1D & 2D channels

Just brainstorming ideas!

SEP2 will be inspired on Lima but not limited to Lima

- **Configuration**
- **Acquisition & Synchronization**
- **Saving**

Current implementation

- It is possible to execute single acquisition measurement e.g. ct, step scans with 1D and 2D detectors.
- In the measurement group one could use either channel or channel + its Datasource attribute.
- Data source is by default composed by Sardana, but could be returned by the controller with GetPar method.
- Data Transfer:
  - Data is transferred via Value attribute readout.
  - Data source is transferred via Datasource attribute readout.

Example

```
Door> defmeas mntgrp-1d2d ct01 oned01 twod01
oned01/datasource twod01/datasource
Door> senv ActiveMntGrp mntgrp-1d2d
Door> senv ScanDir /tmp
Door> senv ScanFile "[`test.h5`, `test.dat`]"
Door> ct
Door> ascan mot01 0 1 1 0.1
```

Current implementation

- H5 recorder:
  - 1D and 2D are correctly stored in the file:

```
import h5py
h5py.File("/tmp/test.h5").items()[-1][1]["measurement"]["twod01"][0]
```

  - Data source is not stored in the file:

```
h5py.File("/tmp/test.dat").items()[-1][1]["measurement"].keys()
```

- Spec recorder:
  - 1D is stored in the file, 2D is not stored in the file
  - Data source is correctly stored in the file:

```
$> tail /tmp/test.dat
```

- Output recorder:
  - 1D and 2D are displayed as their shapes
  - Data source is not displayed, just <string> placeholder is displayed

Current implementation

- It is possible to execute multi acquisition measurement e.g. continuous scan, timescan with 1D detectors.
  - In this case only data is transferred via Data attribute events (index + 1D)

Configuration

- Image e.g. ROI, binning, etc.
- Saving:
  - On channel level
    - Directory
    - Prefix
    - Suffix
    - Index format
    - Override policy
    - Active saving (bool)
  - On experiment configuration level or measurement group level (configuration)
    - Example: the same detector may be used in two different configurations e.g. raster scan (heat map) and data collection.
    - This should include all the attributes configurable on the channel level

Acquisition & Synchronization SEP18

- Extend AcqSynch with two new options:
  - SoftwareStart (which means internal start)
  - HardwareStart (which means external start)

- Extend AcqSynchType with one new option (supported from expconf):
  - Start

- Allow different types of preparation of channels:
  - Per measurement preparation with repetitions=n e.g. Prepare(One|All) or a controller parameter
  - Per acquisition preparation with repetitions=1 e.g. Load(One|All)

- Modify acquisition actions (and synchronization action if necessary) so they support the new concepts added in points 2 and 4.
- Extend GSF (step mode) with measurement preparation (repetitions=n) if possible i.e. scan macro knows beforehand the number of points.

Acquisition & Synchronization SEP18

- Acquisition will be possible on different levels: channel, measurement group, scan

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Data Transfer and Saving

- How to extract and transfer data/datasource:
  - Controller will have two possibilities: either return data (Readable interface) or data source (also Readable interface and distinguish the type in the core? another interface? GetPar?)
  - 2D data should be passed via Data attribute events (as it is done for the 1D)
  - How to pass data source? Via Data attribute events?
- Recorders:
  - Output
    - Hyperlink with image name e.g. sample1_000.edf
  - H5
    - String with URI
    - If H5 format is used by the detector we could provide links (virtual data sets)? Anyone interested in this?

To be continued...

- Please feedback on SEP2 and SEP18
- We need to organize follow-up meetings