

# GenICam Meeting Notes

Montreal October 2008



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**Matrox Imaging**

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## GenICam/GigE Vision Meeting Attendees

October 20 to October 23, 2008

Hôtel le Place D'Armes, Montréal, QC

Company	Representative
AIA	Jeff Fryman
Allied Vision	Holger Eddebuette
Basler	Fritz Dierks
Basler	Thies Möller
Cognex	Tim Barber
DALSA	Eric Bourbonnais
DALSA	Eric Carey
DALSA	Pierre Yapiti
DALSA	Andre DesRuisseaux
e2v	Frederic Deriviere
Euresys	Jean-Michel Wintgens
IDS	Carsten Bienek
JAI	Karsten Christensen
JAI	John Le
Leutron	Jan Bečvář
Lumenera	Jim Balkwill
Matrox	Stephane Maurice
Matrox	Michael Gozzo
Matrox	Dwayne Crawford
MVTec	Thomas Hopfner
MVTec	Ivonne Puhmann
National Instruments	Eric Gross
Pleora	Vincent Rowley
Pleora	Francois Gobeil
Pleora	Trever Burchett
STEMMER	Rupert Stelz
Toshiba-Teli	Koichi Yamakawa

# GenICam Meeting – Day 1

Monday, October 20, 2008

Hotel le Place D'Armes, Montréal, QC

## **Welcome (Stephane Maurice, Matrox)**

- Reviewed homework from Pilsen
- Established voting rights.
- Stemmer reminds that homework should be tracked in Mantis instead of the cumbersome excel file.

## **GenApi Status (Fritz Dierks, Basler)**

- Maintenance release v1.1.1
  - Reviews bug fixes by going over mantis entries.
  - **ACTION: A new RC (v1.1.2) is required.**
    - Fix #279 and #283
    - MVTEC: Add Xerces/Xalan libs to Linux package.
      - Cannot assume that the Linux distro has these installed.
- New features in v1.2
  - #120 : Alias <-> Increments on Floats
    - Provides a path out of Raw/Abs hell.
    - **ACTIONS:**
      - Can GenICam v1.1 handle nodes referencing each other through <pAlias>?
      - Add GetEnumerator() member to IFloat.
      - Document proper usage of aliases.
      - If pAlias is decided to be unidirectional, get rid of Integer::GetFloatAlias().
  - #51 : Replicator
    - Write multiple registers through a single node.
    - Should solve many problems faced by XML writers today.
  - #43 : Multiplexer
  - #254 : GetValue with IgnoreCache flag
    - Can now poll without setting a node's caching mode to NoCache.
  - #250 : ICommand::IsDone() behavior

- Callback whenever IsDone state changes.
  - **ACTION: Split Mantis entry for v1.1.1 changes and v1.2 changes.**
- #256 : <pError> based Error handling.
    - Feature nodes can point to an enumeration node that stores the last error state of the feature.
    - **ACTION: GetValue() on pError must be called with IgnoreCache=true.**
- #262 : Format Float Numbers
    - Add methods for getting notation and precisions of floats.
    - **ACTION: Rename to “DisplayNotation” and “DisplayPrecision”.**
    - **ACTION: Add IP/MAC formatting to Integer nodes. (Pleora to contribute this?)**
- #264 : Integer::GetUnit()
- #44 : Access right-aligned chunk data
- #45 : Direct access to chunk buffer.
    - Automatic chunk data copies no longer required.
- #56 : Hold a copy of the chunk data
    - **ACTION: Allow the application to control CopyData status.**
- #130 : GenApiPreProcessor
    - Can add preprocessed files to cached.
    - Can perform cycle checking on XML.
    - Should we include SFNC validation here?
- #68, #275 : Logging in release mode
    - **ACTION: log4cpp.dll must be delay loaded and gracefully recover if not present.**
- #267 : ImposeMin/Max methods
- #263 : IsValueCacheValid()
    - Allows application to know whether a GetValue() will result in a read on the TL.
    - **ACTION: Add write optimization to SetValue().**

- **ACTION:** Add flag to switch optimization on/off.
- #260 : Make XML Pointers Polymorphic
  - Important integer pointers can now point to Integer, Enumeration or Boolean.
- #255 : Allow Hex Alternatively to Int.
  - Allow hex formatted values to be used. Eases coding up PixelFormat node with GigE Vision pixel formats among other things.
- Miscellaneous new features (pInvalidator, Tokenize function...)
- Packages were updated.

