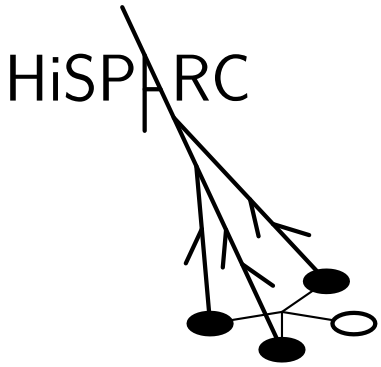

Detector Software Developer Documentation Documentation

Release 1.1

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The HiSPARC Installer Implementation Notes can be downloaded here: HiSPARC Installer

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CHAPTER

ONE

SETTING UP A DEVELOPMENT ENVIRONMENT

This document explains how to set up a development environment on a fresh Windows installation. For reference, *Rebuilding the Development Tree* discusses rebuilding the entire development tree from scratch. Mind that you don't need to do this, and if you do, you'll overwrite lots of third-party binaries which have been committed to the repository.

Just follow these instructions and you can start building your own HiSPARC software installation packages.

1.1 git (a Distributed Version Control System (DVCS))

Homepage http://git-scm.com/

Version 1.7.10.4 (Standalone)

Download http://git-scm.com/downloads

Direct Link (win) http://git-scm.com/download/win

Direct Link (mac) http://git-scm.com/download/mac

Installation steps:

1. Download and run the installer

1.2 HiSPARC Software Checkout

Direct Link https://github.com/HiSPARC/station-software.git

Command Line git clone git@github.com:HiSPARC/station-software.git

GitHub For Windows link github-windows://openRepo/https://github.com/HiSPARC/station-software

GitHub For Mac link github-mac://openRepo/https://github.com/HiSPARC/station-software

Steps:

1. Run Command Prompt (Start -> Run -> `cmd`)
2. `git clone git@github.com:HiSPARC/station-software.git <checkout-location>`.
   Example:

   ```
   C:\Documents and Settings\David Fokkema>cd "My Documents"
   C:\Documents and Settings\David Fokkema\My Documents>mkdir HiSPARC
   C:\Documents and Settings\David Fokkema\My Documents>git clone git@github.com:HiSPARC/station-sc
   ```

3. Edit `\persistent\configuration\startup_settings.bat` to your personal taste

4. You can now run `\hisparc_cmd.bat` if you want to start a command terminal with a HiSPARC detector pc environment

1.3 Notepad++ (a Source Code Editor) (Optional)

Homepage http://notepad-plus-plus.org/

Version 6.1.3 (Installer)

Download http://notepad-plus-plus.org/download/

Direct Link http://download.tuxfamily.org/notepadplus/6.1.3/npp.6.1.3.Installer.exe

Installation steps:

1. Download and run the installer
2. All defaults are ok
3. Navigate to a Python source file and double-click on it.
4. **Windows cannot open this file:** *Select the program from a list*
5. **Choose the program you want to use to open the file: Select Notepad++ and click *Open*. If Notepad++ is not in the list, clic**

   (a) Navigate to `Notepad++/notepad++` and click *Open*

   (b) Select Notepad++ and click *Open*

1.4 LabVIEW Run-Time Engine

Although the run-time engine has already been installed, the license requires a serial number which is *not* committed in the repository.

Installation steps:

1. Copy `\admin\niruntimeinstaller\Bin\silent_install.txt` to `\admin\niruntimeinstaller` and rename to `hisparcspec.ini`
2. Edit `hisparcspec.ini` and enter user information (serial number)

CHAPTER

TWO

REBUILDING THE DEVELOPMENT TREE

This is a complete log of building the development environment from scratch. Lots of third-party packages need to be installed and included in the installer tree.

Note: **Do not use these instructions**. You don't need to follow these instructions to start building a package. This is only needed when you need to recreate the whole tree *from scratch*. It is mostly useful as a reference when one wants to update a package or two with newer versions.

