



Science & Technology
Facilities Council

LIMA with Daresbury Detector Systems

Geoff Mant



Ultra Detector for X-Rays



1D Silicon Strip Detector
used on ID24 at the ESRF

Controlled by commands sent
via tcp socket, data is streamed
from 1G udp socket



XH Detector for X-Rays



1D Germanium Detector based
on Xchip3 for ID24 at the ESRF

Controlled from on-board FPGA
running Linux





Xpress3 for Vortex detectors

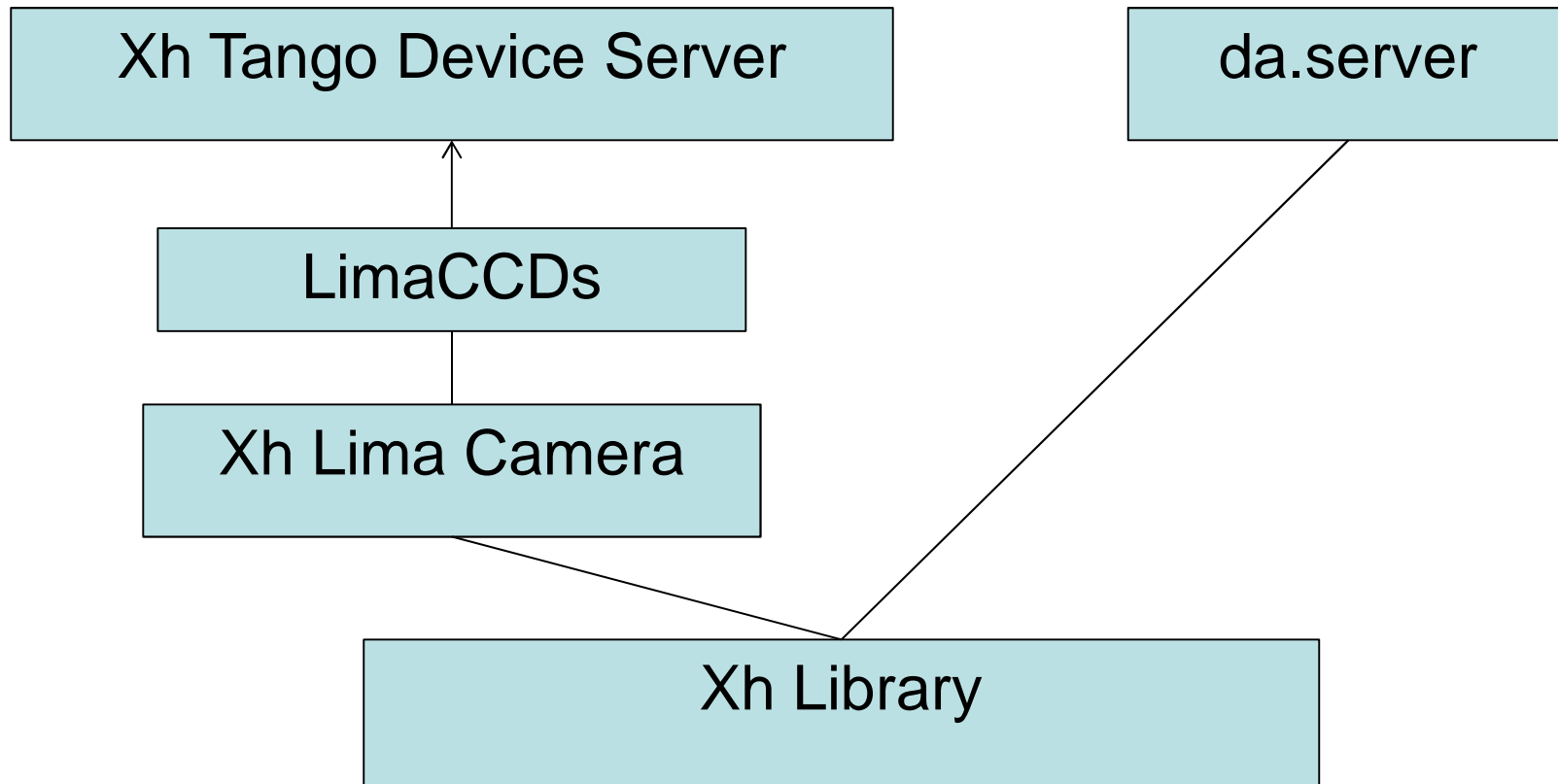


Readout and control system
based on Xilinx FPGA's

Controlled by commands sent
via tcp socket, data address's are
streamed from 10G udp socket and
histogrammed on Linux server



Software Model





Software Tools

The screenshot displays the Eclipse IDE interface. The main editor shows two files: `XhInterface.h` and `XhInterface.cpp`. The `XhInterface.h` file defines an abstract class `Interface` with methods like `prepareAcq()`, `startAcq()`, `stopAcq()`, `getStatus()`, `setNbHwFrames()`, `getNbHwFrames()`, `getValidRanges()`, `getCapList()`, `reset()`, `prepareAcq()`, `startAcq()`, `stopAcq()`, and `getNbHwAcquiredFrames()`. The `XhInterface.cpp` file implements these methods, including a `switch` statement for the `getStatus()` method that handles states like `Idle`, `PausedAtGroup`, `PausedAtFrame`, `PausedAtScan`, `DetWaitForTrigger`, `AcqRunning`, `Camera paused`, `Running`, and `Camera running`.

