DCAF Sequencer Requirements Document

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# Definitions

Sequencer: system that executes a sequence

Sequence: Is a group of steps that execute in a defined order. A sequence has a start and a finish.

Step: Is the minimum element of a sequence. They are executed by the sequencer in the order established by the sequence.

# General Requirements

* Must run on Real Time system os (Pharlap and Linux Rt)
* Each sequencer should only run 1 sequence at a time.
* Sequencer should be able to load multiple sequences.
* Sequencer should be able to pause or abort a sequence.
* Should be able to resume from the paused sequence at the same point.
* Multiple steps can write to a single variable.
* Setup and teardown.
* Steps should not block the sequencer flow to be allow the sequence to be aborted.
* Publish the state of the sequencer.
* External override of the state of the sequencer
* Step Timer

# Use Cases

## Industrial Control

### Case 1: Missile

A missile is a large manifold that contains multiple valves that need to be open to allow water to pass. This type of machine can execute multiple sequences

* Allow manual sequence (this is just a specific type of sequence and is what is run by default).
* Open Valves in sequence
* Open Valves simultaneous
* Time steps (open valve for certain amount of time)
* Reuse same steps with different parameters (open valve)

### Case 2: Mixer

This device mixes chemical substances based on ratios or time.

## Testing

### Case 2: Unmanned electronic device Style Tester

Its an electronic component tester. It executes a sequence of test over a component. Each step can be configured with different parameters and will provide results of the execution of the step.

* Execute test
* Skip test/step
* Steps can be executed depending on the result of previous steps.

### Case 3: Current Battery test Sequence

* Must be capable of controlling multiple DUTs from one controller
  + DUTs must be able to start and stop tests independently of each other
    - For example: 4 DUTS in one thermal chamber while running independent tests. Should be able to change test strategy for one or more DUT without disrupting operation of other DUTs
    - May have to coordinate sharing infrastructure assets (such as power electronics)
* Limited instruction set
  + For, While, Simple Logic, Simple Actions (Go To)
* Should be tied into SystemLink Test Monitor
* Support for sequences written in the following languages
  + Python
  + Excel
  + LabVIEW
* Local UI
  + Should contain an overview of the current sequence execution status
  + Should display current values and status of measured values/HW infrastructure
  + Should contain basic control functionality
    - Go to specified step
    - Emergency Stop