2.1 git (a Distributed Version Control System (DVCS))

Homepage http://git-scm.com/

Version 1.7.10.4 (Standalone)

Download http://git-scm.com/downloads

Direct Link (win) http://git-scm.com/download/win

Direct Link (mac) http://git-scm.com/download/mac

Installation steps:

1. Download and run the installer

2.2 GitHub Client

Homepage http://www.github.com/

Download (win) http://windows.github.com/

Download (mac) http://mac.github.com/

2.3 HiSPARC Software Checkout

Direct Link https://github.com/HiSPARC/station-software.git

Command Line git clone git@github.com:HiSPARC/station-software.git

GitHub For Windows link github-windows://openRepo/https://github.com/HiSPARC/station-software

GitHub For Mac link github-mac://openRepo/https://github.com/HiSPARC/station-software

Steps:

1. **What would you like to do?:** *Get project source from elsewhere -> Checkout*
2. *Branch source:* sftp://<user>@login.nikhef.nl/project/hisparc/bzr/windows-development/trunk/
3. *Local directory where the working tree will be created:* Use a directory of your choice. Suggestion: `My Documents/HiSPARC/trunk`
4. Click *OK*. You will be asked for your `login.nikhef.nl` account password several times.
5. Copy `\persistent\configuration\startup_settings_example.bat` to `\persistent\configuration\startup_settings.bat` and edit to your personal taste
6. You can now run `\hisparc_cmd.bat` if you want to start a command terminal with a HiSPARC detector pc environment

2.4 Notepad++ (a Source Code Editor) (Optional)

Homepage http://notepad-plus-plus.org/

Version 6.1.3 (Installer)

Download http://notepad-plus-plus.org/download/

Direct Link http://download.tuxfamily.org/notepadplus/6.1.3/npp.6.1.3.Installer.exe

Installation steps:

1. Download and run the installer
2. All defaults are ok
3. Navigate to a Python source file and double-click on it.
4. **Windows cannot open this file:** *Select the program from a list*
5. **Choose the program you want to use to open the file: Select Notepad++ and click *Open*. If Notepad++ is not in the list, clic**

   (a) Navigate to `Notepad++/notepad++` and click *Open*

   (b) Select Notepad++ and click *Open*

2.5 LabVIEW Run-Time Engine

Homepage http://www.ni.com/

Version 8.2.1 (Standard download)

Download http://joule.ni.com/nidu/cds/view/p/id/550/lang/en

Direct Link http://lumen.ni.com/nicif/US/GB_NIDU/content.xhtml?du=http://joule.ni.com/nidu/cds/view/p/id/550/lang/en_NL

Homepage http://www.ni.com/

Version 8.6.1 (Standard download)

Download http://joule.ni.com/nidu/cds/view/p/id/1244/lang/en

Direct Link http://lumen.ni.com/nicif/US/GB_NIDU/content.xhtml?du=http://joule.ni.com/nidu/cds/view/p/id/1244/lang/en_NL

Installation steps:

1. Complete the registration procedure or log in
2. Download and run the executable (which is a *WinZip Self-Extractor*)
3. **WinZip Self-Extractor:** Uncheck *When done unzipping open ''.\setup.exe''* and click *Unzip*
4. When finished unzipping, click *Close*
5. Copy `c:\National Instruments Downloads\LabVIEW 8.2.1\Runtime Engine` to `\admin`
6. Rename the `\admin\Runtime Engine` folder to `\admin\niruntimeinstaller`
7. Copy `\admin\niruntimeinstaller\Bin\silent_install.txt` to `\admin\niruntimeinstaller` and rename to `hisparcspec.ini`
8. Edit `hisparcspec.ini` and enter user information (serial number)

2.6 MySQL Community Server (a Database Server)

Homepage http://www.mysql.com/

Version 5.1.53 (x86, 32-bit, ZIP Archive, noinstall)

Download http://www.mysql.com/downloads/mysql/

Direct Link http://www.mysql.com/get/Downloads/MySQL-5.1/mysql-noinstall-5.1.53-win32.zip/from/http://mirror.leaseweb.com/mysql/

Installation steps:

