

LibTmsApi Reference Manual

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Chapter 1

LibTmsApi Main Page

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Version:

1.1.0

Date:

2007-10-19

1.1 Introduction

This document covers the BEAM LibTms software API for the CERN trajectory measurement system. This API provides the ability to control and receive data from the TMS System. The API is an object orientated API implemented in 'C++' with a number of object classes. The API operates over a network type interface using an RPC type mechanism.

The LibTms API makes use of the BEAM standard class library. The BEAM standard class library provides a small set of low level 'C++' classes for strings, lists and system interface functions. There is some brief information on the BEAM class library later on in this page.

1.2 Overview

Generally users of the system are only concerned with the top level, System Controller API. This is the API that control and data gathering clients use to control and gather data from the system. The System Controller API (TmsApi) is implemented using a simple, object orientated, RPC mechanism. Two main objects, the [Tms::TmsControl](#) and [Tms::TmsProcess](#) objects, provide the full API.

The TmsApi has been developed using the BOAP (BEAM Object Access Protocol). This provides a simple but powerful Object Orientated RPC mechanism. The TmsApi is written in a high level interface definition language (IDL). The bidl tool generates the client and server side 'C++' interface and implementation files for the API. These are then provided as a set of 'C++' header files and a binary library file for the clients to link to. The BOAP system employs a simple BOAP name server process that provides a translation between object names and IPAddress/Socket numbers. The BOAP name server runs on the System Controller. More information on the BOAP system can be found in the libBeam documentation.

There are two main Objects that are used by clients of the TMS API. They are the [Tms::TmsControl](#) and the [Tms::TmsProcess](#) objects. The [Tms::TmsControl](#) object is used for system configuration, testing and diagnostics. The [Tms::TmsProcess](#) object is used for normal clients for Proton Synchrotron (PS) Cycle information configuration and data access. There is some example client code in the `tmsExamples` of the source code and displayed later on this page. These objects communicate through a network connection with the `TmsServer` process running on the TMS System Controller. The TMS System Controller operates as a multi-threaded process and can communicate with multiple clients simultaneously.

The TMS system takes most of its system timing signals from digital timing lines connected to the TMS rack hardware. The only timing information that external software needs to supply is the next cycle number and cycle type information. The cycle number is a 32bit unsigned number identifying the next Proton Synchrotron (PS) machine cycle. The cycle type is an ASCII string defining the type of BEAM present in the PS machine. The cycle type defines a set of state/phase tables to be loaded in order to measure the BEAM in the machine. The CERN client software needs to provide this information by calling the `setNextCycle()` function before the next PS cycle is initiated.

The TMS system keeps a library of state/phase tables indexed by the cycle type. These are loaded into the individual PUPE engines FPGA's during the `CYCLE_STOP` to `CYCLE_START` period. The API provides the `setControlInfo` and `delControlInfo` calls to maintain this database.

A client would generally use the [Tms::TmsProcess](#) object for its interface to the TMS system. It would use `getData()` to fetch the required data from the system. There is also an event based data interface implemented using the `requestData()` call and `dataEvent()` event call.

Each of the TMS API calls return an error object. If there is an error, an appropriate error number will be given together with an ASCII string describing the error.

1.3 BEAM class library

The BEAM class library implements some basic low level classes and is used by the TMS API implementation itself. The main class functionality includes:

- [BString](#) - A simple string class
- [BList](#) - A templated list class
- [BArray](#) - A templated array class
- [BError](#) - An error return class containing an integer and string
- [BSocket](#) - A Network socket access class
- [BThread](#) - A thread implementation class
- [BPoll](#) - A file descriptor event polling class
- [BMutex](#) - A mutex lock
- [BRWLock](#) - A read/write lock
- [BSema](#) - A semaphore
- [BCondInt](#) - An integer condition class
- [BFile](#) - A simple file access class
- [BDir](#) - A simple directory access class
- [BEntry](#) - A name/value pair list class

- [BNameValue](#) - A name/value pair class
- [BRtc](#) - A realtime clock
- [BTimer](#) - A simple timer class
- [BUrl](#) - URL access class

1.4 Examples

There are some examples of client applications using the TmsApi in the `tmsExamples` directory of the source code. A simple Data Access client example is listed below:

```

/*****
 *      TmsDataClient.cpp      TMS API example code for a Data Client
 *      T.Barnaby,           BEAM Ltd,           2007-02-07
 *****/
 *
 *      This is a very basic example of using the TmsApi from a clients perspective.
 *      It is designed to give an overview of using the API.
 */
#include <iostream>
#include <stdio.h>
#include <TmsD.h>
#include <TmsC.h>

using namespace Tms;
using namespace std;

// Function to reads some data
BError tmsTest(TmsProcess& tmsProcess){
    BError          err;
    DataInfo        dataInfo;
    Data            data;
    UInt32          cn = 0;
    BString         ct;

    // Find out the current cycle number and type
    if(err = tmsProcess.getCycleInfo(cn, ct)){
        return err.set(1, BString("Error: Getting Cycle Number: ") + err.getString());
    }

    printf("Getting data for cycles starting at cycle: %u\n", cn);

    for(; ; cn++){
        // Setup dataInfo
        printf("GetData: Cycle Number: %u\n", cn);
        dataInfo.cycleNumber    = cn;
        dataInfo.channel        = 1;
        dataInfo.cyclePeriod    = CyclePeriodEvent0;
        dataInfo.startTime      = 0;
        dataInfo.orbitNumber    = 0;
        dataInfo.bunchNumber    = 0;
        dataInfo.function       = DataFunctionRaw;
        dataInfo.argument       = 0;
        dataInfo.numValues      = 1024;
        dataInfo.limitData     = 1;

        if(err = tmsProcess.getData(dataInfo, data)){
            return err.set(1, BString("Error: Getting Data: ") + err.getString());
        }
        printf("Data: NumValues: %d\n", data.numValues);
    }
}

```

```

    }

    return err;
}

int main(int argc, char** argv){
    BError      err;
    BString      host = "localhost";
    TmsProcess   tmsProcess;

    if(argc == 2)
        host = argv[1];

    // Connect to the Process service
    if(err = tmsProcess.connectService(BString("//") + host + "/tmsProcess")){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    // Run a normal data gathering cycle as a normal client would.
    if(err = tmsTest(tmsProcess)){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    return 0;
}

```

A simple Control client example is listed below:

```

/*****
 *   TmsControlClient1.cpp   TMS API example code
 *   T.Barnaby,   BEAM Ltd,   2007-02-07
 *****/
 *
 *   This is a very basic example of using the TmsApi from a clients perspective.
 *   It is designed to give an overview of using the API.
 */
#include <iostream>
#include <stdio.h>
#include <TmsD.h>
#include <TmsC.h>

using namespace Tms;
using namespace std;

const UInt32    tmsStateNum = 16;
const UInt32    tmsPickupNum = 40;

// Initialise and test the TMS system
BError tmsInit(TmsControl& tmsControl){
    BError      err;
    ConfigInfo   configInfo;
    BIter        i;
    BList<BError>   errorList;
    BList<NameValue>   nvList;
    BString      version;

    // Get Version
    if(err = tmsControl.getVersion(version)){
        return err.set(1, BString("Error: initialising TMS: ") + err.getString());
    }
    cout << "Version: " << version << "\n";

    // Initialise TMS system
    if(err = tmsControl.init()){
        return err.set(1, BString("Error: initialising TMS: ") + err.getString());
    }
}

```

```

    }

    // Test TMS system
    if(err = tmsControl.test(errorList)){
        return err.set(1, BString("Error: testing TMS: ") + err.getString());
    }

    for(errorList.start(i); !errorList.isEnd(i); errorList.next(i)){
        cout << "Warning: " << errorList[i].getString() << "\n";
    }

    // Get Status of TMS system
    if(err = tmsControl.getStatus(nvList)){
        return err.set(1, BString("Error: getting status: ") + err.getString());
    }

    for(nvList.start(i); !nvList.isEnd(i); nvList.next(i)){
        cout << nvList[i].name << ":\t" << nvList[i].value << "\n";
    }

    return err;
}

int main(int argc, char** argv){
    BError          err;
    BString         host = "localhost";
    TmsControl      tmsControl;
    TmsProcess      tmsProcess;

    if(argc == 2)
        host = argv[1];

    // Connect to the Control service
    if(err = tmsControl.connectService(BString("//") + host + "/tmsControl")){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    // Connect to the Process service
    if(err = tmsProcess.connectService(BString("//") + host + "/tmsProcess")){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    // Initialise and test the TMS system. Normally carried out by a configuration
    // and test client program.
    if(err = tmsInit(tmsControl)){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    return 0;
}

```

A simple Control client to set the next cycle information example is listed below:

```

/*****
 *      TmsControlClient2.cpp    TMS API example code
 *                               T.Barnaby,    BEAM Ltd,    2007-02-07
 *****/
 *
 *      This is a very basic example of using the TmsApi to set the
 *      TMS's cycleNumber and cycleType.
 *      It is designed to give an overview of using the API.
 */
#include <iostream>
#include <stdio.h>

```

```
#include <unistd.h>
#include <TmsD.h>
#include <TmsC.h>

using namespace Tms;
using namespace std;

// Loop sending next cycle information
BError tmsControlLoop(TmsControl& tmsControl){
    BError          err;
    UInt32          cn = 0;
    BString         ct = "Beam3";

    while(1){
        // Wait for next cycle information
        usleep(1200000);

        // Set next cycle information
        cn = cn + 1;
        ct = "Beam3";

        // Send the next cycle information to the TMS server
        if(err = tmsControl.setNextCycle(cn, ct)){
            cerr << "Error: " << err.getString() << "\n";
        }
    }

    return err;
}

int main(int argc, char** argv){
    BError          err;
    BString         host = "localhost";
    TmsControl      tmsControl;

    if(argc == 2)
        host = argv[1];

    // Connect to the Control service
    if(err = tmsControl.connectService(BString("/") + host + "/tmsControl")){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    // Set the network priority high
    if(err = tmsControl.setPriority(BSocket::PriorityHigh)){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    // Set the TmsServer thread priority high
    if(err = tmsControl.setProcessPriority(PriorityHigh)){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    if(err = tmsControlLoop(tmsControl)){
        cerr << "Error: " << err.getString() << "\n";
        return 1;
    }

    return 0;
}
```

Chapter 2

LibTmsApi Directory Hierarchy

2.1 LibTmsApi Directories

This directory hierarchy is sorted roughly, but not completely, alphabetically:

beam	21
libBeam	22

Chapter 3

LibTmsApi Namespace Index

3.1 LibTmsApi Namespace List

Here is a list of all namespaces with brief descriptions:

Boapns	25
Tms	27

Chapter 4

LibTmsApi Hierarchical Index

4.1 LibTmsApi Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

BArray< T >	33
BBuffer	34
BCond	36
BCondBool	37
BCondInt	39
BCondValue	42
BCondWrap	45
BEntry	51
BError	59
BEventError	64
BEvent	62
BEventError	64
BEventInt	65
BEventPipe	67
BFile	69
BIter	73
BList< T >	74
BDir	48
BList< T >::Node	81
BList< BEntry >	74
BEntryList	56
BEntryFile	54
BList< BNameValue< T > >	74
BNameValueList< T >	85
BList< dirent * >	74
BMutex	82
BNameValue< T >	84
Boapns::BoapEntry	90
BoapFuncEntry	91
BoapPacket	93
BoapPacketHead	98
BoapServiceEntry	107

BoapServiceObject	108
BObject	114
BPoll	116
BRefData	119
BRtc	121
BRWLock	125
BSema	127
BSignal	129
BSocket	131
BoapClientObject	86
Boapns::Boapns	92
Tms::PuControl	185
Tms::PuProcess	190
Tms::TmsControl	207
Tms::TmsEvent	215
Tms::TmsProcess	220
BoapClientObject	86
BoapSignalObject	112
BoapSignalObject	112
BSocketAddress	136
BSocketAddressINET	138
BString	141
BThread	149
BoapServer	99
BoapServerConnection	105
BRtcThreaded	123
BTimer	151
BUrl	154
Tms::ConfigInfo	156
Tms::CycleInformation	157
Tms::CycleInformationPeriod	158
Tms::CycleParam	160
Tms::CycleParamEdit	165
Tms::CycleParamDb	163
Tms::CycleParamItem	168
Tms::CycleParamState	169
Tms::CycleTypeInfoInformation	172
Tms::CycleTypeInfoInformationPeriod	173
Tms::Data	175
Tms::DataInfo	177
Tms::DataValue	180
Tms::NameValue	182
Tms::PuChannel	183
Tms::PupeConfig	189
Tms::PuStateTable	192
Tms::PuStatus	194
SigGen	195
SigGenBeam	196
SigGenNoise	198
SigGenPulse	199
SigGenSine	201
SigGenSquare	202

vector	204
Tms::TestCaptureInfo	205
Tms::TmsEventServerList	217
Tms::TmsPhase	219
Tms::TmsState	224

Chapter 5

LibTmsApi Class Index

5.1 LibTmsApi Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

BArray< T >	33
BBuffer	34
BCond	36
BCondBool (Thread conditional boolean)	37
BCondInt (Thread conditional integer)	39
BCondValue (Thread conditional value)	42
BCondWrap	45
BDir (File system directory class)	48
BEntry (Manipulate a name value pair)	51
BEntryFile (File of Entries)	54
BEntryList (List of Entries. Where an entry is a name value pair)	56
BError (Error return class)	59
BEvent (This class provides a base class for all event objects that can be sent over the events interface)	62
BEventError	64
BEventInt (This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call)	65
BEventPipe (This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call)	67
BFile (File operations class)	69
BIter (Iterator for BList)	73
BList< T > (Template based list class)	74
BList< T >::Node	81
BMutex (Mutex class)	82
BNameValue< T >	84
BNameValueList< T >	85
BoapClientObject	86
Boapns::BoapEntry	90
BoapFuncEntry	91
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Chapter 6

LibTmsApi File Index

6.1 LibTmsApi File List

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Chapter 7

LibTmsApi Directory Documentation

7.1 /src/cern/tms/beam/ Directory Reference

Directories

- directory [libBeam](#)

7.2 /src/cern/tms/beam/libBeam/ Directory Reference

Files

- file [BArray.h](#)
- file [BBuffer.cpp](#)
- file [BBuffer.h](#)
- file [BCond.cpp](#)
- file [BCond.h](#)
- file [BCondInt.cpp](#)
- file [BCondInt.h](#)
- file [BDir.cpp](#)
- file [BDir.h](#)
- file [BEntry.cpp](#)
- file [BEntry.h](#)
- file [BError.cpp](#)
- file [BError.h](#)
- file [BEvent.cpp](#)
- file [BEvent.h](#)
- file [BFile.cpp](#)
- file [BFile.h](#)
- file [BList.h](#)
- file [BList_func.h](#)
- file [BMutex.cpp](#)
- file [BMutex.h](#)
- file [BNameValue.h](#)
- file [Boap.cpp](#)
- file [Boap.h](#)
- file [BoapnsC.cc](#)
- file [BoapnsC.h](#)
- file [BoapnsD.cc](#)
- file [BoapnsD.h](#)
- file [BoapSimple.cc](#)
- file [BoapSimple.h](#)
- file [BObject.cc](#)
- file [BObject.h](#)
- file [BPoll-1.cpp](#)
- file [BPoll.cpp](#)
- file [BPoll.h](#)
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- file [BRefData.h](#)
- file [BRtc.cpp](#)
- file [BRtc.h](#)
- file [BRWLock.cpp](#)
- file [BRWLock.h](#)
- file [BSema.cpp](#)
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- file [BString.h](#)
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- file [BTimer.cpp](#)
- file [BTimer.h](#)
- file [BTypes.h](#)
- file [BUrl.cpp](#)
- file [BUrl.h](#)

Chapter 8

LibTmsApi Namespace Documentation

8.1 Boapns Namespace Reference

Classes

- class [Boapns](#)
- class [BoapEntry](#)

Functions

- [Boapns](#) (BString name)
- [BError getVersion](#) (BString &version)
- [BError getEntryList](#) (BList< [BoapEntry](#) > &entryList)
- [BError getEntry](#) (BString name, [BoapEntry](#) &entry)
- [BError addEntry](#) ([BoapEntry](#) entry)
- [BError delEntry](#) (BString name)
- [BError getNewName](#) (BString &name)

Variables

- const [BUInt32 apiVersion](#) = 0

8.1.1 Function Documentation

8.1.1.1 **BError** Boapns::addEntry (BoapEntry *entry*)

8.1.1.2 **Boapns::Boapns** (BString *name*)

8.1.1.3 **BError** Boapns::delEntry (BString *name*)

8.1.1.4 **BError** Boapns::getEntry (BString *name*, BoapEntry & *entry*)

8.1.1.5 **BError** Boapns::getEntryList (BList< BoapEntry > & *entryList*)

8.1.1.6 **BError** Boapns::getNewName (BString & *name*)

8.1.1.7 **BError** Boapns::getVersion (BString & *version*)

8.1.2 Variable Documentation

8.1.2.1 const **BUInt32** Boapns::apiVersion = 0

8.2 Tms Namespace Reference

Classes

- class [PuControl](#)
This class defines the parameters for a test data capture.
- class [PuProcess](#)
This interface provides functions to configure and capture data from individual pick-up.
- class [TmsControl](#)
This interface provides functions to control, test and get statistics from the TMS as a whole.
- class [TmsProcess](#)
This interface provides functions to capture data from the TMS as a whole.
- class [TmsEvent](#)
This interface provides functions for events to be sent to clients from the TMS as a whole.
- class [CycleParamState](#)
- class [CycleParamEdit](#)
Cycle Parameter management class.
- class [NameValue](#)
- class [PuChannel](#)
This class stores a Physical Pick-Up channel id.
- class [PuStatus](#)
This class stores the status of an individual Pick-Up.
- class [ConfigInfo](#)
This class describes the configuration of the TMS.
- class [DataInfo](#)
This class defines the data to be acquired and/or fetched.
- class [DataValue](#)
This is the definition of a single data value.
- class [Data](#)
This class stores the raw data.
- class [PuStateTable](#)
This class defines the Pick-Up state table.
- class [CycleParam](#)
This class defines the parameters for a PS processing cycle.
- class [CycleParamItem](#)
- class [TestCaptureInfo](#)

This class defines the parameters for a test data capture.

- class [PupeConfig](#)
- class [CycleInformationPeriod](#)
Cycle information.
- class [CycleInformation](#)
- class [CycleTypeInformationPeriod](#)
Cycle Type information.
- class [CycleTypeInformation](#)
- class [TmsEventServerList](#)
- union [TmsState](#)
The Tms State entry.
- union [TmsPhase](#)
The Tms Phase Table Entry.
- class [CycleParamDb](#)
Internal CycleParameter management class.

Enumerations

- enum [Errors](#) {
[ErrorOk](#), [ErrorMisc](#), [ErrorWarning](#), [ErrorInit](#),
[ErrorConfig](#), [ErrorParam](#), [ErrorNotImplemented](#), [ErrorComms](#),
[ErrorCommsTimeout](#), [ErrorMC](#), [ErrorFpga](#), [ErrorStateTable](#),
[ErrorCycleNumber](#), [ErrorDataNotAvailable](#), [ErrorDataGone](#), [ErrorDataFuture](#),
[ErrorTimeout](#) }
- enum [CyclePeriod](#) {
[CyclePeriodAll](#), [CyclePeriodCalibration](#), [CyclePeriodEvent0](#), [CyclePeriodEvent1](#),
[CyclePeriodEvent2](#), [CyclePeriodEvent3](#), [CyclePeriodEvent4](#), [CyclePeriodEvent5](#),
[CyclePeriodEvent6](#), [CyclePeriodEvent7](#), [CyclePeriodEvent8](#), [CyclePeriodEvent9](#) }
- enum [DataType](#) { [DataTypeRaw](#) }
- enum [DataFunction](#) {
[DataFunctionRaw](#), [DataFunctionMean](#), [DataFunctionMeanAll](#), [DataFunctionMean0](#),
[DataFunctionMean1](#) }
- enum [TestOutput](#) { [TestOutputFrefLocal](#), [TestOutputPIIL1](#), [TestOutputPIIL2](#) }
- enum [Priority](#) { [PriorityLow](#), [PriorityNormal](#), [PriorityHigh](#) }
- enum [TimingSig](#) {
[TimingSigClock](#) = 0x01, [TimingSigCycleStart](#) = 0x02, [TimingSigCycleStop](#) = 0x04, [TimingSigCal-](#)
[Start](#) = 0x08,
[TimingSigCalStop](#) = 0x10, [TimingSigInjection](#) = 0x20, [TimingSigHChange](#) = 0x40, [TimingSigFRef](#)
= 0x80 }
The timing signal bits.

- enum `CaptureClock` {
`ClkAdcDiv_1` = 0x00, `ClkAdcDiv_2` = 0x01, `ClkAdcDiv_5` = 0x02, `ClkAdcDiv_10` = 0x03,
`ClkAdcDiv_20` = 0x04, `ClkAdcDiv_50` = 0x05, `ClkAdcDiv_100` = 0x06, `ClkAdcDiv_200` = 0x07,
`ClkAdcDiv_500` = 0x08, `ClkAdcDiv_1000` = 0x09, `ClkAdcDiv_2000` = 0x0A, `ClkAdcDiv_5000` =
0x0B,
`ClkAdcDiv_10000` = 0x0C, `ClkAdcDiv_20000` = 0x0D, `ClkAdcDiv_50000` = 0x0E, `ClkAdcDiv_-`
`100000` = 0x0F,
`ClkMs` = 0x10, `ClkFref` = 0x11 }
The Diagnostics Capture Clock settings.

Variables

- const `BUInt32 apiVersion` = 0
- const unsigned int `tmsNumPickups` = 40
The default number of pick ups.
- const unsigned int `tmsPhaseTableSize` = 512
The size of the Phase Table.

8.2.1 Enumeration Type Documentation

8.2.1.1 enum `Tms::CaptureClock`

The Diagnostics Capture Clock settings.

Enumerator:

- `ClkAdcDiv_1` ADC Clock.
- `ClkAdcDiv_2` ADC Clock divided by 2.
- `ClkAdcDiv_5` ADC Clock divided by 5.
- `ClkAdcDiv_10` ADC Clock divided by 10.
- `ClkAdcDiv_20` ADC Clock divided by 20.
- `ClkAdcDiv_50` ADC Clock divided by 50.
- `ClkAdcDiv_100` ADC Clock divided by 100.
- `ClkAdcDiv_200` ADC Clock divided by 200.
- `ClkAdcDiv_500` ADC Clock divided by 500.
- `ClkAdcDiv_1000` ADC Clock divided by 1000.
- `ClkAdcDiv_2000` ADC Clock divided by 2000.
- `ClkAdcDiv_5000` ADC Clock divided by 5000.
- `ClkAdcDiv_10000` ADC Clock divided by 10000.
- `ClkAdcDiv_20000` ADC Clock divided by 20000.
- `ClkAdcDiv_50000` ADC Clock divided by 50000.
- `ClkAdcDiv_100000` ADC Clock divided by 100000.
- `ClkMs` Millisecond Clock.
- `ClkFref` FREF.

8.2.1.2 enum [Tms::CyclePeriod](#)

Enumerator:

- CyclePeriodAll*
- CyclePeriodCalibration*
- CyclePeriodEvent0*
- CyclePeriodEvent1*
- CyclePeriodEvent2*
- CyclePeriodEvent3*
- CyclePeriodEvent4*
- CyclePeriodEvent5*
- CyclePeriodEvent6*
- CyclePeriodEvent7*
- CyclePeriodEvent8*
- CyclePeriodEvent9*

8.2.1.3 enum [Tms::DataFunction](#)

Enumerator:

- DataFunctionRaw*
- DataFunctionMean*
- DataFunctionMeanAll*
- DataFunctionMean0*
- DataFunctionMean1*

8.2.1.4 enum [Tms::DataType](#)

Enumerator:

- DataTypeRaw*

8.2.1.5 enum [Tms::Errors](#)

Enumerator:

- ErrorOk*
- ErrorMisc*
- ErrorWarning*
- ErrorInit*
- ErrorConfig*
- ErrorParam*
- ErrorNotImplemented*
- ErrorComms*

ErrorCommsTimeout

ErrorMC

ErrorFpga

ErrorStateTable

ErrorCycleNumber

ErrorDataNotAvailable

ErrorDataGone

ErrorDataFuture

ErrorTimeout

8.2.1.6 enum [Tms::Priority](#)

Enumerator:

PriorityLow

PriorityNormal

PriorityHigh

8.2.1.7 enum [Tms::TestOutput](#)

Enumerator:

TestOutputFrefLocal

TestOutputPILL1

TestOutputPILL2

8.2.1.8 enum [Tms::TimingSig](#)

The timing signal bits.

Enumerator:

TimingSigClock 10MHz System Clock

TimingSigCycleStart CYCLE_START event.

TimingSigCycleStop CYCLE_STOP event.

TimingSigCalStart CAL_START event.

TimingSigCalStop CAL_STOP event.

TimingSigInjection INJECTION event.

TimingSigHChange HCHANGE event.

TimingSigFRef FREF signal.

8.2.2 Variable Documentation

8.2.2.1 `const BUInt32 Tms::apiVersion = 0`

8.2.2.2 `const unsigned int Tms::tmsNumPickups = 40`

The default number of pick ups.

8.2.2.3 `const unsigned int Tms::tmsPhaseTableSize = 512`

The size of the Phase Table.

Chapter 9

LibTmsApi Class Documentation

9.1 BArray< T > Class Template Reference

```
#include <BArray.h>
```

Public Member Functions

- [BArray \(\)](#)
- [BArray \(BSize size, T value=T\(\)\)](#)
- [BArray \(const BArray &array\)](#)

9.1.1 Detailed Description

```
template<class T> class BArray< T >
```

Template based Array class. This is based on the Standard C++ library vector class and has all of the functionality of that class.

9.1.2 Constructor & Destructor Documentation

9.1.2.1 `template<class T> BArray< T >::BArray \(\) [inline]`

9.1.2.2 `template<class T> BArray< T >::BArray \(BSize size, T value = T\(\)\) [inline]`

9.1.2.3 `template<class T> BArray< T >::BArray \(const BArray< T > & array\) [inline]`

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

- [/src/cern/tms/beam/libBeam/BArray.h](#)

9.2 BBuffer Class Reference

```
#include <BBuffer.h>
```

Public Member Functions

- [BBuffer \(\)](#)
Create and manipulate a data buffer. On creation the buffer size defaults to 1024 bytes.
- [~BBuffer \(\)](#)
- [int setSize \(uint32_t size\)](#)
Sets the bufer size.
- [int setData \(const void *data, uint32_t size\)](#)
Sets buffer data resized to contain the data.
- [int writeData \(uint32_t pos, const void *data, uint32_t size\)](#)
Writes data into buffer from offset pos.
- [void * data \(\)](#)
The data.
- [uint32_t size \(\)](#)
Size of the buffer in bytes.

Private Attributes

- [uint32_t osize](#)
- [uint32_t odatasize](#)
- [void * odata](#)

9.2.1 Constructor & Destructor Documentation

9.2.1.1 BBuffer::BBuffer ()

Create and manipulate a data buffer. On creation the buffer size defaults to 1024 bytes.

9.2.1.2 BBuffer::~~BBuffer ()

9.2.2 Member Function Documentation

9.2.2.1 int BBuffer::setSize (uint32_t size)

Sets the bufer size.

9.2.2.2 int BBuffer::setData (const void * data, uint32_t size)

Sets buffer data resized to contain the data.

9.2.2.3 int BBuffer::writeData (uint32_t pos, const void * data, uint32_t size)

Writes data into buffer from offset pos.

9.2.2.4 void * BBuffer::data ()

The data.

9.2.2.5 uint32_t BBuffer::size ()

Size of the buffer in bytes.

9.2.3 Member Data Documentation**9.2.3.1 uint32_t BBuffer::osize** [private]**9.2.3.2 uint32_t BBuffer::odatasize** [private]**9.2.3.3 void* BBuffer::odata** [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BBuffer.h](#)
- [/src/cern/tms/beam/libBeam/BBuffer.cpp](#)

9.3 BCond Class Reference

```
#include <BCond.h>
```

Public Member Functions

- [BCond \(\)](#)
Thread conditional variable.
- [~BCond \(\)](#)
- [int signal \(\)](#)
- [int wait \(\)](#)
- [int timedWait \(int timeOutUs\)](#)

Private Attributes

- [pthread_mutex_t omutex](#)
- [pthread_cond_t ocond](#)

9.3.1 Constructor & Destructor Documentation

9.3.1.1 BCond::BCond ()

Thread conditional variable.

9.3.1.2 BCond::~~BCond ()

9.3.2 Member Function Documentation

9.3.2.1 int BCond::signal ()

9.3.2.2 int BCond::wait ()

9.3.2.3 int BCond::timedWait (int *timeOutUs*)

9.3.3 Member Data Documentation

9.3.3.1 pthread_mutex_t BCond::omutex [private]

9.3.3.2 pthread_cond_t BCond::ocond [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BCond.h](#)
- [/src/cern/tms/beam/libBeam/BCond.cpp](#)

9.4 BCondBool Class Reference

Thread conditional boolean.

```
#include <BCondInt.h>
```

Public Member Functions

- [BCondBool \(\)](#)
- [~BCondBool \(\)](#)
- [int set \(\)](#)
Set value. Wakes waiting.
- [int clear \(\)](#)
Clear Value.
- [int value \(\)](#)
Current value.
- [int wait \(\)](#)
Wait until value is true.
- [int timedWait \(int timeOutUs\)](#)
Wait until set, with timeout.

Private Attributes

- [pthread_mutex_t omutex](#)
- [pthread_cond_t ocond](#)
- [int ovalue](#)

9.4.1 Detailed Description

Thread conditional boolean.

9.4.2 Constructor & Destructor Documentation

9.4.2.1 BCondBool::BCondBool ()

9.4.2.2 BCondBool::~~BCondBool ()

9.4.3 Member Function Documentation

9.4.3.1 int BCondBool::set ()

Set value. Wakes waiting.

9.4.3.2 int BCondBool::clear ()

Clear Value.

9.4.3.3 int BCondBool::value ()

Current value.

9.4.3.4 int BCondBool::wait ()

Wait until value is true.

9.4.3.5 int BCondBool::timedWait (int *timeOutUs*)

Wait until set, with timeout.

9.4.4 Member Data Documentation

9.4.4.1 pthread_mutex_t BCondBool::omutex [private]

9.4.4.2 pthread_cond_t BCondBool::ocond [private]

9.4.4.3 int BCondBool::ovalue [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BCondInt.h](#)
- [/src/cern/tms/beam/libBeam/BCondInt.cpp](#)

9.5 BCondInt Class Reference

Thread conditional integer.

```
#include <BCondInt.h>
```

Public Member Functions

- [BCondInt \(\)](#)
- [~BCondInt \(\)](#)
- void [setValue](#) (int value)
Set value.
- int [increment](#) ()
Increment.
- int [decrement](#) ()
Decrement.
- int [value](#) ()
Current value.
- int [wait](#) ()
Wait until value is 0.
- int [waitIncrement](#) (int timeOutUs=0)
Wait until value is 0 then increment.
- int [waitNotZero](#) ()
Wait until value is not 0.
- int [waitNotZeroDecrement](#) ()
Wait until value is not 0 and then decrement.
- int [tryNotZeroDecrement](#) ()
Test if value is not 0, if not zero then decrement.
- int [timedWait](#) (int timeOutUs)
Wait for the condition, with timeout.
- void [operator++](#) (int)
- void [operator--](#) (int)

Private Attributes

- pthread_mutex_t [omutex](#)
- pthread_cond_t [ocond](#)
- int [ovalue](#)

9.5.1 Detailed Description

Thread conditional integer.

9.5.2 Constructor & Destructor Documentation

9.5.2.1 BCondInt::BCondInt ()

9.5.2.2 BCondInt::~~BCondInt ()

9.5.3 Member Function Documentation

9.5.3.1 void BCondInt::setValue (int *value*)

Set value.

9.5.3.2 int BCondInt::increment ()

Increment.

9.5.3.3 int BCondInt::decrement ()

Decrement.

9.5.3.4 int BCondInt::value ()

Current value.

9.5.3.5 int BCondInt::wait ()

Wait until value is 0.

9.5.3.6 int BCondInt::waitIncrement (int *timeOutUs* = 0)

Wait until value is 0 then increment.

9.5.3.7 int BCondInt::waitNotZero ()

Wait until value is not 0.

9.5.3.8 int BCondInt::waitNotZeroDecrement ()

Wait until value is not 0 and then decrement.

9.5.3.9 int BCondInt::tryNotZeroDecrement ()

Test if value is not 0, if not zero then decrement.

9.5.3.10 int BCondInt::timedWait (int *timeOutUs*)

Wait for the condition, with timeout.

