

Montreal GenICam Meeting + GigE Vision Plug-Fest

June 12 to 15, 2006
Hotel Ruby Foo's

GenICam Meeting

The first 3 days are devoted to GenICam. Here is the list of participants.

Attendee	Company	Arrival	Departure
Johann Scholtz	NI	Sunday	Thursday pm
Fritz Dierks	Basler	Saturday	Thursday pm
Francois Gobeil	Pleora	Monday	Thursday pm
Vincent Rowley	Pleora	Monday	Thursday pm
Michael Krag + 2	JAI	Saturday	Friday
Sascha Dorenbeck	Stemmer Imaging	Saturday	Thursday pm
Rupert Stelz	Stemmer Imaging	Saturday	Thursday pm
Christoph Zierl	MVTEC	Saturday	Thursday pm
Jan Becvar	Leutron	Saturday	Friday
Peifang Zhou	DALSA		
Eric Carey	DALSA	-	-
Bruno Menard	DALSA	-	-
Guillaume Schem/Pierre Yapeti	DALSA	-	-
Stephane Maurice + 1 (Michael)	Matrox	-	-
Frédéric Mathieu	Atmel	Sunday	Wednesday
Koichi Yamakawa	Toshiba-Teli	Sunday	Friday

GigE Vision Plug-fest

For those who bring actual GigE Vision products, we will have a more practical session to verify interoperability on Thursday. DALSA will provide with Ethernet switches and CAT-6 cabling. Please bring your own PC/laptop with appropriate Ethernet connection.

Please let me know in advance if you need any special equipment.

We will schedule the session the week before the plug-fest. We will pair two companies to work together for 90 minutes. Then they can present the result to rest of the attendance, focusing on the interoperability.

In order to speed things up, it would be great if participants could bring multiple devices and laptops.

Participant	Company	Products
Eric Carey + 2	DALSA	Cameras
Francois Gobeil + Vincent Rowley	Pleora	PC software + Devices
Fritz Dierks	Balser	Camera + PC software
Stephane Maurice + 2	Matrox	PC software
Rupert Stelz + Sascha Dorenbek	Stemmer	PC software
Johann Scholtz	NI	PC software
Koichi Yamakawa	Toshiba-Teli	Camera
Michael Krag + 2	JAI	Camera

Directions to Hotel

Here is the hotel information. I've reserved a block of 15 rooms under the name of "DALSA" with our corporate rate of \$115CDN. So please make your own reservation (see phone number below) and tell the person you are with the DALSA group.

Hotel Ruby Foo's
7655 Decarie Boulevard, Montreal
(514)731-7701 or toll free (800)361-5419
<https://www.hotelrubyfoos.com/main.cfm>

The Conference will be at the hotel. The hotel is about 10-15 minutes away from the Montreal Airport (Pierre-Elliot Trudeau airport). I recommend you take a taxi to get to the hotel.

Agenda

Day 1 (9h30 to 17h30)

- homework review
- status of GenApi / urgend non-TL matter to discuss
- Endianess attribute in the XML
- TLparamsLocked
- IsStreamable feature
- Standard numbers for Event
- Non-consecutive address with Selector
- Standard Features Naming convention for IIDC and GigE Vision
- GenTL standard text review (Rupert to provide Doxygen + CVS update prior to meeting)

Day 2 (9h00 to 17h30)

- Architecture for a grabber/camera TL (Atmel)
- Architecture review of the GenTL module, e.g. along use cases
 - binding
 - instantiation
 - grabbing
- Fritz to explain pixel type compatibility issue with IIDC
- Endianess revisited

- 20h00 - Dinner at Montreal Old Port

Day 3 (9h00 to 15h00)

- GenICam version official release package
- CVS repository: line end issue
- Coding policy
- Naming Convention addition
- Update to GenICam web site/Press release
- Task List/Homework assignment -> done
- Roadmap
- Next meeting
- Soccer/Football break

Day 4 (9h00 to 16h00)

- GigE Vision plug-fest

Meeting Minutes

Day 1

- *Start at 9h30am.*
- Review agenda
- Presentation from Fritz on current status (PowerPoint)
- Review possibilities to handle global environment. Need examples.
 - Manifest (Francois Gobeil)
 - Delay loading of DLL (Eric Gross)
 - Registry key (Alexender Happe)

