

Meter and AMI Headend Event Codes

1. Overview of MHEC XSD Structure

The Meter and AMI Headend Event Codes (MHEC) were gathered from the following sources:

- ANSI C12.19 Metering codes
- AMI vendor contributions
- MDM vendor contributions
- MultiSpeak

Ultimately there were over 500 MHECs, with many duplicates or almost duplicates. These were organized in an Excel spreadsheet, first just by type, then by a 4-level structure which was eventually carried over into the XSD structure (using Altova XMLSpy), namely:

- Domain or equipment
- Domain part
- Type or issue
- Attribute

As can be seen in the diagram below, the Domain level consists of:

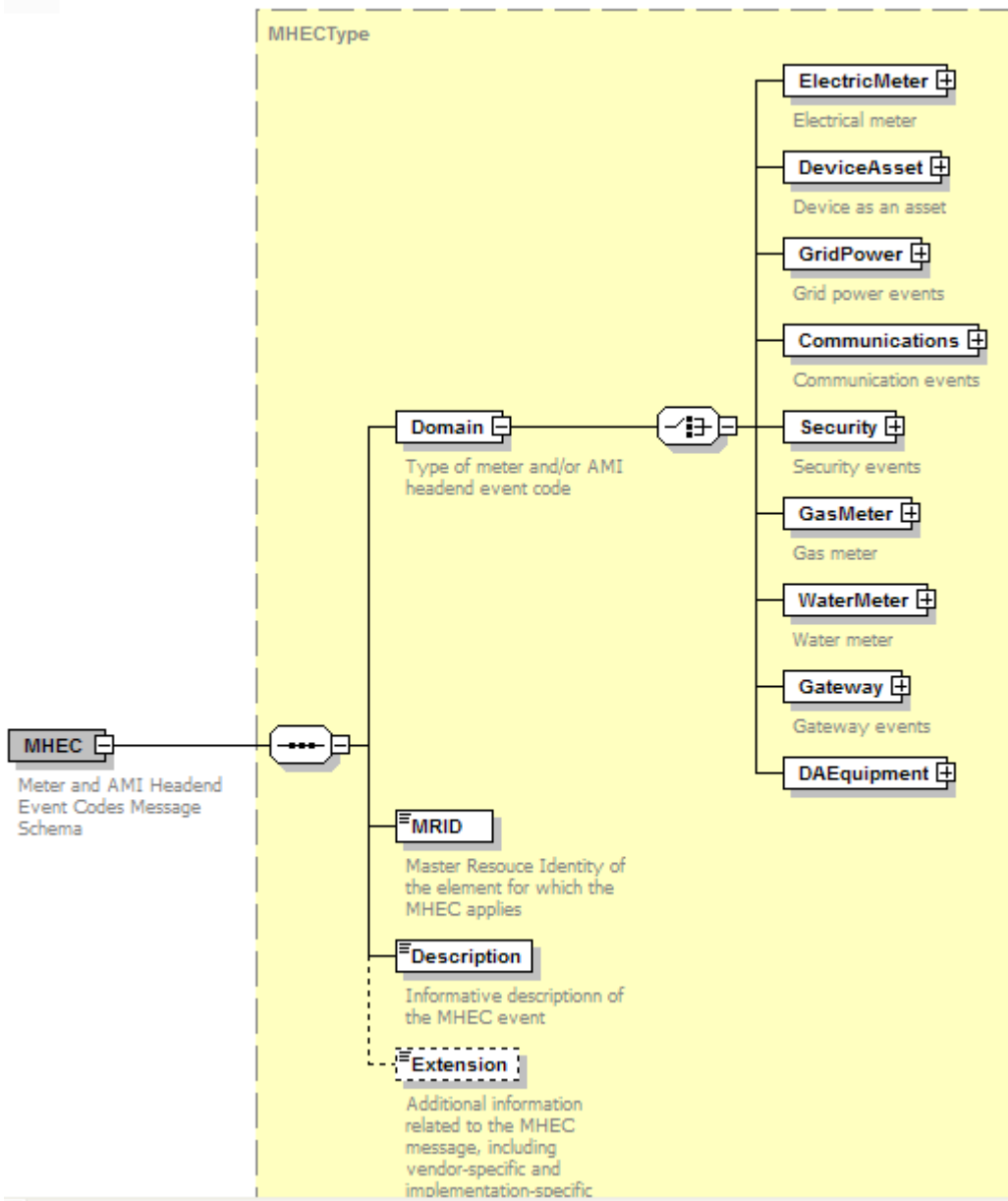
- Electric meters
- Device asset
- Grid power
- Communications
- Security
- Gateway
- Gas meter
- Water meter

Each of these Domains has been organized into various 2nd, 3rd, and 4th level substructures which are shown in the remaining subsections of this document.

Not all Domains have been finalized, so they are shown as TBD. For Gateways, Gas Meters, and Water Meters, the event items only reflect what was initially provided, and may be expanded and/or modified when these devices are specifically addressed.

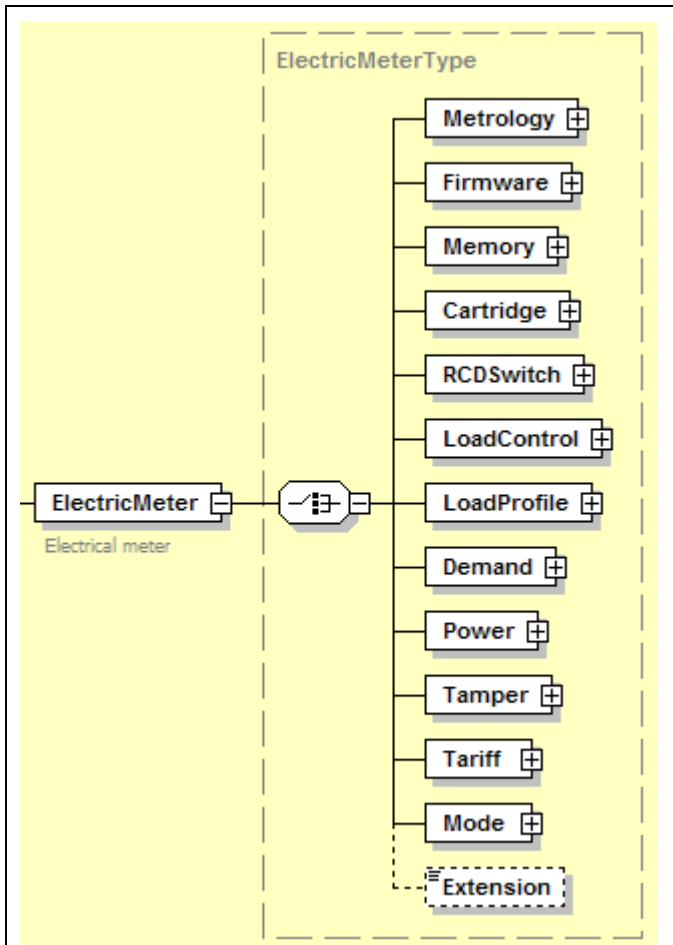
In addition, it is expected that Distribution Automation equipment that is accessed through the AMI system will utilize different protocols, such as IEC 61850 (object models, if not communication profiles). Therefore, these elements are not really addressed in the MHEC structure.