9.5.3.11 void BCondInt::operator++ (int) [inline]

9.5.3.12 void BCondInt::operator-- (int) [inline]

9.5.4 Member Data Documentation

9.5.4.1 pthread_mutex_t BCondInt::omutex [private]

9.5.4.2 pthread_cond_t BCondInt::ocond [private]

9.5.4.3 int BCondInt::ovalue [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BCondInt.h](#)
- [/src/cern/tms/beam/libBeam/BCondInt.cpp](#)

9.6 BCondValue Class Reference

Thread conditional value.

```
#include <BCondInt.h>
```

Public Member Functions

- [BCondValue](#) ()
- [~BCondValue](#) ()
- void [setValue](#) (int value)
Set the value. Wakes waiting.
- int [value](#) ()
Current value.
- int [increment](#) (int v=1)
Increment. Wakes waiting.
- int [decrement](#) (int v=1)
Decrement. Wakes waiting.
- int [waitMoreThanOrEqual](#) (int v, int decrement=0, int timeOutUs=0)
Wait until value is at least the value given.
- int [waitLessThanOrEqual](#) (int v, int increment=0, int timeOutUs=0)
Wait until value is equal to or below the value given.
- int [waitLessThan](#) (int v, int timeOutUs=0)
Wait until value is equal to or below the value given.
- void [operator+=](#) (int v)
Add to value. Wakes waiting.
- void [operator-=](#) (int v)
Subtract from value. Wakes waiting.
- void [operator++](#) (int)
Increment value. Wakes waiting.
- void [operator--](#) (int)
Decrement value. Wakes waiting.

Private Attributes

- pthread_mutex_t [omutex](#)
- pthread_cond_t [ocond](#)
- int [ovalue](#)

9.6.1 Detailed Description

Thread conditional value.

9.6.2 Constructor & Destructor Documentation

9.6.2.1 BCondValue::BCondValue ()

9.6.2.2 BCondValue::~~BCondValue ()

9.6.3 Member Function Documentation

9.6.3.1 void BCondValue::setValue (int *value*)

Set the value. Wakes waiting.

9.6.3.2 int BCondValue::value ()

Current value.

9.6.3.3 int BCondValue::increment (int *v* = 1)

Increment. Wakes waiting.

9.6.3.4 int BCondValue::decrement (int *v* = 1)

Decrement. Wakes waiting.

9.6.3.5 int BCondValue::waitMoreThanOrEqual (int *v*, int *decrement* = 0, int *timeOutUs* = 0)

Wait until value is at least the value given.

9.6.3.6 int BCondValue::waitLessThanOrEqual (int *v*, int *increment* = 0, int *timeOutUs* = 0)

Wait until value is equal to or below the value given.

9.6.3.7 int BCondValue::waitLessThan (int *v*, int *timeOutUs* = 0)

Wait until value is equal to or below the value given.

9.6.3.8 void BCondValue::operator+= (int *v*) [inline]

Add to value. Wakes waiting.

9.6.3.9 void BCondValue::operator-= (int *v*) [inline]

Subtract from value. Wakes waiting.

9.6.3.10 void BCondValue::operator++ (int) [inline]

Increment value. Wakes waiting.

9.6.3.11 void BCondValue::operator-- (int) [inline]

Decrement value. Wakes waiting.

9.6.4 Member Data Documentation**9.6.4.1 pthread_mutex_t BCondValue::omutex [private]****9.6.4.2 pthread_cond_t BCondValue::ocond [private]****9.6.4.3 int BCondValue::ovalue [private]**

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BCondInt.h](#)
- [/src/cern/tms/beam/libBeam/BCondInt.cpp](#)

9.7 BCondWrap Class Reference

```
#include <BCondInt.h>
```

Public Member Functions

- [BCondWrap \(\)](#)
- [~BCondWrap \(\)](#)
- void [setValue](#) (uint32_t value)
Set the value. Wakes waiting.
- uint32_t [value](#) ()
Current value.
- uint32_t [increment](#) (uint32_t v=1)
Increment. Wakes waiting.
- uint32_t [decrement](#) (uint32_t v=1)
Decrement. Wakes waiting.
- int [waitMoreThanOrEqual](#) (uint32_t v, uint32_t decrement=0, uint32_t timeOutUs=0)
Wait until value is at least the value given.
- int [waitLessThanOrEqual](#) (uint32_t v, uint32_t increment=0, uint32_t timeOutUs=0)
Wait until value is equal to or below the value given.
- int [waitLessThan](#) (uint32_t v, uint32_t timeOutUs=0)
Wait until value is equal to or below the value given.
- void [operator+=](#) (int v)
Add to value. Wakes waiting.
- void [operator-=](#) (int v)
Subtract from value. Wakes waiting.
- void [operator++](#) (int)
Increment value. Wakes waiting.
- void [operator--](#) (int)
Decrement value. Wakes waiting.

Private Member Functions

- int [diff](#) (uint32_t v)

Private Attributes

- pthread_mutex_t `omutex`
- pthread_cond_t `ocond`
- uint32_t `ovalue`

9.7.1 Constructor & Destructor Documentation

9.7.1.1 `BCondWrap::BCondWrap ()`

9.7.1.2 `BCondWrap::~~BCondWrap ()`

9.7.2 Member Function Documentation

9.7.2.1 `void BCondWrap::setValue (uint32_t value)`

Set the value. Wakes waiting.

9.7.2.2 `uint32_t BCondWrap::value ()`

Current value.

9.7.2.3 `uint32_t BCondWrap::increment (uint32_t v = 1)`

Increment. Wakes waiting.

9.7.2.4 `uint32_t BCondWrap::decrement (uint32_t v = 1)`

Decrement. Wakes waiting.

9.7.2.5 `int BCondWrap::waitMoreThanOrEqual (uint32_t v, uint32_t decrement = 0, uint32_t timeOutUs = 0)`

Wait until value is at least the value given.

9.7.2.6 `int BCondWrap::waitLessThanOrEqual (uint32_t v, uint32_t increment = 0, uint32_t timeOutUs = 0)`

Wait until value is equal to or below the value given.

9.7.2.7 `int BCondWrap::waitLessThan (uint32_t v, uint32_t timeOutUs = 0)`

Wait until value is equal to or below the value given.

9.7.2.8 `void BCondWrap::operator+=(int v) [inline]`

Add to value. Wakes waiting.

9.7.2.9 void BCondWrap::operator-= (int v) [inline]

Subtract from value. Wakes waiting.

9.7.2.10 void BCondWrap::operator++ (int) [inline]

Increment value. Wakes waiting.

9.7.2.11 void BCondWrap::operator- (int) [inline]

Decrement value. Wakes waiting.

9.7.2.12 int BCondWrap::diff (uint32_t v) [private]**9.7.3 Member Data Documentation****9.7.3.1 pthread_mutex_t BCondWrap::omutex [private]****9.7.3.2 pthread_cond_t BCondWrap::ocond [private]****9.7.3.3 uint32_t BCondWrap::ovalue [private]**

The documentation for this class was generated from the following files:

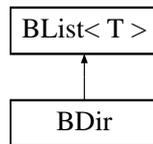
- [/src/cern/tms/beam/libBeam/BCondInt.h](#)
- [/src/cern/tms/beam/libBeam/BCondInt.cpp](#)

9.8 BDir Class Reference

File system directory class.

```
#include <BDir.h>
```

Inheritance diagram for BDir::



Public Member Functions

- [BDir \(\)](#)
- [BDir \(BString name\)](#)
- [~BDir \(\)](#)
- [BError open \(BString name\)](#)
Reads named directory.
- [BError error \(\)](#)
Current value of error.
- [BError read \(\)](#)
read/re-reads directory
- void [clear \(\)](#)
Clears list.
- void [setWild \(BString wild\)](#)
Set wildcard filter string used on read.
- void [setSort \(int on\)](#)
Set alpha sort on/off.
- [BString entryName \(BIter i\)](#)
Get filename.
- stat [entryStat \(BIter i\)](#)
Get file stats.
- stat64 [entryStat64 \(BIter i\)](#)
Get file stats 64.

Private Attributes

- [BError oerror](#)
- [BString odirname](#)
- [BString owild](#)
- [int osort](#)

9.8.1 Detailed Description

File system directory class.

9.8.2 Constructor & Destructor Documentation

9.8.2.1 [BDir::BDir \(\)](#)

9.8.2.2 [BDir::BDir \(BString name\)](#)

9.8.2.3 [BDir::~~BDir \(\)](#)

9.8.3 Member Function Documentation

9.8.3.1 [BError BDir::open \(BString name\)](#)

Reads named directory.

9.8.3.2 [BError BDir::error \(\)](#)

Current value of error.

9.8.3.3 [BError BDir::read \(\)](#)

read/re-reads directory

9.8.3.4 [void BDir::clear \(\) \[virtual\]](#)

Clears list.

Reimplemented from [BList< T >](#).

9.8.3.5 [void BDir::setWild \(BString wild\)](#)

Set wildcard filter string used on read.

9.8.3.6 [void BDir::setSort \(int on\)](#)

Set alpha sort on/off.

9.8.3.7 **BString** BDir::entryName (**BIter** *i*)

Get filename.

9.8.3.8 **struct stat** BDir::entryStat (**BIter** *i*)

Get file stats.

9.8.3.9 **struct stat64** BDir::entryStat64 (**BIter** *i*)

Get file stats 64.

9.8.4 Member Data Documentation

9.8.4.1 **BError** BDir::oerror [private]

9.8.4.2 **BString** BDir::odirname [private]

9.8.4.3 **BString** BDir::owild [private]

9.8.4.4 **int** BDir::osort [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BDir.h](#)
- [/src/cern/tms/beam/libBeam/BDir.cpp](#)

9.9 BEntry Class Reference

Manipulate a name value pair.

```
#include <BEntry.h>
```

Public Member Functions

- [BEntry \(\)](#)
- [BEntry \(BString name, BString value\)](#)
Set name and value.
- [BEntry \(BString line\)](#)
Set name and value from white space delimited string.
- [BString getName \(\)](#)
Get the name.
- [BString getValue \(\)](#)
Get the value.
- void [setLine \(BString line\)](#)
Set name and value from white space delimited string.
- void [setName \(BString name\)](#)
Set the name.
- void [setValue \(BString value\)](#)
Set the value.
- [BString line \(\)](#)
Return name and value as padded single string.
- void [print \(\)](#)
Print name and value.

Private Attributes

- [BString oname](#)
- [BString ovalue](#)

9.9.1 Detailed Description

Manipulate a name value pair.

9.9.2 Constructor & Destructor Documentation

9.9.2.1 BEntry::BEntry ()

9.9.2.2 BEntry::BEntry (BString name, BString value)

Set name and value.

9.9.2.3 BEntry::BEntry (BString line)

Set name and value from white space delimited string.

9.9.3 Member Function Documentation

9.9.3.1 BString BEntry::getName ()

Get the name.

9.9.3.2 BString BEntry::getValue ()

Get the value.

9.9.3.3 void BEntry::setLine (BString line)

Set name and value from white space delimited string.

9.9.3.4 void BEntry::setName (BString name)

Set the name.

9.9.3.5 void BEntry::setValue (BString value)

Set the value.

9.9.3.6 BString BEntry::line ()

Return name and value as padded single string.

9.9.3.7 void BEntry::print ()

Print name and value.

9.9.4 Member Data Documentation

9.9.4.1 [BString BEntry::oname](#) [private]

9.9.4.2 [BString BEntry::ovalue](#) [private]

The documentation for this class was generated from the following files:

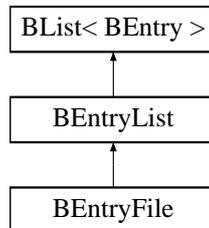
- [/src/cern/tms/beam/libBeam/BEntry.h](#)
- [/src/cern/tms/beam/libBeam/BEntry.cpp](#)

9.10 BEntryFile Class Reference

File of Entries.

```
#include <BEntry.h>
```

Inheritance diagram for BEntryFile::



Public Member Functions

- [BEntryFile](#) ()
- [BEntryFile](#) ([BString](#) filename)
Opens entryfile.
- [~BEntryFile](#) ()
- [int open](#) ([BString](#) filename)
Opens entryfile.
- [int read](#) ()
Reads entry file and builds list.
- [int write](#) ()
Writes list to entryfile.
- [int writeList](#) ([BEntryList](#) &l)
Writes specified list to file.
- [void clear](#) ()
Clears current list.

Private Attributes

- [BString ofilename](#)
- [BString ocomments](#)

9.10.1 Detailed Description

File of Entries.

9.10.2 Constructor & Destructor Documentation

9.10.2.1 BEntryFile::BEntryFile ()

9.10.2.2 BEntryFile::BEntryFile ([BString filename](#))

Opens entryfile.

9.10.2.3 BEntryFile::~~BEntryFile ()

9.10.3 Member Function Documentation

9.10.3.1 int BEntryFile::open ([BString filename](#))

Opens entryfile.

9.10.3.2 int BEntryFile::read ()

Reads entry file and builds list.

9.10.3.3 int BEntryFile::write ()

Writes list to entryfile.

9.10.3.4 int BEntryFile::writeList ([BEntryList & l](#))

Writes specified list to file.

9.10.3.5 void BEntryFile::clear () [virtual]

Clears current list.

Reimplemented from [BEntryList](#).

9.10.4 Member Data Documentation

9.10.4.1 [BString BEntryFile::ofilename](#) [private]

9.10.4.2 [BString BEntryFile::ocomments](#) [private]

The documentation for this class was generated from the following files:

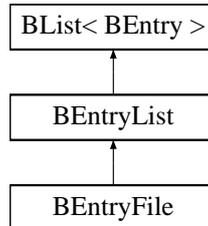
- [/src/cern/tms/beam/libBeam/BEntry.h](#)
- [/src/cern/tms/beam/libBeam/BEntry.cpp](#)

9.11 BEntryList Class Reference

List of Entries. Where an entry is a name value pair.

```
#include <BEntry.h>
```

Inheritance diagram for BEntryList::



Public Member Functions

- [BEntryList \(\)](#)
- [int isSet \(BString name\)](#)
1 if name is in list and value is set
- [BEntry * find \(BString name\)](#)
Returns entry if name is found otherwise NULL.
- [BString findValue \(BString name\)](#)
Returns value of name. Returns "" if name not found.
- [int setValue \(BString name, BString value\)](#)
Set the value of name. Returns 0 if name not found.
- [int setValueRaw \(BString name, BString value\)](#)
Raw setting of value without looking up existing entry.
- [void deleteEntry \(BString name\)](#)
Deletes the entry.
- [void print \(\)](#)
Print list.
- [BString getString \(\)](#)
Return list as string. Each Entry padded and on a new line.
- [void insert \(BIter &i, const BEntry &item\)](#)
Insert item before item.
- [void del \(BIter &i\)](#)
Delete specified item.
- [void clear \(\)](#)
Clear the list.

Private Attributes

- [BIter](#) `olastPos`

9.11.1 Detailed Description

List of Entries. Where an entry is a name value pair.

9.11.2 Constructor & Destructor Documentation

9.11.2.1 `BEntryList::BEntryList ()`

9.11.3 Member Function Documentation

9.11.3.1 `int BEntryList::isSet (BString name)`

1 if name is in list and value is set

9.11.3.2 `BEntry * BEntryList::find (BString name)`

Returns entry if name is found otherwise NULL.

9.11.3.3 `BString BEntryList::findValue (BString name)`

Returns value of name. Returns "" if name not found.

9.11.3.4 `int BEntryList::setValue (BString name, BString value)`

Set the value of name. Returns 0 if name not found.

9.11.3.5 `int BEntryList::setValueRaw (BString name, BString value)`

Raw setting of value without looking up existing entry.

9.11.3.6 `void BEntryList::deleteEntry (BString name)`

Deletes the entry.

9.11.3.7 `void BEntryList::print ()`

Print list.

9.11.3.8 `BString BEntryList::getString ()`

Return list as string. Each Entry padded and on a new line.

9.11.3.9 void BEntryList::insert (BIter & i, const BEntry & item) [virtual]

Insert item before item.

Reimplemented from [BList< BEntry >](#).

9.11.3.10 void BEntryList::del (BIter & i) [virtual]

Delete specified item.

Reimplemented from [BList< BEntry >](#).

9.11.3.11 void BEntryList::clear () [virtual]

Clear the list.

Reimplemented from [BList< BEntry >](#).

Reimplemented in [BEntryFile](#).

9.11.4 Member Data Documentation**9.11.4.1 BIter BEntryList::olastPos [private]**

The documentation for this class was generated from the following files:

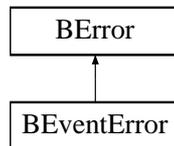
- [/src/cern/tms/beam/libBeam/BEntry.h](#)
- [/src/cern/tms/beam/libBeam/BEntry.cpp](#)

9.12 BError Class Reference

Error return class.

```
#include <BError.h>
```

Inheritance diagram for BError::



Public Types

- enum `Type` { `NONE` = 0, `ERROR` = 1 }

Public Member Functions

- `BError` (int errNo=`NONE`, `BString` errStr="")
Create object.
- `BError` (`BString` errStr)
Create with error set and error string.
- `BError` copy ()
Return an independant copy.
- `BError` & `set` (int errNo, `BString` errStr="")
Set error number and message.
- `BError` & `setError` (`BString` errStr="")
Set error type ERROR with optional message.
- `BString` `getString` () const
Get error message.
- int `getErrorNo` () const
Get The error number.
- `operator int` () const
Return error number.

Private Attributes

- int `oerrNo`
- `BString` `oerrStr`

9.12.1 Detailed Description

Error return class.

9.12.2 Member Enumeration Documentation

9.12.2.1 enum **BError::Type**

Enumerator:

NONE

ERROR

9.12.3 Constructor & Destructor Documentation

9.12.3.1 **BError::BError** (int *errNo* = NONE, **BString** *errStr* = "")

Create object.

9.12.3.2 **BError::BError** (**BString** *errStr*)

Create with error set and error string.

9.12.4 Member Function Documentation

9.12.4.1 **BError** **BError::copy** ()

Return an independant copy.

9.12.4.2 **BError** & **BError::set** (int *errNo*, **BString** *errStr* = "")

Set error number and message.

9.12.4.3 **BError** & **BError::setError** (**BString** *errStr* = "")

Set error type ERROR with optional message.

9.12.4.4 **BString** **BError::getString** () const

Get error message.

9.12.4.5 int **BError::getErrorNo** () const

Get The error number.

9.12.4.6 BError::operator int () const

Return error number.

9.12.5 Member Data Documentation

9.12.5.1 `int BError::oerrNo` [private]

9.12.5.2 `BString BError::oerrStr` [private]

The documentation for this class was generated from the following files:

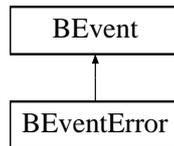
- [/src/cern/tms/beam/libBeam/BError.h](#)
- [/src/cern/tms/beam/libBeam/BError.cpp](#)

9.13 BEvent Class Reference

This class provides a base class for all event objects that can be sent over the events interface.

```
#include <BEvent.h>
```

Inheritance diagram for BEvent::



Public Member Functions

- [BEvent](#) (uint32_t type)
- virtual [~BEvent](#) ()
- uint32_t [getType](#) ()
- virtual [BError](#) [getBinary](#) (void *data, uint32_t &size)
- virtual [BError](#) [setBinary](#) (void *data, uint32_t &size)

Private Attributes

- uint32_t [otype](#)
The event type.

9.13.1 Detailed Description

This class provides a base class for all event objects that can be sent over the events interface.

9.13.2 Constructor & Destructor Documentation

9.13.2.1 [BEvent::BEvent](#) (uint32_t type)

9.13.2.2 [BEvent::~~BEvent](#) () [virtual]

9.13.3 Member Function Documentation

9.13.3.1 uint32_t [BEvent::getType](#) ()

9.13.3.2 [BError](#) [BEvent::getBinary](#) (void * data, uint32_t & size) [virtual]

Reimplemented in [BEventError](#).

9.13.3.3 [BError](#) [BEvent::setBinary](#) (void * data, uint32_t & size) [virtual]

Reimplemented in [BEventError](#).

9.13.4 Member Data Documentation

9.13.4.1 `uint32_t BEvent::otype` [private]

The event type.

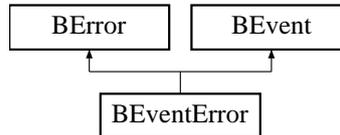
The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BEvent.h](#)
- [/src/cern/tms/beam/libBeam/BEvent.cpp](#)

9.14 BEventError Class Reference

```
#include <BEvent.h>
```

Inheritance diagram for BEventError::



Public Member Functions

- [BEventError](#) (int errNo=NONE, [BString](#) errStr="")
- [BError](#) [getBinary](#) (void *data, uint32_t &size)
- [BError](#) [setBinary](#) (void *data, uint32_t &size)

9.14.1 Constructor & Destructor Documentation

9.14.1.1 [BEventError::BEventError](#) (int *errNo* = NONE, [BString](#) *errStr* = "")

9.14.2 Member Function Documentation

9.14.2.1 [BError](#) [BEventError::getBinary](#) (void **data*, uint32_t &*size*) [virtual]

Reimplemented from [BEvent](#).

9.14.2.2 [BError](#) [BEventError::setBinary](#) (void **data*, uint32_t &*size*) [virtual]

Reimplemented from [BEvent](#).

The documentation for this class was generated from the following files:

- /src/cern/tms/beam/libBeam/[BEvent.h](#)
- /src/cern/tms/beam/libBeam/[BEvent.cpp](#)

9.15 BEventInt Class Reference

This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

```
#include <BEvent.h>
```

Public Member Functions

- [BEventInt \(\)](#)
- [~BEventInt \(\)](#)
- [BError sendEvent \(int event\)](#)
Send an event.
- [BError getEvent \(int &event, int timeOutUs=-1\)](#)
Receive the event.
- [int getFd \(\)](#)

Private Attributes

- [int ofds \[2\]](#)
File descriptors for pipe.

9.15.1 Detailed Description

This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

9.15.2 Constructor & Destructor Documentation

9.15.2.1 BEventInt::BEventInt ()

9.15.2.2 BEventInt::~~BEventInt ()

9.15.3 Member Function Documentation

9.15.3.1 BError BEventInt::sendEvent (int event)

Send an event.

9.15.3.2 BError BEventInt::getEvent (int & event, int timeOutUs = -1)

Receive the event.

9.15.3.3 int BEventInt::getFd ()

9.15.4 Member Data Documentation

9.15.4.1 int [BEventInt::ofds](#)[2] [private]

File descriptors for pipe.

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BEvent.h](#)
- [/src/cern/tms/beam/libBeam/BEvent.cpp](#)

9.16 BEventPipe Class Reference

This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.

```
#include <BEvent.h>
```

Public Member Functions

- [BEventPipe \(\)](#)
- [~BEventPipe \(\)](#)
- [BError sendEvent \(BEvent *event\)](#)
Send an event.
- [BError getEvent \(BEvent *event, int timeOutUs=-1\)](#)
Receive the event.
- [int getReceiveFd \(\)](#)
returns the receive file descriptor for the poll system call

Private Attributes

- [int ofds \[2\]](#)
File descriptors for pipe.

9.16.1 Detailed Description

This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.

9.16.2 Constructor & Destructor Documentation

9.16.2.1 BEventPipe::BEventPipe ()

9.16.2.2 BEventPipe::~~BEventPipe ()

9.16.3 Member Function Documentation

9.16.3.1 BError BEventPipe::sendEvent (BEvent * event)

Send an event.

9.16.3.2 BError BEventPipe::getEvent (BEvent * event, int timeOutUs = -1)

Receive the event.

9.16.3.3 int BEventPipe::getReceiveFd ()

returns the receive file descriptor for the poll system call

9.16.4 Member Data Documentation

9.16.4.1 int BEventPipe::ofds[2] [private]

File descriptors for pipe.

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BEvent.h](#)
- [/src/cern/tms/beam/libBeam/BEvent.cpp](#)

9.17 BFile Class Reference

File operations class.

```
#include <BFile.h>
```

Public Member Functions

- [BFile \(\)](#)
- [BFile \(BString name, BString mode\)](#)
Create opened specified file.
- [BFile \(const BFile &file\)](#)
Create opened specified file.
- [~BFile \(\)](#)
- [BError open \(BString name, BString mode\)](#)
Open file.
- [BError open \(FILE *file\)](#)
Assign object to opened file handle.
- [BError close \(\)](#)
Close file.
- [BError error \(\)](#)
Returns current error state.
- [FILE * getFd \(\)](#)
File descriptor.
- [int length \(\)](#)
File size in bytes.
- [int setVBuf \(char *buf, int mode, size_t size\)](#)
Set stream buffering options.
- [int read \(void *buf, int nbytes\)](#)
Read from file.
- [int readString \(BString &str\)](#)
Read string. (ref fgets).
- [int write \(const void *buf, int nbytes\)](#)
Write to file.
- [int writeString \(const BString &str\)](#)
Write string to file.
- [int seek \(int pos, int whence\)](#)

Set seek position.

- `int printf (const char *fmt,...)`
Formatted print into the file.
- `BFile & operator= (const BFile &file)`

Private Attributes

- `FILE * ofile`
- `BString ofileName`
- `BString omode`
- `BError oerror`

9.17.1 Detailed Description

File operations class.

9.17.2 Constructor & Destructor Documentation

9.17.2.1 `BFile::BFile ()`

9.17.2.2 `BFile::BFile (BString name, BString mode)`

Create opened specified file.

9.17.2.3 `BFile::BFile (const BFile &file)`

Create opened specified file.

9.17.2.4 `BFile::~~BFile ()`

9.17.3 Member Function Documentation

9.17.3.1 `BError BFile::open (BString name, BString mode)`

Open file.

9.17.3.2 `BError BFile::open (FILE *file)`

Assign object to opened file handle.

9.17.3.3 `BError BFile::close ()`

Close file.

9.17.3.4 BError BFile::error ()

Returns current error state.

9.17.3.5 FILE * BFile::getFd ()

File descriptor.

9.17.3.6 int BFile::length ()

File size in bytes.

9.17.3.7 int BFile::setVBuf (char * buf, int mode, size_t size)

Set stream buffering options.

9.17.3.8 int BFile::read (void * buf, int nbytes)

Read from file.

9.17.3.9 int BFile::readString (BString & str)

Read string. (ref fgets).

9.17.3.10 int BFile::write (const void * buf, int nbytes)

Write to file.

9.17.3.11 int BFile::writeString (const BString & str)

Write string to file.

9.17.3.12 int BFile::seek (int pos, int whence)

Set seek position.

9.17.3.13 int BFile::printf (const char * fmt, ...)

Formatted print into the file.

9.17.3.14 **BFile** & **BFile::operator=** (const **BFile** & *file*)

9.17.4 Member Data Documentation

9.17.4.1 **FILE*** **BFile::ofile** [private]

9.17.4.2 **BString** **BFile::ofileName** [private]

9.17.4.3 **BString** **BFile::omode** [private]

9.17.4.4 **BError** **BFile::oerror** [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BFile.h](#)
- [/src/cern/tms/beam/libBeam/BFile.cpp](#)

9.18 BIter Class Reference

Iterator for [BList](#).

```
#include <BList.h>
```

Public Member Functions

- [BIter](#) (void *i=0)
- [operator void * \(\)](#)
- [int operator==](#) (const [BIter](#) &i)

Private Attributes

- void * [oi](#)

9.18.1 Detailed Description

Iterator for [BList](#).

9.18.2 Constructor & Destructor Documentation

9.18.2.1 [BIter::BIter](#) (void * *i* = 0) [inline]

9.18.3 Member Function Documentation

9.18.3.1 [BIter::operator void * \(\)](#) [inline]

9.18.3.2 [int BIter::operator==](#) (const [BIter](#) & *i*) [inline]

9.18.4 Member Data Documentation

9.18.4.1 void* [BIter::oi](#) [private]

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

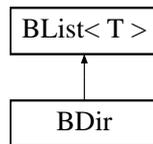
- /src/cern/tms/beam/libBeam/[BList.h](#)

9.19 BList< T > Class Template Reference

Template based list class.

```
#include <BList.h>
```

Inheritance diagram for BList< T >::



Public Types

- typedef int(*) [SortFunc](#) (T &a, T &b)
Prototype for sorting function.

Public Member Functions

- [BList](#) ()
- [BList](#) (const [BList](#)< T > &l)
- virtual [~BList](#) ()
- void [start](#) ([BIter](#) &i) const
Iterator to start of list.
- [BIter begin](#) () const
Iterator for start of list.
- [BIter end](#) () const
Iterator for end of list.
- [BIter end](#) ([BIter](#) &i) const
Iterator for end of list.
- void [next](#) ([BIter](#) &i) const
Iterator for next item in list.
- void [prev](#) ([BIter](#) &i)
Iterator for previous item in list.
- [BIter goTo](#) (int pos)
Iterator for pos item in list.
- int [position](#) ([BIter](#) i)
Position in list item with iterator i.
- unsigned int [number](#) ()

Number of items in list.

- `int isEnd (BIter i) const`
True if iterator refers to last item.
- `T & front ()`
Get first item in list.
- `T & rear ()`
Get last item in list.
- `T & get (BIter i)`
Get item specified by iterator in list.
- `const T & get (BIter i) const`
Get item specified by iterator in list.
- `void append (const T &item)`
Append item to list.
- `virtual void insert (BIter &i, const T &item)`
Insert item before item.
- `void insertAfter (BIter &i, const T &item)`
Insert item after item.
- `virtual void clear ()`
Clear the list.
- `virtual void del (BIter &i)`
Delete specified item.
- `void deleteLast ()`
Delete last item.
- `void deleteFirst ()`
Delete first item.
- `void push (const T &i)`
Push item onto list.
- `T pop ()`
Pop item from list deleting item.
- `void queueAdd (const T &i)`
Add item to end of list.
- `T queueGet ()`
Get item from front of list deleting item.

- void `append` (const `BList< T >` &l)
Append list to list.
- void `swap` (`BIter` i1, `BIter` i2)
Swap two items in list.
- void `sort` ()
Sort list based on get(i) values.
- void `sort` (`SortFunc` func)
Sort list based on Sort func.
- `BList< T >` & `operator=` (const `BList< T >` &l)
- `T` & `operator[]` (int i)
- const `T` & `operator[]` (int i) const
- `T` & `operator[]` (`BIter` i)
- const `T` & `operator[]` (`BIter` i) const
- `BList< T >` `operator+` (const `BList< T >` &l) const

Protected Member Functions

- virtual `Node *` `nodeGet` (`BIter` i)
- virtual const `Node *` `nodeGet` (`BIter` i) const
- virtual `Node *` `nodeCreate` (const `T` &item)

Protected Attributes

- `Node *` `onodes`
- unsigned int `olength`

Private Member Functions

- virtual `Node *` `nodeCreate` ()

Classes

- class `Node`

9.19.1 Detailed Description

`template<class T> class BList< T >`

Template based list class.

9.19.2 Member Typedef Documentation

9.19.2.1 `template<class T> typedef int(*) BList< T >::SortFunc(T &a, T &b)`

Prototype for sorting function.

9.19.3 Constructor & Destructor Documentation

9.19.3.1 `template<class T> BList< T >::BList ()`

9.19.3.2 `template<class T> BList< T >::BList (const BList< T > & l)`

9.19.3.3 `template<class T> BList< T >::~~BList ()` [virtual]

9.19.4 Member Function Documentation

9.19.4.1 `template<class T> void BList< T >::start (BIter & i) const`

Iterator to start of list.

9.19.4.2 `template<class T> BIter BList< T >::begin () const`

Iterator for start of list.

9.19.4.3 `template<class T> BIter BList< T >::end () const`

Iterator for end of list.

9.19.4.4 `template<class T> BIter BList< T >::end (BIter & i) const`

Iterator for end of list.

9.19.4.5 `template<class T> void BList< T >::next (BIter & i) const`

Iterator for next item in list.

9.19.4.6 `template<class T> void BList< T >::prev (BIter & i)`

Iterator for previous item in list.

9.19.4.7 `template<class T> BIter BList< T >::goTo (int pos)`

Iterator for pos item in list.

9.19.4.8 `template<class T> int BList< T >::position (BIter i)`

Position in list item with iterator i.

9.19.4.9 `template<class T> unsigned int BList< T >::number ()`

Number of items in list.

9.19.4.10 `template<class T> int BList< T >::isEnd (BIter i) const`

True if iterator refers to last item.

9.19.4.11 `template<class T> T & BList< T >::front ()`

Get first item in list.

9.19.4.12 `template<class T> T & BList< T >::rear ()`

Get last item in list.

9.19.4.13 `template<class T> T & BList< T >::get (BIter i)`

Get item specified by iterator in list.

9.19.4.14 `template<class T> const T & BList< T >::get (BIter i) const`

Get item specified by iterator in list.

9.19.4.15 `template<class T> void BList< T >::append (const T & item)`

Append item to list.

9.19.4.16 `template<class T> void BList< T >::insert (BIter & i, const T & item) [virtual]`

Insert item before item.

Reimplemented in [BEntryList](#).

9.19.4.17 `template<class T> void BList< T >::insertAfter (BIter & i, const T & item)`

Insert item after item.

9.19.4.18 `template<class T> void BList< T >::clear () [virtual]`

Clear the list.

Reimplemented in [BDir](#), [BEntryList](#), and [BEntryFile](#).

9.19.4.19 `template<class T> void BList< T >::del (BIter & i) [virtual]`

Delete specified item.

Reimplemented in [BEntryList](#).

9.19.4.20 `template<class T> void BList< T >::deleteLast ()`

Delete last item.

9.19.4.21 `template<class T> void BList< T >::deleteFirst ()`

Delete first item.

9.19.4.22 `template<class T> void BList< T >::push (const T & i)`

Push item onto list.

9.19.4.23 `template<class T> T BList< T >::pop ()`

Pop item from list deleting item.

9.19.4.24 `template<class T> void BList< T >::queueAdd (const T & i)`

Add item to end of list.

9.19.4.25 `template<class T> T BList< T >::queueGet ()`

Get item from front of list deleting item.

9.19.4.26 `template<class T> void BList< T >::append (const BList< T > & l)`

Append list to list.

9.19.4.27 `template<class T> void BList< T >::swap (BIter i1, BIter i2)`

Swap two items in list.

