cps units

AR9 Reading alarm thresholds for dose rate and dose
Response:
- threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
- threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
- threshold 1 for dose alarm in µR, µrem or 0.01µSv units
- threshold 2 for dose alarm in µR, µrem or 0.01µSv units

ARP Reading scaler parameter:

- Preset count threshold 1. Response: Number in counts
- Preset count threshold 3. Response: Number in counts
- Preset time. Response: Number in seconds

ARN — Reading background parameter:
- Preset count threshold 1. Response: Number in counts
- Preset count threshold 3. Response: Number in counts
- Preset time. Response: Number in seconds

ARB — Reading background values:
- Background value threshold 1. Response: Value in 0.01 cps
- Background value threshold 3. Response: Value in 0.01 cps

ARt — Reading Tau (from V2.00):
Response: Value in 0.1 s

AW0*Number Number*… — Writing parametrs for sigma threshold.
Number: Sigma value 0 (=off), 2…9.
Number: Min. count rate for sigma alarm in cps
Number: Max. background value in cps
Number: Min. background value in cps

AW1*Number* — Setting the threshold 1 for activity alarm β threshold.
Number: value in 0.01 Bq units.

AW2*Number* — Setting the threshold 2 for activity alarm β threshold
Number: value in 0.01 Bq units

AW3*Number* — Setting the threshold 1 for activity alarm α threshold
Number: value in 0.01 Bq units.

AW4*Number* — Setting the threshold 2 for activity alarm α threshold
Number: value in 0.01 Bq units

AW5*Number* — Setting the threshold 1 for count rate alarm β threshold..
Number: value in 0.01 cps units.

AW6*Number* — Setting the threshold 2 for count rate alarm β threshold.
Number: value in 0.01 cps units.

AW7*Number* — Setting the threshold 1 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW8*Number* — Setting the threshold 2 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW9 *Number Number…* Setting alarm thresholds for dose rate and dose
Number: threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
Number: threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
Number: threshold 1 for dose alarm in µR, µrem or 0.01µSv units
Number: threshold 2 for dose alarm in µR, µrem or 0.01µSv units

AWP*Number Number..* Set scaler parameter:
Number: Preset count threshold 1 in counts (from 0 to 65000 counts)
Number: Preset count threshold 3 in counts (from 0 to 65000 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWN*Number Number..* Set background parameter:
Number: Preset count threshold 1 in counts (from 0 to 65000 counts)
Number: Preset count threshold 3 in counts (from 0 to 65000 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWB*Number Number* Set background value:
Number: Background value threshold 1 in 0.01 cps (from 0 to 65000 cps)
Number: Background value threshold 3 in 0.01 cps (from 0 to 65000 cps)

AWt*Number* Set Tau:
Number: Value in 0.1 s (from 10 to 600 means from 1.0 to 60.0s)

5.12.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- HV power index
- Probe current in 0.1 µA units

z Read filtered count rate β and α threshold
Response:
- Value β threshold 0.01 cps
- Value α threshold in 0.01 cps

A Read display value and status

Response:

- display value β threshold in 0.01 cps, cpm, Bq, dps, dpm or Bq/cm² units
- display value α threshold in 0.01 cps, cpm, Bq, dps dpm or Bq/cm² units or in µR, µrem or 0.01µSv units in dose rate mode
- Status (see 5.5.6.2)

5.12.3 Scaler remote control (from V1.73)

CG Start scaler with parameter previously set

CS Stop scaler

CI Scaler information

Response:

- 0: Scaler stopped, 1: Scaler active
- Scaler counting time
- accumulated counts threshold 1 or window 1
- accumulated counts threshold 3 or window 2
- accumulated counts threshold 1
- accumulated counts threshold 2
- accumulated counts threshold 3
- accumulated counts threshold 4

5.12.4 Configuration flags

5.12.4.1 Configuration flags 1 with kR / kW

Bit number			
0	Disable key lock	0: no	1: yes
1	Not used		
2	Show NBR Bargraph	0: off	1: on
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	NBR	0: off	1: on
7	Single Pulse	0: off	1: on

5.12.4.2 Configuration flags 2 with fR / fW

Bit number			
0	Show Gamma Symbol	0: no	1:yes
1	Not used		
2	Not used		
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (read-only)		
5	Display of temperature	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	Not used		

5.12.4.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		
7	not used		

5.12.4.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Scaler, accumulated counts	0:No	1:yes
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha-LED	0:No	1:yes
9	Alpha-Sound	0:No	1:yes
10	Not used		
11	Alarm, Background LCD	0:No	1:yes
12	Not used		
13	Unit R/h and rem/h: lowest prefix ‘m’ instead of ‘µ’		
14	Not used		
15	Not used		

5.12.4.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number		
0	0x00 Display unit cps	0x05 Display unit Sv/h
1	0x01 Display unit cpm	0x06 Display unit R/h
2	0x02 Display unit Bq	0x07 Display unit rem/h
3	0x03 Display unit dps	0x08 Display unit Bq/cm²
	0x04 Display unit dpm	0x09 Display unit Gy/h (from V2.00)
4	0: Ratemeter, 1: Scaler	
5	Display mode:	
6	00: measurement value β threshold 01: measurement value α threshold 02: dual display 03: graphic display	
7	Ratemeter 0: ADF 1: Tau	

5.12.4.6 Menu configuration

mR Read configuration for main menu, submenu “Settings” , submenu “Alarm indication” and , submenu “Operation mode”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu , submenu “Settings” , submenu “Alarm indication” and , submenu “Operation mode”
See below

5.12.4.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Select counter tube	0: hidden	1:visible
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm β Alarm act. β Alarm dose rate	0: hidden	1:visible

9	Alarm α Alarm act. α Alarm dose	0: hidden	1:visible
10	not used		
11	not used		
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17..31	not used, write “0”		

5.12.4.6.2 Sub menu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Alpha-LED	0: hidden	1:visible
5	Alpha Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Not used, write “0”		
8	Alarm-NBR	0: hidden	1:visible
9	Set HV	0: hidden	1:visible
10	Bluetooth	0: hidden	1:visible
11	Set fixed TC (from V2.00)	0: hidden	1:visible
12	Language (from V2.00)	0: hidden	1:visible
13	Contrast (from V2.00)	0: hidden	1:visible
14…15	not used, write “0”		

5.12.4.6.3 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	LCD LED	0: hidden	1:visible
4…8	not used, write “0”		

5.12.4.6.4 Submenu “Operation mode”

Bit number			
0	Ratemeter ADF	0:hidden	1:visible
1	Scaler	0: hidden	1:visible

2	Ratemeter Tau	0: hidden 1:visible
3…8	not used, write “0”	

5.12.5 High voltage

HR Reading high voltage
Response: value in Volt.

5.12.6 History output

5.12.6.1 History readout ratemeter

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |      |       |   |  |  |   |  |
 |      |       |   |  |  |   |  \---- Temperature in °C
 |      |       |   |  |  |   \------- Measuring time in seconds
 |      |       |   |  |  \----------- Max value α channel
 |      |       |   |  |               Count rate in 0.01 cps
 |      |       |   |  |               Activity in 0.01 Bq
 |      |       |   |  |               Dose rate in 1 µR/h
 |      |       |   |  \-------------- Mean value α channel
 |      |       |   |                  count rate in 0.01 cps,
 |      |       |   |                  Activity in 0.01 Bq
 |      |       |   |                  Dose rate in 1 µR/h
 |      |       |   \----------------- Max value β channel
 |      |       |                      count rate in 0.01 cps,
 |      |       |                      Activity in 0.01 Bq
 |      |       \--------------------- Mean value β channel
 |      |                              count rate in 0.01 cps,
 |      |                              Activity in 0.01 Bq
 |      \------------------------------ Date and Time as a decimal value
 \------------------------------------- History status as a decimal value
                                        see below
```

5.12.6.2 History readout scaler

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |      |       |   |  |  |   |  |
 |      |       |   |  |  |   |  \---- Temperature in °C
 |      |       |   |  |  |   \------- Measuring time in seconds
 |      |       |   |  |  \----------- Background value α channel
 |      |       |   |  |               Count rate in 0.01 cps
 |      |       |   |  \-------------- Measuring value α channel
 |      |       |   |                  count rate in 0.01 cps,
 |      |       |   |                  Activity in 0.01 Bq
 |      |       |   |                  Dose rate in 1 µR/h
 |      |       |   \----------------- Background value β channel
 |      |       |                      count rate in 0.01 cps,
 |      |       \--------------------- Measuring value β channel
 |      |                              count rate in 0.01 cps,
 |      |                              Activity in 0.01 Bq
 |      \------------------------------ Date and Time as a decimal value
 \------------------------------------- History status as a decimal value
                                        see below
```

End of History:

```
End
```

5.12.6.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Number of used probe		
3			
4			
5			
6	Background measurement	0:No	1:Yes
7	Display of	0:αβ	1: β
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x05 Display unit Sv/h	
13	0x01 Display unit cpm	0x06 Display unit R/h	
14	0x02 Display unit Bq	0x07 Display unit rem/h	

<table>
<tr><td>15</td><td>0x03 Display unit dps 0x08 Display unit Bq/cm²
0x04 Display unit dpm 0x09 Display unit Gy/h (from V2.00)</td></tr>
<tr><td>16</td><td>Probe style</td></tr>
<tr><td>17</td><td rowspan="3"><table><tr><td>0000: αβ-Probe</td><td>0011: Dose rate probe</td></tr><tr><td>0001: α-Probe</td><td>0100: Gamma probe multi channel</td></tr><tr><td>0010: β-Probe</td><td></td></tr><tr><td>1011: GM-Probe (Dose rate)</td><td>1000: GM-Probe (Contamination)</td></tr></table></td></tr>
<tr><td>18</td></tr>
<tr><td>19</td></tr>
<tr><td>20</td><td>Accumulated counts 0:No 1:Yes</td></tr>
<tr><td>21</td><td>Not used</td></tr>
<tr><td>22</td><td>Not used</td></tr>
<tr><td>23</td><td>Not used</td></tr>
<tr><td>24</td><td rowspan="3">Window:
000: No window. Display of Rate 1 Rate 3
001: β window. Display Rate 1 – Rate 2 and Rate 3
010: α window. Display of Rate 1 and Rate 3 – Rate 4
011: β and α window. Display of Rate 1 – Rate 2 and Rate 3 – Rate 4
101: Display Rate 1 – Rate 2 and Rate 4</td></tr>
<tr><td>25</td></tr>
<tr><td>26</td></tr>
<tr><td>27</td><td>Not used</td></tr>
<tr><td>28</td><td>Not used</td></tr>
<tr><td>29</td><td>Not used</td></tr>
<tr><td>30</td><td>Reserved</td></tr>
<tr><td>31</td><td>Reserved</td></tr>
</table>

5.12.7 Nuclide table

nR*Number* Reading nuclide data.
Number: number of probe
Response: Nuclide data (see below)

nW*NumberString* Write nuclide data
Number: number of probe
String: nuclide data (see below)

Nuclide data: every string contains up to 16 nuclide data of the corresponding probe
For example:

```
00 01 Sr-90 471 999 Am-241 330 123 …….  0815
-- -- ----- --- --- ------ --- ---       ----
|     |   |   |    |    |     |    |        |
|     |   |   |    |    |     |    |        \--   Checksum (in HEX)
|     |   |   |    |    |     |    \-----------   Factor for α threshold
|     |   |   |    |    |     \----------------   Factor for β threshold
|     |   |   |    |    \----------------------   Name of nuclide 2 (do not use space)
|     |   |   |    \---------------------------   Factor for α threshold
|     |   |   \--------------------------------   Factor for β threshold
|     |   \-----------------------------------   Name of nuclide 1 (do not use space)
|     \---------------------------------------   Active nuclide number
\-------------------------------------------   Number of nuclides in this string
```

Activity calculation:
F=1/Eeff
Ar=Cr*F

For example:
Count rate is 67.3 cps and efficiency for Sr-90 is 29%. Factor F is 1/0.29=3.448.
The activity is 67.3*3.45=232.18 Bq.
Write “0” for null efficiency. In this case the RadEye displays “### Bq”.

Checksum calculation: Checksum starts from the beginning of the message to the end, with the checksum. Checksum is modulo 256.

