2015 Test beam Run Control

Generated by Doxygen 1.8.9.1

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Contents

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Hierarchical Index

1.1 Class Hierarchy

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

Chapter 2

Data Structure Index

2.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 3

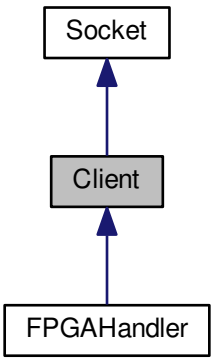
Data Structure Documentation

3.1 Client Class Reference

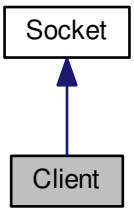
Base client object for the socket.

`#include <Client.h>`

Inheritance diagram for Client:



Collaboration diagram for Client:



Public Member Functions

- Client ()

  General void client constructor.
- Client (int port)

  Bind a socket client to a given port.
- virtual ~Client ()
- bool Connect ()

  Bind this client to the socket.
- void Disconnect ()

  Unbind this client from the socket.
- void Send (const Message &m) const

  Send a message to the master through the socket.
- void Receive ()

  Receive a socket message from the master.
- virtual void ParseMessage (const SocketMessage &m)

  Parse a SocketMessage received from the master.
- virtual SocketType GetType () const

  Socket actor type retrieval method.

Additional Inherited Members

3.1.1 Detailed Description

Base client object for the socket.

Client object used by the server to send/receive commands from the messenger/broadcaster.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

24 Mar 2015

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Client::Client ( ) [inline]

General void client constructor.

3.1.2.2 Client::Client (int *port*)

Bind a socket client to a given port.

3.1.2.3 virtual Client::~Client ( ) [virtual]

3.1.3 Member Function Documentation

3.1.3.1 bool Client::Connect ( )

Bind this client to the socket.

3.1.3.2 void Client::Disconnect ( )

Unbind this client from the socket.

3.1.3.3 virtual SocketType Client::GetType ( ) const [inline], [virtual]

Socket actor type retrieval method.

Reimplemented in FPGAHandler.

3.1.3.4 virtual void Client::ParseMessage (const SocketMessage & *m*) [inline], [virtual]

Parse a SocketMessage received from the master.

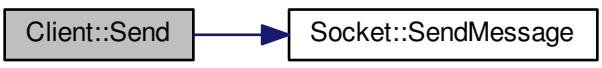
3.1.3.5 void Client::Receive ( )

Receive a socket message from the master.

3.1.3.6 void Client::Send (const Message & *m*) const [inline]

Send a message to the master through the socket.

Here is the call graph for this function:



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

- include/Client.h

3.2 Exception Class Reference

A simple exception handler.

`#include <Exception.h>`

Public Member Functions

- Exception (const char *from, std::string desc, ExceptionType type=Undefined, const int id=0)
- Exception (const char *from, const char *desc, ExceptionType type=Undefined, const int id=0)
- ~Exception ()
- std::string From () const
- int ErrorNumber () const
- std::string Description () const
- ExceptionType Type () const
- std::string TypeString () const
- void Dump (std::ostream &os=std::cerr) const

3.2.1 Detailed Description

A simple exception handler.

Author

Laurent Forthomme `laurent.forthomme@cern.ch`

Date

24 Mar 2015

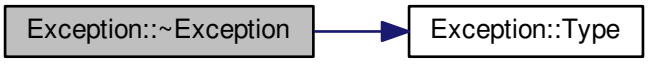
3.2.2 Constructor & Destructor Documentation

3.2.2.1 Exception::Exception (const char * *from*, std::string *desc*, ExceptionType *type* = `Undefined`, const int *id* = `0`) `[inline]`

3.2.2.2 Exception::Exception (const char * *from*, const char * *desc*, ExceptionType *type* = `Undefined`, const int *id* = `0`) `[inline]`

3.2.2.3 Exception::~Exception ( ) `[inline]`

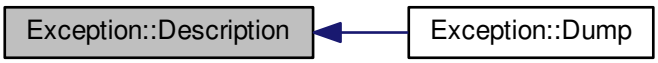
Here is the call graph for this function:



3.2.3 Member Function Documentation

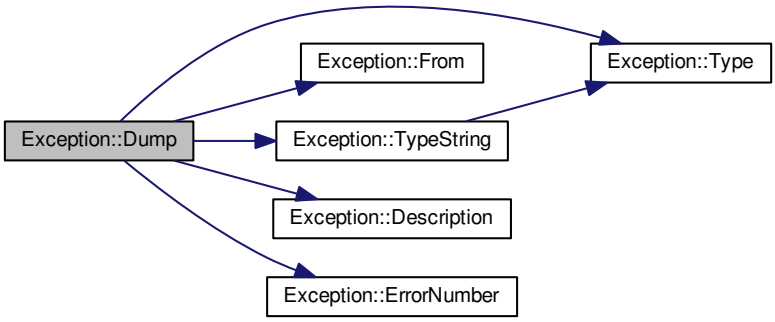
3.2.3.1 std::string Exception::Description ( ) const [inline]

Here is the caller graph for this function:



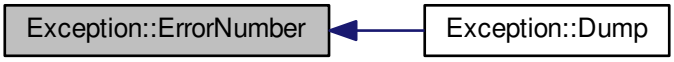
3.2.3.2 void Exception::Dump (std::ostream & *os* = std::cerr) const [inline]

Here is the call graph for this function:



3.2.3.3 int Exception::ErrorNumber ( ) const [inline]

Here is the caller graph for this function:

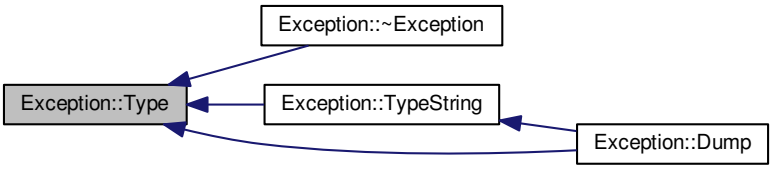


3.2.3.4 std::string Exception::From ( ) const [inline]