1. Unzip to `\user` and rename the `mysql-5.1.53-win32` folder to `mysql`
2. Copy `\user\mysql\my-medium.ini` to `\user\mysql\my.ini`
3. **Edit the `my.ini` file:**
   (a) **Section [mysqld]:** add `basedir="/user/mysql/"`
   (b) **Section [mysqld]:** add `datadir=/persistent/data/mysql/"`
   (c) **Section [mysqld]:** remove comments from following lines:

```
innodb_buffer_pool_size
innodb_additional_mem_pool_size
innodb_log_file_size=10M
innodb_log_buffer_size
innodb_flush_log_at_trx_commit
innodb_lock_wait_timeout
```

   (d) Especially mind the 10M parameter to `innodb_log_file_size`, or MySQL will crash on startup.
4. Create the `\persistent\data` folder
5. Move the `\user\mysql\data` folder to `\persistent\data` and rename to `mysql` (you now have a `\persistent\data\mysql` folder)
6. Run `\hisparc_cmd.bat`, navigate to `\user\mysql\bin` and run `mysqld --console` and keep this window open (this is the *MySQL Server Console*)
7. Run `\hisparc_cmd.bat`, navigate to `\user\mysql\bin` and run `mysql -u root` and do:
   (a) `DROP USER '';`
   (b) `DROP USER ''@localhost;`

(c) `SET PASSWORD FOR root@localhost = PASSWORD('<rootpassword>');`

(d) `SET PASSWORD FOR root@127.0.0.1 = PASSWORD('<rootpassword>');`

(e) `DROP DATABASE test;`

(f) `QUIT;`

8. Run `\hisparc_cmd.bat`, navigate to `\user\mysql\bin` and run `mysql -u root -p < \buffer.sql` and give the root password when prompted
9. In the *MySQL Server Console* window, press `Control-C` to correctly shutdown the server
10. In the `\persistent\data\mysql` folder delete the `mysql-bin.*` files and any `*.pid` and `*.err` files if they exist from previous runs of the server

2.7 MySQL ODBC Driver

Homepage http://www.mysql.com/

Version 5.1.8 (x86, 32-bit, ZIP Archive, noinstall)

Download http://dev.mysql.com/downloads/connector/odbc/

Direct Link http://dev.mysql.com/get/Downloads/Connector-ODBC/5.1/mysql-connector-odbc-noinstall-5.1.8-win32.zip/from/http://ftp.gwdg.de/pub/misc/mysql/

Installation steps:

1. Unzip to `\admin` and rename the `mysql-connector-odbc-noinstall-5.1.8-win32` folder to `odbcconnector`

2.8 OpenVPN

Homepage http://openvpn.net/

Version 2.1.4

Download http://openvpn.net/index.php/open-source/downloads.html

Direct Link http://swupdate.openvpn.net/community/releases/openvpn-2.1.4-install.exe

Installation steps:

1. Download and run the installer
2. Copy the `C:\Program Files\OpenVPN` folder to `\admin` and rename to `openvpn`

2.9 TightVNC

Homepage http://www.tightvnc.com/

Version 1.3.10 (Complete set, no installer)

Download http://www.tightvnc.com/download-old.php

Direct Link http://www.tightvnc.com/download/1.3.10/tightvnc-1.3.10_x86.zip

Installation steps:

1. Create a `\admin\tightvnc` folder and unzip the download to this folder

---

Note: There is a new major version which would solve a lot of VNC-related problems. It would be very nice to include that in an update. That will be our very first admin update, however...

2.10 Windows Driver Kit (WDK)

Homepage http://msdn.microsoft.com/en-us/windows/hardware/gg487428

Version 7.1.0

Download http://www.microsoft.com/downloads/en/details.aspx?displaylang=en&FamilyID=36a2630f-5d56-43b5-b996-7633f2ec14ff

Direct Link http://www.microsoft.com/downloads/info.aspx?na=41&SrcFamilyId=36A2630F-5D56-43B5-B996-7633F2EC14FF&SrcDisplayLang=en&u=http%3a%2f%2fdownload.microsoft.com%2fdownload%2f4%2fA%EFBE-4182-B6A9-AE6850409A78%2fGRMWDK_EN_7600_1.ISO

Installation steps:

1. Microsoft recommends that you download the ISO, burn it, and then insert it in your drive. Alternatively, attach it to a virtual machine, or something similar.
2. Install the *Tools* package.

This is needed for installing the FTDI drivers.

