

GH09.B.1.portkey - Port Expander and Keypad Controller

This specifies details about the workloads associated with the GH09.B.1 design.

Input Workloads

The workloads for this benchmark that when combined with this design specification, form a benchmark. The workloads for this design are defined by the following events. Please see the [groundhog_09_meta_document.pdf](#) for a description of workloads.

Note that there are two conditions in all of the associated workload files. These conditions state that the external environment will respond with the specified action when interrupt0 or interrupt1 are fired. The response is set to read the appropriate register through the SPI. These inputs are put on the workload timeline by the golden functional model and need to be simulated in a created test bench when they occur.

For this design the key input events are:

- reset – the reset signal [signal event]
 - <value0> tag is the associated Boolean value of the signal. Note that the value can be flipped if the designers wish, and the goal is to indicate the initialization of the system.
- gpio_pin – signifies an external input from a gpio pin that is programmed to be an input (or read) from the external environment into the device [signal event]
 - <value0> describes which gpio pin is being written to the pin number
 - <value1> contains the associated Boolean input value
- keypad_press – signifies a press a certain key on the keypad matrix with a row and column [macro event]
 - <value0> is the column pressed
 - <value1> is the row pressed
- keypad_release – signifies the release of a pressed button on the keypad matrix with a row and column [macro event]
 - <value0> is the column of the released button

- <value1> is the row of the released button
- spi – an spi (please see the design spec for more details) request made on the SI pins and the corresponding SS signal. The SPI interface is a serial interface, but this macro event represents a series of transmission bits on the interface. The entire event will happen based on the SCLK defined within the environment file. In the case of a the default environment file provided with this suite, the SCLK is defined by < minimum_arrival_rate_on_serial_interfaces > [macro event]
 - value0 is the bitstring passed in from lsb (being most left) to msb (being most write)

Outputs from the golden functional model tool

The associated output resources that will be generated by the golden functional model are:

- gpio_pin – an signal from a gpio pin programmed to output
 - value0 is the pin number
 - value1 is the associated output value
- spi_SO – output from the SPI interface. . The SPI interface is a serial interface, but this macro event represents a series of transmission bits on the interface. The entire event will happen based on the SCLK defined within the environment file. In the case of a the default environment file provided with this suite, the SCLK is generated by the device [macro event]
 - value0 is the bitstring passed out from lsb (being most left) to msb (being most write)
- interrupt0 – associated with interrupts for key presses
- interrupt1 – associated with interrupts on gpio read interrupts