1.1 Overview of MHEC XSD Structure

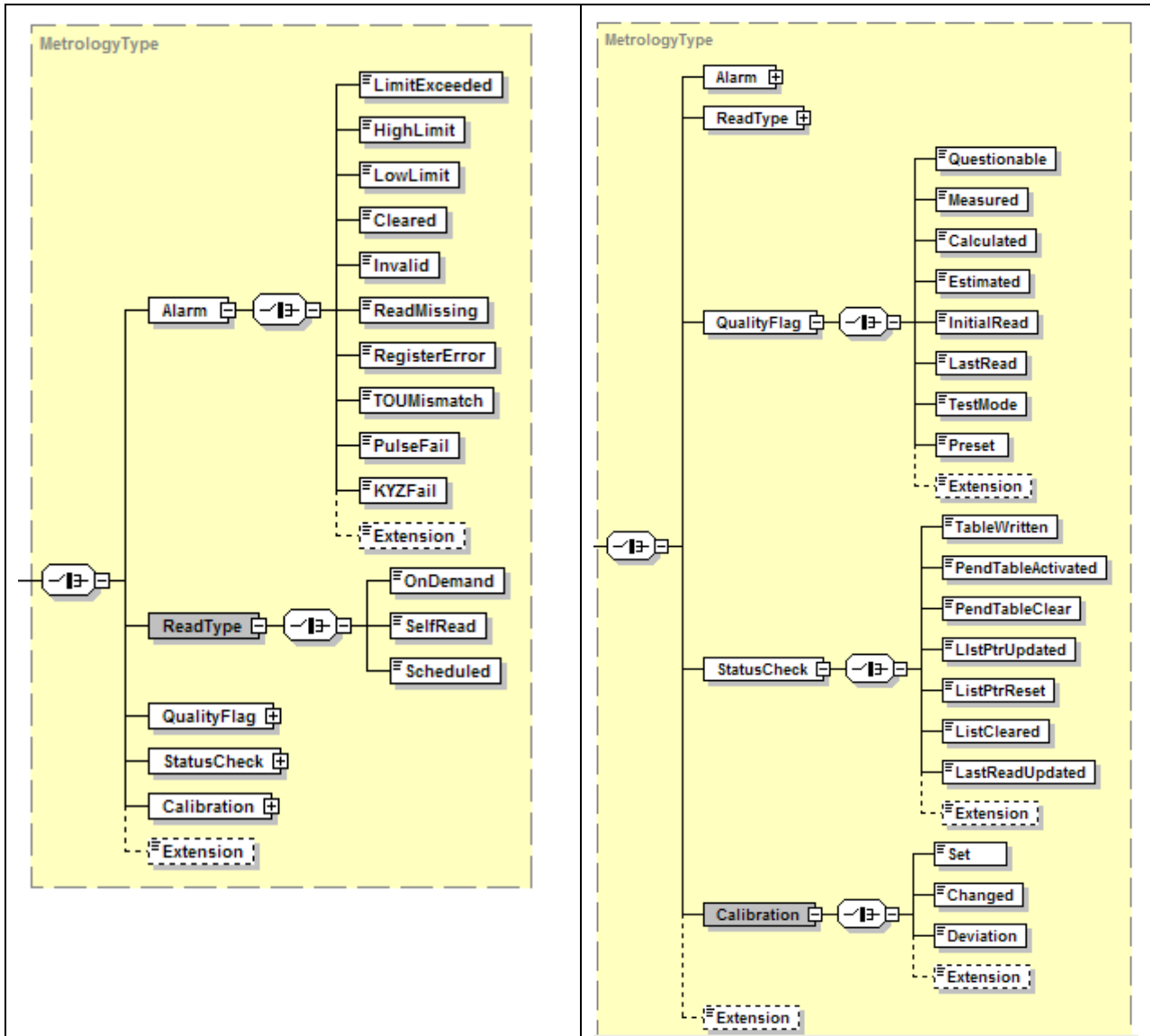


2. Electric Meter XSD Structure

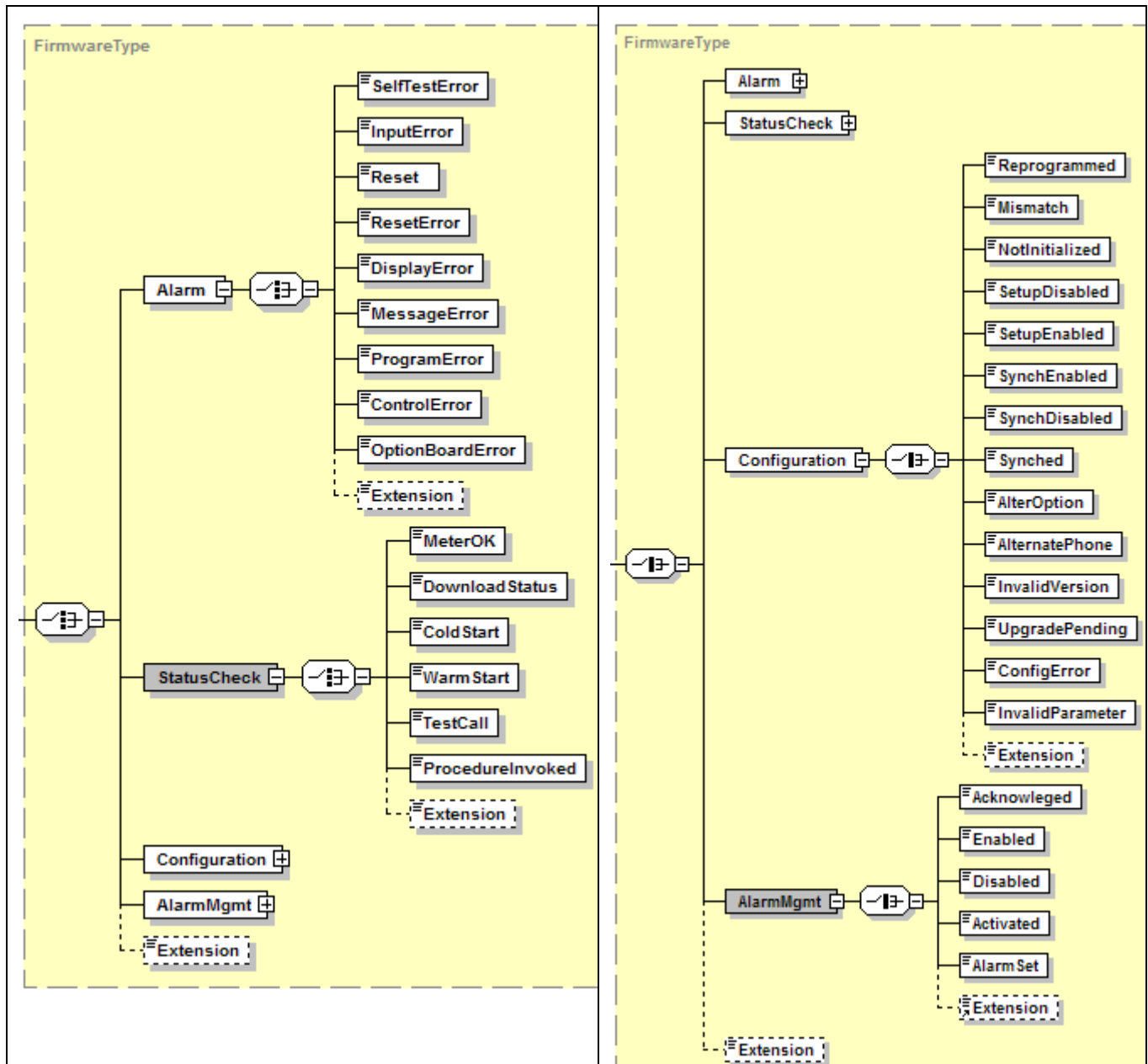
2.1 Overview of Electric Meter Type



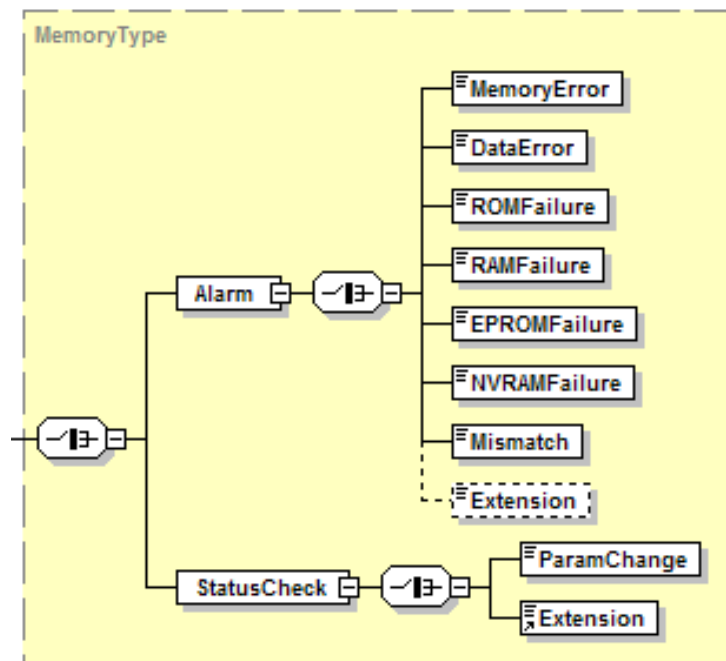
2.2 Metrology Type



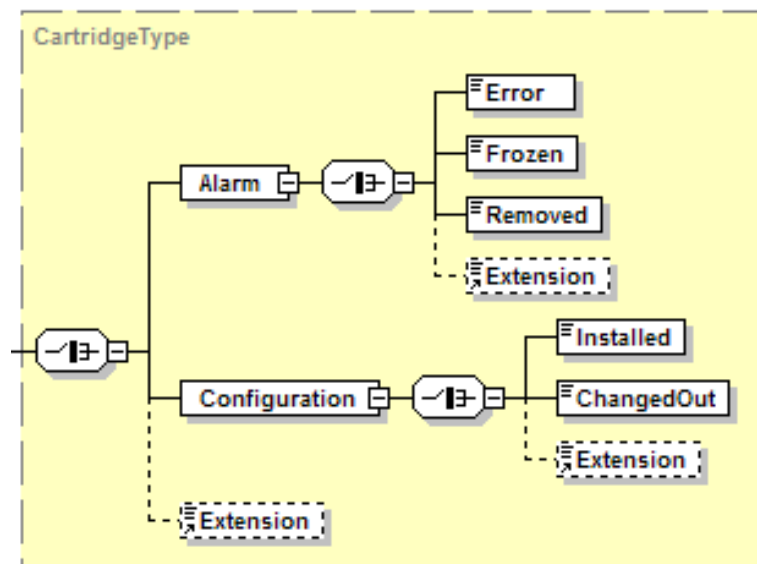
2.3 Firmware



