

kBuffer

1.0

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# Chapter 1

## Main Page

### 1.1 Introduction

kBuffer is a universal library for a ring- / circular buffer.

### 1.2 Functions and Datatypes

[buffer\\_t](#)  
[bufferStatus\\_t](#)

[bufferInit\(\)](#)

[bufferWrite\(\)](#)  
[bufferRead\(\)](#)  
[bufferPeek\(\)](#)

[bufferFill\(\)](#)  
[bufferIsFull\(\)](#)  
[bufferIsEmpty\(\)](#)

[bufferWriteToIndex\(\)](#)  
[bufferReadFromIndex\(\)](#)

[bufferAvailable\(\)](#)

[bufferMean\(\)](#)  
[bufferMeanRMS\(\)](#)

### 1.3 Usage

Have a look [Fundamental Usage](#) for an explanation of the main kBuffer functions (with some examples)  
If you want to take the mean of your buffer, have a look at [Mean of buffer](#)

## 1.4 Example code

An example code project is available under `../../test/x86`. It isn't well documented, but you can compile it for your system.

## Chapter 2

# Fundamental Usage

### 2.1 Buffer datatype definition

A ringbuffer consists of variables, which can be accessed in a continuous way. You have to define, which datatype you want to have the elements. By default, the elements are unsigned 16bit integers (uint16\_t). The datatype is defined in [kBuffer.h](#) :

```
#define bufferDatatype uint16_t
```

Instead of uint16\_t, you can insert (almost) any datatype you want.

### 2.2 Initializing a ringbuffer

At first, you have to include the kBuffer library into your project. This can be done by copying the files from src/kBuffer to your project's directory. You can include the header as usual:

```
#include "kBuffer.h"
```

In your code, you have to define an instance of [buffer\\_t](#). You have to init this instance with the function [bufferInit\(\)](#). If you want to have a ringbuffer with 8 elements:

```
buffer_t ringbuffer;  
bufferInit(&ringbuffer, 8);
```

To check, if the initialization was successfull, you need to parse the return value of [bufferInit\(\)](#):

```
buffer_t ringbuffer;  
if(bufferInit(&ringbuffer, 8) == bufferOK){  
    do_something_it_worked_ok();  
}else{  
    do_something_there_was_an_error();  
}
```

### 2.3 Writing data to the buffer

To write data to the buffer, you can use the [bufferWrite\(\)](#) function:

```
#include "kBuffer.h"  
  
int main(void){
```

```
buffer_t ringbuffer;           // Declare an buffer instance
bufferInit(&ringbuffer, 8);    // Init the buffer with 8 elements
//Notice, that no errorhandling has been done. We just expect a success

bufferWrite(&ringbuffer, 42);  // Write the integer "42" to the buffer.

return 0;
}
```

## 2.4 Reading data from the buffer

To read data from the buffer, you can use the `bufferRead()` function:

```
#include "kBuffer.h"

int main(void) {

    buffer_t ringbuffer;           // Declare an buffer instance
    bufferInit(&ringbuffer, 8);    // Init the buffer with 8 elements
    //Notice, that no errorhandling has been done. We just expect a success

    bufferWrite(&ringbuffer, 42);  // Write the integer "42" to the buffer.

    uint16_t dataRead;             // Declare an integer, where the read data should be stored
    bufferRead(&ringbuffer, &dataRead); // We expect, that dataRead is now 42 (because we have
                                     written 42 to the buffer before)

    return 0;
}
```



## Chapter 3

# Mean of buffer

### 3.1 Enabling of mean functions

Notice: Only enable the mean functions, if the element datatype (i.e. buffer datatype) is some sort of numeric type (i.e. integer, float, ...) To enable the buffer mean functions, you have to uncommented the following define in [kBuffer.h](#):

```
#define BUFFER_ENABLE_MEAN
```

### 3.2 Caution!

There might be problems with this functions. The sum of the values (or the squared values) must be stored in a variable.

This variable is currently a long, but under certain conditions it might overflow.

