Register, byte addresses, bit fields, and description

reg_mprj_xfer																															
0x26000003								0x26000002								0x26000001								0x26000000								address
																								0x13								SPI register
(undefined, reads zero)																								gpio xfer controls								value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio xfer controls (7 bits) bit fields:

bit 0	serial xfer/busy	Write 1 to apply configuration values to GPIO. Auto-zeroing. Read back value 1 = busy, 0 = idle	default = 0
bit 1	bitbang enable	1 = serial transfer bitbang mode enabled; 0 = bitbang mode disabled	default = 0
bit 2	bitbang resetn	0 = bit bang mode reset; 1 = bitbang mode normal operation	default = 0
bit 3	bitbang load	0 = bit bang mode normal operation; 1 = latch configuration values	default = 0
bit 4	bitbang clock	0->1 transition: Advance data in serial shift register by 1 bit in bitbang mode	default = 0
bit 5	bitbang data right	Value = data to apply to serial data right side shift register (GPIO 0 to 18) on next bitbang clock	default = 0
bit 6	bitbang data left	Value = data to apply to serial data left side shift register (GPIO 19 to 37) on next bitbang clock	default = 0

The **reg_mprj_xfer** register controls the programming of the configurable GPIO (general-purpose input/output) pins . There are 38 GPIO pins, in two banks of 19. GPIO 0 to 18 start at the bottom right corner of the chip and extend to the midpoint of the top side of the chip. GPIO 19 to 37 start at the midpoint of the top side of the chip and extend to the bottom left corner. The GPIO indexes always increase in a counterclockwise direction around the chip perimeter. The GPIOs are configured through the "user_defines.v" file to have a specific configuration on power-up. However, the GPIOs may be reprogrammed at any time either through the housekeeping SPI or through processor reads and writes to the memory map described on this page. The programming starts with the intended configuration for each GPIO programmed into registers **reg_mprj_io_0** to **reg_mprj_io_37** (see below). These registers are a *staging area* for the GPIO configuration. The actual GPIO configuration is kept in duplicate registers next to each GPIO and are not directly readable or writeable. The GPIOs are configured by an automatic programming step that copies the configurations from the registers to the GPIO pins via a serial shift register. The **reg_mprj_xfer** register controls this programming process. Normally, only the simple, automatic programming is used. The user sets (through the housekeeping SPI or from a running program) bit 0 to start the configuration transfer from housekeeping registers to the GPIO pins. The same bit 0 may be subsequently monitored; when the bit clears, the configuration programming is complete. The rest of the control bits are intended only for diagnostic purposes. They can be used to override the automatic GPIO programming and perform the programming sequence manually.

reg_mprj_pwr																															
0x26000007								0x26000006								0x26000005								0x26000004								address
																								0x6E								SPI register
(undefined, reads zero)																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

This register intended for future use powering up/down internal power domains. Currently it has no function. default = N/A

reg_mprj_datal																															
0x2600000F								0x2600000E								0x2600000D								0x2600000C								address
0x6A								0x6B								0x6C								0x6D								SPI register
gpio data [31:0]																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 31 to 0 gpio data [31:0] Read values from or write values to the GPIO pins for GPIO[31] (bit 31) down to GPIO[0] (bit 0) default = 0

reg_mprj_datah																															
0x26000013								0x26000012								0x26000011								0x26000010								address
																								0x69								SPI register
(undefined, reads zero)																										gpio data [37:32]						value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 5 to 0 gpio data [37:32] Read values from or write values to the GPIO pins for GPIO[37] (bit 5) down to GPIO[32] (bit 0) default = 0

The **reg_mprj_datah** and **reg_mprj_datal** registers together comprise the 38 bits of data corresponding to the 38 configurable GPIO pins. Writing to the register is only meaningful for GPIO pins that are configured for management control and which are not being controlled by one of the special functions (e.g., SPI master, UART, housekeeping SPI). If the corresponding GPIO is configured for management control, configured as an output, and has the output enabled, then a bit written to these registers will appear as an output value on the corresponding GPIO pin. Reading the value from these registers will read the value at the pin, regardless of whether or not the pin is configured for management control, and whether or not the pin is configured for a special function. However, the GPIO must have the input enabled.

reg_mprj_io_0			
0x26000027	0x26000026	0x26000025	0x26000024	address

																	0x1D					0x1E								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x1803

reg_mprj_io_1

0x2600002B								0x2600002A								0x26000029								0x26000028								address
																0x1F								0x20								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x1803

reg_mprj_io_2

0x2600002F								0x2600002E								0x2600002D								0x2600002C								address
																0x21								0x22								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_3

0x26000033								0x26000032								0x26000031								0x26000030								address
																0x23								0x24								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0801

reg_mprj_io_4

0x26000037								0x26000036								0x26000035								0x26000034								address
																0x25								0x26								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_5

0x2600003B								0x2600003A								0x26000039								0x26000038								address
																0x27								0x28								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_6

0x2600003F								0x2600003E								0x2600003D								0x2600003C								address
																0x29								0x2A								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_7