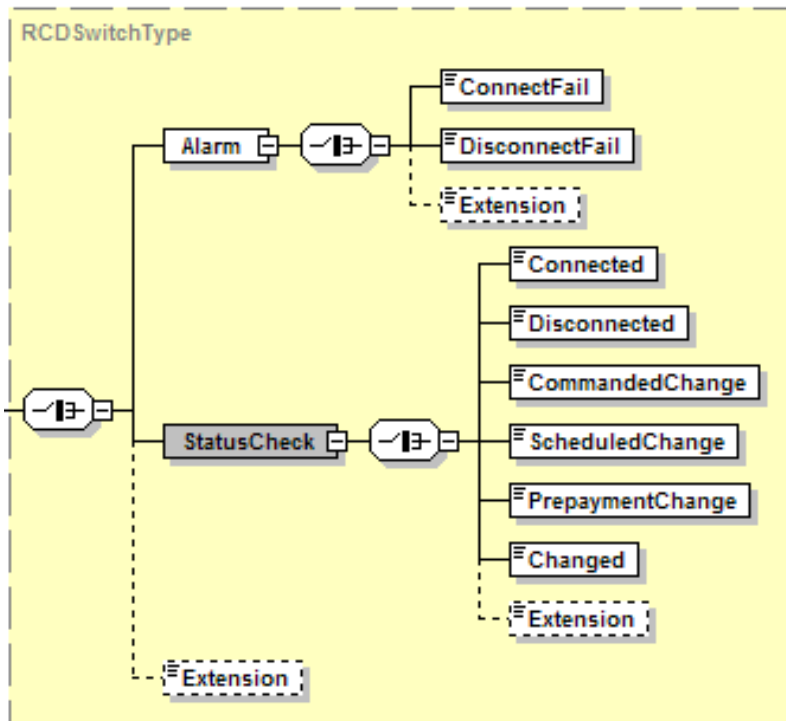
2.4 Memory



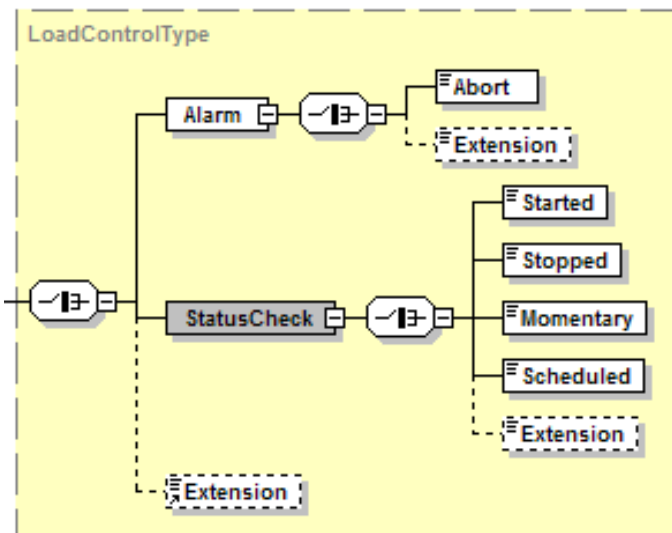
2.5 Cartridge



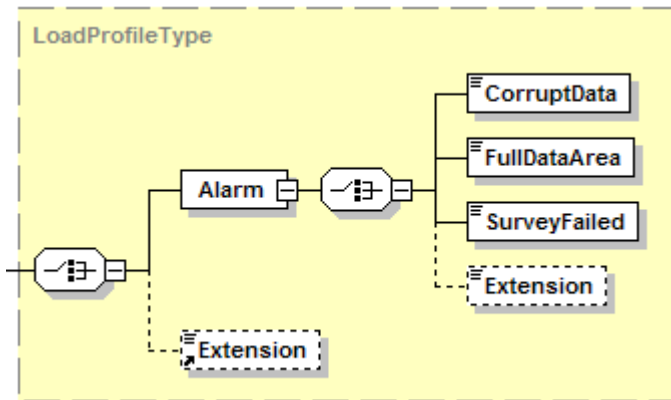
2.6 Remote Connect/Disconnect



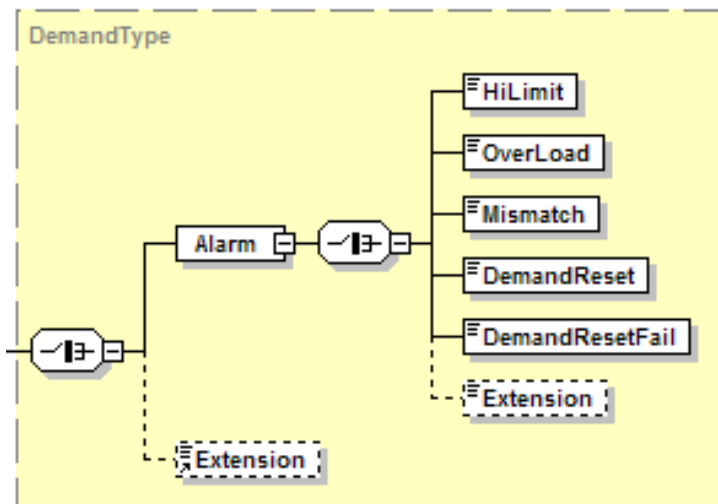
2.7 Load Management



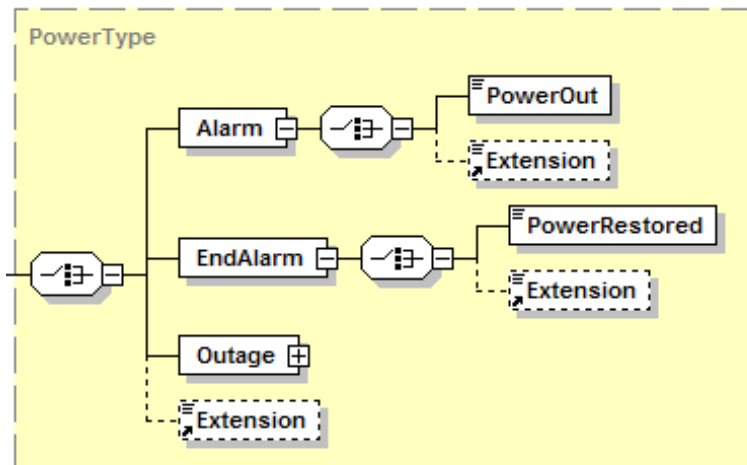
2.8 Load Profile and Demand



