Sourcetree Users Guide

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Introduction

The *Sourcetree* utility creates a folder populated with all files and dependent Qt projects necessary to compile a specific Qt project. The created folder can then be compressed and distributed as the source code for the Qt project. The generated source tree optionally includes a top-level project file and compilation instructions.

Prior to writing this utility the process to create the source tree was done manually with mixed results, no instructions, and no top-level project file. It was assumed the end user would have enough background with Qt to be able to figure out what steps were needed to compile a project but, particularly for projects with sub-dependent projects, this would require some trial and error. When using the *Sourcetree* utility with a top-level project file this kind of problem is eliminated.

Updating the source tree for an an existing project was generally not a problem but other files such as resource images or OS related files were sometimes missed. One obvious example of a missed file was *info.plist* which is needed when compiled for macOS systems.

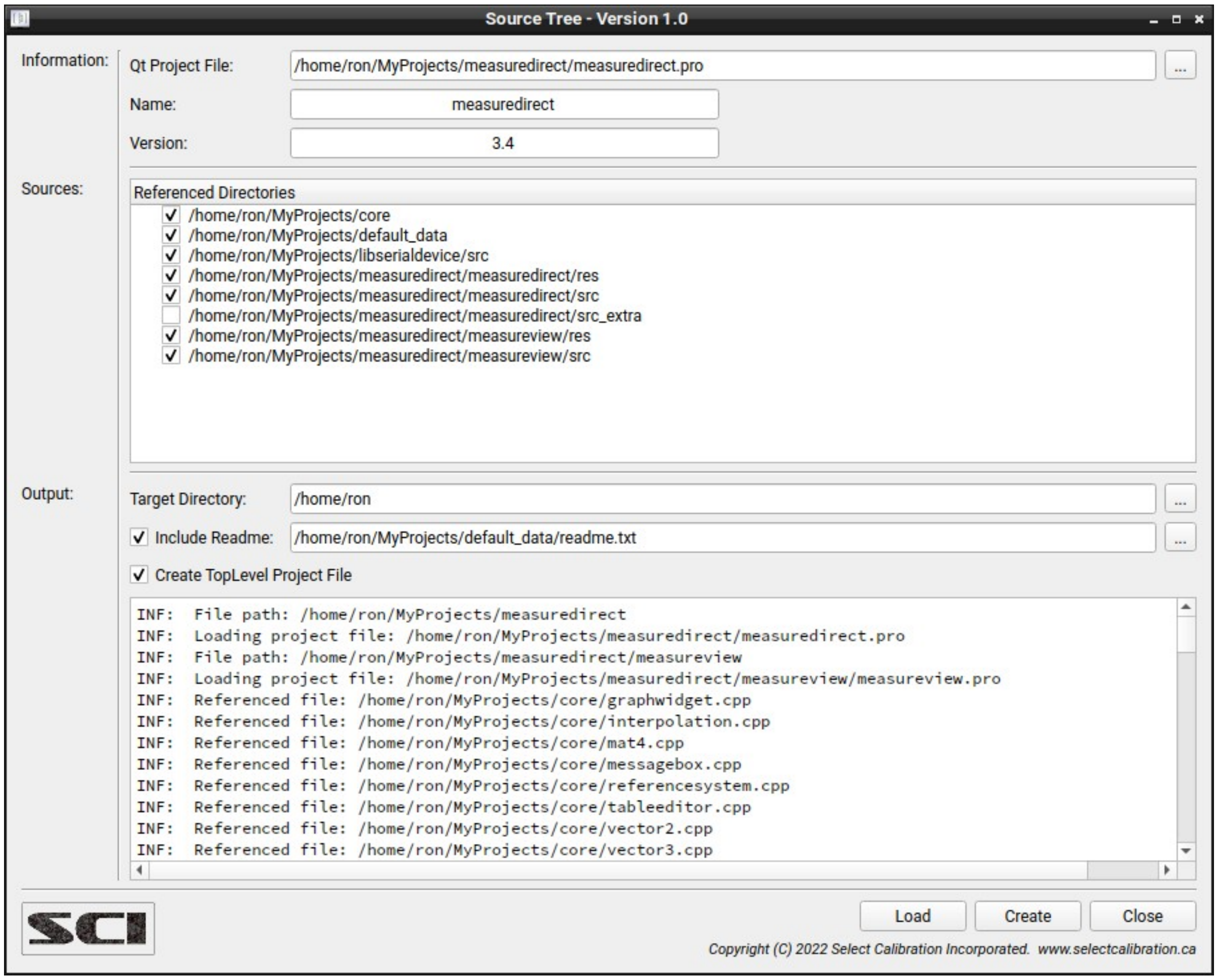
Although binaries for macOS are no longer provided they can be created easily enough provided the necessary prerequisites are met for Qt. The primary development systems used by SCI are GNU/Linux and macOS with only testing done on Windows.