0x26000043								0x26000042								0x26000041								0x26000040								address
																0x2B								0x2C								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_8																															
0x26000047								0x26000046								0x26000045								0x26000044								address
																0x2D								0x2E								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_9																															
0x2600004B								0x2600004A								0x26000049								0x26000048								address
																0x2F								0x30								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_10																															
0x2600004F								0x2600004E								0x2600004D								0x2600004C								address
																0x31								0x32								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_11																															
0x26000053								0x26000052								0x26000051								0x26000050								address
																0x33								0x34								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_12																															
0x26000057								0x26000056								0x26000055								0x26000054								address
																0x35								0x36								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_13																															
0x2600005B								0x2600005A								0x26000059								0x26000058								address
																0x37								0x38								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_14																															
0x2600005F								0x2600005E								0x2600005D								0x2600005C								address
																0x39								0x3A								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_15			
0x26000063	0x26000062	0x26000061	0x26000060	address

																	0x3B					0x3C								SPI register
(undefined, reads zero)																	gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_16

0x26000067								0x26000066								0x26000065								0x26000064								address
																0x3D								0x3E								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_17

0x2600006B								0x2600006A								0x26000069								0x26000068								address
																0x3F								0x40								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_18

0x2600006F								0x2600006E								0x2600006D								0x2600006C								address
																0x41								0x42								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_19

0x26000073								0x26000072								0x26000071								0x26000070								address
																0x43								0x44								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_20

0x26000077								0x26000076								0x26000075								0x26000074								address
																0x45								0x46								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_21

0x2600007B								0x2600007A								0x26000079								0x26000078								address
																0x47								0x48								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_22

0x2600007F								0x2600007E								0x2600007D								0x2600007C								address
																0x49								0x4A								SPI register
(undefined, reads zero)																			gpio configuration													value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_23																													
0x26000083								0x26000082								0x26000081								0x26000080								address
																0x4B								0x4C								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_24																													
0x26000087								0x26000086								0x26000085								0x26000084								address
																0x4D								0x4E								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_25																													
0x2600008B								0x2600008A								0x26000089								0x26000088								address
																0x4F								0x50								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_26																													
0x2600008F								0x2600008E								0x2600008D								0x2600008C								address
																0x51								0x52								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_27																													
0x26000093								0x26000092								0x26000091								0x26000090								address
																0x53								0x54								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_28																													
0x26000097								0x26000096								0x26000095								0x26000094								address
																0x55								0x56								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_29																													
0x2600009B								0x2600009A								0x26000099								0x26000098								address
																0x57								0x58								SPI register
(undefined, reads zero)																gpio configuration																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_30																													
0x2600009F								0x2600009E								0x2600009D								0x2600009C								address

																0x59								0x5A						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_31																														
0x260000A3								0x260000A2								0x260000A1								0x260000A0						address
																0x5B								0x5C						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_32																														
0x260000A7								0x260000A6								0x260000A5								0x260000A4						address
																0x5D								0x5E						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_33																														
0x260000AB								0x260000AA								0x260000A9								0x260000A8						address
																0x5F								0x60						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_34																														
0x260000AF								0x260000AE								0x260000AD								0x260000AC						address
																0x61								0x62						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

default = 0x0403

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37.

reg_mprj_io_35																														
0x260000B3								0x260000B2								0x260000B1								0x260000B0						address
																0x63								0x64						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_36																														
0x260000B7								0x260000B6								0x260000B5								0x260000B4						address
																0x65								0x66						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: See bit field definitions for reg_mprj_io_37. default = 0x0403

reg_mprj_io_37																														
0x260000BB								0x260000BA								0x260000B9								0x260000B8						address
																0x67								0x68						SPI register
(undefined, reads zero)																		gpio configuration												value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

gpio configuration (13 bits) bit fields: default = 0x0403

bit 0	management enable	1 = management SoC controls GPIO; 0 = user project controls GPIO
bit 1	output disable	1 = digital output driver disabled ; 0 = digital output driver enabled (management controlled mode only)
bit 2	hold state value	Value of GPIO when in low-power state.
bit 3	input disable	1 = digital input driver disabled; 1 = digital input driver enabled
bit 4	IB mode select	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bit 5	analog enable	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bit 6	analog select	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bit 7	analog polarity	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bit 8	slow slew	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bit 9	trip point select	See definition in SkyWater documentation for sky130_fd_io__top_gpiov2
bits 10-12	digital mode	See table below for typical settings; see SkyWater documentation for complete list.
000	disabled	Both input and output digital buffers disabled. Use this when connecting an analog signal to the pad
001	input	Digital input only. Output buffer is disabled.
010	input pullup	Input mode with pull-up. User mode only: Output must be enabled and driven to value 1.
011	input pulldown	Input mode with pull-down. User mode only: Output must be enabled and driven to value 0.
110	output	Digital output. User mode only: Output must be enabled (OEB = 0)

The registers **reg_mprj_io_0** through **reg_mprj_io_37** are a staging area for the configuration of GPIO pins 0 to 37, respectively. Each GPIO is controlled by a 13 bit vector with values as described above. The values in the staging area are copied to the GPIO pins by use of the register **reg_mrpj_xfer** (see above). The default value of all GPIOs other than 0 to 4 is determined by the values set by the user in the file **user_defines.v**. The configuration is via-programmed at the GPIO itself. However, the value is not duplicated in the housekeeping registers, which continue to read the default values indicated above until the register is modified. The header file **defs.h** includes macros for the most common GPIO configuration settings.