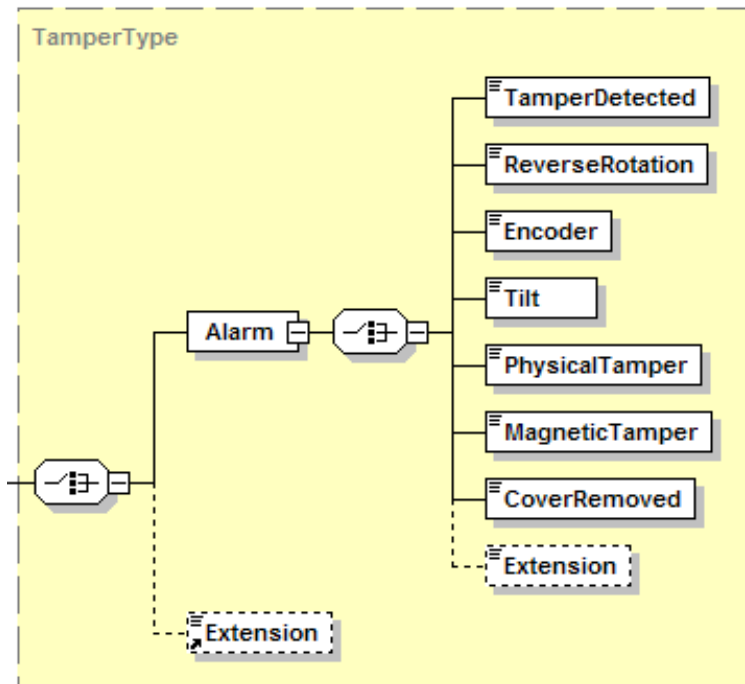
2.9 Demand



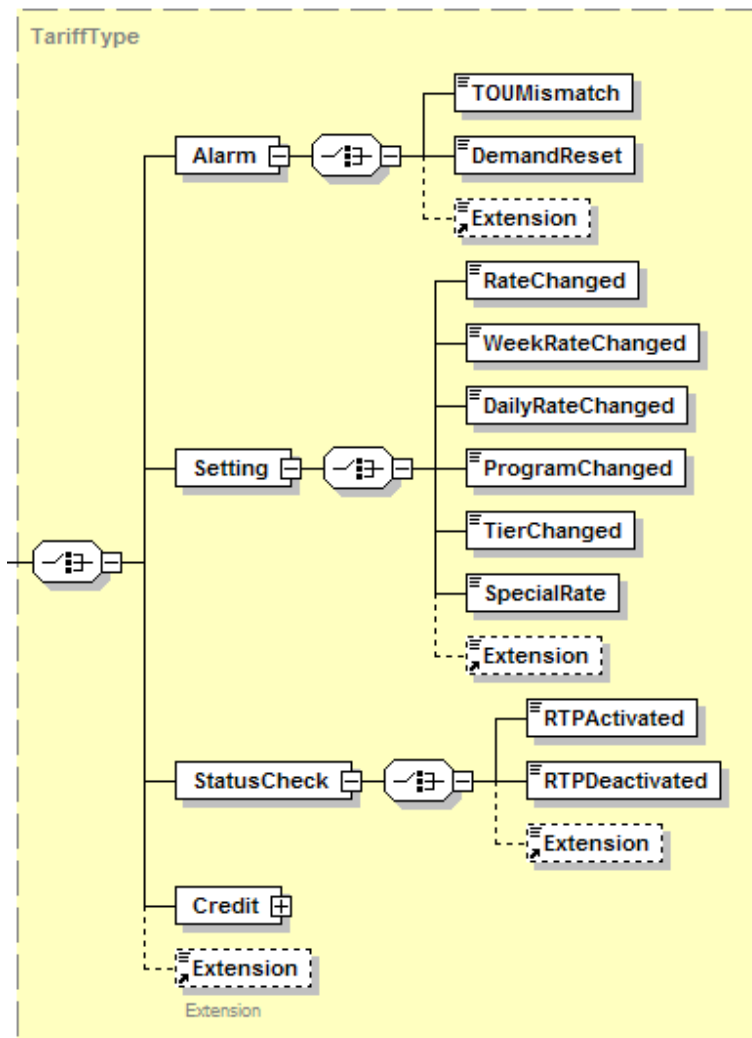
2.10 Power Outage/Restoration



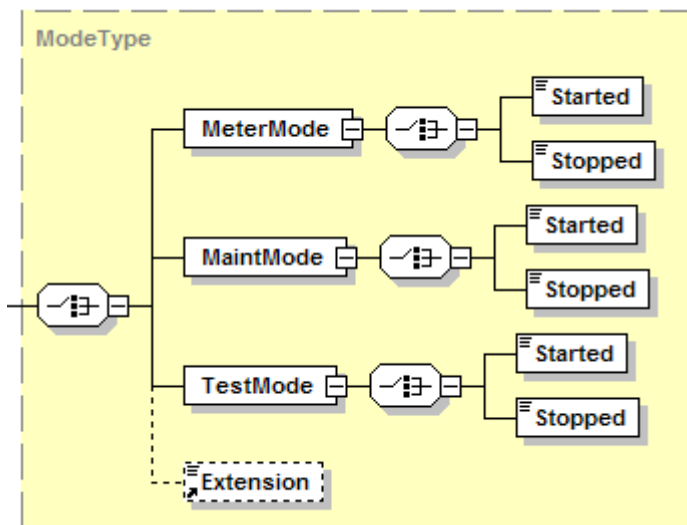
2.11 Tamper Detection



2.12 Tariff

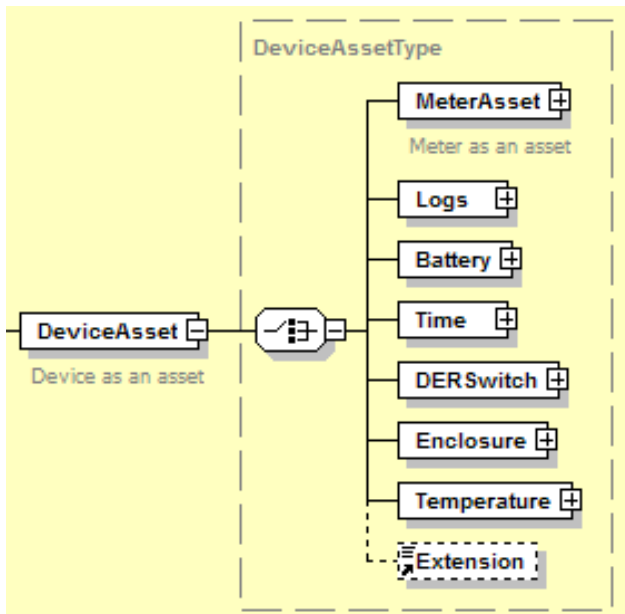


2.13 Mode

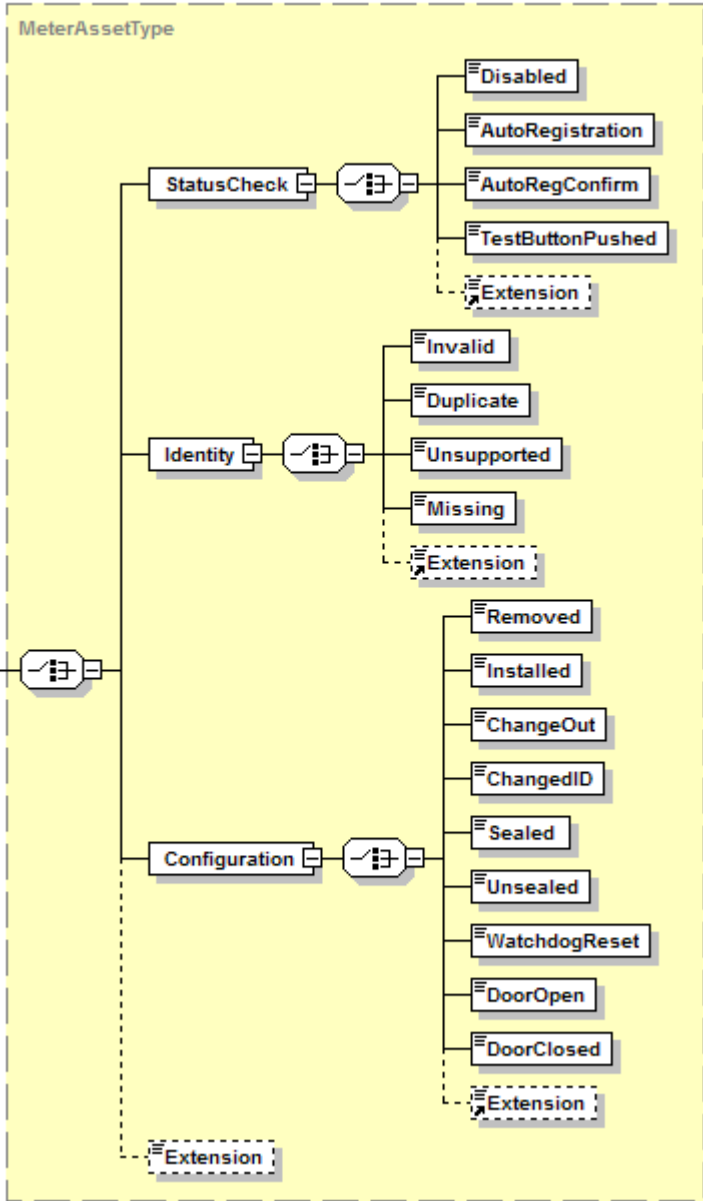


