DDCcontrol Documentation

Nicolas Boichat

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Documentation for DDCcontrol version 0.1.2.

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Chapter 1. About DDCcontrol

About DDCcontrol

DDCcontrol is a tool used to control monitor parameters, like brightness and contrast, without using the OSD (On Screen Display) and the buttons in front of the monitor.

All the software provided by monitor manufacturers (NEC/Mitsubishi NaviSet and Samsung Magic-Tune) are closed-source and only runs on Windows. DDCcontrol is open-source and runs on Linux.

There is two versions of this tool, a command line version, and an user-friendly Gnome GUI.

DDC/CI

DDC/CI is a protocol designed by VESA to configure monitor by software, using two wires on the VGA or DVI cables, which forms an I2C bus.

Chapter 2. Install notes

Software Requirement

To compile and run DDCcontrol, you need to have these packages installed:

- libxml2 [http://www.xmlsoft.org/]

- pci-utils [http://atrey.karlin.mff.cuni.cz/~mj/pciutils.shtml]

- gtk+>=2.4 [http://www.gtk.org/]

In addition to the library packages, you also need the development packages, which are not usually installed. For example, on Debian, their names are `libxml2-dev`, `pciutils-dev` and `libgtk2.0-dev`. Others distributions probably have similar packages names.

Note

You don't need pci-utils if you don't use direct PCI memory access, and you don't need gtk+ if you don't plan to use the Gnome GUI. Usually, this is not the case, so you will need these packages.

Download the sources

Go to the download section [http://sourceforge.net/project/showfiles.php?group_id=117933] of ddccontrol project's page and download the latest `ddccontrol` and `ddccontrol-db` source tarballs.

Then unpack these two archives with:

```
# tar xvfz ddccontrol-X.Y.tar.gz
# tar xvfz ddccontrol-db-YYYYMMDD.tar.gz
```

You should now have two directories, `ddccontrol` and `ddccontrol-db`.

Compile and install

To compile and install the source tarballs, type:

```
# ./configure
# make
# su root
Password: <root password>
# make install
```

You need to do this in `ddccontrol` *and* `ddccontrol-db` directories.

If you set the `--prefix` parameter when configuring one package, you must set it to the same value when configuring the other.

Configure `/dev/i2c-*` devices

Note
`/dev/i2c-*` devices are only working with kernel 2.6 or greater.

If your graphics card is supported by `/dev/i2c-*` devices (see Appendix C, *Supported graphics cards*), you must load the `i2c-dev` module by typing, as root:

```
# modprobe i2c-dev
```

You must also load your graphics card framebuffer driver (for card-specific instructions see Appendix C, *Supported graphics cards*).

If you want to automatically load these modules when Linux starts, see your distribution's documentation.

To allow standard (i.e. non-root) users to use DDCcontrol, you must change permissions on `/dev/i2c-*`. This is done by typing, as root:

```
# chmod a+rw /dev/i2c-*
```

Kernel configuration options

If `i2c-dev` or your graphics card's framebuffer modules are not available with your kernel, you can build your own kernel with the following options turned on (with recommend to build them as modules):

- Devices drivers->I2C support.

- Devices drivers->I2C support->I2C device interface.

- Devices drivers->Graphics support->Framebuffer support.

- and a specific driver for your graphic card (see Appendix C, *Supported graphics cards*).

Chapter 3. Usage

Gnome GUI

If GTK+>=2.4 is installed on your computer, the configure process will detect it, and build the GTK+ application.

The Gnome GUI is designed to be user-friendly, so it should be easy to use it. To launch this GUI, simply type:

```
# gddccontrol
```

Command line tool

The command line tool is useful for debugging purpose, and to create automatic scripts.

Note

We won't present everything you can do with ddccontrol, if you want more information, type:

```
# ddccontrol -h
```

Usage example

This example explains how to list all available controls and then change the brightness parameter.

