

BINLOG

Manual

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Change History

Date	Changes (Author)
2020-02-12	Imported manual into new template (Bma)
2020-02-20	Mark functions not supported under Linux (Wep)

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1 Introduction

This document describes the usage of the binlog library provided with CANoe/CANalyzer.

The BL package is installed in the folder `Programming\BLF_Logging` of the CANoe/CANalyzer installation.

Besides the binlog header file in the `Include` folder, a sample CMake project is provided in the subfolder `BLF_Project`, which demonstrates the usage of the binlog library. The resulting sample program `bl` creates the BL file `test.blf`.

In the subfolder `Demo` CANoe/CANalyzer configurations are provided, which make use of the generated sample BL file.

2 BL Functions

2.1 Overview

```
BLAPI( BLHANDLE) BLCREATEFILE( const char * lpFileName,  
                                uint32_t dwDesiredAccess);
```

```
BLAPI( BLHANDLE) BLCREATEFILEW( const wchar_t * lpFileName,  
                                uint32_t dwDesiredAccess);
```

```
BLAPI( BLHANDLE) BLCREATEFILEEX( const char * lpFileName,  
                                uint32_t dwDesiredAccess,  
                                const char * lpServer,  
                                const char * lpHost);
```

```
BLAPI( BLHANDLE) BLCREATEFILEEXW( const wchar_t * lpFileName,  
                                uint32_t dwDesiredAccess,  
                                const wchar_t * lpServer,  
                                const wchar_t * lpHost);
```

```
BLAPI( BLHANDLE) BLCREATEFILEEX2( const char * lpFileName,  
                                uint32_t dwDesiredAccess,  
                                const char * lpServer,  
                                const char * lpHost,  
                                IBLCallback* pCallback);
```

```
BLAPI( BLHANDLE) BLCREATEFILEEX2W( const wchar_t * lpFileName,  
                                uint32_t dwDesiredAccess,  
                                const wchar_t * lpServer,  
                                const wchar_t * lpHost,  
                                IBLCallback* pCallback);
```

```
BLAPI( int32_t) BLCLOSEHANDLE( BLHANDLE hFile);
```

```
BLAPI( int32_t) BLWRITEOBJECT( BLHANDLE hFile,  
                                VBLOBJECTHEADERBASE* pBase);
```

```
BLAPI( int32_t)  BLPeekObject(BLHANDLE hFile,  
                             VBLObjectHeaderBase* pBase);
```

```
BLAPI( int32_t)  BLSkipObject(BLHANDLE hFile,  
                             VBLObjectHeaderBase* pBase);
```

```
BLAPI( int32_t)  BLReadObject(BLHANDLE hFile,  
                             VBLObjectHeaderBase* pBase);
```

```
BLAPI( int32_t)  BLReadObjectSecure(BLHANDLE hFile,  
                                     VBLObjectHeaderBase* pBase,  
                                     size_t expectedSize);
```

```
BLAPI( int32_t)  BLFreeObject(BLHANDLE hFile,  
                              VBLObjectHeaderBase* pBase);
```

```
BLAPI( int32_t)  BLSeekTime( BLHANDLE hFile,  
                             uint64_t timeStamp,  
                             void* arg,  
                             int32_t(*pProgressCallback)(void*, float),  
                             uint16_t callbackRate);
```

```
BLAPI( int32_t)  BLSetApplication(BLHANDLE hFile,  
                                  uint8_t appID,  
                                  uint8_t appMajor,  
                                  uint8_t appMinor,  
                                  uint8_t appBuild);
```

```
BLAPI( int32_t)  BLSetWriteOptions( BLHANDLE hFile,  
                                    uint32_t dwCompression,  
                                    uint32_t dwReserved);
```

```
BLAPI( int32_t)  BLSetMeasurementStartTime( BLHANDLE hFile,  
                                             const LPSYSTEMTIME lpStartTime);
```

```
BLAPI( int32_t)  BLGetFileStatistics( BLHANDLE hFile,  
                                       VBLFileStatistics* pStatistics);
```

```
BLAPI( int32_t)  BLGetFileStatisticsEx( BLHANDLE hFile,  
                                         VBLFileStatisticsEx* pStatistics);
```

```
BLAPI( int32_t)  BLFlushFileBuffers( BLHANDLE hFile,  
                                       uint32_t dwFlags);
```

```
BLAPI( int32_t)  BLSetNotificationEvent( BLHANDLE hFile,  
                                          BLHANDLE handle);
```

2.2 BLCreatFile

Syntax	BLAPI (BLHANDLE) BLCreatFile(const char *lpFileName, uint32_t dwDesiredAccess)
Description	Use this function to open a BL file with the desired access.
Parameters	<p>const char * lpFileName</p> <p>Pointer to a null-terminated string that specifies the name of the file to create or open.</p> <p>uint32_t dwDesiredAccess</p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be GENERIC_READ or GENERIC_WRITE.</p>
Return values	If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is BLINVALID_HANDLE_VALUE.