reg_hkspi_status																															
0x26100003								0x26100002								0x26100001								0x26100000								address
																								0x00								SPI register
(undefined, reads zero)																								SPI status								value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 0-7 SPI status This byte is currently unused and undefined (intended for SPI mode control) default = 0

reg_hkspi_chip_id																															
0x26100007								0x26100006								0x26100005								0x26100004								address
								0x01								0x02								0x03								SPI register
(undefined, reads zero)								Manufacturer ID (= 0x456)																Product ID = (0x11)								value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 0-23 Fixed product ID value 0x11 representing Caravel v4 (Sky130). Value is read-only default = 0x11

bits 16-23 Fixed manufacturer ID value 0x456 representing Efabless Corporation. Value is read-only default = 0x456

reg_hkspi_user_id																															
0x2610000B								0x2610000A								0x26100009								0x26100008								address
0x04								0x05								0x06								0x07								SPI register
User project ID																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 0-31 Unique project ID assigned to each user design. Traditionally, bits 16-31 are an ID sub-field for the MPW run. default = (variable)

The **reg_hkspi_user_id** register allows a user to read back the 32-bit project ID value assigned to the Caravel user project. Each project on a reticle (currently 40 projects per shuttle run) gets a unique identification number that is automatically via-programmed into this register during chip assembly prior to tape-out.

reg_hkspi_pll_ena																															
0x2610000F								0x2610000E								0x2610000D								0x2610000C								address
																								0x08								SPI register
(undefined, reads zero)																														DCO	ENA	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 0 ENA DLL/DCO enable (1 = enabled; 0 = disabled) default = 0

bit 1 DCO DCO mode enable (1 = use DCO mode; 0 = use DLL mode) default = 1

The caravel chip has an on-board oscillator that is a programmable-length ring oscillator, or DCO (digitally-controlled oscillator). The oscillator on the Sky130 version of Caravel has a frequency range of about 50MHz to 120MHz (at a low-voltage supply of 1.8V). This register controls the enabled state of the DCO and the DLL (digital locked loop), which is a controller that automatically trims the DCO to lock the frequency to a multiple of the external clock input. The base enable (bit 0) must be set to 1 for either the DCO or the DLL to operate. The DCO enable bit is effectively a DLL disable bit, which lets the DCO run freely with manual trim control through the **reg_hkspi_pll_trim** register. Registers affecting DCO and DLL operation are **reg_hkspi_pll_ena**, **reg_hkspi_pll_bypass**, **reg_hkspi_pll_trim**, **reg_hkspi_pll_source**, and **reg_hkspi_pll_divider**. Please see the register descriptions below for additional information.

reg_hkspi_pll_bypass																													
0x26100013								0x26100012								0x26100011								0x26100010						address
																								0x09						SPI register
(undefined, reads zero)																													BYP	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 0 BYP DLL bypass (1 = use external clock; 0 = use DLL/DCO clock) default = 1

The **reg_hkspi_pll_bypass** register contains one bit which, when set, bypasses the DLL or DCO (see above) and allows the Caravel chip core to be driven by the signal on the external clock pin. When cleared, the Caravel chip core is driven from the DLL/DCO clock. The default value is 1 so that the clock rate on power-up is defined by the external clock.

reg_hkspi_irq																													
0x26100017								0x26100016								0x26100015								0x26100014						address
																								0x0A						SPI register
(undefined, reads zero)																													IRQ	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 0 IRQ Manual interrupt (1 = interrupt; 0 = no action) default = 0

The **reg_hkspi_irq** register can be used to apply a manual interrupt to the VexRISC processor. The value of bit 0 is passed directly to the interrupt vector of the processor.

reg_hkspi_reset																													
0x2610001B								0x2610001A								0x26100019								0x26100018						address
																								0x0B						SPI register
(undefined, reads zero)																													RST	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 0 RST Manual reset (1 = apply reset; 0 = release reset) default = 0

The **reg_hkspi_reset** register can be used to apply a manual reset to the VexRISC processor. It is equivalent to grounding the RESETB pin on the chip. Note that both the pin and software resets do not affect values in the housekeeping module, which can only be reset by a power cycle to the chip.

reg_hkspi_pll_trim																													
0x2610001F								0x2610001E								0x2610001D								0x2610001C						address
0x10								0x0F								0x0E								0x0D						SPI register
(undefined, reads zero)						DLL manual trim																								value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

all bits All 1 values = maximum trim; all 0 values = minimum trim (To-do: table needed) default = 0x03ffefff

The **reg_hkspi_pll_trim** value controls the frequency of the DCO when the DCO is not in DLL mode (free-running DCO mode). The trim is undecoded, so each trim bit will turn a section of the ring oscillator on or off, lengthening or shortening the ring oscillator. With 26 trim bits, there are effectively 27 unique settings of the DCO, from minimum trim (value 0x00000000) to maximum trim (value 0x03ffffff). The default state is one less than the maximum trim and is necessary for proper startup of the DLL.

reg_hkspi_pll_source																													
0x26100023								0x26100022								0x26100021								0x26100020						address
																								0x11						SPI register
(undefined, reads zero)																										out div 2			out div 1		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 2-0 out div 1 Core clock DLL output divider (0 = thru; 1 = off; 2-7 = divide by 2 to 7 default = 2

bits 5-3 out div 2 Secondary (user) clock DLL output divider (0 = thru; 1 = off; 2-7 = divide by 2 to 7 default = 2

