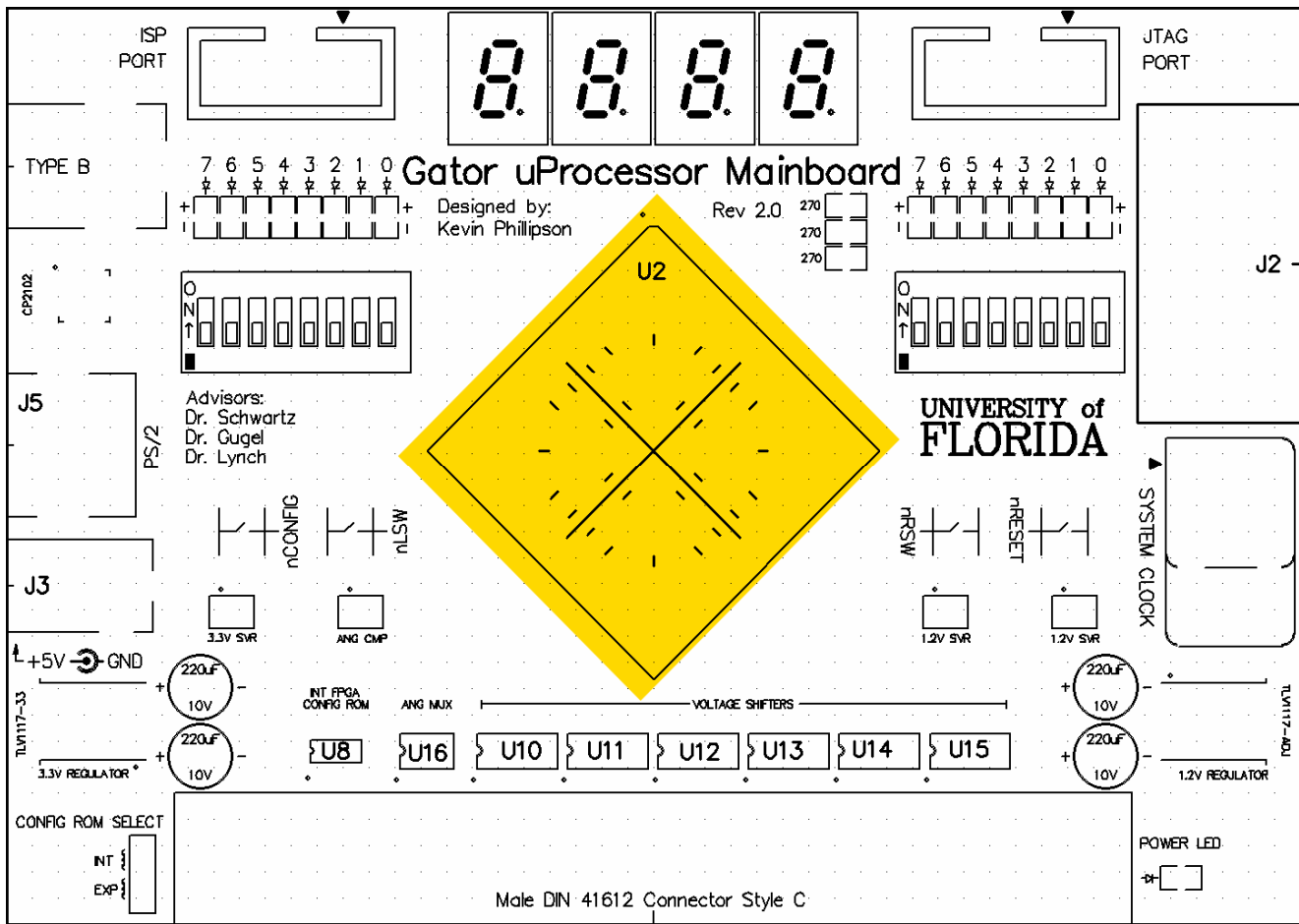


Altera Cyclone II FPGA



The Cyclone II EP2C20Q240C8 (part U2) is used on the Gator uProcessor Mainboard. The pins used are described in Table 1 and 2.