5.12.8 Probe data

cR	Reading channel text for Dual Probes. Response: *C1 C3*
cW *C1 C3*	write channel text for Dual Probes. *C1:* Name for lower channel (e.g. R1-R2). Max. 5 Character *C3:* Name for upper channel (e.g. R4). Max. 5 Character
zR*Number*	Reading probe data. *Number*: consecutive number Response: probe data (see below)
zW*NumberString*	Write probe data *Number*: consecutive number *String*: probe data
zRA	Read the number of stored probes. Response: value from 0…15
zWA*Number*	Read the number of stored probes. *Number*: value from 0…15
zRG	Reading active probe. Response: value from 0…15
zWG*Number*	Write active probe. *Number*: value from 0…15

For example:

```
HP-380AB 10000 5 5 5 5 600 100 100 30 100 10 1 3 5 8 30 225 1000 1250 1234
```

```
  1        2  3 4 5 6  7   8   9  A  B  C  D E F G  H  I   J    K    L
```

1	Probe name. Max. 11 characters. Do not use space
2	Calibration factor in (nSv/h)/cps
3	Dead time Rate 1 µs
4	Dead time Rate 2 µs
5	Dead time Rate 3 µs
6	Dead time Rate 4 µs
7	High voltage in Volt
8	Overload Rate 1 in kcps
9	Overload Rate 3 in kcps
A	Overload probe current µA

B	Area of this probe
C	Timeout for detector error in seconds
D	Factor Rate 1 for dose rate calculation. Range: -128…+127
E	Factor Rate 2 for dose rate calculation. Range: -128…+127
F	Factor Rate 3 for dose rate calculation. Range: -128…+127
G	Factor Rate 4 for dose rate calculation. Range: -128…+127
H	Threshold Rate 1 in mV. Range: 30..1220mV
I	Threshold Rate 2 in mV. Range: 30..1220mV
J	Threshold Rate 3 in mV. Range: 30..1220mV
K	Threshold Rate 4 in mV. Range: 30..1220mV
L	Flags

Flags

<table>
<tr><td>Bit number</td><td colspan="2"></td></tr>
<tr><td>0</td><td colspan="2" rowspan="2">Window:
00: No window. Display of Rate 1 Rate 3
01: β window. Display Rate 1 – Rate 2 and Rate 3
10: α window. Display of Rate 1 and Rate 3 – Rate 4
11: β and α window. Display of Rate 1 – Rate 2 and Rate 3 – Rate 4</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td colspan="2">Pulse fade out 0: off 1: on</td></tr>
<tr><td>3</td><td colspan="2">Probe style</td></tr>
<tr><td>4</td><td>0000: αβ-Probe</td><td>0011: Dose rate probe</td></tr>
<tr><td>5</td><td>0001: α-Probe</td><td>0100: Gamma probe multi channel</td></tr>
<tr><td>6</td><td>0010: β-Probe</td><td></td></tr>
<tr><td></td><td>1011: GM-Probe (Dose rate)</td><td>1000: GM-Probe (Contamination)</td></tr>
<tr><td>7</td><td colspan="2">FHZ674-NBR</td></tr>
<tr><td>8</td><td colspan="2">Single Pulse 0: every Count, 1: with Divide Ratio (see Command ARC)</td></tr>
<tr><td>9</td><td colspan="2">Not used</td></tr>
<tr><td>10</td><td colspan="2">Display Rate 4 in place of Rate 3 (from V2.00)</td></tr>
<tr><td>11</td><td colspan="2">Use long integration time 0:No 1:Yes</td></tr>
<tr><td>12</td><td colspan="2">Calibration factor 0: Hx 1: H*10</td></tr>
<tr><td>13</td><td colspan="2">Not used</td></tr>
<tr><td>14</td><td colspan="2">Probe is calibrated 0:No 1:Yes</td></tr>
<tr><td>15</td><td colspan="2">Must be “0”</td></tr>
</table>

Dead time correction:

$$C1 = \frac{C1raw}{1 - \tau 1 * C1raw}$$

$\tau 1$	Dead time
C1raw:	raw count rate

1- τ1*C1raw is limited to min. 0.1

Dose rate calculation:
DR=Cf * (D *Rate1+ E *Rate2+ F *Rate3+ G *Rate4)
DR: Dose rate in nSv/h
Cf: Calibration factor in nSv/h/cps
Rate 1..4 Count rate of threshold 1..4 in cps

5.12.9 Event log

```
6656 520549251
---- ---------
  |       |
  |       \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Probe Type Part 1 *)
7	
8	Operation mode 0: Ratemeter 1:Scaler
9	Probe Type Part 2 *)
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Clear dose 0: no 1:yes
15	1: Mode activity
16	1: Dose rate, count rate or activity -alarm
17	1: Alarm dose
18	NBR-Alarm
19	01: Low energy 10: High energy 11: Anomaly
20	Dose rate, count rate or activity > alarm threshold 1
21	Dose rate, count rate or activity > alarm threshold 2
22	Dose > alarm threshold 1 (Dose rate probe) count rate or activity R3 > alarm threshold 1 (Contamination, Dual Channel)
23	Dose > alarm threshold 1 (Dose rate probe) count rate or activity R3 > alarm threshold 1 (Contamination, Dual Channel)
24	1: Window Alpha
25	1: Safety alarm

26	Power off
27	Power on
28	1: NBR active
29	1: Mid Energy
30	1: Window Beta
31	Not used

*) Probe Type

```
xxxx x00x 00xx xxxx
|||| |||| |||| ||||
|||| |++--++------- Probe Type
```

00x00: αβ-Probe	00x11: Dose rate probe
00x01: α-Probe	01x00: Gamma probe multi channel
00x10: β-Probe	
10x11: GM-Probe (Dose rate)	10x00: GM-Probe (Contamination)

5.12.10 Automatic sending

```
<STX>721  5 0 0 14 SX 1234 AB<ETX><CR><LF>
      |   | | |  |  |   |   |
      |   | | |  |  |   |   \---- BCC in HEX
      |   | | |  |  |   \-------- Dose in µR/h-units
      |   | | |  |  \------------ information RadEye SX
      |   | | |  \--------------- Status as Hex-value
      |   | | \------------------ Measuring unit Rate 3
      |   | \-------------------- Rate 3
      |   \---------------------- Measuring unit Rate 1
      \------------------------- Rate 1
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low

6	not used
7	not used

Measuring unit for Rate 1 and Rate 3

5	cps
3	cpm
6	Bq
9	dps
7	dpm
8	Bq/cm²
2	R/h
0	Sv/h
10	Rem/h
1	Gy/h

5.12.11 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold (read-only) 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)

22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.12.12 Miscellaneous

ARC	Read single pulse divider
	Response: number for single pulse divider
ARt	Read fixed time constant (from V2.00)
	Response: time in 0.1s units
AWC*Number*	Write single pulse divider
	Number: value from 1 to 65535
AWt	Write fixed time constant (from V2.00)
	Number: value from 10 to 65535

5.13 RadEye PX

Used firmware version: 1.63

5.13.1 Limit values

AR1	Reading the threshold 1 for activity alarm β threshold. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm β threshold. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for activity alarm α threshold. Response: number in 0.01 Bq units.
AR4	Reading the threshold 2 for activity alarm α threshold. Response: number in 0.01 Bq units.
AR5	Reading the threshold 1 for count rate alarm β threshold. Response: number in 0.01 cps units
AR6	Reading the threshold 2 for count rate alarm β threshold. Response: number in 0.01 cps units
AR7	Reading the threshold 1 for count rate alarm α threshold. Response: number in 0.01 cps units
AR8	Reading the threshold 2 for count rate alarm α threshold. Response: number in 0.01 cps units
AR9	Reading alarm thresholds for dose rate and dose Response: - threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units - threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units - threshold 1 for dose alarm in µR, µrem or 0.01µSv units - threshold 2 for dose alarm in µR, µrem or 0.01µSv units
ARP	Reading scaler parameter: - Preset count threshold 1. Response: Number in counts - Preset count threshold 3. Response: Number in counts - Preset time. Response: Number in seconds
ARN	Reading background parameter: - Preset count threshold 1. Response: Number in counts

- Preset count threshold 3. Response: Number in counts
- Preset time. Response: Number in seconds

ARB Reading background values:
- Background value threshold 1. Response: Value in 0.01 cps
- Background value threshold 3. Response: Value in 0.01 cps

AW1*Number* Setting the threshold 1 for activity alarm β threshold.
Number: value in 0.01 Bq units.

AW2*Number* Setting the threshold 2 for activity alarm β threshold
Number: value in 0.01 Bq units

AW3*Number* Setting the threshold 1 for activity alarm α threshold
Number: value in 0.01 Bq units.

AW4*Number* Setting the threshold 2 for activity alarm α threshold
Number: value in 0.01 Bq units

AW5*Number* Setting the threshold 1 for count rate alarm β threshold..
Number: value in 0.01 cps units.

AW6*Number* Setting the threshold 2 for count rate alarm β threshold.
Number: value in 0.01 cps units.

AW7*Number* Setting the threshold 1 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW8*Number* Setting the threshold 2 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW9*Number Number…* Setting alarm thresholds for dose rate and dose
Number: threshold 1 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
Number: threshold 2 for dose rate alarm in µR/h, µrem/h or 0.01µSv/h units
Number: threshold 1 for dose alarm in µR, µrem or 0.01µSv units
Number: threshold 2 for dose alarm in µR, µrem or 0.01µSv units

AWP*Number Number*.. Set scaler parameter:
Number: Preset count threshold 1 in counts (from 0 to 9999 counts)
Number: Preset count threshold 3 in counts (from 0 to 9999 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWN*Number Number*.. Set background parameter:
Number: Preset count threshold 1 in counts (from 0 to 9999 counts)
Number: Preset count threshold 3 in counts (from 0 to 9999 counts)

Number: Preset time in seconds (from 0 to 9999 seconds)

AWB*Number Number* Set background value:
Number: Background value threshold 1 in 0.01 cps (from 0 to 100 cps)
Number: Background value threshold 3 in 0.01 cps (from 0 to 100 cps)

5.13.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Reserved
- HV power index

z Read filtered count rate β and α threshold
Response:
- Value β threshold 0.01 cps
- Value α threshold in 0.01 cps

A Read display value and status

Response:

- display value β threshold in 0.01 cps, cpm, Bq, dps, dpm or Bq/cm² units
- display value α threshold in 0.01 cps, cpm, Bq, dps dpm or Bq/cm² units or in µR, µrem or 0.01µSv units in dose rate mode
- Status (see 5.5.6.2)

5.13.3 Configuration flags

5.13.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Not used
7	Single Pulse 0: off 1: on

5.13.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (read-only)
5	Display of temperature 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Not used

5.13.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		
7	not used		

5.13.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Not used		
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha-LED	0:No	1:yes
9	Alpha-Sound	0:No	1:yes
10	Not used		
11	Not used		
12	Not used		
13	Ratemeter Tau active	0:No	1:yes
14	Not used		
15	Not used		

5.13.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x05 Display unit Sv/h
1	0x01 Display unit cpm 0x06 Display unit R/h
2	0x02 Display unit Bq 0x07 Display unit rem/h
3	0x03 Display unit dps 0x08 Display unit Bq/cm²
	0x04 Display unit dpm 0x09 Display unit Gy/h
4	0: Ratemeter (Tau or ADF), 1: Scaler
5	Display mode:
6	00: measurement value β threshold 01: measurement value α threshold 02: dual display 03: graphic display
7	0: two decimal places 1: one decimal place

5.13.3.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

5.13.3.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Select counter tube	0: hidden	1:visible
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm β Alarm act. β Alarm dose rate	0: hidden	1:visible
9	Alarm α Alarm act. α Alarm dose	0: hidden	1:visible
10	not used		
11	not used		
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

5.13.3.6.2 Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Alpha-LED	0: hidden	1:visible
5	Alpha Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Display αβ / β	0: hidden	1:visible
8	Not used		
9	Set HV	0: hidden	1:visible
10	Bluetooth	0: hidden	1:visible
11	Edit Tau	0: hidden	1:visible
12	Language	0: hidden	1:visible
13	Contrast	0: hidden	1:visible
14	not used		
15	not used		

5.13.3.6.3 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3…8	not used, write “0”		

5.13.3.6.4 Submenu “Operation mode”

Bit number			
0	Ratemeter ADF	0:hidden	1:visible
1	Scaler	0: hidden	1:visible
2	Ratemeter Tau	0: hidden	1:visible

5.13.4 High voltage

HR Reading high voltage
Response: value in Volt.