- Use a relative path “./GenApiSchema_Version_1_0.xsd” to avoid support. This would be mandatory. No objection from participants => Action: **Add this to standard text** (Fritz).
- Fritz created an installation package for GenApi for MS VS 8.0.
- Review build and release procedure of GenApi (refer to Building_and_Releasing.doc). Proposed to have a single release number for all the elements to simplify support. Make part of release note.
- Proposed to create a side-branch in CVS at each release. Main branch used for next release.
- Bugs should be discussed on the GenICam mailing list. 2 weeks to provide the fix. An additional 2 weeks to accept the fix. A bug should typically be fixed by the module keeper or the bug reporter. Should post up-front a bug is discovered and a new release candidate is being built.
- Who should be allowed to archive bug fix in CVS? Should be the keeper of the module to ensure integrity. Action: **Look into possibility to have read-only access into CVS (Christoph)** for safety reason.
- *Discussion:* merge into main branch after bug fix has been validated in the branch. This is to avoid breaking the main branch. We need quick reaction time in the branch to fix the bug for customer, but not in the main branch because we don't expect to release more than one new major version per year. => **voted to merge immediately to main trunk.** Bug fix must be documented in release notes.
- Action: **Need to define terminology for the release process in CVS** (Fritz and Christoph).
- Found a solution to virtual destructor of the IBase interface.
- *New issue:* Enumeration with only one member cause an error at runtime.
- *New issue:* Tooltip as an attribute in RegisterDescription. Error when it is missing. Should become mandatory (not backward compatible).
- *New issue:* Write-only register for MaskedIntReg cannot use read-modify-write. This needs to be caught by the Schema.
- New proposed features to add:
 - Add <pCommandValue> element to the Command node.
 - <pAddress> could also point to <IEnumeration>, for instance when an array is not evenly spaced in memory. This can be used to simply Selector implementation.
 - <pIsImplemented> could also point to IBoolean.
 - intConverter to include <pVariable> element.
- Which version of GenApi to use with GigE Vision. In practice, GigE Vision relies on the Schema. Action: **Modify Schema not to break backward compatibility** with July 2005 version, then reference the Schema version in GigE Vision spec. (release 1.0). Action: **Jeff Fryman/Eric C. to send mail to clarify the version of the Schema to use (version 1.0). Attached Schema to this email.**
- Need to maintain the location on the GenICam website for all officially released Schema. GigE Vision web site can make reference to that URL. This is same URL found in XML (xsi:schemaLocation attribute).

- Revise CppUnit test coverage of current modules (review of homework). Today's voting members are: Atmel, Basler, Leutron, Matrox, MvTec, NI, Pleora, Stemmer.
- Proposal for the release:
 - Version 1.0 of the GenApi Schema and GenICam standard test.
 - Version 1.0 of the GenICam reference implementation (including the GenApi module and Validator).
 - No objection from Voting companies on this proposal.
- Volunteers for new homework. This is for test coverage of functions not already covered by CppUnit.
 - Basler
 - Matrox
 - Pleora
 - Atmel
 - Leutron
 - MvTec
 - NI
 - Stemmer
- Homework for test to be accomplished within 2 weeks after this GenICam meeting. Publishing date: Monday July 10th 2006.
- *Break for lunch*
- Endianess discussion: Representation in GenICam is what gets out of the camera. All GigE Vision registers are BigEndian. Ensure strings are always larger than 4 bytes. What happens for 64-bit registers (split into 2 x 32-bit registers)? **To revisit...**
- <MSB> value is always lower than <LSB> value for BigEndian. It is the other way around for LittleEndian. Action: **Fritz to fix example in GenICam PDF.** <MSB> and <LSB> are incorrectly represented for BigEndian.
- TLIsParamsLocked discussion. Would need to add a new method for the TL to lock a given feature. This would provide fine granularity in locking nodes. Lock would include a count if multiple threads try to lock/unlock. That means that camera and TL would have different mechanisms to lock a given feature. Action: **Fritz to look into adding that method.**
- Each camera should implement a TLIsParamLocked node that is served by the TL to indicate the acquisition parameters affecting the image format (size and layout) cannot be changed anymore. This node will effectively lock any features affecting image format using <pIsLocked>.
- IsStreamable discussion: Camera manufacturer should add this attribute to features that needs to be streamed out of the camera (for configuration).
- Should we specify a common file format for the streamed file? Action: **NI to propose a common format for this file.**
- As an extension, we could have GenApi managing this file. Action: **NI to look into this.**
- Camera manufacturer shall make sure they implement the Invalidator to indicate dependencies between features.