Here is the caller graph for this function:

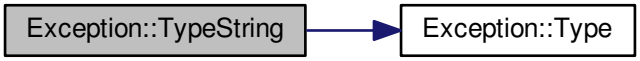
3.2.3.5 ExceptionType Exception::Type ( ) const [inline]

Here is the caller graph for this function:

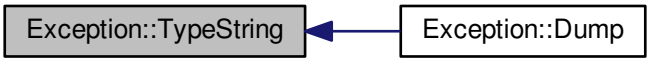


3.2.3.6 std::string Exception::TypeString ( ) const [inline]

Here is the call graph for this function:



Here is the caller graph for this function:



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

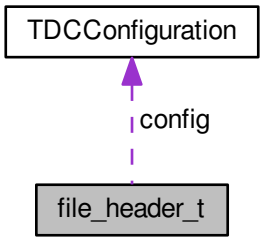
- include/Exception.h

3.3 file_header_t Struct Reference

Header to the output files.

`#include <FPGAHandler.h>`

Collaboration diagram for file_header_t:



Data Fields

- uint32_t magic
- uint32_t run_id
- uint32_t spill_id
- TDCConfiguration config

3.3.1 Detailed Description

Header to the output files.

General header to store in each collected data file for offline readout. It enable any reader to retrieve the run/spill number, as well as the HPTDC configuration during data collection.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

14 Apr 2015

3.3.2 Field Documentation

3.3.2.1 TDCConfiguration file_header_t::config

3.3.2.2 uint32_t file_header_t::magic

3.3.2.3 uint32_t file_header_t::run_id

3.3.2.4 uint32_t file_header_t::spill_id

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

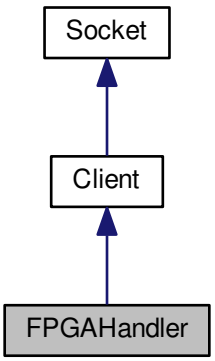
- include/FPGAHandler.h

3.4 FPGAHandler Class Reference

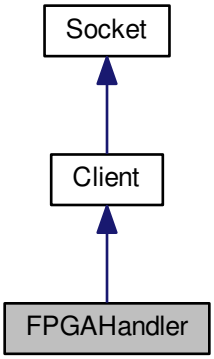
Driver for timing detectors' FPGA readout.

`#include <FPGAHandler.h>`

Inheritance diagram for FPGAHandler:



Collaboration diagram for FPGAHandler:



Public Member Functions

- FPGAHandler (int port, const char *dev)

  Bind to a FPGA through the USB protocol, and to the socket.
- virtual ~FPGAHandler ()
- void OpenFile ()

  Open an output file to store header/HPTDC events.
- void CloseFile ()

  Close a previously opened output file used to store header/HPTDC events.
- std::string GetFilename () const

  Retrieve the file name used to store data collected from the FPGA.
- void SetConfiguration (const TDCConfiguration &c)

  Submit the HPTDC setup word as a TDCConfiguration object.
- TDCConfiguration GetConfiguration ()

  Retrieve the HPTDC setup word as a TDCConfiguration object.
- void ReadBuffer ()
- SocketType GetType () const

  Socket actor type retrieval method.

Additional Inherited Members

3.4.1 Detailed Description

Driver for timing detectors' FPGA readout.

Main driver for a homebrew FPGA designed for the timing detectors' HPTDC chip readout.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

14 Apr 2015

3.4.2 Constructor & Destructor Documentation

3.4.2.1 FPGAHandler::FPGAHandler (int *port,* const char * *dev*)

Bind to a FPGA through the USB protocol, and to the socket.

3.4.2.2 virtual FPGAHandler::~FPGAHandler ( ) [virtual]

3.4.3 Member Function Documentation

3.4.3.1 void FPGAHandler::CloseFile ( )

Close a previously opened output file used to store header/HPTDC events.

3.4.3.2 TDCConfiguration FPGAHandler::GetConfiguration ( ) [inline]

Retrieve the HPTDC setup word as a TDCConfiguration object.

3.4.3.3 std::string FPGAHandler::GetFilename ( ) const [inline]

Retrieve the file name used to store data collected from the FPGA.

3.4.3.4 SocketType FPGAHandler::GetType ( ) const [inline], [virtual]

Socket actor type retrieval method.

Reimplemented from Client.

3.4.3.5 void FPGAHandler::OpenFile ( )

Open an output file to store header/HPTDC events.

3.4.3.6 void FPGAHandler::ReadBuffer ( )

3.4.3.7 void FPGAHandler::SetConfiguration (const TDCConfiguration & *c*) [inline]

Submit the HPTDC setup word as a TDCConfiguration object.

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

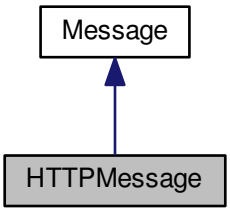
- include/FPGAHandler.h

3.5 HTTPMessage Class Reference

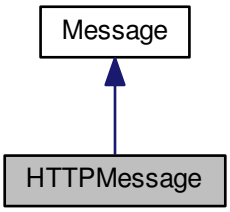
Message to be transmitted through a WebSocket protocol.

`#include <HTTPMessage.h>`

Inheritance diagram for HTTPMessage:



Collaboration diagram for HTTPMessage:



Public Member Functions

- HTTPMessage (WebSocket ∗ws, Message m, MessageAction a)
- HTTPMessage (WebSocket ∗ws, const char ∗msg, MessageAction a)
- void Decode ()
- void Encode ()
- MessageKey GetKey () const
- void Dump (std::ostream &os=std::cout) const

Additional Inherited Members

3.5.1 Detailed Description

Message to be transmitted through a WebSocket protocol.

Type of message compatible to the transmission through a WebSocket protocol. It enables a direct conversion of standards from any socket message format used elsewhere in this code using the *MessageAction* statement.