2.3 BLCreatFileW

Syntax	BLAPI (BLHANDLE) BLCreatFileW(const wchar_t * lpFileName, uint32_t dwDesiredAccess)
Description	Use this function to open a BL file with the desired access.
Parameters	<p>const wchar_t * lpFileName</p> <p>Pointer to a null-terminated wide string that specifies the name of the file to create or open.</p> <p>uint32_t dwDesiredAccess</p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be GENERIC_READ or GENERIC_WRITE.</p>
Return values	If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is BLINVALID_HANDLE_VALUE.

2.4 BLCreatFileEx

Syntax	<pre> BLAPI (BLHANDLE) BLCreatFileEx(const char * lpFileName, uint32_t dwDesiredAccess, const char * lpServer, const char * lpHost) </pre>
Description	<p>Use this function to open a BL file with the desired access.</p> <p>Under Linux <code>lpServer</code> and <code>lpHost</code> are ignored.</p>
Parameters	<p><code>const char * lpFileName</code></p> <p>Pointer to a null-terminated string that specifies the name of the file to create or open.</p> <p><code>uint32_t dwDesiredAccess</code></p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be <code>GENERIC_READ</code> or <code>GENERIC_WRITE</code>.</p> <p><code>const char * lpServer</code></p> <p>Pointer to a null-terminated string that specifies an external logging provider, with the syntax <GUID> <dll name>. If a null-pointer is passed, no external logging provider is used</p> <p><code>const char * lpHost</code></p> <p>Pointer to a null-terminated string that specifies a logging host. Currently unused.</p>
Return values	<p>If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is <code>BLINVALID_HANDLE_VALUE</code>.</p>

2.5 BLCreateFileExW

Syntax	<pre>BLAPI(BLHANDLE) BLCreateFileExW(const wchar_t * lpFileName, uint32_t dwDesiredAccess, const wchar_t * lpServer, const wchar_t * lpHost)</pre>
Description	<p>Use this function to open a BL file with the desired access.</p> <p>Under Linux <code>lpServer</code> and <code>lpHost</code> are ignored.</p>
Parameters	<p><code>const wchar_t * lpFileName</code></p> <p>Pointer to a null-terminated wide string that specifies the name of the file to create or open.</p> <p><code>uint32_t dwDesiredAccess</code></p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be <code>GENERIC_READ</code> or <code>GENERIC_WRITE</code>.</p> <p><code>const wchar_t * lpServer</code></p> <p>Pointer to a null-terminated wide string that specifies an external logging provider, with the syntax <code><GUID> <dll name></code>. If a null-pointer is passed, no external logging provider is used</p> <p><code>const wchar_t * lpHost</code></p> <p>Pointer to a null-terminated wide string that specifies a logging host. Currently unused.</p>
Return values	<p>If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is <code>BLINVALID_HANDLE_VALUE</code>.</p>

2.6 BLCREATEFILEEX2

Syntax	<pre>BLAPI (BLHANDLE) BLCREATEFILEEX2 (const char * lpFileName, uint32_t dwDesiredAccess, const char * lpServer, const char * lpHost, IBLCallback* pCallback)</pre>
Description	<p>Use this function to open a BL file with the desired access.</p> <p>Under Linux <code>lpServer</code> and <code>lpHost</code> are ignored.</p>
Parameters	<p><code>const char * lpFileName</code></p> <p>Pointer to a null-terminated string that specifies the name of the file to create or open.</p> <p><code>uint32_t dwDesiredAccess</code></p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be <code>GENERIC_READ</code> or <code>GENERIC_WRITE</code>.</p> <p><code>const char * lpServer</code></p> <p>Pointer to a null-terminated string that specifies an external logging provider, with the syntax <code><GUID> <dll name></code>. If a null-pointer is passed, no external logging provider is used</p> <p><code>const char * lpHost</code></p> <p>Pointer to a null-terminated string that specifies a logging host. Currently unused.</p> <p><code>IBLCallback* pCallback</code></p> <p>Pointer to a callback function where binlog can write status and error messages. If a null-pointer is passed, the messages are suppressed.</p>
Return values	<p>If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is <code>INVALID_HANDLE_VALUE</code>.</p>