9.19.4.28 `template<class T> void BList< T >::sort ()`

Sort list based on get(i) values.

9.19.4.29 `template<class T> void BList< T >::sort (SortFunc func)`

Sort list based on Sort func.

9.19.4.30 `template<class T> BList< T > & BList< T >::operator= (const BList< T > & l)`**9.19.4.31** `]`

`template<class T> T & BList< T >::operator[] (int i)`

9.19.4.32]

template<class T> const T & **BList**< T >::operator[] (int *i*) const

9.19.4.33]

template<class T> T & **BList**< T >::operator[] (**BIter** *i*)

9.19.4.34]

template<class T> const T & **BList**< T >::operator[] (**BIter** *i*) const

9.19.4.35 template<class T> **BList**< T > **BList**< T >::operator+ (const **BList**< T > & *l*) const

9.19.4.36 template<class T> **BList**< T >::Node * **BList**< T >::nodeGet (**BIter** *i*) [protected, virtual]

9.19.4.37 template<class T> const **BList**< T >::Node * **BList**< T >::nodeGet (**BIter** *i*) const [protected, virtual]

9.19.4.38 template<class T> **BList**< T >::Node * **BList**< T >::nodeCreate (const T & *item*) [protected, virtual]

9.19.4.39 template<class T> **BList**< T >::Node * **BList**< T >::nodeCreate () [private, virtual]

9.19.5 Member Data Documentation

9.19.5.1 template<class T> Node* **BList**< T >::onodes [protected]

9.19.5.2 template<class T> unsigned int **BList**< T >::olength [protected]

The documentation for this class was generated from the following files:

- /src/cern/tms/beam/libBeam/**BList.h**
- /src/cern/tms/beam/libBeam/**BList_func.h**

9.20 BList< T >::Node Class Reference

```
#include <BList.h>
```

Public Member Functions

- [Node](#) (const T &i)

Public Attributes

- [Node * next](#)
- [Node * prev](#)
- [T item](#)

```
template<class T> class BList< T >::Node
```

9.20.1 Constructor & Destructor Documentation

9.20.1.1 `template<class T> BList< T >::Node::Node (const T & i) [inline]`

9.20.2 Member Data Documentation

9.20.2.1 `template<class T> Node* BList< T >::Node::next`

9.20.2.2 `template<class T> Node* BList< T >::Node::prev`

9.20.2.3 `template<class T> T BList< T >::Node::item`

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

- [/src/cern/tms/beam/libBeam/BList.h](#)

9.21 BMutex Class Reference

Mutex class.

```
#include <BMutex.h>
```

Public Member Functions

- [BMutex \(\)](#)
- [BMutex \(const \[BMutex\]\(#\) &mutex\)](#)
- [~BMutex \(\)](#)
- [int lock \(\)](#)
Set lock, wait in necessary.
- [int unlock \(\)](#)
Unlock the lock.
- [int tryLock \(\)](#)
Test the lock.
- [BMutex & operator= \(const \[BMutex\]\(#\) &mutex\)](#)

Private Attributes

- [pthread_mutex_t omutex](#)

9.21.1 Detailed Description

Mutex class.

9.21.2 Constructor & Destructor Documentation

9.21.2.1 [BMutex::BMutex \(\)](#)

9.21.2.2 [BMutex::BMutex \(const \[BMutex\]\(#\) & mutex\)](#)

9.21.2.3 [BMutex::~~BMutex \(\)](#)

9.21.3 Member Function Documentation

9.21.3.1 [int \[BMutex::lock \\(\\)\]\(#\)](#)

Set lock, wait in necessary.

9.21.3.2 [int \[BMutex::unlock \\(\\)\]\(#\)](#)

Unlock the lock.

9.21.3.3 int BMutex::tryLock ()

Test the lock.

9.21.3.4 BMutex & BMutex::operator= (const BMutex & mutex)

9.21.4 Member Data Documentation

9.21.4.1 pthread_mutex_t BMutex::omutex [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BMutex.h](#)
- [/src/cern/tms/beam/libBeam/BMutex.cpp](#)

9.22 BNameValue< T > Class Template Reference

```
#include <BNameValue.h>
```

Public Member Functions

- [BNameValue \(\)](#)
- [BNameValue \(BString name, const T &value\)](#)
- [BString getName \(\)](#)
- [T & getValue \(\)](#)

Private Attributes

- [BString oname](#)
- [T ovalue](#)

```
template<class T> class BNameValue< T >
```

9.22.1 Constructor & Destructor Documentation

9.22.1.1 [template<class T> BNameValue< T >::BNameValue \(\)](#) [inline]

9.22.1.2 [template<class T> BNameValue< T >::BNameValue \(BString name, const T & value\)](#)
[inline]

9.22.2 Member Function Documentation

9.22.2.1 [template<class T> BString BNameValue< T >::getName \(\)](#) [inline]

9.22.2.2 [template<class T> T& BNameValue< T >::getValue \(\)](#) [inline]

9.22.3 Member Data Documentation

9.22.3.1 [template<class T> BString BNameValue< T >::oname](#) [private]

9.22.3.2 [template<class T> T BNameValue< T >::ovalue](#) [private]

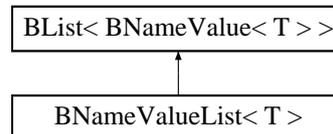
The documentation for this class was generated from the following file:

- [/src/cern/tms/beam/libBeam/BNameValue.h](#)

9.23 BNameValueList< T > Class Template Reference

```
#include <BNameValue.h>
```

Inheritance diagram for BNameValueList< T >::



Public Member Functions

- T * [find](#) (BString name)

```
template<class T> class BNameValueList< T >
```

9.23.1 Member Function Documentation

9.23.1.1 `template<class T> T* BNameValueList< T >::find (BString name) [inline]`

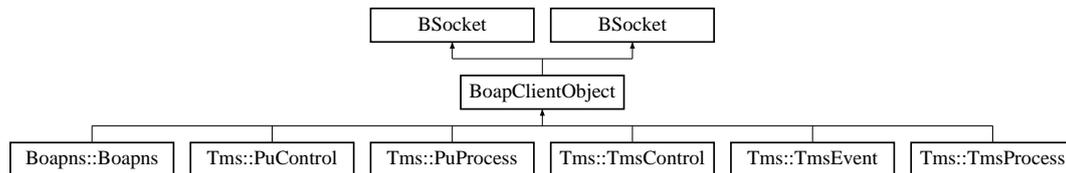
The documentation for this class was generated from the following file:

- [/src/cern/tms/beam/libBeam/BNameValue.h](#)

9.24 BoapClientObject Class Reference

```
#include <BoapSimple.h>
```

Inheritance diagram for BoapClientObject::



Public Member Functions

- [BoapClientObject \(BString name= ""\)](#)
- [BError connectService \(BString name\)](#)
- [BError disconnectService \(\)](#)
- [BString getServiceName \(\)](#)
- [BError ping \(BUInt32 &apiVersion\)](#)
- [BError setConnectionPriority \(BoapPriority priority\)](#)
- [void setMaxLength \(BUInt32 maxLength\)](#)
- [BoapClientObject \(BString name\)](#)
- [BError connectService \(BString name\)](#)

Protected Member Functions

- [BError pingLocked \(BUInt32 &apiVersion\)](#)
- [BError checkApiVersion \(\)](#)
- [BError performSend \(BoapPacket &tx\)](#)
- [BError performRecv \(BoapPacket &rx\)](#)
- [BError performCall \(BoapPacket &tx, BoapPacket &rx\)](#)
- [BError performSend \(BoapPacket &tx\)](#)
- [BError performRecv \(BoapPacket &rx\)](#)
- [BError performCall \(BoapPacket &tx, BoapPacket &rx\)](#)

Protected Attributes

- [BString oname](#)
- [BUInt32 oapiVersion](#)
- [BoapPriority opriority](#)
- [BoapService oservice](#)
- [int oconnected](#)
- [BUInt32 omaxLength](#)
- [BoapPacket otx](#)
- [BoapPacket orx](#)
- [BMutex olock](#)

9.24.1 Constructor & Destructor Documentation

9.24.1.1 **BoapClientObject::BoapClientObject** (**BString** *name* = " ")

9.24.1.2 **BoapClientObject::BoapClientObject** (**BString** *name*)

9.24.2 Member Function Documentation

9.24.2.1 **BError** **BoapClientObject::connectService** (**BString** *name*)

9.24.2.2 **BError** **BoapClientObject::disconnectService** ()

9.24.2.3 **BString** **BoapClientObject::getServiceName** ()

9.24.2.4 **BError** **BoapClientObject::ping** (**BUInt32** & *apiVersion*)

9.24.2.5 **BError** **BoapClientObject::setConnectionPriority** (**BoapPriority** *priority*)

9.24.2.6 **void** **BoapClientObject::setMaxLength** (**BUInt32** *maxLength*)

9.24.2.7 **BError** **BoapClientObject::pingLocked** (**BUInt32** & *apiVersion*) [protected]

9.24.2.8 **BError** **BoapClientObject::checkApiVersion** () [protected]

9.24.2.9 **BError** **BoapClientObject::performSend** (**BoapPacket** & *tx*) [protected]

9.24.2.10 **BError** **BoapClientObject::performRecv** (**BoapPacket** & *rx*) [protected]

9.24.2.11 **BError** **BoapClientObject::performCall** (**BoapPacket** & *tx*, **BoapPacket** & *rx*)
[protected]

9.24.2.12 **BError** **BoapClientObject::connectService** (**BString** *name*)

9.24.2.13 **BError** **BoapClientObject::performSend** (**BoapPacket** & *tx*) [protected]

9.24.2.14 **BError** **BoapClientObject::performRecv** (**BoapPacket** & *rx*) [protected]

9.24.2.15 **BError** **BoapClientObject::performCall** (**BoapPacket** & *tx*, **BoapPacket** & *rx*)
[protected]

9.24.3 Member Data Documentation

9.24.3.1 **BString** **BoapClientObject::oname** [protected]

9.24.3.2 **BUInt32** **BoapClientObject::oapiVersion** [protected]

9.24.3.3 **BoapPriority** **BoapClientObject::opriority** [protected]

9.24.3.4 **BoapService** **BoapClientObject::oservice** [protected]

9.24.3.5 **int** **BoapClientObject::oconnected** [protected]

9.24.3.6 **BUInt32** **BoapClientObject::omaxLength** [protected]

9.24.3.7 **BoapPacket** **BoapClientObject::otx** [protected] Generated on Tue Nov 27 09:19:56 2007 for LibTmsApi by Doxygen

9.24.3.8 **BoapPacket** **BoapClientObject::orx** [protected]

9.24.3.9 **BMutex** **BoapClientObject::olock** [protected]

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.25 Boapns::BoapEntry Class Reference

```
#include <BoapnsD.h>
```

Public Member Functions

- [BoapEntry \(\)](#)
- [BoapEntry \(BString pname, BString phostName, BList< BString > paddressList, UInt32 pport, UInt32 pservice\)](#)

Public Attributes

- [BString name](#)
- [BString hostName](#)
- [BList< BString > addressList](#)
- [UInt32 port](#)
- [UInt32 service](#)

9.25.1 Constructor & Destructor Documentation

9.25.1.1 Boapns::BoapEntry::BoapEntry ()

9.25.1.2 Boapns::BoapEntry::BoapEntry ([BString pname](#), [BString phostName](#), [BList< BString > paddressList](#), [UInt32 pport](#), [UInt32 pservice](#))

9.25.2 Member Data Documentation

9.25.2.1 [BString Boapns::BoapEntry::name](#)

9.25.2.2 [BString Boapns::BoapEntry::hostName](#)

9.25.2.3 [BList<BString> Boapns::BoapEntry::addressList](#)

9.25.2.4 [UInt32 Boapns::BoapEntry::port](#)

9.25.2.5 [UInt32 Boapns::BoapEntry::service](#)

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BoapnsD.h](#)
- [/src/cern/tms/beam/libBeam/BoapnsD.cc](#)

9.26 BoapFuncEntry Class Reference

```
#include <BoapSimple.h>
```

Public Member Functions

- [BoapFuncEntry](#) (int cmd, [BoapFunc](#) func)
- [BoapFuncEntry](#) (int cmd, [BoapFunc](#) func)

Public Attributes

- [UInt32](#) ocmd
- [BoapFunc](#) ofunc

9.26.1 Constructor & Destructor Documentation

9.26.1.1 [BoapFuncEntry::BoapFuncEntry](#) (int *cmd*, [BoapFunc](#) *func*)

9.26.1.2 [BoapFuncEntry::BoapFuncEntry](#) (int *cmd*, [BoapFunc](#) *func*)

9.26.2 Member Data Documentation

9.26.2.1 [UInt32](#) [BoapFuncEntry::ocmd](#)

9.26.2.2 [BoapFunc](#) [BoapFuncEntry::ofunc](#)

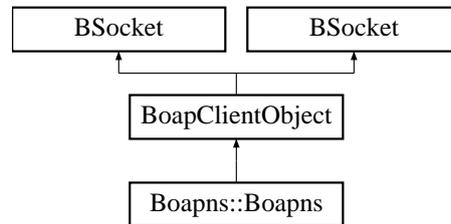
The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.27 Boapns::Boapns Class Reference

```
#include <BoapnsC.h>
```

Inheritance diagram for Boapns::Boapns::



Public Member Functions

- [Boapns](#) ([BString](#) name="")
- [BError](#) [getVersion](#) ([BString](#) &version)
- [BError](#) [getEntryList](#) ([BList](#)< [BoapEntry](#) > &entryList)
- [BError](#) [getEntry](#) ([BString](#) name, [BoapEntry](#) &entry)
- [BError](#) [addEntry](#) ([BoapEntry](#) entry)
- [BError](#) [delEntry](#) ([BString](#) name)
- [BError](#) [getNewName](#) ([BString](#) &name)

9.27.1 Constructor & Destructor Documentation

9.27.1.1 [Boapns::Boapns::Boapns](#) ([BString](#) name = "")

9.27.2 Member Function Documentation

9.27.2.1 [BError](#) [Boapns::Boapns::getVersion](#) ([BString](#) & version)

9.27.2.2 [BError](#) [Boapns::Boapns::getEntryList](#) ([BList](#)< [BoapEntry](#) > & entryList)

9.27.2.3 [BError](#) [Boapns::Boapns::getEntry](#) ([BString](#) name, [BoapEntry](#) & entry)

9.27.2.4 [BError](#) [Boapns::Boapns::addEntry](#) ([BoapEntry](#) entry)

9.27.2.5 [BError](#) [Boapns::Boapns::delEntry](#) ([BString](#) name)

9.27.2.6 [BError](#) [Boapns::Boapns::getNewName](#) ([BString](#) & name)

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

- [/src/cern/tms/beam/libBeam/BoapnsC.h](#)

9.28 BoapPacket Class Reference

```
#include <BoapSimple.h>
```

Public Member Functions

- [BoapPacket \(\)](#)
- [~BoapPacket \(\)](#)
- [int resize \(int size\)](#)
- [BError setData \(void *data, int nbytes\)](#)
- [int nbytes \(\)](#)
- [char * data \(\)](#)
- [int peekHead \(BoapPacketHead &head\)](#)
- [int pushHead \(BoapPacketHead &head\)](#)
- [int push \(Int8 v\)](#)
- [int push \(UInt8 v\)](#)
- [int push \(Int16 v\)](#)
- [int push \(UInt16 v\)](#)
- [int push \(Int32 v\)](#)
- [int push \(UInt32 v\)](#)
- [int push \(Int64 v\)](#)
- [int push \(UInt64 v\)](#)
- [int push \(const BString &v\)](#)
- [int push \(Double v\)](#)
- [int push \(const BError &v\)](#)
- [int push \(UInt32 nBytes, const void *data, char *swapType="1"\)](#)
- [int popHead \(BoapPacketHead &head\)](#)
- [int pop \(Int8 &v\)](#)
- [int pop \(UInt8 &v\)](#)
- [int pop \(Int16 &v\)](#)
- [int pop \(UInt16 &v\)](#)
- [int pop \(Int32 &v\)](#)
- [int pop \(UInt32 &v\)](#)
- [int pop \(Int64 &v\)](#)
- [int pop \(UInt64 &v\)](#)
- [int pop \(BString &v\)](#)
- [int pop \(Double &v\)](#)
- [int pop \(BError &v\)](#)
- [int pop \(UInt32 nBytes, void *data, char *swapType="1"\)](#)
- [BoapPacket \(\)](#)
- [~BoapPacket \(\)](#)
- [int resize \(int size\)](#)
- [BError setData \(void *data, int nbytes\)](#)
- [int nbytes \(\)](#)
- [char * data \(\)](#)
- [int pushHead \(BoapPacketHead &head\)](#)
- [int push \(Int8 v\)](#)
- [int push \(UInt8 v\)](#)
- [int push \(Int16 v\)](#)

- int [push](#) (UInt16 v)
- int [push](#) (Int32 v)
- int [push](#) (UInt32 v)
- int [push](#) (BString &v)
- int [push](#) (Double v)
- int [push](#) (BError &v)
- int [push](#) (UInt32 nBytes, const void *data)
- int [popHead](#) (BoapPacketHead &head)
- int [pop](#) (Int8 &v)
- int [pop](#) (UInt8 &v)
- int [pop](#) (Int16 &v)
- int [pop](#) (UInt16 &v)
- int [pop](#) (Int32 &v)
- int [pop](#) (UInt32 &v)
- int [pop](#) (BString &v)
- int [pop](#) (Double &v)
- int [pop](#) (BError &v)
- int [pop](#) (UInt32 nBytes, void *data)

Private Member Functions

- void [copyWithSwap](#) (void *dst, const void *src, UInt32 nBytes, char *swapType)
- void [updateLen](#) ()
- void [updateLen](#) ()

Private Attributes

- int [osize](#)
- int [onbytes](#)
- char * [odata](#)
- int [opos](#)
- char * [odata](#)

9.28.1 Constructor & Destructor Documentation

9.28.1.1 `BoapPacket::BoapPacket ()`

9.28.1.2 `BoapPacket::~~BoapPacket ()`

9.28.1.3 `BoapPacket::BoapPacket ()`

9.28.1.4 `BoapPacket::~~BoapPacket ()`

9.28.2 Member Function Documentation

9.28.2.1 `int BoapPacket::resize (int size)`

9.28.2.2 `BError BoapPacket::setData (void * data, int nbytes)`

9.28.2.3 `int BoapPacket::nbytes ()`

9.28.2.4 `char * BoapPacket::data ()`

9.28.2.5 `int BoapPacket::peekHead (BoapPacketHead & head)`

9.28.2.6 `int BoapPacket::pushHead (BoapPacketHead & head)`

9.28.2.7 `int BoapPacket::push (Int8 v)`

9.28.2.8 `int BoapPacket::push (UInt8 v)`

9.28.2.9 `int BoapPacket::push (Int16 v)`

9.28.2.10 `int BoapPacket::push (UInt16 v)`

9.28.2.11 `int BoapPacket::push (Int32 v)`

9.28.2.12 `int BoapPacket::push (UInt32 v)`

9.28.2.13 `int BoapPacket::push (Int64 v)`

9.28.2.14 `int BoapPacket::push (UInt64 v)`

9.28.2.15 `int BoapPacket::push (const BString & v)`

9.28.2.16 `int BoapPacket::push (Double v)`

9.28.2.17 `int BoapPacket::push (const BError & v)`

9.28.2.18 `int BoapPacket::push (UInt32 nBytes, const void * data, char * swapType = "1")`

9.28.2.19 `int BoapPacket::popHead (BoapPacketHead & head)`

9.28.2.20 `int BoapPacket::pop (Int8 & v)`

9.28.2.21 `int BoapPacket::pop (UInt8 & v)`

9.28.2.22 `int BoapPacket::pop (Int16 & v)`

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9.28.2.23 `int BoapPacket::pop (UInt16 & v)`

9.28.2.24 `int BoapPacket::pop (Int32 & v)`

9.28.2.25 `int BoapPacket::pop (UInt32 & v)`

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.29 BoapPacketHead Struct Reference

```
#include <BoapSimple.h>
```

Public Attributes

- [UInt32 type](#)
- [UInt32 length](#)
- [UInt32 service](#)
- [UInt32 cmd](#)
- [BoapType type](#)
- [BoapService service](#)
- [UInt32 reserved \[12\]](#)

9.29.1 Member Data Documentation

[9.29.1.1 UInt32 BoapPacketHead::type](#)

[9.29.1.2 UInt32 BoapPacketHead::length](#)

[9.29.1.3 UInt32 BoapPacketHead::service](#)

[9.29.1.4 UInt32 BoapPacketHead::cmd](#)

[9.29.1.5 BoapType BoapPacketHead::type](#)

[9.29.1.6 BoapService BoapPacketHead::service](#)

[9.29.1.7 UInt32 BoapPacketHead::reserved\[12\]](#)

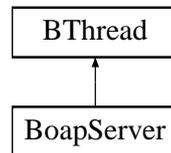
The documentation for this struct was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)

9.30 BoapServer Class Reference

```
#include <BoapSimple.h>
```

Inheritance diagram for BoapServer::



Public Types

- enum { `NOTHEADS` = 0, `THREADED` = 1 }

Public Member Functions

- `BoapServer` ()
- `~BoapServer` ()
- `BError` `init` (`BString` `boapNsHost=""`, `int` `threaded=0`, `int` `isBoapns=0`)
- `BError` `run` (`int` `inThread=0`)
- `BError` `processEvent` (`BoapPacket` &`rx`)
- `BError` `addObject` (`BoapServiceObject` *`object`)
- `BError` `process` (`BoapServerConnection` *`conn`, `BoapPacket` &`rx`, `BoapPacket` &`tx`)
- `BError` `sendEvent` (`BoapPacket` &`tx`)
- `BSocket` & `getSocket` ()
- `BSocket` & `getEventSocket` ()
- `BError` `processEvent` (`int` `fd`)
- `BString` `getHostName` ()
- `void` `clientGone` (`BoapServerConnection` *`client`)
- `int` `getConnectionsNumber` ()
- `BoapServer` ()
- `BError` `init` (`int` `boapNs=0`)
- `BError` `run` ()
- `BError` `processEvent` (`BoapPacket` &`rx`)
- `BError` `addObject` (`BoapServiceObject` *`object`)
- `BError` `process` (`int` `fd`)
- `BError` `sendEvent` (`BoapPacket` &`tx`)
- `BSocket` & `getSocket` ()
- `BSocket` & `getEventSocket` ()
- `BError` `processEvent` (`int` `fd`)
- `BString` `getHostName` ()

Private Member Functions

- `void` * `function` ()

Private Attributes

- int `othreaded`
- int `oisBoapns`
- `Boapns::Boapns * oboapns`
- `BList< BoapServerConnection * > oclients`
- `BEventInt oclientGoneEvent`
- `BList< BoapServiceEntry > oservices`
- `BPoll opoll`
- `BSocket onet`
- `BSocket onetEvent`
- `BSocketAddressINET onetEventAddress`
- `BString ohostName`
- int `oboapNs`
- `BoapPacket orx`
- `BoapPacket otx`
- `BList< BoapServiceEntry > oservices`

9.30.1 Member Enumeration Documentation

9.30.1.1 anonymous enum

Enumerator:

NOTHEADS

THREADED

9.30.2 Constructor & Destructor Documentation

9.30.2.1 **BoapServer::BoapServer ()**

9.30.2.2 **BoapServer::~~BoapServer ()**

9.30.2.3 **BoapServer::BoapServer ()**

9.30.3 Member Function Documentation

9.30.3.1 **BError** **BoapServer::init (BString boapNsHost = "", int threaded = 0, int isBoapns = 0)**

9.30.3.2 **BError** **BoapServer::run (int inThread = 0)**

9.30.3.3 **BError** **BoapServer::processEvent (BoapPacket & rx)**

9.30.3.4 **BError** **BoapServer::addObject (BoapServiceObject * object)**

9.30.3.5 **BError** **BoapServer::process (BoapServerConnection * conn, BoapPacket & rx, BoapPacket & tx)**

9.30.3.6 **BError** **BoapServer::sendEvent (BoapPacket & tx)**

9.30.3.7 **BSocket** & **BoapServer::getSocket ()**

9.30.3.8 **BSocket** & **BoapServer::getEventSocket ()**

9.30.3.9 **BError** **BoapServer::processEvent (int fd)**

9.30.3.10 **BString** **BoapServer::getHostName ()**

9.30.3.11 **void** **BoapServer::clientGone (BoapServerConnection * client)**

9.30.3.12 **int** **BoapServer::getConnectionsNumber ()**

9.30.3.13 **void * BoapServer::function ()** [private, virtual]

Reimplemented from [BThread](#).

- 9.30.3.14 **BError** BoapServer::init (int *boapNs* = 0)
- 9.30.3.15 **BError** BoapServer::run ()
- 9.30.3.16 **BError** BoapServer::processEvent (**BoapPacket** & *rx*)
- 9.30.3.17 **BError** BoapServer::addObject (**BoapServiceObject** * *object*)
- 9.30.3.18 **BError** BoapServer::process (int *fd*)
- 9.30.3.19 **BError** BoapServer::sendEvent (**BoapPacket** & *tx*)
- 9.30.3.20 **BSocket&** BoapServer::getSocket ()
- 9.30.3.21 **BSocket&** BoapServer::getEventSocket ()
- 9.30.3.22 **BError** BoapServer::processEvent (int *fd*)
- 9.30.3.23 **BString** BoapServer::getHostName ()

9.30.4 Member Data Documentation

- 9.30.4.1 int **BoapServer::othreaded** [private]
- 9.30.4.2 int **BoapServer::oisBoapns** [private]
- 9.30.4.3 **Boapns::Boapns*** **BoapServer::oboapns** [private]
- 9.30.4.4 **BList<BoapServerConnection*>** **BoapServer::oclients** [private]
- 9.30.4.5 **BEventInt** **BoapServer::oclientGoneEvent** [private]
- 9.30.4.6 **BList<BoapServiceEntry>** **BoapServer::oservices** [private]
- 9.30.4.7 **BPoll** **BoapServer::opoll** [private]
- 9.30.4.8 **BSocket** **BoapServer::onet** [private]
- 9.30.4.9 **BSocket** **BoapServer::onetEvent** [private]
- 9.30.4.10 **BSocketAddressINET** **BoapServer::onetEventAddress** [private]
- 9.30.4.11 **BString** **BoapServer::ohostName** [private]
- 9.30.4.12 int **BoapServer::oboapNs** [private]
- 9.30.4.13 **BoapPacket** **BoapServer::orx** [private]
- 9.30.4.14 **BoapPacket** **BoapServer::otx** [private]
- 9.30.4.15 **BList<BoapServiceEntry>** **BoapServer::oservices** [private]

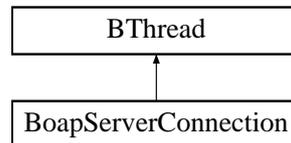
The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.31 BoapServerConnection Class Reference

```
#include <Boap.h>
```

Inheritance diagram for BoapServerConnection::



Public Member Functions

- [BoapServerConnection](#) ([BoapServer](#) &boapServer, int fd)
- [BError](#) process ()
- [BSocket](#) & [getSocket](#) ()
- void [setMaxLength](#) ([BUInt32](#) maxLength)

Private Member Functions

- void * [function](#) ()

Private Attributes

- [BoapServer](#) & oboapServer
- [BSocket](#) osocket
- [BoapPacket](#) orx
- [BoapPacket](#) otx
- [BUInt32](#) omaxLength

9.31.1 Constructor & Destructor Documentation

9.31.1.1 [BoapServerConnection::BoapServerConnection](#) ([BoapServer](#) & boapServer, int fd)

9.31.2 Member Function Documentation

9.31.2.1 [BError](#) [BoapServerConnection::process](#) ()

9.31.2.2 [BSocket](#) & [BoapServerConnection::getSocket](#) ()

9.31.2.3 void [BoapServerConnection::setMaxLength](#) ([BUInt32](#) maxLength)

9.31.2.4 void * [BoapServerConnection::function](#) () [private, virtual]

Reimplemented from [BThread](#).

9.31.3 Member Data Documentation

9.31.3.1 [BoapServer& BoapServerConnection::oboapServer](#) [private]

9.31.3.2 [BSocket BoapServerConnection::osocket](#) [private]

9.31.3.3 [BoapPacket BoapServerConnection::orx](#) [private]

9.31.3.4 [BoapPacket BoapServerConnection::otx](#) [private]

9.31.3.5 [BUInt32 BoapServerConnection::omaxLength](#) [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)

9.32 BoapServiceEntry Class Reference

```
#include <BoapSimple.h>
```

Public Member Functions

- [BoapServiceEntry](#) ([BoapService](#) service=0, [BoapServiceObject](#) *object=0)
- [BoapServiceEntry](#) ([BoapService](#) service=0, [BoapServiceObject](#) *object=0)

Public Attributes

- [BoapService](#) oservice
- [BoapServiceObject](#) * oobject
- [BoapServiceObject](#) * oobject

9.32.1 Constructor & Destructor Documentation

9.32.1.1 [BoapServiceEntry::BoapServiceEntry](#) ([BoapService](#) service = 0, [BoapServiceObject](#) * object = 0) [inline]

9.32.1.2 [BoapServiceEntry::BoapServiceEntry](#) ([BoapService](#) service = 0, [BoapServiceObject](#) * object = 0) [inline]

9.32.2 Member Data Documentation

9.32.2.1 [BoapService](#) [BoapServiceEntry::oservice](#)

9.32.2.2 [BoapServiceObject*](#) [BoapServiceEntry::oobject](#)

9.32.2.3 [BoapServiceObject*](#) [BoapServiceEntry::oobject](#)

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)

9.33 BoapServiceObject Class Reference

```
#include <BoapSimple.h>
```

Public Member Functions

- [BoapServiceObject](#) ([BoapServer](#) &server, [BString](#) name="")
- virtual [~BoapServiceObject](#) ()
- [BError](#) setName ([BString](#) name)
- [BError](#) sendEvent ([BString](#) signalName, [Int32](#) arg)
- virtual [BError](#) processEvent ([BString](#) objectName, [BString](#) name, [Int32](#) arg)
- [BString](#) name ()
- [BError](#) doPing ([BoapServerConnection](#) *conn, [BoapPacket](#) &rx, [BoapPacket](#) &tx)
- [BError](#) doConnectionPriority ([BoapServerConnection](#) *conn, [BoapPacket](#) &rx, [BoapPacket](#) &tx)
- [BError](#) process ([BoapServerConnection](#) *conn, [BoapPacket](#) &rx, [BoapPacket](#) &tx)
- virtual [BError](#) processEvent ([BoapPacket](#) &rx)
- [BoapServiceObject](#) ([BoapServer](#) &server, [BString](#) name)
- virtual [~BoapServiceObject](#) ()
- [BError](#) sendEvent ([BString](#) signalName, [Int32](#) arg)
- virtual [BError](#) processEvent ([BString](#) objectName, [BString](#) name, [Int32](#) arg)
- [BString](#) name ()
- [BError](#) process ([BoapPacket](#) &rx, [BoapPacket](#) &tx)
- virtual [BError](#) processEvent ([BoapPacket](#) &rx)

Protected Member Functions

- [BError](#) sendEvent ([BoapPacket](#) &tx)
- [BError](#) sendEvent ([BoapPacket](#) &tx)

Protected Attributes

- [BoapServer](#) & oserver
- [BString](#) oname
- [BUInt32](#) oapiVersion
- [BList](#)< [BoapFuncEntry](#) > ofuncList
- [BoapServer](#) & oserver
- [BList](#)< [BoapFuncEntry](#) > ofuncList

9.33.1 Constructor & Destructor Documentation

9.33.1.1 **BoapServiceObject::BoapServiceObject** (**BoapServer** & *server*, **BString** *name* = "")

9.33.1.2 **BoapServiceObject::~~BoapServiceObject** () [virtual]

9.33.1.3 **BoapServiceObject::BoapServiceObject** (**BoapServer** & *server*, **BString** *name*)

9.33.1.4 **virtual BoapServiceObject::~~BoapServiceObject** () [virtual]

9.33.2 Member Function Documentation

9.33.2.1 **BError BoapServiceObject::setName** (**BString** *name*)

9.33.2.2 **BError BoapServiceObject::sendEvent** (**BString** *signalName*, **Int32** *arg*)

9.33.2.3 **BError BoapServiceObject::processEvent** (**BString** *objectName*, **BString** *name*, **Int32** *arg*)
[virtual]

9.33.2.4 **BString BoapServiceObject::name** ()

9.33.2.5 **BError BoapServiceObject::doPing** (**BoapServerConnection** * *conn*, **BoapPacket** & *rx*,
BoapPacket & *tx*)

9.33.2.6 **BError BoapServiceObject::doConnectionPriority** (**BoapServerConnection** * *conn*,
BoapPacket & *rx*, **BoapPacket** & *tx*)

9.33.2.7 **BError BoapServiceObject::process** (**BoapServerConnection** * *conn*, **BoapPacket** & *rx*,
BoapPacket & *tx*)

9.33.2.8 **BError BoapServiceObject::processEvent** (**BoapPacket** & *rx*) [virtual]

9.33.2.9 **BError BoapServiceObject::sendEvent** (**BoapPacket** & *tx*) [protected]

9.33.2.10 **BError BoapServiceObject::sendEvent** (**BString** *signalName*, **Int32** *arg*)

9.33.2.11 **virtual BError BoapServiceObject::processEvent** (**BString** *objectName*, **BString** *name*,
Int32 *arg*) [virtual]

9.33.2.12 **BString BoapServiceObject::name** ()