The **reg_hkspi_pll_source** register defines the values of the two output dividers associated with the DCO/DLL. The primary divider (div 1) divides the DCO/DLL frequency down by the given value to generate the primary (core) clock for the processor. The secondary divider (div 2) divides the DCO/DLL frequency down by the given value to generate the secondary (user) clock, which is passed directly to the user project as an independent clock that is independent of the core clock (wishbone clock). Note that value 0 is effectively divide-by-1 (pass-through), while value 1 disables the divider. The output dividers operate in both DCO and DLL modes.

reg_hkspi_pll_divider																															
0x26100027								0x26100026								0x26100025								0x26100024								address
																								0x12								SPI register
(undefined, reads zero)																												feedback div				value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 4-0 feedback div DLL feedback divider. Values 1-31 = divide by 1 to 31 default = 4

The **reg_hkspi_pll_divider** register defines the value of the feedback divider for the DLL. This divider value is only relevant when the DLL mode is on (DCO mode off). The DLL will lock to a frequency that is the frequency of the external input clock multiplied by the feedback divider value. The feedback divider value must be set such that the resulting DLL frequency is in the operational range of the DCO (which is 50MHz to 120MHz at 1.8V vccd supply). The value of the resulting clock when running in DLL mode can be computed as the external clock frequency times the feedback divider value, divided by the output divider value (see **reg_hkspi_pll_source**).

reg_power_good																															
0x26200003								0x26200002								0x26200001								0x26200000								address
																								0x1A								SPI register
(undefined, reads zero)																												power monitors				value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

power monitors (4 bits) bit fields:

bit 0 vdda2 power good 1 = vdda2 (user 2 3.3V domain) powered up; 0 = vdda2 powered down default = N/A

bit 1 vdda1 power good 1 = vdda1 (user 1 3.3V domain) powered up; 0 = vdda1 powered down default = N/A

bit 2 vccd2 power good 1 = vccd2 (user 2 1.8V domain) powered up; 0 = vccd2 powered down default = N/A

bit 3 vccd1 power good 1 = vccd1 (user 1 1.8V domain) powered up; 0 = vccd1 powered down default = N/A

The **reg_power_good** read-only bits report the status of the power supply to the four independent user area power supplies. Note that these are trivially simple power detectors and will read "1" whenever a supply is high enough to trip a digital buffer input, which is half of the nominal power supply or less.

reg_clk_out_dest																															
0x26200007								0x26200006								0x26200005								0x26200004								address
																								0x1B								SPI register
(undefined, reads zero)																													monitors			value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

monitors bit fields:

bit 0 trap monitor 1 = Moniitor CPU trap state on GPIO[13] (unavailable on current caravel version) default = 0

bit 1 core clock monitor 1 = Monitor core clock on GPIO[14] default = 0

bit 2 user clock monitor 1 = Monitor secondary (user) clock on GPIO[15] default = 0

The **reg_clk_out_dest** monitoring functions allow either or both of the core clock and the user clock to be routed to a GPIO pin for monitoring. Specific GPIO pins (14 and 15) are assigned to these functions.

reg_irq_source																															
0x2620000F								0x2620000E								0x2620000D								0x2620000C								address
																								0x1C								SPI register
(undefined, reads zero)																														source		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

source bit fields:

bit 0 IRQ 1 source 1 = Enable pin GPIO[7] as IRQ[1] input source default = 0

bit 1 IRQ 2 source 1 = Enable pin GPIO[12] as IRQ[2] input source default = 0

The **reg_irq_source** register controls the enablement of special-purpose GPIO pins (7 and/or 12) to be used for external interrupts to the processor from an off-chip source.

reg_hkspi_disable																															
0x26200013								0x26200012								0x26200011								0x26200010								address
																								0x6F								SPI register
(undefined, reads zero)																														DIS	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bit 0 DIS Disable the housekeeping SPI. 1 = SPI disabled; 0 = SPI enabled default = 0

The **reg_hkspi_disable** register contains a single bit that will disable the special function of the housekeeping SPI. The housekeeping SPI should be disabled whenever GPIO pins 1 to 4 are used for any purpose other than the housekeeping SPI interface. Otherwise, the CSB pin (GPIO 3) can trigger an action on the SPI, which may then attempt to apply an output value to SDO (GPIO 1).

How to read this register map:

register_name																															
0x1234567B								0x1234567A								0x12345679								0x12345678								address
								0x01								0x02								0x03								SPI register
(undefined, reads zero)								Register field contents																Register field contents								value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

bits 0-23 Bit field decription default = 0

Register **register_name** description

Documentation page written by Tim Edwards, May 12, 2023, and corresponds to the Sky130 version of Caravel v4

	Base Address	
	Hex	Decimal

CTRL_RESET

0xF0000003				0xF0000002				0xF0000001				0xF0000000					
(undefined, reads zero)																U_RST	C_RST
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0000000 4026531840
value
bit

Field	Name	Description
[0]	SOC_RST	Write 1 to this register to reset the full SoC (Pulse Reset)
[1]	CPU_RST	Write 1 to this register to reset the CPU(s) of the SoC (Hold Reset)

CTRL_SCRATCH

0xF0000007				0xF0000006				0xF0000005				0xF0000004					
scratch space																	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0000004 4026531844
value
bit

Use this register as a scratch space to verify that software read/write accesses to the Wishbone/CSR bus are working correctly. The initial reset value of 0x1234578 can be used to verify endianness.