3. Device Asset XSD Structure

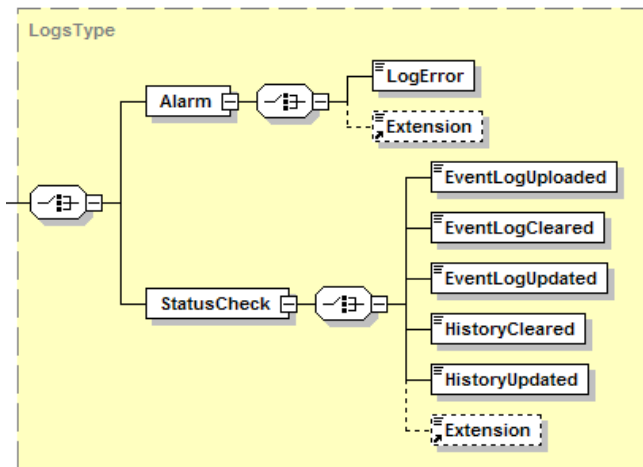
3.1 Overview of Device Asset



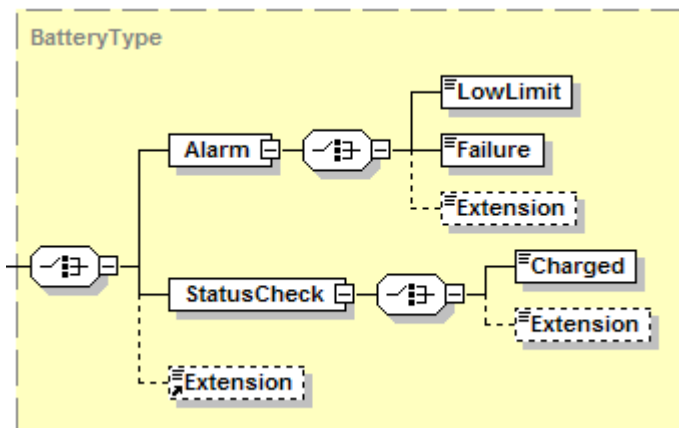
3.2 Meter Asset



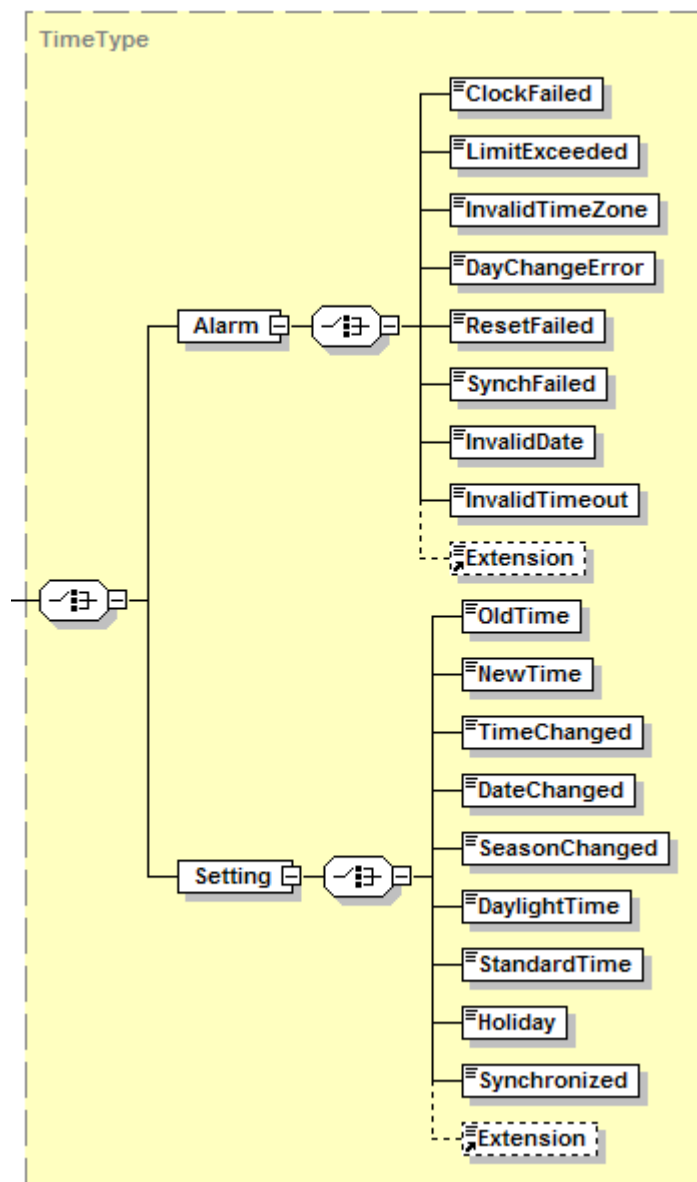
3.3 Logs



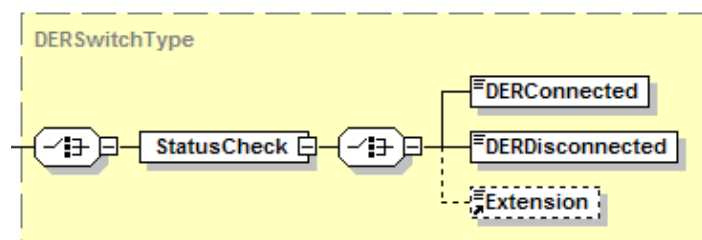
3.4 Battery



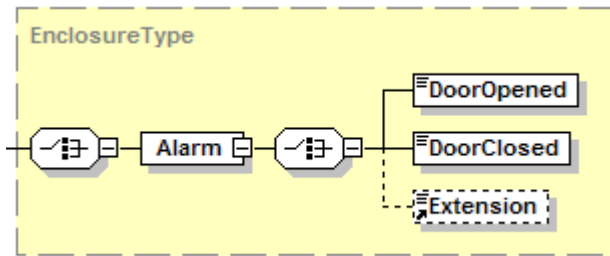
3.5 Time