- Standard event number discussion: Need to provide this information in the naming convention for GigE Vision. Action: **Stephane to add a section in Naming Convention document to describe that for next week.**
- Non-consecutive address with Selector. This is addressed using Enumeration.
- Naming Convention for GigE Vision: Who is maintaining the document: GigE Vision committee, GenICam committee or a third (new) committee? Stephane will maintain it as part of new committee (that includes member from both GigE Vision and GenICam). Action: **Eric C. to check with Jeff (AIA).**
- Fritz has found a number of entries in GigE Vision naming convention that is difficult to port to IIDC (even with a SwissKnife). Basler has a proposal to work-around these, but this involves modification to standard features naming convention (not backward compatible).
 - TriggerMode
 - TriggerSoftware
 - TriggerSource
 - TriggerActivation
 - ExposureMode
 - PixelCoding
 - PixelSize
 - PixelColorFilter
- Fritz to check with his people why pixel type convention cannot be remapped to IIDC so we can discuss further tomorrow. It seems NI was able to have something to accommodate that.
- GenTL standard text review. Presentation by Rupert. Overview of architecture.
- Discussion about possibility for unification of camera and TL XML for Camera Link interface.
- *End of meeting at 18:20.*

Day 2

- *Meeting starts at 9:15*
- Presentation of grabber/camera TL architecture (Atmel, Word document)
- Discussion about this architecture. Questions about unifying XML from camera with grabber. Should they be merged into a single XML or interpreted by the software. This is still an open question.
- First step is to allow a single feature to control both the camera and grabber.
- Second step is to have a TLC (Transport Layer Client) for grabber plus its XML so high-level software could easily switch between TLC.
- TLC would typically be built on top of the grabber native control API.
- Camera TLC DLL performs translation from XML registers into serial commands.
- Rupert indicated Stemmer has developed a GEV client following this architecture.
- Impact on CameraLink2: should address the register issue in same way as GEV. Ensure GenICam is supported by this new interface. Naming Convention should

also be created early. Action: **Check with your CL2 committee representative and explain impact of this.**

- Review of the GenTL API (CHM document posted by Rupert last week).
- Presentation of the sequence of calls to setup and execute an image transfer.
- Discussion about buffer allocation and announcement. What about devices requiring memory alignment (such as PCI32 based device)? This is not supported at the moment.
- What about non-contiguous buffers (line pitch/AOI)? This is not supported at the moment.
- The buffer announces function must prepare everything to eliminate overhead during actual image transfer.
- Currently, there are 2 mechanisms to indicate a buffer has been acquired: DSWaitForBuffer and the Event/Callback. A single mechanism would be preferable. Callbacks are more flexible. A helper function could provide the DSWaitForBuffer implementation on top of this callback scheme when required.
- Presentation of a DOS console example of the GenTL interface (Sasha, TIDosTest.cpp). This resides below the Factory.
- Would be interesting to start creating a list of use cases using this API to ensure we support most typical situations. Action: **Rupert to coordinate.**
- Revisit Pixel Type issue (Fritz). Johann proposed a direct mapping between GEV Pixel Type and IIDC. This would require an IntConverter node (sort of an integer to integer look-up table). Restriction would be that DataDepth and ColorFilterId have to be read-only, and we could not control the MONO10/12/16. PixelFormat obviously remains a mandatory feature. Pixel features of naming convention should remain read-only. Action: **Fritz to look into this IntConverter.**
- Stephane suggested creating a callback mechanism between nodes so a node could trigger another node when its content is changed. This could be implemented in a future release. This could also be used to combine together multiple XML files in an elegant way (grabber vs camera XML).
- Looked into mapping of trigger features of GEV naming convention with IIDC. Basler raised the issue mapping is difficult. But it looks there is a way to correctly covers it with current feature list. We will deprecate the TriggerMode(Off,Software,Hardware) and replace with TriggerMode(On,Off). We will deprecate TriggerSource(Line1,Line2) with TriggerSource(Line1,Line2,Software). Action: **Stephane to modify Naming Convention with this new scheme.**
- *Lunch break*
- Endianess revisited (long discussion): For little-endian cameras, the ReadReg command shall always flip the bytes inside the 32-bit word, even when accessing a string. Action: **Eric to clarify in next version of GEV spec.**
- Add an attribute in RegisterDescription to indicate if bytes must be flipped (a global flip indicator). Default to NoFlip. Action: **Fritz to add that to the specification.**
- For the moment, we can keep little-endian camera having <Endianess> set to BigEndian. This is working because of the way software providers treat the ReadReg/WriteReg access to the camera. In the future, it will be recommended to

use the Flip attribute and set <Endianness> to represent the true physical representation inside the camera. This way, ReadReg could be used to read strings and perform correct byte flipping due to Endianness.

