

Products: R&S CompactTSVP, R&S GTSL, NI LabVIEW 8.2

Creating LabVIEW Drivers for the R&S CompactTSVP by Using GTSL Shared Library Import

Application Note

This application note describes the procedure used to create LabVIEW driver libraries by importing *.DLL files from the GTSL (Generic Test Software Library) development framework for the R&S CompactTSVP. This common recipe allows all upcoming versions of the GTSL to be imported as well, for seamless deployment of R&S CompactTSVP modules.



Subject to change - Daniel Seemann 2007-07 - Application Note 1SP801_3E

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Introduction

The R&S GTSL Setup CD provides instrument drivers and programming support for all Rohde & Schwarz modular instrumentation modules of the R&S CompactTSVP product family.

Ordering information: R&S GTSL [Version]
Setup CD for R&S TS-LBAS
ID: 1143.4105.00

The drivers contain all the functions that IVI and VXIplug&play require. In addition, the drivers contain high-level functions that configure the instruments or control the switching paths to interconnect DUT signals. The drivers also contain lower-level functions that initiate acquisition procedures or handle special features of the modules.

All drivers require the VISA 2.5 or later and the IVI engine 1.83 or later.

Please see the file **readme.txt** on the R&S GTSL Setup CD for further installation details.

The National Instruments LabVIEW version used to compile this document:



Configuring Import Settings

The creation of the LabVIEW wrapper VIs is based on the functions in the various *.DLL files provided by the GTSL as shared libraries.

Open the **T**ools menu either via the "Getting Started" panel of LabVIEW or by opening a "Blank VI".

From the **T**ools menu select **Import**.

Now choose **Shared Library (.dll)...**

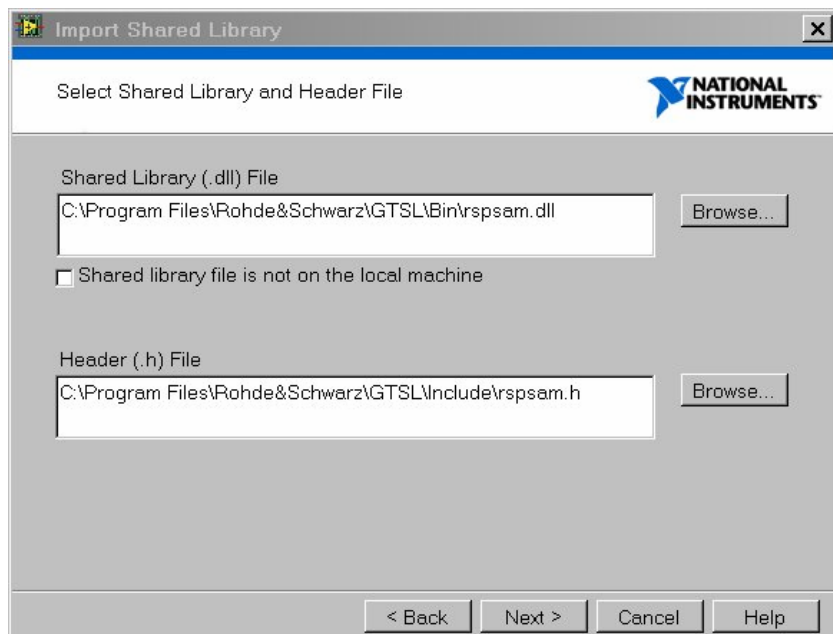
The **Import Shared Library** panel opens up. Select the following option:

Create VIs for a shared library

This option creates VIs based on the header file and shared library file you provide.

Click the **Next** button to proceed to the wizard.

You must now provide the shared library name and a C/C++ compatible header file. Refer to "Supported Data Types" for the "Import Shared Library Wizard" for more information about how the LabVIEW Import Shared Library wizard converts data types.