9.33.2.13 **BError BoapServiceObject::process** (**BoapPacket** & *rx*, **BoapPacket** & *tx*)

9.33.2.14 **virtual BError BoapServiceObject::processEvent** (**BoapPacket** & *rx*) [virtual]

9.33.2.15 **BError BoapServiceObject::sendEvent** (**BoapPacket** & *tx*) [protected]

9.33.3 Member Data Documentation

9.33.3.1 **BoapServer& BoapServiceObject::oserver** [protected]

9.33.3.2 **BString BoapServiceObject::oname** [protected]

9.33.3.3 **BUInt32 BoapServiceObject::oapiVersion** [protected]

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9.33.3.4 **BList<BoapFuncEntry> BoapServiceObject::ofuncList** [protected]

9.33.3.5 **BoapServer& BoapServiceObject::oserver** [protected]

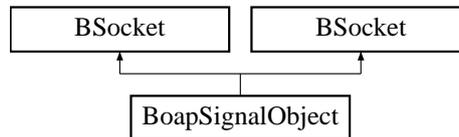
9.33.3.6 **BList<BoapFuncEntry> BoapServiceObject::ofuncList** [protected]

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)
- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.34 BoapSignalObject Class Reference

```
#include <BoapSimple.h>
```

Inheritance diagram for BoapSignalObject::



Public Member Functions

- [BoapSignalObject \(\)](#)
- [BoapSignalObject \(\)](#)

Protected Member Functions

- [BError performSend \(BoapPacket &tx\)](#)
- [BError performSend \(BoapPacket &tx\)](#)

Protected Attributes

- [BoapPacket otx](#)
- [BoapPacket orx](#)

9.34.1 Constructor & Destructor Documentation

9.34.1.1 [BoapSignalObject::BoapSignalObject \(\)](#)

9.34.1.2 [BoapSignalObject::BoapSignalObject \(\)](#)

9.34.2 Member Function Documentation

9.34.2.1 [BError BoapSignalObject::performSend \(BoapPacket & tx\)](#) [protected]

9.34.2.2 [BError BoapSignalObject::performSend \(BoapPacket & tx\)](#) [protected]

9.34.3 Member Data Documentation

9.34.3.1 [BoapPacket BoapSignalObject::otx](#) [protected]

9.34.3.2 [BoapPacket BoapSignalObject::orx](#) [protected]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/Boap.h](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.h](#)

- [/src/cern/tms/beam/libBeam/Boap.cpp](#)
- [/src/cern/tms/beam/libBeam/BoapSimple.cc](#)

9.35 BObject Class Reference

```
#include <BObject.h>
```

Public Member Functions

- [BObject](#) ()
- virtual [~BObject](#) ()
- virtual [BError](#) [getBinary](#) (BDataBuf &buf)
- virtual [BError](#) [setBinary](#) (BDataBuf &buf)
- virtual [BString](#) [getString](#) ()
- virtual [BError](#) [setString](#) (BString str)
- virtual [BMemberList](#) [getMemberList](#) ()
- virtual [BError](#) [addMember](#) (BString name, [BObject](#) *object)
- virtual void [printIt](#) ()
- virtual BType & [getType](#) ()

Static Public Member Functions

- static [BObject](#) * [createObj](#) ()

Static Public Attributes

- static BType [otype](#)

9.35.1 Constructor & Destructor Documentation

9.35.1.1 **BObject::BObject** ()

9.35.1.2 **BObject::~~BObject** () [virtual]

9.35.2 Member Function Documentation

9.35.2.1 **BError** **BObject::getBinary** (**BDataBuf** & *buf*) [virtual]

9.35.2.2 **BError** **BObject::setBinary** (**BDataBuf** & *buf*) [virtual]

9.35.2.3 **BString** **BObject::getString** () [virtual]

9.35.2.4 **BError** **BObject::setString** (**BString** *str*) [virtual]

9.35.2.5 **BMemberList** **BObject::getMemberList** () [virtual]

9.35.2.6 **BError** **BObject::addMember** (**BString** *name*, **BObject** * *object*) [virtual]

9.35.2.7 **void** **BObject::printIt** () [virtual]

9.35.2.8 **BType** & **BObject::getType** () [virtual]

9.35.2.9 **BObject** * **BObject::createObj** () [static]

9.35.3 Member Data Documentation

9.35.3.1 **BType** **BObject::otype** [static]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BObject.h](#)
- [/src/cern/tms/beam/libBeam/BObject.cc](#)

9.36 BPoll Class Reference

This class provides an interface for polling a number of file descriptors. It uses round robin polling.

```
#include <BPoll.h>
```

Public Types

- typedef pollfd [PollFd](#)

Public Member Functions

- [BPoll](#) ()
- [~BPoll](#) ()
- void [append](#) (int fd, int events=POLLIN|POLLERR|POLLHUP|POLLNVAL)
Append a file descriptor to polling list.
- void [delFd](#) (int fd)
Remove a file descriptor from polling list.
- [BError doPoll](#) (int &fd, int timeoutUs=-1)
Perform polling operation.
- int [getPollFdsNum](#) ()
- [PollFd *](#) [getPollFds](#) ()
- void [clear](#) ()

Private Member Functions

- int [nextFd](#) (int i)

Private Attributes

- int [ofdsNum](#)
The number of FD's in list.
- [PollFd *](#) [ofds](#)
The list of poll fd's.
- int [ofdsNext](#)
The next list entry for round robin polling.

9.36.1 Detailed Description

This class provides an interface for polling a number of file descriptors. It uses round robin polling.

9.36.2 Member Typedef Documentation

9.36.2.1 typedef struct pollfd [BPoll::PollFd](#)

9.36.3 Constructor & Destructor Documentation

9.36.3.1 [BPoll::BPoll](#) ()

9.36.3.2 [BPoll::~~BPoll](#) ()

9.36.4 Member Function Documentation

9.36.4.1 void [BPoll::append](#) (int *fd*, int *events* = POLLIN|POLLEERR|POLLHUP|POLLNVAL)

Append a file descriptor to polling list.

9.36.4.2 void [BPoll::delFd](#) (int *fd*)

Remove a file descriptor from polling list.

9.36.4.3 [BError](#) [BPoll::doPoll](#) (int & *fd*, int *timeoutUs* = -1)

Perform polling operation.

9.36.4.4 int [BPoll::getPollFdsNum](#) ()

9.36.4.5 [BPoll::PollFd](#) * [BPoll::getPollFds](#) ()

9.36.4.6 void [BPoll::clear](#) ()

9.36.4.7 int [BPoll::nextFd](#) (int *i*) [private]

9.36.5 Member Data Documentation

9.36.5.1 int [BPoll::ofdsNum](#) [private]

The number of FD's in list.

9.36.5.2 [PollFd](#)* [BPoll::ofds](#) [private]

The list of poll fd's.

9.36.5.3 int [BPoll::ofdsNext](#) [private]

The next list entry for round robin polling.

The documentation for this class was generated from the following files:

- /src/cern/tms/beam/libBeam/[BPoll.h](#)

- [/src/cern/tms/beam/libBeam/BPoll-1.cpp](#)
- [/src/cern/tms/beam/libBeam/BPoll.cpp](#)

9.37 BRefData Class Reference

Referenced data storage.

```
#include <BRefData.h>
```

Public Member Functions

- [BRefData](#) ()
- [BRefData](#) (int len)
- [BRefData](#) (const [BRefData](#) &refData)
- [~BRefData](#) ()
- [BRefData](#) * [copy](#) ()
- [BRefData](#) * [addRef](#) ()
- int [deleteRef](#) ()
- int [refCount](#) ()
- char * [data](#) ()
- int [len](#) ()
- void [setLen](#) (int len)
- [BRefData](#) & [operator=](#) ([BRefData](#) &refData)

Private Attributes

- void * [oData](#)
- int [oLen](#)
- int [oSize](#)
- int [oRefCount](#)

9.37.1 Detailed Description

Referenced data storage.

9.37.2 Constructor & Destructor Documentation

9.37.2.1 `BRefData::BRefData ()`

9.37.2.2 `BRefData::BRefData (int len)`

9.37.2.3 `BRefData::BRefData (const BRefData & refData)`

9.37.2.4 `BRefData::~~BRefData ()`

9.37.3 Member Function Documentation

9.37.3.1 `BRefData * BRefData::copy ()`

9.37.3.2 `BRefData * BRefData::addRef ()`

9.37.3.3 `int BRefData::deleteRef ()`

9.37.3.4 `int BRefData::refCount () [inline]`

9.37.3.5 `char* BRefData::data () [inline]`

9.37.3.6 `int BRefData::len () [inline]`

9.37.3.7 `void BRefData::setLen (int len)`

9.37.3.8 `BRefData & BRefData::operator= (BRefData & refData)`

9.37.4 Member Data Documentation

9.37.4.1 `void* BRefData::oData [private]`

9.37.4.2 `int BRefData::oLen [private]`

9.37.4.3 `int BRefData::oSize [private]`

9.37.4.4 `int BRefData::oRefCount [private]`

The documentation for this class was generated from the following files:

- `/src/cern/tms/beam/libBeam/BRefData.h`
- `/src/cern/tms/beam/libBeam/BRefData.cpp`

9.38 BRtc Class Reference

Realtime clock.

```
#include <BRtc.h>
```

Public Member Functions

- [BRtc](#) ()
- [~BRtc](#) ()
- [BError init](#) (int rate)
Setup interrupt rate.
- void [wait](#) (int delayUs)
Wait specified uS.

Private Attributes

- int [ofd](#)
- int [orate](#)

9.38.1 Detailed Description

Realtime clock.

9.38.2 Constructor & Destructor Documentation

9.38.2.1 [BRtc::BRtc](#) ()

9.38.2.2 [BRtc::~~BRtc](#) ()

9.38.3 Member Function Documentation

9.38.3.1 [BError BRtc::init](#) (int *rate*)

Setup interrupt rate.

9.38.3.2 void [BRtc::wait](#) (int *delayUs*)

Wait specified uS.

9.38.4 Member Data Documentation

9.38.4.1 int [BRtc::ofd](#) [private]

9.38.4.2 int [BRtc::orate](#) [private]

The documentation for this class was generated from the following files:

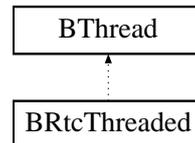
- [/src/cern/tms/beam/libBeam/BRtc.h](#)
- [/src/cern/tms/beam/libBeam/BRtc.cpp](#)

9.39 BRtcThreaded Class Reference

Threaded real time clock.

```
#include <BRtc.h>
```

Inheritance diagram for BRtcThreaded::



Public Member Functions

- [BRtcThreaded \(\)](#)
- [~BRtcThreaded \(\)](#)
- [BError init \(int rate\)](#)
Setup interrupt rate.
- void [wait \(int delayUs\)](#)
Wait specified uS.

Private Member Functions

- void * [function \(\)](#)

Private Attributes

- [BRtc orte](#)
- [int orate](#)
- [BCond ocond](#)

9.39.1 Detailed Description

Threaded real time clock.

9.39.2 Constructor & Destructor Documentation

9.39.2.1 BRtcThreaded::BRtcThreaded ()

9.39.2.2 BRtcThreaded::~~BRtcThreaded ()

9.39.3 Member Function Documentation

9.39.3.1 [BError](#) BRtcThreaded::init (int rate)

Setup interrupt rate.

9.39.3.2 void BRtcThreaded::wait (int *delayUs*)

Wait specified uS.

9.39.3.3 void * BRtcThreaded::function () [private, virtual]

Reimplemented from [BThread](#).

9.39.4 Member Data Documentation

9.39.4.1 BRtc BRtcThreaded::ortc [private]

9.39.4.2 int BRtcThreaded::orate [private]

9.39.4.3 BCond BRtcThreaded::ocond [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BRtc.h](#)
- [/src/cern/tms/beam/libBeam/BRtc.cpp](#)

9.40 BRWLock Class Reference

thread read-write locks

```
#include <BRWLock.h>
```

Public Member Functions

- [BRWLock \(\)](#)
- [BRWLock \(const BRWLock &rwlock\)](#)
- [~BRWLock \(\)](#)
- [int rdLock \(\)](#)
Set lock, wait if necessary.
- [int tryRdLock \(\)](#)
Test the lock.
- [int wrLock \(\)](#)
Set lock, wait if necessary.
- [int tryWrLock \(\)](#)
Test the lock.
- [int unlock \(\)](#)
Unlock the lock.
- [BRWLock & operator= \(const BRWLock &rwlock\)](#)

Private Attributes

- `pthread_rwlock_t olock`

9.40.1 Detailed Description

thread read-write locks

9.40.2 Constructor & Destructor Documentation

9.40.2.1 BRWLock::BRWLock ()

9.40.2.2 BRWLock::BRWLock (const BRWLock & rwlock)

9.40.2.3 BRWLock::~BRWLock ()

9.40.3 Member Function Documentation

9.40.3.1 int BRWLock::rdLock ()

Set lock, wait if necessary.

9.40.3.2 int BRWLock::tryRdLock ()

Test the lock.

9.40.3.3 int BRWLock::wrLock ()

Set lock, wait if necessary.

9.40.3.4 int BRWLock::tryWrLock ()

Test the lock.

9.40.3.5 int BRWLock::unlock ()

Unlock the lock.

9.40.3.6 BRWLock & BRWLock::operator= (const BRWLock & *rwlock*)**9.40.4 Member Data Documentation****9.40.4.1 pthread_rwlock_t BRWLock::olock** [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BRWLock.h](#)
- [/src/cern/tms/beam/libBeam/BRWLock.cpp](#)

9.41 BSema Class Reference

Sempahore class.

```
#include <BSema.h>
```

Public Member Functions

- [BSema](#) (int value=0)
- [BSema](#) (const [BSema](#) &sema)
- [~BSema](#) ()
- int [post](#) ()
Post condition.
- int [wait](#) ()
Wait for contition.
- int [timedWait](#) (int timeUs)
Wait for condition with timeout.
- int [tryWait](#) ()
Test for the condition.
- int [getValue](#) () const
- [BSema](#) & [operator=](#) (const [BSema](#) &sema)

Private Attributes

- [sem_t](#) [osema](#)

9.41.1 Detailed Description

Sempahore class.

9.41.2 Constructor & Destructor Documentation

9.41.2.1 [BSema::BSema](#) (int *value* = 0)

9.41.2.2 [BSema::BSema](#) (const [BSema](#) & *sema*)

9.41.2.3 [BSema::~~BSema](#) ()

9.41.3 Member Function Documentation

9.41.3.1 int [BSema::post](#) ()

Post condition.

9.41.3.2 int BSema::wait ()

Wait for contition.

9.41.3.3 int BSema::timedWait (int *timeUs*)

Wait for condition with timeout.

9.41.3.4 int BSema::tryWait ()

Test for the condition.

9.41.3.5 int BSema::getValue () const

9.41.3.6 BSema & BSema::operator= (const BSema & *sema*)

9.41.4 Member Data Documentation

9.41.4.1 sem_t BSema::osema [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BSema.h](#)
- [/src/cern/tms/beam/libBeam/BSema.cpp](#)

9.42 BSignal Class Reference

```
#include <SigGen.h>
```

Public Types

- enum { [NumChannels](#) = 9 }

Public Member Functions

- [BSignal](#) (int [id](#)=0, int [numSamples](#)=0, int [numRepeat](#)=0, int [nextId](#)=0)
- [BSignal](#) (const [BSignal](#) &sig)
- [~BSignal](#) ()
- [BSignal](#) & [operator=](#) (const [BSignal](#) &sig)

Public Attributes

- int [id](#)
- int [numSamples](#)
- int [numRepeat](#)
- int [nextId](#)
- [Sample](#) * [data](#) [[NumChannels](#)]

9.42.1 Member Enumeration Documentation

9.42.1.1 anonymous enum

Enumerator:

NumChannels

9.42.2 Constructor & Destructor Documentation

9.42.2.1 **BSignal::BSignal** (*int id* = 0, *int numSamples* = 0, *int numRepeat* = 0, *int nextId* = 0)

9.42.2.2 **BSignal::BSignal** (const **BSignal** & *sig*)

9.42.2.3 **BSignal::~BSignal** ()

9.42.3 Member Function Documentation

9.42.3.1 **BSignal & BSignal::operator=** (const **BSignal** & *sig*)

9.42.4 Member Data Documentation

9.42.4.1 *int* **BSignal::id**

9.42.4.2 *int* **BSignal::numSamples**

9.42.4.3 *int* **BSignal::numRepeat**

9.42.4.4 *int* **BSignal::nextId**

9.42.4.5 *Sample** **BSignal::data**[NumChannels]

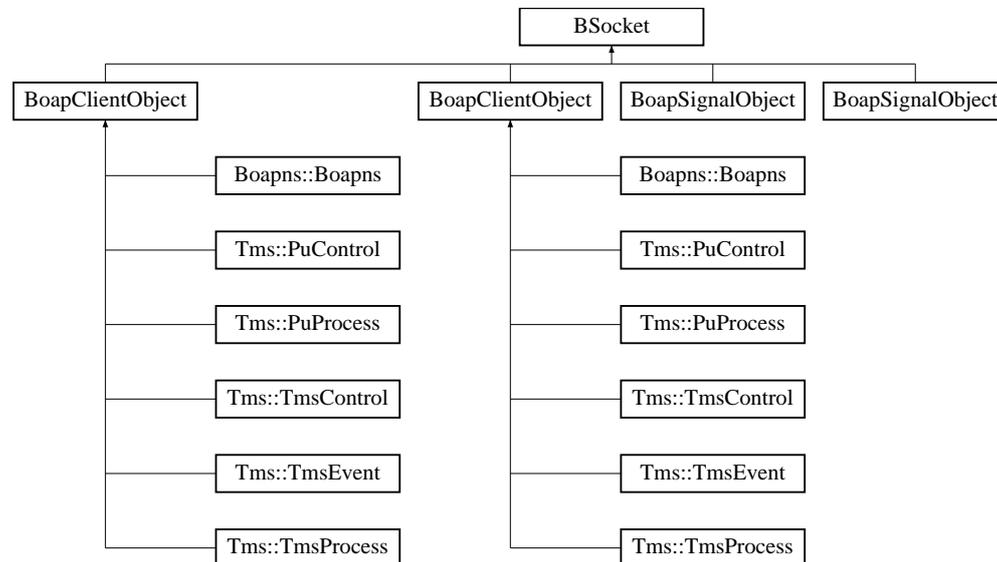
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.43 BSocket Class Reference

```
#include <BSocket.h>
```

Inheritance diagram for BSocket::



Public Types

- enum `NType` { `STREAM`, `DGRAM` }
- enum `Priority` { `PriorityLow`, `PriorityNormal`, `PriorityHigh` }

Public Member Functions

- `BSocket ()`
- `BSocket (int fd)`
- `BSocket (NType type)`
- `~BSocket ()`
- `BError init (NType type)`
- `int getFd ()`
- `BError bind (const BSocketAddress &add)`
- `BError connect (const BSocketAddress &add)`
- `BError shutdown (int how)`
- `BError close ()`
- `BError listen (int backlog=5)`
- `BError accept (int &fd)`
- `BError accept (int &fd, BSocketAddress &address)`
- `BError send (const void *buf, BSize nbytes, BSize &nbytesSent, int flags=0)`
- `BError sendTo (const BSocketAddress &address, const void *buf, BSize nbytes, BSize &nbytesSent, int flags=0)`
- `BError recv (void *buf, BSize maxbytes, BSize &nbytesRecv, int flags=0)`
- `BError recvFrom (BSocketAddress &address, void *buf, BSize maxbytes, BSize &nbytesRecv, int flags=0)`

- [BError setSockOpt](#) (int level, int optname, void *optval, unsigned int optlen)
- [BError getSockOpt](#) (int level, int optname, void *optval, unsigned int *optlen)
- [BError setReuseAddress](#) (int on)
- [BError setBroadCast](#) (int on)
- [BError setPriority](#) ([Priority](#) priority)
- [BError getMTU](#) (uint32_t &mtu)
- [BError getAddress](#) ([BSocketAddress](#) &address)

Private Attributes

- int [osocket](#)

9.43.1 Member Enumeration Documentation

9.43.1.1 enum [BSocket::NType](#)

Enumerator:

STREAM

DGRAM

9.43.1.2 enum [BSocket::Priority](#)

Enumerator:

PriorityLow

PriorityNormal

PriorityHigh

9.43.2 Constructor & Destructor Documentation

9.43.2.1 `BSocket::BSocket ()`

9.43.2.2 `BSocket::BSocket (int fd)`

9.43.2.3 `BSocket::BSocket (NType type)`

9.43.2.4 `BSocket::~~BSocket ()`

9.43.3 Member Function Documentation

9.43.3.1 `BError BSocket::init (NType type)`

9.43.3.2 `int BSocket::getFd ()`

9.43.3.3 `BError BSocket::bind (const BSocketAddress & add)`

9.43.3.4 `BError BSocket::connect (const BSocketAddress & add)`

9.43.3.5 `BError BSocket::shutdown (int how)`

9.43.3.6 `BError BSocket::close ()`

9.43.3.7 `BError BSocket::listen (int backlog = 5)`

9.43.3.8 `BError BSocket::accept (int & fd)`

9.43.3.9 `BError BSocket::accept (int & fd, BSocketAddress & address)`

9.43.3.10 `BError BSocket::send (const void * buf, BSize nbytes, BSize & nbytesSent, int flags = 0)`

9.43.3.11 `BError BSocket::sendTo (const BSocketAddress & address, const void * buf, BSize nbytes, BSize & nbytesSent, int flags = 0)`

9.43.3.12 `BError BSocket::recv (void * buf, BSize maxbytes, BSize & nbytesRecv, int flags = 0)`

9.43.3.13 `BError BSocket::recvFrom (BSocketAddress & address, void * buf, BSize maxbytes, BSize & nbytesRecv, int flags = 0)`

9.43.3.14 `BError BSocket::setSockOpt (int level, int optname, void * optval, unsigned int optlen)`

9.43.3.15 `BError BSocket::getSockOpt (int level, int optname, void * optval, unsigned int * optlen)`

9.43.3.16 `BError BSocket::setReuseAddress (int on)`

9.43.3.17 `BError BSocket::setBroadCast (int on)`

9.43.3.18 `BError BSocket::setPriority (Priority priority)`

9.43.3.19 `BError BSocket::getMTU (uint32_t & mtu)`

9.43.3.20 `BError BSocket::getAddress (BSocketAddress & address)`

9.43.4 Member Data Documentation

Generated on Tue Nov 27 09:19:56 2007 for LibTmsApi by Doxygen

9.43.4.1 `int BSocket::osocket` [private]

The documentation for this class was generated from the following files:

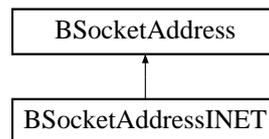
- [/src/cern/tms/beam/libBeam/BSocket.h](#)
- [/src/cern/tms/beam/libBeam/BSocket.cpp](#)

9.44 BSocketAddress Class Reference

Socket Address.

```
#include <BSocket.h>
```

Inheritance diagram for BSocketAddress::



Public Types

- typedef sockaddr [SockAddr](#)

Public Member Functions

- [BSocketAddress](#) ()
- [BSocketAddress](#) (const [BSocketAddress](#) &add)
- [BSocketAddress](#) ([SockAddr](#) *address, int len)
- [~BSocketAddress](#) ()
- [BError](#) set ([SockAddr](#) *address, int len)
- const [SockAddr](#) * raw () const
- int len () const
- [BSocketAddress](#) & operator= (const [BSocketAddress](#) &add)
- operator const [SockAddr](#) * () const
- int operator== (const [BSocketAddress](#) &add) const
- int operator!= (const [BSocketAddress](#) &add) const

Private Attributes

- int olen
- [SockAddr](#) * oaddress

9.44.1 Detailed Description

Socket Address.

9.44.2 Member Typedef Documentation

9.44.2.1 typedef struct sockaddr [BSocketAddress::SockAddr](#)

9.44.3 Constructor & Destructor Documentation

9.44.3.1 [BSocketAddress::BSocketAddress](#) ()

9.44.3.2 [BSocketAddress::BSocketAddress](#) (const [BSocketAddress](#) & *add*)

9.44.3.3 [BSocketAddress::BSocketAddress](#) ([SockAddr](#) * *address*, int *len*)

9.44.3.4 [BSocketAddress::~~BSocketAddress](#) ()

9.44.4 Member Function Documentation

9.44.4.1 [BError](#) [BSocketAddress::set](#) ([SockAddr](#) * *address*, int *len*)

9.44.4.2 const [BSocketAddress::SockAddr](#) * [BSocketAddress::raw](#) () const

9.44.4.3 int [BSocketAddress::len](#) () const

9.44.4.4 [BSocketAddress](#) & [BSocketAddress::operator=](#) (const [BSocketAddress](#) & *add*)

9.44.4.5 [BSocketAddress::operator](#) const [SockAddr](#) * () const [inline]

9.44.4.6 int [BSocketAddress::operator==](#) (const [BSocketAddress](#) & *add*) const

9.44.4.7 int [BSocketAddress::operator!=](#) (const [BSocketAddress](#) & *add*) const

9.44.5 Member Data Documentation

9.44.5.1 int [BSocketAddress::olen](#) [private]

9.44.5.2 [SockAddr](#)* [BSocketAddress::oaddress](#) [private]

The documentation for this class was generated from the following files:

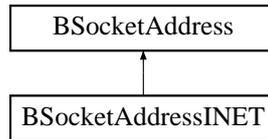
- [/src/cern/tms/beam/libBeam/BSocket.h](#)
- [/src/cern/tms/beam/libBeam/BSocket.cpp](#)

9.45 BSocketAddressINET Class Reference

IP aware socket address.

```
#include <BSocket.h>
```

Inheritance diagram for BSocketAddressINET::



Public Types

- typedef sockaddr_in [SockAddrIP](#)

Public Member Functions

- [BError set](#) ([BString](#) hostName, uint32_t port)
- [BError set](#) (uint32_t address, uint32_t port)
- [BError set](#) ([BString](#) hostName, [BString](#) service, [BString](#) type)
- void [setPort](#) (uint32_t port)
- uint32_t [address](#) ()
Returns socket ip address.
- uint32_t [port](#) ()
Returns socket port.
- [BString](#) [getString](#) ()
Return string version of address <ip>:<port>.

Static Public Member Functions

- static [BString](#) [getHostName](#) ()
Get this hosts network name.
- static [BList](#)< uint32_t > [getIpAddresses](#) ()
Get a list of all the IP addresses of this host.
- static [BList](#)< [BString](#) > [getIpAddressList](#) ()
Get a list of all the IP addresses of this host under hostname.
- static [BList](#)< [BString](#) > [getIpAddressListAll](#) ()
Get a list of all the IP addresses of this host looking at physical interfaces.

9.45.1 Detailed Description

IP aware socket address.

9.45.2 Member Typedef Documentation

9.45.2.1 `typedef struct sockaddr_in` [BSocketAddressINET::SockAddrIP](#)

9.45.3 Member Function Documentation

9.45.3.1 [BError](#) `BSocketAddressINET::set` ([BString](#) *hostName*, `uint32_t` *port*)

9.45.3.2 [BError](#) `BSocketAddressINET::set` (`uint32_t` *address*, `uint32_t` *port*)

9.45.3.3 [BError](#) `BSocketAddressINET::set` ([BString](#) *hostName*, [BString](#) *service*, [BString](#) *type*)

9.45.3.4 `void` `BSocketAddressINET::setPort` (`uint32_t` *port*)

9.45.3.5 `uint32_t` `BSocketAddressINET::address` ()

Returns socket ip address.

9.45.3.6 `uint32_t` `BSocketAddressINET::port` ()

Returns socket port.

9.45.3.7 [BString](#) `BSocketAddressINET::getString` ()

Return string version of address <ip>:<port>.

9.45.3.8 [BString](#) `BSocketAddressINET::getHostName` () `[static]`

Get this hosts network name.

9.45.3.9 [BList](#)< `uint32_t` > `BSocketAddressINET::getIpAddresses` () `[static]`

Get a list of all the IP addresses of this host.

9.45.3.10 [BList](#)< [BString](#) > `BSocketAddressINET::getIpAddressList` () `[static]`

Get a list of all the IP addresses of this host under hostname.

9.45.3.11 [BList](#)< [BString](#) > `BSocketAddressINET::getIpAddressListAll` () `[static]`

Get a list of all the IP addresses of this host looking at physical interfaces.

The documentation for this class was generated from the following files:

- `/src/cern/tms/beam/libBeam/BSocket.h`

- [/src/cern/tms/beam/libBeam/BSocket.cpp](#)

9.46 BString Class Reference

```
#include <BString.h>
```

Public Member Functions

- [BString](#) ()
- [BString](#) (const [BString](#) &string)
- [BString](#) (const char *str)
- [BString](#) (char ch)
- [BString](#) (int v)
- [BString](#) (unsigned int v)
- [BString](#) (long v)
- [BString](#) (unsigned long long)
- [BString](#) (double v)
- virtual [~BString](#) ()
- [BString copy](#) ()
Return an independant copy.

- virtual void [strChanged](#) ()
- int [len](#) () const
Length of string.

- const char * [retStr](#) () const
Ptr to char representation.*

- char * [retStrDup](#) () const
Ptr to newly malloc'd char.*

- int [retInt](#) () const
Return string as a int.

- double [retDouble](#) () const
Return string as a double.

- int [compare](#) (const [BString](#) &string) const
Compare strings.

- int [compareWild](#) (const [BString](#) &string) const
Compare string to string with wildcards.

- int [compareWildExpression](#) (const [BString](#) &string) const
Compare string to space delimited patterns.

- [BString add](#) (const [BString](#) &str) const
Add two strings.

- [BString & truncate](#) (int len)
Truncate to length len.

- [BString & pad](#) (int len)
Pad to length len.
- [BString & toUpper](#) ()
Convert to uppercase.
- [BString & toLower](#) ()
Convert to lowercase.
- void [removeNL](#) ()
Remove if present NL from last char.
- [BString subString](#) (int start, int len) const
Returns substring.
- int [del](#) (int start, int len)
Delete substring.
- int [insert](#) (int start, [BString](#) str)
Insert substring.
- void [printf](#) (const char *fmt,...)
Formatted print into the string.
- int [find](#) (char ch) const
Find ch in string searching forwards.
- int [findReverse](#) (char ch) const
Find ch in string searching backwards.
- [BList< BString > getTokenList](#) ([BString](#) separators)
Break string into tokens.
- [BString removeSeparators](#) ([BString](#) separators)
Remove any char from sepatators from string.
- [BString pullToken](#) ([BString](#) terminators)
Pull token from start of string.
- [BString pullSeparators](#) ([BString](#) separators)
Pull separators from start of string.
- [BString pullWord](#) ()
Pull a word out of the head of the string.
- [BString pullLine](#) ()
Pull a line out of the head of the string.
- [BString field](#) (int field) const

- char ** fields ()
- BString & operator= (const BString &string)
- char & operator[] (int pos)
- int operator== (const BString &s) const
- int operator== (const char *s) const
- int operator> (const BString &s) const
- int operator> (const char *s) const
- int operator< (const BString &s) const
- int operator< (const char *s) const
- int operator>= (const BString &s) const
- int operator<= (const BString &s) const
- int operator!= (const BString &s) const
- int operator!= (const char *s) const
- BString operator+ (const BString &s) const
- BString operator+ (const char *s) const
- BString operator+= (const BString &s)
- BString operator+= (const char *s)
- BString operator+ (char ch) const
- BString operator+ (int i) const
- BString operator+ (unsigned int i) const
- BString operator+ (unsigned long long i) const
- operator const char * () const

Static Public Member Functions

- static BString convert (char ch)
Converts char to string.
- static BString convert (int value)
Converts int to string.
- static BString convert (unsigned int value)
Converts uint to string.
- static BString convert (long value)
Converts long to string.
- static BString convert (double value)
Converts double to string.
- static BString convert (unsigned long long value)
Converts u long long to string.
- static BString convertHex (int value)
Converts int to string as hex value.
- static BString convertHex (unsigned int value)
Converts uint to string as hex value.

Protected Attributes

- [BRefData](#) * *ostr*

Private Member Functions

- void [Init](#) (const char **str*)
- int [inString](#) (int *pos*) const
- int [isSpace](#) (char *ch*) const

9.46.1 Constructor & Destructor Documentation

9.46.1.1 [BString::BString](#) ()

9.46.1.2 [BString::BString](#) (const [BString](#) & *string*)

9.46.1.3 [BString::BString](#) (const char * *str*)

9.46.1.4 [BString::BString](#) (char *ch*)

9.46.1.5 [BString::BString](#) (int *v*)

9.46.1.6 [BString::BString](#) (unsigned int *v*)

9.46.1.7 [BString::BString](#) (long *v*)

9.46.1.8 [BString::BString](#) (unsigned long *long*)

9.46.1.9 [BString::BString](#) (double *v*)

9.46.1.10 [BString::~~BString](#) () [virtual]

9.46.2 Member Function Documentation

9.46.2.1 [BString](#) [BString::convert](#) (char *ch*) [static]

Converts char to string.

9.46.2.2 [BString](#) [BString::convert](#) (int *value*) [static]

Converts int to string.

9.46.2.3 [BString](#) [BString::convert](#) (unsigned int *value*) [static]

Converts uint to string.

9.46.2.4 [BString](#) [BString::convert](#) (long *value*) [static]

Converts long to string.

9.46.2.5 BString BString::convert (double *value*) [static]

Converts double to string.

9.46.2.6 BString BString::convert (unsigned long long *value*) [static]

Converts u long long to string.

