**LED\_MATRIX**

**The modules in the firmware project (by 20171205):**

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| --- | --- |
| top.v | Top interconnections module |
| defines.vh | Main parameters |
| version\_num.v  version\_num.tcl | Firmware version – vector connected to the registers’ file |
| test\_pattern\_generator.v  vga\_controller.v  video\_sync\_generator.v  video\_address\_generator.v | Test pattern generator |
| uart\_rxtx.v  uart.v  uart\_fifo.v | UART |
| dpi\_sync\_detector.v | Input data sync detector |
| freq\_measure.v | Input video data frequency meter |
| stb\_extender.v | strobe extender (to transfer a strobe from a fast to the slow clock domain) |
| strobe\_gen\_1k\_10\_5\_1.v | Time-based strobes generator |
| regfile\_uart\_mapper.v | Registers’ file |
| pwm.v | PWM for brightness control |
| pll1.v | Main PLL |
| pll\_video\_input.v | DPI (Video) input PLL |
| outbuf\_dpram.v | Video-buffer with initialization by logo2\_.mif |
| hub75\_drv.v | MBI5124 and ICN2038 -based LED matrix’s driver |
| \mbi5153\_drv\  mbi5153\_commands.v  mbi5153\_data.v  mbi5153\_frame.v  mbi5153\_top.v  fsm\_rq\_rdy.v | Files for supporting MBI5153 driver  Sending commands  Sending video-data (1 line per request)  Sending 1 frame  Config, send frame, send VSync, GCLK control, etc.  Latching request and interacting with its end “customer” |
| image\_clipper.v | DPI (Video) data clipping |
| dpi\_recevier.v | Simple input video-data synchronizer & counter |

Tools:

bmp256x64\_2mif.m – make a MIF logo for initializing DPRAM

bmp360x90\_2\_bmp120x270.m – converting a picture for the matrix driven by Linsn modules