CTRL_BUS_ERRORS

0xF000000B				0xF000000A				0xF0000009				0xF0000008					
bus errors																	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0000008 4026531848
value
bit

Total number of Wishbone bus errors (timeouts) since start.

DEBUG_MODE_OUT

0xF0000803				0xF0000802				0xF0000801				0xF0000800					
GPIO Output Control																	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0000800 4026533888
value
bit

GPIO Output(s) Control.

DEBUG_OEB_OUT

0xF0001003				0xF0001002				0xF0001001				0xF0001000					
GPIO Output Control																	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0001000 4026535936
value
bit

GPIO Output(s) Control.

FLASH_CORE_MMAP_DUMMY_BITS

0xF0001803				0xF0001802				0xF0001801				0xF0001800					
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0001800 4026537984
value
bit

Desciption ?

FLASH_CORE_MASTER_CS

0xF0001807				0xF0001806				0xF0001805				0xF0001804					
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0001804 4026537988
value
bit

It acts as an enable for flash if you want to enable the flashing you would write 1 to it that would

FLASH_CORE_MASTER_PHYCONFIG

0xF000180B				0xF000180A				0xF0001809				0xF0001808					
				MASK								WIDTH				LEN	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F0001808 4026537992
value
bit

Field	Name	Description
[7:0]	LEN	SPI Xfer length (in bits).
[11:8]	WIDTH	SPI Xfer width (1/2/4/8).
[23:16]	MASK	SPI DQ output enable mask (set bits to 1 to enable output drivers on DQ lines).

FLASH_CORE_MASTER_RXTX

0xF000180F				0xF000180E				0xF000180D				0xF000180C					
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
13	12	11	10	9	8	7	6	5	4	3	2	1	0				

address F000180C 4026537996
value
bit

Desciption ?

FLASH_CORE_MASTER_STATUS																															
0xF0001813								0xF0001812								0xF0001811								0xF0001810								address	F0001810	4026538000
(undefined, reads zero)																													REA	REA	value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Field	Name	Description
[0]	TX_READY	TX FIFO is not full.
[1]	RX_READY	RX FIFO is not empty.

FLASH_PHY_CLK_DIVISOR																															
0xF0002003								0xF0002002								0xF0002001								0xF0002000								address	F0002000	4026540032
																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

It is the ratio between the core clock and flashing clock for example if FLASH_PHY_CLK_DIVISOR is 0 the flashing clock would be half the core clock if it's 1 the flashing clock will be 1/4 of the core clock

GPIO_MODE1																															
0xF0002803								0xF0002802								0xF0002801								0xF0002800								address	F0002800	4026542080
GPIO Tristate(s) Control.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Tristate(s) Control.

GPIO_MODE0																															
0xF0002807								0xF0002806								0xF0002805								0xF0002804								address	F0002804	4026542084
GPIO Tristate(s) Control.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Tristate(s) Control.

GPIO_IEN																															
0xF000280B								0xF000280A								0xF0002809								0xF0002808								address	F0002808	4026542088
GPIO Tristate(s) Control.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Tristate(s) Control.

GPIO_OE																															
0xF000280F								0xF000280E								0xF000280D								0xF000280C								address	F000280C	4026542092
GPIO Tristate(s) Control.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Tristate(s) Control.

GPIO_IN																															
0xF0002813								0xF0002812								0xF0002811								0xF0002810								address	F0002810	4026542096
GPIO Input(s) Status.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Input(s) Status.

GPIO_OUT																															
0xF0002817								0xF0002816								0xF0002815								0xF0002814								address	F0002814	4026542100
GPIO Ouptut(s) Control.																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Ouptut(s) Control.

LA_IEN3																															
0xF0003003								0xF0003002								0xF0003001								0xF0003000								address	F0003000	4026544128
LA Input Enable																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 96-127 of LA_IEN. LA Input Enable

LA_IEN2																															
0xF0003007								0xF0003006								0xF0003005								0xF0003004								address	F0003004	4026544132
LA Input Enable																															value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 64-95 of LA_IEN.

LA_IEN1																																	
0xF000300B								0xF000300A								0xF0003009								0xF0003008								address	F0003008	4026544136
LA Input Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 32-63 of LA_IEN.

LA_IEN0																																	
0xF000300F								0xF000300E								0xF000300D								0xF000300C								address	F000300C	4026544140
LA Input Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 0-31 of LA_IEN.

LA_OE3																																	
0xF0003013								0xF0003012								0xF0003011								0xF0003010								address	F0003010	4026544144
LA Output Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 96-127 of LA_OE. LA Output Enable

LA_OE2																																	
0xF0003017								0xF0003016								0xF0003015								0xF0003014								address	F0003014	4026544148
LA Output Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 64-95 of LA_OE.

LA_OE1																																	
0xF000301B								0xF000301A								0xF0003019								0xF0003018								address	F0003018	4026544152
LA Output Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 32-63 of LA_OE.

LA_OE0																																	
0xF000301F								0xF000301E								0xF000301D								0xF000301C								address	F000301C	4026544156
LA Output Enable																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 0-31 of LA_OE.

LA_IN3																																	
0xF0003023								0xF0003022								0xF0003021								0xF0003020								address	F0003020	4026544160
LA Input(s) Status.																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 96-127 of LA_IN. LA Input(s) Status.