9.46.2.7 BString BString::convertHex (int *value*) [static]

Converts int to string as hex value.

9.46.2.8 BString BString::convertHex (unsigned int *value*) [static]

Converts uint to string as hex value.

9.46.2.9 BString BString::copy ()

Return an independant copy.

9.46.2.10 void BString::strChanged () [virtual]**9.46.2.11 int BString::len () const**

Length of string.

9.46.2.12 const char * BString::retStr () const

Ptr to char* representation.

9.46.2.13 char * BString::retStrDup () const

Ptr to newly malloc'd char*.

9.46.2.14 int BString::retInt () const

Return string as a int.

9.46.2.15 double BString::retDouble () const

Return string as a double.

9.46.2.16 int BString::compare (const BString & *string*) const

Compare strings.

9.46.2.17 `int BString::compareWild (const BString & string) const`

Compare string to string with wildcards.

9.46.2.18 `int BString::compareWildExpression (const BString & string) const`

Compare string to space delimited patterns.

9.46.2.19 `BString BString::add (const BString & str) const`

Add two strings.

9.46.2.20 `BString & BString::truncate (int len)`

Truncate to length len.

9.46.2.21 `BString & BString::pad (int len)`

Pad to length len.

9.46.2.22 `BString & BString::toUpper ()`

Convert to uppercase.

9.46.2.23 `BString & BString::toLower ()`

Convert to lowercase.

9.46.2.24 `void BString::removeNL ()`

Remove if present NL from last char.

9.46.2.25 `BString BString::subString (int start, int len) const`

Returns substring.

9.46.2.26 `int BString::del (int start, int len)`

Delete substring.

9.46.2.27 `int BString::insert (int start, BString str)`

Insert substring.

9.46.2.28 void BString::printf (const char *fmt, ...)

Formatted print into the string.

9.46.2.29 int BString::find (char ch) const

Find ch in string searching forwards.

9.46.2.30 int BString::findReverse (char ch) const

Find ch in string searching backwards.

9.46.2.31 BList< BString > BString::getTokenList (BString separators)

Break string into tokens.

9.46.2.32 BString BString::removeSeparators (BString separators)

Remove any char from separators from string.

9.46.2.33 BString BString::pullToken (BString terminators)

Pull token from start of string.

9.46.2.34 BString BString::pullSeparators (BString separators)

Pull separators from start of string.

9.46.2.35 BString BString::pullWord ()

Pull a word out of the head of the string.

9.46.2.36 BString BString::pullLine ()

Pull a line out of the head of the string.

9.46.2.37 BString BString::field (int field) const**9.46.2.38 char ** BString::fields ()****9.46.2.39 BString & BString::operator= (const BString & string)****9.46.2.40]**

char & BString::operator[] (int pos)

- 9.46.2.41 `int BString::operator==(const BString & s) const` [inline]
- 9.46.2.42 `int BString::operator==(const char * s) const` [inline]
- 9.46.2.43 `int BString::operator>(const BString & s) const` [inline]
- 9.46.2.44 `int BString::operator>(const char * s) const` [inline]
- 9.46.2.45 `int BString::operator<(const BString & s) const` [inline]
- 9.46.2.46 `int BString::operator<(const char * s) const` [inline]
- 9.46.2.47 `int BString::operator>=(const BString & s) const` [inline]
- 9.46.2.48 `int BString::operator<=(const BString & s) const` [inline]
- 9.46.2.49 `int BString::operator!=(const BString & s) const` [inline]
- 9.46.2.50 `int BString::operator!=(const char * s) const` [inline]
- 9.46.2.51 `BString BString::operator+(const BString & s) const` [inline]
- 9.46.2.52 `BString BString::operator+(const char * s) const` [inline]
- 9.46.2.53 `BString BString::operator+=(const BString & s)` [inline]
- 9.46.2.54 `BString BString::operator+=(const char * s)` [inline]
- 9.46.2.55 `BString BString::operator+(char ch) const` [inline]
- 9.46.2.56 `BString BString::operator+(int i) const` [inline]
- 9.46.2.57 `BString BString::operator+(unsigned int i) const` [inline]
- 9.46.2.58 `BString BString::operator+(unsigned long long i) const` [inline]
- 9.46.2.59 `BString::operator const char * () const` [inline]
- 9.46.2.60 `void BString::Init(const char * str)` [private]
- 9.46.2.61 `int BString::inString(int pos) const` [private]
- 9.46.2.62 `int BString::isSpace(char ch) const` [private]

9.46.3 Member Data Documentation

- 9.46.3.1 `BRefData* BString::ostr` [protected]

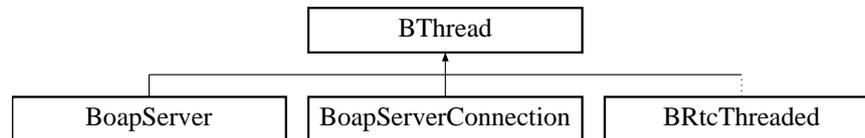
The documentation for this class was generated from the following files:

- `/src/cern/tms/beam/libBeam/BString.h`
- `/src/cern/tms/beam/libBeam/BString.cpp`

9.47 BThread Class Reference

```
#include <BThread.h>
```

Inheritance diagram for BThread::



Public Member Functions

- [BThread \(\)](#)
- [virtual ~BThread \(\)](#)
- [int setInitPriority \(int policy, int priority\)](#)
- [int setInitStackSize \(size_t stackSize\)](#)
- [int start \(\)](#)
- [void * result \(\)](#)
- [int running \(\)](#)
- [int setPriority \(int policy, int priority\)](#)
- [int cancel \(\)](#)
- [void * waitForCompletion \(\)](#)
- [pthread_t getThread \(\)](#)
- [virtual void * function \(\)](#)

Static Private Member Functions

- [static void * startFunc \(void *\)](#)

Private Attributes

- [pthread_t othread](#)
- [size_t ostackSize](#)
- [int opolicy](#)
- [int opriority](#)
- [int orunning](#)
- [void * oresult](#)

9.47.1 Constructor & Destructor Documentation

9.47.1.1 `BThread::BThread ()`

9.47.1.2 `BThread::~~BThread ()` [virtual]

9.47.2 Member Function Documentation

9.47.2.1 `int BThread::setInitPriority (int policy, int priority)`

9.47.2.2 `int BThread::setInitStackSize (size_t stackSize)`

9.47.2.3 `int BThread::start ()`

9.47.2.4 `void * BThread::result ()`

9.47.2.5 `int BThread::running ()`

9.47.2.6 `int BThread::setPriority (int policy, int priority)`

9.47.2.7 `int BThread::cancel ()`

9.47.2.8 `void * BThread::waitForCompletion ()`

9.47.2.9 `pthread_t BThread::getThread ()`

9.47.2.10 `void * BThread::function ()` [virtual]

Reimplemented in [BoapServerConnection](#), [BoapServer](#), and [BRtcThreaded](#).

9.47.2.11 `void * BThread::startFunc (void *)` [static, private]

9.47.3 Member Data Documentation

9.47.3.1 `pthread_t BThread::othread` [private]

9.47.3.2 `size_t BThread::ostackSize` [private]

9.47.3.3 `int BThread::opolicy` [private]

9.47.3.4 `int BThread::oprriority` [private]

9.47.3.5 `int BThread::orunning` [private]

9.47.3.6 `void* BThread::oreult` [private]

The documentation for this class was generated from the following files:

- `/src/cern/tms/beam/libBeam/BThread.h`
- `/src/cern/tms/beam/libBeam/BThread.cpp`

9.48 BTimer Class Reference

Stopwatch style timer.

```
#include <BTimer.h>
```

Public Member Functions

- [BTimer](#) ()
- [~BTimer](#) ()
- void [start](#) ()
Start timer.
- void [stop](#) ()
Stop timer.
- void [clear](#) ()
Clear timer.
- double [getElapsedTime](#) ()
Returns the elapsed time from the last start.
- void [add](#) ([BTimer](#) &timer)
Add two timers.
- double [average](#) ()
Average time is duration between [start\(\)](#) and [stop\(\)](#) / number of stops.
- double [peak](#) ()
Peak time.

Static Private Member Functions

- static double [getTime](#) ()

Private Attributes

- [BMutex](#) olock
- unsigned int onum
- double ostartTime
- double oendTime
- double oaverage
- double opeak

9.48.1 Detailed Description

Stopwatch style timer.

9.48.2 Constructor & Destructor Documentation

9.48.2.1 `BTimer::BTimer ()`

9.48.2.2 `BTimer::~~BTimer ()`

9.48.3 Member Function Documentation

9.48.3.1 `void BTimer::start ()`

Start timer.

9.48.3.2 `void BTimer::stop ()`

Stop timer.

9.48.3.3 `void BTimer::clear ()`

Clear timer.

9.48.3.4 `double BTimer::getElapsedTime ()`

Returns the elapsed time from the last start.

9.48.3.5 `void BTimer::add (BTimer & timer)`

Add two timers.

9.48.3.6 `double BTimer::average ()`

Average time is duration between [start\(\)](#) and [stop\(\)](#) / number of stops.

9.48.3.7 `double BTimer::peak ()`

Peak time.

9.48.3.8 **double BTimer::getTime ()** [static, private]

9.48.4 Member Data Documentation

9.48.4.1 **BMutex BTimer::oLock** [private]

9.48.4.2 **unsigned int BTimer::onum** [private]

9.48.4.3 **double BTimer::ostartTime** [private]

9.48.4.4 **double BTimer::oendTime** [private]

9.48.4.5 **double BTimer::oaverage** [private]

9.48.4.6 **double BTimer::opeak** [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BTimer.h](#)
- [/src/cern/tms/beam/libBeam/BTimer.cpp](#)

9.49 BUrl Class Reference

Basic access to a Url.

```
#include <BUrl.h>
```

Public Member Functions

- [BUrl \(\)](#)
- [~BUrl \(\)](#)
- [BError readString \(BString url, BString &str\)](#)

Reads URL.

Static Private Member Functions

- static [size_t writeData](#) (void *data, size_t size, size_t elSize, void *stream)

Private Attributes

- [BString ores](#)

Static Private Attributes

- static int [oinit](#)

9.49.1 Detailed Description

Basic access to a Url.

9.49.2 Constructor & Destructor Documentation

9.49.2.1 BUrl::BUrl ()

9.49.2.2 BUrl::~~BUrl ()

9.49.3 Member Function Documentation

9.49.3.1 BError BUrl::readString (BString url, BString & str)

Reads URL.

9.49.3.2 `size_t BUrl::writeData (void * data, size_t size, size_t elSize, void * stream)` [static, private]

9.49.4 Member Data Documentation

9.49.4.1 `int BUrl::oinit` [static, private]

9.49.4.2 `BString BUrl::ores` [private]

The documentation for this class was generated from the following files:

- [/src/cern/tms/beam/libBeam/BUrl.h](#)
- [/src/cern/tms/beam/libBeam/BUrl.cpp](#)

9.50 Tms::ConfigInfo Class Reference

This class describes the configuration of the TMS.

```
#include <TmsD.h>
```

Public Member Functions

- [ConfigInfo \(\)](#)
- [ConfigInfo \(BArray< PuChannel > ppuReferences\)](#)

Public Attributes

- [BArray< PuChannel > puReferences](#)

The logical to physical Pick-Up table. Each PuReference includes a Module Controller identifier, a Physical Pick-Up number and a Physical Channel.

9.50.1 Detailed Description

This class describes the configuration of the TMS.

9.50.2 Constructor & Destructor Documentation

9.50.2.1 [Tms::ConfigInfo::ConfigInfo \(\)](#)

9.50.2.2 [Tms::ConfigInfo::ConfigInfo \(BArray< PuChannel > ppuReferences\)](#)

9.50.3 Member Data Documentation

9.50.3.1 [BArray<PuChannel> Tms::ConfigInfo::puReferences](#)

The logical to physical Pick-Up table. Each PuReference includes a Module Controller identifier, a Physical Pick-Up number and a Physical Channel.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.51 Tms::CycleInformation Class Reference

```
#include <TmsD.h>
```

Public Member Functions

- [CycleInformation](#) ()
- [CycleInformation](#) ([UInt32](#) pcycleNumber, [BString](#) pcycleType, [BList](#)< [CycleInformationPeriod](#) > pperiods)

Public Attributes

- [UInt32](#) cycleNumber
The PS Cycle number.
- [BString](#) cycleType
The Cycle Type Name.
- [BList](#)< [CycleInformationPeriod](#) > periods
The list of cycle periods.

9.51.1 Constructor & Destructor Documentation

9.51.1.1 Tms::CycleInformation::CycleInformation ()

9.51.1.2 Tms::CycleInformation::CycleInformation ([UInt32](#) pcycleNumber, [BString](#) pcycleType, [BList](#)< [CycleInformationPeriod](#) > pperiods)

9.51.2 Member Data Documentation

9.51.2.1 [UInt32](#) Tms::CycleInformation::cycleNumber

The PS Cycle number.

9.51.2.2 [BString](#) Tms::CycleInformation::cycleType

The Cycle Type Name.

9.51.2.3 [BList](#)<[CycleInformationPeriod](#)> Tms::CycleInformation::periods

The list of cycle periods.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.52 Tms::CycleInformationPeriod Class Reference

Cycle information.

```
#include <TmsD.h>
```

Public Member Functions

- [CycleInformationPeriod \(\)](#)
- [CycleInformationPeriod \(UInt32 pcyclePeriod, UInt32 pstartTime, UInt32 pendTime, UInt32 pharmonic, UInt32 pnumBunches, UInt32 pbunchMask, UInt32 pnumValues\)](#)

Public Attributes

- [UInt32 cyclePeriod](#)
The Cycle Period.
- [UInt32 startTime](#)
The start time in ms.
- [UInt32 endTime](#)
The end time in ms.
- [UInt32 harmonic](#)
The Machines harmonic number.
- [UInt32 numBunches](#)
The number of bunches.
- [UInt32 bunchMask](#)
Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.
- [UInt32 numValues](#)
The total number of raw data values available.

9.52.1 Detailed Description

Cycle information.

9.52.2 Constructor & Destructor Documentation

9.52.2.1 **Tms::CycleInformationPeriod::CycleInformationPeriod ()**

9.52.2.2 **Tms::CycleInformationPeriod::CycleInformationPeriod ([UInt32 pcyclePeriod](#), [UInt32 pstartTime](#), [UInt32 pendTime](#), [UInt32 pharmonic](#), [UInt32 pnumBunches](#), [UInt32 pbunchMask](#), [UInt32 pnumValues](#))**

9.52.3 Member Data Documentation

9.52.3.1 **[UInt32 Tms::CycleInformationPeriod::cyclePeriod](#)**

The Cycle Period.

9.52.3.2 **[UInt32 Tms::CycleInformationPeriod::startTime](#)**

The start time in ms.

9.52.3.3 **[UInt32 Tms::CycleInformationPeriod::endTime](#)**

The end time in ms.

9.52.3.4 **[UInt32 Tms::CycleInformationPeriod::harmonic](#)**

The Machines harmonic number.

9.52.3.5 **[UInt32 Tms::CycleInformationPeriod::numBunches](#)**

The number of bunches.

9.52.3.6 **[UInt32 Tms::CycleInformationPeriod::bunchMask](#)**

Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.

9.52.3.7 **[UInt32 Tms::CycleInformationPeriod::numValues](#)**

The total number of raw data values available.

The documentation for this class was generated from the following files:

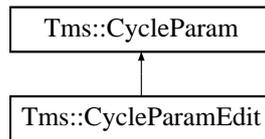
- [TmsD.h](#)
- [TmsD.cc](#)

9.53 Tms::CycleParam Class Reference

This class defines the parameters for a PS processing cycle.

```
#include <TmsD.h>
```

Inheritance diagram for Tms::CycleParam::



Public Member Functions

- [CycleParam \(\)](#)
- [CycleParam \(BString pcycleType, BString pinfo, UInt32 pchannel, UInt32 pllCycleStartFrequency, UInt32 pllInitialFrequency, UInt32 pllInitialFrequencyDelay, UInt32 pllFrefGain, UInt32 pllGain, UInt32 pllDdsMinimum, UInt32 pllDdsMaximum, BArray< Int32 > pfrefPhaseDelay, BArray< PuStateTable > pstateTable, BArray< BString > psettings\)](#)

Public Attributes

- [BString cycleType](#)
The Cycle Type Name of this parameter set, normally the BEAM type the set of parameters is designed to measure.
- [BString info](#)
Information on this parameter set.
- [UInt32 channel](#)
The channel number this configuration is for; 0 defines all channels.
- [UInt32 pllCycleStartFrequency](#)
This defines the initial PLL frequency. This is loaded on START_CYCLE.
- [UInt32 pllInitialFrequency](#)
This defines the initial PLL frequency. This is loaded after the delay given in pllInitialFrequencyDelay.
- [UInt32 pllInitialFrequencyDelay](#)
This defines the delay in milliseconds from START_CYCLE when the pllInitialFrequency is loaded.
- [UInt32 pllFrefGain](#)
The gain of the FREF signal. This is a value in the range +-8191. A normal value would be around 4096.
- [UInt32 pllGain](#)
The gain of the PLL feedback system. This is the gain reduction of the PLL in terms of right bit shifts. A bit shift of 7 is about unity gain.

- [UInt32 pllDdsMinimum](#)
PLLDDSäminimumăfrequency. If this and pllDdsMaximum is set to 0, this feature is disabled.
- [UInt32 pllDdsMaximum](#)
PLLDDSämaximumăfrequency. If this and pllDdsMinimum is set to 0, this feature is disabled.
- [BArray< Int32 > frefPhaseDelay](#)
The phase delay parameters for the Fref timing signal for each of the Pick-Up channels. This is set based on the position of the Pick-Up's in the PS ring. Its value is based of Fref / 512.
- [BArray< PuStateTable > stateTable](#)
TheăarrayăofăStateăTableăentriesăforătheăprocessingărun.
- [BArray< BString > settings](#)
A string array defining the settings for the states. Used for [CycleParam](#) editors.

9.53.1 Detailed Description

This class defines the parameters for a PS processing cycle.

9.53.2 Constructor & Destructor Documentation

9.53.2.1 Tms::CycleParam::CycleParam ()

9.53.2.2 Tms::CycleParam::CycleParam (BString pcycleType, BString pinfo, UInt32 pchannel, UInt32 pllCycleStartFrequency, UInt32 pllInitialFrequency, UInt32 pllInitialFrequencyDelay, UInt32 pllFrefGain, UInt32 pllGain, UInt32 pllDdsMinimum, UInt32 pllDdsMaximum, BArray< Int32 > pfrefPhaseDelay, BArray< PuStateTable > pstateTable, BArray< BString > psettings)

9.53.3 Member Data Documentation

9.53.3.1 BString Tms::CycleParam::cycleType

The Cycle Type Name of this parameter set, normally the BEAM type the set of parameters is designed to measure.

9.53.3.2 BString Tms::CycleParam::info

Information on this parameter set.

9.53.3.3 UInt32 Tms::CycleParam::channel

The channel number this configuration is for, 0 defines all channels.

9.53.3.4 [UInt32 Tms::CycleParam::pllCycleStartFrequency](#)

This defines the initial PLL frequency. This is loaded on START_CYCLE.

9.53.3.5 [UInt32 Tms::CycleParam::pllInitialFrequency](#)

This defines the initial PLL frequency. This is loaded after the delay given in `pllInitialFrequency-Delay`.

9.53.3.6 [UInt32 Tms::CycleParam::pllInitialFrequencyDelay](#)

This defines the delay in milliseconds from START_CYCLE when the `pllInitialFrequency` is loaded.

9.53.3.7 [UInt32 Tms::CycleParam::pllFrefGain](#)

The gain of the FREF signal. This is a value in the range +-8191. A normal value would be around 4096.

9.53.3.8 [UInt32 Tms::CycleParam::pllGain](#)

The gain of the PLL feedback system. This is the gain reduction of the PLL in terms of right bit shifts. A bit shift of 7 is about unity gain.

9.53.3.9 [UInt32 Tms::CycleParam::pllDdsMinimum](#)

PLL DDS minimum frequency. If this and `pllDdsMaximum` is set to 0, this feature is disabled.

9.53.3.10 [UInt32 Tms::CycleParam::pllDdsMaximum](#)

PLL DDS maximum frequency. If this and `pllDdsMinimum` is set to 0, this feature is disabled.

9.53.3.11 [BArray<Int32> Tms::CycleParam::frefPhaseDelay](#)

The phase delay parameters for the Fref timing signal for each of the Pick-Up channels. This is set based on the position of the Pick-Up's in the PS ring. Its value is based of $Fref / 512$.

9.53.3.12 [BArray<PuStateTable> Tms::CycleParam::stateTable](#)

The array of state table entries for the processing run.

9.53.3.13 [BArray<BString> Tms::CycleParam::settings](#)

A string array defining the settings for the states. Used for `CycleParam` editors.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.54 Tms::CycleParamDb Class Reference

Internal CycleParameter management class.

```
#include <TmsLib.h>
```

Public Member Functions

- [CycleParamDb](#) ([BString](#) baseDir=".")
- [BError](#) [getCycleTypes](#) ([BList](#)< [BString](#) > &typeList)
Get the list of CycleParameter types in the directory.
- [BError](#) [getFileNames](#) ([BList](#)< [BString](#) > &fileList)
Get a list of all of the CycleParameter file names.
- [BError](#) [getCycleParams](#) ([BString](#) fileName, [Tms::CycleParam](#) ¶m)
Get the CycleParameter from the given file name.
- [BError](#) [setCycleParams](#) ([Tms::CycleParam](#) param)
Set the CycleParameters. Writes to the appropriate file name.
- [BError](#) [deleteCycleParams](#) ([BString](#) cycleType, [UInt32](#) puChannel)
Deletes a CycleParameter definition file.
- [BError](#) [readCycleParams](#) ([BString](#) fileName, [Tms::CycleParam](#) ¶m)
Reads a set of CycleParameters from a file.
- [BError](#) [writeCycleParams](#) ([BString](#) fileName, [Tms::CycleParam](#) param)
Writes a set of CycleParameters to a file.

Private Attributes

- [BString](#) obaseDir

9.54.1 Detailed Description

Internal CycleParameter management class.

9.54.2 Constructor & Destructor Documentation

9.54.2.1 [Tms::CycleParamDb::CycleParamDb](#) ([BString](#) baseDir = ".")

9.54.3 Member Function Documentation

9.54.3.1 [BError](#) [Tms::CycleParamDb::getCycleTypes](#) ([BList](#)< [BString](#) > & typeList)

Get the list of CycleParameter types in the directory.

9.54.3.2 BError Tms::CycleParamDb::getFileNames (BList< BString > & fileList)

Get a list of all of the CycleParameter file names.

9.54.3.3 BError Tms::CycleParamDb::getCycleParams (BString fileName, Tms::CycleParam & param)

Get the CycleParameter from the given file name.

9.54.3.4 BError Tms::CycleParamDb::setCycleParams (Tms::CycleParam param)

Set the CycleParameters. Writes to the appropriate file name.

9.54.3.5 BError Tms::CycleParamDb::deleteCycleParams (BString cycleType, UInt32 puChannel)

Deletes a CycleParameter definition file.

9.54.3.6 BError Tms::CycleParamDb::readCycleParams (BString fileName, Tms::CycleParam & param)

Reads a set of CycleParameters from a file.

9.54.3.7 BError Tms::CycleParamDb::writeCycleParams (BString fileName, Tms::CycleParam param)

Writes a set of CycleParameters to a file.

9.54.4 Member Data Documentation**9.54.4.1 BString Tms::CycleParamDb::obaseDir** [private]

The documentation for this class was generated from the following files:

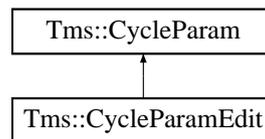
- [TmsLib.h](#)
- [TmsLib.cc](#)

9.55 Tms::CycleParamEdit Class Reference

Cycle Parameter management class.

```
#include <TmsCycleParam.h>
```

Inheritance diagram for Tms::CycleParamEdit::



Public Member Functions

- [CycleParamEdit \(\)](#)
- [CycleParamEdit \(const \[CycleParam\]\(#\) ¶m\)](#)
- [BString getString \(\)](#)
Gets the Cycle Parameters in a string format for writing to a file or display.
- [BError setString \(BString str\)](#)
Sets the Cycle Parameters from a string. For reading from a file.
- [BError readFromFile \(BString fileName\)](#)
Reads the Cycle Parameters from a file.
- [BError writeToFile \(BString fileName\)](#)
Writes the Cycle Parameters to a file.
- [BError setStates \(BList< \[CycleParamState\]\(#\) > cycleStates\)](#)
Sets the Cycle Parameter states given the state information list.
- [BError getStates \(BList< \[CycleParamState\]\(#\) > &cycleStates\)](#)
Returns the state information list describing the Cycle Parameter states. These may not be present.

Static Public Member Functions

- static void [getDefaultState \(CycleParamState &state\)](#)
Get the default settings for a state.
- static void [getdefaultPickupPositions \(BArray< \[Int32\]\(#\) > &pos\)](#)
Calculates the base pickup phase values for the PS ring.

Private Member Functions

- double [value](#) (int numSamples, int harmonic, double phase, int sample)
- int [bunch](#) (int numSamples, int harmonic, double phase, int sample)
- [BError generateState](#) (int num, [Tms::TmsState](#) state, [CycleParamState](#) stateParam, int lo1Harmonic, double lo1Phase, int lo2Harmonic, double lo2Phase)

9.55.1 Detailed Description

Cycle Parameter management class.

9.55.2 Constructor & Destructor Documentation

9.55.2.1 [Tms::CycleParamEdit::CycleParamEdit \(\)](#)

9.55.2.2 [Tms::CycleParamEdit::CycleParamEdit \(const \[CycleParam\]\(#\) & param\)](#)

9.55.3 Member Function Documentation

9.55.3.1 [BString Tms::CycleParamEdit::getString \(\)](#)

Gets the Cycle Parameters in a string format for writing to a file or display.

9.55.3.2 [BError Tms::CycleParamEdit::setString \(\[BString\]\(#\) str\)](#)

Sets the Cycle Parameters from a string. For reading from a file.

9.55.3.3 [BError Tms::CycleParamEdit::readFromFile \(\[BString\]\(#\) fileName\)](#)

Reads the Cycle Parameters from a file.

9.55.3.4 [BError Tms::CycleParamEdit::writeToFile \(\[BString\]\(#\) fileName\)](#)

Writes the Cycle Parameters to a file.

9.55.3.5 [BError Tms::CycleParamEdit::setStates \(\[BList\]\(#\)< \[CycleParamState\]\(#\) > cycleStates\)](#)

Sets the Cycle Parameter states given the state information list.

9.55.3.6 [BError Tms::CycleParamEdit::getStates \(\[BList\]\(#\)< \[CycleParamState\]\(#\) > & cycleStates\)](#)

Returns the state information list describing the Cycle Parameter states. These may not be present.

9.55.3.7 [void Tms::CycleParamEdit::getDefaultState \(\[CycleParamState\]\(#\) & state\) \[static\]](#)

Get the default settings for a state.

9.55.3.8 `void Tms::CycleParamEdit::getDefaultPickupPositions (BArray< Int32 > & pos)`
[static]

Calculates the base pickup phase values for the PS ring.

9.55.3.9 `double Tms::CycleParamEdit::value (int numSamples, int harmonic, double phase, int sample)` [private]

9.55.3.10 `int Tms::CycleParamEdit::bunch (int numSamples, int harmonic, double phase, int sample)` [private]

9.55.3.11 `BError Tms::CycleParamEdit::generateState (int num, Tms::TmsState state, CycleParamState stateParam, int lo1Harmonic, double lo1Phase, int lo2Harmonic, double lo2Phase)` [private]

This function will generate the phase tables for a given state. It is passed the parameters for the LO1 reference and the LO2 reference. If lo?Harmonic is 1, then FREF is generated.

The documentation for this class was generated from the following files:

- [TmsCycleParam.h](#)
- [TmsCycleParam-1.cc](#)
- [TmsCycleParam.cc](#)

9.56 Tms::CycleParamItem Class Reference

```
#include <TmsD.h>
```

Public Member Functions

- [CycleParamItem \(\)](#)
- [CycleParamItem \(BString pcycleType, UInt32 pchannel\)](#)

Public Attributes

- [BString cycleType](#)
The Cycle Type Name of this parameter set, normally the BEAM type the set of parameters is designed to measure.
- [UInt32 channel](#)
The channel number this configuration is for, 0 defines all channels.

9.56.1 Constructor & Destructor Documentation

9.56.1.1 [Tms::CycleParamItem::CycleParamItem \(\)](#)

9.56.1.2 [Tms::CycleParamItem::CycleParamItem \(BString pcycleType, UInt32 pchannel\)](#)

9.56.2 Member Data Documentation

9.56.2.1 [BString Tms::CycleParamItem::cycleType](#)

The Cycle Type Name of this parameter set, normally the BEAM type the set of parameters is designed to measure.

9.56.2.2 [UInt32 Tms::CycleParamItem::channel](#)

The channel number this configuration is for, 0 defines all channels.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.57 Tms::CycleParamState Class Reference

```
#include <TmsCycleParam.h>
```

Public Member Functions

- [CycleParamState](#) ()
- [BString getString](#) ()
Returns the [CycleParamState](#) in string form.
- [BError setString](#) ([BString](#) str)
Sets the [CycleParamState](#) from a string.

Public Attributes

- [UInt32 period](#)
The cycle period.
- [UInt32 bunchMask](#)
The set of bunches to capture bit mask.
- [UInt32 mean1Mask](#)
The set of bunches to pass through meanFilter1.
- [UInt32 mean2Mask](#)
The set of bunches to pass through meanFilter2.
- [UInt32 loHarmonic](#)
The LO harmonic number used in this state.
- [double loPhase](#)
The phase offset of the LO as a fraction of FREF (+-1.0).
- [int useLoFref](#)
Flag setting system to use LO as FREF rather than phase table address MSB.
- [int acquireData](#)
Flag to acquire data during this state.
- [double gateWidth](#)
The gate pulse width as a fraction of LO (0 - 1.0).
- [double gatePhase](#)
The gate phase offset as a fraction of LO (0 - 1.0).
- [double blrWidth](#)
The gate pulse width as a fraction of LO (0 - 1.0).

- double `blrPhase`

The gate phase offset as a fraction of LO (0 - 1.0).

9.57.1 Constructor & Destructor Documentation

9.57.1.1 `Tms::CycleParamState::CycleParamState ()`

9.57.2 Member Function Documentation

9.57.2.1 `BString Tms::CycleParamState::getString ()`

Returns the `CycleParamState` in string form.

9.57.2.2 `BError Tms::CycleParamState::setString (BString str)`

Sets the `CycleParamState` from a string.

9.57.3 Member Data Documentation

9.57.3.1 `UInt32 Tms::CycleParamState::period`

The cycle period.

9.57.3.2 `UInt32 Tms::CycleParamState::bunchMask`

The set of bunches to capture bit mask.

9.57.3.3 `UInt32 Tms::CycleParamState::mean1Mask`

The set of bunches to pass through meanFilter1.

9.57.3.4 `UInt32 Tms::CycleParamState::mean2Mask`

The set of bunches to pass through meanFilter2.

9.57.3.5 `UInt32 Tms::CycleParamState::loHarmonic`

The LO harmonic number used in this state.

9.57.3.6 `double Tms::CycleParamState::loPhase`

The phase offset of the LO as a fraction of FREF (+-1.0).

9.57.3.7 `int Tms::CycleParamState::useLoFref`

Flag setting system to use LO as FREF rather than phase table address MSB.

9.57.3.8 int [Tms::CycleParamState::acquireData](#)

Flag to acquire data during this state.

9.57.3.9 double [Tms::CycleParamState::gateWidth](#)

The gate pulse width as a fraction of LO (0 - 1.0).

9.57.3.10 double [Tms::CycleParamState::gatePhase](#)

The gate phase offset as a fraction of LO (0 - 1.0).

9.57.3.11 double [Tms::CycleParamState::blrWidth](#)

The gate pulse width as a fraction of LO (0 - 1.0).

9.57.3.12 double [Tms::CycleParamState::blrPhase](#)

The gate phase offset as a fraction of LO (0 - 1.0).

The documentation for this class was generated from the following files:

- [TmsCycleParam.h](#)
- [TmsCycleParam-1.cc](#)
- [TmsCycleParam.cc](#)

9.58 Tms::CycleTypeInfo Class Reference

```
#include <TmsD.h>
```

Public Member Functions

- [CycleTypeInfo \(\)](#)
- [CycleTypeInfo \(BString pcycleType, BString pinfo, BList< CycleTypeInfoPeriod > pperiods\)](#)

Public Attributes

- [BString cycleType](#)
The Cycle Type Name.
- [BString info](#)
Information string on this cycle type.
- [BList< CycleTypeInfoPeriod > periods](#)
The list of cycle periods.

9.58.1 Constructor & Destructor Documentation

9.58.1.1 Tms::CycleTypeInfo::CycleTypeInfo ()

9.58.1.2 Tms::CycleTypeInfo::CycleTypeInfo ([BString pcycleType](#), [BString pinfo](#), [BList< CycleTypeInfoPeriod > pperiods](#))

9.58.2 Member Data Documentation

9.58.2.1 [BString Tms::CycleTypeInfo::cycleType](#)

The Cycle Type Name.

9.58.2.2 [BString Tms::CycleTypeInfo::info](#)

Information string on this cycle type.

