

# ***Linux Installation How to***

## ***MYTHEN Detector System Software***

Version: V2





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## 1. Document History

### 1.1. Current document

<i>Version</i>	<i>Date</i>	<i>status</i>	<i>prepared</i>	<i>checked</i>	<i>released</i>
2	11.06.2013	Released	AM	DJ	DJ

### 1.2. Changes

<i>Version</i>	<i>Date</i>	<i>Changes</i>
1.0	13.08.2009	First public version
1.1	07.04.2010	MYTHEN GUI Installation updated
1.2	05.03.2012	Document extension to entire MYTHEN product family
1.3	11.06.2013	Adapted CD
2	18.11.2015	Updated contact information

## 2. How to use this documentation

Before you start to operate the MYTHEN detector system please read the User Manual and the Technical Documentation included in the documentation package carefully.

This document has been designed for the MYTHEN detector systems.

### 2.1. Address and Support

DECTRIS Ltd.  
Taefernweg 1  
5405 Baden-Daettwil  
Switzerland  
Phone: +41 56 500 21 02  
Fax: + 41 56 500 21 01

#### Website:

- [www.dectris.com](http://www.dectris.com) → support → Technical Notes → MYTHEN
- [www.dectris.com](http://www.dectris.com) → support → FAQ
- [www.dectris.com](http://www.dectris.com) → support → Problem Report

#### Email:

- [support@dectris.com](mailto:support@dectris.com)







Should you have questions concerning the system or its use, please contact us *via* phone, mail or fax.



**Do not ship the system back before you receive the necessary transport and shipping information!**

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## 2.2. Explanation of Symbols

<b>Symbol</b>	<b>Description</b>
	Important or helpful notice
	Caution. Please follow the instructions carefully to prevent equipment damage or personal injury.
	DC-current
	AC-current
	Ground
	Functional earth

## 2.3. Explanation of Terms

<b>Term</b>	<b>Description</b>
<b>GUI</b>	<b>G</b> raphical <b>U</b> ser <b>I</b> nterface
<b>DCS1</b>	<b>D</b> etector <b>C</b> ontrol <b>S</b> ystem for <b>1</b> detector module
<b>DCS6</b>	<b>D</b> etector <b>C</b> ontrol <b>S</b> ystem for up to <b>6</b> detector modules
<b>DCS24</b>	<b>D</b> etector <b>C</b> ontrol <b>S</b> ystem for up to <b>24</b> detector modules
<b>Detector module</b>	The smallest fully functional unit of the detector (1280 channels).
<b>System CD</b>	<b>CD</b> delivered with MYTHEN detector system
<b>&lt;CD&gt;</b>	path to System CD inserted in your PC
<b>HD</b>	<b>H</b> ard <b>D</b> rive

## **2.4. Disclaimer**

DECTRIS Ltd. has carefully compiled the contents on this manual according to the current state of knowledge. Damage and warranty claims arising from missing or incorrect data are excluded.

DECTRIS Ltd. bears no responsibility or liability for damage of any kind, also for indirect or consequential damage resulting from the use of this system.

DECTRIS Ltd. is the sole owner of all user rights related to the contents of the manual (in particular information, images or materials), unless otherwise indicated. Without the written permission of DECTRIS Ltd. it is prohibited to integrate the protected contents published in these applications into other programs or other Web sites or to use them by any other means.

DECTRIS Ltd. reserves the right, at its own discretion and without liability or prior notice, to modify and/or discontinue this application in whole or in part at any time, and is not obliged to update the contents of the manual.

### 3. Warnings



Please read these warnings before operating the detector system.

---

- DO NOT TOUCH THE ENTRANCE WINDOW OF THE DETECTOR.
- Place the protective cover on the entrance window of the detector when it is not in use.
- The detector is not specified to withstand direct beam at a synchrotron. Such exposure will damage the exposed channels.
- The detector system should have enough space for proper ventilation. Operating the detector outside the specified ambient conditions could damage the system.
- The air inlets and outlets of the detector control system should not be blocked.
- Power down the detector system before connecting or disconnecting any cable.
- Before connecting the power supply to the mains-supply, check the supply voltage with the label on the power supply. Using an improper main voltage will destroy the power supply and could damage the detector.
- Make sure the cables are connected and properly secured.
- Avoid pressure or tension on the cables.
- Opening the detector, the detector control system or the power supply housing without explicit instructions from DECTRIS Ltd. will void the warranty.
- The embedded Linux operating system on the detector control system has customized software for controlling the MYTHEN detector system. Do not make any changes to the Linux operating system without explicit instructions from DECTRIS Ltd.