List available controls

To list available controls, type:

```
# ddccontrol -p
```

This probes for available monitors, then takes the first probed monitor and lists controls supported by it. This should give you an output like this (this example uses a Samsung Syncmaster 173P and a nVidia GeForce FX 5700):

```
ddccontrol version 0.1
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Public License.

Device : pci:01:00.0-0
Error while reading write message answer: Bad message
Reading EDID 0x50 failed.
Device : pci:01:00.0-1
Device : pci:01:00.0-2
Detected monitors :
 - Device : pci:01:00.0-1
   DDC/CI supported : Yes
   Monitor Name : Samsung SyncMaster 173P (DVI)
   Input type : Digital
  (Automatically selected)
 - Device : pci:01:00.0-2
   DDC/CI supported : Yes
   Monitor Name : NEC Multisync 2080UX+
   Input type : Analog
Reading EDID and initializing DDC/CI at bus pci:01:00.0-1...
Device : pci:01:00.0-1
```

```
EDID readings:
    Plug and Play ID: SAM00E2 [Samsung SyncMaster 173P (DVI)]
    Input type: Digital

= Samsung SyncMaster 173P (DVI)
> Color settings
   > Brightness and Contrast
      > id=brightness, name=Brightness, address=0x10, delay=-1ms, type=0
        supported, value=55, maximum=100
      > id=contrast, name=Contrast, address=0x12, delay=-1ms, type=0
        supported, value=60, maximum=100
      > id=magicbright, name=Magic Bright Mode, address=0xdc, delay=-1ms, type=2
        Possible values:
         > id=text - name=Text, value=1
         > id=internet - name=Internet, value=2
         > id=entertain - name=Entertain, value=3
         > id=custom - name=Custom, value=4
        supported, value=4, maximum=4
> Others
   > Restore defaults
      > id=defaults, name=Restore Factory Defaults, address=0x4, delay=-1ms, type=1
        Possible values:
         > id=default - name=Restore Factory Defaults, value=1
        supported, value=0, maximum=1
      > id=defaultluma, name=Restore Brightness and Contrast, address=0x5,
delay=-1ms, type=1
        Possible values:
         > id=default - name=Restore Brightness and Contrast, value=1
        supported, value=0, maximum=1
      > id=settings, name=Settings, address=0xb0, delay=-1ms, type=1
        Possible values:
         > id=store - name=Save Current Settings, value=1
         > id=restorefactory - name=Restore Factory Settings, value=2
        supported, value=0, maximum=2
   > Input settings
      > id=inputsource, name=Input Source Select, address=0x60, delay=-1ms, type=2
        Possible values:
         > id=analog - name=Analog, value=1
         > id=digital - name=Digital, value=3
        supported, value=3, maximum=3
   > Power control
      > id=dpms, name=DPMS Control, address=0xd6, delay=-1ms, type=2
        Possible values:
         > id=on - name=On, value=1
         > id=standby - name=Standby, value=4
        supported, value=1, maximum=4
```

Change the brightness

The lines concerning brightness in the available controls list are:

```
> id=brightness, name=Brightness, address=0x10, delay=-1ms, type=0
  supported, value=55, maximum=100
```

The important elements are address (here: 0x10), current value (55) and maximum value (100).

To change the brightness value to 70/100, type:

```
ddccontrol -p -r 0x10 -w 70
```

The last lines of the output should be:

```
Writing 0x10, 0x46(70)...
Control 0x10: +/70/100 [Brightness]
```

Appendix A. Report problems and successes

If you have problems building or running DDCcontrol, if your monitor doesn't work with DDCcontrol, or if your graphics card is not listed in the Appendix C, *Supported graphics cards*, please write a message to ddccontrol-users@lists.sourceforge.net [mailto:ddccontrol-users@lists.sourceforge.net].

For more informations on ddccontrol mailing lists, see the sourceforge project page [http://sourceforge.net/mail/?group_id=117933].