You could replace it with an "unsigned long long" (or something smaller)

### 3.3 Mean of the buffer

You can take the mean of the buffer with the function [bufferMean\(\)](#):

```
uint16_t mean;  
  
bufferMean(&buffer, &mean);
```

You can also get the RMS (Root Mean Square), by calling the function [bufferMeanRMS\(\)](#) (Parameters are the same)



## Chapter 4

# Bug List

**globalScope> Global `bufferMean` (`buffer_t` \*buffer, `bufferDatatype` \*meanOut)**

The sum of the buffer is taken. Take precautions, that this variable won't overflow

**globalScope> Global `bufferMeanRMS` (`buffer_t` \*buffer, `bufferDatatype` \*meanOut)**

The sum of squared buffer elements is taken. Take precautions, that this variable won't overflow



## Chapter 5

# Data Structure Index

### 5.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">buffer_t</a>	Struct for buffer handling. If you need a ringbuffer in your software, you should instantiate a <a href="#">buffer_t</a> , and run the necessary functions with a pointer to your instance . . . . .	13
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## Chapter 6

# File Index

### 6.1 File List

Here is a list of all documented files with brief descriptions:

kBuffer/ <a href="#">kBuffer.c</a>	
A universal ringbuffer library	15
kBuffer/ <a href="#">kBuffer.h</a>	
A universal ringbuffer library	21





## Chapter 7

# Data Structure Documentation

### 7.1 `buffer_t` Struct Reference

Struct for buffer handling. If you need a ringbuffer in your software, you should instantiate a `buffer_t`, and run the necessary functions with a pointer to your instance.

```
#include <kBuffer.h>
```

#### Data Fields

- `uint8_t isInitialized`  
*is 0 if the buffer is not initialized*
- `uint16_t writePointer`  
*The write pointer of the buffer. At a write procedure, data gets written and the pointer is incremented.*
- `uint16_t readPointer`  
*The read pointer of the buffer. At a read procedure, data gets read and the pointer is incremented.*
- `uint16_t length`  
*The number of elements in the buffer.*
- `uint8_t elementLength`  
*The number of bytes of one buffer element. The total memory consumption in Bytes is equal to  $\text{length} * \text{elementLength}$ .*
- `uint16_t datacount`  
*A variable which is increased by one when new data gets written and decremented by one when data is read.*
- `bufferDatatype * data`  
*A pointer to the first element of the buffer.  $\text{length} * \text{elementLength}$  bytes of memory are allocated after this pointer.*

#### 7.1.1 Detailed Description

Struct for buffer handling. If you need a ringbuffer in your software, you should instantiate a `buffer_t`, and run the necessary functions with a pointer to your instance.

The documentation for this struct was generated from the following file:

- `kBuffer/kBuffer.h`



## Chapter 8

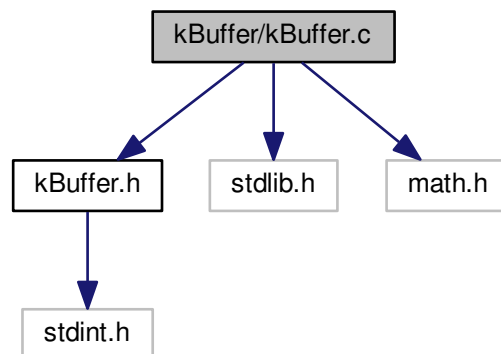
# File Documentation

### 8.1 kBuffer/kBuffer.c File Reference

A universal ringbuffer library.

```
#include "kBuffer.h"
#include <stdlib.h>
#include <math.h>
```

Include dependency graph for kBuffer.c:



### Functions

- `bufferStatus_t bufferInit (buffer_t *buffer, uint16_t bufferSize)`  
*init a new buffer This function inits a new `buffer_t`.*
- `bufferStatus_t bufferWriteToIndex (buffer_t *buffer, uint16_t index, bufferDatatype data)`  
*write data to a specific index of the buffer. WARNING: Take care when using this function, it is against the main concept of a ringbuffer*
- `bufferStatus_t bufferReadFromIndex (buffer_t *buffer, uint16_t index, bufferDatatype *data)`  
*read data from a specifig index of the buffer WARNING: Take care when using this function, it is against the main concept of a ringbuffer*
- `uint8_t bufferIsEmpty (buffer_t *buffer)`

