S4_VHDL Specifications

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1 Product Overview - IC_4 Top View

History

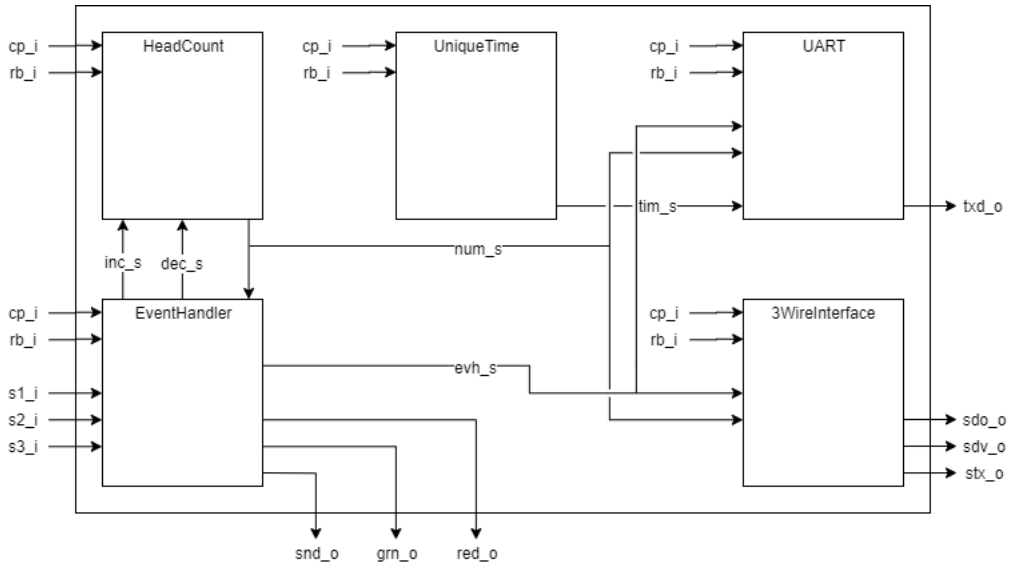
Target Spec. Current version: 0.1, 2020-11-9
Previous version:-

06.11.2020	General description added
06.11.2020	Block diagram added
06.11.2020	Functional description added

1.1 General description

IC4 is a single chip based application containing processing capabilities to detect and keep track of the amount of people in one room. It is part of a system solution to fullfill the covid-19-restrictions and regulate the amount of people in an area. This solution is only meant for a chamber with only one doorway available to enter or to exit.
The IC4 is designed on a FPGA prototype-board Max1000 with 10M16SAU169C8G device on board.

1.2 Block diagram



Signal	Signal name	Description
rb_i	reset	reset, active low
cp_i	system clock	e.g. 10MHz
s1_i	light_curtain s1	log1: something passes
s2_i	light_curtain s2	log1: something passes
s3_i	light_curtain s3	log1: something passes
grn_o	LED, access garanted	Green LED, go ahead
red_o	LED, stop, no entry	Red LED, stop, access denied
sdo_o	serial data out	drives S3 or MC
sdv_o	serial data valid	drives S3 or MC
stx_o	serial transfer active	drives S3 or MC
txd_o	serial out	to RS-232-driver, 9k6,8N2,ASCII,to PC
snd_o	sound signal	acoustic signal, to loudspeaker
inc_s	increment	increments head count when triggered
dec_s	decrement	decrements head count when triggered
num_s	number	contains the head count number
evh_s	event	contains the current event

1.3 Functional description

HeadCount

Stores the current number of people in the room. It increments or decrements the number if needed.

EventHandler

It recieves the signals from the light curtains and dectects with event is triggered. Depending on the event it will play a sound, turn on a LED and create an output signal.

UniqueTime

This element is only counting the clock-cycles, to generate a unique timestamp.

UART

The connection to RS232 is done by the UART. It takes the unique timestamp from the UART as well as the head count from the HeadCount and event type from the EventHandler, when a signal from the EventHandler is recieved.

3WireInterface

The IC_3 can be connected by using the 3WireInterface. When it recieves a signal from the EventHandler it should pass the head count and event type to the IC_3.