Appendix B. Supported monitors

The following monitors are supported by DDCcontrol:

Mitsubishi

- Diamond Pro 2060u (VGA input B only)

NEC

- Multisync 2080UX+ (VGA and DVI inputs)

Samsung

- SyncMaster 173P (VGA and DVI inputs)

- SyncMaster 173T

- SyncMaster 193P (VGA and DVI inputs)

Your monitor is not on this list?

If your monitor is not on this list, and so doesn't work with DDCcontrol, but you think that it supports the DDC/CI protocol, please run this command:

```
ddccontrol -p -c -d
```

And send the output to one of the DDCcontrol mailing lists (see Appendix A, *Report problems and successes*).

Appendix C. Supported graphics cards

/dev/i2c-* versus PCI memory

To control a monitor, DDCcontrol must access to the I2C bus of the graphics card. There are two methods to do so: the first one uses /dev/i2c-* devices provided by kernel drivers (abbreviated by dev in tables), the second one reads and writes directly in the card PCI memory (abbreviated by PCI in the tables).

Depending on your hardware, one method or the other works, or even both.

ATI

Radeon series

ATI Radeon cards only work with /dev/i2c-* devices. To use them, you must load the radeonfb module by typing, as root:

```
# modprobe radeonfb
```

The kernel configuration options needed to enable Radeon framebuffer driver and I2C support are:

- Devices drivers->Graphics support->Framebuffer support->ATI Radeon display support.

- Devices drivers->Graphics support->Framebuffer support->ATI Radeon display support->DDC/I2C for ATI Radeon support.

ATI cards support table

These ATI cards have been reported to work, but others models should also work. If yours is not listed, please send a message to one of the DDCcontrol mailing lists (see Appendix A, *Report problems and successes*).

Name	Works	
	dev	PCI
Radeon 7500	Yes	No
Radeon 9200	Yes	No
Radeon 9500	Yes	No
Radeon 9550 SE	Yes	No
Radeon 9600 Pro	Yes	No
Radeon 9700	Yes	No

nVidia

Direct PCI memory access support

Almost every nVidia cards work with direct PCI memory access, and this method is compatible

with the nVidia proprietary drivers.

To use it, you have nothing special to do, everything is done by DDCcontrol.

`/dev/i2c-*` devices support

Note

To use `/dev/i2c-*` devices with nVidia cards, you must have a rather recent kernel (at least version 2.6.9).

Most nVidia cards, starting with TNT, but excluding the most recent GeForce FX series, work with `/dev/i2c-*` devices. To use them, you must load the `rivafb` module by typing, as root:

```
# modprobe rivafb
```

The kernel configuration options needed to enable nVidia framebuffer and I2C support are:

• Devices drivers->Graphics support->Framebuffer support->nVidia Riva support.

• Devices drivers->Graphics support->Framebuffer support->nVidia Riva support->Enable DDC Support.

Warning

The `rivafb` kernel module is *not* compatible with the binary nVidia X drivers, which are the only drivers for nVidia cards to provide 3D acceleration.

This is why we recommend that you use direct PCI memory access with nVidia cards.

nVidia cards support table

Most of these nVidia cards have been reported to work, but others models should also work. If yours is not listed, please send a message to one of the DDCcontrol mailing lists (see Appendix A, *Report problems and successes*).

Name	Works	
	dev	**PCI**
GeForce Ti 200	Yes	Yes
GeForce FX 5700	No	Yes
GeForce 6200 TC	???	Yes
nForce 2 IGP	No	No

Appendix D. Thanks

Thanks to Oleg I. Vdovikin, for his work which was used as a basis for ddccontrol, and for his help when designing the XML database.

Thanks to Christian Schilling, for his nice additions to the Gnome GUI.

Thanks to William Hollingworth, of NEC/Mitsubishi, for his constant help and support to this project.

Thanks to all users that reported if DDCcontrol works on their hardware.

Thanks to various people on mailing-lists (X.org, fbdevel...), for their help, in particular Jon Smirl, on the X.org list, who guided me in the direction of using the kernel framebuffer driver.

Appendix E. Documents for developers

Monitor database structure

The monitor database is written in XML, it can be found in the `db` directory of `ddccontrol-db` package.