Author

Laurent Forthomme laurent.forthomme@cern.ch

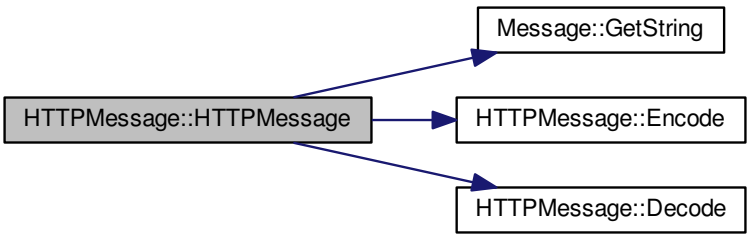
Date

1 Apr 2015

3.5.2 Constructor & Destructor Documentation

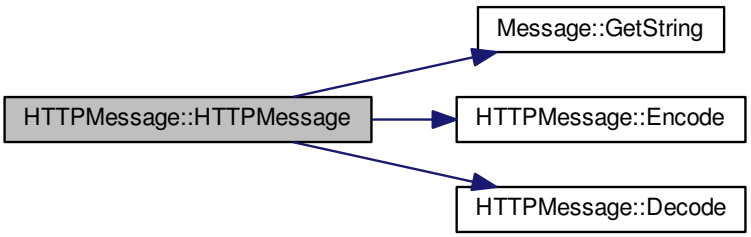
3.5.2.1 HTTPMessage::HTTPMessage (WebSocket * *ws*, Message *m*, MessageAction *a*) [inline]

Here is the call graph for this function:



3.5.2.2 HTTPMessage::HTTPMessage (WebSocket * *ws*, const char * *msg*, MessageAction *a*) [inline]

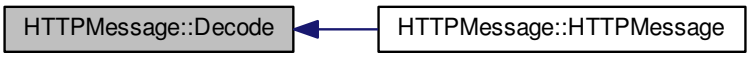
Here is the call graph for this function:



3.5.3 Member Function Documentation

3.5.3.1 void HTTPMessage::Decode ( ) [inline]

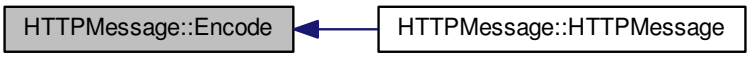
Here is the caller graph for this function:



3.5.3.2 void HTTPMessage::Dump (std::ostream & *os* = std::cout) const [inline]

3.5.3.3 void HTTPMessage::Encode ( ) [inline]

Here is the caller graph for this function:



3.5.3.4 MessageKey HTTPMessage::GetKey ( ) const [inline]

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

- include/HTTPMessage.h

3.6 ListenerInfo Struct Reference

Information on a socket's listener.

`#include <Messenger.h>`

Data Fields

- std::string name
- SocketType type

3.6.1 Detailed Description

Information on a socket's listener.

Structure handling its name and type for any listener/client to be used in the socket management parts of this code.

3.6.2 Field Documentation

3.6.2.1 std::string ListenerInfo::name

3.6.2.2 SocketType ListenerInfo::type

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

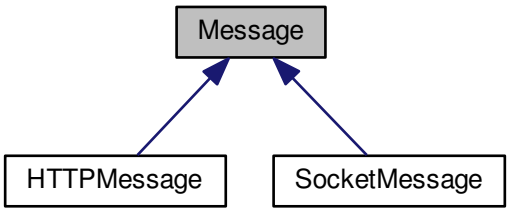
- include/Messenger.h

3.7 Message Class Reference

Base socket message type.

`#include <Message.h>`

Inheritance diagram for Message:



Public Member Functions

- Message ()

  Void message constructor.
- Message (const char *msg)

  Construct a message from a string.
- Message (std::string msg)

  Construct a message from a string.
- virtual ~Message ()
- MessageKey GetKey () const

  Placeholder for the MessageKey retrieval method.
- std::string GetString () const

  Retrieve the string carried by this message as a whole.
- bool IsFromWeb () const

  Extract from any message its potential arrival from a WebSocket protocol.
- void Dump (std::ostream &os=std::cout) const

Protected Attributes

- std::string fString

3.7.1 Detailed Description

Base socket message type.

Base handler for messages to be transmitted through the socket

Author

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Date

6 Apr 2015

3.7.2 Constructor & Destructor Documentation

3.7.2.1 Message::Message ( ) [inline]

Void message constructor.

3.7.2.2 Message::Message (const char * *msg*) [inline]

Construct a message from a string.

3.7.2.3 Message::Message (std::string *msg*) [inline]

Construct a message from a string.

3.7.2.4 virtual Message::~Message ( ) [inline], [virtual]

3.7.3 Member Function Documentation

3.7.3.1 void Message::Dump (std::ostream & *os* = std::cout) const [inline]

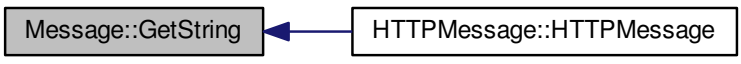
3.7.3.2 MessageKey Message::GetKey ( ) const [inline]

Placeholder for the MessageKey retrieval method.

3.7.3.3 std::string Message::GetString ( ) const [inline]

Retrieve the string carried by this message as a whole.

Here is the caller graph for this function:



3.7.3.4 bool Message::IsFromWeb ( ) const [inline]

Extract from any message its potential arrival from a WebSocket protocol.

3.7.4 Field Documentation

3.7.4.1 std::string Message::fString [protected]

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

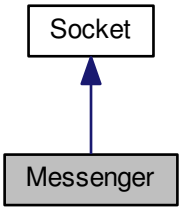
- include/Message.h

3.8 Messenger Class Reference

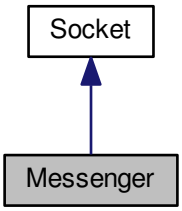
Base master object for the socket.

`#include <Messenger.h>`

Inheritance diagram for Messenger:



Collaboration diagram for Messenger:



Public Member Functions

- Messenger ()

Build a void master object or socket actor.