## Bugfixes for v1.2

- Several bug fixes have already been made to v1.2 (261,238,270,244,114,96,87)
- Struct node order is different from MaskedIntReg order.
  - Can be fixed, but older XML files need to be modified.
  - Basler resists since the maintenance cost outweighs the benefits.
  - Pleora suggests that the schema can be BW compatible or support the new ordering.
  - **ACTION:** Basler will investigate this possibility.
- **ACTION:** Jan to provide a patch to MathParser to remove the uppercase restriction on variable names.
- **ACTION:** #114 applies on description nodes as well.
- Open issues (279,278,110,99,277,276,271,20,127,108,2) must be fixed ahead of v1.2.

## Missing Features in v1.2

- Multiple Languages
  - Have a helper function that can get a language specific string table from the zip and lookup the conversions?
  - NI: Have a wstring equivalent of gcstring. Set the language once and load the localized conversion.

- **ACTION:** Write a proposal on integrating ASCII/Unicode support in gcbase to handle multiple languages.
- Allow HTML In Description
  - **DECISION:** Use DocuURL tag to mark URL for feature specific documentation.
  - **ACTION:** Add a way for DocuURL to specify an on-device location.
- Multiplexer Functionality for Float
  - Should be included in v1.2
- VS2008 Support, Build System (Eric Gross, NI)
  - NI recommends CMake (<http://cmake.org>)
  - Open source and cross platform
  - Creates native makefiles/project files from a common file.
  - Can be integrated with test infrastructure (CTest/CDash)
  - Replace complex batch file configuration.
  - **ACTION:** NI to continue investigation.

## ***Other GenApi Topics***

### **Tradeshaw – Stuttgart (Fritz Dierks, Basler)**

- 60 square foot booth provided for standards presentation.
- Representatives from GenICam committee will staff booth throughout the day.
- Tradeshaw booth “roll-up”
  - **ACTION:** Mats from Pleora to review text ASAP and provide logos in EPS format for EMVA designers.
  - **ACTION:** Exchange points on event delivery and embedded data in image.
  - MVTec suggests that “Support for GigE Vision cameras is mandatory” be added to the GigE Vision roll-up and removed from the GenICam one.
  - IFloat::Gain() doesn’t exist yet, should we mention it?

### **Nodemap persistence (Eric Gross, NI)**

- NI proposes that all nodes to be persisted be presented as children of the root node in order to simplify implementation.
  - Resistance is seen from several members. Will be discussed later?
- Ordering Discussion:
  - Resistance to having an ordered index is not favored.
- Discussion has been delegated to a subcommittee that will prepare a more robust proposal.

### **GenApi v1.2 Roadmap (Fritz Dierks, Basler)**

- All open bugs must be fixed.
- Missing features/optimizations must be implemented.
- Helper class should be added to handle manifest usage.
- **ACTION: Go through Mantis, look through features, and determine which you will be able to contribute to the project.**
- GenApi must pass compilation and tests under Linux.
- The setup projects must be updated.
- RC, Vote, Acceptance as usual.
- Challenges
  - Camera and SW vendors must coordinate releases.
  - New camera features can only be used once software is ready.