5.13.5 History output

5.13.5.1 History readout ratemeter

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Max value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  |               Activity in 0.01 Bq
 |     |       |   |  |               Dose rate in 1 µR/h
 |     |       |   |  \-------------- Mean value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   |                  Dose rate in 1 µR/h
 |     |       |   \----------------- Max value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       |                      Activity in 0.01 Bq
 |     |       \--------------------- Mean value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

5.13.5.2 History readout scaler

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Background value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  \-------------- Measuring value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   |                  Dose rate in 1 µR/h
 |     |       |   \----------------- Background value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       \--------------------- Measuring value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

End of History:

End

5.13.5.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Number of used probe		
3			
4			
5			
6	Background measurement	0:No	1:Yes
7	Display of	0:αβ	1: β
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps 0x01 Display unit cpm 0x02 Display unit Bq 0x03 Display unit dps 0x04 Display unit dpm	0x05 Display unit Sv/h 0x06 Display unit R/h 0x07 Display unit rem/h 0x08 Display unit Bq/cm² 0x09 Display unit Gy/h	
13			
14			
15			
16	Probe style		
17	000: αβ-Probe	011: Dose rate probe	
18	001: α-Probe	100: Gamma probe multi channel	
	010: β-Probe		
19	Not used		
20	Accumulated counts	0:No	1:Yes
21	Not used		
22	Not used		
23	Not used		
24	Not used		
25	Not used		
26	Not used		
27	Not used		
28	Not used		
29	Not used		
30	Not used		
31	Not used		

5.13.6 Nuclide table

nR*Number* Reading nuclide data.
Number: number of probe
Response: Nuclide data (see below)

nW*NumberString* Write nuclide data
Number: number of probe
String: nuclide data (see below)

Nuclide data: every string contains up to 16 nuclide data of the corresponding probe
For example:

```
00 01 Sr-90 471 999 Am-241 330 123 usw. 0815
-- -- ----- --- --- ------ --- ---      ----
|     |   |   |    |    |     |    |        |
|     |   |   |    |    |     |    |        \--  Checksum (in HEX)
|     |   |   |    |    |     |    \-----------  Factor for α threshold
|     |   |   |    |    |     \----------------  Factor for β threshold
|     |   |   |    |    \----------------------  Name of nuclide 2 (do not use space)
|     |   |   |    \---------------------------  Factor for α threshold
|     |   |   \-------------------------------  Factor for β threshold
|     |   \-----------------------------------  Name of nuclide 1 (do not use space)
|     \---------------------------------------  Active nuclide number
\-------------------------------------------  Number of nuclides in this string
```

Activity calculation:
F=1/Eeff
Ar=Cr*F

For example:
Count rate is 67.3 cps and efficiency for Sr-90 is 29%. Factor F is 1/0.29=3.448.
The activity is 67.3*3.45=232.18 Bq.
Write “0” for null efficiency. In this case the RadEye displays “### Bq”.

Checksum calculation: Checksum starts from the beginning of the message to the end, with the checksum. Checksum is modulo 256.

5.13.7 Probe data

zR*Number*	Reading probe data. *Number*: consecutive number Response: probe data (see below)
zW*NumberString*	Write probe data *Number*: consecutive number *String*: probe data
zRA	Read the number of stored probes. Response: value from 0…15
zWA*Number*	Read the number of stored probes. *Number*: value from 0…15
zRG	Reading active probe. Response: value from 0…15
zWG*Number*	Write active probe. *Number*: value from 0…15

For example:

```
HP-380AB 10000 5 5 5 5 600 100 100 30 100 10 1 3 5 8 30 225 1000 1250 1234
```

1	Probe name. Max. 11 characters. Do not use space
2	Calibration factor in 10(nSv/h)/cps units
3	Dead time Rate 1 µs
4	Dead time Rate 2 µs
5	Dead time Rate 3 µs
6	Not used
7	High voltage in Volt
8	Overload Rate 1 in kcps
9	Overload Rate 3 in kcps
A	Not used
B	Area of this probe
C	Timeout for detector error in seconds
D	Factor Rate 1 for dose rate calculation. Range: -128…+127
E	Factor Rate 2 for dose rate calculation. Range: -128…+127
F	Factor Rate 3 for dose rate calculation. Range: -128…+127

G	Not used
H	Threshold Rate 1 in mV. Range: 30..1220mV
I	Threshold Rate 2 in mV. Range: 30..1220mV
J	Threshold Rate 3 in mV. Range: 30..1220mV
K	Not used
L	Flags

Flags

<table>
<tr><td>Bit number</td><td></td></tr>
<tr><td>0</td><td rowspan="2">Window:
00: No window. Display of Rate 1 Rate 3
01: β window. Display Rate 1 – Rate 2 and Rate 3</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Pulse fade out 0: off 1: on</td></tr>
<tr><td>3</td><td>Probe style</td></tr>
<tr><td>4</td><td rowspan="3"><table><tr><td>000: αβ-Probe</td><td>011: Dose rate probe</td></tr><tr><td>001: α-Probe</td><td>100: Gamma probe multi channel</td></tr><tr><td>010: β-Probe</td><td></td></tr></table></td></tr>
<tr><td>5</td></tr>
<tr><td>6</td><td>Reserved, write “0”</td></tr>
<tr><td>7</td><td>Reserved, write “0”</td></tr>
<tr><td>8</td><td>Single Pulse 0: every Count, 1: with Divide Ratio (see Command ARC)</td></tr>
<tr><td>9..15</td><td>Not used</td></tr>
</table>

Dead time correction:

$$C1 = \frac{C1raw}{1 - \tau 1 * C1raw}$$

$\tau 1$ Dead time

C1raw: raw count rate

1- τ1*C1raw is limited to min. 0.1

Dose rate calculation:

DR=Cf * (D *Rate1+ E *Rate2+ F *Rate3)

DR: Dose rate in nSv/h

Cf: Calibration factor in nSv/h/cps

Rate 1..3 Count rate of threshold 1..3 in cps

5.13.8 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Operation mode 0: Ratemeter 1:Scaler
9	Not used
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Clear dose 0: no 1:yes
15	1: Alarm threshold changed
16	1: Dose rate, count rate or activity -alarm
17	1: Alarm dose
18	NBR-Alarm 01: Low energy 10: High energy 11: Anomaly
19	
20	Dose rate, count rate or activity > alarm threshold 1
21	Dose rate, count rate or activity > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	1: Scaler or Background parameter changed
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Not used

5.13.9 Automatic sending

```
<STX>721  5 0 0 14 PX 1234 AB<ETX><CR><LF>
      |   | | |  |  |   |   |
      |   | | |  |  |   |   \---- BCC in HEX
      |   | | |  |  |   \-------- Dose in µR/h
      |   | | |  |  \------------ information RadEye GX
      |   | | |  \--------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Fixed to “5“
      \------------------------- Count rate 1 in 0.01cps
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.13.10 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold (read-only) 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.13.11 Miscellaneous

ARC Read single pulse divider
Response: number for single pulse divider

ARt	Read fixed time constant (from V1.69) Response: time in 0.1s units
AWC*Number*	Write single pulse divider Number: value from 1 to 65535
AWt	Write fixed time constant (from V1.69) Number: value from 10 to 65535

5.14 RadEye HEC

Used firmware version: 1.69

5.14.1 Limit values

AR1	Reading the threshold 1 for activity alarm β threshold. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm β threshold. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for activity alarm α threshold. Response: number in 0.01 Bq units.
AR4	Reading the threshold 2 for activity alarm α threshold. Response: number in 0.01 Bq units.
AR5	Reading the threshold 1 for count rate alarm β threshold. Response: number in 0.01 cps units
AR6	Reading the threshold 2 for count rate alarm β threshold. Response: number in 0.01 cps units
AR7	Reading the threshold 1 for count rate alarm α threshold. Response: number in 0.01 cps units
AR8	Reading the threshold 2 for count rate alarm α threshold. Response: number in 0.01 cps units
AW1*Number*	Setting the threshold 1 for activity alarm β threshold. *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 2 for activity alarm β threshold *Number*: value in 0.01 Bq units
AW3*Number*	Setting the threshold 1 for activity alarm α threshold Number: value in 0.01 Bq units.
AW4*Number*	Setting the threshold 2 for activity alarm α threshold *Number*: value in 0.01 Bq units
AW5*Number*	Setting the threshold 1 for count rate alarm β threshold.. *Number:* value in 0.01 cps units.

AW6*Number* Setting the threshold 2 for count rate alarm β threshold.
Number: value in 0.01 cps units.

AW7*Number* Setting the threshold 1 for count rate alarm α threshold.
Number: value in 0.01 cps units

AW8*Number* Setting the threshold 2 for count rate alarm α threshold.
Number: value in 0.01 cps units

5.14.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- HV power index
- Probe current in 0.1 µA units

z Read filtered count rate β and α threshold
Response:
- Value β threshold 0.01 cps
- Value α threshold in 0.01 cps

5.14.3 Scaler remote control (from V1.69)

CG Start scaler with parameter previously set

CS Stop scaler

CI Scaler information
Response:
- 0: Scaler stopped, 1: Scaler active
- Scaler counting time
- accumulated counts threshold 1 or window 1
- accumulated counts threshold 3 or window 2
- accumulated counts threshold 1
- accumulated counts threshold 2
- accumulated counts threshold 3
- accumulated counts threshold 4

A Read display value and status

Response:

- display value β threshold in 0.01 cps, cpm, Bq, dps, dpm or Bq/cm² units
- display value α threshold in 0.01 cps, cpm, Bq, dps dpm or Bq/cm² units
- Status (see 5.5.6.2)

5.14.4 Configuration flags

5.14.4.1 Configuration flags 1 with kR / kW

Bit number			
0	Not used		
1	Not used		
2	Not used		
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	Not used		
7	Single Pulse	0: off	1: on

5.14.4.2 Configuration flags 2 with fR / fW

Bit number			
0	Not used		
1	Not used		
2	Not used		
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (read-only)		
5	Display of temperature	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	Not used		

5.14.4.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	not used, write “0”		
6	Preset Count is read only	0:off	1:on
7	Beep at the end of a scaler measurement	0:off	1:on

5.14.4.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	not used, write “1”		
2	not used, write “0”		
3	Scaler mode	0: Preset count	1: Preset time
4	Not used		
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Alpha-LED	0:No	1:yes
9	Alpha-Sound	0:No	1:yes
10	Not used		
11	Not used		
12	Not used		
13	Not used		
14	Not used		
15	Not used		

5.14.4.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x04 Display unit dpm 0x01 Display unit cpm 0x08 Display unit Bq/cm²
1	
2	0x02 Display unit Bq
3	0x03 Display unit dps
4	0: Ratemeter, 1: Scaler
5	Display mode:
6	00: measurement value β threshold 01: measurement value α threshold 02: dual display
7	0: two decimal places 1: one decimal place

5.14.4.6 Menu configuration

mR Read configuration for main menu and submenu “Settings”
Response: Hex-values. See below

mR*Hex Hex* Write configuration for main menu and submenu “Settings”
See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Select counter tube	0: hidden	1:visible
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm β Alarm act. β	0: hidden	1:visible
9	Alarm α Alarm act. α	0: hidden	1:visible
10	not used		
11	not used		
12	not used		
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Alpha-LED	0: hidden	1:visible
5	Alpha Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Display αβ/β	0: hidden	1:visible
8	Source test		
9	Set HV	0: hidden	1:visible
10	not used, write “0”		
11	Language *(from V1.69)*	0: hidden	1:visible
12	Contrast *(from V1.69)*	0: hidden	1:visible
13..15	not used, write “0”		

5.14.5 High voltage

HR Reading high voltage
Response: value in Volt.

5.14.6 Remote control (from V1.68)

CG Start a scaler measurement

CS Stop a scaler measurement

CI Scaler measurement information:

- Scaler measurement 0: stopped 1: active
- expired time
- accumulated counts alpha/beta or beta channel
- accumulated counts alpha channel (Rate 3)
- accumulated counts counter 1
- accumulated counts counter 2
- accumulated counts counter 3
- accumulated counts counter 4

5.14.7 History output

5.14.7.1 History readout ratemeter

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Max value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  |               Activity in 0.01 Bq
 |     |       |   |  \-------------- Mean value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   \----------------- Max value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       |                      Activity in 0.01 Bq
 |     |       \--------------------- Mean value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

5.14.7.2 History readout scaler