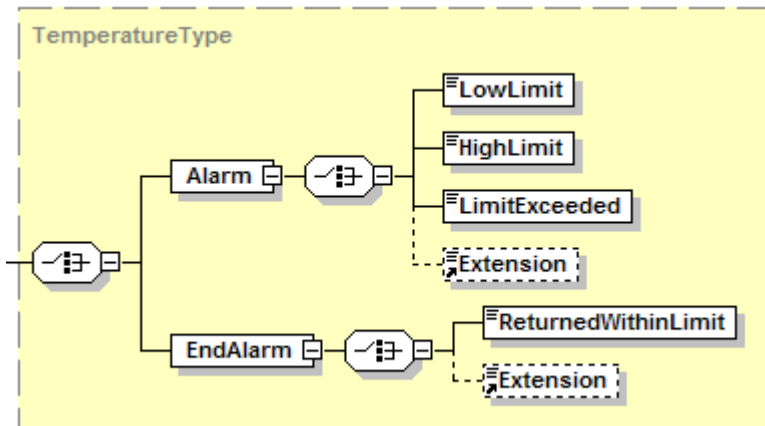
3.6 DER Switch



3.7 Enclosure

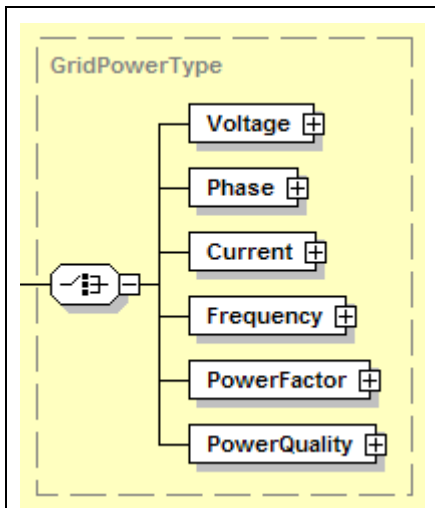


3.8 Temperature

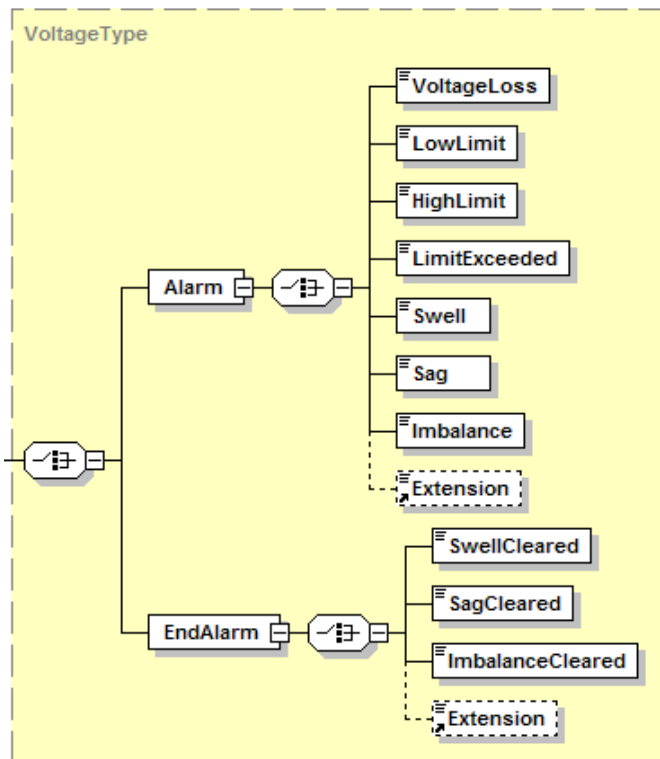


4. Grid Power XSD Structure

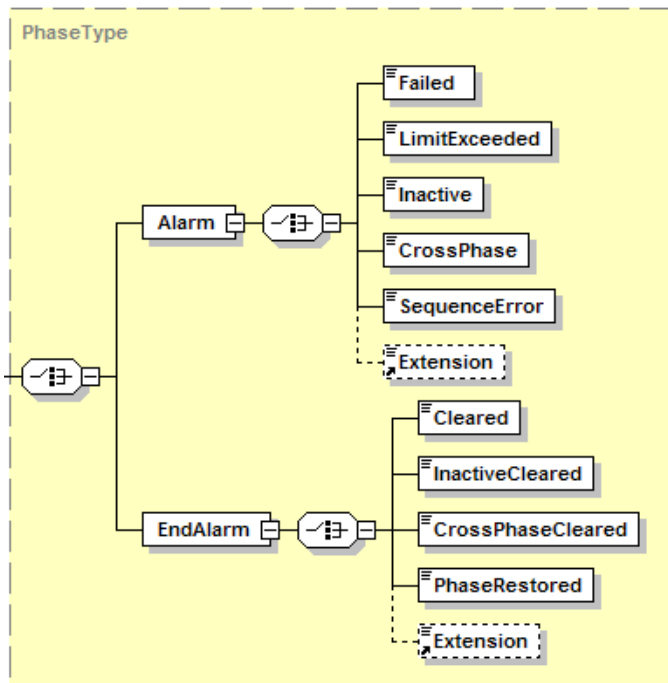
4.1 Overview of Grid Power



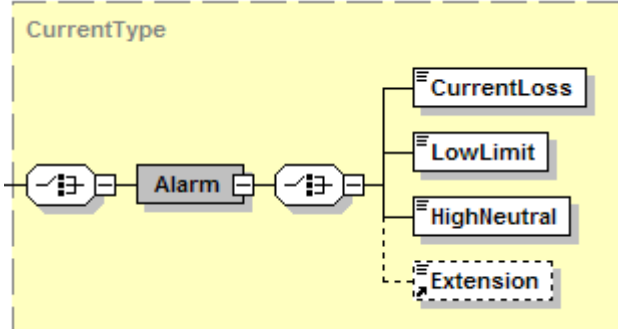
4.2 Voltage