## GenICam Meeting – Day 2

Tuesday, October 21, 2008

Hôtel le Place D'Armes, Montréal, QC

### **Camera Link Proposal (Fritz Dierks, Basler)**

- Binding
  - Should CLProtocol DLLs be installed in a central location?
  - ACTION: Decide on where to put these files. Should they be in GenICam Root?
- Retrieving XML File
  - clpGetXmlDescription function in DLL figures out where to get the XML file (on device, disk, web...)
  - If this fails, driver's local directory will be searched.
  - No clear way to select which schema to use. Use manifest?
- Standardized C API
  - CLProtocol.dll is a new module in the GenICam standard.
  - The DLL does not make any references to the GenICam reference implementation.
  - ACTION: Add a cookie to clpGetErrorText to be able to lookup error code by camera.
  - ACTION: ProbeDevice() to return the longest timeout supported by the underlying device.
    - When the operation can execute very quickly, the CLProtocol DLL should override this timeout.
- How to Proceed?
  - Launch at "The Vision Show" in 2009?
  - Form a subcommittee with at least 1 frame grabber manufacturer, at least 1 ascii camera manufacturer and at least 1 binary camera manufacturer.
  - NI expressed interest as a FG manufacturer.
  - JAI, Leutron are interested but do not want a time commitment.
  - Basler is interested. (They proposed the spec)
    - Took 3 days to implement CL support in Pylon for inexperienced coder.
  - Dalsa may give it a try.
  - Need to have a first plugfest in March to be ready for Vision 2009.

### ***Sony License Proposal (Fritz Dierks, Basler)***

- Sony wants to alter provisions for patented intellectual property and GenICam.
- Consensus is that a legal expert needs to review the proposition.
- Sony has joined GigE Vision -> speak to AIA to see how they handled this.
  - AIA recommends that the license agreement is not modified for Sony.
  - **DECISION:** The modification will not be made.
- **ACTION?** Pleora to run it through legal team??

### ***GenICam and GigE Vision Endianness (Jan Becvar, Leutron)***

- Endianness mess is due to early concessions made during plugfests between the first GigE Vision software/camera vendors.
- Current (broken) model in IPort implementations should be documented to avoid inconsistency between 1.0/1.1 implementations.
- How to improve:
  - IPort should behave as if only ReadMem or ReadReg exists. One command can emulate the other if necessary. It is preferred for an Iport to use ReadMem since it is more flexible.
  - If ReadReg is used, data that is read must be flipped if the DeviceMode register indicates that the camera is a LittleEndian device.
  - There was some confusion about whether or not the bootstrap registers can be little endian. Pleora points to section 27.2 of the GeV spec to prove that this IS possible.
  - This new behaviors can be enabled after querying node map to determine that a GenICam v1.2 schema is in use.
  - Note that this treatment is essentially the same as that which was presented in Montreal in '06.
- **ACTIONS:**
  - **Create a Do's and Don'ts document for GenICam that is voted on, versioned.**
    - Include endianness clarification.
    - Perhaps can also specify whether or not all nodes should be children of root.
    - Will recommend that the device schema version information be provided to GenTL for its benefit.
  - **Create a working group to tackle this issue.**

## ***GenCam Marketing Subcommittee Reports (Vincent Rowley, Pleora)***

- Clarified camera interface vs. protocol in current one pager.
- Adjusted nutritional fact table to reflect this, also created a graphical matrix to make this easy to visualize.
  
- Version
  - The matrix is intended to show the GenCam version.
  - Mapping table to between GenApi SFNC and GenTL should be maintained somewhere.
  - Since GenApi v1.2 contains many new features, should we call it GenApi v2.0?
- Possibility of empty boxes in product matrix.
  - Pleora will consider this case, it may need to redesign the matrix.
  - Debate as to whether to have a blank/no in the matrix.
  - The marketing subcommittee will decide.
- Carsten suggests:
  - One pager should discuss protocols, not hardware interfaces.
  - Camera interface enumeration defines protocols (both standard and proprietary)
  - Logos should be used in matrix version of nutrition facts, not text.