Overview

The *Sourcetree* utility is a single window sectioned into different functions. Illustration 1 shows the *Sourcetree* utility with the Qt project *MeasureDirect* loaded.

Creating a source tree for an existing Qt project involves the following steps:

1. Select the Qt project file from the Information section of the *Sourcetree* utility.
2. Click the *Load* button to read the Qt project file and all dependent files.
3. Change the Name and Version fields in the Information section as necessary. The name field is automatically set based on the name of the source project where the version field contains the last used entry.
4. Review the list of included source directories in the source section of the *Sourcetree* utility and uncheck anything that should be excluded from the final source tree.
5. Review the output options for target location, readme file, and the option for the creation of the top-level project.
6. Click the *Create* button to have the source tree created.



Qt Project File: /home/ron/MyProjects/measuredirect/measuredirect.pro

Name: measuredirect

Version: 3.4

Referenced Directories

- ✓ /home/ron/MyProjects/core
- ✓ /home/ron/MyProjects/default_data
- ✓ /home/ron/MyProjects/libserialdevice/src
- ✓ /home/ron/MyProjects/measuredirect/measuredirect/res
- ✓ /home/ron/MyProjects/measuredirect/measuredirect/src
- ☐ /home/ron/MyProjects/measuredirect/measuredirect/src_extra
- ✓ /home/ron/MyProjects/measuredirect/measureview/res
- ✓ /home/ron/MyProjects/measuredirect/measureview/src

Target Directory: /home/ron

✓ Include Readme: /home/ron/MyProjects/default_data/readme.txt

✓ Create TopLevel Project File

```
INF:  File path: /home/ron/MyProjects/measuredirect
INF:  Loading project file: /home/ron/MyProjects/measuredirect/measuredirect.pro
INF:  File path: /home/ron/MyProjects/measuredirect/measureview
INF:  Loading project file: /home/ron/MyProjects/measuredirect/measureview/measureview.pro
INF:  Referenced file: /home/ron/MyProjects/core/graphwidget.cpp
INF:  Referenced file: /home/ron/MyProjects/core/interpolation.cpp
INF:  Referenced file: /home/ron/MyProjects/core/mat4.cpp
INF:  Referenced file: /home/ron/MyProjects/core/messagebox.cpp
INF:  Referenced file: /home/ron/MyProjects/core/referencesystem.cpp
INF:  Referenced file: /home/ron/MyProjects/core/tableeditor.cpp
INF:  Referenced file: /home/ron/MyProjects/core/vector2.cpp
INF:  Referenced file: /home/ron/MyProjects/core/vector3.cpp
```

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Illustration 1: Main window of the Sourcetree utility processing MeasureDirect version 3.4

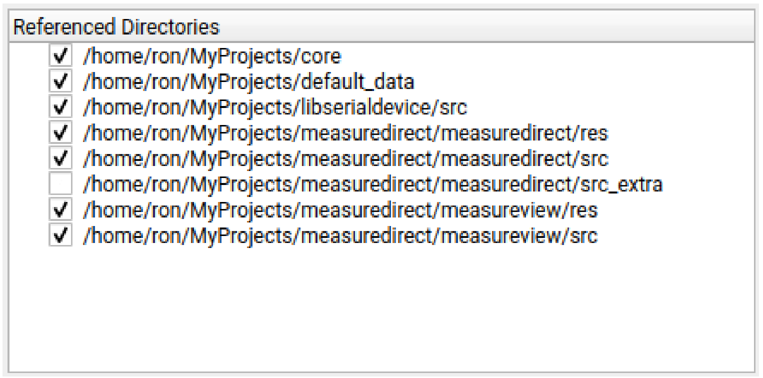
Options:

Section	*Option*	*Description*
Information	Qt Project File	Name and location of the existing Qt project file that will be used to generate the source tree.
	Name	Name associated to the project. When a project is loaded the name of the containing folder of the project file is used but this can be changed.
	Version	Version of the program. This value is static and must be set by the user.
Sources	Referenced Directories	List of directories that contain one or more required files. Any references to files in the specific directory can be ignored by unchecking the entry. See section Source Directory Exclusion for details.
Output	Target Directory	Location where the source tree folder will be created.