This directory contains the following files:

- `options.xml`

- `monitor/%monitor_id%.xml`

Control list

XML file: `options.xml`

`control` elements (e.g. "brightness") are contained in `group` elements (e.g. "color settings"). `group` and `subgroup` elements allow the GUI to separate the controls in different branches on the tree.

`options` attributes:

- `date`: indicates the release date of the current database (YYYYMMDD format).

- `dbversion`: indicates which version of database format is used (must be set to 1).

`control` attributes:

- `id`: abbreviated control name.

- `name`: full English control name.

- `address`: DDC address (optional).

- `type`: one of these values:

  - "`value`": The control accepts values in a continuous range (e.g. brightness).

  - "`command`": An action occurs when the value is set to something greater than "`0`" (e.g. degauss). If you don't define any `value` element in a command control, the default value "`0x01`" will be used.

  - "`list`": The control accepts a list of values (e.g. OSD language).

`value` attributes:

- `id`: abbreviated value name.

- `name`: full English value name (it is not needed if there is only one value for command controls).

- `value`: DDC control value (optional).

File format:

```
<?xml version="1.0"?>
<options date="%date%" dbversion="1">
  <group name="%groupname%">
    <subgroup name="%subgroupname%">
      <control id="%control_id%" type="value" name="%control_name%"
address="%hex_address%"/>
        <!-- Command using the default 0x01 address -->
      <control id="%control_id%" type="command" name="%control_name%"
address="%hex_address%"/>
      <control id="%control_id%" type="command" name="%control_name%"
address="%hex_address%">
        <value id="%value_id%" value="%hex_value%"/>
      </control>
      <control id="%control_id%" type="list" name="%control_name%"
address="%hex_address%">
        <value id="%value_id%" name="%value_name%" value="%hex_value%"/>
        <value...>
      </control>
      <control ...>
    </subgroup>
  </group>
  <group ...>
</options>
```

Monitor Profiles

XML files: `monitor/%monitor_id%.xml`

List of controls supported by a monitor.

`control id` attributes are defined in `options.xml`. If control type is "`list`" or "`command`" without non-default value, supported values must be defined.

`address` attribute for `control` elements and `value` attribute for `value` elements are optional if they are defined in the general options file.

The `init` attribute in `monitor` element define the type of the initialization: DDC/CI standard ("`standard`"), or Samsung ("`samsung`").

The `caps` attribute is optional. Its format is defined in ACCESS.bus specifications and is treated as following:

- If `caps` is not defined, caps are read from monitor.

- If this attribute exists and have a "`vcp`" string (e.g. "`type(lcd) vcp(10 12)`") then the specified caps string is used.

- If this attribute exists but does not have a "`vcp`" (e.g. "`type(crt)`" or "``"), then all controls defined in the monitor profile are supposed to be supported.

You can set a `delay` attribute in `control` elements to set the time in milliseconds to wait after changing the value of this control. If you don't, a default value is used.

File format:

```
<?xml version="1.0"?>
<monitor name="%full_monitor_name%" init="[standard|samsung]" caps="%caps%">
  <controls>
    <!--- value -->
    <control id="%control_id%" address="%hex_address%" delay="%wait_time%"/>
    <!--- command using a default 0x01 value-->
    <control id="%control_id%" address="%hex_address%" delay="%wait_time%"/>
    <!--- command -->
    <control id="%control_id%" address="%hex_address%" delay="%wait_time%">
      <value id="activate" value="%hex_value%"/>
    </control>
    <!--- list -->
    <control id="%control_id%" address="%hex_address%" delay="%wait_time%">
```

```
        <value id="%value_id%" value="%hex_value%"/>
        <value...>
      </control>
      <control...>
    </controls>
</monitor>
```

If a monitor supports exactly the same controls as another one, you can define it as shown:

```
<?xml version="1.0"?>
<monitor include="%monitor_id%" name="%full_monitor_name%" caps="%caps%"/>
```

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