- Checks, wheter the buffer is empty.*
- `uint8_t bufferIsFull (buffer_t *buffer)`
- Checks, wheter the buffer is full.*
- `bufferStatus_t bufferWrite (buffer_t *buffer, bufferDatatype data)`
- add data to the end of the ringbuffer*
- `bufferStatus_t bufferRead (buffer_t *buffer, bufferDatatype *data)`
- read data from the beginning of the buffer*
- `bufferStatus_t bufferFill (buffer_t *buffer, bufferDatatype data, uint8_t silent)`
- fill the whole buffer with given dummy data.*
- `bufferStatus_t bufferAvailable (buffer_t *buffer, uint16_t *available)`
- return, how many elements are stored and available in the buffer*
- `bufferStatus_t bufferPeek (buffer_t *buffer, bufferDatatype *data)`
- have a look at the next element in the buffer, but do not increase the read pointer*
- `bufferStatus_t bufferMean (buffer_t *buffer, bufferDatatype *meanOut)`
- take the average of the whole buffer*
- `bufferStatus_t bufferMeanRMS (buffer_t *buffer, bufferDatatype *meanOut)`
- take the root mean square of the whole buffer*

### 8.1.1 Detailed Description

A universal ringbuffer library.

Author

Peter Kappelt

See also

<https://github.com/peterkappelt/kBuffer>

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### 8.1.2 Function Documentation

#### 8.1.2.1 `bufferStatus_t bufferAvailable ( buffer_t * buffer, uint16_t * available )`

return, how many elements are stored and available in the buffer

Parameters

<i>buffer</i>	pointer to a <code>buffer_t</code> instance
<i>available</i>	pointer to a variable where the number of available elements should be stored

Returns

an element of `bufferStatus_t`

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the buffer wasn't initialized

8.1.2.2 `bufferStatus_t` `bufferFill` ( `buffer_t *` *buffer*, `bufferDatatype` *data*, `uint8_t` *silent* )

fill the whole buffer with given dummy data.

## Parameters

<i>buffer</i>	pointer <code>buffer_t</code> instance
<i>data</i>	data to fill the buffer with
<i>silent</i>	if this parameter is 1, the buffer will be filled with data, but the write pointer stays at its current position (usefull, if you take the mean but the buffer is not full yet. You can just prefill it, the mean will be taken with the prefilled values)

## Returns

an element of `bufferStatus_t`

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the buffer wasn't initialized

8.1.2.3 `bufferStatus_t` `bufferInit` ( `buffer_t *` *buffer*, `uint16_t` *bufferSize* )

init a new buffer This function inits a new `buffer_t`.

## Parameters

<i>buffer</i>	Pointer (&) to a <code>buffer_t</code> object.
<i>bufferSize</i>	desired size of the buffer, the total buffer size (e.g. length-of-datatype * bufferSize) may not exceed $2^{16}$ bytes

## Returns

an element of `bufferStatus_t`

## Return values

<i>bufferMemoryAllocationFailed</i>	The memory allocation with malloc failed. Make sure, you have enough memory available
<i>bufferOK</i>	It seems, like everything went well

8.1.2.4 `uint8_t` `bufferIsEmpty` ( `buffer_t *` *buffer* )

Checks, wheter the buffer is empty.

## Parameters

<i>buffer</i>	Pointer to a <a href="#">buffer_t</a> instance
---------------	--

## Return values

<i>1</i>	buffer is empty
<i>0</i>	buffer is not empty

8.1.2.5 `uint8_t bufferIsFull ( buffer_t * buffer )`

Checks, wheter the buffer is full.

## Parameters

<i>buffer</i>	Pointer to a <a href="#">buffer_t</a> instance
---------------	--

## Return values

<i>1</i>	buffer is full
<i>0</i>	buffer is not full

8.1.2.6 `bufferStatus_t bufferMean ( buffer_t * buffer, bufferDatatype * meanOut )`

take the average of the whole buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>meanOut</i>	pointer to a variable, where the mean will be stored

## Returns

a element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected, the mean is stored at the given variable
<i>bufferNotInitialized</i>	the buffer is not initialized

**Bug** The sum of the buffer is taken. Take precautions, that this variable won't overflow

8.1.2.7 `bufferStatus_t bufferMeanRMS ( buffer_t * buffer, bufferDatatype * meanOut )`

take the root mean square of the whole buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>meanOut</i>	pointer to a variable, where the mean will be stored

## Returns

a element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected, the mean is stored at the given variable
<i>bufferNotInitialized</i>	the buffer is not initialized