LA_IN2																																	
0xF0003027								0xF0003026								0xF0003025								0xF0003024								address	F0003024	4026544164
LA Input(s) Status.																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 64-95 of LA_IN.

LA_IN1																																	
0xF000302B								0xF000302A								0xF0003029								0xF0003028								address	F0003028	4026544168
LA Input(s) Status.																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

Bits 32-63 of LA_IN.

LA_IN0																																	
0xF000302F								0xF000302E								0xF000302D								0xF000302C								address	F000302C	4026544172
LA Input(s) Status.																																value		

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

Bits 0-31 of LA_IN.

LA_OUT3				
0xF0003033	0xF0003032	0xF0003031	0xF0003030	address
LA Ouptut(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0003030 4026544176

Bits 96-127 of LA_OUT. LA Ouptut(s) Control.

LA_OUT2				
0xF0003037	0xF0003036	0xF0003035	0xF0003034	address
LA Ouptut(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0003034 4026544180

Bits 64-95 of LA_OUT.

LA_OUT1				
0xF000303B	0xF000303A	0xF0003039	0xF0003038	address
LA Ouptut(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0003038 4026544184

Bits 32-63 of LA_OUT.

LA_OUT0				
0xF000303F	0xF000303E	0xF000303D	0xF000303C	address
LA Ouptut(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000303C 4026544188

Bits 0-31 of LA_OUT.

MPRJ_WB_IENA_OUT				
0xF0003803	0xF0003802	0xF0003801	0xF0003800	address
GPIO Output(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0003800 4026546176

GPIO Output(s) Control.

QSPI_ENABLED_OUT				
0xF0004003	0xF0004002	0xF0004001	0xF0004000	address
GPIO Output(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0004000 4026548224

GPIO Output(s) Control.

SPI_ENABLED_OUT				
0xF0004003	0xF0004002	0xF0004001	0xF0004000	address
GPIO Output(s) Control.				value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0004000 4026548224

GPIO Output(s) Control.

SPI_MASTER_CONTROL				
0xF0004803	0xF0004802	0xF0004801	0xF0004800	address
		LENGTH		START value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0004800 4026550272

Field	Name	Description
[0]	START	Write 1 to this register to reset the full SoC (Pulse Reset)
[1]	LENGTH	Write 1 to this register to reset the CPU(s) of the SoC (Hold Reset)

SPI_MASTER_STATUS				
0xF0004807	0xF0004806	0xF0004805	0xF0004804	address
(undefined, reads zero)				DONE value

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0004804 4026550276

Field	Name	Description
[0]	DONE	SPI Xfer Done (when read as 1).

SPI_MASTER_MOSI																																	
0xF000480B								0xF000480A								0xF0004809								0xF0004808								address	F0004808	4026550280
SPI MOSI data																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

SPI MOSI data (MSB-first serialization).

SPI_MASTER_MISO																																	
0xF000480F								0xF000480E								0xF000480D								0xF000480C								address	F000480C	4026550284
SPI MISO data																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

SPI MISO data (MSB-first de-serialization).

SPI_MASTER_CS																																	
0xF0004813								0xF0004812								0xF0004811								0xF0004810								address	F0004810	4026550288
															MOD																SEL	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

SPI CS Chip-Select and Mode

Feild	Name	Description	
		value	description
		0b0..001	Chip 0 selected for SPI Xfer.
[0]	SEL	0b1..000	Chip N selected for SPI Xfer.
		value	description
		0b0	Normal operation (CS handled by Core).
[16]	MODE	0b1	Manual operation (CS handled by User, direct recopy of sel), useful for Bulk transfers.

SPI_MASTER_LOOPBACK																																	
0xF0004817								0xF0004816								0xF0004815								0xF0004814								address	F0004814	4026550292
																															SEL	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

SPI CS Chip-Select and Mode

Feild	Name	Description	
		value	description
		0b0	Normal operation.
[0]	SEL	0b1	Loopback operation (MOSI to MISO).

SPI_MASTER_CLK_DIVIDER																																	
0xF000481B								0xF000481A								0xF0004819								0xF0004818								address	F0004818	4026550296
SPI Clk Divider.																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

SPI Clk Divider.

The Timer is implemented as a countdown timer that can be used in various modes:
Polling : Returns current countdown value to software
One-Shot: Loads itself and stops when value reaches 0
Periodic: (Re-)Loads itself when value reaches 0

TIMER0_LOAD																																	
0xF0005003								0xF0005002								0xF0005001								0xF0005000								address	F0005000	4026552320
Timer Load value																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

Load value when Timer is (re-)enabled. In One-Shot mode, the value written to this register specifies the Timer's duration in clock cycles.

TIMER0_RELOAD																																	
0xF0005007								0xF0005006								0xF0005005								0xF0005004								address	F0005004	4026552324
Timer Reload value																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

Reload value when Timer reaches 0. In Periodic mode, the value written to this register specify the Timer's period in clock cycles.

TIMER0_EN																																	
0xF000500B								0xF000500A								0xF0005009								0xF0005008								address	F0005008	4026552328
Timer Enable flag																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

Enable flag of the Timer. Set this flag to 1 to enable/start the Timer. Set to 0 to disable the Timer.

TIMER0_UPDATE_VALUE																																
0xF000500F								0xF000500E								0xF000500D								0xF000500C								address
Timer Update Value																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000500C 4026552332

Update trigger for the current countdown value. A write to this register latches the current countdown value to value register.