## ***GenTL Status (Rupert Stelz, Stemmer)***

- V1.0 is released.
- A customer has already written a GenTL layer for Dalsa Sopera.
- Wiki discussed in Pilsen is not yet ready due to difficulties in user management.
  - Leutron suggests public Wiki service.
  - **ACTION: Configure a wiki with proper user management.**
- TL Simulator and reference implementation to be updated for v1.0 of GenTL.
- Established rules for producer installation/search paths.
  - GenTL root?
  - What to do with multiple private GenCam installations?
  - The same problem occurs with CameraLink DLLs (CLProtocol...)
  - **ACTION: Solve this installation issue.**
- Variable sized images.
- Other features
  - GenTL headers are not C compatible.
    - Due to presence of namespace keyword.

- **ACTION:** Stemmer will clear this up with an `#ifdef _cplusplus` around the C++ code.
- Standard feature names for GenTL
  - Carsten presents his document on standard features for GenTL.
  - Confusion over prefixes for Gev\* names in the TL.
    - **ACTION:** Create a workgroup for a proposal on a set of names in the SFNC.
      - Will be maintained in a separate document with identical format as SFNC.
      - May use Google documents to collaborate on first version, move to MSWORD later.

## ***GenICam Certification Proposal (Stephane Maurice, Matrox)***

### **Hardware Tests**

- Debate on whether or not the word “MUST” should be used to require that a camera that implements a feature described by the SFNC uses the name defined in the SFNC.
  - Pleora notes that the current GenICam whitepaper already uses a MUST. This was voted on and accepted in Pilsen.
  - **ACTION:** Re-open this issue for further discussion.
- Functional Testing
  - Who provides the TL for testing the various technologies?
- NI proposes that features described in the XML file perform the way they are described.
  - Features marked as readable must be readable, etc...
  - Power-on state must be a valid state.
- Certification committee will analyze failures on a case-by-case basis?

### **Software certification**

- Reduced to the voted definition of “must consume a GenICam compliant XML”.
  - Dalsa asks for software certification to guarantee more features.
- **ACTION:** Solicit proposal for a simplified certification sheet.

### ***SFNC Validation Toolset (Michael Gozzo, Matrox)***

- Toolset to generate reference XML file and Schematron validation rules directly from the SFNC text.
- VBA Script can parse the SFNC text and generate a machine-readable text file for further processing.
- Modified PERL script from Leutron parses machine readable text file and generates either reference XML or Schematron rules.
- Test runner takes device XML file as input and produces HTML report on conformance.
- **ACTION:** Modify the SFNC feature tables to include data needed for VBA script to produce reference XML file.
- **ACTION:** Enhance the VBA script to generate feature summary table (section 2) based on feature details.

## GenICam Meeting – Day 3

Wednesday, October 22, 2008

Hôtel le Place D'Armes, Montréal, QC

### *SFNC Review (Stephane Maurice, Matrox)*

#### Categories

- DeviceInformation category changed to DeviceControl
- GigE Vision Transport Layer category changed to GigE Vision Control.
- Categories in feature tables are accepted. Look at maintaining consistency with section names.
- Control in category names will be kept.
- **ACTION: Remove “Root” from a subcategory.**
- Note that “Root” cannot be made invisible as all child nodes will inherit this visibility.

#### Tooltips

- These must be shortened but provide real meaning.

#### Description

- Use first paragraph of text
  - This has several limitations, there is opposition to it.
- Matrox proposes that anything in the table go into the XML and anything outside the table does not become part of it. The information outside of the table can be considered to be extra “notes” on a feature.
- 

#### Event Numbers

- Basler proposes removing the EventIdentifier node. Instead, create a floating node(s) for every type of event.
- **ACTION: Basler to propose a naming scheme to link events in the event selector to the EventPort names and categories grouping together all possible EventData features for an event.**

## Event Notification

- Cannot easily deprecate “GigEVisionEvent” and replace with “On” due to limitation of GenAPI enumerations.
  - Enumerations can not have two EnumEntries with the same IntValue.
- **ACTION:** Will deprecate anyway, but cannot expect devices in the field to only support “On”