2.7 BLCreateFileEx2W

Syntax	<pre>BLAPI (BLHANDLE) BLCreateFileEx2W(const wchar_t * lpFileName, uint32_t dwDesiredAccess, const wchar_t * lpServer, const wchar_t * lpHost, IBLCallback* pCallback)</pre>
Description	<p>Use this function to open a BL file with the desired access.</p> <p>Under Linux <code>lpServer</code>, <code>lpHost</code> and <code>pCallback</code> are ignored.</p>
Parameters	<p><code>const wchar_t * lpFileName</code></p> <p>Pointer to a null-terminated wide string that specifies the name of the file to create or open.</p> <p><code>uint32_t dwDesiredAccess</code></p> <p>Specifies the type of access to the file. An application can obtain read access or write access. This parameter can be <code>GENERIC_READ</code> or <code>GENERIC_WRITE</code>.</p> <p><code>const wchar_t * lpServer</code></p> <p>Pointer to a null-terminated wide string that specifies an external logging provider, with the syntax <code><GUID> <dll name></code>. If a null-pointer is passed, no external logging provider is used</p> <p><code>const wchar_t * lpHost</code></p> <p>Pointer to a null-terminated wide string that specifies a logging host. Currently unused.</p> <p><code>IBLCallback* pCallback</code></p> <p>Pointer to a callback function where binlog can write status and error messages. If a null-pointer is passed, the messages are suppressed.</p>
Return values	<p>If the function succeeds, the return value is an open handle to the specified file. If the function fails, the return value is <code>BLINVALID_HANDLE_VALUE</code>.</p>

2.8 BLCloseHandle

Syntax	BLAPI(int32_t) BLCloseHandle(BLHANDLE hFile)
Description	Use this function to close a BL file opened with BLCreateFile.
Parameters	BLHANDLE hFile The file handle returned by BLCreateFile.
Return values	If the function succeeds, the return value is nonzero. If the function fails, the return value is zero.

2.9 BLWriteObject

Syntax	BLAPI(int32_t) BLWriteObject(BLHANDLE hFile, VBLObjectHeaderBase* pBase)
Description	Use this function to write a BL object to the file.
Parameters	BLHANDLE hFile The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_WRITE access to the file. VBLObjectHeaderBase* pBase Pointer to a BL object structure containing the data to be written to the file.
Return values	If the function succeeds, the return value is nonzero. If the function fails, the return value is zero.

2.10 BLPeekObject

Syntax	BLAPI(int32_t) BLPeekObject(BLHANDLE hFile, VBLObjectHeaderBase* pBase)
Description	Use this function to read the base header part of a BL object.
Parameters	<p>BLHANDLE hFile</p> <p>The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_READ access to the file.</p> <p>VBLObjectHeaderBase* pBase</p> <p>Pointer to a BL object structure that receives the object header description.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.11 BLSkipObject

Syntax	BLAPI(int32_t) BLSkipObject(BLHANDLE hFile, VBLObjectHeader Base* pBase)
Description	Use this function to skip a BL object.
Parameters	<p>BLHANDLE hFile</p> <p>The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_READ access to the file.</p> <p>VBLObjectHeaderBase* pBase</p> <p>Pointer to a BL object structure that describes the object to be skipped.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.12 BLReadObject (Obsolete)

Obsolete: This function has been replaced by BLReadObjectSecure.

Syntax	BLAPI(int32_t) BLReadObject(BLHANDLE hFile, VBLObjectHeaderBase* pBase)
Description	Use this function to read a BL object.
Parameters	<p>BLHANDLE hFile The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_READ access to the file.</p> <p>VBLObjectHeaderBase* pBase Pointer to a BL object structure that describes the object to be read.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.13 BLReadObjectSecure

Syntax	BLAPI(int32_t) BLReadObjectSecure(BLHANDLE hFile, VBLObjectHeaderBase* pBase, size_t expectedSize)
Description	Use this function to read a BL object.
Parameters	<p>BLHANDLE hFile The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_READ access to the file.</p> <p>VBLObjectHeaderBase* pBase Pointer to a BL object structure that describes the object to be read.</p> <p>size_t expectedSize Size of BL object structure which is provided by pointer pBase.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.14 BLFreeObject