TIMER0_VALUE																																
0xF0005013								0xF0005012								0xF0005011								0xF0005010								address
Timer Value																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005010 4026552336

Latched countdown value. This value is updated by writing to update_value.

TIMER0_EV_STATUS																																
0xF0005017								0xF0005016								0xF0005015								0xF0005014								address
																															ZERO	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005014 4026552340

This register contains the current raw level of the zero event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	ZERO	Level of the zero event

TIMER0_EV_PENDING																																
0xF000501B								0xF000501A								0xF0005019								0xF0005018								address
																															ZERO	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005018 4026552344

When a zero event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	ZERO	1 if a zero event occurred. This Event is triggered on a falling edge.

TIMER0_EV_ENABLE																																
0xF000501F								0xF000501E								0xF000501D								0xF000501C								address
																															ZERO	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000501C 4026552348

This register enables the corresponding zero events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	ZERO	Write a 1 to enable the zero Event

UART_RXTX																																
0xF0005803								0xF0005802								0xF0005801								0xF0005800								address
																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005800 4026554368

It has the data for uart tx and rx, when reading from it it returns the value from RX and when writing to it writes to the TX ?

UART_TXFULL																																
0xF0005807								0xF0005806								0xF0005805								0xF0005804								address
																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005804 4026554372

TX FIFO Full.

UART_RXEMPTY																																
0xF000580B								0xF000580A								0xF0005809								0xF0005808								address
																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0005808 4026554376

RX FIFO Empty.

UART_EV_STATUS																																
0xF000580F								0xF000580E								0xF000580D								0xF000580C								address
(undefined, reads zero)																														RX	TX	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000580C 4026554380

This register contains the current raw level of the rx event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	TX	Level of the tx event
[1]	RX	Level of the rx event

UART_EV_PENDING																																	
0xF0005813								0xF0005812								0xF0005811								0xF0005810								address	F0005810	4026554384
(undefined, reads zero)																													RX	TX	value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

When a rx event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	TX	1 if a tx event occurred. This Event is triggered on a falling edge.
[1]	RX	1 if a rx event occurred. This Event is triggered on a falling edge.

UART_EV_ENABLE																																	
0xF0005817								0xF0005816								0xF0005815								0xF0005814								address	F0005814	4026554388
(undefined, reads zero)																													RX	TX	value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

This register enables the corresponding rx events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	TX	Write a 1 to enable the tx Event
[1]	RX	Write a 1 to enable the rx Event

UART_TXEMPTY																																	
0xF000581B								0xF000581A								0xF0005819								0xF0005818								address	F0005818	4026554392
																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

TX FIFO Empty.

UART_RXFULL																																	
0xF000581F								0xF000581E								0xF000581D								0xF000581C								address	F000581C	4026554396
																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

RX FIFO Full.

UART_ENABLED_OUT																																	
0xF0006003								0xF0006002								0xF0006001								0xF0006000								address	F0006000	4026556416
GPIO Output(s) Control.																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Output(s) Control.

USER_IRQ_0_IN																																	
0xF0006803								0xF0006802								0xF0006801								0xF0006800								address	F0006800	4026558464
GPIO Input(s) Status.																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO Input(s) Status.

USER_IRQ_0_MODE																																	
0xF0006807								0xF0006806								0xF0006805								0xF0006804								address	F0006804	4026558468
GPIO IRQ Mode																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_0_EDGE																																	
0xF000680B								0xF000680A								0xF0006809								0xF0006808								address	F0006808	4026558472
GPIO IRQ Edge																																value		
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit		

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_0_EV_STATUS																																
0xF000680F								0xF000680E								0xF000680D								0xF000680C								address
(undefined, reads zero)																															I0	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000680C 4026558476

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_0_EV_PENDING																																
0xF0006813								0xF0006812								0xF0006811								0xF0006810								address
(undefined, reads zero)																															I0	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0006810 4026558480

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_0_EV_ENABLE																																
0xF0006817								0xF0006816								0xF0006815								0xF0006814								address
(undefined, reads zero)																															I0	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0006814 4026558484

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

USER_IRQ_1_IN																																
0xF0007003								0xF0007002								0xF0007001								0xF0007000								address
GPIO Input(s) Status.																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0007000 4026560512

GPIO Input(s) Status.

USER_IRQ_1_MODE																																
0xF0007007								0xF0007006								0xF0007005								0xF0007004								address
GPIO IRQ Mode																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0007004 4026560516

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_1_EDGE																																
0xF000700B								0xF000700A								0xF0007009								0xF0007008								address
GPIO IRQ Edge																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0007008 4026560520

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_1_EV_STATUS																																
0xF000700F								0xF000700E								0xF000700D								0xF000700C								address
(undefined, reads zero)																															I0	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F000700C 4026560524

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_1_EV_PENDING																																
0xF0007013								0xF0007012								0xF0007011								0xF0007010								address
(undefined, reads zero)																															I0	value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

F0007010 4026560528

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_1_EV_ENABLE

0xF0007017								0xF0007016								0xF0007015								0xF0007014								address	F0007014	4026560532
(undefined, reads zero)																														I0		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

USER_IRQ_2_IN																																
0xF0007803								0xF0007802								0xF0007801								0xF0007800								address	F0007800	4026562560
GPIO Input(s) Status.																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

GPIO Input(s) Status.