```
256 716612088 721 999 12 50 120 23
--- --------- --- --- -- -- --- --
 |     |       |   |  |  |   |  |
 |     |       |   |  |  |   |  \---- Temperature in °C
 |     |       |   |  |  |   \------- Measuring time in seconds
 |     |       |   |  |  \----------- Background value α channel
 |     |       |   |  |               Count rate in 0.01 cps
 |     |       |   |  \-------------- Measuring value α channel
 |     |       |   |                  count rate in 0.01 cps,
 |     |       |   |                  Activity in 0.01 Bq
 |     |       |   \----------------- Background value β channel
 |     |       |                      count rate in 0.01 cps,
 |     |       \--------------------- Measuring value β channel
 |     |                              count rate in 0.01 cps,
 |     |                              Activity in 0.01 Bq
 |     \------------------------------ Date and Time as a decimal value
 \------------------------------------ History status as a decimal value
                                       see below
```

End of History:

```
End
```

5.14.7.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Accumulated counts	0:No	1:Yes
2	Not used		
3	Number of used parameter set		
4			
5			
6	Background measurement	0:No	1:Yes
7	Beta Window	0:αβ	1: β
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x04 Display unit dpm	
13	0x01 Display unit cpm	0x08 Display unit Bq/cm²	
14	0x02 Display unit Bq		
15	0x03 Display unit dps		

5.14.8 Nuclide table

nR*Number* Reading nuclide data.
Number: number of probe
Response: Nuclide data (see below)

nW*NumberString* Write nuclide data
Number: number of probe
String: nuclide data (see below)

Nuclide data: every string contains up to 16 nuclide data of the corresponding parameter set
For example:

```
00 01 Sr-90 471 999 Am-241 330 123 usw. 0815
-- -- ----- --- --- ------ --- ---      ----
|     |   |   |    |    |     |    |        |
|     |   |   |    |    |     |    |        \--  Checksum (in HEX)
|     |   |   |    |    |     |    \-----------  Factor for α threshold
|     |   |   |    |    |     \----------------  Factor for β threshold
|     |   |   |    |    \----------------------  Name of nuclide 2 (do not use space)
|     |   |   |    \---------------------------  Factor for α threshold
|     |   |   \--------------------------------  Factor for β threshold
|     |   \-----------------------------------  Name of nuclide 1 (do not use space)
|     \---------------------------------------  Active nuclide number
\------------------------------------------------ Number of nuclides in this string
```

Activity calculation:
F=1/Eeff
Ar=Cr*F

For example:
Count rate is 67.3 cps and efficiency for Sr-90 is 29%. Factor F is 1/0.29=3.448.
The activity is 67.3*3.45=232.18 Bq.
Write “0” for null efficiency. In this case the RadEye displays “### Bq”.

Checksum calculation: Checksum starts from the beginning of the message to the end, with the checksum. Checksum is modulo 256.

5.14.9 Parameter data

zR*Number*	Reading parameter data. *Number*: consecutive number Response: parameter data (see below)
zW*NumberString*	Write parameter data *Number*: consecutive number *String*: parameter data
zRA	Read the number of stored parameters. Response: value from 0…7
zWA*Number*	Read the number of stored parameters. *Number*: value from 0…7
zRG	Reading active parameter. Response: value from 0…7
zWG*Number*	Write active parameter. *Number*: value from 0…7

For example:

```
HEC-Def 10000 5 5 5 5 600 100 100 30 100 10 1 3 5 8 30 225 1000 1250 1234
  1       2  3 4 5 6  7   8   9   A   B   C  D E F G  H  I   J    K    L
```

1	Probe name. Max. 11 characters. Do not use space
2	Not used
3	Dead time Rate 1 µs
4	Dead time Rate 2 µs
5	Dead time Rate 3 µs
6	Dead time Rate 4 µs
7	High voltage in Volt
8	Overload Rate 1 in kcps
9	Overload Rate 3 in kcps
A	Overload probe current µA
B	Reference area
C	Timeout for detector error in seconds
D	Not used
E	Not used
F	Not used

G	Not used
H	Threshold Rate 1 in mV. Range: 30..1220mV
I	Threshold Rate 2 in mV. Range: 30..1220mV
J	Threshold Rate 3 in mV. Range: 30..1220mV
K	Not used, write “1220”mV
L	Flags

Flags

Bit number	
0	Window: 00: No window. Display of Rate 1 Rate 3 01: β window. Display Rate 1 – Rate 2 and Rate 3
1	
2	Pulse fade out 0: off 1: on
3	Not used
4	
5	
6	Reserved, write “0”
7	Reserved, write “0”
8	Single Pulse 0: every Count, 1: with Divide Ratio (see Command ARC)
9..15	Not used

Dead time correction:

$$C1 = \frac{C1raw}{1 - \tau 1 * C1raw}$$

C1raw: raw count rate

$\tau 1$ Dead time

1- τ1*C1raw is limited to min. 0.1

5.14.10 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Operation mode 0: Ratemeter 1:Scaler
9	Not used
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	Clear dose 0: no 1:yes
15	1: Alarm threshold changed
16	1: count rate or activity -alarm
17	Not used
18	Not used
19	
20	count rate or activity > alarm threshold 1
21	count rate or activity > alarm threshold 2
22	Not used
23	Not used
24	1: Scaler or Background parameter changed
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Not used

5.14.11 Automatic sending

```
<STX>721  5 0 0 14 HEC 1234 AB<ETX><CR><LF>
      |   | | |  |  |   |   |
      |   | | |  |  |   |   \---- BCC in HEX
      |   | | |  |  |   \-------- Dose in µR/h
      |   | | |  |  \------------ information RadEye GX
      |   | | |  \--------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Fixed to “5“
      \------------------------- Count rate 1 in 0.01cps
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.14.12 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold (read-only) 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Not used
23	Not used
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.14.13 Checksource

lRA	Read number of check sources. Response: number from 0 to 15
lRR	Read repeat time and timestamp of last complete test. Response: - repeat time in hh from 0 to 65535 (0=off) - date and time of last complete test
lR0..15	Read check source information - Name of source - Serial of source - Activity of Source (Bq) - Day of activity - Month of activity - Year of activity - Half life (with factor 1000) - Beta efficiency (with factor 100) - Alpha efficiency (with factor 100) - Crossover - Flags - Timestamp of last Test

- Beta efficiency (with factor 100)

5.15 RadEye GFex/GF-10ex/Gex/G-10ex

Used firmware version: V1.53

5.15.1 Limit values

AR5	Reading the threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
AR6	Reading the threshold 2 for dose rate alarm. Response: see command AR5
AR7	Reading the threshold 1 for the dose alarm Response: number in µSv, 100µR or 100µrem units
AR8	Reading the threshold 2 for the dose alarm see command AR7
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units. e. g. AW3123 means 123µR/h.
AW6*Number*	Setting the threshold 2 for dose rate alarm. see command AW3
AW7*Number*	Setting the threshold 1 for dose alarm. *Number* = in 100µR, 100µrem or 1µSv units. e. g. AW7123 means 12.3mR.
AW8*Number*	Setting the threshold 2 for dose alarm. *Number* = see command AW7

5.15.2 Measurement values

Z	Read raw count rates with dead time correction Response: - Counter 1 in cps - TTP value - HV power in cps

5.15.3 Configuration flags

5.15.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	not used, write “0”
7	Single Pulse 0: off 1: on

5.15.3.2 Configuration flags 2 with fR / fW

Bit number		
0	Disable keylock:	0: no 1:yes
1		
2	Fixed to “1”	
3	Alarm threshold read-only	0: off 1:on
4	Flag for overload (readonly)	
5	Temp.display	0: off 1:on
6	Temperature unit	0: °C 1: °F
7	Don not silence audio alarm	0: off 1:on

5.15.3.3 Configuration flags 3 with KR / KW

Bit number		
0	Key tone	0:off 1:on
1	Autosend	0:off 1:on
2	Finder	0:off 1:on
3	Mean-Max	0:off 1:on
4	not used, write “0”	
5	display of dose	0:off 1:on
6	Fixed to “1”	
7	Not used	

5.15.3.4 Configuration flags 4 with jR / jW

Bit number	
0	not used, write “0”

1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: preset count	1: preset time
4	Scaler “Auto restart”	0:off	1:on
5	Net Scaler	0:off	1:on
6	Net Ratemeter	0:off	1:on
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	Display mR/h instead µR/h	0:No	1:yes
14	not used, write “0”		
15	not used, write “0”		

5.15.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x05 Display unit Sv/h 0x06 Display unit R/h 0x07 Display unit rem/h
1	
2	
3	
4	0: Ratemeter, 1: Scaler
5	Last used display unit (dose rate)
6	0x00 Sv/h 0x01 R/h 0x02 rem/h
7	Not used

5.15.3.6 Menu configuration

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit		
5	Operation mode		
6	Scaler parameter		
7	not used, write “0”		
8	not used, write “0”		
9	Alarm Dose Rate	0: hidden	1:visible
10	not used, write “0”		
11	Alarm Dose	0: hidden	1:visible
12	Clear Dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		
30	not used, write “0”		
31	not used, write “0”		

Submenu Settings:

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Source test	0: hidden	1:visible
6	not used, write “0”		

7	not used, write “0”
8	not used, write “0”
9	not used, write “0”
10	not used, write “0”
11	not used, write “0”
12	not used, write “0”
13	not used, write “0”
14	not used, write “0”
15	not used, write “0”

Alarm indication

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		

5.15.4 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

5.15.5 Dead time correction

x — Read dead time
Response: dead time in ns

5.15.6 History output

5.15.6.1 History readout

History status for 1. readout and change of history cycle time

```
1073741944 520534610
---------- ---------
     |          |
     |          |
     |          \-------- Date and Time as a decimal value
     \------------------- History status as a decimal value
```

following readout:

```
15 11 +19
-- -- ---
|  |   |
|  |   \--- Temperature in °C
|  \------- Rate mean in µR/h, µrem/h or 0.01µSv/h units
\---------- Rate max in µR/h, µrem/h or 0.01µSv/h units
```

End of History:

```
End
```

5.15.6.2 History status

decimal value converted in HEX:

```
0x40000078
  |   ----
  |     |
  |     \-- History cycle time (0x78 -> 120s)
  |
  \-------- 4: identifier for status information
            6: identifier for status information +
            last power on without power off
```

5.15.7 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Fixed to “0”
9	Fixed to “0”
10	Fixed to “1”
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: Alarm dose rate
17	1: Alarm dose
18	Not used
19	Not used
20	Dose rate > alarm threshold 1
21	Dose rate > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Power off
27	Power on
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