- Messenger (int port)

  Build a master object to control the socket.
- ~Messenger ()
- bool Connect ()

  Connect the master to the socket.
- void Disconnect ()

  Remove the master and destroy the socket.
- void Send (const Message &m, int sid) const

  Send any type of message to any client.
- void Receive ()

  Handle a message reception from a client.
- void Broadcast (const Message &m) const

  Emit a message to all clients connected through the socket.
- SocketType GetType () const

  Socket actor type retrieval method.

Additional Inherited Members

3.8.1 Detailed Description

Base master object for the socket.

Messenger/broadcaster object used by the server to send/receive commands from the clients/listeners.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

23 Mar 2015

3.8.2 Constructor & Destructor Documentation

3.8.2.1 Messenger::Messenger ( )

Build a void master object or socket actor.

3.8.2.2 Messenger::Messenger (int *port*)

Build a master object to control the socket.

3.8.2.3 Messenger::~Messenger ( )

3.8.3 Member Function Documentation

3.8.3.1 void Messenger::Broadcast (const Message & *m*) const

Emit a message to all clients connected through the socket.

Parameters

in	*m*	Message to transmit

3.8.3.2 bool Messenger::Connect ( )

Connect the master to the socket.

Connect this master to the socket for clients to be able to bind.

3.8.3.3 void Messenger::Disconnect ( )

Remove the master and destroy the socket.

Remove this master from the socket, thus disconnecting automatically the clients connected.

3.8.3.4 SocketType Messenger::GetType ( ) const [inline]

Socket actor type retrieval method.

3.8.3.5 void Messenger::Receive ( )

Handle a message reception from a client.

3.8.3.6 void Messenger::Send (const Message & *m*, int *sid*) const [inline]

Send any type of message to any client.

Parameters

in	*m*	Message to transmit
in	*sid*	Unique identifier of the client on this socket

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

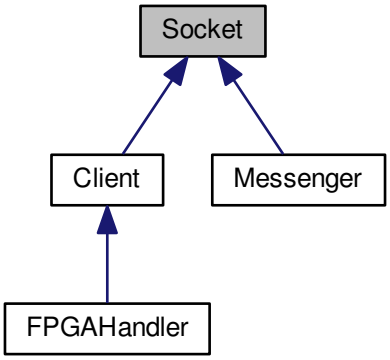
- include/Messenger.h

3.9 Socket Class Reference

Base socket object from which clients/master from a socket inherit.

`#include <Socket.h>`

Inheritance diagram for Socket:



Public Member Functions

- Socket ()
- Socket (int port)
- virtual ~Socket ()
- void Stop ()

  Terminates the socket and all attached communications.
- void SetPort (int port)
- int GetPort () const

  Retrieve the port used for this socket.
- void AcceptConnections (Socket &socket)

  Accept connection from a client.
- void SelectConnections ()
- void SetSocketId (int sid)
- int GetSocketId () const
- SocketType GetSocketType (int sid) const
- bool IsWebSocket (int sid) const
- void DumpConnected () const

Protected Member Functions

- bool Start ()

  Start the socket.
- void Bind ()

  Bind a name to a socket.
- void PrepareConnection ()
- void Listen (int maxconn)

  Listen to incoming messages.
- void SendMessage (Message message, int id=-1) const

  Send a message on a socket.
- Message FetchMessage (int id=-1) const

  Receive a message from a socket.

Protected Attributes

- int fPort
- char fBuffer [MAX_WORD_LENGTH]
- SocketCollection fSocketsConnected
- fd_set fMaster

  Master file descriptor list.
- fd_set fReadFds

  Temp file descriptor list for select()

3.9.1 Detailed Description

Base socket object from which clients/master from a socket inherit.

General object providing all useful method to connect/bind/send/receive information through system sockets.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

23 Mar 2015

3.9.2 Constructor & Destructor Documentation

3.9.2.1 Socket::Socket ( ) [inline]

3.9.2.2 Socket::Socket (int *port*)

3.9.2.3 virtual Socket::~Socket ( ) [virtual]

3.9.3 Member Function Documentation

3.9.3.1 void Socket::AcceptConnections (Socket & *socket*)

Accept connection from a client.

Set the socket to accept connections any client transmitting through the socket

Parameters

in,out	*socket*	Master/client object to enable on the socket

3.9.3.2 void Socket::Bind ( ) [protected]

Bind a name to a socket.

Returns

Success of the operation

3.9.3.3 void Socket::DumpConnected ( ) const

3.9.3.4 Message Socket::FetchMessage (int *id* = -1) const [protected]

Receive a message from a socket.

Returns

Received message as a std::string

3.9.3.5 int Socket::GetPort ( ) const [inline]

Retrieve the port used for this socket.

3.9.3.6 int Socket::GetSocketId ( ) const [inline]

3.9.3.7 SocketType Socket::GetSocketType (int *sid*) const [inline]

Here is the caller graph for this function:

3.9.3.8 bool Socket::IsWebSocket (int *sid*) const [inline]

Here is the call graph for this function:

3.9.3.9 void Socket::Listen (int *maxconn*) [protected]

Listen to incoming messages.

Set the socket to listen to any message coming from outside

3.9.3.10 void Socket::PrepareConnection ( ) [protected]

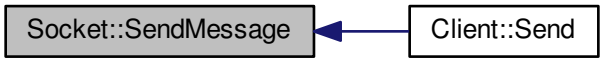
3.9.3.11 void Socket::SelectConnections ( )

Register all open file descriptors to read their communication through the socket

3.9.3.12 void Socket::SendMessage (Message *message*, int *id* = -1) const [protected]

Send a message on a socket.

Here is the caller graph for this function:



3.9.3.13 void Socket::SetPort (int *port*) [inline]

3.9.3.14 void Socket::SetSocketId (int *sid*) [inline]

3.9.3.15 bool Socket::Start ( ) [protected]

Start the socket.

Launch all mandatory operations to set the socket to be used

Returns

Success of the operation

3.9.3.16 void Socket::Stop ( )

Terminates the socket and all attached communications.