2.11 FTDI Drivers (Communication with Electronics Box USB Chip)

Homepage http://www.ftdichip.com/

Version 2.08.24 (CDM, x86 32-bit)

Download http://www.ftdichip.com/Drivers/VCP.htm

Direct Link http://www.ftdichip.com/Drivers/CDM/CDM%202.08.24%20WHQL%20Certified.zip

Setup executable http://www.ftdichip.com/Drivers/CDM/CDM20824_Setup.exe

Installation steps:

1. Unpack the zip file.
2. Move the `CDM20824_WHQL_Certified` folder to `\admin`.
3. Rename the folder to `ftdi_drivers`.
4. Copy `C:\WinDDK\7600.16385.1\redist\DIFx\dpinst\EngMui\x86\dpinst.exe` to `\admin\ftdi_drivers`.
5. Copy `\admin\ftdi_drivers\i386\ftd2xx.dll` to `\user\hisparcdaq`.

2.12 GPS Monitor (DSPMON)

Homepage http://www.trimble.com/timing/resolution-t.aspx

Version 1.46

Download http://www.trimble.com/timing/resolution-t.aspx?dtID=support

Direct Link http://trl.trimble.com/dscgi/ds.py/Get/File-366495/DSPMon_V1-46.exe

Installation steps:

1. Create folder `\user\dspmon`.
2. Copy `DSPMon_V1-46.exe` to `\user\dspmon`.
3. Rename file to `DSPMon.exe`.

2.13 Nagios: Send Passive Check Results (NSCA Client)

Homepage http://exchange.nagios.org/directory/Addons/Passive-Checks/NSCA-Win32-Client/details

Version Unknown

Download http://exchange.nagios.org/components/com_mtree/attachment.php?link_id=550&cf_id=29

Installation steps:

1. Unpack zip file.
2. Copy `send_nsca_win32_bin` folder to `\user\hsmonitor\data`.
3. Rename folder to `send_nsca_win32`.
4. Edit `\user\hsmonitor\data\send_nsca_win32\send_nsca.cfg`: change `encryption_method=1` to `encryption_method=0`.

Note: I'd really like to change this to something better. Still, it is not as bad as it seems since everything is sent over the VPN.

2.14 Nagios: Client (NSClient++)

Homepage http://nsclient.org/nscp/

Version 0.3.8

Download http://nsclient.org/nscp/downloads

Direct Link http://files.nsclient.org/x-0.3.x/NSClient%2B%2B-0.3.8-Win32.zip

Installation steps:

1. Unpack zip file.
2. Enter `NSClient++-0.3.8-Win32` folder.
3. Copy everything, *except* `scripts` *folder and* `nsci.ini` *file*, to `\admin\nsclientpp`.

2.15 Nullsoft Scriptable Install System (NSIS)

Homepage http://nsis.sourceforge.net/

Version 2.46

Download http://nsis.sourceforge.net/Download

Direct Link http://prdownloads.sourceforge.net/nsis/nsis-2.46-setup.exe?download

Installation steps:

1. Run .exe file.
2. Perform a *Full* installation.
3. Copy `C:\Program Files\NSIS` to `\bake`.
4. Rename `NSIS` folder to `nsis`.

2.16 NSIS Unzip plugin (Nsisunz)

Homepage http://nsis.sourceforge.net/Nsisunz_plug-in

Version June 22, 2007

Direct Link http://saivert.com/nsis/nsisunz.7z

Installation steps:

1. Open archive.
2. Copy `Release/nsisunz.dll` to `\bake\nsis\Plugins`.

2.17 NSIS XtInfoPlugin

Homepage http://nsis.sourceforge.net/XtInfoPlugin_plug-in

Version 1.0.0.2

Direct Link http://nsis.sourceforge.net/mediawiki/images/1/1d/XtInfoPlugin_v_1.0.0.2.zip

Installation steps:

1. Open archive.
2. Copy `xtInfoPlugin\xtInfoPlugin.dll` to `\bake\nsis\Plugins`.

2.18 NSIS Simple Service Plugin (SimpleSC)

Homepage http://nsis.sourceforge.net/NSIS_Simple_Service_Plugin

Version 1.29

Direct Link http://nsis.sourceforge.net/mediawiki/images/e/ed/NSIS_Simple_Service_Plugin_1.29.zip