5.15.8 Automatic sending

```
<STX>7 2 0 0 14 FH41B2 123 AB<ETX><CR><LF>
```

```
| | | | |    |    |   |
| | | | |    |    |   \- BCC in HEX
| | | | |    |    \----- Dose in µR/h
| | | | |    \---------- information RadEye G
| | | | \--------------- Status as Hex-value
| | | \----------------- „0“ not used
| | \------------------- „0“ not used
| \--------------------- „2“ not used
\----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm dose rate
3	1: Alarm dose
4	not used
5	1: Battery voltage low
6	not used
7	not used

5.15.9 Status information

F Reading status information
Response Number with status information

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	0x01: measuring unit R/h 0x10. measuring unit Sv/h 0x11: measuring unit rem/h	
9		
10		
11	not used,	
12	Alarm threshold read-only	0: off 1:on
13	Flag for overload	
14	Temperature display	0: off 1:on
15	Fixed to “0”	

16	1: Alarm dose rate
17	1: Alarm dose
18	Fixed to “0”
19	Not used
20	Dose rate > alarm threshold 1
21	Dose rate > alarm threshold 2
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.16 RadEye G/G-10/B20/G20/G20-10/GF/GF-10 (from V2.00)

Used firmware version: V2.06

5.16.1 Limit values

AR1	Reading the threshold 1 for activity alarm. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for count rate alarm. Response: number in 0.01 cps units.
AR4	Reading the threshold 2 for count rate alarm. Response: number in 0.01 cps units.
AR5	Reading the threshold 1 dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR6	Reading the threshold 2 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR7	Reading the threshold 1 for dose alarm. Response: number in µR, µrem or 0.01µSv units
AR8	Reading the threshold 2 for dose alarm. Response number in µR, µrem or 0.01µSv units
ARP	Reading scaler parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
ARN	Reading background parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
ARB	Reading background value: Response: Value in 0.01cps
AW1*Number*	Setting the threshold 1 for activity alarm *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 2 for activity alarm *Number*: value in 0.01 Bq units

AW3*Number* Setting the threshold 1 for count rate alarm
Number: value in 0.01 cps units.

AW4*Number* Setting the threshold 2 for count rate alarm
Number: value in 0.01 cps units

AW5*Number* Setting the threshold 1 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW6*Number* Setting the threshold 2 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW7*Number* Setting the threshold 1 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

AW8*Number* Setting the threshold 2 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

AWP*Number Number* Set scaler parameter:
Number: Preset count in counts (from 0 to 9999 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWN*Number Number* Set background parameter:
Number: Preset count in counts (from 0 to 9999 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWB*Number Number* Set background value:
Number: Value in 0.01 cps (from 0 to 100 cps)

5.16.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- HV power in cps

z Read filtered count rate
Response: Number in 0.01 cps units

A Read display value and status
Response:
- display value Dose rate in 1µR/h, 1µrem/h, 0.01µSv/h units or 0.01 cps, cpm, Bq, dps, dpm, Bq/cm² units
- Status (see 5.16.6.3)

5.16.3 Configuration flags

5.16.3.1 Configuration flags 1 with kR / kW

Bit number	
0	Not used
1	Not used
2	Not used
3	Alarming Sound 0: off 1: on
4	Alarming LED 0: off 1: on
5	Alarming Vibration 0: off 1: on
6	Not used
7	Single Pulse 0: off 1: on

5.16.3.2 Configuration flags 2 with fR / fW

Bit number	
0	Not used
1	Not used
2	Not used, write “1”
3	Alarm threshold read-only 0: off 1:on
4	Flag for overload (readonly)
5	Display of temperature 0: off 1:on
6	Temperature unit 0: °C 1: °F
7	Not used

5.16.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		
7	not used		

5.16.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Not used		
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Not used		
9	Not used		
10	Not used		
11	Not used		
12	Not used		
13	Not used		
14	Not used		
15	Not used		

5.16.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x04 Display unit dpm
1	0x01 Display unit cpm 0x05 Display unit Sv/h
2	0x02 Display unit Bq 0x06 Display unit R/h
3	0x03 Display unit dps 0x07 Display unit rem/h
	0x08 Display unit Bq/cm²
4	0: Ratemeter, 1: Scaler
5	Last used display unit (dose rate)
6	0x00 Sv/h 0x01 R/h 0x02 rem/h
7	Not used

5.16.3.6 Menu configuration

mR Read configuration for

- main menu,
- submenu “Settings”
- submenu “Alarm indication”

Response: Hex-values. See below

mR*Hex Hex* Write configuration for

- main menu,
- submenu “Settings”
- submenu “Alarm indication”

See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm activity	0: hidden	1:visible
11	Alarm dose	0: hidden	1:visible
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17	not used, write “0”		
18	not used, write “0”		
19	not used, write “0”		
20	not used, write “0”		
21	not used, write “0”		
22	not used, write “0”		
23	not used, write “0”		
24	not used, write “0”		
25	not used, write “0”		
26	not used, write “0”		
27	not used, write “0”		
28	not used, write “0”		
29	not used, write “0”		

30	not used, write “0”
31	not used, write “0”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	not used, write “0”		
11	not used, write “0”		
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		

5.16.4 High voltage

HR — Reading high voltage bit value
Response: Bit value 0…255.

5.16.5 Dead time correction

x — Read dead time
Response: dead time in ns

5.16.6 History output

5.16.6.1 History readout ratemeter

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Max value
 |     |       |                Count rate in 0.01 cps, cpm
 |     |       |                Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |       |          Dose rate µR/h, rem/h or 0.01µSv/h
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

5.16.6.2 History readout scaler

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Background in 0.01 cps
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

End of History:

End

5.16.6.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Reserved. For internal use only.		
3	Accumulated counts	0:No	1:Yes
4	Background measurement	0:No	1:Yes
5	Scaler with	0: Preset Counts	1: Preset Time
6	Used filter (B20 and B20-ER only)		
7	0: No filter 1: Alpha blocker, 2:H*(10), 3:Hx		
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x04 Display unit dpm	
13	0x01 Display unit cpm	0x05 Display unit Sv/h	
14	0x02 Display unit Bq	0x06 Display unit R/h	
15	0x03 Display unit dps	0x07 Display unit rem/h	
		0x08 Display unit Bq/cm²	

5.16.7 Nuclide table

nR*Number*	Reading nuclide data. *Number*: consecutive number Response: Nuclide data (see below)
nW*NumberString*	Write nuclide data *Number*: consecutive number *String*: nuclide data e.g. `nW02Sr-90 500 555 3333`
nRA	Reading number of stored nuclides. Response: value from 0…15
nWA*Number*	Write the number of stored nuclides. *Number*: value from 0…15
nRG	Reading active nuclide. Response: value from 0…15
nWA*Number*	Write the number of active nuclides. *Number*: value from 0…15

Nuclide data:

```
Sr-90 500 555 3333
----- --- --- ----
  |     |   |   |
  |     |   |   \----  Factor for activity calculation with gamma filter
  |     |   \--------  Factor for activity calculation with alpha blocker
  |     \------------  Factor for activity calculation without filter
  \------------------  Nuclide name. Up to 6 characters. Do not use space (0x20)
```

Activity calculation:

F=1/Eeff

Ar=Cr*F

F:	Factor for Efficiency calculation
Eeff	Efficiency for this nuclide
Ar	Activity
Cr	Measured count rate

For example:
Count rate is 67.3 cps without filter and efficiency for Sr-90 is

- 29% without filter.
- 25% with alpha blocker
- 10% with gamma filter

Factor F is 1/0.29=3.448.

- 1/0.29 = 3.448 without filter.
- 1/0.25 = 4.0 with alpha blocker
- 1/0.10 = 10.0 with gamma filter

To set the parameter, sent: `nW00Sr-90 345 400 1000`.
The activity is 67.3*3.45=232.18 Bq

5.16.8 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	Not used	
9		
10		
11	Sound	0: off 1:on
12	LED	0: off 1:on
13	Vibration alarm	0: off 1:on
14	Clear dose	0: no 1:yes
15	1: Alarm threshold changed	
16	1: Dose rate, count rate or activity -alarm	
17	1: Alarm dose	
18	Not used	
19	Not used	
20	Dose rate, count rate or activity > alarm threshold 1	
21	Dose rate, count rate or activity > alarm threshold 2	
22	Dose > alarm threshold 1	
23	Dose > alarm threshold 2	
24	1: Scaler or Background parameter changed	
25	Not used	
26	Power off	
27	Power on	
28	Not used	
29	Not used	
30	Not used	
31	Not used	

5.16.9 Automatic sending

```
<STX>721  2 0 0 14 B20ER 1234 AB<ETX><CR><LF>
      |   | | | |    |     |   |
      |   | | | |    |     |   \- BCC in HEX
      |   | | | |    |     \----- Dose in µR/h
      |   | | | |    \----------- information RadEye *)
      |   | | | \---------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Mesurement unit **)
      \-------------------------- Measurement value
```

*) Information RadEye:

B20	RadEye B20
B20ER	RadEye B20-ER
G20	RadEye G20
G20ER	RadEye G20-ER
G2010	RadEye G20-10
G20ER1	RadEye G20-ER10
GF	RadEye GF
GF10	RadEye GF-10
FH41B2	RadEye G or RadEye G-10

**) Measurement unit

5	Dimension cps
3	Dimension cpm
7	Dimension dpm
8	Dimension Bq/cm²
6	Dimension Bq
9	Dimension dps
0	Dimension Sv/h
10	Dimension rem/h
2	Dimension R/h

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.16.10 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Not used
25	Not used
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Not used

5.17 RadEye G/G-10/B20/G20/G20-10/GF/GF-10 (from V3.00)

Used firmware version: V3.06

5.17.1 Limit values

AR1	Reading the threshold 1 for activity alarm. Response: number in 0.01 Bq units.
AR2	Reading the threshold 2 for activity alarm. Response: number in 0.01 Bq units.
AR3	Reading the threshold 1 for count rate alarm. Response: number in 0.01 cps units.
AR4	Reading the threshold 2 for count rate alarm. Response: number in 0.01 cps units.
AR5	Reading the threshold 1 dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR6	Reading the threshold 2 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h units
AR7	Reading the threshold 1 for dose alarm. Response: number in µR, µrem or 0.01µSv units
AR8	Reading the threshold 2 for dose alarm. Response number in µR, µrem or 0.01µSv units
ARP	Reading scaler parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
ARN	Reading background parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds
ARB	Reading background value: Response: Value in 0.01cps
ARt	Reading Tau (from V3.06): Response: Value in 0.1 s
AW1*Number*	Setting the threshold 1 for activity alarm *Number*: value in 0.01 Bq units.
AW2*Number*	Setting the threshold 2 for activity alarm *Number*: value in 0.01 Bq units

AW3*Number* Setting the threshold 1 for count rate alarm
Number: value in 0.01 cps units.

AW4*Number* Setting the threshold 2 for count rate alarm
Number: value in 0.01 cps units

AW5*Number* Setting the threshold 1 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW6*Number* Setting the threshold 2 dose rate alarm.
Number: value in µR/h, µrem/h or 0.01µSv/h units.

AW7*Number* Setting the threshold 1 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

AW8*Number* Setting the threshold 2 for dose alarm.
Number: value in µR, µrem or 0.01µSv units

AWP*Number Number* Set scaler parameter:
Number: Preset count in counts (from 0 to 9999 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWN*Number Number* Set background parameter:
Number: Preset count in counts (from 0 to 9999 counts)
Number: Preset time in seconds (from 0 to 9999 seconds)

AWB*Number Number* Set background value:
Number: Value in 0.01 cps (from 0 to 100 cps)

AWt*Number* Set Tau:
Number: Value in 0.1 s (from 10 to 600 means from 1.0 to 60.0s)

5.17.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- TTP-Value
- HV power in cps

z Read filtered count rate
Response: Number in 0.01 cps units

A Read display value and status

Response:

- display value Dose rate in 1µR/h, 1µrem/h, 0.01µSv/h units or 0.01 cps, cpm, Bq, dps, dpm, Bq/cm² units
- Status (see 5.17.6.3)

5.17.3 Configuration flags

5.17.3.1 Configuration flags 1 with kR / kW

Bit number			
0	Not used		
1	Live graph (from V3.06)	0: disable	1: enable
2	Not used		
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	Not used		
7	Single Pulse	0: off	1: on

5.17.3.2 Configuration flags 2 with fR / fW

Bit number		
0	Keylock(from V3.06)	0: enable, 1:disable
1	Not used	
2	Not used, write “1”	
3	Alarm threshold read-only	0: off 1:on
4	Flag for overload (readonly)	
5	Display of temperature	0: off 1:on
6	Temperature unit	0: °C 1: °F
7	not used	

5.17.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	not used		

7	not used

5.17.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Not used		
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: Preset count	1: Preset time
4	Accumulated counts	0:No	1:yes
5	Scaler, after measurement	0: Stop	1: automatic restart
6	Scaler net	0:No	1:yes
7	Ratemeter net	0:No	1:yes
8	Not used		
9	Not used		
10	Not used		
11	Alarm LCD LED	0:No	1:yes
12	BTCombo: Remote power off	0:No	1:yes
13	Display mR/h instead of µR/h	0:No	1:yes
14	Not used		
15	Not used		

5.17.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x05 Display unit Sv/h
1	0x01 Display unit cpm 0x06 Display unit R/h
2	0x02 Display unit Bq 0x07 Display unit rem/h
3	0x03 Display unit dps 0x08 Display unit Bq/cm²
	0x04 Display unit dpm 0x09 Display unit Gy/h
4	0: Ratemeter, 1: Scaler
5	Last used display unit (dose rate)
6	00 Gy/h 10 R/h
	01 Sv/h 11 rem/h
7	Ratemeter Mode: 1:ADF 0:Tau (only B20/B20-ER)

5.17.3.6 Menu configuration

mR Read configuration for

- main menu,
- submenu “Settings”
- submenu “Alarm indication”

Response: Hex-values. See below

mR*Hex Hex* Write configuration for

- main menu,
- submenu “Settings”
- submenu “Alarm indication”

See below

5.17.3.6.1 Main menu RadEye G/G10

Bit number			
0	Switch off	0:hidden	1:visible
1	Sound	0: hidden	1:visible
2	LED	0: hidden	1:visible
3	Vibrator	0: hidden	1:visible
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	Alarm dose rate	0: hidden	1:visible
9	Alarm dose	0: hidden	1:visible
10	not used, write “0”		
11	Autosend	0: hidden	1:visible
12	not used, write “0”		
13	Clear dose	0: hidden	1:visible
14	Finder	0: hidden	1:visible
15	Single Pulse	0: hidden	1:visible
16	Backlight	0: hidden	1:visible
17	Show Alarm	0: hidden	1:visible
18	Settings	0: hidden	1:visible
19	Text Info	0: hidden	1:visible
20	Bluetooth	0: hidden	1:visible
21..31	not used, write “0”		

5.17.3.6.2 Main menu RadEye B20../G20../GF..

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Nuclide table	0: hidden	1:visible
8	Alarm count rate	0: hidden	1:visible
9	Alarm dose rate	0: hidden	1:visible
10	Alarm activity	0: hidden	1:visible
11	Alarm dose	0: hidden	1:visible
12	Clear dose	0: hidden	1:visible
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text Info	0: hidden	1:visible
17..31	not used, write “0”		

5.17.3.6.3 Submenu “Settings” RadEye B20../G20../GF..

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Source test	0: hidden	1:visible
6	Language	0: hidden	1:visible
7	Contrast	0: hidden	1:visible
8	Edit Tau	0: hidden	1:visible
8..15	not used, write “0”		

5.17.3.6.4 Submenu “Settings” RadEye G/G10

Bit number			
0	Batt. type	0:hidden	1:visible
1	Set Date/Time	0: hidden	1:visible
2	Source check	0: hidden	1:visible
3	Language	0: hidden	1:visible

4	Contrast	0: hidden	1:visible
5..15	not used, write “0”		

5.17.3.6.5 Submenu “Alarm Indication” RadEye B20../G20../GF..

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	not used, write “0”		
4	not used, write “0”		
5	not used, write “0”		
6	not used, write “0”		
7	not used, write “0”		
8	not used, write “0”		

5.17.4 High voltage

HR Reading high voltage bit value
Response: Bit value 0…255.

5.17.5 Dead time correction

x Read dead time
Response: dead time in ns

5.17.6 History output

5.17.6.1 History readout ratemeter

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Max value
 |     |       |                Count rate in 0.01 cps, cpm
 |     |       |                Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |       |           Dose rate µR/h, rem/h or 0.01µSv/h
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \---------------------------- History status as a decimal value
                                see below
```

