

Operation Manual

CombiTest

MT8852B Plug-In

DUT Control API Reference

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Chapter 1 — Introduction

CombiTest with the MT8852B Plug-in facilitates production line testing of Bluetooth devices using the MT8852B Bluetooth test set.

During calibration sequences the MT8852B Plug-in controls the DUT via an interface supported through the DUT Control DLL.

This document details the API calls which must be supported by the DUT Control DLL in order for the MT8852B Plug-in to fully control the DUT.

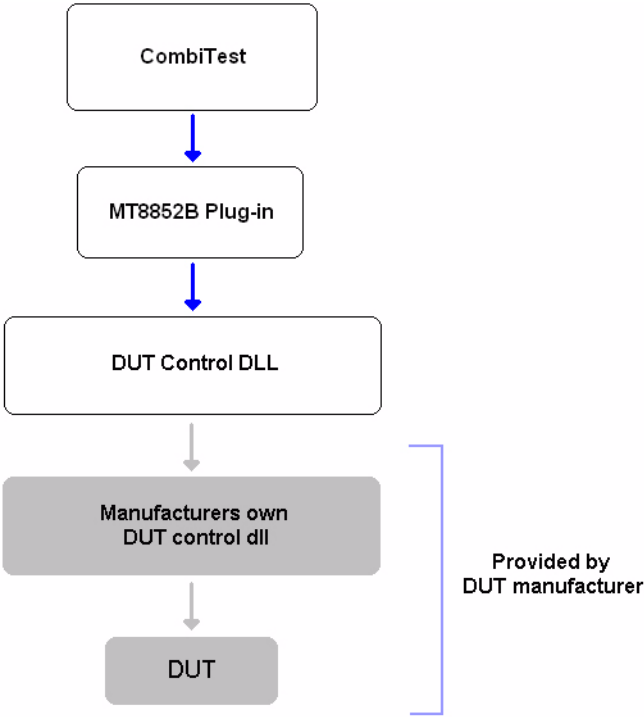


Figure 1-1. DUT Control Interface Structure

Chapter 2 — API Reference

2-1 General

DLL_Info

Description:	The DLL_Info function is used to retrieve information about the DUT Control DLL.
Prototype:	Bool DLL_Info(char* Description, char* Part Number, char* Version Number);
Parameters:	Description: [out] pointer to the description string Part Number: [out] pointer to the part number string Version Number: [out] pointer to the version number string
Return values:	If the function succeeds the return value is true. If the function fails the return value is false.
Remarks:	None

DUT_BT_Support_Info

Description:	The DUT_BT_Support_Info function is used to retrieve information about the supported direct mode Bluetooth capabilities of the DUT.
Prototype:	Bool DUT_BT_Support_Info(unsigned long* SupportInfo);
Parameters:	SupportInfo [out] bitmask where: 0 = No direct mode capabilities are supported. 1 = Vendor specific calibration is supported. $2^1 - 2^{31}$ = Reserved for future use.
Return values:	If the function succeeds the return value is true. If the function fails the return value is false.
Remarks:	The bitmask should be hard-coded within the control DLL according to the capabilities of the chipset under control.

DUT_BT_Open

- Description:** The DUT_BT_Open function opens the control interface, performing the required initialisation for Bluetooth testing.
- Prototype:** Bool DUT_BT_Open(void);
- Parameters:** None
- Return values:** If the function succeeds the return value is true.
If the function fails the return value is false.
- Remarks:** This is the first function to be called before attempting any DUT control for Bluetooth.

DUT_BT_Close

- Description:** The DUT_BT_Close function closes the control interface to the DUT, performing the required clean-up and taking the DUT out of Bluetooth test mode, if required.
- Prototype:** Bool DUT_BT_Close(void);
- Parameters:** None
- Return values:** If the function succeeds the return value is true.
If the function fails the return value is false.
- Remarks:** This function should be called when Bluetooth testing is complete and the DUT interface is no longer required.

DUT_Settings_File_Path

- Description:** The DUT_Settings_File_Path function sets the file path to the external Control Settings file before the device is initialized.
- Prototype:** Bool DUT_Settings_File_Path(char* FilePath, bool Set_nGet);
- Parameters:** FilePath: [in/out] Pointer specifying the full path to a settings file or a location in memory to store the default path.
Set_nGet: [in] Determines whether a path is being set, or the default path is being retrieved.
- Return values:** True
- Remarks:** The FilePath is limited to 200 bytes (ASCII Encoding).