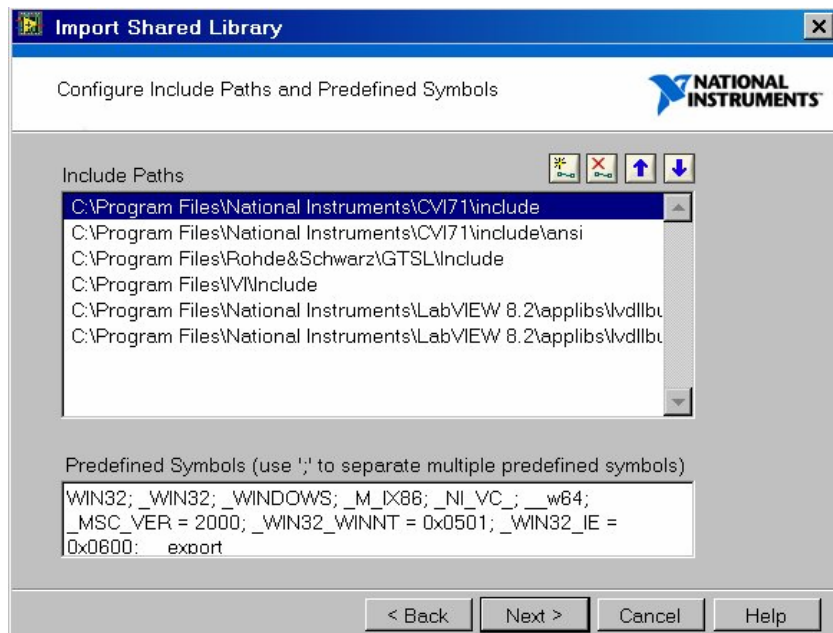


Now browse to the default location of the R&S GTSL files as shown above.

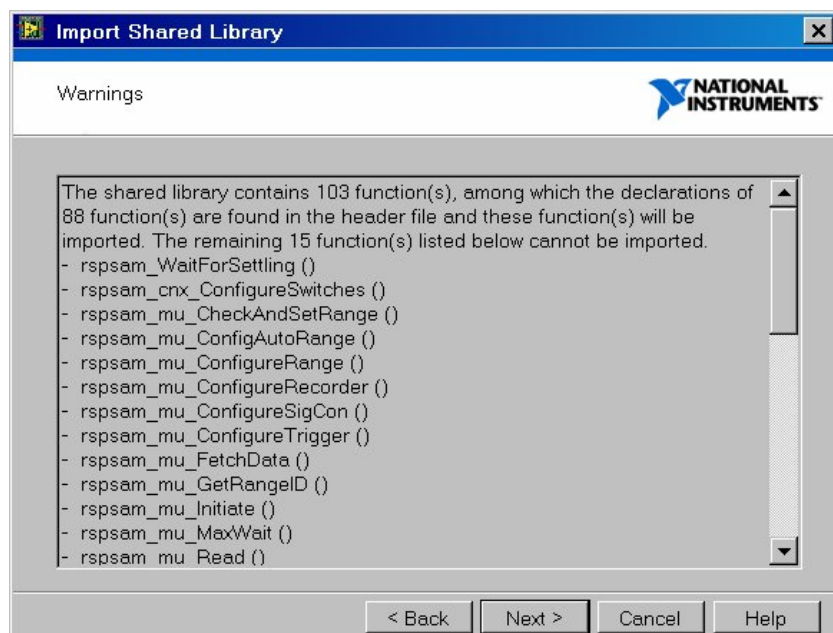
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The wizard cross-checks the header-file information. If the corresponding header to a specified .DLL links to another header, there must be a path-reference as well for all invoked header files.

In our case we need to include further LabWindows/CVI paths and additionally the IVI\include path as shown below:



In some cases warnings occur because certain functions are used internally at Rohde & Schwarz, e.g. inside EGTSL In-Circuit Test (ICT) software. These functions are exported to the DLL, but their prototypes are held inside different header files which are not published. Therefore please skip the warnings.