3.9.4 Field Documentation

3.9.4.1 char Socket::fBuffer[MAX_WORD_LENGTH] [protected]

3.9.4.2 fd_set Socket::fMaster [protected]

Master file descriptor list.

3.9.4.3 int Socket::fPort [protected]

3.9.4.4 fd_set Socket::fReadFds [protected]

Temp file descriptor list for select()

3.9.4.5 SocketCollection Socket::fSocketsConnected [protected]

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

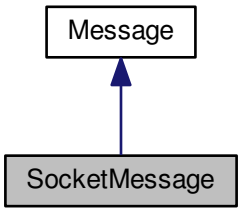
- include/Socket.h

3.10 SocketMessage Class Reference

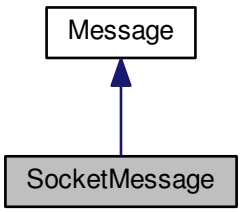
Socket-passed message type.

`#include <SocketMessage.h>`

Inheritance diagram for SocketMessage:



Collaboration diagram for SocketMessage:



Public Member Functions

- SocketMessage ()
- SocketMessage (const Message &msg)
- SocketMessage (const char *msg_s)
- SocketMessage (std::string msg_s)
- SocketMessage (MessageKey key)

  Construct a socket message out of a key.
- SocketMessage (MessageKey key, const char *value)

Construct a socket message out of a key and a string-type value.

- SocketMessage (MessageKey key, std::string value)

  Construct a socket message out of a key and a string-type value.
- SocketMessage (MessageKey key, const int value)

  Construct a socket message out of a key and an integer-type value.
- SocketMessage (MessageKey key, const float value)

  Construct a socket message out of a key and a float-type value.
- SocketMessage (MessageKey key, const double value)

  Construct a socket message out of a key and a double precision-type value.
- SocketMessage (MessageMap msg_m)

  Construct a socket message out of a map of key/string-type value.
- ~SocketMessage ()
- void SetKeyValue (MessageKey key, std::string value)

  String-valued message.
- void SetKeyValue (MessageKey key, const char *value)

  String-valued message.
- void SetKeyValue (MessageKey key, int int_value)

  Send an integer-valued message.
- void SetKeyValue (MessageKey key, float float_value)

  Float-valued message.
- void SetKeyValue (MessageKey key, double double_value)

  Double-valued message.
- std::string GetString () const

  Extract the whole key:value message.
- MessageKey GetKey () const

  Extract the message's key.
- std::string GetValue () const

  Extract the message's string value.
- int GetIntValue () const

  Extract the message's integer value.
- VectorValue GetVectorValue () const

  Extract the message's vector of string value.
- void Dump (std::ostream &os=std::cout) const

Additional Inherited Members

3.10.1 Detailed Description

Socket-passed message type.

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

26 Mar 2015

3.10.2 Constructor & Destructor Documentation

3.10.2.1 SocketMessage::SocketMessage ( ) [inline]

3.10.2.2 SocketMessage::SocketMessage (const Message & *msg*) [inline]

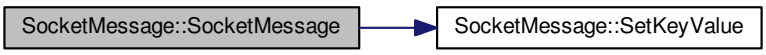
3.10.2.3 SocketMessage::SocketMessage (const char * *msg_s*) [inline]

3.10.2.4 SocketMessage::SocketMessage (std::string *msg_s*) [inline]

3.10.2.5 SocketMessage::SocketMessage (MessageKey *key*) [inline]

Construct a socket message out of a key.

Here is the call graph for this function:



3.10.2.6 SocketMessage::SocketMessage (MessageKey *key*, const char * *value*) [inline]

Construct a socket message out of a key and a string-type value.

Here is the call graph for this function:

3.10.2.7 SocketMessage::SocketMessage (MessageKey *key*, std::string *value*) [inline]

Construct a socket message out of a key and a string-type value.

Here is the call graph for this function:

3.10.2.8 SocketMessage::SocketMessage (MessageKey *key*, const int *value*) [inline]

Construct a socket message out of a key and an integer-type value.

Here is the call graph for this function:

3.10.2.9 SocketMessage::SocketMessage (MessageKey *key*, const float *value*) [inline]

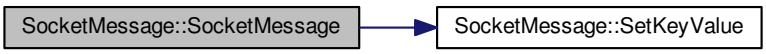
Construct a socket message out of a key and a float-type value.

Here is the call graph for this function:

3.10.2.10 SocketMessage::SocketMessage (MessageKey *key*, const double *value*) [inline]

Construct a socket message out of a key and a double precision-type value.

Here is the call graph for this function:



3.10.2.11 SocketMessage::SocketMessage (MessageMap *msg_m*) [inline]

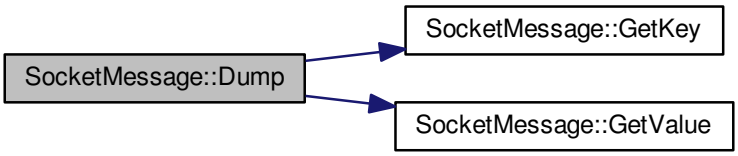
Construct a socket message out of a map of key/string-type value.

3.10.2.12 SocketMessage::~SocketMessage ( ) [inline]

3.10.3 Member Function Documentation

3.10.3.1 void SocketMessage::Dump (std::ostream & *os* = `std::cout`) const [inline]

Here is the call graph for this function:



3.10.3.2 int SocketMessage::GetIntValue ( ) const [inline]

Extract the message's integer value.

3.10.3.3 MessageKey SocketMessage::GetKey ( ) const [inline]

Extract the message's key.

Here is the caller graph for this function:

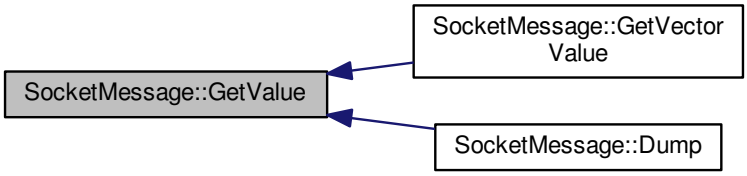
3.10.3.4 std::string SocketMessage::GetString ( ) const [inline]

Extract the whole key:value message.