Syntax	BLAPI(int32_t) BLFreeObject(BLHANDLE hFile, VBLObjectHeaderBase* pBase)
Description	Use this function to free the memory which has been allocated for a previously read BL object. Although this is only required for dynamic sized objects such as environment variables it doesn't harm to call this method for fixed sized objects like CAN messages as well.
Parameters	<p>BLHANDLE hFile The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_READ access to the file.</p> <p>VBLObjectHeaderBase* pBase Pointer to a BL object structure that describes the object to be freed.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.15 BLSeekTime

Syntax	<pre>BLAPI(int32_t) BLSeekTime (BLHANDLE hFile, uint64_t timeStamp, void* arg, int32_t(*pProgressCallback)(void*, float), uint16_t callbackRate)</pre>
Description	<p>Use this function to seek forward in a BLF file to the first object with a certain time stamp.</p> <p>This function is not supported under Linux.</p>
Parameters	<p><code>BLHANDLE hFile</code></p> <p>The file handle returned by <code>BLCreateFile</code>. The file handle must have been created with <code>GENERIC_READ</code> access to the file.</p> <p><code>uint64_t timeStamp</code></p> <p>The time stamp value you are searching for.</p> <p><code>void* arg</code></p> <p>Argument which is passed back to the <code>pProgressCallback</code> call. It can be used as a bridge between the C-Style binlog interface and C++ (by passing the class this pointer).</p> <p><code>int32_t (*pProgressCallback) (void*, float)</code></p> <p>Callback function, which passes back the <code>arg</code> pointer and the progress value (between 0 and 1.0).</p> <p><code>uint16_t callbackRate</code></p> <p>Rate how often <code>pProgressCallback</code> is called (in ms).</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.16 BLSetApplication

Syntax	<pre>BLAPI(int32_t) BLSetApplication(BLHANDLE hFile, uint8_t appID, uint8_t appMajor, uint8_t appMinor, uint8_t appBuild)</pre>
Description	Use this function to specify the application which writes the file.
Parameters	<p><code>BLHANDLE hFile</code></p> <p>The file handle returned by <code>BLCreateFile</code>. The file handle must have been created with <code>GENERIC_WRITE</code> access to the file.</p> <p><code>uint8_t appID</code></p> <p>The application identifier.</p> <p><code>uint8_t appMajor</code></p> <p>The application major version number.</p> <p><code>uint8_t appMinor</code></p> <p>The application minor version number.</p> <p><code>uint8_t appBuild</code></p> <p>The application build version number.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.17 BLSetWriteOptions

Syntax	BLAPI(int32_t) BLSetWriteOptions(BLHANDLE hFile, uint32_t dwCompression, uint32_t dwReserved)
Description	Use this function to set the compression.
Parameters	<p>BLHANDLE hFile</p> <p>The file handle returned by BLCreatFile. The file handle must have been created with GENERIC_WRITE access to the file.</p> <p>uint32_t dwCompression</p> <p>The compression to be used during write. Valid values range from 0 (no compression) to 10 (maximum compression).</p> <p>uint32_t dwReserved</p> <p>Reserved. Must be zero.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.18 BLSetMeasurementStartTime

Syntax	BLAPI(int32_t) BLSetMeasurementStartTime(BLHANDLE hFile, const LPSYSTEMTIME lpStartTime);
Description	Use this function to set the measurement start time
Parameters	<p>BLHANDLE hFile</p> <p>The file handle returned by BLCreatFile. The file handle must have been created with GENERIC_WRITE access to the file.</p> <p>LPSYSTEMTIME lpStartTime</p> <p>The pointer to the windows system time structure</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

2.19 BLGetFileStatistics

Syntax	BLAPI(int32_t) BLGetFileStatistics(BLHANDLE hFile, VBLFileStatistics* pStatistics)
Description	Use this function to retrieve the file statistics.
Parameters	BLHANDLE hFile The file handle returned by BLCreatFile. The file handle must have been created with GENERIC_READ access to the file. VBLFileStatistics* pStatistics The pointer to the file statistics structure.
Return values	If the function succeeds, the return value is nonzero. If the function fails, the return value is zero.

2.20 BLGetFileStatisticsEx

Syntax	BLAPI(int32_t) BLGetFileStatisticsEx(BLHANDLE hFile, VBLFileStatisticsEx* pStatistics)
Description	Use this function to retrieve the extended file statistics.
Parameters	BLHANDLE hFile The file handle returned by BLCreatFile. The file handle must have been created with GENERIC_READ access to the file. VBLFileStatisticsEx* pStatistics The pointer to the extended file statistics structure.
Return values	If the function succeeds, the return value is nonzero. If the function fails, the return value is zero.

