

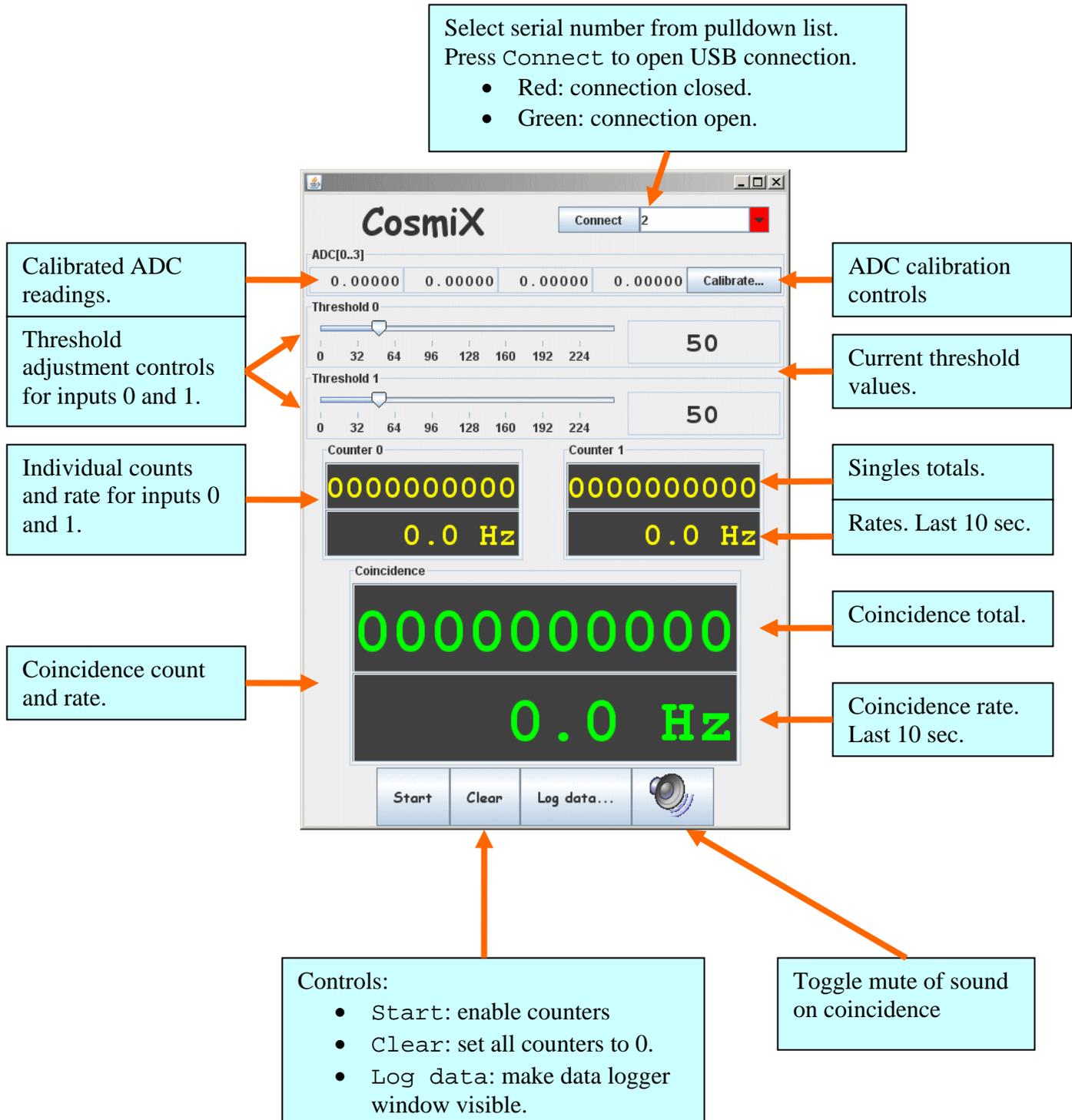
CosmiX notes

The CosmiX main panel

The USB serial number, thresholds and other parameters are saved between sessions.

Pressing **Connect** tries to re-establish (i.e. close and re-open) the USB connection. The connection status is indicated by the colour of the serial number selection box.

On connection, the thresholds are written and counters are cleared and disabled.



Data logging

The `Log data...` button on the main panel makes the data logger control window visible. There you can set the name of the file where data will be logged. A file extension of `.csv` is recommended as the data are written as comma separated values and this is a format recognized by Excel.

The data logged are a little different from previously. Each entry consists of time-of-day, time in milliseconds since start of logging and the corresponding counter values for the single counters and the coincidence count. The raw (uncalibrated) ADC values of the four ADC channels are also logged. The pressure sensor reading is `adc3`.

Logging is controlled by the following buttons:

- **Start:** Create new logging file and enable logging. **Warning! An existing file of the same name will be overwritten.**
- **Stop:** Close the current log file.
- **Pause:** Temporarily stop logging.
- **Resume:** Continue logging to the same file.

The logging interval is adjustable. The value should be entered into the box provided as an integer value of seconds. It doesn't make much sense to record at less than 10 second intervals at typical cosmic rates and even this is much too frequent for most measurements.

Rates are not logged. These are best calculated (e.g. in Excel) from the raw count values and timestamp data.

History charts

The logging window also contains charts that show the coincidence rate and pressure as a function of time. The appearance of the charts can be modified by right-clicking on the corresponding chart to get a pop-up menu with the various options. The charts are updated every minute. The time information in the charts is only approximate. Data analyses should use the logged information.

ADCs

There are four analogue inputs that are digitised using a 10-bit ADC. `adc0` and `adc1` operate in differential mode and `adc2` and `adc3` operate in single-ended mode. `adc3` can also be connected to the pressure sensor. The raw digitised values are scaled and offset by amounts that can be set by clicking `Calibrate...` and entering the desired values in the appropriate fields. The raw value is multiplied by the scale factor then the offset is added. The calibrated values are displayed in the main window.

Full scale range of the single-ended analogue inputs is 0-2.44 V and for the differential inputs is ± 2.44 V.

Software installation

The software package contains the following files that comprise the CosmiX application:

- `cosmix.jar`: the Java GUI
- `jcommon-1.0.12.jar` and `jfreechart-1.0.9.jar`: the charting package
- `libJniCosmix.dll`: the CosmiX hardware application extension
- `SiUsbXp.dll`: the SiLabs USB Xpress application extension
- `Driver/`: directory containing driver installation files

The files can be simply unpacked from the ZIP file into any directory for which you have write permission. I recommend `C:\Program Files\Cavendish\` as this is the default location used for some device driver files. Keep the files together in the same directory otherwise you will quickly get into trouble.

First install the USB device drivers (before connecting the USB cable). To do this, go to the `Driver/` directory and run `USBXpressInstaller.exe`. You can accept all the defaults unless you want to change the installation path. If you get an error saying that not all files could be copied, ignore it and continue.

[Important note when doing an upgrade installation: if you have previously installed the device drivers you may have an old version of `SiUsbXp.dll` in `C:\Windows\system32\`. This will cause problems as it is

incompatible with the new device drivers. It can be safely deleted. The new driver installation puts the `SiUsbXp.dll` file in the CosmiX installation directory and it should remain there.]

Now connect the USB cable. The New Hardware wizard will ask whether to install drivers. Disable the “Search the internet” option then allow the wizard to find the driver automatically.

Once the driver installation is finished, run the application by entering the following command in a command prompt:

```
java -jar cosmix.jar
```

Simply double-clicking on `cosmix.jar` should also work but you may not see any error messages if there was a problem..