3.10.3.5 std::string SocketMessage::GetValue ( ) const [inline]

Extract the message's string value.

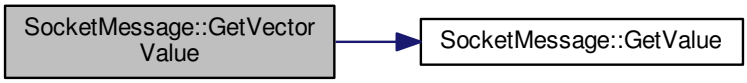
Here is the caller graph for this function:



3.10.3.6 VectorValue SocketMessage::GetVectorValue ( ) const [inline]

Extract the message's vector of string value.

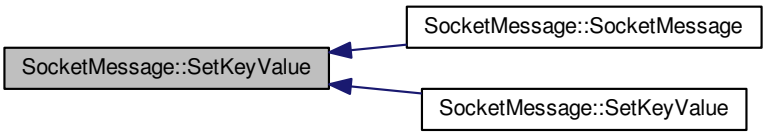
Here is the call graph for this function:



3.10.3.7 void SocketMessage::SetKeyValue (MessageKey *key*, std::string *value*) [inline]

String-valued message.

Here is the caller graph for this function:



3.10.3.8 void SocketMessage::SetKeyValue (MessageKey *key*, const char * *value*) [inline]

String-valued message.

Here is the call graph for this function:

3.10.3.9 void SocketMessage::SetKeyValue (MessageKey *key,* int *int_value*) [inline]

Send an integer-valued message.

Here is the call graph for this function:

3.10.3.10 void SocketMessage::SetKeyValue (MessageKey *key,* float *float_value*) [inline]

Float-valued message.

Here is the call graph for this function:

3.10.3.11 void SocketMessage::SetKeyValue (MessageKey *key,* double *double_value*) [inline]

Double-valued message.

Here is the call graph for this function:

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

- include/SocketMessage.h

3.11 TDCConfiguration Class Reference

Setup word to be sent to the HPTDC chip.

`#include <TDCConfiguration.h>`

Public Types

- enum EdgeResolution {
  E_100ps =0, E_200ps, E_400ps, E_800ps,
  E_1p6ns, E_3p12ns, E_6p25ns, E_12p5ns }
- enum DeadTime { DT_5ns =0, DT_10ns, DT_30ns, DT_100ns }
- enum WidthResolution {
  W_100ps =0, W_200ps, W_400ps, W_800ps,
  W_1p6ns, W_3p2ns, W_6p25ns, W_12p5ns,
  W_25ns, W_50ns, W_100ns, W_200ns,
  W_400ns, W_800ns }
- enum EnabledError {
  VernierError =0x1, CoarseError =0x2, ChannelSelectError =0x4, L1BufferParityError =0x8,
  TriggerFIFOParityError =0x10, TriggerMatchingError =0x20, ReadoutFIFOParityError =0x40, ReadoutState↩
  Error =0x80,
  SetupParityError =0x100, ControlParityError =0x200, JTAGInstructionParityError =0x400 }

Public Member Functions

- TDCConfiguration ()
- virtual ~TDCConfiguration ()
- void SetWord (const unsigned int i, const word_t word)

  Set one single word in the configuration.
- word_t GetWord (const unsigned int i) const

  Retrieve one single word from the configuration.
- uint8_t GetNumWords () const

  Number of words in the configuration.
- void SetEnableError (const uint16_t &err)
- uint16_t GetEnableError () const
- void SetEdgeResolution (const EdgeResolution r)
- EdgeResolution GetEdgeResolution () const
- void SetMaxEventSize (unsigned int sz)

  Set the maximum number of hits per event.
- uint8_t GetMaxEventSize () const

  Extract the maximum number of hits per event.
- void SetRejectFIFOFull (bool rej=true)

  Reject hits when readout FIFO full.
- bool GetRejectFIFOFull () const

  Are hits rejected when readout FIFO is full?
- void SetChannelOffset (int channel, uint16_t offset)
- uint16_t GetChannelOffset (int channel) const
- void SetAllChannelsOffset (uint16_t offset)

- void SetDLLAdjustment (int tap, uint8_t adj)

  Set the DLL taps adjustments with a resolution of ∼10 ps.
- uint8_t GetDLLAdjustment (int tap) const
- void SetAllTapsDLLAdjustment (uint8_t adj)
- void SetRCAdjustment (int tap, uint8_t adj)
- uint8_t GetRCAdjustment (int tap)
- void SetWidthResolution (const WidthResolution r)
- WidthResolution GetWidthResolution () const
- void SetDeadTime (const DeadTime dt)
- DeadTime GetDeadTime () const
- void SetLeadingMode (const bool lead=true)

  Enable the detection of leading edges.
- bool GetLeadingMode () const

  Extract the status for the detection of leading edges.
- void SetTrailingMode (const bool trail=true)

  Enable/disable the detection of trailing edges.
- bool GetTrailingMode () const

  Extract the status for the detection of trailing edges.
- void SetTriggerMatchingMode (const bool trig=true)
- bool GetTriggerMatchingMode () const
- void SetEdgesPairing (const bool pair=true)
- bool GetEdgesPairing () const
- void Dump (int verb=1, std::ostream &os=std::cout) const

3.11.1 Detailed Description

Setup word to be sent to the HPTDC chip.