- GenTL bindings discussion (Rupert).
- *End of meeting at 18:00*

Day 3

- Start of meeting at 9:10am
- Presentation of the Building and Releasing GenICam document (Fritz, Word document = Building_and_Releasing.doc). This document is an “How To” on generating a new GenICam package. At the moment, this includes GenAPI.
- Required tools to generate a build:
 - Microsoft Visual C++ (7.1 or 8.0)
 - Doxygen
 - DOT
 - Microsoft HTML Workshop
- Need to determine who is managing the release and the communication related to releases.
- Release candidate are also tagged in CVS. Tags are never deleted.
- End of line issue: Just before release 1.0, we need to adjust the files in CVS for the end of line problem. Action: **Christoph to perform the adjustments when everybody has put files back in CVS.**
- Coding policy: We should put in place a coding style for GenICam source code to facilitate contributions from different people. This could take the form of a short document indicating how things should be put in the source code and makefiles. This is basically for newcomers. Action: **Jan to provide a proposal document.**
 - Space for indentation
 - No warning during compilation
 - Provide test code for any new software pieces
 - Use default Visual Studio settings for bracketing and spacing (found under Options / Text Editor / C/C++, with exception of the “use space for indentation”).
 - Maintain the logger mechanism
 - Bug report should lead to creation of a test case
 - Usage of CVS (edit command of CVS)
- Naming Convention: Proposal from Vincent to add a feature to control the number of CameraLink taps used by the camera. This typically affects the frame rate out of the camera. Should we use current features to indirectly control this (through a SwissKnife?) or add a new feature? Need to distinguish between sensor taps (physical topology of the sensor) and CameraLink ports (from A to H for FULL). Conclusion is we need to have new features to represent this reality. Action: **Jan to relook into his CameraLink feature proposal and repost it.** Action: **Stephane to post a request to find a proper designation for features to indicate number of taps of sensor (current proposal is “SensorTaps”) and number of transmission taps (“TransmissionTaps”).**

- Naming Convention open issues (Stephane). Go over the list of issues that were still open in draft 1.0.
- Chunk part: Action: **Fritz to revise naming convention for Chunk.**
- Action: **Stephane, Physical Line # and user output # could start with 0 index (acceptable but not recommended for new designs).**
- Action: **Stephane, Add FrameRateRaw as an Integer. This should correspond to the float version (FrameRateAbs).**
- Action: **Stephane, Add PixelDynamicRangeSelector in next version.**
- Action: **Eric to propose for next GEV spec the possibility to use the EVENTDATA message** to pass back asynch. device error codes using a single EventID. The DATA would represent the error code (and maybe a string).
- `<Converter Name="ExposureTimeAbs">`
`<FormulaTo><![CDATA[FROM / 20]]></ FormulaTo>`
`<FormulaFrom><![CDATA[TO * 20]]></ FormulaFrom>`
`<pValue>ExposureTimeRaw</pValue>`
`</Converter>`
- *Break for lunch*
- Press release: Action: **Eric to write a press release note to be revised by EMVA about GenICam 1.0 (GenAPI module + Naming convention and reference GigE Vision/IIDC).** Action: **Eric to mail meeting minutes to mailing list.**
- Web site: Put press release and meeting minutes. Do we want to present products using GenICam? Could “announce” product on this page (camera and software products). Action: **Fritz to check with EMVA to adapt the web page.**
- Roadmap to next meeting:
 - Need to get more involved with IIDC.
 - Improve Standard Naming Convention.
 - TLI
 - To discuss on mailing list.
- Next Meeting: Japan was proposed to get closer to IIDC camera manufacturers and show GenICam really is an international specification. This meeting would address interoperability of GenICam with IIDC. End of September? Action: **Michael to check with JAI if this could be feasible.** Action: **Yamakawa-san to check with IIDC for interest by IIDC camera manufacturers.** Might also want to have a small session during Stuttgart Vision.
- How to ensure we maintain backward compatibility of GenICam? One element of solution is to use the GEV camera simulator and create an XML file with the 7 mandatory features (already planned by GEV committee). Could also have GenICam camera vendor provide XML files to validate against the unit test (try to load them into GenICam). This will require more discussion on the mailing list. Action: **Francois to propose a framework for the latter test.**
- For future addition to the GenICam code, people must first post on mailing list (indicating this is a future in the Subject field of the email) and discuss before making actual modification into CVS.
- Looked into the bug tracking system (Mantis, Stemmer presented a quick demo, www.imaging.de/apps/mantis_genicam). Created a few accounts.

- *The End!*

GigE Vision Plug fest

- Padding of last stream packet is allowed. Software needs to handle that.
- Need to use Invalidators in camera XML file to accurately reflect relationship related parameters.
- Use GigE Vision version 1.0 in bootstrap version register.
- Should investigate idea of a virtual plug-fest.
- GenAPI logging can be used to better understand what happens when XML file is loaded. Refer to “How to use logging.doc”.
- PacketSize restrictions are not reflected anywhere. That could be described in the XML file.
- Structure of the feature tree differs between manufacturers. This is allowed, but should we suggest a default?
- AccessMode (RO, WO or RW) should correctly reflect the actual implementation.
- We have seen camera power-up default value not matching the XML.
- TLParamsLocked is missing from most XML (though it is not mandatory).
- IntRegMasked cannot be write-only because of read-modify-write.
- PayloadSize mandatory features of camera shall reflect the final Width and Height dynamically (after binning, scaling, cropping or any other operation affecting data in a Block_id).