



# The FESA Development Guideline

# Topics

- **Overview**
- **Properties**
- **Fields**
- **Misc**

# Overview

- **Why we need a GSI – Convention ?**
- **Wiki: “development workflow for productive classes”**
- **Read the “FESA Development Guideline” !!**
- **“Add Class” → GSIClassTemplate**
- **GSI-specific-elements will be enforced for productive classes !**
- **Use the FESA-browser for detailed information!**

# Topics

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# Properties

- ▼ [e](#) interface
  - ▼ [e](#) device-interface
    - ▼ [e](#) setting
      - ▷ [e](#) GSI-Init-Property
      - ▷ [e](#) GSI-Reset-Property
      - ▷ [e](#) GSI-Setting-Property
      - ▷ [e](#) GSI-Power-Property
    - ▼ [e](#) acquisition
      - ▷ [e](#) GSI-Status-Property
      - ▷ [e](#) GSI-Acquisition-Property
      - ▷ [e](#) GSI-Version-Property
    - ▷ [e](#) global-interface

# Properties

▼ <b>e</b> GSI-Status-Property	((description*), (filter-ite
<b>a</b> multiplexed	false
<b>a</b> name	Status
<b>a</b> on-change	true
<b>a</b> subscribable	true
<b>a</b> visibility	operational
▷ <b>e</b> acq-stamp-item	(description*, scalar, dat
▷ <b>e</b> update-flag-item	(description*, custom-ty
▷ <b>e</b> cycle-name-item	(description*, array, data
▷ <b>e</b> cycle-stamp-item	(description*, scalar, dat
▷ <b>e</b> get-action	(server-action-ref   abstra
▷ <b>e</b> status-item	((description*, (scalar   a
▷ <b>e</b> detailed-status-item	((description*, (scalar   a
▷ <b>e</b> detailed-status-labels-item	((description*, (scalar   a
▷ <b>e</b> powerState-item	((description*, (scalar   a
▷ <b>e</b> control-item	((description*, (scalar   a
▷ <b>e</b> interlock-item	((description*, (scalar   a
▷ <b>e</b> opReady-item	((description*, (scalar   a
▷ <b>e</b> error_collection-item	(error_codes, error_mess

# Properties

▼ <b>e</b> GSI-Acquisition-Property	((description*), (
<b>a</b> multiplexed	true
<b>a</b> name	Acquisition
<b>a</b> on-change	true
<b>a</b> subscribable	true
<b>a</b> visibility	operational
▷ <b>e</b> value-item	((description*, (s
▷ <b>e</b> acq-stamp-item	(description*, sca
▷ <b>e</b> update-flag-item	(description*, cus
▷ <b>e</b> cycle-name-item	(description*, arr
▷ <b>e</b> cycle-stamp-item	(description*, sca
▷ <b>e</b> get-action	(server-action-ref
▼ <b>e</b> multiplexing-context-item	((acqStamp, cycle
<b>a</b> direction	OUT
▷ <b>e</b> acqStamp	(scalar)
▷ <b>e</b> cycleStamp	(scalar)
▷ <b>e</b> cycleName	(array)
▷ <b>e</b> multiplexing-context-field-ref	

# Properties

▼ <b>e</b> GSI-Version-Property	(((description*), (filter-ite
<b>a</b> multiplexed	false
<b>a</b> name	Version
<b>a</b> on-change	false
<b>a</b> subscribable	false
<b>a</b> visibility	operational
▶ <b>e</b> acq-stamp-item	(description*, scalar, dat
▶ <b>e</b> update-flag-item	(description*, custom-ty
▶ <b>e</b> cycle-name-item	(description*, array, data
▶ <b>e</b> cycle-stamp-item	(description*, scalar, dat
▶ <b>e</b> get-action	(server-action-ref   abstr
▼ <b>e</b> version-item	(array)
<b>a</b> direction	OUT
<b>a</b> name	deploy_unit_version
▶ <b>e</b> array	(custom-constant-dim)
▼ <b>e</b> version-item	(array)
<b>a</b> direction	OUT
<b>a</b> name	fesa_version
▶ <b>e</b> array	(custom-constant-dim)



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# Fields

- ▼ [e](#) data
  - ▼ [e](#) device-data
    - ▼ [e](#) configuration
      - ▶ [e](#) GSI-detailed-status-labels-field
    - ▼ [e](#) setting
      - ▶ [e](#) field
      - ▶ [e](#) GSI-power-field
    - ▼ [e](#) acquisition
      - ▶ [e](#) field
      - ▶ [e](#) GSI-control-field
      - ▶ [e](#) GSI-powerState-field
      - ▶ [e](#) GSI-status-field
      - ▶ [e](#) GSI-interlock-field
      - ▶ [e](#) GSI-opReady-field
      - ▶ [e](#) GSI-detailed-status-field
      - ▶ [e](#) GSI-multiplexing-context-field
      - ▶ [e](#) GSI-error\_collection-field

# Fields (Status-Property)

▼ <b>e</b> GSI-status-field	(custom-type-sca
<b>a</b> multiplexed	false
<b>a</b> name	status
▼ <b>e</b> custom-type-scalar	
<b>a</b> data-type-name-ref	DEVICE_STATUS

**Custom-type: DEVICE\_STATUS:**  
**Enum( 0=UNKNOWN, 1=OK, 2=WARNING, 3=ERROR )**  
**Overall-Status of the device**

# Fields (Status-Property)

▼ <b>e</b> acquisition	((fault-field?, state-field?,
▼ <b>e</b> GSI-detailed-status-field	(array)
<b>a</b> multiplexed	false
<b>a</b> name	detailedStatus
▼ <b>e</b> array	((dim   custom-constant-d
<b>a</b> type	bool
▼ <b>e</b> custom-constant-dim	
<b>a</b> constant-name-ref	DETAILED_STATUS_SIZE