## **4. Hardware Setup**

- Install the detector system according to the Technical Documentation
- Turn on the power of the detector system
- Turn on the power of the PC

## 5. Linux Installation

### 5.1. Operating System

The proposed Linux installation procedure was tested with Scientific Linux 5.2. Use SL-52-062608-i386-DVD.iso for installation (download it from <http://ftp.scientificlinux.org/linux/scientific/52/iso/i386/>).

To check the correctness of the downloaded image create the checksum with the command `sha1sum SL-52-062608-i386-DVD.iso` (Linux system) and compare the result with the content of the SL-52-062608-i386-DVD.SHA1SUM file, which can be downloaded also from <http://ftp.scientificlinux.org/linux/scientific/52/iso/i386/>.

For further information see [www.scientificlinux.org](http://www.scientificlinux.org).

Other Linux installations may work, but are not tested.

If you have Linux already running, go on with chapter 4.2.3.

## 5.2. Installation Process

### 5.2.1. Basic Installation

- insert DVD and reboot PC
- select graphical installation process
- HD: *remove all partitions on selected drives and create default layout*
- Boot loader: *The GRUB boot loader will be installed on /dev/sda.*
- set Network Devices
  - active on Boot
  - Hostname: automatically via DHCP
- time:
  - time at your place
  - System clock uses UTC
- user: root - set root password
- software packages (selection):
  - select customize now
  - select SL Addons
    - Misc Scientific Linux Packages
    - Multimedia
    - Yum Utilities
  - Desktop Environments - choose either:
    - GNOME Desktop Environment
    - KDE Desktop Environment
  - Applications:
    - Editors
    - Emacs
    - Engineering and Scientific
    - Games and Entertainment
    - Graphical Internet
    - Graphics
    - Office Productivity
    - Sound and Video
    - Text-based Internet
  - Development:
    - Development Libraries
    - Development Tools
    - Java Development
    - KDE Software Development
    - Ruby
    - X Software Development

- Servers
  - MySQL Database
  - Printing Support
- Base System:
  - Administrative Tools
  - Base
  - Java
  - System Tools
  - X Window System
- Installation log files:
  - /root/install.log
  - /root/anaconda-ks.cfg

### 5.2.2. After Reboot

- Login screen
  - Sessions: KDE
- Firewall enabled
  - FTP
  - SSH
  - Secure WWW (HTTPS)
  - Telnet
  - WWW (HTTP)
- SE Linux (security enhanced linux) → disable
- Kdump
  - enable kdump
  - 128 MByte
- Date and Time
  - adjust to your local time
- User
  - username: user
  - full name: user
  - password

### 5.2.3. First Boot

#### 5.2.3.1. Adapt .bashrc as user

- **adapt existing .bashrc** (or copy it from the system CD: `cp CD/software/linux_files/bashrc .bashrc`)
- finally .bashrc should look like:
  - # .bashrc
  - 
  - # Source global definitions
  - if [ -f /etc/bashrc ]; then
  - . /etc/bashrc
  - fi
  - 
  - # User specific environment and startup programs
  - export ROOTSYS=/usr/local/root
  - export QTDIR=/usr/lib/qt-3.3/
  - 
  - export PATH=\$QTDIR/bin:\$ROOTSYS/bin:\$PATH:\$HOME/bin
  - export LD\_LIBRARY\_PATH=\$QTDIR/lib:\$ROOTSYS/lib:\$LD\_LIBRARY\_PATH
- source .bashrc

### 5.2.3.2. Network Configuration

- Network Configuration for P2P connection to MYTHEN system
  - K Menu → Administration → Network
  - Network Configuration
    - select DNS tab
      - Hostname: your hostname
      - primary DNS: your primary DNS
      - secondary DNS: your secondary DNS
      - DNS search path: your search path
    - Devices tab
      - edit device eth0
        - Nickname: P2P\_Mythen
        - Activate device when computer starts
        - Allow all users to enable and disable the device
        - Statically set IP addresses:
          - Address: 192.168.0.100
          - Subnet mask: 255.255.255.0
- File → Save
- File → Quit
- in shell as root
  - /etc/init.d/network restart
  - /sbin/ifconfig → IP address should be 192.168.0.100

## 6. Software Installation

MYTHEN Software requires QT3 and ROOT version less or equal to version 5.18.