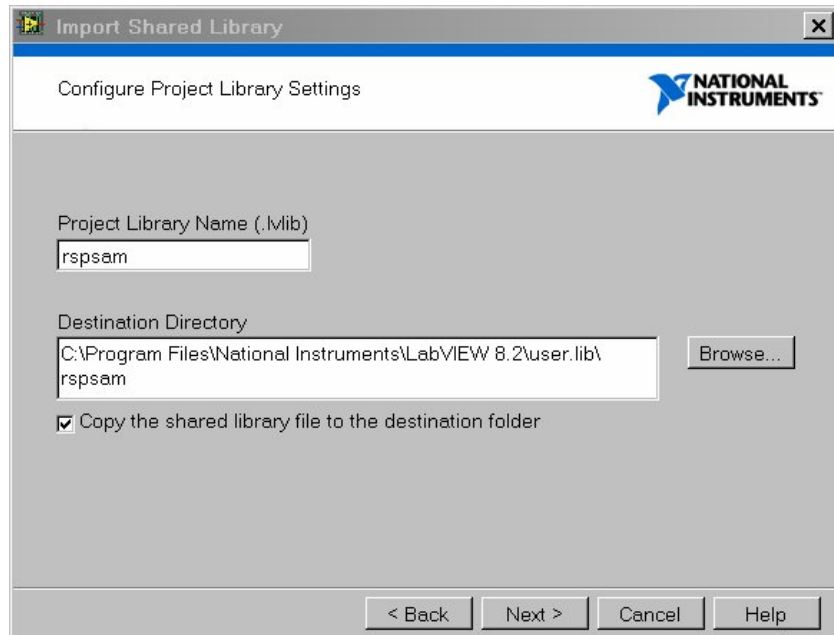


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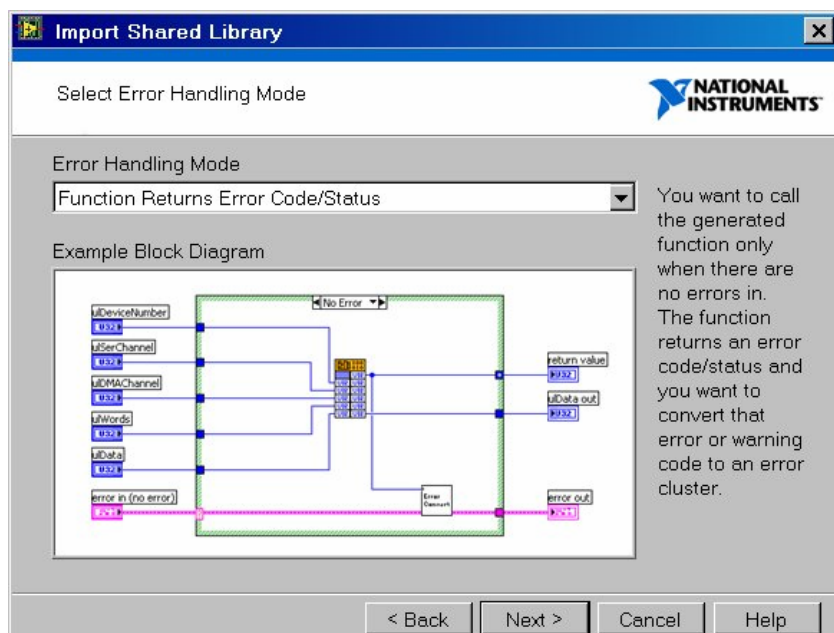
After the configuration of “Include Paths” proceed to the next panel where the header files have been parsed and all available functions appear in a list. Please verify that every function is checked, or click the **Check All** button.

The next step configures the project library settings.

The created wrapper VIs for the functions should be stored to the default location `\user.lib\` which is already specified by LabVIEW.



The selection of the **Error Handling Mode** is quite essential. It is advisable to compute the errors in standard clusters and bundle the three returned parameters. In addition, the mode shown in the screenshot below does not execute the function if an error has already occurred – which also makes the most sense for the R&S GTSL libraries.



The **Configure VIs and Controls** panel should be accepted with default settings, which are usually parsed correctly.

The **Generation Summary** panel provides the information about how many functions will be generated.

After a successful creation of the VI library the wizard provides a report file which should be verified. The report is at the following location:

C:\Program Files\National Instruments\
LabVIEW 8.2\user.lib\resmgr\Report.html

Please see the following example:

Import Shared Library Report
Tuesday, June 26, 2007 14:39:14

Your generated files are installed in the following folder:
C:\Program Files\National Instruments\LabVIEW 8.2\user.lib\resmgr

Parsing header file warnings:
No errors/warnings occurred when parsing the header file.