2.21 BLFlushFileBuffers

Syntax	BLAPI(int32_t) BLFlushFileBuffers(BLHANDLE hFile, uint32_t dwFlags)
Description	Use this function to flush the file buffers.
Parameters	<p>BLHANDLE hFile</p> <p>The file handle returned by BLCreateFile. The file handle must have been created with GENERIC_WRITE access to the file.</p> <p>uint32_t dwFlags</p> <p>Flag indicating how to flush. Valid values are:</p> <p>BL_FLUSH_STREAM - flushes all internal streams</p> <p>BL_FLUSH_FILE - flushes the file and combinations thereof.</p>
Return values	<p>If the function succeeds, the return value is nonzero.</p> <p>If the function fails, the return value is zero.</p>

3 BL structures

3.1 Overview

VBLObjectHeaderBase

VBLFileStatistics

3.2 VBLObjectHeaderBase

```
typedef struct VBLObjectHeaderBase_t
{
    uint32_t mSignature; /* signature (BL_OBJ_SIGNATURE) */
    uint16_t mHeaderSize; /* sizeof object header */
    uint16_t mHeaderVersion; /* header version (1) */
    uint32_t mObjectSize; /* object size */
    uint32_t mObjectType; /* object type (BL_OBJ_TYPE_XXX) */
} VBLObjectHeaderBase;
```

3.3 VBLFileStatistics

```
typedef struct VBLFileStatistics_t
{
    uint32_t mStatisticsSize; /* sizeof (VBLFileStatistics) */
    uint8_t mApplicationID; /* application ID */
    uint8_t mApplicationMajor; /* application major number */
    uint8_t mApplicationMinor; /* application minor number */
    uint8_t mApplicationBuild; /* application build number */
    uint64_t mFileSize; /* file size in bytes */
    uint64_t mUncompressedFileSize;
                                /* uncompressed file size in bytes */
    uint32_t mObjectCount; /* number of objects */
    uint32_t mObjectsRead; /* number of objects read */
} VBLFileStatistics;
```

3.4 VBLFileStatisticsEx

```
typedef struct VBLFileStatisticsEx_t
{
    uint32_t mStatisticsSize; /* sizeof(VBLFileStatisticsEx) */
    uint8_t mApplicationID; /* application ID */
    uint8_t mApplicationMajor; /* application major number */
    uint8_t mApplicationMinor; /* application minor number */
    uint8_t mApplicationBuild; /* application build number */
    uint64_t mFileSize; /* file size in bytes */
    uint64_t mUncompressedFileSize;
    /* uncompressed file size in bytes */
    uint32_t mObjectCount; /* number of objects */
    uint32_t mObjectsRead; /* number of objects read */
    SYSTEMTIME mMeasurementStartTime;
    /* measurement start time */
    SYSTEMTIME mLastObjectTime; /* last object time */
    uint32_t mReserved[18]; /* reserved */
} VBLFileStatisticsEx;
```

4 Additional informations

4.1 Extended CAN identifiers

The following structure is used to write CAN frames:

```
typedef struct VBLCANMessage_t
{
    VBLObjectHeader mHeader;    /* object header */
    uint16_t         mChannel;   /* application channel */
    uint8_t          mFlags;     /* CAN dir & rtr */
    uint8_t          mDLC;       /* CAN dlc */
    uint32_t         mID;        /* CAN ID */
    uint8_t          mData[8];   /* CAN data */
} VBLCANMessage;
```

The member `mID` is used for the numeric identifier of the frame. If you want to write an extended frame identifier, you must set the highest bit of the `mID` field. E.g. if you want to write a frame with the extended identifier `0x100`, you must do the following:

```
message.mID = 0x80000100
```

For the same frame with a standard identifier you would use the field `mID` in the following way:

```
message.mID = 0x00000100
```


5 License

5.1 Acknowledgement

The compression routines used in the BL library derive from the zlib library.

5.2 The zlib Software License

zlib (<http://www.gzip.org/zlib/>) Copyright (C) 1995-2002 Jean-loup Gailly and Mark Adler

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files <https://www.ietf.org/rfc/rfc1950.txt> (zlib format), [rfc1951.txt](https://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](https://www.ietf.org/rfc/rfc1952.txt) (gzip format).