9.58.2.3 [BList< CycleTypeInfoPeriod > Tms::CycleTypeInfo::periods](#)

The list of cycle periods.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.59 Tms::CycleTypeInformationPeriod Class Reference

Cycle Type information.

```
#include <TmsD.h>
```

Public Member Functions

- [CycleTypeInformationPeriod \(\)](#)
- [CycleTypeInformationPeriod \(UInt32 pcyclePeriod, UInt32 pharmonic, UInt32 pnumBunches, UInt32 pbunchMask\)](#)

Public Attributes

- [UInt32 cyclePeriod](#)
The Cycle Period.
- [UInt32 harmonic](#)
The Machines harmonic number.
- [UInt32 numBunches](#)
The number of bunches.
- [UInt32 bunchMask](#)
Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.

9.59.1 Detailed Description

Cycle Type information.

9.59.2 Constructor & Destructor Documentation

9.59.2.1 [Tms::CycleTypeInformationPeriod::CycleTypeInformationPeriod \(\)](#)

9.59.2.2 [Tms::CycleTypeInformationPeriod::CycleTypeInformationPeriod \(UInt32 pcyclePeriod, UInt32 pharmonic, UInt32 pnumBunches, UInt32 pbunchMask\)](#)

9.59.3 Member Data Documentation

9.59.3.1 [UInt32 Tms::CycleTypeInformationPeriod::cyclePeriod](#)

The Cycle Period.

9.59.3.2 [UInt32 Tms::CycleTypeInformationPeriod::harmonic](#)

The Machines harmonic number.

9.59.3.3 [UInt32 Tms::CycleTypeInfoPeriod::numBunches](#)

The number of bunches.

9.59.3.4 [UInt32 Tms::CycleTypeInfoPeriod::bunchMask](#)

Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.60 Tms::Data Class Reference

This class stores the raw data.

```
#include <TmsD.h>
```

Public Member Functions

- [Data](#) ()
- [Data](#) ([UInt32](#) pnumValues, [UInt32](#) pdataType, [UInt32](#) pnumBunches, [UInt32](#) pnumChannels, [BArray](#)<[DataValue](#) > pdataValues, [BArray](#)<[BError](#) > perrors)

Public Attributes

- [UInt32](#) numValues
The total number of data samples.
- [UInt32](#) dataType
The type of data in the data block.
- [UInt32](#) numBunches
The number of bunches.
- [UInt32](#) numChannels
The number of channels.
- [BArray](#)<[DataValue](#) > dataValues
The data.
- [BArray](#)<[BError](#) > errors
Individual errors for each channel within dataValues.

9.60.1 Detailed Description

This class stores the raw data.

9.60.2 Constructor & Destructor Documentation

9.60.2.1 Tms::Data::Data ()

9.60.2.2 [Tms::Data::Data](#) ([UInt32](#) pnumValues, [UInt32](#) pdataType, [UInt32](#) pnumBunches, [UInt32](#) pnumChannels, [BArray](#)<[DataValue](#) > pdataValues, [BArray](#)<[BError](#) > perrors)

9.60.3 Member Data Documentation

9.60.3.1 [UInt32](#) Tms::Data::numValues

The total number of data samples.

9.60.3.2 [UInt32 Tms::Data::dataType](#)

The type of data in the data block.

9.60.3.3 [UInt32 Tms::Data::numBunches](#)

The number of bunches.

9.60.3.4 [UInt32 Tms::Data::numChannels](#)

The number of channels.

9.60.3.5 [BArray<DataValue> Tms::Data::dataValues](#)

The data.

9.60.3.6 [BArray<BError> Tms::Data::errors](#)

Individual errors for each channel within dataValues.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.61 Tms::DataInfo Class Reference

This class defines the data to be acquired and/or fetched.

```
#include <TmsD.h>
```

Public Member Functions

- [DataInfo \(\)](#)
- [DataInfo \(UInt32 pcycleNumber, UInt32 pchannel, UInt32 pcyclePeriod, UInt32 pstartTime, UInt32 porbitNumber, UInt32 pbunchNumber, UInt32 pfunction, UInt32 pargument, UInt32 pnumValues, Int32 plimitData\)](#)

Public Attributes

- [UInt32 cycleNumber](#)
The PS Cycle number.
- [UInt32 channel](#)
The pick-up channel number.
- [UInt32 cyclePeriod](#)
The cycle period the data is from.
- [UInt32 startTime](#)
The start time in milli-seconds in the cycle period (starting from 0).
- [UInt32 orbitNumber](#)
The starting orbit number (starting from 0).
- [UInt32 bunchNumber](#)
The Bunch number (starting from 1 (0 is all bunches)).
- [UInt32 function](#)
The data processing function to perform or performed. (0 normal data).
- [UInt32 argument](#)
The Argument to the data processing function.
- [UInt32 numValues](#)
The total number of data points to return.
- [Int32 limitData](#)
If set limits the data to that within the period.

9.61.1 Detailed Description

This class defines the data to be acquired and/or fetched.

9.61.2 Constructor & Destructor Documentation

9.61.2.1 `Tms::DataInfo::DataInfo ()`

9.61.2.2 `Tms::DataInfo::DataInfo (UInt32 pcycleNumber, UInt32 pchannel, UInt32 pcyclePeriod, UInt32 pstartTime, UInt32 porbitNumber, UInt32 pbunchNumber, UInt32 pfunction, UInt32 pargument, UInt32 pnumValues, Int32 plimitData)`

9.61.3 Member Data Documentation

9.61.3.1 `UInt32 Tms::DataInfo::cycleNumber`

The PS Cycle number.

9.61.3.2 `UInt32 Tms::DataInfo::channel`

The pick-up channel number.

9.61.3.3 `UInt32 Tms::DataInfo::cyclePeriod`

The cycle period the data is from.

9.61.3.4 `UInt32 Tms::DataInfo::startTime`

The start time in milli-seconds in the cycle period (starting from 0).

9.61.3.5 `UInt32 Tms::DataInfo::orbitNumber`

The starting orbit number (starting from 0).

9.61.3.6 `UInt32 Tms::DataInfo::bunchNumber`

The Bunch number (starting from 1 (0 is all bunches)).

9.61.3.7 `UInt32 Tms::DataInfo::function`

The data processing function to perform or performed. (0 normal data).

9.61.3.8 `UInt32 Tms::DataInfo::argument`

The Argument to the data processing function.

9.61.3.9 `UInt32 Tms::DataInfo::numValues`

The total number of data points to return.

9.61.3.10 [Int32 Tms::DataInfo::limitData](#)

If set limits the data to that within the period.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.62 Tms::DataValue Class Reference

This is the definition of a single data value.

```
#include <TmsD.h>
```

Public Member Functions

- [DataValue \(\)](#)
- [DataValue \(Int16 psigma, Int16 pdeltaX, Int16 pdeltaY, Int16 ptime\)](#)

Public Attributes

- [Int16 sigma](#)
The Sigma value.
- [Int16 deltaX](#)
The DeltaX value.
- [Int16 deltaY](#)
The DeltaY value.
- [Int16 time](#)
The Time in ms this sample was processed.

9.62.1 Detailed Description

This is the definition of a single data value.

9.62.2 Constructor & Destructor Documentation

9.62.2.1 Tms::DataValue::DataValue ()

9.62.2.2 Tms::DataValue::DataValue (Int16 psigma, Int16 pdeltaX, Int16 pdeltaY, Int16 ptime)

9.62.3 Member Data Documentation

9.62.3.1 Int16 Tms::DataValue::sigma

The Sigma value.

9.62.3.2 Int16 Tms::DataValue::deltaX

The DeltaX value.

9.62.3.3 Int16 Tms::DataValue::deltaY

The DeltaY value.

9.62.3.4 **Int16 Tms::DataValue::time**

The Time in ms this sample was processed.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.63 Tms::NameValue Class Reference

```
#include <TmsD.h>
```

Public Member Functions

- [NameValue \(\)](#)
- [NameValue \(BString pname, BString pvalue\)](#)

Public Attributes

- [BString name](#)
The Name of the value.
- [BString value](#)
The actual value in string form.

9.63.1 Constructor & Destructor Documentation

9.63.1.1 [Tms::NameValue::NameValue \(\)](#)

9.63.1.2 [Tms::NameValue::NameValue \(BString pname, BString pvalue\)](#)

9.63.2 Member Data Documentation

9.63.2.1 [BString Tms::NameValue::name](#)

The Name of the value.

9.63.2.2 [BString Tms::NameValue::value](#)

The actual value in string form.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.64 Tms::PuChannel Class Reference

This class stores a Physical Pick-Up channel id.

```
#include <TmsD.h>
```

Public Member Functions

- [PuChannel \(\)](#)
- [PuChannel \(UInt8 pmoduleNum, UInt8 ppupeNum, UInt8 ppupeChan\)](#)

Public Attributes

- [UInt8 moduleNum](#)
The Module number.
- [UInt8 pupeNum](#)
The PUPE number.
- [UInt8 pupeChan](#)
The PUPE channel.

9.64.1 Detailed Description

This class stores a Physical Pick-Up channel id.

9.64.2 Constructor & Destructor Documentation

9.64.2.1 [Tms::PuChannel::PuChannel \(\)](#)

9.64.2.2 [Tms::PuChannel::PuChannel \(UInt8 pmoduleNum, UInt8 ppupeNum, UInt8 ppupeChan\)](#)

9.64.3 Member Data Documentation

9.64.3.1 [UInt8 Tms::PuChannel::moduleNum](#)

The Module number.

9.64.3.2 [UInt8 Tms::PuChannel::pupeNum](#)

The PUPE number.

9.64.3.3 [UInt8 Tms::PuChannel::pupeChan](#)

The PUPE channel.

The documentation for this class was generated from the following files:

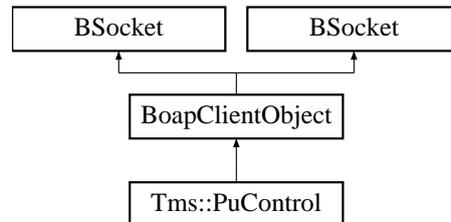
- [TmsD.h](#)
- [TmsD.cc](#)

9.65 Tms::PuControl Class Reference

This class defines the parameters for a test data capture.

```
#include <TmsC.h>
```

Inheritance diagram for Tms::PuControl::



Public Member Functions

- [PuControl](#) ([BString](#) name="")
- [BError getVersion](#) ([BString](#) &version)

Gets the software version.
- [BError init](#) ()

Initialises the system including loading all of the PUPE engines firmware. The call will return an error object indicating success or an error.
- [BError setProcessPriority](#) ([UInt32](#) priority)

Sets the priority of the process servicing this service.
- [BError configure](#) ([ConfigInfo](#) configInfo)

Configure the system for use. This includes mapping the individual physical Pickup channels to logical pickup channels.
- [BError setControlInfo](#) ([CycleParam](#) params)

Sets the control information for the cycle type given and subsequent cycles. The parameters for the processing cycle are passed, this includes the Phase and State table information. The call will return an error object indicating success or an error.
- [BError setNextCycle](#) ([UInt32](#) cycleNumber, [BString](#) cycleType)

Sets the cycle number and type for the next processing cycle. The call will return an error object indicating success or an error condition as appropriate. This should be called at least 10ms before the next CYCLE_START event.
- [BError test](#) ([BList](#)< [BError](#) > &errors)

Performs a basic test of the system returning a list of errors. The call will return an error object indicating success or an error.
- [BError getStatus](#) ([BList](#)< [NameValue](#) > &statusList)

Returns the current status of the system. This information includes the number of Pickup present and their individual status.
- [BError getStatistics](#) ([BList](#)< [NameValue](#) > &statsList)

Returns a list of the statistic values as name/value pairs. The call will return an error object indicating success or an error.

- **BError setTestMode** (PuChannel puChannel, UInt32 testOutput, UInt32 timingDisableMask)
The signal source for the digital test output connector. 0: None, 1: FrefLocal. The timingDisableMask bit mask defines which of the timing inputs should be disabled. If a timing input is disabled it can be still operated by software command.
- **BError setTimingSignals** (PuChannel puChannel, UInt32 timingSignals)
This function sets the given timing signals to the values as defined in the timingSignals bit array.
- **BError captureTestData** (PuChannel puChannel, TestCaptureInfo captureInfo, BArray< UInt64 > &data)
This function will capture test data.
- **BError setTestData** (PuChannel puChannel, Int32 on, BArray< UInt32 > data)
This function will set a PU channel to sample data from memory rather than the ADC's.
- **BError setPupeConfig** (PuChannel puPhysChannel, PupeConfig pupeConfig)
Sets special PUPE configuration for test purposes.
- **BError getPupeConfig** (PuChannel puPhysChannel, PupeConfig &pupeConfig)
Gets special PUPE configuration for test purposes.

9.65.1 Detailed Description

This class defines the parameters for a test data capture.

Cycle information Cycle Type information This interface provides functions to control, test and get statistics from an individual pick-up

9.65.2 Constructor & Destructor Documentation

9.65.2.1 Tms::PuControl::PuControl (BString name = " ")

9.65.3 Member Function Documentation

9.65.3.1 BError Tms::PuControl::getVersion (BString & version)

Gets the software version.

Parameters:

version A string variable filled in with the version number string.

9.65.3.2 BError Tms::PuControl::init ()

Initialises the system including loading all of the PUPE engines firmware. The call will return an error object indicating

9.65.3.3 BError Tms::PuControl::setProcessPriority (UInt32 priority)

Sets the priority of the process servicing this service.

9.65.3.4 BError Tms::PuControl::configure (ConfigInfo configInfo)

Configure the system for use. This includes mapping the individual physical Pickup channels to logical pickup channels.

9.65.3.5 BError Tms::PuControl::setControlInfo (CycleParam params)

Sets the control information for the cycle type given and subsequent cycles. The parameters for the processing cycle are passed, this includes the Phase and State table information. The call will return an error object indicating success or an error.

9.65.3.6 BError Tms::PuControl::setNextCycle (UInt32 cycleNumber, BString cycleType)

Sets the cycle number and type for the next processing cycle. The call will return an error object indicating success or an error condition as appropriate. This should be called at least 10ms before the next CYCLE_START event.

9.65.3.7 BError Tms::PuControl::test (BList< BError > & errors)

Performs a basic test of the system returning a list of errors. The call will return an error object indicating success or an error.

9.65.3.8 BError Tms::PuControl::getStatus (BList< NameValue > & statusList)

Returns the current status of the system. This information includes the number of PickUp present and their individual status.

9.65.3.9 BError Tms::PuControl::getStatistics (BList< NameValue > & statsList)

Returns a list of the statistic values as name/value pairs. The call will return an error object indicating success or an error.

9.65.3.10 BError Tms::PuControl::setTestMode (PuChannel puChannel, UInt32 testOutput, UInt32 timingDisableMask)

The signal source for the digital test output connector. 0: None, 1: FrefLocal. The timingDisableMask bit mask defines which of the timing inputs should be disabled. If a timing input is disabled it can be still operated by software command.

9.65.3.11 BError Tms::PuControl::setTimingSignals (PuChannel puChannel, UInt32 timingSignals)

This function sets the given timing signals to the values as defined in the timingSignals bit array.

9.65.3.12 BError Tms::PuControl::captureTestData (PuChannel puChannel, TestCaptureInfo captureInfo, BArray< UInt64 > & data)

This function will capture test data.

9.65.3.13 **BError** `Tms::PuControl::setTestData (PuChannel puChannel, Int32 on, BArray< UInt32 > data)`

This function will set a PU channel to sample data from memory rather than the ADC's.

9.65.3.14 **BError** `Tms::PuControl::setPupeConfig (PuChannel puPhysChannel, PupeConfig pupeConfig)`

Sets special PUPE configuration for test purposes.

9.65.3.15 **BError** `Tms::PuControl::getPupeConfig (PuChannel puPhysChannel, PupeConfig & pupeConfig)`

Gets special PUPE configuration for test purposes.

The documentation for this class was generated from the following files:

- [TmsC.h](#)
- [TmsC.cc](#)
- [tmsFunctions.dox](#)

9.66 Tms::PupeConfig Class Reference

```
#include <TmsD.h>
```

Public Member Functions

- [PupeConfig \(\)](#)
- [PupeConfig \(UInt32 pinternalTimingMask, Int32 padcSysclkSync, Int32 pdisableBlr\)](#)

Public Attributes

- [UInt32 internalTimingMask](#)
Use internal, software/hardware generated, timing signals for the given signals.
- [Int32 adcSysclkSync](#)
Sets the ADC clock to be synchronised with the SYSCLK timing clock.
- [Int32 disableBlr](#)
Disable the BLR algorithm.

9.66.1 Constructor & Destructor Documentation

9.66.1.1 Tms::PupeConfig::PupeConfig ()

9.66.1.2 Tms::PupeConfig::PupeConfig (UInt32 pinternalTimingMask, Int32 padcSysclkSync, Int32 pdisableBlr)

9.66.2 Member Data Documentation

9.66.2.1 UInt32 Tms::PupeConfig::internalTimingMask

Use internal, software/hardware generated, timing signals for the given signals.

9.66.2.2 Int32 Tms::PupeConfig::adcSysclkSync

Sets the ADC clock to be synchronised with the SYSCLK timing clock.

9.66.2.3 Int32 Tms::PupeConfig::disableBlr

Disable the BLR algorithm.

The documentation for this class was generated from the following files:

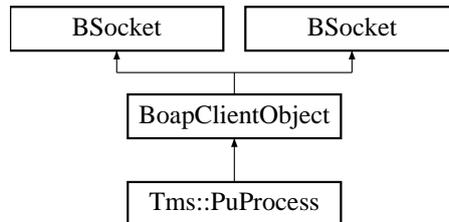
- [TmsD.h](#)
- [TmsD.cc](#)

9.67 Tms::PuProcess Class Reference

This interface provides functions to configure and capture data from individual pick-up.

```
#include <TmsC.h>
```

Inheritance diagram for Tms::PuProcess::



Public Member Functions

- [PuProcess](#) ([BString](#) name="")
- [BError getVersion](#) ([BString](#) &version)

Gets the software version.
- [BError getCycleInformation](#) ([UInt32](#) cycleNumber, [CycleInformation](#) &cycleInformation)

Gets information on given cycle number.
- [BError getStatus](#) ([PuChannel](#) puChannel, [PuStatus](#) &puStatus)
- [BError getData](#) ([PuChannel](#) puChannel, [DataInfo](#) dataInfo, [Data](#) &data)

This function returns a set of data from the data present in the data cache or directly from the Pick-Up processing engines. The [DataInfo](#) object describes the data required. The call will return the required data along with an error object indicating success or an error condition as appropriate. The call will block until data is ready.

- [BError addEventServer](#) ([BString](#) name)

Adds an event server.
- [BError requestData](#) ([PuChannel](#) puChannel, [DataInfo](#) dataInfo)

This adds a request for some data. The [DataInfo](#) object defines the data required. This request can be made at any time. If the data is present in cache the data will be available immediately, if not the system will await the data from a subsequent processing cycle. When the data is available a "data" event will be sent to the client. Not that it is not necessary to use [requestData](#). The client can call [getData\(\)](#) directly although this call will block until the data is actually ready.

9.67.1 Detailed Description

This interface provides functions to configure and capture data from individual pick-up.

9.67.2 Constructor & Destructor Documentation

9.67.2.1 **Tms::PuProcess::PuProcess** (**BString** *name* = "")

9.67.3 Member Function Documentation

9.67.3.1 **BError** **Tms::PuProcess::getVersion** (**BString** & *version*)

Gets the software version.

9.67.3.2 **BError** **Tms::PuProcess::getCycleInformation** (**UInt32** *cycleNumber*, **CycleInformation** & *cycleInformation*)

Gets information on given cycle number.

9.67.3.3 **BError** **Tms::PuProcess::getStatus** (**PuChannel** *puChannel*, **PuStatus** & *puStatus*)

9.67.3.4 **BError** **Tms::PuProcess::getData** (**PuChannel** *puChannel*, **DataInfo** *dataInfo*, **Data** & *data*)

This function returns a set of data from the data present in the data cache or directly from the Pick-Up processing engines. The **DataInfo** object describes the data required. The call will return the required data along with an error object indicating success or an error condition as appropriate. The call will block until data is ready.

9.67.3.5 **BError** **Tms::PuProcess::addEventServer** (**BString** *name*)

Adds an event server.

9.67.3.6 **BError** **Tms::PuProcess::requestData** (**PuChannel** *puChannel*, **DataInfo** *dataInfo*)

This adds a request for some data. The **DataInfo** object defines the data required. This request can be made at any time. If the data is present in cache the data will be available immediately, if not the system will await the data from a subsequent processing cycle. When the data is available a "data" event will be sent to the client. Not that it is not necessary to use requestData. The client can call **getData()** directly although this call will block until the data is actually ready.

The documentation for this class was generated from the following files:

- [TmsC.h](#)
- [TmsC.cc](#)

9.68 Tms::PuStateTable Class Reference

This class defines the Pick-Up state table.

```
#include <TmsD.h>
```

Public Member Functions

- [PuStateTable \(\)](#)
- [PuStateTable \(UInt32 pperiod, UInt32 pstate, UInt32 pharmonic, UInt32 pnumBunches, UInt32 pbunchMask, BArray< UInt8 > pphaseTable\)](#)

Public Attributes

- [UInt32 period](#)
The Cycle period this state is used for.
- [UInt32 state](#)
The State table entry.
- [UInt32 harmonic](#)
The harmonic number for this state.
- [UInt32 numBunches](#)
The number of bunches to capture.
- [UInt32 bunchMask](#)
Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.
- [BArray< UInt8 > phaseTable](#)
The Phase table for this state.

9.68.1 Detailed Description

This class defines the Pick-Up state table.

9.68.2 Constructor & Destructor Documentation

9.68.2.1 Tms::PuStateTable::PuStateTable ()

9.68.2.2 Tms::PuStateTable::PuStateTable (UInt32 pperiod, UInt32 pstate, UInt32 pharmonic, UInt32 pnumBunches, UInt32 pbunchMask, BArray< UInt8 > pphaseTable)

9.68.3 Member Data Documentation

9.68.3.1 UInt32 Tms::PuStateTable::period

The Cycle period this state is used for.

9.68.3.2 [UInt32 Tms::PuStateTable::state](#)

The State table entry.

9.68.3.3 [UInt32 Tms::PuStateTable::harmonic](#)

The harmonic number for this state.

9.68.3.4 [UInt32 Tms::PuStateTable::numBunches](#)

The number of bunches to capture.

9.68.3.5 [UInt32 Tms::PuStateTable::bunchMask](#)

Bitmask defining which buckets the bunches are captured from. Bit 0 is bucket 1, bit 1 is bucket 2 etc.

9.68.3.6 [BArray<UInt8> Tms::PuStateTable::phaseTable](#)

The Phase table for this state.

The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.69 Tms::PuStatus Class Reference

This class stores the status of an individual Pick-Up.

```
#include <TmsD.h>
```

Public Member Functions

- [PuStatus \(\)](#)
- [PuStatus \(Int32 pruning, BError perror\)](#)

Public Attributes

- [Int32 running](#)
TheäPick■Upäisäcurrentlyärunning.
- [BError error](#)
TheäPick■Up'säcurrentäerrorästatus.

9.69.1 Detailed Description

This class stores the status of an individual Pick-Up.

9.69.2 Constructor & Destructor Documentation

9.69.2.1 [Tms::PuStatus::PuStatus \(\)](#)

9.69.2.2 [Tms::PuStatus::PuStatus \(Int32 pruning, BError perror\)](#)

9.69.3 Member Data Documentation

9.69.3.1 [Int32 Tms::PuStatus::running](#)

TheäPick■Upäisäcurrentlyärunning.

9.69.3.2 [BError Tms::PuStatus::error](#)

TheäPick■Up'säcurrentäerrorästatus.

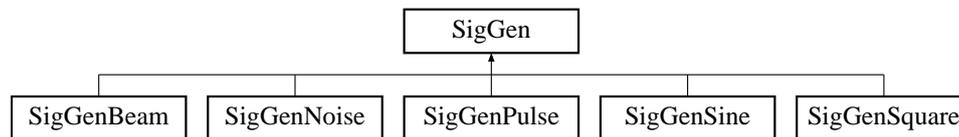
The documentation for this class was generated from the following files:

- [TmsD.h](#)
- [TmsD.cc](#)

9.70 SigGen Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGen::



Public Member Functions

- [SigGen \(\)](#)
- [virtual ~SigGen \(\)](#)
- [BError config \(double sampleRate\)](#)
- [virtual BError generate \(Sample *data, int numSamples\)](#)

Protected Attributes

- double [osampleRate](#)
- unsigned long long [ox](#)

9.70.1 Constructor & Destructor Documentation

9.70.1.1 [SigGen::SigGen \(\)](#)

9.70.1.2 [SigGen::~~SigGen \(\)](#) [virtual]

9.70.2 Member Function Documentation

9.70.2.1 [BError SigGen::config \(double sampleRate\)](#)

9.70.2.2 [BError SigGen::generate \(Sample * data, int numSamples\)](#) [virtual]

Reimplemented in [SigGenSine](#), [SigGenSquare](#), [SigGenNoise](#), [SigGenPulse](#), and [SigGenBeam](#).

9.70.3 Member Data Documentation

9.70.3.1 double [SigGen::osampleRate](#) [protected]

9.70.3.2 unsigned long long [SigGen::ox](#) [protected]

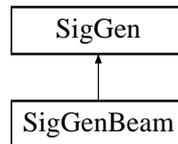
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.71 SigGenBeam Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGenBeam::



Public Member Functions

- [SigGenBeam \(\)](#)
- virtual [~SigGenBeam \(\)](#)
- **BError** [config](#) (double *sampleRate*, double *fref*, int *harmonic*, int *bunchSet*, double *reduce*, int *blr*, double *amplitude*)
- **BError** [generate](#) ([Sample](#) *data, int *numSamples*)
- **BError** [generateIntegrated](#) ([Sample](#) *data, int *numSamples*)

Public Attributes

- int [oharmonic](#)
- int [obunchSet](#)
- double [oreduce](#)
- int [oblr](#)
- double [oamplitude](#)
- double [ofref](#)

9.71.1 Constructor & Destructor Documentation

9.71.1.1 [SigGenBeam::SigGenBeam \(\)](#)

9.71.1.2 [SigGenBeam::~~SigGenBeam \(\)](#) [virtual]

9.71.2 Member Function Documentation

9.71.2.1 **BError** [SigGenBeam::config](#) (double *sampleRate*, double *fref*, int *harmonic*, int *bunchSet*, double *reduce*, int *blr*, double *amplitude*)

9.71.2.2 **BError** [SigGenBeam::generate](#) ([Sample](#) * *data*, int *numSamples*) [virtual]

Reimplemented from [SigGen](#).

9.71.2.3 **BError** SigGenBeam::generateIntegrated (*Sample * data*, int *numSamples*)

9.71.3 Member Data Documentation

9.71.3.1 int SigGenBeam::oharmonic

9.71.3.2 int SigGenBeam::obunchSet

9.71.3.3 double SigGenBeam::oreduce

9.71.3.4 int SigGenBeam::oblr

9.71.3.5 double SigGenBeam::oamplitude

9.71.3.6 double SigGenBeam::ofref

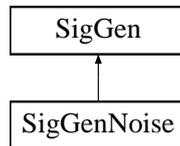
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.72 SigGenNoise Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGenNoise::



Public Member Functions

- [SigGenNoise \(\)](#)
- virtual [~SigGenNoise \(\)](#)
- **Error** [config](#) (double *sampleRate*, double *amplitude*=1.0)
- **Error** [generate](#) ([Sample](#) **data*, int *numSamples*)

Public Attributes

- double [oamplitude](#)

9.72.1 Constructor & Destructor Documentation

9.72.1.1 [SigGenNoise::SigGenNoise \(\)](#)

9.72.1.2 [SigGenNoise::~~SigGenNoise \(\)](#) [virtual]

9.72.2 Member Function Documentation

9.72.2.1 **Error** [SigGenNoise::config](#) (double *sampleRate*, double *amplitude* = 1.0)

9.72.2.2 **Error** [SigGenNoise::generate](#) ([Sample](#) * *data*, int *numSamples*) [virtual]

Reimplemented from [SigGen](#).

9.72.3 Member Data Documentation

9.72.3.1 double [SigGenNoise::oamplitude](#)

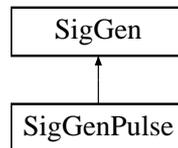
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.73 SigGenPulse Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGenPulse::



Public Member Functions

- [SigGenPulse \(\)](#)
- virtual [~SigGenPulse \(\)](#)
- **Error** [config](#) (double *sampleRate*, double *freq*, double *amplitude*, double *onTime*, double *startTime*=0.0)
- **Error** [generate](#) ([Sample](#) **data*, int *numSamples*)

Public Attributes

- double [ofreq](#)
- double [oamplitude](#)
- double [oonTime](#)
- double [ostartTime](#)

9.73.1 Constructor & Destructor Documentation

9.73.1.1 [SigGenPulse::SigGenPulse \(\)](#)

9.73.1.2 [SigGenPulse::~~SigGenPulse \(\)](#) [virtual]

9.73.2 Member Function Documentation

9.73.2.1 **Error** [SigGenPulse::config](#) (double *sampleRate*, double *freq*, double *amplitude*, double *onTime*, double *startTime* = 0.0)

9.73.2.2 **Error** [SigGenPulse::generate](#) ([Sample](#) * *data*, int *numSamples*) [virtual]

Reimplemented from [SigGen](#).

9.73.3 Member Data Documentation

9.73.3.1 double [SigGenPulse::ofreq](#)

9.73.3.2 double [SigGenPulse::oamplitude](#)

9.73.3.3 double [SigGenPulse::oonTime](#)

9.73.3.4 double [SigGenPulse::ostartTime](#)

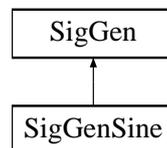
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.74 SigGenSine Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGenSine::



Public Member Functions

- [SigGenSine \(\)](#)
- [virtual ~SigGenSine \(\)](#)
- [BError config](#) (double *sampleRate*, double *freq*, double *amplitude*=1.0)
- [BError generate](#) ([Sample](#) **data*, int *numSamples*)

Public Attributes

- double [ofreq](#)
- double [oamplitude](#)

9.74.1 Constructor & Destructor Documentation

9.74.1.1 [SigGenSine::SigGenSine \(\)](#)

9.74.1.2 [SigGenSine::~~SigGenSine \(\)](#) [virtual]

9.74.2 Member Function Documentation

9.74.2.1 [BError SigGenSine::config](#) (double *sampleRate*, double *freq*, double *amplitude* = 1.0)

9.74.2.2 [BError SigGenSine::generate](#) ([Sample](#) * *data*, int *numSamples*) [virtual]

Reimplemented from [SigGen](#).

9.74.3 Member Data Documentation

9.74.3.1 double [SigGenSine::ofreq](#)

9.74.3.2 double [SigGenSine::oamplitude](#)

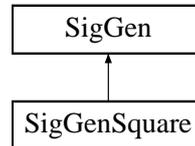
The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.75 SigGenSquare Class Reference

```
#include <SigGen.h>
```

Inheritance diagram for SigGenSquare::



Public Member Functions

- [SigGenSquare \(\)](#)
- [virtual ~SigGenSquare \(\)](#)
- [BError config](#) (double *sampleRate*, double *freq*, double *amplitude*=1.0, double *offset*=0.0)
- [BError generate](#) ([Sample](#) **data*, int *numSamples*)

Public Attributes

- double [ofreq](#)
- double [oamplitude](#)
- double [ooffset](#)

9.75.1 Constructor & Destructor Documentation

9.75.1.1 [SigGenSquare::SigGenSquare \(\)](#)

9.75.1.2 [SigGenSquare::~~SigGenSquare \(\)](#) [virtual]

9.75.2 Member Function Documentation

9.75.2.1 [BError SigGenSquare::config](#) (double *sampleRate*, double *freq*, double *amplitude* = 1.0, double *offset* = 0.0)

9.75.2.2 [BError SigGenSquare::generate](#) ([Sample](#) * *data*, int *numSamples*) [virtual]

Reimplemented from [SigGen](#).

9.75.3 Member Data Documentation

9.75.3.1 double [SigGenSquare::ofreq](#)

9.75.3.2 double [SigGenSquare::oamplitude](#)

9.75.3.3 double [SigGenSquare::ooffset](#)

The documentation for this class was generated from the following files:

- [SigGen.h](#)
- [SigGen.cpp](#)

9.76 vector Class Reference

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

- [/src/cern/tms/beam/libBeam/BArray.h](#)

9.77 Tms::TestCaptureInfo Class Reference

This class defines the parameters for a test data capture.

```
#include <TmsD.h>
```

Public Member Functions

- [TestCaptureInfo \(\)](#)
- [TestCaptureInfo \(UInt32 psource, UInt32 pclock, UInt32 pstartTime, UInt32 ppostTriggerDelay, UInt32 ptriggerMask, Int32 ptriggerAnd, Int32 ptriggerStore, Int32 ptriggerSourceData\)](#)

Public Attributes

- [UInt32 source](#)
The source data (0 - 3).
- [UInt32 clock](#)
The Clock source.
- [UInt32 startTime](#)
The start time in ms from CYCLE_START before trigger is activated.
- [UInt32 postTriggerDelay](#)
The delay, in clock cycles, after the trigger before capture starts.
- [UInt32 triggerMask](#)
The Trigger bit mask. This is the bit mask of the 8 timing signals.
- [Int32 triggerAnd](#)
The Trigger function is an AND rather than an OR.
- [Int32 triggerStore](#)
Store the trigger in the upper 8 data bits.
- [Int32 triggerSourceData](#)
Use lower 32bits of data as trigger source rather than timing signals.

