# Applying pre-recorded profiles as setpoints

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This note presents a possible approach to apply pre-recorded profiles as setpoints for a control algorithm developed on Simulink with ACG SDK. It assumes the following constraints:

- The profile may be more complex than a simple succession of steps.
- It should be possible to apply/launch the profile using Cockpit in order to log the system response during run-time.

This approach is used, for example, in the example of motor control of an electric vehicle, to apply a WLTP speed profile as speed reference.

## Software resources

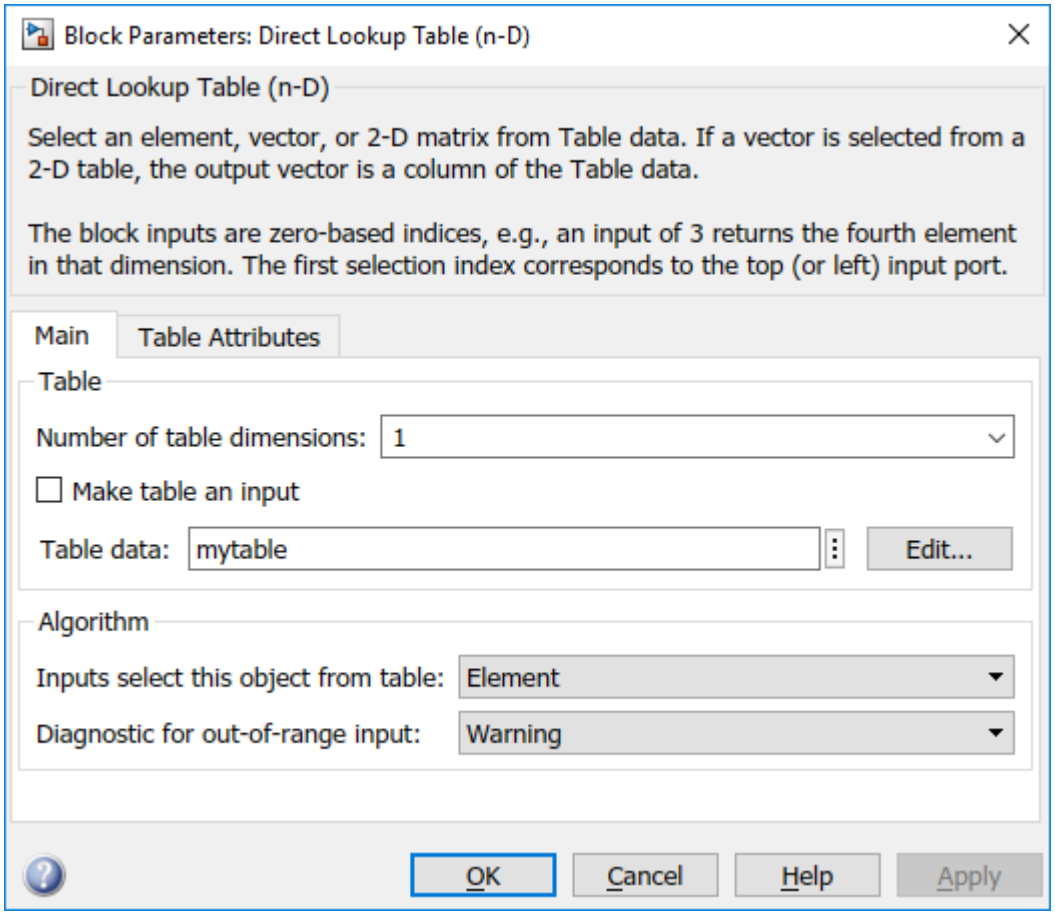
Pre-recorded profile example (Simulink)Download

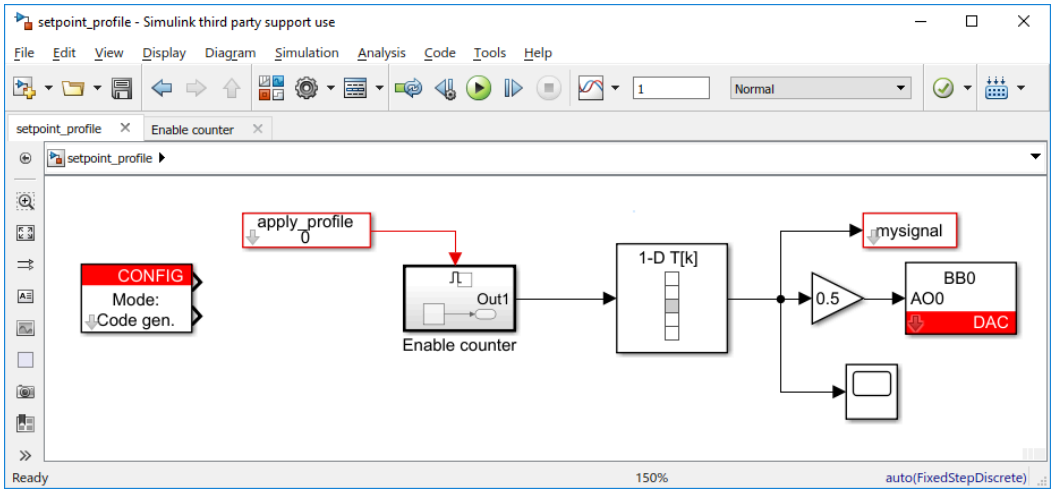
## Proposed solution

The proposed solution mainly uses a 1D lookup table in Simulink, in combination with an enabled subsystem containing a discrete counter.

This solution operates as follows:

- The counter produces the indices, which are used inside the lookup table to access a pre-recorded vector of data (e.g. `mytable`).
- The counter is located inside an enabled subsystem, so that the counter is normally reset, and only starts counting when desired.
- The variable that is used to enable the subsystem can be triggered from within Cockpit.




Inside Cockpit, the profile can be activated by properly configuring the datalogger:

- The length of the scoping window should be configured at least as long as the pre-recorded profile (here 1000 points, while the pre-recorded profile is 400 samples long).
- The transient generator can be used to set the `apply_profile` variable to 1 at the beginning of the window, and back to 0 at the end of the window. Meanwhile, the profile is repeated if needed.