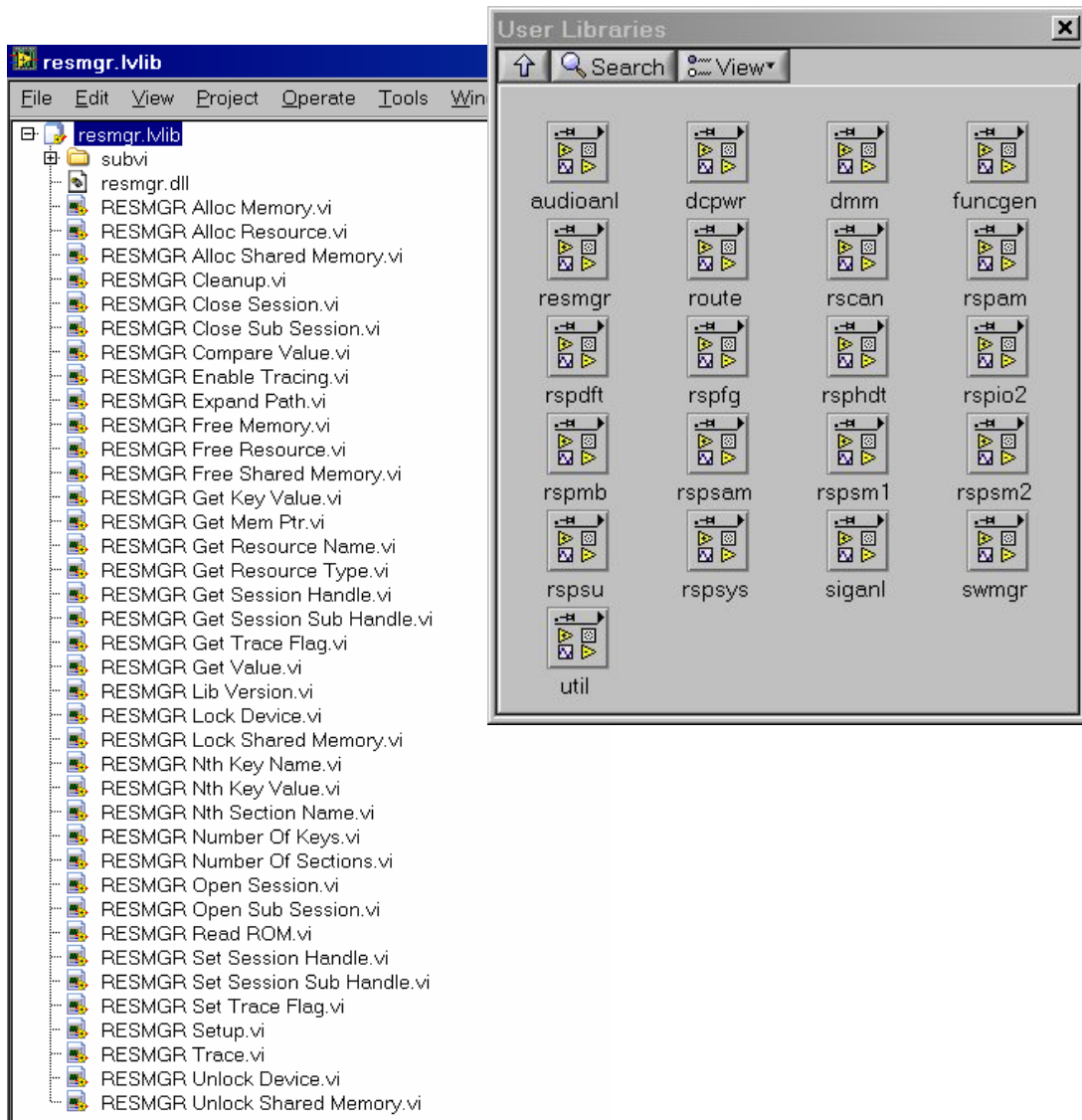
The following errors/warnings occurred when generating the wrapper VIs for this shared library.

VI Not Executable

The VI is not executable because of one of the following reasons:

1. The shared library or a dependent file is not installed.
To make the VI executable, you must install the shared library and all support files on the computer on which you run the VI.
2. A required custom control might be empty or cannot be found.
To make the VI executable, update the custom control manually.
3. The VI contains a parameter with an unsupported data type.
To make the VI executable, you must replace the empty cluster that the wizard generates with a control or indicator that uses supported data types.
RESMGR Alloc Memory.vi
RESMGR Get Mem Ptr.vi
RESMGR Lock Shared Memory.vi

You can now open the user libraries and deploy the generated functions:



References

National Instruments LabVIEW Help

Rohde&Schwarz GTSL Online Help

List of R&S GTSL Files available via Shared Library Import

GTSL driver file overview		Ver. 2007-06-26	
Prepared by Daniel Seemann			
	Driver library	Help file	HW supported
1.	audioanl.dll	audioanl.hlp	analyse audio waveform, license TS-LAA
2.	dcpwr.dll	dcpwr.hlp	TS-PSU, IVI_DCPWR
3.	dmm.dll	dmm.hlp	TS-PSAM, NI PXI 4060, IVI_DMM
4.	funcgen.dll	funcgen.hlp	TS-PFG, IVI_FGEN
5.	resmgr.dll	resmgr.hlp	GTSL resource manager, required for IVI based libs
6.	route.dll	route.hlp	Sophisticated switching support for TSVP, TS-LSRL software license
7.	rscan.dll	rscan.hlp	TS-PSYS1, IXXAT CAN controllers, e.g. USB-to-CAN
8.	rspam.dll	rspam.hlp	TS-PAM
9.	rspdft.dll	rspdft.hlp	TS-PDFT
10.	rspfg.dll	rspfg.hlp	TS-PFG
11.	rsphdt.dll	rsphdt.hlp	TS-PHDT
12.	rspio2.dll	rspio2.hlp	TS-PIO2
13.	rspmb.dll	rspmb.hlp	TS-PMB
14.	rspsam.dll	rspsam.hlp	TS-PSAM
15.	rspsm1.dll	rspsm1.hlp	TS-PSM1
16.	rspsm2.dll	rspsm2.hlp	TS-PSM2
17.	rspsu.dll	rspsu.hlp	TS-PSU
18.	rspsys.dll	rspsys.hlp	TS-PSYS1, TS-PSYS2
19.	siganl.dll	siganl.hlp	TS-PAM, IVI_SCOPE
20.	swmgr.dll	swmgr.hlp	Switch manager, for all TSVP switch devices
21.	util.dll	util.hlp	Utility functions for GTSL



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