### 6.1. ROOT Installation

- in a shell as user root
  - `cd /usr/local`
  - `cp CD/software/root/root_v5.18.00.source.tar.gz .` (or download it from `ftp://root.cern.ch/root/root_v5.18.00.source.tar.gz`)
  - `gunzip root_v5.18.00.source.tar.gz`
  - `tar -xvf root_v5.18.00.source.tar`
  - `rm root_v5.18.00.source.tar`
  - `cd /usr/local/root`
  - configure with qt enabled:
    - `./configure --enable-qt`
    - compile:
      - `make`
      - add `<dir>**pathToRoot**/fonts</dir>` to `/etc/fonts/fonts.conf` (e.g. `<dir>/usr/local/root/fonts</dir>`)
- as user
  - `cd ~`
  - `root` → test starting root
  - `.q` (in root shell to quit)

## 6.2. MYTHEN Software

- in a shell as user
  - `cd /home/user/`
  - `cp CD/software/Mythensoft/MythenSoft.tar.gz .`
  - `gunzip MythenSoft.tar.gz`
  - `tar -xvf MythenSoft.tar`
  - `rm MythenSoft.tar`
  - `cd ~/MythenSoft/src/MythenGUI`
  - compile:
    - `make`
  - `cd ~/MythenSoft`
  - Firmware version < 2.0.4:
    - `cp CD/software/module/module_SNxyz.tar.gz .` (replace xyz by the module number delivered to you according to the system information sheet)
    - `gunzip module_SNxyz.tar.gz`
    - `tar -xvf module_SNxyz.tar`
    - `rm module_SNxyz.tar`
  - Firmware version > 2.0.4:
    - `cp CD/software/module/ASCII/module.tar.gz .`
    - `gunzip module.tar.gz`
    - `tar -xvf module.tar.gz`
    - `rm module.tar`
- create icon on Desktop for MythenGUI
  - right click → Create New → Link to Application ...
  - select general tab:
    - MythenGUI
    - Icon: → Other icons: Browse → /home/user/MythenSoft/src/MythenGUI/MythenGUI\_1.png
  - select application tab:
    - Command: Browse → /home/user/MythenSoft/src/MythenGUI/StartMythenGUI.sh
  - adapt StartMythenGUI.sh z.B. `MythenGUI -scale 1.4`
- adapt the GUI to the correct number of detector modules
  - `cd /home/user/MythenSoft/config`
  - edit `config.txt`
    - NMOD should correspond to your number of detector modules
  - Save `config.txt`
- do a power-off, reboot and test all
- have fun ...



## 7. Appendix

### 7.1. Referenced Documents

All the following documents are available through DECTRIS Ltd. homepage.

[https://www.dectris.com/technical\\_mythen.html#main\\_head\\_navigation](https://www.dectris.com/technical_mythen.html#main_head_navigation)

<b>Term</b>	<b>Description</b>
<b>Firmware Update Guide</b>	Firmware_Update-MYTHEN-V2.pdf
<b>Module Handling Instructions</b>	Handling_Instructions-MYTHEN-V3.pdf
<b>Linux Installation Guide</b>	Linux_Installation-HowTo_MYTHEN-V2.pdf
<b>Network Settings</b>	Network_Settings-MYTHEN-V2.pdf
<b>Quick Start Guide</b>	QuickStart-MYTHEN-V3.pdf
<b>Socket Interface Specifications</b>	Socket_Interface_Spec-MYTHEN-V3.1.0-V1.pdf
<b>Technical Documentation</b>	Technical_Documentation-MYTHEN-V2.pdf
<b>Trigger Notes</b>	Trigger_Note-MYTHEN-V3.pdf
<b>User Manual</b>	User_Manual-MYTHEN-V3.pdf