Object handling the configuration word provided by/to the HPTDC chip

Author

Laurent Forthomme laurent.forthomme@cern.ch

Date

16 Apr 2015

3.11.2 Member Enumeration Documentation

3.11.2.1 enum TDCConfiguration::DeadTime

Enumerator

DT_5ns

DT_10ns

DT_30ns

DT_100ns

3.11.2.2 enum TDCConfiguration::EdgeResolution

Enumerator

E_100ps

E_200ps

E_400ps

E_800ps

E_1p6ns

E_3p12ns

E_6p25ns

E_12p5ns

3.11.2.3 enum TDCConfiguration::EnabledError

Enumerator

VernierError

CoarseError

ChannelSelectError

L1BufferParityError

TriggerFIFOParityError

TriggerMatchingError

ReadoutFIFOParityError

ReadoutStateError

SetupParityError

ControlParityError

JTAGInstructionParityError

3.11.2.4 enum TDCConfiguration::WidthResolution

Enumerator

W_100ps

W_200ps

W_400ps

W_800ps

W_1p6ns

W_3p2ns

W_6p25ns

W_12p5ns

W_25ns

W_50ns

W_100ns

W_200ns

W_400ns

W_800ns

3.11.3 Constructor & Destructor Documentation

3.11.3.1 TDCConfiguration::TDCConfiguration ( )

3.11.3.2 virtual TDCConfiguration::~TDCConfiguration ( ) [inline], [virtual]

3.11.4 Member Function Documentation

3.11.4.1 void TDCConfiguration::Dump (int *verb* = 1, std::ostream & *os* = std::cout) const

3.11.4.2 uint16_t TDCConfiguration::GetChannelOffset (int *channel*) const [inline]

3.11.4.3 DeadTime TDCConfiguration::GetDeadTime ( ) const [inline]

3.11.4.4 uint8_t TDCConfiguration::GetDLLAdjustment (int *tap*) const [inline]

3.11.4.5 EdgeResolution TDCConfiguration::GetEdgeResolution ( ) const [inline]

3.11.4.6 bool TDCConfiguration::GetEdgesPairing ( ) const [inline]

3.11.4.7 uint16_t TDCConfiguration::GetEnableError ( ) const [inline]

3.11.4.8 bool TDCConfiguration::GetLeadingMode ( ) const [inline]

Extract the status for the detection of leading edges.

3.11.4.9 uint8_t TDCConfiguration::GetMaxEventSize ( ) const [inline]

Extract the maximum number of hits per event.

3.11.4.10 uint8_t TDCConfiguration::GetNumWords ( ) const [inline]

Number of words in the configuration.

Return the number of words making up the full configuration word.

3.11.4.11 uint8_t TDCConfiguration::GetRCAdjustment (int *tap*) [inline]

3.11.4.12 bool TDCConfiguration::GetRejectFIFOFull ( ) const [inline]

Are hits rejected when readout FIFO is full?

Extract whether or not hits are rejected once FIFO is full.

3.11.4.13 bool TDCConfiguration::GetTrailingMode ( ) const [inline]

Extract the status for the detection of trailing edges.

3.11.4.14 bool TDCConfiguration::GetTriggerMatchingMode ( ) const [inline]

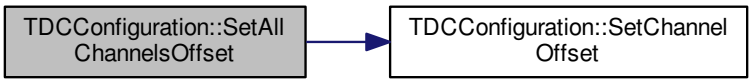
3.11.4.15 WidthResolution TDCConfiguration::GetWidthResolution ( ) const [inline]

3.11.4.16 word_t TDCConfiguration::GetWord (const unsigned int *i*) const [inline]

Retrieve one single word from the configuration.

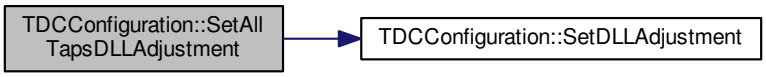
3.11.4.17 void TDCConfiguration::SetAllChannelsOffset (uint16_t *offset*) [inline]

Here is the call graph for this function:



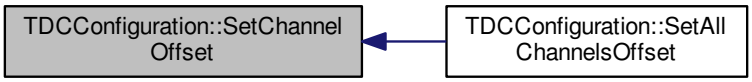
3.11.4.18 void TDCConfiguration::SetAllTapsDLLAdjustment (uint8_t *adj*) [inline]

Here is the call graph for this function:



3.11.4.19 void TDCConfiguration::SetChannelOffset (int *channel,* uint16_t *offset*) [inline]

Here is the caller graph for this function:

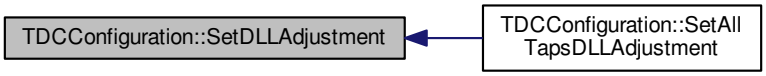


3.11.4.20 void TDCConfiguration::SetDeadTime (const DeadTime *dt*) [inline]

3.11.4.21 void TDCConfiguration::SetDLLAdjustment (int *tap,* uint8_t *adj*) [inline]

Set the DLL taps adjustments with a resolution of ∼10 ps.

Here is the caller graph for this function:



3.11.4.22 void TDCConfiguration::SetEdgeResolution (const EdgeResolution *r*) [inline]

3.11.4.23 void TDCConfiguration::SetEdgesPairing (const bool *pair* = true) [inline]

3.11.4.24 void TDCConfiguration::SetEnableError (const uint16_t & *err*) [inline]

3.11.4.25 void TDCConfiguration::SetLeadingMode (const bool *lead* = true) [inline]

Enable the detection of leading edges.

3.11.4.26 void TDCConfiguration::SetMaxEventSize (unsigned int *sz*) [inline]

Set the maximum number of hits per event.

Set the maximum number of hits that can be recorded for each event. It is always rounded to the next power of 2 (in the range 0-128), and if bigger than 128 then set to unimited.

3.11.4.27 void TDCConfiguration::SetRCAdjustment (int *tap,* uint8_t *adj*) [inline]

3.11.4.28 void TDCConfiguration::SetRejectFIFOFull (bool *rej* = true) [inline]

Reject hits when readout FIFO full.

Set whether or not hits are rejected once FIFO is full.

3.11.4.29 void TDCConfiguration::SetTrailingMode (const bool *trail* = true) [inline]

Enable/disable the detection of trailing edges.

3.11.4.30 void TDCConfiguration::SetTriggerMatchingMode (const bool *trig* = true) [inline]

3.11.4.31 void TDCConfiguration::SetWidthResolution (const WidthResolution *r*) [inline]

3.11.4.32 void TDCConfiguration::SetWord (const unsigned int *i,* const word_t *word*) [inline]

Set one single word in the configuration.