2-2 Calibration Configuration

DUT_BT_Cal_Start

Description: This function starts the overall calibration process for Bluetooth.

Prototype: Bool DUT_BT_Cal_Start (void);

Parameters: None

Return values: If the function succeeds the return value is true.
If the function fails the return value is false.

Remarks: None

DUT_BT_Cal_Stop

Description: This function stops the overall calibration process allowing any de-initialisation or cleaning up to be performed.

Prototype: Bool DUT_BT_Cal_Stop(void);

Parameters: None

Return values: If the function succeeds the return value is true.
If the function fails the return value is false.

Remarks: None

DUT_BT_Get_Custom_Cal_Status

Description: This function returns the current custom calibration status and status message.

Prototype: Bool DUT_BT_Get_Custom_Cal_Status(unsigned long* calStatus, char* statusMessage);

Parameters: calStatus: [out] Calibration status where:
0 = Running
1 = Stopped
2 = Error
3 = Complete
statusMessage: [out] Message for describing the current calibration status to the user.

Return values: If the function succeeds the return value is true.
If the function fails the return value is false.

Remarks: None

DUT_BT_Get_Custom_Cal_Config

Description:	This function returns the custom calibration configuration used to configure the MT8852B to take the required measurements.
Prototype:	Bool DUT_BT_Get_Custom_Cal_Config(unsigned long* calType, int* channel, unsigned long* modulationScheme, float *gateWidth);
Parameters:	calType: [out] Calibration type where: 0 = No Measurement (e.g. internal calibration method) 1 = Power 2 = Frequency channel: [out] Channel number (-2 - 98). modulationScheme: [out] Modulation scheme where: 0 = Not applicable. 1 = PI/4. 2 = 8DPSK. gateWidth: [out] Capture gate width in milliseconds (0.1 - 3.0).
Return values:	If the function succeeds the return value is true. If the function fails the return value is false.
Remarks:	The modulation scheme parameter is not currently used and is reserved for future use.

DUT_BT_Custom_Cal_Result

Description:	This function passes the measurement result back to the custom calibration algorithms.
Prototype:	Bool DUT_BT_Custom_Cal_Result(const float result);
Parameters:	result: [in] Measurement result. This is dependant on the calibration type.
Return values:	If the function succeeds the return value is true. If the function fails the return value is false.
Remarks:	None

Chapter 3 — Bluetooth Calibration Sequence

3-1 Overview

The following flow diagram illustrates the basic Bluetooth calibration sequence that is initiated and controlled by the MT8852B plug-in.