The Project Explorer on the left shows a project structure with folders like `common`, `frelon`, `marccd`, `maxipix`, `mythen`, `pco`, `perkinelmer`, `photonicscience`, `pilatus`, `prosilica`, `rayonixhs`, `roperscientific`, `simulator`, `ueye`, `ultra`, and `xh`. The `xh` folder contains subfolders `include` and `src`, along with files like `Makefile`, `VERSION`, `xpad`, `Makefile`, and `pom.xml`.

The Console window at the bottom shows the output of a CDT Build Console for the project `Lima`. The output indicates a successful build of configuration Debug for project Lima, listing the compilation of various source files and ending with `**** Build Finished ****`.



Software Tools

The screenshot shows the TANGO Code Generator interface for the 'Ultra' platform. The window title is 'TANGO Code Generator - Release 8.1.5 - Ultra'. The main area displays a class hierarchy diagram with 'Tango DeviceImpl' at the top, followed by 'LimaCCDs', and 'Ultra' at the bottom. The left sidebar shows a tree view with 'Class Properties', 'Device Properties', and 'Commands'. The 'Device Properties' section includes: LimaCameraType, NbProcessingThread, AccThresholdCallbackModule, HostAddress, TcpPort, UltraAddress, MaxTF, ModuleName, and UdpPort. The 'Commands' section includes: State, Status, openShutterManual, closeShutterManual, getAttrStringValueList, prepareAcq, startAcq, stopAcq, reset, setImageHeader, getImage, getBaselImage, readAccSaturatedImageCounter, readAccSaturatedSumCounter, setAccSaturatedMask, writeImage, readImage, getPluginDeviceNameFromType, prepareAcq, readAccSaturatedSumCounter, and SaveConfiguration.

The screenshot shows the TANGO Code Generator interface for the 'Xh' platform. The window title is 'TANGO Code Generator - Release 8.1.5 - Xh'. The main area displays a class hierarchy diagram with 'Tango DeviceImpl' at the top, followed by 'LimaCCDs', and 'Xh' at the bottom. The left sidebar shows a tree view with 'Class Properties', 'Device Properties', 'Commands', and 'Scalar Attributes'. The 'Device Properties' section includes: LimaCameraType, NbProcessingThread, AccThresholdCallbackModule, XhPathName, TtyPathName, NumPixels, HeadMask, IsXstrip, Debug, and Xchip3. The 'Commands' section includes: State, Status, openShutterManual, closeShutterManual, getAttrStringValueList, prepareAcq, startAcq, stopAcq, reset, setImageHeader, getImage, getBaselImage, readAccSaturatedImageCounter, readAccSaturatedSumCounter, setAccSaturatedMask, writeImage, readImage, and getPluginDeviceNameFromType. The 'Scalar Attributes' section includes: lima_type, camera_type, camera_model, and acq_status.



Software Tools

The screenshot displays the Jive 4.24 [gmvig1:10000] software interface. The main window is divided into several sections:

- Server Tree:** A hierarchical view on the left showing the structure of the system, including servers like DataBases, TangoAccessControl, TangoTest, Ultra, myUltra, Xh, myXh, and xh/tango/1.
- Device Info:** A central panel showing details for the selected device 'xh/tango/1'.

```
Device: xh/tango/1
type_id: IDL:Tango/Device_4:1.0
iiop_version: 1.2
host: gmvig1.d1.ac.uk (148.79.163.10)
port: 37527
Server: Xh/myXh
Server PID: 27584
Exported: true
last_exported: 15th March 2013 at 11:00:47
last_unexported: ?
```
- Device Panel [xh/tango/1]:** A floating window with tabs for Commands, Attributes, and Admin. The Attributes tab is active, showing a list of attributes for 'vrefc'.

Name	Value
video_last_image_counter	vrefc
video_live	vrefc
video_mode	READ_WRITE
video_roi	Spectrum
vled	DevDouble
vpupref	2
vref	0
vrefc	No unit
vres1	No standard unit
vres2	No display unit
write_statistic	%6.2f
- Output Log:** A text area at the bottom of the Device Panel showing the results of a write operation.

```
Duration: 2 msec
Write OK
-----
Attribute: xh/tango/1/vrefc
Duration: 1 msec
measure date: 18/03/2013 16:41:39 + 800ms
quality: VALID
dim x: 2
Read length: 2
Read [0] 0.0
Read [1] 0.0
Write length: 2
Set [0] 0.0
Set [1] 3.3
```




Problems/Requests

- Source not checked-in
- Main problem: buffers

- HDF5
- Coding standards
- Two versions of LimaCCD/LimaDetector
- Create interface in POGO save to xmi to allow generation of cpp and python



Acknowledgements

William Helsby
Jon Headspith

Andy Gotz
Alejandro Homs