Section	*Option*	*Description*
	Include Readme	Option to include a readme file. The specified file will be copied into the top level of the source tree.
	Create Top-Level Project File	Option to create a top-level project file. If created the entire project and all dependencies can by created in one step.
	Load	Load the specified Qt project file.
	Create	Create the source tree.
	Close	Close the utility.

Source Directory Exclusion

Source directories containing one or more referenced files can be ignored when creating the source tree by unchecking the specific folder. Illustration 2 shows an example of the exclusion of referenced files for a specific project.



Referenced Directories

- ✓ /home/ron/MyProjects/core
- ✓ /home/ron/MyProjects/default_data
- ✓ /home/ron/MyProjects/libserialdevice/src
- ✓ /home/ron/MyProjects/measuredirect/measuredirect/res
- ✓ /home/ron/MyProjects/measuredirect/measuredirect/src
- ☐ /home/ron/MyProjects/measuredirect/measuredirect/src_extra
- ✓ /home/ron/MyProjects/measuredirect/measureview/res
- ✓ /home/ron/MyProjects/measuredirect/measureview/src

Illustration 2: List of directories from which referenced files will be added to the source tree.

Only directories can be excluded and not individual files. Depending on the type of file(s) contained in the excluded directory the source code may not compile.

One method to deal with problems of missing source files is by using define statements. From the example shown in illustration 2 where the sub folder src*_extra* is excluded the project file and source code has the following entries:

Project File:

```
DEFINES +=              INCLUDE_SRC_EXTRA
…
contains(DEFINES, INCLUDE_SRC_EXTRA) {
    SOURCES +=          src_extra/controller_dc_code.cpp
    HEADERS +=          src_extra/controller_dc_code.h
}
```

Source File:

```
#if defined  INCLUDE_SRC_EXTRA
#include "../src_extra/controller_dc_code.h"
#endif
```

Excluding directories doesn't make sense in most cases but there are, on occasion, reasons why it might be necessary.

Output

Using the *Sourcetree* utility project as an input the following shows the structure of the generated source tree:

```
sourcetree-1.0
├── core
│   ├── messagebox.cpp
│   ├── messagebox.h
│   └── nspool.mm
├── default_data
│   └── Info.plist
├── project.pro
├── readme.txt
└── sourcetree
    ├── res
    │   ├── icons.icns
    │   ├── logo.png
    │   ├── resource.rc
    │   ├── sourcetree.png
    │   ├── sourcetree.qrc
    │   └── winicon.ico
    ├── sourcetree.pro
    └── src
        ├── main.cpp
        ├── sourcetree.cpp
        └── sourcetree.h

5 directories, 16 files
```

The files included in the source tree contain operating specific references files such as *info.plist* (macOS) or *resource.rc* (Windows) regardless of the operating system the utility is run on. Files such as the Windows resource file are also scanned for dependent files and included in the final source tree.

Program Compilation

Compiling the program from the source tree can be done by running the following commands from the terminal window:

```
qmake
make
```