USER_IRQ_2_MODE																																
0xF0007807								0xF0007806								0xF0007805								0xF0007804								address	F0007804	4026562564
GPIO IRQ Mode																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_2_EDGE																																
0xF000780B								0xF000780A								0xF0007809								0xF0007808								address	F0007808	4026562568
GPIO IRQ Edge																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_2_EV_STATUS																																
0xF000780F								0xF000780E								0xF000780D								0xF000780C								address	F000780C	4026562572
(undefined, reads zero)																														I0		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_2_EV_PENDING																																
0xF0007813								0xF0007812								0xF0007811								0xF0007810								address	F0007810	4026562576
(undefined, reads zero)																														I0		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_2_EV_ENABLE																																
0xF0007817								0xF0007816								0xF0007815								0xF0007814								address	F0007814	4026562580
(undefined, reads zero)																														I0		value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

USER_IRQ_3_IN																																
0xF0008003								0xF0008002								0xF0008001								0xF0008000								address	F0008000	4026564608
GPIO Input(s) Status.																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

GPIO Input(s) Status.

USER_IRQ_3_MODE																																
0xF0008007								0xF0008006								0xF0008005								0xF0008004								address	F0008004	4026564612
GPIO IRQ Mode																																value
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_3_EDGE																																	
0xF000800B								0xF000800A								0xF0008009								0xF0008008								address	F0008008	4026564616
GPIO IRQ Edge																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_3_EV_STATUS																																	
0xF000800F								0xF000800E								0xF000800D								0xF000800C								address	F000800C	4026564620
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_3_EV_PENDING																																	
0xF0008013								0xF0008012								0xF0008011								0xF0008010								address	F0008010	4026564624
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_3_EV_ENABLE																																	
0xF0008017								0xF0008016								0xF0008015								0xF0008014								address	F0008014	4026564628
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

USER_IRQ_4_IN																																	
0xF0008803								0xF0008802								0xF0008801								0xF0008800								address	F0008800	4026566656
GPIO Input(s) Status.																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO Input(s) Status.

USER_IRQ_4_MODE																																	
0xF0008807								0xF0008806								0xF0008805								0xF0008804								address	F0008804	4026566660
GPIO IRQ Mode																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_4_EDGE																																	
0xF000880B								0xF000880A								0xF0008809								0xF0008808								address	F0008808	4026566664
GPIO IRQ Edge																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_4_EV_STATUS																																	
0xF000880F								0xF000880E								0xF000880D								0xF000880C								address	F000880C	4026566668
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_4_EV_PENDING																																	
0xF0008813								0xF0008812								0xF0008811								0xF0008810								address	F0008810	4026566672
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_4_EV_ENABLE																																	
0xF0008817								0xF0008816								0xF0008815								0xF0008814								address	F0008814	4026566676
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

USER_IRQ_5_IN																																	
0xF0009003								0xF0009002								0xF0009001								0xF0009000								address	F0009000	4026568704
GPIO Input(s) Status.																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO Input(s) Status.

USER_IRQ_5_MODE																																	
0xF0009007								0xF0009006								0xF0009005								0xF0009004								address	F0009004	4026568708
GPIO IRQ Mode																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO IRQ Mode: 0: Edge, 1: Change.

USER_IRQ_5_EDGE																																	
0xF000900B								0xF000900A								0xF0009009								0xF0009008								address	F0009008	4026568712
GPIO IRQ Edge																																value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

GPIO IRQ Edge (when in Edge mode): 0: Rising Edge, 1: Falling Edge.

USER_IRQ_5_EV_STATUS																																	
0xF000900F								0xF000900E								0xF000900D								0xF000900C								address	F000900C	4026568716
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register contains the current raw level of the i0 event trigger. Writes to this register have no effect.

Field	Name	Description
[0]	I0	Level of the i0 event

USER_IRQ_5_EV_PENDING																																	
0xF0009013								0xF0009012								0xF0009011								0xF0009010								address	F0009010	4026568720
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

When a i0 event occurs, the corresponding bit will be set in this register. To clear the Event, set the corresponding bit in this register.

Field	Name	Description
[0]	I0	1 if a i0 event occurred. This Event is triggered on a falling edge.

USER_IRQ_5_EV_ENABLE																																	
0xF0009017								0xF0009016								0xF0009015								0xF0009014								address	F0009014	4026568724
(undefined, reads zero)																															I0	value	
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	bit	

This register enables the corresponding i0 events. Write a 0 to this register to disable individual events.

Field	Name	Description
[0]	I0	Write a 1 to enable the i0 Event

Caravel Address Space Overview

Starting Address	Ending Address	Length	Acronym	Register Region / Memory Name	Description
0x00000000	0x000003ff	0x00000400	dff2	D Flip Flop Memory	1kx8b or 512x16b or 256X32b
0x00000400	0x000005ff	0x00000200	dff2	D Flip Flop Memory 2	512x8b or 256x16b 128X32b
0x10000000	0x10ffffff	0x01000000	flash	External Flash Memory Interface	16M Maximum
0x30000000	0x3fffffff	0x10000000	mprj	User Project Register Space	Wishbone interface to user project area
0x26000000	0x262fffff	0x00300000	hk	HouseKeeping Register Space	
0xf0000000	0xf0010ffff	0x00010000	csr	SoC Control Register Space	