**Bug** The sum of squared buffer elements is taken. Take precautions, that this variable won't overflow

8.1.2.8 `bufferStatus_t bufferPeek ( buffer_t * buffer, bufferDatatype * data )`

have a look at the next element in the buffer, but do not increase the read pointer

## Parameters

<i>buffer</i>	pointer to a <code>buffer_t</code> instance
<i>data</i>	pointer to a variable where data should be stored

## Returns

a element of `bufferStatus_t`

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the <code>bufferInit()</code> method hasn't been called or failed before
<i>bufferEmpty</i>	the buffer is empty an no more data can be read

8.1.2.9 `bufferStatus_t bufferRead ( buffer_t * buffer, bufferDatatype * data )`

read data from the beginning of the buffer

## Parameters

<i>buffer</i>	pointer to a <code>buffer_t</code> instance
<i>data</i>	pointer to a variable where data should be stored

## Returns

a element of `bufferStatus_t`

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the <code>bufferInit()</code> method hasn't been called or failed before
<i>bufferEmpty</i>	the buffer is empty an no more data can be read

8.1.2.10 `bufferStatus_t bufferReadFromIndex ( buffer_t * buffer, uint16_t index, bufferDatatype * data )`

read data from a specifig index of the buffer WARNING: Take care when using this function, it is against the main concept of a ringbuffer

## Parameters

<i>buffer</i>	Pointer to a <code>buffer_t</code> instance
---------------	---

<i>index</i>	The index, where data should be written. It can be in range 0 to length - 1
<i>data</i>	Pointer to a variable where the read data should be written to.

**Returns**

an element of [bufferStatus\\_t](#)

**Return values**

<i>bufferOK</i>	It went successful
<i>bufferNotInitialized</i>	The buffer is not initialized. You have to call <code>bufferInit</code> before (or the init failed before)
<i>bufferError</i>	The desired data index is out of range

**8.1.2.11 `bufferStatus_t` `bufferWrite` ( `buffer_t` \* `buffer`, `bufferDatatype` `data` )**

add data to the end of the ringbuffer

**Parameters**

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>data</i>	data which should be written

**Returns**

a element of [bufferStatus\\_t](#)

**Return values**

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the <code>bufferInit()</code> method hasn't been called or failed before
<i>bufferFull</i>	the buffer is full an no more data can be written

**8.1.2.12 `bufferStatus_t` `bufferWriteToIndex` ( `buffer_t` \* `buffer`, `uint16_t` `index`, `bufferDatatype` `data` )**

write data to a specific index of the buffer. WARNING: Take care when using this function, it is against the main concept of a ringbuffer

**Parameters**

<i>buffer</i>	Pointer to a <a href="#">buffer_t</a> instance
<i>index</i>	The index, where data should be written. It can be in range 0 to length - 1
<i>data</i>	The actual data which should be written

**Returns**

an element of [bufferStatus\\_t](#)

**Return values**

<i>bufferOK</i>	It went successful
-----------------	--------------------



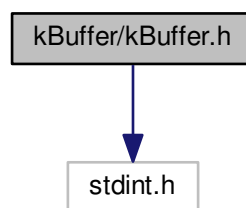
<i>bufferNotInitialized</i>	The buffer is not initialized. You have to call <code>bufferInit</code> before (or the init failed before)
<i>bufferError</i>	The desired data index is out of range

## 8.2 kBuffer/kBuffer.h File Reference

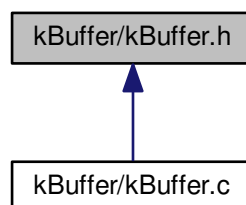
A universal ringbuffer library.

```
#include <stdint.h>
```

Include dependency graph for kBuffer.h:



This graph shows which files directly or indirectly include this file:



### Data Structures

- struct [buffer\\_t](#)

*Struct for buffer handling. If you need a ringbuffer in your software, you should instantiate a [buffer\\_t](#), and run the necessary functions with a pointer to your instance.*

### Macros

- #define [bufferDatatype](#) `uint16_t`

*The datatype of one buffer element. As default, it is an 16 bit unsigned integer. Feel free to change it to your needs.*

- #define [BUFFER\\_ENABLE\\_MEAN](#)

Enables mean/ averaging functions. If you uncomment this define, the following functions will be compiled.  
 Only enable it, if bufferDatatype is some sort of numeric datatype (integer, float, ...)  
`bufferMean();`  
`bufferMeanRMS();`