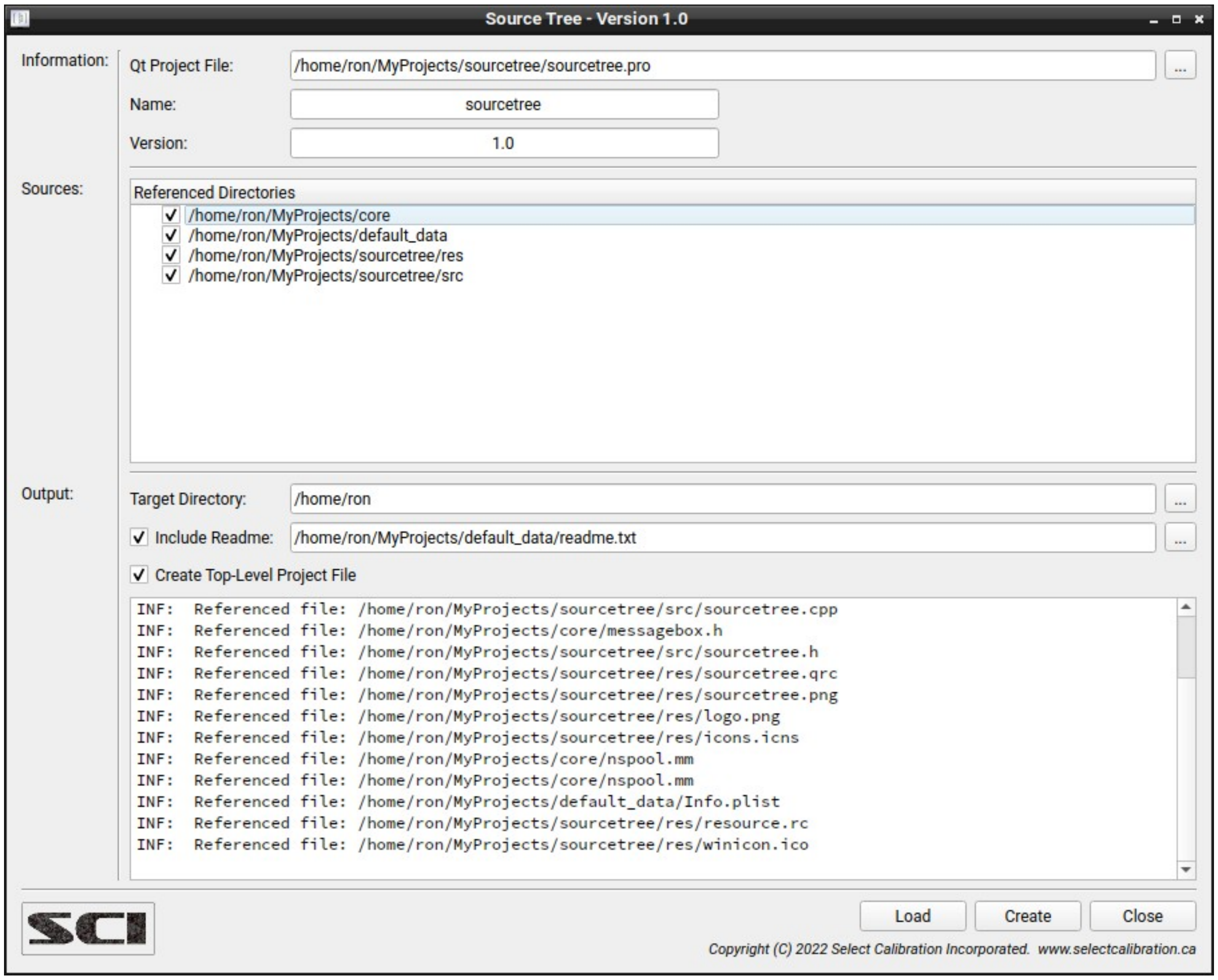
It is necessary to have a version of Qt installed and accessible from the command line in order to perform this step.