▼ <b>e</b> configuration	((hw-address?, device-relations-field?, (fi
▼ <b>e</b> GSI-detailed-status-labels-field	(array2D, default)
<b>a</b> name	detailedStatus_labels
▼ <b>e</b> array2D	((dim1   custom-constant-dim1   variable-
<b>a</b> type	char
▼ <b>e</b> custom-constant-dim1	
<b>a</b> constant-name-ref	DETAILED_STATUS_SIZE
▼ <b>e</b> custom-constant-dim2	
<b>a</b> constant-name-ref	MAX_DETAILED_STATUS_LABEL_LENGTH
<b>e</b> default	{TestLabel0,TestLabel1}

# Fields (Power-Property)

▼ <b>e</b> setting	((state-field?, cycle
▶ <b>e</b> field	(description*, (scala
▼ <b>e</b> GSI-power-field	(custom-type-scalar
<b>a</b> multiplexed	false
<b>a</b> name	power
<b>a</b> persistent	true
▼ <b>e</b> custom-type-scalar	
<b>a</b> data-type-name-ref	DEVICE_POWER

**Custom-type: DEVICE\_POWER**  
**Enum (1=ON, 2=OFF)**  
**Desired power-state of the device**

# Fields (Status-Property)

▼ <b>e</b> GSI-powerState-field	(custom-type-scalar)
<b>@</b> multiplexed	false
<b>@</b> name	powerState
▼ <b>e</b> custom-type-scalar	
<b>@</b> data-type-name-ref	DEVICE_POWER_STATE

**Custom-type:** DEVICE\_POWER\_STATE

**Enum ( 0=UNKNOWN, 1=ON, 2=OFF, 3=STANDBY, 4=POWER\_DOWN, 5=POWER\_UP )**

**power-state of the device**

# Fields (Status-Property)

▼ <b>e</b> GSI-control-field	(custom-type-scal
<b>@</b> multiplexed	false
<b>@</b> name	control
▼ <b>e</b> custom-type-scalar	
<b>@</b> data-type-name-ref	DEVICE_CONTROL

**Custom-type: DEVICE\_CONTROL**

**Enum ( 0=REMOTE, 1=LOCAL )**

**Device is controlled locally, or via the control-system ?**

# Fields (Status-Property)

▼ <b>e</b> GSI-interlock-field	(scalar)
<b>a</b> multiplexed	false
<b>a</b> name	interlock
▼ <b>e</b> scalar	
<b>a</b> type	bool

▼ <b>e</b> GSI-opReady-field	(scalar)
<b>a</b> multiplexed	false
<b>a</b> name	opReady
▼ <b>e</b> scalar	
<b>a</b> type	bool



# Fields (Status-Property)

▼ <b>e</b> custom-types	(notification-up
▼ <b>e</b> struct	(description*, s
@ name	GSI_ERROR
▼ <b>e</b> struct-item	(description*, (
@ name	error_string
▶ <b>e</b> array	((dim   custom-con
▼ <b>e</b> struct-item	(description*, (scal
@ name	error_code
▶ <b>e</b> scalar	
▼ <b>e</b> struct-item	(description*, (scal
@ name	error_timestamp
▶ <b>e</b> scalar	
▼ <b>e</b> struct-item	(description*, (scal
@ name	error_cycle_name
▶ <b>e</b> array	((dim   custom-con
▼ <b>e</b> GSI-error_collection-field	(custom-type-array)
@ multiplexed	false
@ name	error_collection
▼ <b>e</b> custom-type-array	(custom-constant-dim)
@ data-type-name-ref	GSI_ERROR
▼ <b>e</b> custom-constant-dim	
@ constant-name-ref	MAX_NUMBER_OF_ERROR_MESSAGES

```
std::string errorString= "TestError";  
long error_code= 4711;  
(*iter)->error_collection.addError(error_code,errorString,context,(*iter));
```

# Fields (Acquisition-Property)

▼ <b>e</b> GSI-multiplexing-context-field	(custom-type-scalar)
<b>a</b> multiplexed	true
<b>a</b> name	acquisitionContext
▼ <b>e</b> custom-type-scalar	
<b>a</b> data-type-name-ref	GSI_MUX_CONTEXT

▼ <b>e</b> struct	(description*, struct-item*)
<b>a</b> name	GSI_MUX_CONTEXT
▼ <b>e</b> struct-item	(description*, (scalar   array*))
<b>a</b> name	acqStamp
▷ <b>e</b> scalar	
▼ <b>e</b> struct-item	(description*, (scalar   array*))
<b>a</b> name	cycleStamp
▷ <b>e</b> scalar	
▼ <b>e</b> struct-item	(description*, (scalar   array*))
<b>a</b> name	cycleName
▷ <b>e</b> array	((dim   custom-constant*))

```
// easy method
(*device)->acquisitionContext.insert(pCtxt);
```

```
// advanced method ( usage of self-defined acquisition-stamp )
// stamp in Nanoseconds UTC
int64_t stamp = 12345678;
(*device)->acquisitionContext.insert(pCtxt,stamp);
```

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## Field – suffixes to use

- `_status`
- `_min / _max`
- `_toAbs`
- `_tolRel`
- `_tolCheckMode`
- `_acqStamp`
- `_unit`

## Quality of Acq. Data

- `NOT_OK`
- `BAD_QUALITY`
- `DIFFERENT_FROM_SETTING`
- `OUT_OF_RANGE`
- `BUSY`
- `TIMEOUT`
- ...

... and many more standards !

For details, check the FESA-Development-Guideline in the Wiki !!



**Thanks for your attention!**