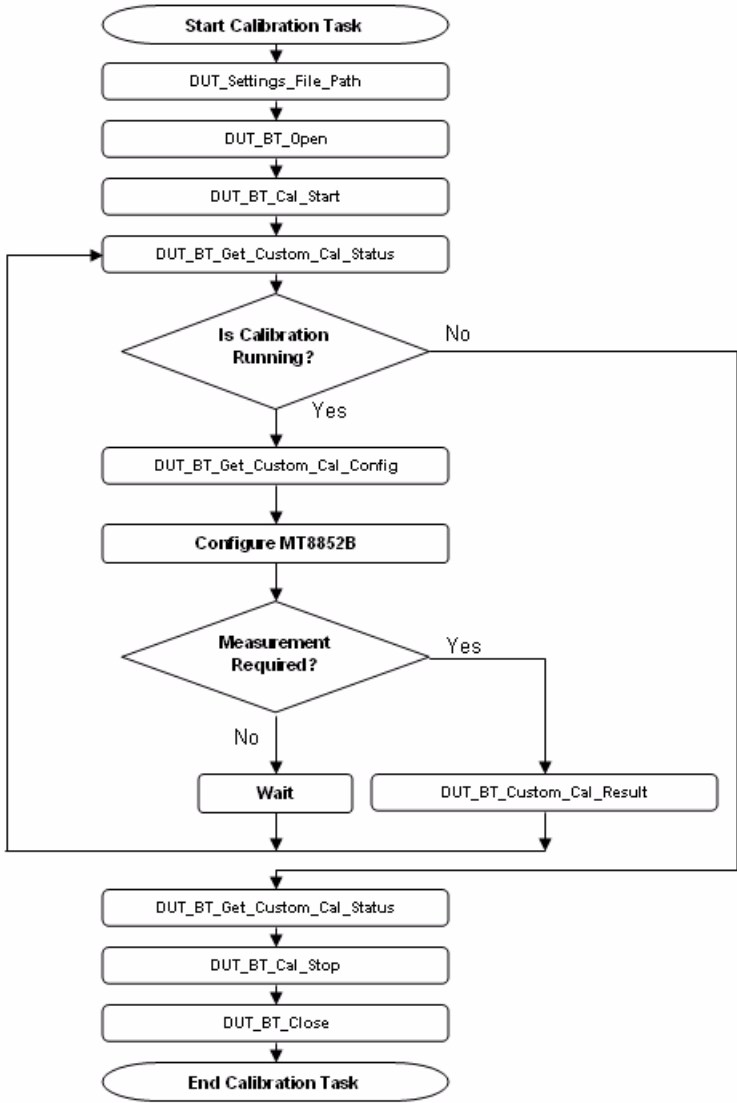


Figure 3-1. Calibration API Call Sequencing

3-2 Calibration Sequence Details

The MT8852B plug-in starts the procedure described in Figure 3-1 by invoking the API function `DUT_Settings_File_Path`. This function provides the control DLL with the path to the control settings file from which to load the required settings. The plug-in subsequently calls `DUT_BT_Open`, which initializes the DUT for the purpose of performing calibration.

The calibration process is initiated when the MT8852B plug-in invokes the API function `DUT_BT_Cal_Start`. The call to this function must start a calibration process that executes on a separate thread in the control DLL. The call to `DUT_BT_Cal_Start` should not return until the calibration thread reaches a point at which a measurement is required or an error occurs. The control DLL must provide a means of halting and resuming the main thread (i.e. API functions invoked by the MT8852B plug-in) and the internal thread (i.e. the calibration process).

In general, when a measurement is required, the internal thread must be halted and the main thread permitted to resume, passing control back to the MT8852B plug-in. Similarly, when a measurement is complete, the internal thread should be resumed and the main thread halted until another measurement is required or an error occurs.

Figure 3-1 assumes that the call to `DUT_BT_Cal_Start` has returned and succeeded, at which point the MT8852B plug-in will invoke the API function `DUT_BT_Get_Custom_Cal_Status`. The parameters returned by this function provide the MT8852B plug-in with the current status of the calibration procedure. The call to this function also returns a calibration status message that can be used to communicate the current internal state of the calibration procedure to the user via the progress output window of the test executive.

If the status returned indicates that an error has occurred, the MT8852B plug-in will abort the calibration procedure.

If the status returned indicates that no errors have occurred and calibration is still running, the MT8852B plug-in will assume the control DLL is requesting service and perform a query to obtain more information by invoking the API function `DUT_BT_Get_Custom_Cal_Config`. The parameters returned from this function call provide the MT8852B plug-in with the type of calibration that is being performed and therefore the type of any measurement that needs to be performed.

For example, if the calibration type refers to frequency calibration, the MT8852B plug-in will configure the MT8852B to perform a carrier offset measurement. The remaining parameters returned by this function are used to inform the MT8852B plug-in how the MT8852B should be configured in order to perform a valid measurement, i.e. the channel, gate width etc. It is important that the control DLL configures these parameters for retrieval by the MT8852B plug-in before the internal thread is halted.

The MT8852B plug-in will check the calibration type to determine whether a measurement is required. If a measurement is not required (i.e. calibration is performed internally without the need for external measurement to determine correction factors), the MT8852B plug-in will momentarily halt execution on the main thread, allowing the internal thread time to complete the current operation.

If a measurement is required, the MT8852B plug-in will issue the appropriate measurement and pass the result to the control DLL by invoking the API function `DUT_BT_Custom_Cal_Result`. When the control DLL receives the result, the internal thread should resume, allowing calibration to proceed and the main thread halted until the next measurement request.

The MT8852B plug-in will then invoke the API function `DUT_BT_Get_Custom_Cal_Status` again to verify the internal calibration process state. The MT8852B plug-in is therefore continually polling the control DLL to obtain the internal status, configuration settings and performing the required measurements until the internal thread completes or an error occurs.

When the process completes or an error occurs, the MT8852B plug-in will invoke the API function `DUT_BT_Get_Custom_Cal_Status` once more to obtain the final calibration status before the vendor specific calibration task is deemed to have completed.

The MT8852B plug-in then calls the function `DUT_BT_Cal_Stop` to finalize the calibration process. When this function is called, the control DLL should ensure that any internal threads that are still running are terminated or allowed to execute to completion.

Finally the plug-in will invoke the API function `DUT_BT_Close` to terminate the connection to the DUT and perform any required cleaning up.

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