9.77.1 Detailed Description

This class defines the parameters for a test data capture.

9.77.2 Constructor & Destructor Documentation

9.77.2.1 `Tms::TestCaptureInfo::TestCaptureInfo ()`

9.77.2.2 `Tms::TestCaptureInfo::TestCaptureInfo (UInt32 psource, UInt32 pclock, UInt32 pstartTime, UInt32 ppostTriggerDelay, UInt32 ptriggerMask, Int32 ptriggerAnd, Int32 ptriggerStore, Int32 ptriggerSourceData)`

9.77.3 Member Data Documentation

9.77.3.1 `UInt32 Tms::TestCaptureInfo::source`

The source data (0 - 3).

9.77.3.2 `UInt32 Tms::TestCaptureInfo::clock`

The Clock source.

9.77.3.3 `UInt32 Tms::TestCaptureInfo::startTime`

The start time in ms from CYCLE_START before trigger is activated.

9.77.3.4 `UInt32 Tms::TestCaptureInfo::postTriggerDelay`

The delay, in clock cycles, after the trigger before capture starts.

9.77.3.5 `UInt32 Tms::TestCaptureInfo::triggerMask`

The Trigger bit mask. This is the bit mask of the 8 timing signals.

9.77.3.6 `Int32 Tms::TestCaptureInfo::triggerAnd`

The Trigger function is an AND rather than an OR.

9.77.3.7 `Int32 Tms::TestCaptureInfo::triggerStore`

Store the trigger in the upper 8 data bits.

9.77.3.8 `Int32 Tms::TestCaptureInfo::triggerSourceData`

Use lower 32bits of data as trigger source rather than timing signals.

The documentation for this class was generated from the following files:

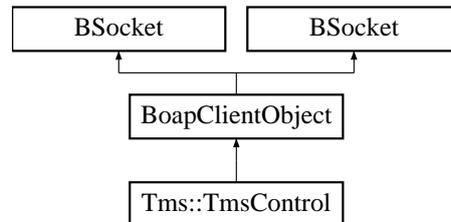
- [TmsD.h](#)
- [TmsD.cc](#)

9.78 Tms::TmsControl Class Reference

This interface provides functions to control, test and get statistics from the TMS as a whole.

```
#include <TmsC.h>
```

Inheritance diagram for Tms::TmsControl::



Public Member Functions

- [TmsControl](#) (BString name="")
- [BError getVersion](#) (BString &version)
Gets the software version.
- [BError setProcessPriority](#) (UInt32 priority)
Sets the priority of the process servicing this service.
- [BError init](#) ()
Initialises the system including resetting all of the PUPE engines firmware. The call will return an error object indicating success or an error condition as appropriate.
- [BError configure](#) (ConfigInfo configInfo)
Configure the system for use. This includes mapping the individual physical Pickup channels to logical pickup channels.
- [BError getConfiguration](#) (ConfigInfo &configInfo)
Get the current configuration.
- [BError setControlInfo](#) (CycleParam params)
Sets the control information for the cycle type given. The parameters for the processing cycle are passed, this includes the Phase and State table information. The call will return an error object indicating success or an error.
- [BError getControlInfo](#) (BString cycleType, UInt32 puChannel, CycleParam ¶ms)
Gets the control information for the cycle type and puChannel number given. The call will return an error object indicating success or an error.
- [BError delControlInfo](#) (BString cycleType, UInt32 puChannel)
Deletes the control information for the cycle type and puChannel number given. The call will return an error object indicating success or an error.
- [BError getControlList](#) (BList< CycleParamItem > &itemList)
Gets the list of Cycle Parameters present in the system.

- **BError setNextCycle** (UInt32 cycleNumber, BString cycleType)

Sets the cycle number and type for the next processing cycle. The call will return an error object indicating success or an error condition as appropriate. This should be called at least 10ms before the next CYCLE_START event.
- **BError test** (BList< BError > &errors)

Performs a basic test of the system returning a list of errors. The call will return an error object indicating success or an error condition as appropriate.
- **BError getStatus** (BList< NameValue > &statusList)

Returns the current status of the system. This information includes the number of PickUps present and their individual status.
- **BError getStatistics** (BList< NameValue > &statsList)

Returns a list of the statistic values as name/value pairs. The call will return an error object indicating success or an error condition as appropriate.
- **BError getPuChannel** (UInt32 puChannel, PuChannel &puPhysChannel)

Returns the physical module/Pupe/Channel number given a logical PickUp id. This can be used so that the individual PickUps test functions can be accessed etc.
- **BError setTestMode** (PuChannel puPhysChannel, UInt32 testOutput, UInt32 timingDisableMask)

The signal source for the digital test output connector. 0: None, 1: FrefLocal. The timingDisableMask bit mask defines which of the timing inputs should be disabled. If a timing input is disabled it can be still operated by software command.
- **BError setTimingSignals** (PuChannel puPhysChannel, UInt32 timingSignals)

This function sets the given timing signals to the values as defined in the timingSignals bit array.
- **BError captureTestData** (PuChannel puPhysChannel, TestCaptureInfo captureInfo, BArray< UInt64 > &data)

This function will capture test data.
- **BError setTestData** (PuChannel puPhysChannel, Int32 on, BArray< UInt32 > data)

This function will set a PU channel to sample data from memory rather than the ADC's.
- **BError setPupeConfig** (PuChannel puPhysChannel, PupeConfig pupeConfig)

Sets special PUPE configuration for test purposes.
- **BError getPupeConfig** (PuChannel puPhysChannel, PupeConfig &pupeConfig)

Gets special PUPE configuration for test purposes.
- **BError puServerStarted** (UInt32 number)

A TmsPuServer has started.

9.78.1 Detailed Description

This interface provides functions to control, test and get statistics from the TMS as a whole.

9.78.2 Constructor & Destructor Documentation

9.78.2.1 Tms::TmsControl::TmsControl (BString name = " ")

9.78.3 Member Function Documentation

9.78.3.1 BError Tms::TmsControl::getVersion (BString & version)

Gets the software version.

Parameters:

version A string variable filled in with the version number string.

9.78.3.2 BError Tms::TmsControl::setProcessPriority (UInt32 priority)

Sets the priority of the process servicing this service.

Parameters:

priority This is the priority of the process. It can be set to one of: PriorityLow, PriorityNormal, PriorityHigh.

9.78.3.3 BError Tms::TmsControl::init ()

Initialises the system including resetting all of the PUPE engines firmware. The call will return an error object indicating success or an error condition as appropriate.

This function restarts the TMS system. It re-initialises each of the TmsPuServer processes running on the Module Controllers and reboots each of the PUPE boards from scratch loading the current FPGA firmware. All errors and statistics values are reset.

9.78.3.4 BError Tms::TmsControl::configure (ConfigInfo configInfo)

Configure the system for use. This includes mapping the individual physical Pickup channels to logical pickup channels.

Parameters:

configInfo The channel mapping table.

This function configures the logical to physical channel mapping table.

9.78.3.5 BError Tms::TmsControl::getConfiguration (ConfigInfo & configInfo)

Get the current configuration.

Parameters:

configInfo The channel mapping table that is filled in with the current curent channel mapping.

This function reads the current logical to physical channel mapping table.

9.78.3.6 **BError** Tms::TmsControl::setControlInfo (CycleParam params)

Sets the control information for the cycle type given. The parameters for the processing cycle are passed, this includes the Phase and State table information. The call will return an error object indicating success or an error.

Parameters:

params Cycle information parameters (state/phase table information).

This function over-writes or adds an entry in the Cycle Parameter database. The Cycle Parameters define the setting for each processing cycle including the state and phase tables for the PUPE FPGA engines.

9.78.3.7 **BError** Tms::TmsControl::getControlInfo (BString cycleType, UInt32 puChannel, CycleParam & params)

Gets the control information for the cycle type and puChannel number given. The call will return an error object indicating success or an error.

Parameters:

cycleType This string defines the cycle type for which to get the information.

puChannel This defines the channel to get the information for. 0 means all channels.

params The resulting cycle parameters are placed in this object.

This function reads back the set of Cycle parameters for the given cycle type and channel number. Normal the same cycle parameters are used for all PUPE engines. In this case setting the puChannel to 0 reads the Cycle Parameters that are being used on all channels. If a specific channel has other parameters the puChannel variable can be set to the appropriate channel number to get its particular settings.

9.78.3.8 **BError** Tms::TmsControl::delControlInfo (BString cycleType, UInt32 puChannel)

Deletes the control information for the cycle type and puChannel number given. The call will return an error object indicating success or an error.

Parameters:

cycleType This string defines the cycle type to delete from the database.

puChannel This defines the specific channel to delete the information for. 0 means all channels.

This function will delete a set of Cycle parameters from the TMS's Cycle parameter database.

9.78.3.9 **BError** Tms::TmsControl::getControlList (BList< CycleParamItem > & itemList)

Gets the list of Cycle Parameters present in the system.

Parameters:

itemList The list of CycleType information is returned.

This function will return a list of entries describing the Cycle Paramter sets present in the TMS database.

9.78.3.10 BError Tms::TmsControl::setNextCycle (UInt32 cycleNumber, BString cycleType)

Sets the cycle number and type for the next processing cycle. The call will return an error object indicating success or an error condition as appropriate. This should be called at least 10ms before the next CYCLE_START event.

Parameters:

cycleNumber This is the next cycle number. This should be an incrementing 32bit unsigned value.

cycleType This is a string defining the cycle type for the next cycle.

This call configures the TMS system for the next processing cycle. It defines the cycle number that will be used to tag data captured during the cycle and it defines the type of machine cycle. The cycleType is used to lookup the appropriate state/phase table information to use in the FPGA's. The call should be made at least 10ms before the CYCLE_START event for the cycle it refers to. This gives time for the FPGA's to be loaded with the appropriate state/phase table information. As the function is time critical, the communications channel should be set to a high priority using the `setPriority()` call and the processing threads priority should be set to high using the `setProcessPriority()` call. The call will return the error: "ErrorCycleNumber", "The next cycle has already started" if the call has not completed before the CYCLE_START event. All client data reads, for this cycle, will also return this error message.

9.78.3.11 BError Tms::TmsControl::test (BList< BError > & errors)

Performs a basic test of the system returning a list of errors. The call will return an error object indicating success or

Parameters:

errors The list of errors is placed in this list object.

This function will perform a test of the TMS system. It will report each test performed and the status of the test in the BError object. A status value of 0 indicates all was Ok, any other value is an error where the number indicates the error. A string gives the test name and the Ok or error condition as a string.

9.78.3.12 BError Tms::TmsControl::getStatus (BList< NameValue > & statusList)

Returns the current status of the system. This information includes the number of PickUp present and their individual

Parameters:

statusList The list of status items is placed in this list object.

This function gets the status of the TMS system. It returns a list of name/value pairs.

9.78.3.13 BError Tms::TmsControl::getStatistics (BList< NameValue > & statsList)

Returns a list of the statistic values as name/value pairs. The call will return an error object indicating success or an

Parameters:

statsList The statistics list is placed in this list object.

This function gets the statistics values from the TMS system. It returns a list of name/value pairs.

9.78.3.14 **BError** Tms::TmsControl::getPuChannel (**UInt32** *puChannel*, **PuChannel** & *puPhysChannel*)

Returns the physical module/Pupe/Channel number given a logical PickUp id. This can be used so that the individual PickUps test functions can be accessed etc.

Parameters:

puChannel The logical channel number.

puPhysChannel The physical channel identifier is returned in this variable.

This function is given a logical pick-up channel number. It will return the physical module, pupe number and pupe channle that has been allocated to this channel.

9.78.3.15 **BError** Tms::TmsControl::setTestMode (**PuChannel** *puPhysChannel*, **UInt32** *testOutput*, **UInt32** *timingDisableMask*)

The signal source for the digital test output connector. 0: None, 1: FrefLocal. The timingDisableMask bit mask defines which of the timing inputs should be disabled. If a timing input is disabled it can be still operated by software command.

Parameters:

puPhysChannel The physical channel identifier.

testOutput The signal to output on the test output. 0 is FREF any other value is undefined at the moment.

timingDisableMask This 8 bit mask defines which of the timing input signals are disabled.

This function sets up a particular pick-up channel's digital test output source and allows the channels input timing signals to be set to a software driven mode rather than taken from the hardware timing inputs. The timing mask bits are: 7 - FREF, 6 - HCHANGE, 5 - INJECTION, 4 - CAL_STOP, 3 - CAL_START, 2 - CYCLE_STOP, 1 - CYCLE_START, 0 - SYSCLOCK

9.78.3.16 **BError** Tms::TmsControl::setTimingSignals (**PuChannel** *puPhysChannel*, **UInt32** *timingSignals*)

This function sets the given timing signals to the values as defined in the timingSignals bit array.

Parameters:

puPhysChannel The physical channel identifier.

timingSignals The 8 bit mask defining the state of the software driven timing signals.

If the [setTestMode\(\)](#) function had been used to "enable" particular timing signals to be driven by software, then this function can be used to set/reset particular timing signals for the pick-up channel given. The timing signals bits are: 7 - FREF, 6 - HCHANGE, 5 - INJECTION, 4 - CAL_STOP, 3 - CAL_START, 2 - CYCLE_STOP, 1 - CYCLE_START, 0 - SYSCLOCK

9.78.3.17 **BError** Tms::TmsControl::captureTestData (**PuChannel** *puPhysChannel*, **TestCaptureInfo** *captureInfo*, **BArray**< **UInt64** > & *data*)

This function will capture test data.

Parameters:

puPhysChannel The physical channel identifier.

captureInfo The specification of the diagnostics trigger and data to capture.

data The diagnostics 64bit data array is stored in this array.

This function is for diagnostics purposes. It is used to capture internal signals from the PUPE FPGA processing system. The captureInfo parameter defines the signals to be captured, the clock rate and the trigger to start capture as well as the start time before the trigger become active and the delay, in clock cycle, after trigger that the data capture starts. The call will block until the trigger condition is matched and the resulting data is returned. The call will timeout after 10seconds returning the error, "ErrorTimeout". In the current system 4096 data samples will be returned.

9.78.3.18 **BError** Tms::TmsControl::setTestData (**PuChannel** *puPhysChannel*, **Int32** *on*, **BArray**< **UInt32** > *data*)

This function will set a PU channel to sample data from memory rather than the ADC's.

Parameters:

puPhysChannel The physical channel identifier.

on Boolean to enable the internal data source. 0 is off, 1 is on.

data The array of 32bit data values to use as the FREF,Sigma,DeltaX and DeltaY test signal.

This call loads the PUPE systems test data SDRAM with the data passed in the data array. It then sets up the individual channel to sources its FREF, Sigma, DeltaX and DelatY signals from the test SDRAM. The data source should have a multiple of 2 samples. The "on" parameter is used to enable or disable the individual channels inputs from this test data SDRAM.

9.78.3.19 **BError** Tms::TmsControl::setPupeConfig (**PuChannel** *puPhysChannel*, **PupeConfig** *pupeConfig*)

Sets special PUPE configuration for test purposes.

Parameters:

puPhysChannel The physical channel identifier.

pupeConfig The configuration parameters to use.

This functions sets up some special configuration parameters for the PUPE channel. It is used mainly for diagnostics and test purposes. The main settings it can affect are: The ADC Clock sources PLL synchronisation, internal timing for the digital timing signals and the enabling/dissabling of the BLR algorithm.

9.78.3.20 **BError** `Tms::TmsControl::getPupeConfig (PuChannel puPhysChannel, PupeConfig & pupeConfig)`

Gets special PUPE configuration for test purposes.

Parameters:

puPhysChannel The physical channel identifier.

pupeConfig The returned configuration parameters.

This function returns the current configuration of the given channel.

9.78.3.21 **BError** `Tms::TmsControl::puServerStarted (UInt32 number)`

A TmsPuServer has started.

Parameters:

number The number of the PuServer started.

This is an internal function called by the TmsPuServer processes to indicate to the TmsServer that they have just started running and are present in the system. The TmsServer will initialise the appropriate tmsPuServer program and its individual PUPE engines on receipt of this call.

The documentation for this class was generated from the following files:

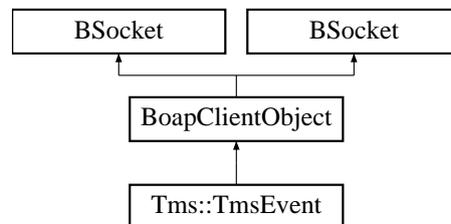
- [TmsC.h](#)
- [TmsC.cc](#)
- [tmsFunctions.dox](#)

9.79 Tms::TmsEvent Class Reference

This interface provides functions for events to be sent to clients from the TMS as a whole.

```
#include <TmsC.h>
```

Inheritance diagram for Tms::TmsEvent::



Public Member Functions

- [TmsEvent](#) ([BString](#) name="")
- [BError errorEvent](#) ([UInt32](#) cycleNumber, [BError](#) error)

This event function gets called on a system error. The errorEvent object contains and error number and string describing the error. The getStatus() call can be used to fetch further information.
- [BError cycleStartEvent](#) ([UInt32](#) cycleNumber)

This event function gets called on the CYCLE_START event with the cycle number about to be processed.
- [BError cycleStopEvent](#) ([UInt32](#) cycleNumber)

This event function gets called on the CYCLE_END event with the cycle number completed.
- [BError dataEvent](#) ([DataInfo](#) dataInfo)

This event function gets called when some requested data becomes available. The DataInfo object contains information on the data. The getData() call can be used to fetch the actual data.

9.79.1 Detailed Description

This interface provides functions for events to be sent to clients from the TMS as a whole.

9.79.2 Constructor & Destructor Documentation

9.79.2.1 Tms::TmsEvent::TmsEvent ([BString](#) name = "")

9.79.3 Member Function Documentation

9.79.3.1 [BError](#) Tms::TmsEvent::errorEvent ([UInt32](#) cycleNumber, [BError](#) error)

This event function gets called on a system error. The errorEvent object contains and error number and string describing the error. The getStatus() call can be used to fetch further information.

9.79.3.2 BError Tms::TmsEvent::cycleStartEvent (UInt32 cycleNumber)

This event function gets called on the CYCLE_START event with the cycle number about to be processed.

9.79.3.3 BError Tms::TmsEvent::cycleStopEvent (UInt32 cycleNumber)

This event function gets called on the CYCLE_END event with the cycle number completed.

9.79.3.4 BError Tms::TmsEvent::dataEvent (DataInfo dataInfo)

This event function gets called when some requested data becomes available. The [DataInfo](#) object contains information on the data. The `getData()` call can be used to fetch the actual data.

The documentation for this class was generated from the following files:

- [TmsC.h](#)
- [TmsC.cc](#)

9.80 Tms::TmsEventServerList Class Reference

```
#include <TmsEventServerList.h>
```

Public Member Functions

- [TmsEventServerList](#) ()
- [~TmsEventServerList](#) ()
- [BError](#) [append](#) ([BString](#) name)
- [BError](#) [del](#) ([BString](#) name)
- [BError](#) [errorEvent](#) ([UInt32](#) cycleNumber, [BError](#) error)

This event function gets called on a system error. The errorEvent object contains and error number and string describing the error. The [getStatus\(\)](#) call can be used to fetch further information.
- [BError](#) [cycleStartEvent](#) ([UInt32](#) cycleNumber)

This event function gets called on the CYCLE_START event with the cycle number about to be processed.
- [BError](#) [cycleStopEvent](#) ([UInt32](#) cycleNumber)

This event function gets called on the CYCLE_END event with the cycle number completed.
- [BError](#) [dataEvent](#) ([DataInfo](#) dataInfo)

This event function gets called when some requested data becomes available. The [DataInfo](#) object contains information on the data. The [getData\(\)](#) call can be used to fetch the actual data.

Private Attributes

- [BMutex](#) olock
- [BList](#)< [TmsEvent](#) * > oeventServers

9.80.1 Constructor & Destructor Documentation

9.80.1.1 [Tms::TmsEventServerList::TmsEventServerList](#) ()

9.80.1.2 [Tms::TmsEventServerList::~~TmsEventServerList](#) ()

9.80.2 Member Function Documentation

9.80.2.1 [BError](#) [Tms::TmsEventServerList::append](#) ([BString](#) name)

9.80.2.2 [BError](#) [Tms::TmsEventServerList::del](#) ([BString](#) name)

9.80.2.3 [BError](#) [Tms::TmsEventServerList::errorEvent](#) ([UInt32](#) cycleNumber, [BError](#) error)

This event function gets called on a system error. The errorEvent object contains and error number and string describing the error. The [getStatus\(\)](#) call can be used to fetch further information.

9.80.2.4 [BError](#) [Tms::TmsEventServerList::cycleStartEvent](#) ([UInt32](#) cycleNumber)

This event function gets called on the CYCLE_START event with the cycle number about to be processed.

9.80.2.5 **BError** Tms::TmsEventServerList::cycleStopEvent (**UInt32** *cycleNumber*)

This event function gets called on the CYCLE_END event with the cycle number completed.

9.80.2.6 **BError** Tms::TmsEventServerList::dataEvent (**DataInfo** *dataInfo*)

This event function gets called when some requested data becomes available. The **DataInfo** object contains information on the data. The getData() call can be used to fetch the actual data.

9.80.3 Member Data Documentation

9.80.3.1 **BMutex** Tms::TmsEventServerList::oLock [private]

9.80.3.2 **BList**<**TmsEvent***> Tms::TmsEventServerList::oEventServers [private]

The documentation for this class was generated from the following files:

- [TmsEventServerList.h](#)
- [TmsEventServerList.cc](#)

9.81 Tms::TmsPhase Union Reference

The [Tms](#) Phase Table Entry.

```
#include <TmsLib.h>
```

Public Attributes

- struct {
 - unsigned int [lo1](#):1
 - unsigned int [blr](#):1
 - unsigned int [gate](#):1
 - unsigned int [lo2](#):1
 - unsigned int [spare](#):2
 - unsigned int [meanFilter1](#):1
 - unsigned int [meanFilter2](#):1
- };
- unsigned char [value](#)

9.81.1 Detailed Description

The [Tms](#) Phase Table Entry.

9.81.2 Member Data Documentation

9.81.2.1 unsigned int [Tms::TmsPhase::lo1](#)

9.81.2.2 unsigned int [Tms::TmsPhase::blr](#)

9.81.2.3 unsigned int [Tms::TmsPhase::gate](#)

9.81.2.4 unsigned int [Tms::TmsPhase::lo2](#)

9.81.2.5 unsigned int [Tms::TmsPhase::spare](#)

9.81.2.6 unsigned int [Tms::TmsPhase::meanFilter1](#)

9.81.2.7 unsigned int [Tms::TmsPhase::meanFilter2](#)

9.81.2.8 struct { ... }

9.81.2.9 unsigned char [Tms::TmsPhase::value](#)

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

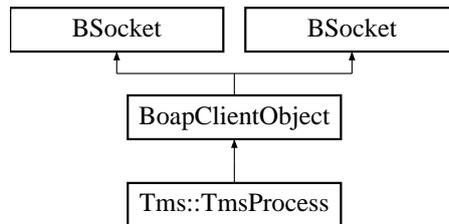
- [TmsLib.h](#)

9.82 Tms::TmsProcess Class Reference

This interface provides functions to capture data from the TMS as a whole.

```
#include <TmsC.h>
```

Inheritance diagram for Tms::TmsProcess::



Public Member Functions

- [TmsProcess](#) ([BString](#) name="")
- [BError getVersion](#) ([BString](#) &version)

Gets the software version.
- [BError getCycleInfo](#) ([UInt32](#) &cycleNumber, [BString](#) &cycleType)

Gets the current cycle number and type.
- [BError getCycleInformation](#) ([UInt32](#) cycleNumber, [CycleInformation](#) &cycleInformation)

Gets information on given cycle number.
- [BError getCycleTypeInfoInformation](#) ([BString](#) cycleType, [CycleTypeInfoInformation](#) &cycleTypeInfoInformation)

Gets information on given cycle Type.
- [BError getData](#) ([DataInfo](#) dataInfo, [Data](#) &data)

This function returns a set of data from the data present in the data cache or directly from the Pick-Up processing engines. The [DataInfo](#) object describes the data required. The call will return the required data along with an error object indicating success or an error condition as appropriate. The call will block until data is ready.
- [BError addEventServer](#) ([BString](#) name)

This call adds an event server to call on events such as the "dataEvent" generated by the requestData(0 call as well as error events. The Client will use this to notify the TmsServer of its local [TmsEvent](#) object.
- [BError requestData](#) ([DataInfo](#) dataInfo)

This adds a request for some data. The [DataInfo](#) object defines the data required. This request can be made at any time. If the data is present in cache the data will be available immediately, if not the system will await the data from a subsequent processing cycle. When the data is available a "data" event will be sent to the client. Not that it is not necessary to use requestData. The client can call [getData\(\)](#) directly although this call will block until the data is actually ready.

9.82.1 Detailed Description

This interface provides functions to capture data from the TMS as a whole.

9.82.2 Constructor & Destructor Documentation

9.82.2.1 Tms::TmsProcess::TmsProcess (BString name = "")

Parameters:

name The name of the [TmsProcess](#) BOAP object to connect to.

The BOAP object name has the general form: "//HostName/ObjectName"

9.82.3 Member Function Documentation

9.82.3.1 BError Tms::TmsProcess::getVersion (BString & version)

Gets the software version.

Parameters:

version A string variable filled in with the version number string.

9.82.3.2 BError Tms::TmsProcess::getCycleInfo (UInt32 & cycleNumber, BString & cycleType)

Gets the current cycle number and type.

Parameters:

cycleNumber The current cycle number is returned here

cycleType The current cycle type is returned here.

This function returns the current TMS cycle number being processed and the type of the cycle.

9.82.3.3 BError Tms::TmsProcess::getCycleInformation (UInt32 cycleNumber, CycleInformation & cycleInformation)

Gets information on given cycle number.

Parameters:

cycleNumber The current cycle number to get information on

cycleInformation The returned cycle information

This function provides information on the given cycle. It interrogates the first PUPE channel and returns the Cycle information based on the internal state of that channel. The main information returned includes the cycle type and a list of all of the Cycle Periods captured and the times and amount of data in each.

9.82.3.4 **BError** Tms::TmsProcess::getCycleTypeInfo(**BString** *cycleType*, **CycleTypeInfo** & *cycleTypeInfo*)

Gets information on given cycle Type.

9.82.3.5 **BError** Tms::TmsProcess::getData(**DataInfo** *dataInfo*, **Data** & *data*)

This function returns a set of data from the data present in the data cache or directly from the Pick-Up processing engines. The **DataInfo** object describes the data required. The call will return the required data along with an error object indicating success or an error condition as appropriate. The call will block until data is ready.

Parameters:

dataInfo Information on the type of data required.

data The raw data is returned in this object.

This is the main user function used by clients of the TMS system. It is used to return portions of the acquired data. The fields of the **dataInfo** parameter define which data is required and are defined in the **DataInfo** class documentation.

The call will check to see if the data for the cycle number requested is still present in the PUPE memory. The PUPE memory has enough storage for about 3 seconds worth of data (3 processing cycles). If the data has gone the call will return the error "ErrorDataGone". If the system has not processed the requested cycle, but will do so within 256 seconds, the call will block awaiting the data.

If the channel number is given as 0 the call will interrogate each of the Pick-Up channels and return the combined data from all of them. Note that this could take significant time and may not be possible if the parameter **numValues** is large. Within the **Data** structure returned there is an array of error values, one per channel. If an error occurs on any set of the channels the call will return the first error that occurred and the complete list of errors in the **errors** array. The actual data will be returned for all channels that did not have an error. Those channels that had an error will have data values of 0 returned.

If the bunch number is given as 0, then the system will return the data for all of the bunches.

The data will be returned in the following order, where B - Bunch, C - Channel:

[C1.B1, C1.B2, C1.B3, C1.B4], [C1.B1, C1.B2, C1.B3, C1.B4], ... [C2.B1, C2.B2, C2.B3, C2.B4], [C2.B1, C2.B2, C2.B3, C2.B4], ...

That is the data is ordered by bunch, then sample, then channel. See the TMS Software documentation manual for more details of this functions operation.

9.82.3.6 **BError** Tms::TmsProcess::addEventServer(**BString** *name*)

This call adds an event server to call on events such as the "dataEvent" generated by the requestData(0 call as well as error events. The Client will use this to notify the TmsServer of its local **TmsEvent** object.

Parameters:

name The BOAP object name to add.

Adds an event server that gets called on certain TmsServer events such as data ready, CYCLE_START, CYCLE_STOP and errors.

9.82.3.7 **BError** Tms::TmsProcess::requestData (**DataInfo** *dataInfo*)

This adds a request for some data. The **DataInfo** object defines the data required. This request can be made at any time. If the data is present in cache the data will be available immediately, if not the system will await the data from a subsequent processing cycle. When the data is available a "data" event will be sent to the client. Not that it is not necessary to use requestData. The client can call [getData\(\)](#) directly although this call will block until the data is actually ready.

Parameters:

dataInfo Information on the type of data required.

This call sets up a request for data. The *dataInfo* parameter works in the same manner as the "getData" call, defining the portion of data required. This call will return immediately. Assuming the client has informed the TMS system of an event server object using the "addEventServer" call, then the client will receive the "dataEvent" event when the data become available. The client can then fetch the data using the conventional "getData" call. In the current version of the software the "requestData" call simply sends a message when the data for the requested cycle is ready. In future implementations the TMS system could actually fetch the data automatically from the PUPE boards and store it in memory ready for later retrieval by the getData call.

The documentation for this class was generated from the following files:

- [TmsC.h](#)
- [TmsC.cc](#)
- [tmsFunctions.dox](#)

9.83 Tms::TmsState Union Reference

The [Tms](#) State entry.

```
#include <TmsLib.h>
```

Public Attributes

- struct {
 - unsigned int [aquireData](#):1
 - unsigned int [pllReference1](#):1
 - unsigned int [pllReference2](#):1
 - unsigned int [pllFeedbackSelect](#):1
 - unsigned int [pllLO1FromAddress](#):1
 - unsigned int [pllLO2FromAddress](#):1
 - unsigned int [spare0](#):2
 - unsigned int [cycleStop](#):4
 - unsigned int [calStop](#):4
 - unsigned int [calStart](#):4
 - unsigned int [injection](#):4
 - unsigned int [hchange](#):4
 - unsigned int [delay](#):4

- unsigned int [value](#)

9.83.1 Detailed Description

The [Tms](#) State entry.

9.83.2 Member Data Documentation

- 9.83.2.1 unsigned int [Tms::TmsState::acquireData](#)
- 9.83.2.2 unsigned int [Tms::TmsState::pllReference1](#)
- 9.83.2.3 unsigned int [Tms::TmsState::pllReference2](#)
- 9.83.2.4 unsigned int [Tms::TmsState::pllFeedbackSelect](#)
- 9.83.2.5 unsigned int [Tms::TmsState::pllLO1FromAddress](#)
- 9.83.2.6 unsigned int [Tms::TmsState::pllLO2FromAddress](#)
- 9.83.2.7 unsigned int [Tms::TmsState::spare0](#)
- 9.83.2.8 unsigned int [Tms::TmsState::cycleStop](#)
- 9.83.2.9 unsigned int [Tms::TmsState::calStop](#)
- 9.83.2.10 unsigned int [Tms::TmsState::calStart](#)
- 9.83.2.11 unsigned int [Tms::TmsState::injection](#)
- 9.83.2.12 unsigned int [Tms::TmsState::hchange](#)
- 9.83.2.13 unsigned int [Tms::TmsState::delay](#)
- 9.83.2.14 struct { ... }
- 9.83.2.15 unsigned int [Tms::TmsState::value](#)

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

- [TmsLib.h](#)

Chapter 10

LibTmsApi File Documentation

10.1 /src/cern/tms/beam/libBeam/BArray.h File Reference

```
#include <BTypes.h>  
#include <vector>
```

Classes

- class [BArray< T >](#)

Defines

- #define [BArray_H 1](#)

10.1.1 Define Documentation

10.1.1.1 #define BArray_H 1

10.2 /src/cern/tms/beam/libBeam/BBuffer.cpp File Reference

```
#include <stdlib.h>
#include <memory.h>
#include <BBuffer.h>
```

Defines

- #define [SIZE](#) 1024

10.2.1 Define Documentation

10.2.1.1 #define SIZE 1024

10.3 /src/cern/tms/beam/libBeam/BBuffer.h File Reference

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

Classes

- class [BBuffer](#)

Defines

- #define [BBUFFER_H](#) 1

10.3.1 Define Documentation

10.3.1.1 #define BBUFFER_H 1

10.4 /src/cern/tms/beam/libBeam/BCond.cpp File Reference

```
#include <BCond.h>  
#include <sys/time.h>  
#include <stdio.h>
```

10.5 /src/cern/tms/beam/libBeam/BCond.h File Reference

```
#include <pthread.h>
```

Classes

- class [BCond](#)

Defines

- #define [BCOND_H](#) 1

10.5.1 Define Documentation

10.5.1.1 #define BCOND_H 1

10.6 /src/cern/tms/beam/libBeam/BCondInt.cpp File Reference

```
#include <BCondInt.h>
#include <sys/time.h>
#include <stdio.h>
#include <errno.h>
```

10.7 /src/cern/tms/beam/libBeam/BCondInt.h File Reference

```
#include <BTypes.h>
#include <pthread.h>
```

Classes

- class [BCondValue](#)
Thread conditional value.
- class [BCondInt](#)
Thread conditional integer.
- class [BCondBool](#)
Thread conditional boolean.
- class [BCondWrap](#)

Defines

- #define [BCONDINT_H](#) 1

10.7.1 Define Documentation

10.7.1.1 #define BCONDINT_H 1

10.8 /src/cern/tms/beam/libBeam/BDir.cpp File Reference

```
#include <BDir.h>
#include <dirent.h>
#include <stdlib.h>
#include <errno.h>
#include <string.h>
```

Functions

- static int [wild](#) (const dirent *e)

Variables

- static [BString wildString](#)

10.8.1 Function Documentation

10.8.1.1 [static int wild \(const dirent * e\)](#) [static]

10.8.2 Variable Documentation

10.8.2.1 [BString wildString](#) [static]

10.9 /src/cern/tms/beam/libBeam/BDir.h File Reference

```
#include <BList.h>
#include <BString.h>
#include <BError.h>
#include <sys/stat.h>
```

Classes

- class [BDir](#)
File system directory class.