5.17.6.2 History readout scaler

```
256 716612088 721 999 120 23
--- --------- --- --- --- --
 |     |       |   |   |  |
 |     |       |   |   |  \--- Temperature in °C
 |     |       |   |   \------ Measuring time in seconds
 |     |       |   \---------- Background in 0.01 cps
 |     |       \-------------- Mean value
 |     |                        Count rate in 0.01 cps, cpm
 |     |                        Activity in 0.01 Bq, dps, dpm, Bq/cm²
 |     |                        Dose rate µR/h, rem/h or 0.01µSv/h
 |     \---------------------- Date and Time as a decimal value
 \--------------------------- History status as a decimal value
                                see below
```

End of History:

```
End
```

5.17.6.3 History status

Decimal value converted in HEX:

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Reserved. For internal use only.		
3	Accumulated counts	0:No	1:Yes
4	Background measurement	0:No	1:Yes
5	Scaler with	0: Preset Counts	1: Preset Time
6	Used filter (B20 and B20-ER only)		
7	0: No filter 1: Alpha blocker, 2:H*(10), 3:Hx		
8	Number of used nuclide		
9			
10			
11			
12	0x00 Display unit cps	0x05 Display unit Sv/h	
13	0x01 Display unit cpm	0x06 Display unit R/h	
14	0x02 Display unit Bq	0x07 Display unit rem/h	
15	0x03 Display unit dps	0x08 Display unit Bq/cm²	
	0x04 Display unit dpm	0x09 Display unit Gy/h	

5.17.7 Nuclide table

nR*Number*	Reading nuclide data. *Number*: consecutive number Response: Nuclide data (see below)
nW*NumberString*	Write nuclide data *Number*: consecutive number *String*: nuclide data e.g. `nW02Sr-90 500 555 3333`
nRA	Reading number of stored nuclides. Response: value from 0…15
nWA*Number*	Write the number of stored nuclides. *Number*: value from 0…15
nRG	Reading active nuclide. Response: value from 0…15
nWA*Number*	Write the number of active nuclides. *Number*: value from 0…15

Nuclide data:

```
Sr-90 500 555 3333
----- --- --- ----
  |     |   |   |
  |     |   |   \----  Factor for activity calculation with gamma filter
  |     |   \--------  Factor for activity calculation with alpha blocker
  |     \------------  Factor for activity calculation without filter
  \------------------  Nuclide name. Up to 6 characters. Do not use space (0x20)
```

Activity calculation:

F=1/Eeff

Ar=Cr*F

F:	Factor for Efficiency calculation
Eeff	Efficiency for this nuclide
Ar	Activity
Cr	Measured count rate

For example:

Count rate is 67.3 cps without filter and efficiency for Sr-90 is

- 29% without filter.
- 25% with alpha blocker

- 10% with gamma filter

Factor F is 1/0.29=3.448.

- 1/0.29 = 3.448 without filter.
- 1/0.25 = 4.0 with alpha blocker
- 1/0.10 = 10.0 with gamma filter

To set the parameter, sent: `nW00Sr-90 345 400 1000`.
The activity is 67.3*3.45=232.18 Bq

5.17.8 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number		
0	HV-Error	
1	Detector error	
2	Low Battery voltage	
3	Not used	
4	Watchdog error	
5	EEPROM checksum error	
6	Not used	
7	Not used	
8	Not used	
9		
10		
11	Sound	0: off 1:on
12	LED	0: off 1:on
13	Vibration alarm	0: off 1:on
14	Clear dose	0: no 1:yes
15	1: Alarm threshold changed	
16	1: Dose rate, count rate or activity -alarm	
17	1: Alarm dose	
18	Not used	
19	Not used	
20	Dose rate, count rate or activity > alarm threshold 1	
21	Dose rate, count rate or activity > alarm threshold 2	
22	Dose > alarm threshold 1	
23	Dose > alarm threshold 2	
24	1: Scaler or Background parameter changed	
25	Not used	
26	Power off	
27	Power on	
28	Not used	
29	Not used	
30	Not used	
31	Not used	

5.17.9 Automatic sending

```
<STX>721  2 0 0 14 B20ER 1234 AB<ETX><CR><LF>
      |   | | | |    |     |   |
      |   | | | |    |     |   \- BCC in HEX
      |   | | | |    |     \----- Dose in µR/h
      |   | | | |    \----------- information RadEye *)
      |   | | | \---------------- Status as Hex-value
      |   | | \------------------ Fixed to “0“
      |   | \-------------------- Fixed to “0“
      |   \---------------------- Mesurement unit **)
      \-------------------------- Measurement value
```

*) Information RadEye:

B20	RadEye B20
B20ER	RadEye B20-ER
G20	RadEye G20
G20ER	RadEye G20-ER
G2010	RadEye G20-10
G20ER1	RadEye G20-ER10
GF	RadEye GF
GF10	RadEye GF-10
FH41B2	RadEye G or RadEye G-10

**) Measurement unit

5	Dimension cps
3	Dimension cpm
7	Dimension dpm
8	Dimension Bq/cm²
6	Dimension Bq
9	Dimension dps
0	Dimension Sv/h
10	Dimension rem/h
2	Dimension R/h
1	Dimension Gy/h

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm
3	Not used
4	Not used
5	1: Battery voltage low
6	not used
7	not used

5.17.10 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	Not used
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	Not used
16	1: Alarm
17	Not used
18	Not used
19	Not used
20	Value > alarm threshold 1 (depending on display mode)
21	Value > alarm threshold 2 (depending on display mode)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24..31	Not used

5.18 RadEye GN/GN+

Used firmware version: 3.02

5.18.1 Limit values

AR0 — Reading parameters for sigma threshold.
Response:
- Sigma value gamma 0 (=off), 2…9.
- '0'
- Sigma value neutron 0 (=off), 2…9
- '5'

AR1 — Reading the threshold 1 and 2 for alarm count rate gamma.
Response: number in 0.01 cps

AR2 — Reading the threshold 1 and 2 for alarm count rate neutron.
Response: number in 0.01 cps.

AR3 — Reading the threshold 1 and 2 for alarm dose rate gamma.
Response: number in R/h or 0.01µSv/h units.

AR4 — Reading the threshold 1 and 2 for alarm dose gamma.
Response: number in R or 0.01µSv units.

AR5 — Reading the threshold 1 and 2 for alarm dose rate neutron.
Response: number in R/h or 0.01µSv/h units.

AR6 — Reading the threshold 1 and 2 for alarm dose neutron.
Response: number in R or 0.01µSv units.

ART — Read alarm timeout
Response: number in seconds

SR3 — Read NBR alarm threshold
- LOW Energy
- MID Energy
- HIGH Energy
- NBR Alarm min. count rate

AW0*Number Number* Set parameters for sigma alarm.
- Sigma value gamma 0 (=off), 2…9.
- '0'
- Sigma value neutron 0 (=off), 2…9
- '5'

AW1*Number Number* Set the threshold 1 and 2 for alarm count rate gamma.
Number: number in 0.01 cps

AW2*Number Number* Set the threshold 1 and 2 for alarm count rate neutron.
Number: number in 0.01 cps.

AW3*Number Number* Set the threshold 1 and 2 for alarm dose rate gamma.
Number: number in R/h or 0.01µSv/h units.

AW4*Number Number* Set the threshold 1 and 2 for alarm dose gamma.
Number: number in R or 0.01µSv units.

AW5*Number Number* Set the threshold 1 and 2 for alarm dose rate neutron.
Number: number in R/h or 0.01µSv/h units.

AW6*Number Number* Set the threshold 1 and 2 for alarm dose neutron.
Number: number in R or 0.01µSv units.