Compilation Example

The following shows the *Sourcetree* utility compiled from the generated source tree on GNU/Linux. The source tree is created in the folder ~/sourcetree-1.0 in this example:

```
ron:~> cd sourcetree-1.0
ron:~/sourcetree-1.0> qmake
Info: creating stash file /home/ron/sourcetree-1.0/.qmake.stash
ron:~/sourcetree-1.0> make
cd sourcetree/ && ( test -e Makefile || /usr/lib/qt5/bin/qmake -o Makefile
/home/ron/sourcetree-1.0/sourcetree/sourcetree.pro ) && make -f Makefile
make[1]: Entering directory '/home/ron/sourcetree-1.0/sourcetree'
g++ -c -pipe -O2 -D_REENTRANT -Wall -W -fPIC -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -
DQT_CORE_LIB -I. -I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets
-I/usr/lib/qt5/include/QtGui -I/usr/lib/qt5/include/QtCore -Ibuild/moc -isystem
/usr/include/libdrm -I/usr/lib/qt5/mkspecs/linux-g++ -o build/obj/messagebox.o
../core/messagebox.cpp
g++ -c -pipe -O2 -D_REENTRANT -Wall -W -fPIC -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -
DQT_CORE_LIB -I. -I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets
-I/usr/lib/qt5/include/QtGui -I/usr/lib/qt5/include/QtCore -Ibuild/moc -isystem
/usr/include/libdrm -I/usr/lib/qt5/mkspecs/linux-g++ -o build/obj/main.o src/main.cpp
g++ -c -pipe -O2 -D_REENTRANT -Wall -W -fPIC -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -
DQT_CORE_LIB -I. -I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets
-I/usr/lib/qt5/include/QtGui -I/usr/lib/qt5/include/QtCore -Ibuild/moc -isystem
/usr/include/libdrm -I/usr/lib/qt5/mkspecs/linux-g++ -o build/obj/sourcetree.o
src/sourcetree.cpp
/usr/lib/qt5/bin/rcc -name sourcetree res/sourcetree.qrc -o qrc_sourcetree.cpp
g++ -c -pipe -O2 -D_REENTRANT -Wall -W -fPIC -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -
DQT_CORE_LIB -I. -I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets
-I/usr/lib/qt5/include/QtGui -I/usr/lib/qt5/include/QtCore -Ibuild/moc -isystem
/usr/include/libdrm -I/usr/lib/qt5/mkspecs/linux-g++ -o build/obj/qrc_sourcetree.o
qrc_sourcetree.cpp
g++ -pipe -O2 -D_REENTRANT -dM -E -o build/moc/moc_predefs.h
/usr/lib/qt5/mkspecs/features/data/dummy.cpp
/usr/lib/qt5/bin/moc -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -DQT_CORE_LIB --
include /home/ron/sourcetree-1.0/sourcetree/build/moc/moc_predefs.h
-I/usr/lib/qt5/mkspecs/linux-g++ -I/home/ron/sourcetree-1.0/sourcetree
-I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets -I/usr/lib/qt5/include/QtGui
-I/usr/lib/qt5/include/QtCore -I/usr/include/c++/7 -I/usr/include/c++/7/x86_64-suse-linux
```

```
-I/usr/include/c++/7/backward -I/usr/lib64/gcc/x86_64-suse-linux/7/include
-I/usr/local/include -I/usr/lib64/gcc/x86_64-suse-linux/7/include-fixed -I/usr/x86_64-
suse-linux/include -I/usr/include src/sourcetree.h -o build/moc/moc_sourcetree.cpp
g++ -c -pipe -O2 -D_REENTRANT -Wall -W -fPIC -DQT_NO_DEBUG -DQT_WIDGETS_LIB -DQT_GUI_LIB -
DQT_CORE_LIB -I. -I/usr/lib/qt5/include -I/usr/lib/qt5/include/QtWidgets
-I/usr/lib/qt5/include/QtGui -I/usr/lib/qt5/include/QtCore -Ibuild/moc -isystem
/usr/include/libdrm -I/usr/lib/qt5/mkspecs/linux-g++ -o build/obj/moc_sourcetree.o
build/moc/moc_sourcetree.cpp
g++ -Wl,-O1 -Wl,-rpath,/usr/lib/qt5/lib -o bin/sourcetree build/obj/messagebox.o
build/obj/main.o build/obj/sourcetree.o build/obj/qrc_sourcetree.o
build/obj/moc_sourcetree.o   -lpthread /usr/lib/qt5/lib/libQt5Widgets.so
/usr/lib/qt5/lib/libQt5Gui.so /usr/lib/qt5/lib/libQt5Core.so /usr/lib64/libGL.so
make[1]: Leaving directory '/home/ron/sourcetree-1.0/sourcetree'
ron:~/sourcetree-1.0> sourcetree/bin/sourcetree
ron:~/sourcetree-1.0>
```


Source Tree - Version 1.0
Information:
Sources:
Output:
Load
Create
Close
SCI
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Qt Project File: /home/ron/MyProjects/sourcetree/sourcetree.pro
Name: sourcetree
Version: 1.0

Referenced Directories
- ✓ /home/ron/MyProjects/core
- ✓ /home/ron/MyProjects/default_data
- ✓ /home/ron/MyProjects/sourcetree/res
- ✓ /home/ron/MyProjects/sourcetree/src

Target Directory: /home/ron
✓ Include Readme: /home/ron/MyProjects/default_data/readme.txt
✓ Create Top-Level Project File

```
INF:  Referenced file: /home/ron/MyProjects/sourcetree/src/sourcetree.cpp
INF:  Referenced file: /home/ron/MyProjects/core/messagebox.h
INF:  Referenced file: /home/ron/MyProjects/sourcetree/src/sourcetree.h
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/sourcetree.qrc
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/sourcetree.png
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/logo.png
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/icons.icns
INF:  Referenced file: /home/ron/MyProjects/core/nspool.mm
INF:  Referenced file: /home/ron/MyProjects/core/nspool.mm
INF:  Referenced file: /home/ron/MyProjects/default_data/Info.plist
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/resource.rc
INF:  Referenced file: /home/ron/MyProjects/sourcetree/res/winicon.ico
```

Illustration 3: Execution of the compiled sourcetree utility from the command line.

Revision History

Date	*Version*	*Changes*
July 25, 2022	1.0	New Program
Dec 25, 2023	1.1	[bugfix] Better handling of poorly formatted Qt project files.