Installation steps:

1. Open archive.
2. Copy `SimpleSC.dll` to `\bake\nsis\Plugins`.

2.19 NSIS Simple Firewall Plugin (SimpleFC)

Homepage http://nsis.sourceforge.net/NSIS_Simple_Firewall_Plugin

Version 1.18

Direct Link http://nsis.sourceforge.net/mediawiki/images/6/67/NSIS_Simple_Firewall_Plugin_1.18.zip

Installation steps:

1. Open archive.
2. Copy `SimpleFC.dll` to `\bake\nsis\Plugins`.

2.20 NSIS Access Control Plugin

Homepage http://nsis.sourceforge.net/AccessControl_plug-in

Version January 23, 2008

Direct Link http://nsis.sourceforge.net/mediawiki/images/4/4a/AccessControl.zip

Installation steps:

1. Open archive.
2. Copy `AccessControl\Plugins\*.dll` to `\bake\nsis\Plugins`.

2.21 Python

Homepage http://python.org/

Version 2.7.1

Download http://www.python.org/download/

Direct Link http://www.python.org/ftp/python/2.7.1/python-2.7.1.msi

Installation steps:

1. Install *Just for me* (this makes it easier to redistribute the package).

2.22 Python for Windows Extensions (pywin32)

Homepage http://sourceforge.net/projects/pywin32/

Version Build 216

Download http://sourceforge.net/projects/pywin32/files/pywin32/

Direct Link http://sourceforge.net/projects/pywin32/files/pywin32/Build216/pywin32-216.win32-py2.7.exe/download

Installation steps:

1. Default installation.

2.23 Windows Management Instrumentation for Python (Python-WMI)

Homepage http://timgolden.me.uk/python/wmi/index.html

Version 1.4.6

Download http://timgolden.me.uk/python/wmi/index.html#where-do-i-get-it

Direct Link http://timgolden.me.uk/python/downloads/WMI-1.4.6.win32.exe

Installation steps:

1. Default installation.

2.24 MySQL for Python (MySQLdb)

Homepage http://www.lfd.uci.edu/~gohlke/pythonlibs/

Version 1.2.3

Download http://www.lfd.uci.edu/~gohlke/pythonlibs/

Note: Since I don't own Microsoft Visual Studio, I can't compile the MySQL extension module myself. If you *do* own MSVC, you might be able to compile and run the official package from http://pypi.python.org/pypi/MySQL-python/.

Installation steps:

1. Default installation.

2.25 Finishing Python Installation

Steps:

1. Copy `C:\Python27` to `\user`.
2. Rename `Python27` folder to `python`.

Unfortunately, the world of Windows is complex. The world of Windows compilers is even more complex. You can't use binaries (executables or DLLs) from different compilers or even compiler versions together. For instance, you can't import a Python module containing compiled code when it is compiled with a different compiler than Python itself. Since Windows installations commonly don't *have* a compiler, this can be a pain and breaks installers. What's more: compile code with Microsoft Visual C++ and install it on a machine *without* Microsoft Visual C++ and it may not work out of the box. For instance, try this:

```
>>> import _tkinter
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ImportError: DLL load failed: This application has failed to start
because the application configuration is incorrect. Reinstalling the
application may fix this problem.
>>> import win32api
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ImportError: DLL load failed: The specified module could not be found.
```

This not only happens with Tkinter and PyWin32, but also with several other packages that are used by the HiSPARC software. Just trying to import _tkinter is an easy check to see if things are ok. For Python 2.7.1, the error can be resolved by installing the Microsoft Visual C++ 2008 Redistributable package. Don't try another version, it won't work. Alternatively, you can fix the python installation by copying a few files around. This is much easier to do.

Steps (continued):

1. Copy `msvcr90.dll` and `Microsoft.VC90.CRT.manifest` to `\user\python\DDLs`.
2. Copy contents of `\user\python\Lib\site-packages\pywin32_system32` to `\user\python`.

Now try:

```
>>> import _tkinter
>>> import win32api
```