SW3 *Number… Number* Set NBR alarm threshold
- LOW Energy
- MID Energy
- HIGH Energy
- NBR Alarm min. count rate

5.18.2 Measurement values

Z Read raw count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- Counter 5 in cps
- Counter 6 in cps
- HV power index

z Read filtered count rates
Response:
- Value gamma 0.01 cps

- Value neutron in 0.01 cps

A Read display value and status

Response:

- display value gamma in 0.01 cps, R/h, rem/h or 0.01µSv/h
- display value neutron in 0.01 cps, , R/h, rem/h or 0.01µSv/h
- Status (see 5.18.5.2)

5.18.3 Configuration flags

5.18.3.1 Configuration flags 1 with kR / kW

Bit number		
0	Not used	
1	Not used	
2	Alarm LCD-LED	0: off 1: on
3	Alarming Sound	0: off 1: on
4	Alarming LED	0: off 1: on
5	Alarming Vibration	0: off 1: on
6	NBR	0: off 1: on
7	Single Pulse	0: off 1: on

5.18.3.2 Configuration flags 2 with fR / fW

Bit number		
0	Keylock	0: disable 1:enable
1	Not used	
2	Not used	
3	Alarm threshold read-only	0: off 1:on
4	Flag for overload (read-only)	
5	Display of temperature	0: off 1:on
6	Temperature unit	0: °C 1: °F
7	Not used	

5.18.3.3 Configuration flags 3 with KR / KW

Bit number		
0	Key tone	0:off 1:on
1	Autosend	0:off 1:on
2	Finder	0:off 1:on
3	Mean-Max	0:off 1:on
4	not used, write “0”	
5	display of dose	0:off 1:on
6	not used	

7	not used

5.18.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Safety alarm	0: disable	1:enable
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Single pulse click divider	0: disable	1:enable
4	Not used		
5	Not used		
6	Not used		
7	Not used		
8	Not used		
9	Not used		
10	Not used		
11	Not used		
12	Not used		
13	Not used		
14	Not used		
15	Not used		

5.18.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Gamma

Bit number	
0	0x00 Display unit cps 0x01 Display unit cpm 0x05 Display unit Sv/h 0x06 Display unit R/h 0x07 Display unit rem/h
1	
2	
3	
4	Not used
5	Dose rate: 01: Sv/h 10: R/h 11: rem/h
6	
7	Cross mode

Neutron

Bit number	
0	0x00 Display unit cps 0x05 Display unit Sv/h
1	0x01 Display unit cpm 0x06 Display unit R/h
2	0x07 Display unit rem/h
3	
4	Not used
5	Display mode:
6	00: Gamma 01: Neutron 02: dual display
7	Cross mode

5.18.3.6 Menu configuration

mR Read configuration for main menu, submenu “Settings” and “Alarm indication”
Response: Hex-values. See below

mR*Hex… Hex* Write configuration for main menu, submenu “Settings” and “Alarm indication”
See below

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Backlight	0: hidden	1:visible
3	Measuring unit Gamma	0: hidden	1:visible
4	Measuring unit Neutron	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Set DR factor	0: hidden	1:visible
8	Edit alarms	0: hidden	1:visible
9	Clear dose Gamma	0: hidden	1:visible
10	Clear dose Neutron	0: hidden	1:visible
11	Settings	0: hidden	1:visible
12	Alarm indication	0: hidden	1:visible
13	Show alarm	0: hidden	1:visible
14	Text Info	0: hidden	1:visible
15	Training	0: hidden	1:visible
16..31	not used, write “0”		

Sub menu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible

4	Cross-mode	0: hidden	1:visible
5	Sound	0: hidden	1:visible
6	Set Date/Time	0: hidden	1:visible
7	Language	0: hidden	1:visible
8	Bluetooth	0: hidden	1:visible
9	Lu-Test	0: hidden	1:visible
10..15	not used, write “0”		

Sub menu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	LCD-LED	0: hidden	1:visible
4..7	not used, write “0”		

sR	Read menu language Response: Number 0: English 1: German 2: French 3: Russian
sW*value*	Write menu language (*value* see command sR)

5.18.4 High voltage

HR	Reading high voltage Response: value in Volt.
hR	Read high voltage correction Response: value from 0..255 (128=no correction)
hW*value*	Set high voltage correction *Value* from 0..255 (128=no correction)

5.18.5 History output

5.18.5.1 History readout ratemeter

```
8 4342708 646 1024 5 10 1 3 300 19 123 30 80
|    |     |   |   |  | | |  |   |  |  |  |
|    |     |   |   |  | | |  |   |  |  |  \- max. dose rate Neutron (in µR/h)
|    |     |   |   |  | | |  |   |  |  \---- mean dose rate Neutron (Factor 100)
|    |     |   |   |  | | |  |   |  \------- Dataset no.
|    |     |   |   |  | | |  |   \---------- Temperature in °C
|    |     |   |   |  | | |  \-------------- Measuring time
|    |     |   |   |  | | \----------------- max. value Neutron (Count rate Factor 100)
|    |     |   |   |  | \------------------- Mean value Neutron (Count rate Factor 100)
|    |     |   |   |  \--------------------- max. dose rate Gamma (in µR/h, 10nSv/h-units)
|    |     |   |   \------------------------ mean dose rate Gamma (Factor 100)
```

```
|    |     |   \--------------------------- max. value C1 (in cps, Factor 100)
|    |     \------------------------------- mean value C1 (in cps, Factor 100)
|    \--------------------------------------- Timestamp (Format s.o.)
\------------------------------------------- History status
```

End of History:

End

5.18.5.2 History status

Decimal value converted in HEX:

```
0101 0101    0101 0101    0101 0101    0101 0101
|||| ||||    |||| ||||    |||| ||||    |||| ||||
|||| ||||    |||| ||||    |||| ||||    |||| |||\-- Background sub, 0:No, 1:Yes
|||| ||||    |||| ||||    |||| ||||    |||| ||\--- 1: Scaler
|||| ||||    |||| ||||    |||| ||||    ||++ ++----
|||| ||||    |||| ||||    |||| ||||    |\--------- 1:Background measurement
|||| ||||    |||| ||||    |||| ++++--------------- Measuring unit Gamma:
|||| ||||    |||| ||||    ||||                     0:cps,1:cpm,5:Sv/h, 6;R/h, 7:rem/h
|||| ||||    |||| ||||    ++++-------------------- Measuring unit Neutronen:
|||| ||||    |||| ||||                             0:cps,1:cpm,5:Sv/h, 6;R/h, 7:rem/h
|||| ||||    |||| ||||
|||| ||||    |||| ++++---------------------------- Used dose rate factor Neutron (0..15)
|||| ||||    ||||
|||| ||||    |||\------------------------------- 1: Accumulated counts
|||| ||||    ||\-------------------------------- Training mode, 0:No, 1:Yes
```

Bit number			
0	Net value	0:No	1:Yes
1	Operation mode	0: Ratemeter	1:Scaler
2	Not used		
3			
4			
5			
6	Background measurement	0:No	1:Yes
7	dose rate unit gamma: 5: Sv/h, 6: R/h, 7rem/h		
8			
9			
10			
12	Measuring unit neutron 0: cps, 1: cpm, 5: Sv/h, 6: R/h, 7rem/h		
13			
14			
15			
16..19	Not used		
20	Accumulated counts	0:No	1:Yes
21	Training mode	0:No	1:Yes
22..31	Not used		

5.18.6 Nuclide table

nR*Number* Reading nuclide data.
Number: number of nuclide
Response: Nuclide data (see below)

nW*NumberString* Write nuclide data
Number: number of nuclide
String: nuclide data (see below)

Nuclide data: every string contains nuclide data
For example:

```
00 Sr-90 471
-- ----- ---
|     |   |
|     |   \----------------------------------- Factor in (nSv/h)/cps
|     \--------------------------------------- Name of nuclide
\------------------------------------------- Nuclide number
```

5.18.7 Event log

```
6656 520549251
---- ---------
  |       |
  |       \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value


      ———— 0 0 0 0 0 0 0 0 = Alarmflags
           | | | | | | | |
           | | | | | | | \- Alarmschwelle 1 Gamma
           | | | | | | \--- Alarmschwelle 2 Gamma
           | | | | +-+----- 01: Niederenergetisch
           | | | |          10: Hochenergetisch
           | | | |          11: Mittelenergetisch
           | | | |          00: NORM
           | | | \ -------- Alarmschwelle 1 Neutron
           | | \ ---------- Alarmschwelle 2 Neutron
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error

5	EEPROM checksum error	
6	Not used	
7	Not used	
8	Not used	
9		
10	LCD-LED	0: off 1:on
11	Sound	0: off 1:on
12	LED	0: off 1:on
13	Vibration alarm	0: off 1:on
14	NBR on if device started	0: off 1:on
15	Single pulse	0: off 1:on
16	Dose rate or count rate gamma > alarm threshold 1	
17	Dose rate or count rate gamma > alarm threshold 2	
18	NBR-Alarm	
19	00: NORM 01: Low energy	10: High energy 11: Mid energy
20	Dose rate or count rate neutron > alarm threshold 1	
21	Dose rate or count rate neutron > alarm threshold 2	
22	Dose alarm gamma	
23	Dose alarm neutron	
24	Training mode	0: off 1:on
25	Dose cleared	0: no 1:yes
26	Power off	
27	Power on	
28	Not used	
29	Not used	
30	Not used	
31	Not used	

5.18.8 Automatic sending

```
<STX>9 560 1 544 00 GN AB<ETX><CR><LF>
     |  |  |  |  |  |  |
     |  |  |  |  |  |  \--------- BCC in HEX
     |  |  |  |  |  \------------ Information RadEye type
     |  |  |  |  \--------------- Status as Hex-value
     |  |  |  \------------------ Dimension neutron, see 5.18.3.5
     |  |  \--------------------- Rate neutron in 0.01cps, µR/h or 0.01µSv/h
     |  \------------------------ Dimension gamma, see 5.18.3.5
     \--------------------------- Rate gamma in cps, µR/h or 0.01µSv/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Alarm gamma
3	1: Alarm neutron
4	1: Alarm dose gamma
5	1: Alarm fast neutron
6	1: NBR alarm
7	1: Safety alarm

Type

Type	RadEye
GN	RadEye GN
GN+	RadEye GN+

5.18.9 Status information

F	Reading status information Response Number with status information, see 5.18.5.2

5.18.10 Miscellaneous

ARC	Read single pulse divider Response: number for single pulse divider
AWCNumber	Write single pulse divider Number: value from 1 to 65535

5.19 RadEye PRD-CD

Used firmware version: 3.10

C = ADF (Rate1 – Rate2) - ADF(Rate2) * f
R = ADF(Max (Rate1), a*Rate4) – Min(Rate1 – Rate2; 1.5*C(Cal))

Dimension less Value = $\frac{C}{C(cal)} * Ref$
C(cal): Cal measurement on left block

5.19.1 Limit values

AR0	Reading computed sigma alarm threshold 1. Response: number in cps.
AR1	Reading alarm threshold 1 and 2 for contraband Response: number in 0.01 cps.
AR2	Reading alarm threshold 1 and 2 for Rate 2 Response: number in 0.01 cps.
AR3	Reading the threshold 1 for gross count rate alarm. Response: number in 0.01 cps.
AR4	Reading the threshold 2 for gross count rate alarm. Response: number in 0.01 cps.
AR5	Reading the threshold 1 for dose rate alarm. Response: number in µR/h, µrem/h or 0.01µSv/h unit. Depending on used measuring unit e.g. `123` means `123` µR/h resp. 1.23 µSv/h
AR6	Reading the threshold 2 for dose rate alarm. Response: see command AR5
AR7	Reading the threshold 1 for the dose alarm Response: number in µSv, 100µR or 100µrem units
AR8	Reading the threshold 2 for the dose alarm see command AR7
AR9	Reading sigma value Response: Number from 2..9

ARM	Reading minimum count rate for sigma alarm Response: Number in cps
ARN	Reading: - NBR alarm threshold low energy Response: Number in 0.01% units - Background preset count Response: Number in counts - Background preset time Response: Number in seconds
ARP	Reading scaler parameter: - Preset count. Response: Number in counts - Preset time. Response: Number in seconds - Scaler wait. time Response: Number in seconds
ARB	Reading scaler background values: - Background value Response: Number in 0.01 cps units - Used time for background value Response: Number in seconds
ARK	Reading contraband parameter - a with Factor 100 (65 means 0,65) - f with Factor 1000 (1300 means 1.3) - C(cal) with Factor 1000 (150000 means 150) - Calibration Precision in 0.1%-units (16 means 1.6%) - Calibration Reference *Ref* - Timeout Contrabandmode in s. From 0s(=off) to 64800s (=18h)
ARH	NBR alarm threshold high energy Response: Number in 0.01% units
SR3	Reading minimum count rate for NBR alarm Response: Number in cps
AW1*Number Number*	Set the alarm threshold 1 and 2 for contraband. *Number* = Number in 0.01 cps.
AW2*Number Number*	Set the alarm threshold 1 and 2 for Rate 2. *Number* = Number in 0.01 cps.
AW3*Number*	Setting the threshold 1 for gross count rate alarm. *Number* = Number in 0.01 cps.
AW4*Number*	Setting the threshold 2 for gross count rate alarm. *Number* = see command AW3.
AW5*Number*	Setting the threshold 1 for dose rate alarm. *Number* = in µR/h, µrem/h or 0.01µSv/h units.

e. g. AW3123 means 123µR/h.