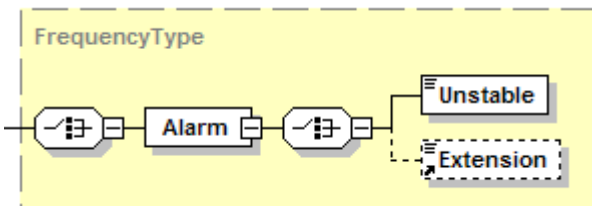
4.3 Phase



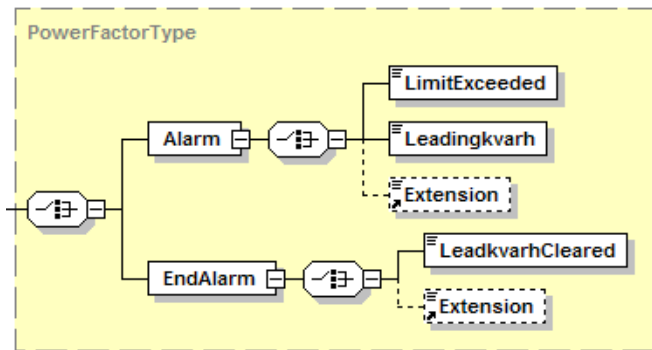
4.4 Current



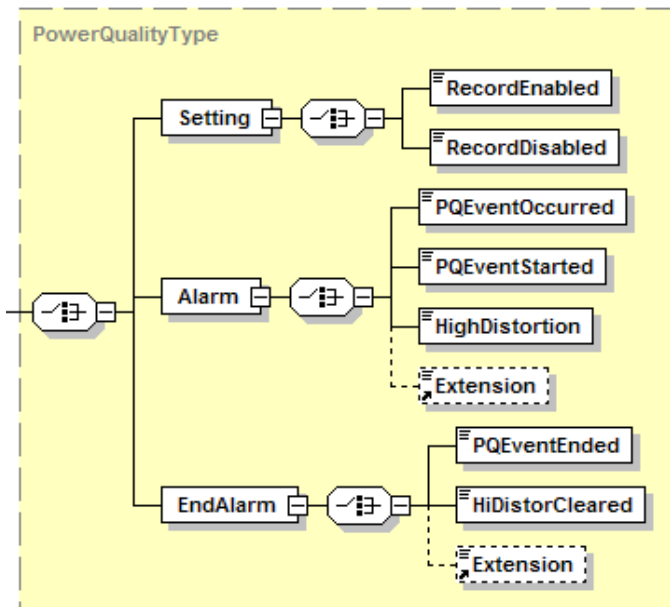
4.5 Frequency



4.6 Power Factor

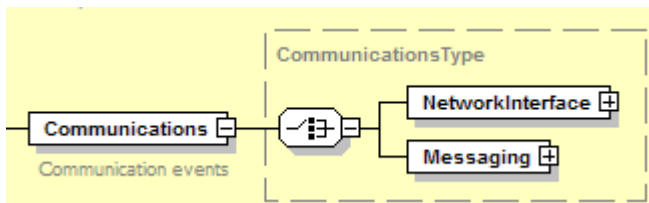


4.7 Power Quality

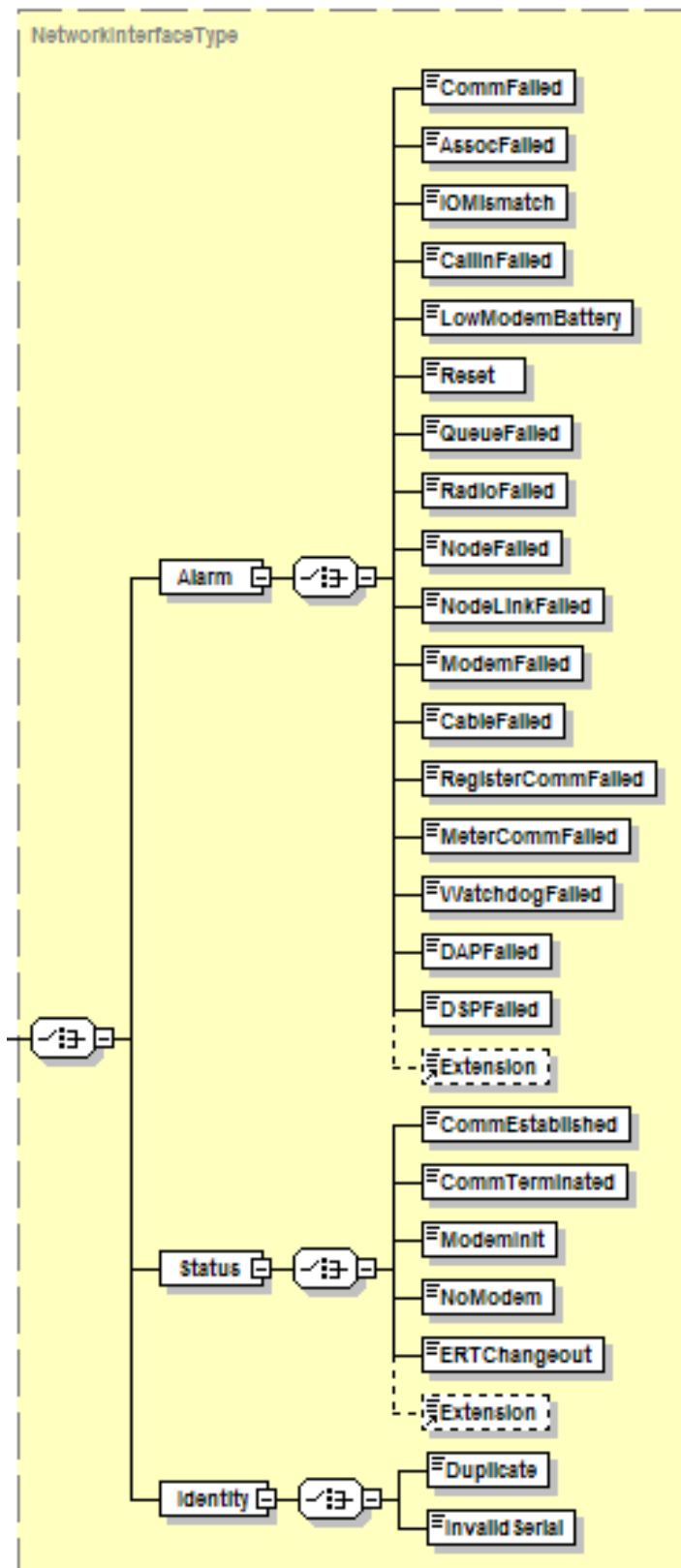


5. Communications XSD Structure