## Abs/Raw Features

- The Abs/Raw features should be marked as having Guru Visibility.
- Basler suggests creating a “Deprecated” category. There is resistance to this as it may look bad in a UI.
- **ACTION:** Basler will add a parameter to every node to flag it as deprecated.
- **DECISION:**
  - Deprecate Abs and Raw
  - Alias is not mandatory; some floats may not want/need to implement this.
- Non-linear nodes should provide a pAlias.
- **ACTION:** Basler will add an increment to the float node. If the increment doesn’t make sense, a helper function, (IsIncrementValid(?)), will return whether or not the increment can be used.

## LutShadow

- Why can’t LUTValueAll be used?
- **ACTION:** Remove LUTShadow features.
- Will maintain the status quo.

## Feature Locking Descriptions

- **ACTION:** Add Leutron’s descriptions regarding locking mechanisms.
- Device can block acquisition itself, so can the application.

## Device Temperature

- No issues.

## SensorPixelClock

- Proposal: Rename features to PixelClock and PixelClockSelector.
  - No change to category
- **ACTION: Review the proposal.**
- Issues with changes introduced by clock value changes.
  - Adjusting the clock can invalidate many features.
  - Elegant software implementation required to handle this.

## CameraLink Feature Inclusion

- CL working group will review these features before they are included in the SFNC.
- **ACTION: Matrox will present mandatory features *per interface* and ensure that the VBA script can handle this.**

## Miscellaneous

- Maintenance Release
  - **ACTION: Basler to release v1.1.1 (end of November) and prepare a RC for v1.1.2 (end of December).**
  - Vote was taken on the subject, a clear majority accepted.
- Tradeshow
  - Delegate roll-up to Mats (Pleora / Marketing Subcommittee)
- Version (v1.2 vs 2.0)
  - **DECISION: Keep v1.2 for Stuttgart presentation. Defer the versioning discussion to a later date. Chicago?**
- **ACTION: Put DisplayName recommendation in the feature tables.**
- **ACTION: Matrox will make first pass at inserting descriptions/tooltips. Someone else to clean these up.**
- **ACTION: Remove Device IPort node from the Device category.**
- **ACTION: Provide proper names for these “magic” features.**



### ***Homework Review (Stephane Maurice, Matrox)***

- **ACTION:** Matrox will update Mantis with the homework list.
- **ACTION:** JAI will continue testing the .net layer with NUnit (Done end of December 2005)
- **ACTION:** Stemmer defers various factory/registry homework.
- **ACTION:** A RC of an SFNC with CameraLink features is due 4 weeks after the CL group's conclusion.
- **ACTION:** Pleora and subcommittee will take on self-certification tasks, review the certification proposal and the tools. Due 2 weeks before the next meeting.
- **ACTION:** Leutron will find tools/tests for XSLT.
- **ACTION:** MVTec will setup wiki with user rights management by end of December, 2008.
- **ACTION:** NI (along with Basler, MVTec) will implement CMake build/test system. Done by next meeting, 2009.
- Deferred proposal to include scripting in GenApi.
- Deferred the implementation of requirements in the standard text.
- **ACTION:** Add tooltips/descriptions to the SFNC (first pass for machine-readability done by Matrox, second-pass by ???) for next meeting.
- **ACTION:** Euresys has volunteered to host the next meeting pending management approval. Possible date is early April 2009.

### ***Color Transformation Proposal (Stephane Maurice, Matrox)***

- A modified version of Dalsa's proposal is presented to the committee. This proposal was previously sent to the GenICam mailing list.
- **DECISION:** Not accepted (as a result of a vote)
  - Require more general coefficient names.
  - Stemmer would like to have a feature for presetting coefficients.
- Does it make sense to include preprocessing feature definitions in the SFNC?
- Possible confusion between value-based and pixel-based preprocessing features.
- Revised proposal will be presented on the mailing list.