AW6*Number* Setting the threshold 2 for dose rate alarm.
see command AW3

AW7*Number* Setting the threshold 1 for dose alarm.
Number = in 100µR, 100µrem or 1µSv units.
e. g. AW7123 means 12.3mR.

AW8*Number* Setting the threshold 2 for dose alarm.
Number = see command AW7

AW9*Number* Setting the sigma value.
Number = form 2 to 9

AWM*Number* Setting minimum count rate for sigma alarm
Number= value from 0 to 255

AWN*Number Number Number*
Setting NBR alarm threshold level low energy
Number=value in 0.01% units. From 1.00% to 2.55%
Setting background preset count
Number=counts. From 0 to 9999
Setting background preset time
Number=seconds. From 0 to 9999s

AWH*Number* Setting NBR alarm threshold level high energy
Number=value in 0.01% units. From 0% to 1.00%

AWB*Number Number* Setting background value
Number=0.01 cps units. From 0 to 10000 (100cps)
Setting used time for background value
Number=seconds. From 0 to 9999s

AWP*Number Number* Setting scaler preset count
Number=counts. From 0 to 9999
Setting scaler preset time
Number=seconds. From 0 to 9999s

AWK*Number Number* Writing contraband parameter
- a with Factor 100 (65 means 0,65)
- f with Factor 1000 (1300 means 1.3)
- C(cal) with Factor 1000 (150000 means 150)
- Calibration Precision in 0.1%-units (16 means 1.6%)
- Calibration Reference *Ref*
- Timeout Contrabandmode in s. From 0s(=off) to 64800s (=18h)

SW3 *Number* Setting minimum count rate for NBR alarm
Number= value from 0 to 255

5.19.2 Measurement values

Z Read count rates with dead time correction
Response:
- Counter 1 in cps
- Counter 2 in cps
- Counter 3 in cps
- Counter 4 in cps
- PMT current index

z Read filtered count rate 1
Response: Number in cps

5.19.3 Configuration flags

5.19.3.1 Configuration flags 1 with kR / kW

Bit number			
0	not used, write “0”		
1			
2			
3	Alarming Sound	0: off	1: on
4	Alarming LED	0: off	1: on
5	Alarming Vibration	0: off	1: on
6	NBR	0: off	1: on
7	Single Pulse	0: off	1: on

5.19.3.2 Configuration flags 2 with fR / fW

Bit number			
0	not used, write “0”		
1			
2	not used, write “0”		
3	Alarm threshold read-only	0: off	1:on
4	Flag for overload (readonly)		
5	Temp.display	0: off	1:on
6	Temperature unit	0: °C	1: °F
7	In cps-mode display of dose rate	0: no	1: yes

5.19.3.3 Configuration flags 3 with KR / KW

Bit number			
0	Key tone	0:off	1:on
1	Autosend	0:off	1:on
2	Finder	0:off	1:on
3	Mean-Max	0:off	1:on
4	not used, write “0”		
5	display of dose	0:off	1:on
6	Use click divider for single pulse	0:off	1:on
7	not used, write “0”		

5.19.3.4 Configuration flags 4 with jR / jW

Bit number			
0	Safety-Alarm	0:off	1:on
1	Battery type	0:Alkaline	1:NiMh
2	Display rotation	0:No	1:yes
3	Scaler mode	0: preset count	1: preset time
4	Scaler “Auto restart”	0:off	1:on
5	Net Scaler	0:off	1:on
6	Net Ratemeter	0:off	1:on
7	not used, write “0”		
8	not used, write “0”		
9	not used, write “0”		
10	Used Ba-133 activity:	0: 10µCi	1: 5µCi
11	Alarm LCD-LED	0:off	1:on
12	not used, write “0”		
13	not used, write “0”		
14	not used, write “0”		
15	not used, write “0”		

5.19.3.5 Measuring unit with uR /uW

uR Read measuring unit and operation mode
Response: Hex-value. See below

uR*Hex* Write measuring unit and operation mode
See below

Bit number	
0	0x00 Display unit cps 0x05 Display unit Sv/h 0x06 Display unit R/h 0x07 Display unit rem/h 0x08 Display unit Bq
1	
2	
3	
4	0: Ratemeter, 1: Scaler
5	0x01 Display unit Sv/h 0x02 Display unit R/h 0x03 Display unit rem/h
6	
7	1: Contraband mode

5.19.3.6 Menu configuration

mR Read menu configuration for
- Main menu
- Submenu “Settings”
- Submenu “Alarm indication”
- Submenu “Set alarm”

Response: Hex-values. See below

mW*Hex Hex Hex* Write menu configuration for
- Main menu
- Submenu “Settings”
- Submenu “Set alarm”

See below

5.19.3.6.1 Main menu

Bit number			
0	Switch off	0:hidden	1:visible
1	Background	0: hidden	1:visible
2	Not used, write “0”		
3	Backlight	0: hidden	1:visible
4	Measuring unit	0: hidden	1:visible
5	Operation mode	0: hidden	1:visible
6	Scaler parameter	0: hidden	1:visible
7	Not used, write “0”		
8	Set alarm	0: hidden	1:visible
9	Not used, write “0”		
10	Not used, write “0”		
11	Not used, write “0”		
12	Not used, write “0”		
13	Settings	0: hidden	1:visible
14	Alarm indication	0: hidden	1:visible
15	Show alarm	0: hidden	1:visible
16	Text info	0: hidden	1:visible
17	Bluetooth	0: hidden	1:visible
18..31	not used, write “0”		

5.19.3.6.2 Submenu “Settings”

Bit number			
0	Batt. type	0:hidden	1:visible
1	Autosend	0: hidden	1:visible
2	Single Pulse	0: hidden	1:visible
3	Finder	0: hidden	1:visible
4	Set Date/Time	0: hidden	1:visible
5	Lu-Test	0: hidden	1:visible
6	Language	0: hidden	1:visible
7	Spill-over	0: hidden	1:visible
8	Rated Alarm	0: hidden	1:visible
9	Contrast	0: hidden	1:visible
10..15	not used, write “0”		

5.19.3.6.3 Submenu “Alarm indication”

Bit number			
0	Sound	0:hidden	1:visible
1	LED	0: hidden	1:visible
2	Vibrator	0: hidden	1:visible
3	LCD-LED	0: hidden	1:visible
4…8	not used, write “0”		

5.19.3.6.4 Submenu “Set alarm”

Bit number			
0	Count Rate	0:hidden	1:visible
1	Not used, write “0”		
2	Contraband	0: hidden	1:visible
3	Dose rate	0: hidden	1:visible
4	Dose	0: hidden	1:visible
5	Alarm NBR	0: hidden	1:visible
6…8	not used, write “0”		

5.19.4 Spill-over

ARK Reading spill-over
Response: value 0…255 (0.1 % units, default 80 means 8.0%)

AWK*Number* Set spill-over
Number from 0…255

5.19.5 High voltage

HR	Reading high voltage bit value Response: Bit value 0…255.
hR	Reading high voltage correction bit date and time of last successful Luthetium check Response: Number 0…255 with offset 128 and date and time as YYMMDDhhmm
hW*Number*	Setting of high voltage correction bit Number from 0…255

5.19.6 Dead time correction

x	Read dead time Response: dead time in ns for - Counter 1 (Rate 1) - Counter 2 (Rate 2) - Counter 3 (Rate 3) - Counter 4 (Rate 4)

5.19.7 History output

5.19.7.1 History readout

Ratemeter:

```
1536 716612088 1239 1600 30 5 120 23 4
---- --------- ---- ---- -- - --- -- -
 |      |        |     |   |  |  |  |  |
 |      |        |     |   |  |  |  \---- Temperature in °C
 |      |        |     |   |  |  \------- Measuring time in seconds
 |      |        |     |   |  \---------- Max value dose rate
 |      |        |     |   |               µR/h, µrem/h, 0.01µSv/h
 |      |        |     |   |               ContrabandIndex “C” max. Factor 1
 |      |        |     |   \------------ Mean value dose rate
 |      |        |     |                   0.1µR/h, 0.1µrem/h, 0.001µSv/h
 |      |        |     |                   ContrabandIndex “C” mean Factor 10
 |      |        |     \---------------- Max value
 |      |        |                         Count rate in 0.01 cps
 |      |        |                         Activity in 0.01 Bq
 |      |        |                         Contraband “R” max. 0.01cps
 |      |        \---------------------- Mean value
 |      |                                  Count rate in 0.01 cps
 |      |                                  Activity in 0.01 Bq
 |      |                                  Contraband “R” mean 0.01cps
 |      \------------------------------- Date and Time as a decimal value
 \------------------------------------- History status as a decimal value
                                          see below
```

End of History:

```
End
```

5.19.7.2 History status

decimal value converted in HEX:

Bit number			
0	Ratemeter/Scaler net value	0: no	1: yes
1	Operation mode Scaler	0: no	1: yes
2	Not used, read as ‘0’		
3	Not used, read as ‘0’		
4	Background measurement	0: no	1: yes
5	Preset time	0: no	1: yes
6	Not used, read as ‘0’		
7	Contraband mode	0: no	1: yes
8..11	5:Sv/h, 6:R/h, 7:rem/h, 8: Contamination (Bq)		

12..15	Not used, read as ‘0’

5.19.8 Event log

```
6656 520549251
---- ---------
  |      |
  |      \------------     Date and time as a decimal value (see 3.2)
  \--------------------     Event log as a decimal value
```

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x02: Display count rate 0x04: Display dose rate
9	
10	
11	Sound 0: off 1:on
12	LED 0: off 1:on
13	Vibration alarm 0: off 1:on
14	1: Dose cleared
15	1: Alarm threshold changed
16	1: count rate, dose rate, contraband or Rate 2-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (count rate, dose rate, contraband or Rate 2)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Power off
27	Power on
28	NBR-alarm
29	Not used
30	Not used
31	Not used

5.19.9 Calibration log

```
520549251 175590 0 0001
--------- ------ - ----
  |         |    |   |
  |         |    |   \--   Status
  |         |    \------   Rate “R” with factor 1000
  |         \-----------   Rate “C” with factor 1000
  \---------------------   Date and time as a decimal value (see 3.2)
```

Status

Bit number	
0	Calibration value saved
1..15	Not used

CI Initialize calibration log readout. Return: Number of saved entries
CC Clear calibration log
C+ Read next entry

5.19.10 Automatic sending

```
<STX>7 2 0 0 14 PRD-CD 123 AB<ETX><CR><LF>
      | | | | |    |    |   |
      | | | | |    |    |   \- BCC in HEX
      | | | | |    |    \----- Dose in µR/h
      | | | | |    \---------- information RadEye PRD-CD
      | | | | \--------------- Status as Hex-value
      | | | \----------------- „0“ not used
      | | \------------------- „0“ not used
      | \--------------------- „2“ not used
      \----------------------- Dose rate in µR/h
```

Formation of a BCC (block check character):
Modulo 256 sum of <STX> up to the last character before the BCC (including), coded as hexadecimal ASCII-number (e.g. 1F).

Status

Bit number	
0	Not used
1	1: Overload
2	1: Count rate, dose rate or level-alarm
3	1: Dose alarm
4	1: NBR alarm
5	1: Battery voltage low
6	not used
7	not used

5.19.11 Status information

F Reading status information
Response Number with status information

Bit number	
0	HV-Error
1	Detector error
2	Low Battery voltage
3	Not used
4	Watchdog error
5	EEPROM checksum error
6	Not used
7	Not used
8	0x02: Display count rate 0x04: Display dose rate
9	
10	
11	not used,
12	Alarm threshold read-only 0: off 1:on
13	Flag for overload
14	Temperature display 0: off 1:on
15	In cps-mode display of dose rate 0: no 1: yes
16	1: Count rate, dose rate or level-alarm
17	1: Dose alarm
18	1: Safety alarm
19	Not used
20	Value > alarm threshold 1 (depending on count rate, dose rate or level display)
21	Value > alarm threshold 2 (depending on count rate, dose rate or level display)
22	Dose > alarm threshold 1
23	Dose > alarm threshold 2
24	Low energy alarm
25	High energy alarm
26	Not used
27	Not used
28	Not used
29	Not used
30	Not used
31	Fixed to “0”

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