Defines

- #define [BDIR_H](#) 1

10.9.1 Define Documentation

10.9.1.1 #define BDIR_H 1

10.10 /src/cern/tms/beam/libBeam/BEntry.cpp File Reference

```
#include <ctype.h>
#include <stdio.h>
#include <string.h>
#include <unistd.h>
#include <fcntl.h>
#include <errno.h>
#include <BEntry.h>
```

10.11 /src/cern/tms/beam/libBeam/BEntry.h File Reference

```
#include <BList.h>
#include <BString.h>
```

Classes

- class [BEntry](#)
Manipulate a name value pair.
- class [BEntryList](#)
List of Entries. Where an entry is a name value pair.
- class [BEntryFile](#)
File of Entries.

10.12 /src/cern/tms/beam/libBeam/BError.cpp File Reference

```
#include <BError.h>
```

10.13 /src/cern/tms/beam/libBeam/BError.h File Reference

```
#include <BString.h>
```

Classes

- class [BError](#)
Error return class.

Defines

- #define [BERROR_H](#) 1

10.13.1 Define Documentation

10.13.1.1 #define BERROR_H 1

10.14 /src/cern/tms/beam/libBeam/BEvent.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <BEvent.h>
#include <BPoll.h>
```

10.15 /src/cern/tms/beam/libBeam/BEvent.h File Reference

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

Classes

- class [BEvent](#)

This class provides a base class for all event objects that can be sent over the events interface.

- class [BEventError](#)
- class [BEventPipe](#)

This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.

- class [BEventInt](#)

This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

Defines

- #define [BEvent_H](#) 1

Enumerations

- enum [BEventType](#) { [BEventTypeNone](#), [BEventTypeInt](#), [BEventTypeError](#) }

10.15.1 Define Documentation

10.15.1.1 #define [BEvent_H](#) 1

10.15.2 Enumeration Type Documentation

10.15.2.1 enum [BEventType](#)

Enumerator:

[BEventTypeNone](#)

[BEventTypeInt](#)

[BEventTypeError](#)

10.16 /src/cern/tms/beam/libBeam/BFile.cpp File Reference

```
#include <BFile.h>
#include <sys/stat.h>
#include <string.h>
#include <stdarg.h>
#include <errno.h>
```

Defines

- #define [STRBUF](#) 10240

10.16.1 Define Documentation

10.16.1.1 #define STRBUF 10240

10.17 /src/cern/tms/beam/libBeam/BFile.h File Reference

```
#include <stdio.h>
#include <BString.h>
#include <BError.h>
```

Classes

- class [BFile](#)
File operations class.

Defines

- #define [BFILE_H](#) 1

10.17.1 Define Documentation

10.17.1.1 #define BFILE_H 1

10.18 /src/cern/tms/beam/libBeam/BList.h File Reference

```
#include <BList_func.h>
```

Classes

- class [BIter](#)
Iterator for [BList](#).
- class [BList< T >](#)
Template based list class.
- class [BList< T >::Node](#)

Defines

- #define [BLIST_H](#) 1

10.18.1 Define Documentation

10.18.1.1 #define BLIST_H 1

10.19 /src/cern/tms/beam/libBeam/BList_func.h File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <memory.h>
```

10.20 /src/cern/tms/beam/libBeam/BMutex.cpp File Reference

```
#include <BMutex.h>
```

Defines

- #define [MDEBUG](#) 0

10.20.1 Define Documentation

10.20.1.1 #define MDEBUG 0

10.21 /src/cern/tms/beam/libBeam/BMutex.h File Reference

```
#include <pthread.h>
```

Classes

- class [BMutex](#)
Mutex class.

Defines

- #define [BMUTEX_H](#) 1

10.21.1 Define Documentation

10.21.1.1 #define BMUTEX_H 1

10.22 /src/cern/tms/beam/libBeam/BNameValue.h File Reference

```
#include <BList.h>
#include <BString.h>
```

Classes

- class [BNameValue< T >](#)
- class [BNameValueList< T >](#)

Defines

- #define [BNAMEVALUE_H](#) 1
- #define [TEMPLATE_NEW](#) 1

10.22.1 Define Documentation

10.22.1.1 [#define BNAMEVALUE_H](#) 1

10.22.1.2 [#define TEMPLATE_NEW](#) 1

10.23 /src/cern/tms/beam/libBeam/Boap.cpp File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <errno.h>
#include <unistd.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netinet/tcp.h>
#include <Boap.h>
#include <byteswap.h>
#include <BoapnsD.h>
#include <BoapnsC.h>
```

Defines

- #define [DEBUG](#) 0
- #define [APIVERSION_TEST](#) 1
- #define [dprintf](#)(fmt, a...)
- #define [IS_BIG_ENDIAN](#) 1

Functions

- static void [swap8](#) (char *d, char *s)
- static void [swap16](#) (char *d, char *s)
- static void [swap32](#) (char *d, char *s)
- static void [swap64](#) (char *d, char *s)

Variables

- const int [boapPort](#) = 12000

The default BOAP connection port.

- const int [roundSize](#) = 256

10.23.1 Define Documentation

10.23.1.1 `#define APIVERSION_TEST 1`

10.23.1.2 `#define DEBUG 0`

10.23.1.3 `#define dprintf(fmt, a...)`

10.23.1.4 `#define IS_BIG_ENDIAN 1`

10.23.2 Function Documentation

10.23.2.1 `static void swap16 (char *d, char *s)` [inline, static]

10.23.2.2 `static void swap32 (char *d, char *s)` [inline, static]

10.23.2.3 `static void swap64 (char *d, char *s)` [inline, static]

10.23.2.4 `static void swap8 (char *d, char *s)` [inline, static]

10.23.3 Variable Documentation

10.23.3.1 `const int boapPort = 12000`

The default BOAP connection port.

10.23.3.2 `const int roundSize = 256`

10.24 /src/cern/tms/beam/libBeam/Boap.h File Reference

```
#include <stdint.h>
#include <BPoll.h>
#include <BSocket.h>
#include <BThread.h>
#include <BError.h>
#include <BEvent.h>
#include <BMutex.h>
#include <BTypes.h>
```

Namespaces

- namespace [Boapns](#)

Classes

- struct [BoapPacketHead](#)
- class [BoapPacket](#)
- class [BoapClientObject](#)
- class [BoapSignalObject](#)
- class [BoapServiceEntry](#)
- class [BoapServerConnection](#)
- class [BoapServer](#)
- class [BoapFuncEntry](#)
- class [BoapServiceObject](#)

Typedefs

- typedef [UInt32](#) [BoapService](#)
- typedef [BError](#)([BoapServiceObject](#)::*) [BoapFunc](#) ([BoapServerConnection](#) *conn, [BoapPacket](#) &rx, [BoapPacket](#) &tx)

Enumerations

- enum [BoapType](#) {
 [BoapTypeRpc](#), [BoapTypeRpcReply](#), [BoapTypeSignal](#), [BoapTypeRpc](#),
 [BoapTypeSignal](#) }
- enum [BoapPriority](#) { [BoapPriorityLow](#), [BoapPriorityNormal](#), [BoapPriorityHigh](#) }

Variables

- const [UInt32](#) [BoapMagic](#) = 0x424F4100

10.24.1 Typedef Documentation

10.24.1.1 typedef **BError**(BoapServiceObject::*) **BoapFunc**(BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)

10.24.1.2 typedef **UInt32** **BoapService**

10.24.2 Enumeration Type Documentation

10.24.2.1 enum **BoapPriority**

Enumerator:

BoapPriorityLow

BoapPriorityNormal

BoapPriorityHigh

10.24.2.2 enum **BoapType**

Enumerator:

BoapTypeRpc

BoapTypeRpcReply

BoapTypeSignal

BoapTypeRpc

BoapTypeSignal

10.24.3 Variable Documentation

10.24.3.1 const **UInt32** **BoapMagic** = 0x424F4100

10.25 /src/cern/tms/beam/libBeam/BoapnsC.cc File Reference

```
#include <BoapnsC.h>
```

Namespaces

- namespace [Boapns](#)

Functions

- [Boapns::Boapns](#) (BString name)
- [BError Boapns::getVersion](#) (BString &version)
- [BError Boapns::getEntryList](#) (BList< BoapEntry > &entryList)
- [BError Boapns::getEntry](#) (BString name, BoapEntry &entry)
- [BError Boapns::addEntry](#) (BoapEntry entry)
- [BError Boapns::delEntry](#) (BString name)
- [BError Boapns::getNewName](#) (BString &name)

10.26 /src/cern/tms/beam/libBeam/BoapnsC.h File Reference

```
#include <stdlib.h>
#include <stdint.h>
#include <Boap.h>
#include <BString.h>
#include <BList.h>
#include <BArray.h>
#include <BoapnsD.h>
```

Namespaces

- namespace [Boapns](#)

Classes

- class [Boapns::Boapns](#)

Defines

- #define [BOAPNSC_H](#) 1

Variables

- const [BUInt32](#) [Boapns::apiVersion](#) = 0

10.26.1 Define Documentation

10.26.1.1 #define BOAPNSC_H 1

10.27 /src/cern/tms/beam/libBeam/BoapnsD.cc File Reference

```
#include <BoapnsD.h>
```

Namespaces

- namespace [Boapns](#)

10.28 /src/cern/tms/beam/libBeam/BoapnsD.h File Reference

```
#include <Boap.h>
#include <BList.h>
#include <BArray.h>
```

Namespaces

- namespace [Boapns](#)

Classes

- class [Boapns::BoapEntry](#)

Defines

- #define [BOAPNSD_H](#) 1

10.28.1 Define Documentation

10.28.1.1 #define BOAPNSD_H 1

10.29 /src/cern/tms/beam/libBeam/BoapSimple.cc File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <errno.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <Boap.h>
#include <BoapnsD.h>
#include <BoapnsC.h>
```

Defines

- #define [DEBUG](#) 0
- #define [dprintf](#)(fmt, a...)

Variables

- const int [roundSize](#) = 256

10.29.1 Define Documentation

10.29.1.1 #define [DEBUG](#) 0

10.29.1.2 #define [dprintf](#)(fmt, a...)

10.29.2 Variable Documentation

10.29.2.1 const int [roundSize](#) = 256

10.30 /src/cern/tms/beam/libBeam/BoapSimple.h File Reference

```
#include <stdint.h>
#include <BPoll.h>
#include <BSocket.h>
#include <BError.h>
```

Classes

- struct [BoapPacketHead](#)
- class [BoapPacket](#)
- class [BoapClientObject](#)
- class [BoapSignalObject](#)
- class [BoapServiceEntry](#)
- class [BoapServer](#)
- class [BoapFuncEntry](#)
- class [BoapServiceObject](#)

Typedefs

- typedef int8_t [Int8](#)
- typedef uint8_t [UInt8](#)
- typedef int16_t [Int16](#)
- typedef uint16_t [UInt16](#)
- typedef int32_t [Int32](#)
- typedef uint32_t [UInt32](#)
- typedef double [Double](#)
- typedef uint32_t [BoapService](#)
- typedef [BError](#)([BoapServiceObject](#)::*) [BoapFunc](#) ([BoapPacket](#) &rx, [BoapPacket](#) &tx)

Enumerations

- enum [BoapType](#) {
 [BoapTypeRpc](#), [BoapTypeRpcReply](#), [BoapTypeSignal](#), [BoapTypeRpc](#),
 [BoapTypeSignal](#) }

10.30.1 Typedef Documentation

10.30.1.1 typedef **BError**(BoapServiceObject::*) **BoapFunc**(BoapPacket &rx, BoapPacket &tx)

10.30.1.2 typedef uint32_t **BoapService**

10.30.1.3 typedef double **Double**

10.30.1.4 typedef int16_t **Int16**

10.30.1.5 typedef int32_t **Int32**

10.30.1.6 typedef int8_t **Int8**

10.30.1.7 typedef uint16_t **UInt16**

10.30.1.8 typedef uint32_t **UInt32**

10.30.1.9 typedef uint8_t **UInt8**

10.30.2 Enumeration Type Documentation

10.30.2.1 enum **BoapType**

Enumerator:

BoapTypeRpc

BoapTypeRpcReply

BoapTypeSignal

BoapTypeRpc

BoapTypeSignal

10.31 /src/cern/tms/beam/libBeam/BObject.cc File Reference

```
#include <stdio.h>
#include <ctype.h>
#include <memory.h>
#include <string.h>
#include <BObject.h>
#include <iostream>
```

Defines

- #define [DEBUG](#) 0

10.31.1 Define Documentation

10.31.1.1 #define [DEBUG](#) 0

10.32 /src/cern/tms/beam/libBeam/BObject.h File Reference

```
#include <BType.h>
#include <BDataBuf.h>
#include <BString.h>
#include <BNameValue.h>
#include <BList.h>
#include <BError.h>
```

Classes

- class [BObject](#)

Defines

- #define [BOBJECT_H](#) 1

Typedefs

- typedef [BNameValue](#)< [BObject](#) * > [BMember](#)
- typedef [BNameValueList](#)< [BObject](#) * > [BMemberList](#)

10.32.1 Define Documentation

10.32.1.1 #define [BOBJECT_H](#) 1

10.32.2 Typedef Documentation

10.32.2.1 typedef [BNameValue](#)<[BObject](#)*> [BMember](#)

10.32.2.2 typedef [BNameValueList](#)<[BObject](#)*> [BMemberList](#)

10.33 /src/cern/tms/beam/libBeam/BPoll-1.cpp File Reference

```
#include <stdlib.h>  
#include <unistd.h>  
#include <errno.h>  
#include <BPoll.h>
```

10.34 /src/cern/tms/beam/libBeam/BPoll.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <BPoll.h>
```

10.35 /src/cern/tms/beam/libBeam/BPoll.h File Reference

```
#include <BList.h>
#include <BError.h>
#include <sys/poll.h>
```

Classes

- class [BPoll](#)

This class provides an interface for polling a number of file descriptors. It uses round robin polling.

Defines

- #define [BPOLL_H](#) 1

10.35.1 Define Documentation

10.35.1.1 #define BPOLL_H 1

10.36 /src/cern/tms/beam/libBeam/BRefData.cpp File Reference

```
#include <stdlib.h>
#include <string.h>
#include <BRefData.h>
```

Defines

- #define [DEBUG](#) 0
- #define [CHUNK](#) 16

10.36.1 Define Documentation

10.36.1.1 #define [CHUNK](#) 16

10.36.1.2 #define [DEBUG](#) 0

10.37 /src/cern/tms/beam/libBeam/BRefData.h File Reference

Classes

- class [BRefData](#)
Referenced data storage.

Defines

- #define [BREFDATA_H](#) 1

10.37.1 Define Documentation

10.37.1.1 #define BREFDATA_H 1

10.38 /src/cern/tms/beam/libBeam/BRtc.cpp File Reference

```
#include <BRtc.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <errno.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/ioctl.h>
#include <linux/rtc.h>
```

10.39 /src/cern/tms/beam/libBeam/BRtc.h File Reference

```
#include <BError.h>
#include <BThread.h>
#include <BCond.h>
```

Classes

- class [BRtc](#)
Realtime clock.
- class [BRtcThreaded](#)
Threaded real time clock.

10.40 /src/cern/tms/beam/libBeam/BRWLock.cpp File Reference

```
#include <BRWLock.h>
```

10.41 /src/cern/tms/beam/libBeam/BRWLock.h File Reference

```
#include <pthread.h>
```

Classes

- class [BRWLock](#)
thread read-write locks

Defines

- #define [BRWLOCK_H](#) 1

10.41.1 Define Documentation

10.41.1.1 #define BRWLOCK_H 1

10.42 /src/cern/tms/beam/libBeam/BSema.cpp File Reference

```
#include <BSema.h>
#include <errno.h>
#include <sys/time.h>
```

10.43 /src/cern/tms/beam/libBeam/BSema.h File Reference

```
#include <semaphore.h>
```

Classes

- class [BSema](#)
Sempahore class.

Defines

- #define [BSEMA_H](#) 1

10.43.1 Define Documentation

10.43.1.1 #define BSEMA_H 1

10.44 /src/cern/tms/beam/libBeam/BSocket.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
#include <stdio.h>
#include <errno.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <netdb.h>
#include <net/if.h>
#include "BSocket.h"
```

Defines

- #define [IP_MTU](#) 14

10.44.1 Define Documentation

10.44.1.1 #define IP_MTU 14

10.45 /src/cern/tms/beam/libBeam/BSocket.h File Reference

```
#include <BString.h>
#include <BError.h>
#include <BTypes.h>
#include <stdint.h>
#include <sys/types.h>
#include <sys/prctl.h>
```

Classes

- class [BSocketAddress](#)
Socket Address.
- class [BSocketAddressINET](#)
IP aware socket address.
- class [BSocket](#)

Defines

- #define [BSOCKET_H 1](#)

10.45.1 Define Documentation

10.45.1.1 #define BSOCKET_H 1

10.46 /src/cern/tms/beam/libBeam/BString.cpp File Reference

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <stdarg.h>
#include <ctype.h>
#include "BString.h"
```

Defines

- #define [DEBUG](#) 0
- #define [STRIP](#) 0x7f
- #define [MINUS](#) '-'

Functions

- static int [gmatch](#) (const char *s, const char *p)
- std::ostream & [operator<<](#) (std::ostream &o, [BString](#) &s)
- std::istream & [operator>>](#) (std::istream &i, [BString](#) &s)

10.46.1 Define Documentation

10.46.1.1 #define [DEBUG](#) 0

10.46.1.2 #define [MINUS](#) '-'

10.46.1.3 #define [STRIP](#) 0x7f

10.46.2 Function Documentation

10.46.2.1 static int [gmatch](#) (const char *s, const char *p) [static]

10.46.2.2 std::ostream& [operator<<](#) (std::ostream &o, [BString](#) &s)

10.46.2.3 std::istream& [operator>>](#) (std::istream &i, [BString](#) &s)

10.47 /src/cern/tms/beam/libBeam/BString.h File Reference

```
#include <BRefData.h>
#include <BList.h>
#include <iostream>
```

Classes

- class [BString](#)

Defines

- #define [BSTRING_H 1](#)

Functions

- std::ostream & [operator<<](#) (std::ostream &o, [BString](#) &s)
- std::istream & [operator>>](#) (std::istream &i, [BString](#) &s)

10.47.1 Define Documentation

10.47.1.1 #define BSTRING_H 1

10.47.2 Function Documentation

10.47.2.1 std::ostream& operator<< (std::ostream & o, [BString](#) & s)

10.47.2.2 std::istream& operator>> (std::istream & i, [BString](#) & s)

10.48 /src/cern/tms/beam/libBeam/BThread.cpp File Reference

```
#include <BThread.h>
#include <unistd.h>
#include <errno.h>
#include <sys/types.h>
```

10.49 /src/cern/tms/beam/libBeam/BThread.h File Reference

```
#include <pthread.h>
```

Classes

- class [BThread](#)

Defines

- #define [BTHREAD_H](#) 1

10.49.1 Define Documentation

10.49.1.1 #define BTHREAD_H 1

10.50 /src/cern/tms/beam/libBeam/BTimer.cpp File Reference

```
#include <BTimer.h>  
#include <sys/time.h>
```

10.51 /src/cern/tms/beam/libBeam/BTimer.h File Reference

```
#include <BMutex.h>
```

Classes

- class [BTimer](#)
Stopwatch style timer.

10.52 /src/cern/tms/beam/libBeam/BTypes.h File Reference

```
#include <stdint.h>
#include <sys/types.h>
#include <vector>
```

Defines

- #define [BTYPES_H](#) 1

Typedefs

- typedef int8_t [BInt8](#)
- typedef uint8_t [BUInt8](#)
- typedef int16_t [BInt16](#)
- typedef uint16_t [BUInt16](#)
- typedef int32_t [BInt32](#)
- typedef uint32_t [BUInt32](#)
- typedef int64_t [BInt64](#)
- typedef uint64_t [BUInt64](#)
- typedef float [BFloat](#)
- typedef double [BDouble](#)
- typedef size_t [BSize](#)
- typedef uint32_t [BUInt](#)
- typedef std::vector< float > [BArrayFloat](#)
- typedef std::vector< double > [BArrayDouble](#)
- typedef int8_t [Int8](#)
- typedef uint8_t [UInt8](#)
- typedef int16_t [Int16](#)
- typedef uint16_t [UInt16](#)
- typedef int32_t [Int32](#)
- typedef uint32_t [UInt32](#)
- typedef int64_t [Int64](#)
- typedef uint64_t [UInt64](#)
- typedef float [Float](#)
- typedef double [Double](#)

10.52.1 Define Documentation

10.52.1.1 `#define BTYPES_H 1`

10.52.2 Typedef Documentation

10.52.2.1 `typedef std::vector<double> BArrayDouble`

10.52.2.2 `typedef std::vector<float> BArrayFloat`

10.52.2.3 `typedef double BDouble`

10.52.2.4 `typedef float BFloat`

10.52.2.5 `typedef int16_t BInt16`

10.52.2.6 `typedef int32_t BInt32`

10.52.2.7 `typedef int64_t BInt64`

10.52.2.8 `typedef int8_t BInt8`

10.52.2.9 `typedef size_t BSize`

10.52.2.10 `typedef uint32_t BUInt`

10.52.2.11 `typedef uint16_t BUInt16`

10.52.2.12 `typedef uint32_t BUInt32`

10.52.2.13 `typedef uint64_t BUInt64`

10.52.2.14 `typedef uint8_t BUInt8`

10.52.2.15 `typedef double Double`

10.52.2.16 `typedef float Float`

10.52.2.17 `typedef int16_t Int16`

10.52.2.18 `typedef int32_t Int32`

10.52.2.19 `typedef int64_t Int64`

10.52.2.20 `typedef int8_t Int8`

10.52.2.21 `typedef uint16_t UInt16`

10.52.2.22 `typedef uint32_t UInt32`

10.52.2.23 `typedef uint64_t UInt64`

10.52.2.24 `typedef uint8_t UInt8`

10.53 /src/cern/tms/beam/libBeam/BUrl.cpp File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <memory.h>
#include <BUrl.h>
#include <curl/curl.h>
```

10.54 /src/cern/tms/beam/libBeam/BUrl.h File Reference

```
#include <stdio.h>
#include <BString.h>
#include <BError.h>
```

Classes

- class [BUrl](#)
Basic access to a Url.

Defines

- #define [BURL_H](#) 1

10.54.1 Define Documentation

10.54.1.1 #define BURL_H 1

10.55 overview.dox File Reference

10.56 SigGen.cpp File Reference

```
#include <SigGen.h>
#include <math.h>
#include <time.h>
```

Defines

- #define `DEBUG` 0
- #define `dprintf`(fmt, a...)

10.56.1 Define Documentation

10.56.1.1 #define `DEBUG` 0

10.56.1.2 #define `dprintf`(fmt, a...)

10.57 SigGen.h File Reference

```
#include <BList.h>
#include <BError.h>
```

Classes

- class [BSignal](#)
- class [SigGen](#)
- class [SigGenSine](#)
- class [SigGenSquare](#)
- class [SigGenNoise](#)
- class [SigGenPulse](#)
- class [SigGenBeam](#)

Defines

- #define [SigGen_h 1](#)

Typedefs

- typedef float [Sample](#)
- typedef [BList](#)< [BSignal](#) > [BSignalList](#)

10.57.1 Define Documentation

10.57.1.1 #define [SigGen_h 1](#)

10.57.2 Typedef Documentation

10.57.2.1 typedef [BList](#)<[BSignal](#)> [BSignalList](#)

10.57.2.2 typedef float [Sample](#)

10.58 test1.cpp File Reference

```
#include <stdio.h>
#include <TmsLib.h>
```

Functions

- void [printCycleParams](#) ([Tms::CycleParam](#) *p*)
- int [main](#) ()

10.58.1 Function Documentation

10.58.1.1 [int main](#) ()

10.58.1.2 [void printCycleParams](#) ([Tms::CycleParam](#) *p*)

10.59 TmsC.cc File Reference

```
#include <TmsC.h>
```

Namespaces

- namespace [Tms](#)

10.60 TmsC.h File Reference

This file contains the TmsAPI class definitions.

```
#include <stdlib.h>
#include <stdint.h>
#include <Boap.h>
#include <BString.h>
#include <BList.h>
#include <BArray.h>
#include <TmsD.h>
```

Namespaces

- namespace [Tms](#)

Classes

- class [Tms::PuControl](#)
This class defines the parameters for a test data capture.
- class [Tms::PuProcess](#)
This interface provides functions to configure and capture data from individual pick-up.
- class [Tms::TmsControl](#)
This interface provides functions to control, test and get statistics from the TMS as a whole.
- class [Tms::TmsProcess](#)
This interface provides functions to capture data from the TMS as a whole.
- class [Tms::TmsEvent](#)
This interface provides functions for events to be sent to clients from the TMS as a whole.

Defines

- #define [TMSC_H](#) 1

Variables

- const [BUInt32](#) [Tms::apiVersion](#) = 0

10.60.1 Detailed Description

This file contains the TmsAPI class definitions.

10.60.2 Define Documentation

10.60.2.1 `#define TMSC_H 1`

10.61 TmsCycleParam-1.cc File Reference

```
#include <stdlib.h>
#include <stdint.h>
#include <unistd.h>
#include <errno.h>
#include <math.h>
#include <TmsCycleParam.h>
#include <BFile.h>
#include <BEntry.h>
```

Namespaces

- namespace [Tms](#)

10.62 TmsCycleParam.cc File Reference

```
#include <stdlib.h>
#include <stdint.h>
#include <unistd.h>
#include <errno.h>
#include <math.h>
#include <TmsCycleParam.h>
#include <BFile.h>
#include <BEntry.h>
```

Namespaces

- namespace [Tms](#)

10.63 TmsCycleParam.h File Reference

```
#include <TmsLib.h>
```

Namespaces

- namespace [Tms](#)

Classes

- class [Tms::CycleParamState](#)
- class [Tms::CycleParamEdit](#)
Cycle Parameter management class.

Defines

- #define [TmsCycleParam_H 1](#)

10.63.1 Define Documentation

10.63.1.1 #define TmsCycleParam_H 1

10.64 TmsD.cc File Reference

```
#include <TmsD.h>
```

Namespaces

- namespace [Tms](#)

10.65 TmsD.h File Reference

```
#include <Boap.h>
#include <BList.h>
#include <BArray.h>
```

Namespaces

- namespace [Tms](#)

Classes

- class [Tms::NameValue](#)
- class [Tms::PuChannel](#)
This class stores a Physical Pick-Up channel id.
- class [Tms::PuStatus](#)
This class stores the status of an individual Pick-Up.
- class [Tms::ConfigInfo](#)
This class describes the configuration of the TMS.
- class [Tms::DataInfo](#)
This class defines the data to be acquired and/or fetched.
- class [Tms::DataValue](#)
This is the definition of a single data value.
- class [Tms::Data](#)
This class stores the raw data.
- class [Tms::PuStateTable](#)
This class defines the Pick-Up state table.
- class [Tms::CycleParam](#)
This class defines the parameters for a PS processing cycle.
- class [Tms::CycleParamItem](#)
- class [Tms::TestCaptureInfo](#)
This class defines the parameters for a test data capture.
- class [Tms::PupeConfig](#)
- class [Tms::CycleInformationPeriod](#)
Cycle information.
- class [Tms::CycleInformation](#)
- class [Tms::CycleTypeInfoInformationPeriod](#)
Cycle Type information.
- class [Tms::CycleTypeInfoInformation](#)

Defines

- #define TMSD_H 1

Enumerations

- enum Tms::Errors {
Tms::ErrorOk, Tms::ErrorMisc, Tms::ErrorWarning, Tms::ErrorInit,
Tms::ErrorConfig, Tms::ErrorParam, Tms::ErrorNotImplemented, Tms::ErrorComms,
Tms::ErrorCommsTimeout, Tms::ErrorMC, Tms::ErrorFpga, Tms::ErrorStateTable,
Tms::ErrorCycleNumber, Tms::ErrorDataNotAvailable, Tms::ErrorDataGone, Tms::ErrorData-
Future,
Tms::ErrorTimeout }
- enum Tms::CyclePeriod {
Tms::CyclePeriodAll, Tms::CyclePeriodCalibration, Tms::CyclePeriodEvent0, Tms::CyclePeriod-
Event1,
Tms::CyclePeriodEvent2, Tms::CyclePeriodEvent3, Tms::CyclePeriodEvent4, Tms::CyclePeriod-
Event5,
Tms::CyclePeriodEvent6, Tms::CyclePeriodEvent7, Tms::CyclePeriodEvent8, Tms::CyclePeriod-
Event9 }
- enum Tms::DataType { Tms::DataTypeRaw }
- enum Tms::DataFunction {
Tms::DataFunctionRaw, Tms::DataFunctionMean, Tms::DataFunctionMeanAll, Tms::Data-
FunctionMean0,
Tms::DataFunctionMean1 }
- enum Tms::TestOutput { Tms::TestOutputFrefLocal, Tms::TestOutputPIL1, Tms::TestOutputPIL2
}
- enum Tms::Priority { Tms::PriorityLow, Tms::PriorityNormal, Tms::PriorityHigh }

10.65.1 Define Documentation

10.65.1.1 #define TMSD_H 1

10.66 TmsEventServerList.cc File Reference

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

Namespaces

- namespace [Tms](#)

10.67 TmsEventServerList.h File Reference

```
#include <TmsD.h>
```

```
#include <TmsC.h>
```

Namespaces

- namespace [Tms](#)

Classes

- class [Tms::TmsEventServerList](#)

Defines

- #define [TmsEventServerList_H](#) 1

10.67.1 Define Documentation

10.67.1.1 #define TmsEventServerList_H 1

10.68 tmsFunctions.dox File Reference

Namespaces

- namespace [Tms](#)

10.69 TmsLib.cc File Reference

```
#include <stdlib.h>
#include <stdint.h>
#include <unistd.h>
#include <math.h>
#include <TmsLib.h>
#include <BDir.h>
#include <BEntry.h>
#include <BFile.h>
#include <TmsCycleParam.h>
```

Namespaces

- namespace [Tms](#)

10.70 TmsLib.h File Reference

```
#include <TmsD.h>
```

```
#include <TmsC.h>
```

Namespaces

- namespace [Tms](#)

Classes

- union [Tms::TmsState](#)
The Tms State entry.
- union [Tms::TmsPhase](#)
The Tms Phase Table Entry.
- class [Tms::CycleParamDb](#)
Internal CycleParameter management class.

Defines

- #define [TmsLib_H](#) 1

Enumerations

- enum [Tms::TimingSig](#) {
[Tms::TimingSigClock](#) = 0x01, [Tms::TimingSigCycleStart](#) = 0x02, [Tms::TimingSigCycleStop](#) = 0x04, [Tms::TimingSigCalStart](#) = 0x08,
[Tms::TimingSigCalStop](#) = 0x10, [Tms::TimingSigInjection](#) = 0x20, [Tms::TimingSigHChange](#) = 0x40, [Tms::TimingSigFRef](#) = 0x80 }
The timing signal bits.
- enum [Tms::CaptureClock](#) {
[Tms::ClkAdcDiv_1](#) = 0x00, [Tms::ClkAdcDiv_2](#) = 0x01, [Tms::ClkAdcDiv_5](#) = 0x02, [Tms::ClkAdcDiv_10](#) = 0x03,
[Tms::ClkAdcDiv_20](#) = 0x04, [Tms::ClkAdcDiv_50](#) = 0x05, [Tms::ClkAdcDiv_100](#) = 0x06, [Tms::ClkAdcDiv_200](#) = 0x07,
[Tms::ClkAdcDiv_500](#) = 0x08, [Tms::ClkAdcDiv_1000](#) = 0x09, [Tms::ClkAdcDiv_2000](#) = 0x0A, [Tms::ClkAdcDiv_5000](#) = 0x0B,
[Tms::ClkAdcDiv_10000](#) = 0x0C, [Tms::ClkAdcDiv_20000](#) = 0x0D, [Tms::ClkAdcDiv_50000](#) = 0x0E, [Tms::ClkAdcDiv_100000](#) = 0x0F,
[Tms::ClkMs](#) = 0x10, [Tms::ClkFref](#) = 0x11 }
The Diagnostics Capture Clock settings.

Variables

- const unsigned int `Tms::tmsNumPickups` = 40
The default number of pick ups.
- const unsigned int `Tms::tmsPhaseTableSize` = 512
The size of the Phase Table.

10.70.1 Define Documentation

10.70.1.1 `#define TmsLib_H 1`

10.71 TmsS.cc File Reference

```
#include <TmsC.h>
```

```
#include <TmsS.h>
```

Namespaces

- namespace [Tms](#)

10.72 TmsT.cc File Reference

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

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