Electronical Data Sheets in practical use

Falk Ahlendorf, Dr. Rolf Hartmann

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ASTRO APS a highly modular design

Power Interfaces:	5
Operational Data Interfaces:	10
Detector types:	2
Hardware Revisions:	2
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Possible Configurations:	**200**

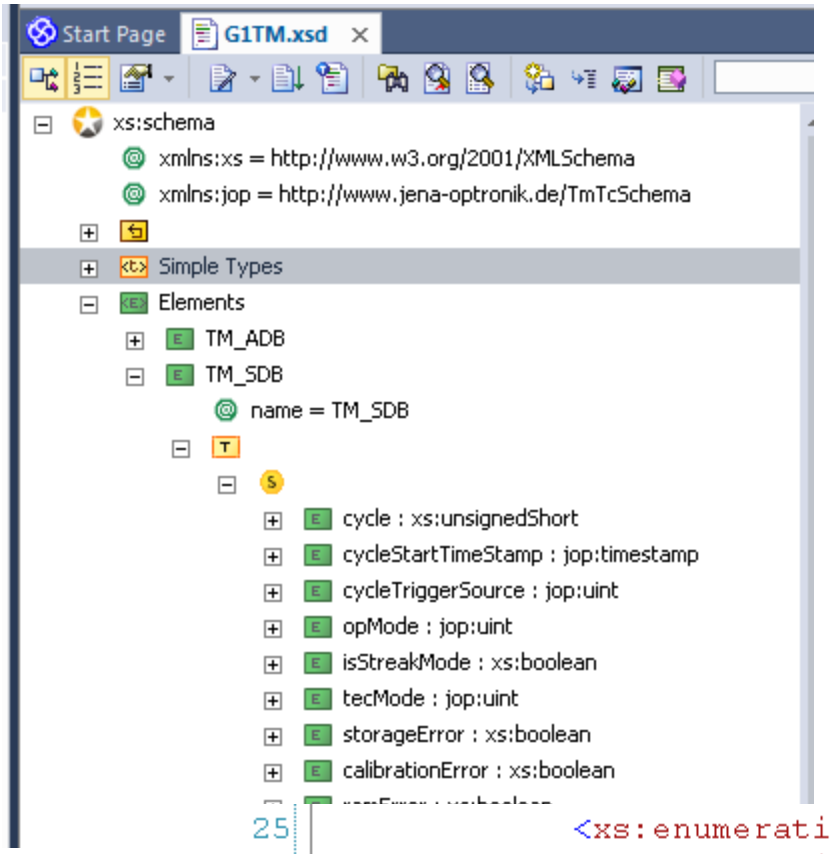
How to handle and test?

Unit Tester Next Generation

- Highly configurable test system
- Build upon standards
  - Python – Test control
  - PDF – Test protocols
  - HDF5 / FITS – For data exchange
  - XSD – For TM/TC description
  - XML – For test and system configuration

EDS

Supported by Tools

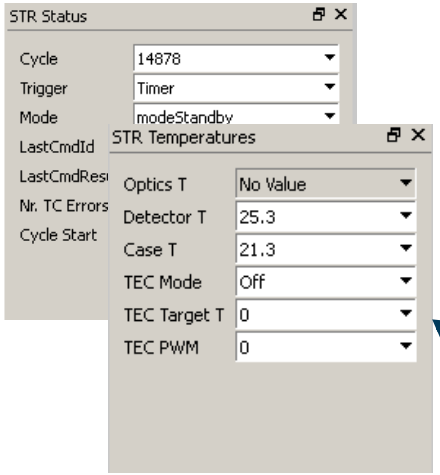



```
25                <xs:enumeration id="13" value="Erro
26                <xs:enumeration id="14" value="TooM
27                <xs:enumeration id="15" value="Divi
28                <xs:enumeration |
29            </xs:restriction>
30        </xs:simpleType>
31
```

id
value

- Due to the used standard third party COTS tools available
  - Various tools for visualization
  - Editors with syntax check
  - Auto completion
  - syntax highlighting
- Easy versioning due to text files
  - git, svn, cvs, …
- Converter into SAVOIR EDS exists and works

Benefit




```
<xs:element name="fifoError" type="xs:boolean" />
<xs:element name="targetTemperature" type="xs:integer" jop:scaling="10^-2" jop:unit="deg" />
<xs:element name="temperatureDetector" type="xs:short" jop:scaling="10^-1" jop:unit="deg" />
```

Automatic generation of GUIs and Code

Simple to change and adapt

```
<xs:element name="fifoError" type="xs:boolean" />
<xs:element name="targetTemperature" type="xs:short" jop:scaling="10^-1" jop:unit="deg" />
```

Simple reuse

```
<jop:ref element="/xs:schema/xs:element[name=TM_ADB]" substitute="timestampCodec=mil1553r" />
<jop:ref element="/xs:schema/xs:element[name=TM_SDB]" substitute="timestampCodec=mil1553r" />
<jop:ref element="/xs:schema/xs:element[name=TM_TDB]" />
```

Drawbacks

- Some errors are hard to spot

```
<xs:element name="targetTemperature" type="xs:short" jop:scaling="10^-2" jop:unit="deg" />
<xs:element name="targetTemperature" type="xs:short" jop:scaling="10^-1" jop:unit="deg" />
```

- Some things are hard to express
  - Variable length packets (e.g. PUS Service 1.2 & 1.4)
  - User adjustable packet layout (e.g. PUS Service 3)
- Interchangeability with other parties can be problematic if the other party imposes additional limitations
  - Unlimited identifier length vs. limited identifier length

Lessons learned so far

- An EDS has the potential to speed up and reduce cost for delta developments
- For an EDS to work there needs to be exactly defined what is minimum supported EDS feature set
- Sooner or later someone will find things that are not expressible by the format, so there needs to be a standardized way to extend the format
- There needs to be a freely available format validator so that everyone can check that the EDS is syntactically correct
- We write our EDS by hand so there is a need for a good editor with auto completion and syntax checking / highlighting
- Be prepared for hard to spot errors

Thank you for your Attention!

Questions?

Falk Ahlendorf
Jena-Optronik GmbH
Otto-Eppenstein-Str. 3
07745 Jena / Germany