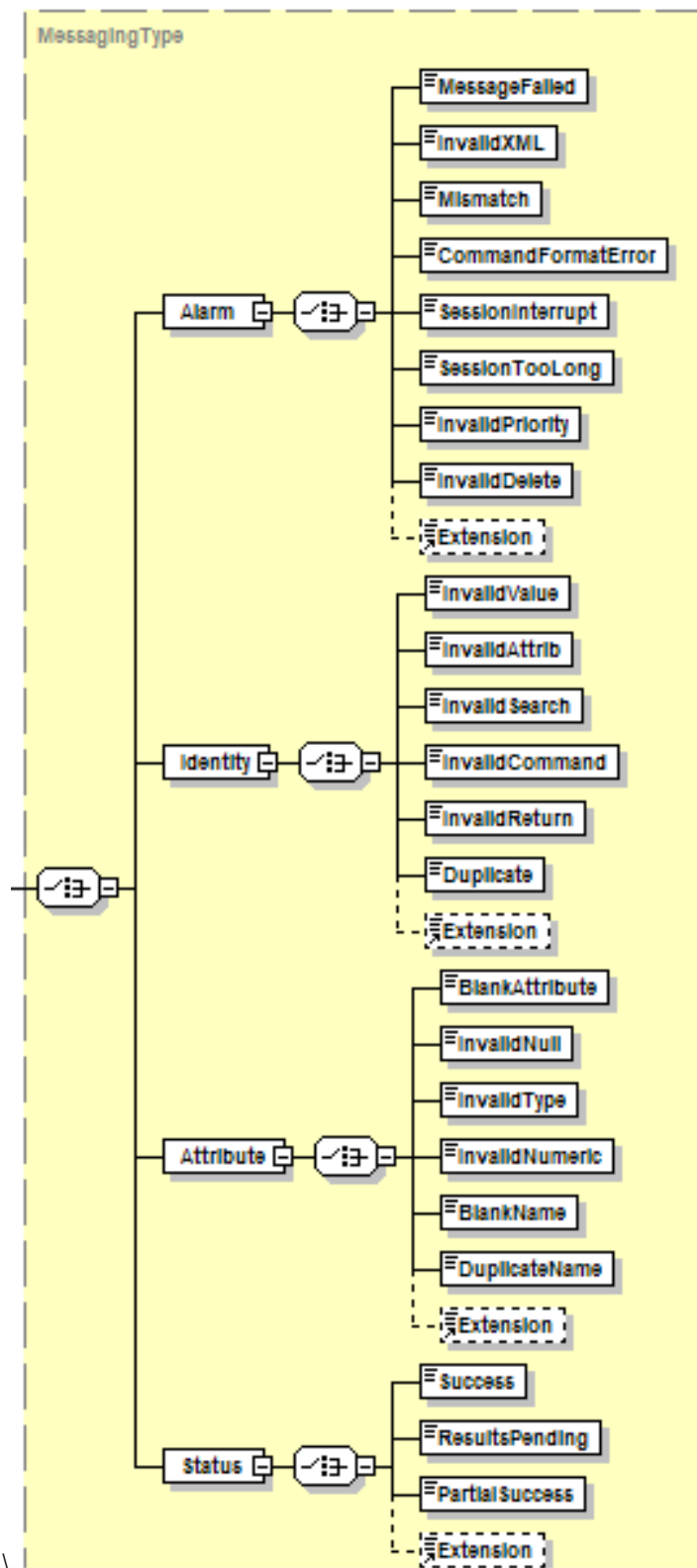
5.1 Overview of Communications



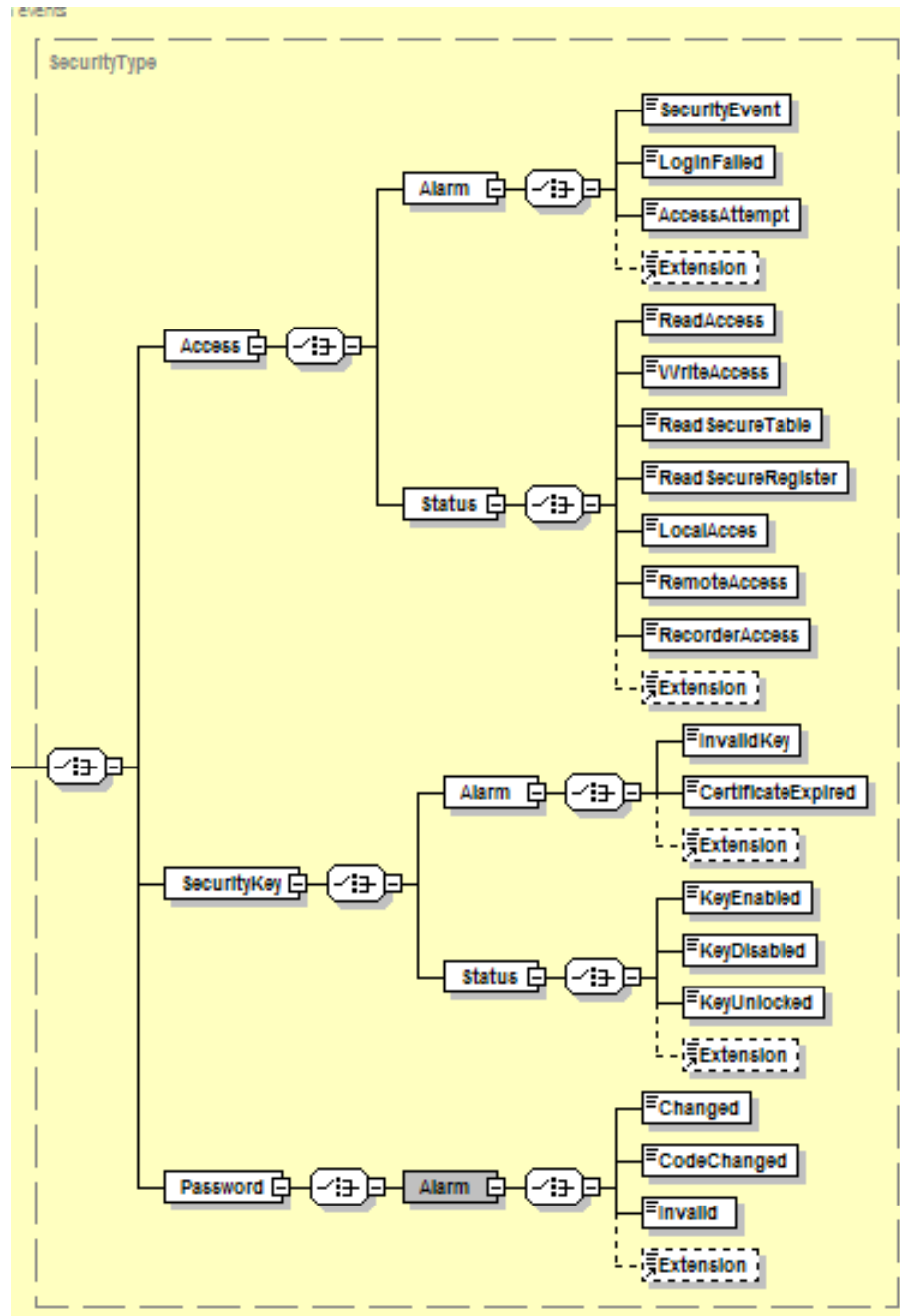
5.2 Network Interface



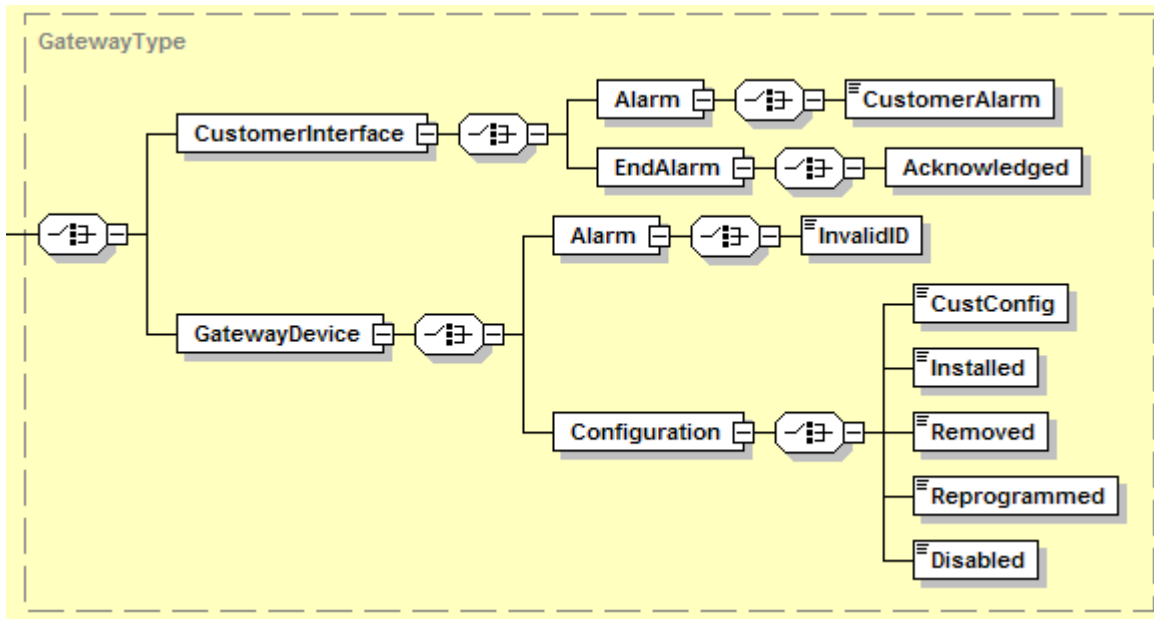
5.3 Messaging



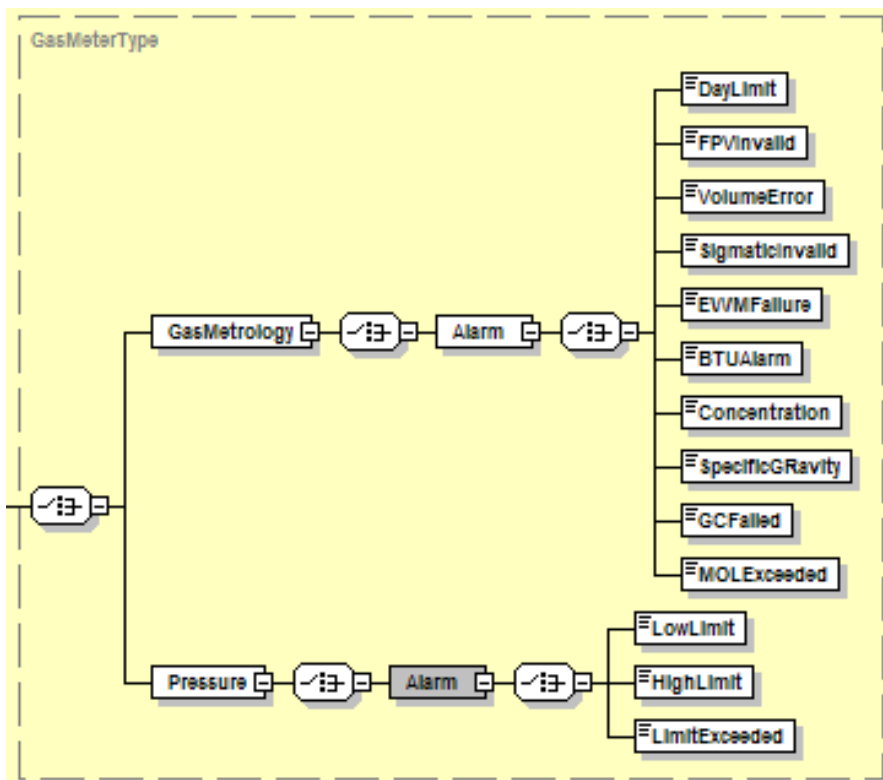
6. Security



7. Gateway



8. Gas Meter



9. Water Meter

(TBD)