## Enumerations

- enum `bufferStatus_t` {  
`bufferOK = 0, bufferMemoryAllocationFailed, bufferEmpty, bufferFull,`  
`bufferNotInitialized, bufferError` }  
*buffer function return codes*

## Functions

- `bufferStatus_t bufferInit (buffer_t *buffer, uint16_t bufferSize)`  
*init a new buffer This function inits a new `buffer_t`.*
- `bufferStatus_t bufferWriteToIndex (buffer_t *buffer, uint16_t index, bufferDatatype data)`  
*write data to a specific index of the buffer. WARNING: Take care when using this function, it is against the main concept of a ringbuffer*
- `bufferStatus_t bufferReadFromIndex (buffer_t *buffer, uint16_t index, bufferDatatype *data)`  
*read data from a specifig index of the buffer WARNING: Take care when using this function, it is against the main concept of a ringbuffer*
- `uint8_t bufferIsEmpty (buffer_t *buffer)`  
*Checks, wheter the buffer is empty.*
- `uint8_t bufferIsFull (buffer_t *buffer)`  
*Checks, wheter the buffer is full.*
- `bufferStatus_t bufferWrite (buffer_t *buffer, bufferDatatype data)`  
*add data to the end of the ringbuffer*
- `bufferStatus_t bufferRead (buffer_t *buffer, bufferDatatype *data)`  
*read data from the beginning of the buffer*
- `bufferStatus_t bufferFill (buffer_t *buffer, bufferDatatype data, uint8_t silent)`  
*fill the whole buffer with given dummy data.*
- `bufferStatus_t bufferAvailable (buffer_t *buffer, uint16_t *available)`  
*return, how many elements are stored and available in the buffer*
- `bufferStatus_t bufferMean (buffer_t *buffer, bufferDatatype *meanOut)`  
*take the average of the whole buffer*
- `bufferStatus_t bufferMeanRMS (buffer_t *buffer, bufferDatatype *meanOut)`  
*take the root mean square of the whole buffer*

### 8.2.1 Detailed Description

A universal ringbuffer library.

#### Author

Peter Kappelt

#### See also

<https://github.com/peterkappelt/kBuffer>

## Copyright

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## 8.2.2 Enumeration Type Documentation

### 8.2.2.1 enum `bufferStatus_t`

buffer function return codes

## Enumerator

- `bufferOK`** it seems, as everything worked as expected
- `bufferMemoryAllocationFailed`** happens while allocating memory, there is not enough free memory (-> malloc failed)
- `bufferEmpty`** happens at reading data, buffer is empty and there is no more data to read
- `bufferFull`** happens at writing data, buffer is full, no more data can be written
- `bufferNotInitialized`** The buffer is not initialized
- `bufferError`** an error occurred, which isn't explained nearer. Have a look at the according function

## 8.2.3 Function Documentation

### 8.2.3.1 `bufferStatus_t` `bufferAvailable` ( `buffer_t * buffer`, `uint16_t * available` )

return, how many elements are stored and available in the buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>available</i>	pointer to a variable where the number of available elements should be stored

## Returns

an element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the buffer wasn't initialized

### 8.2.3.2 `bufferStatus_t` `bufferFill` ( `buffer_t * buffer`, `bufferDatatype data`, `uint8_t silent` )

fill the whole buffer with given dummy data.

## Parameters

<i>buffer</i>	pointer <a href="#">buffer_t</a> instance
<i>data</i>	data to fill the buffer with
<i>silent</i>	if this parameter is 1, the buffer will be filled with data, but the write pointer stays at its current position (usefull, if you take the mean but the buffer is not full yet. You can just prefill it, the mean will be taken with the prefilled values)

## Returns

an element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the buffer wasn't initialized

**8.2.3.3** `bufferStatus_t bufferInit ( buffer_t * buffer, uint16_t bufferSize )`

init a new buffer This function inits a new `buffer_t`.

## Parameters

<i>buffer</i>	Pointer (&) to a <code>buffer_t</code> object.
<i>bufferSize</i>	desired size of the buffer, the total buffer size (e.g. length-of-datatype * bufferSize) may not exceed $2^{16}$ bytes

## Returns

an element of `bufferStatus_t`

## Return values

<i>bufferMemoryAllocationFailed</i>	The memory allocation with malloc failed. Make sure, you have enough memory available
<i>bufferOK</i>	It seems, like everything went well

**8.2.3.4** `uint8_t bufferIsEmpty ( buffer_t * buffer )`

Checks, wheter the buffer is empty.