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

- include/TDCConfiguration.h

3.12 TDCEvent Class Reference

HPTDC event parser.

`#include <TDCEvent.h>`

Public Types

- enum EventType {
  Invalid =-1, GroupHeader =0, GroupTrailer, TDCHeader,
  TDCTrailer, LeadingEdge, TrailingEdge, Error,
  Debug }

Public Member Functions

- TDCEvent (const uint32_t &word)
- virtual ~TDCEvent ()
- EventType GetType () const

  Type of packet read out from the TDC.
- unsigned int GetTDCId () const

  Programmed identifier of master TDC.
- uint16_t GetEventId () const

  Event identifier from event counter.
- uint16_t GetWordCount () const

  Total number of words in event (including headers and trailers)
- uint16_t GetBunchId () const

  Bunch identifier of trigger (or trigger time tag)
- uint32_t GetLeadingTime (bool pair=false) const

  Leading edge measurement in programmed time resolution.
- uint8_t GetWidth () const

  Width of pulse in programmed time resolution.
- uint32_t GetTrailingTime () const

  Trailing edge measurement in programmed time resolution.
- uint16_t GetErrorFlags () const

  Return error flags if an error condition has been detected.

3.12.1 Detailed Description

HPTDC event parser.

Object enabling to decipher any measurement/error/debug event returned by the HPTDC chip

Author

Laurent Forthomme `laurent.forthomme@cern.ch`

Date

20 Apr 2015

3.12.2 Member Enumeration Documentation

3.12.2.1 enum TDCEvent::EventType

Enumerator

Invalid
GroupHeader
GroupTrailer
TDCHeader
TDCTrailer
LeadingEdge
TrailingEdge
Error
Debug

3.12.3 Constructor & Destructor Documentation

3.12.3.1 TDCEvent::TDCEvent (const uint32_t & *word*) [inline]

3.12.3.2 virtual TDCEvent::~TDCEvent ( ) [inline], [virtual]

3.12.4 Member Function Documentation

3.12.4.1 uint16_t TDCEvent::GetBunchId ( ) const [inline]

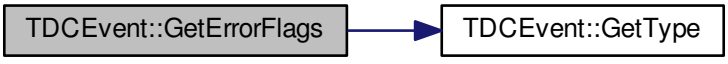
Bunch identifier of trigger (or trigger time tag)

Here is the call graph for this function:

3.12.4.2 uint16_t TDCEvent::GetErrorFlags ( ) const [inline]

Return error flags if an error condition has been detected.

Here is the call graph for this function:



3.12.4.3 uint16_t TDCEvent::GetEventId ( ) const [inline]

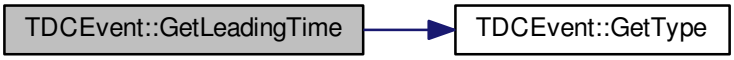
Event identifier from event counter.

Here is the call graph for this function:

3.12.4.4 uint32_t TDCEvent::GetLeadingTime (bool *pair* = false) const [inline]

Leading edge measurement in programmed time resolution.

Here is the call graph for this function:



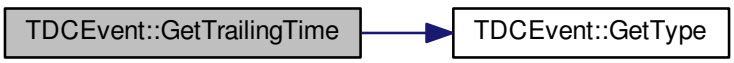
3.12.4.5 unsigned int TDCEvent::GetTDCId ( ) const [inline]

Programmed identifier of master TDC.

3.12.4.6 uint32_t TDCEvent::GetTrailingTime ( ) const [inline]

Trailing edge measurement in programmed time resolution.

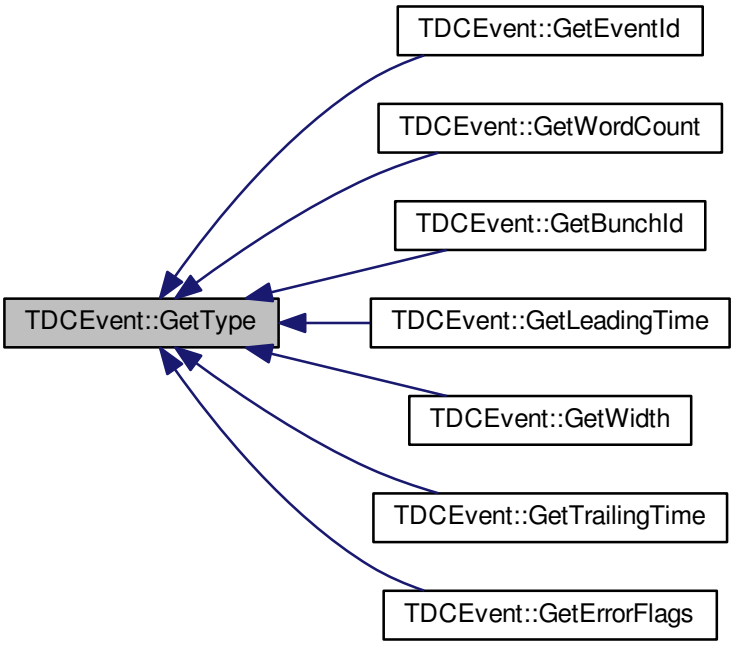
Here is the call graph for this function:



3.12.4.7 EventType TDCEvent::GetType ( ) const [inline]

Type of packet read out from the TDC.

Here is the caller graph for this function:



3.12.4.8 uint8_t TDCEvent::GetWidth ( ) const [inline]

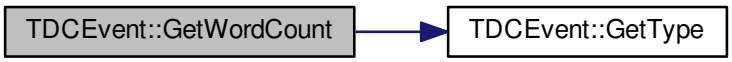
Width of pulse in programmed time resolution.

Here is the call graph for this function:

3.12.4.9 uint16_t TDCEvent::GetWordCount ( ) const [inline]

Total number of words in event (including headers and trailers)

Here is the call graph for this function:



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

- include/TDCEvent.h

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