## Parameters

<i>buffer</i>	Pointer to a <code>buffer_t</code> instance
---------------	---

## Return values

<i>1</i>	buffer is empty
<i>0</i>	buffer is not empty

**8.2.3.5** `uint8_t bufferIsFull ( buffer_t * buffer )`

Checks, wheter the buffer is full.

## Parameters

<i>buffer</i>	Pointer to a <code>buffer_t</code> instance
---------------	---

## Return values

<i>1</i>	buffer is full
<i>0</i>	buffer is not full

**8.2.3.6** `bufferStatus_t bufferMean ( buffer_t * buffer, bufferDatatype * meanOut )`

take the average of the whole buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>meanOut</i>	pointer to a variable, where the mean will be stored

## Returns

a element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected, the mean is stored at the given variable
<i>bufferNotInitialized</i>	the buffer is not initialized

**Bug** The sum of the buffer is taken. Take precautions, that this variable won't overflow

### 8.2.3.7 [bufferStatus\\_t](#) `bufferMeanRMS ( buffer\_t * buffer, bufferDatatype * meanOut )`

take the root mean square of the whole buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>meanOut</i>	pointer to a variable, where the mean will be stored

## Returns

a element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected, the mean is stored at the given variable
<i>bufferNotInitialized</i>	the buffer is not initialized

**Bug** The sum of squared buffer elements is taken. Take precautions, that this variable won't overflow

### 8.2.3.8 [bufferStatus\\_t](#) `bufferRead ( buffer\_t * buffer, bufferDatatype * data )`

read data from the beginning of the buffer

## Parameters

<i>buffer</i>	pointer to a <a href="#">buffer_t</a> instance
<i>data</i>	pointer to a variable where data should be stored

## Returns

a element of [bufferStatus\\_t](#)

## Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the <a href="#">bufferInit()</a> method hasn't been called or failed before

<i>bufferEmpty</i>	the buffer is empty an no more data can be read
--------------------	---

#### 8.2.3.9 `bufferStatus_t` `bufferReadFromIndex` ( `buffer_t * buffer`, `uint16_t index`, `bufferDatatype * data` )

read data from a specifig index of the buffer WARNING: Take care when using this function, it is against the main concept of a ringbuffer

##### Parameters

<i>buffer</i>	Pointer to a <code>buffer_t</code> instance
<i>index</i>	The index, where data should be written. It can be in range 0 to length - 1
<i>data</i>	Pointer to a variable where the read data should be written to.

##### Returns

an element of `bufferStatus_t`

##### Return values

<i>bufferOK</i>	It went successfull
<i>bufferNotInitialized</i>	The buffer is not initialized. You have to call <code>bufferInit</code> before (or the init failed before)
<i>bufferError</i>	The desired data index is out of range

#### 8.2.3.10 `bufferStatus_t` `bufferWrite` ( `buffer_t * buffer`, `bufferDatatype data` )

add data to the end of the ringbuffer

##### Parameters

<i>buffer</i>	pointer to a <code>buffer_t</code> instance
<i>data</i>	data which should be written

##### Returns

a element of `bufferStatus_t`

##### Return values

<i>bufferOK</i>	it worked as expected
<i>bufferNotInitialized</i>	the <code>bufferInit()</code> method hasn't been called or failed before
<i>bufferFull</i>	the buffer is full an no more data can be written

#### 8.2.3.11 `bufferStatus_t` `bufferWriteToIndex` ( `buffer_t * buffer`, `uint16_t index`, `bufferDatatype data` )

write data to a specific index of the buffer. WARNING: Take care when using this function, it is against the main concept of a ringbuffer

##### Parameters

<i>buffer</i>	Pointer to a <code>buffer_t</code> instance
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<i>index</i>	The index, where data should be written. It can be in range 0 to length - 1
<i>data</i>	The actual data which should be written

**Returns**

an element of [bufferStatus\\_t](#)

**Return values**

<i>bufferOK</i>	It went successful
<i>bufferNotInitialized</i>	The buffer is not initialized. You have to call <code>bufferInit</code> before (or the init failed before)
<i>bufferError</i>	The desired data index is out of range





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