Table 1a: Cyclone II EP2C20Q240C8 pins (part 1) in function order.

Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function
222	VGA_VSYNC	IO	177	R7SEG0_A	IO	52	L7SEG1_A	IO
230	VGA_RED	IO	92	PS2_DATA	CLK14	37	L7SEG0_P	IO
223	VGA_HSYNC	IO	94	PS2_CLK	CLK13	42	L7SEG0_G	IO
228	VGA_GREEN	IO	155	PB7	IO	44	L7SEG0_F	IO
226	VGA_BLUE	IO	156	PB6	IO	46	L7SEG0_E	IO
91	USB_TXD	CLK15	157	PB5	IO	47	L7SEG0_D	IO
90	USB_RXD	IO	159	PB4	IO	38	L7SEG0_C	IO
58	T7	IO	161	PB3	IO	39	L7SEG0_B	IO
64	T6	IO / DEV_OE	162	PB2	IO	41	L7SEG0_A	IO
65	T5	IO	164	PB1	IO	73	CS7	IO
66	T4	IO	165	PB0	IO	78	CS6	IO
67	T3	IO	166	PA7	IO	79	CS5	IO
68	T2	IO	167	PA6	IO	80	CS4	IO
70	T1	IO	168	PA5	IO	84	CS3	IO
72	T0	IO	170	PA4	IO	86	CS2	IO
151	SYS_CLK_3.3V	CLK7	171	PA3	IO	87	CS1	IO
231	RLED7	IO	173	PA2	IO	88	CS0	IO
232	RLED6	IO	174	PA1	IO	119	AS	IO
233	RLED5	IO	175	PA0	IO	100	ADC_SEL2	IO
234	RLED4	IO	117	nWR	IO	97	ADC_SEL1	IO
235	RLED3	IO	154	nRSW	CLK4	96	ADC_SEL0	IO
236	RLED2	IO	152	nRESET	CLK6	105	ADC_DAC7	IO
237	RLED1	IO	118	nRD	IO	106	ADC_DAC6	IO
238	RLED0	IO / DEV_CLRn	153	nLSW	CLK5	109	ADC_DAC5	IO
208	RDIP_SW7	IO	6	LLED7	IO / CRC_ERROR	110	ADC_DAC4	IO
209	RDIP_SW6	CLK8	7	LLED6	IO / CLKUSR	111	ADC_DAC3	IO
210	RDIP_SW5	CLK9	8	LLED5	IO	113	ADC_DAC2	IO
212	RDIP_SW4	CLK10	9	LLED4	IO	114	ADC_DAC1	IO
213	RDIP_SW3	CLK11	11	LLED3	IO	116	ADC_DAC0	IO
214	RDIP_SW2	IO	13	LLED2	IO	95	ADC_CMP	CLK12
216	RDIP_SW1	IO	14	LLED1	IO	132	A9	IO
218	RDIP_SW0	IO	15	LLED0	IO	134	A8	IO
191	R7SEG1_P	IO	16	LDIP_SW7	IO	135	A7_D7	IO
197	R7SEG1_G	IO	18	LDIP_SW6	IO	136	A6_D6	IO
199	R7SEG1_F	IO	20	LDIP_SW5	IO	137	A5_D5	IO
200	R7SEG1_E	IO	21	LDIP_SW4	IO	139	A4_D4	IO
203	R7SEG1_D	IO	30	LDIP_SW3	CLK0	140	A3_D3	IO
192	R7SEG1_C	IO	31	LDIP_SW2	CLK1	141	A2_D2	IO
194	R7SEG1_B	IO	34	LDIP_SW1	CLK2	125	A15	IO
195	R7SEG1_A	IO	35	LDIP_SW0	CLK3	126	A14	IO / INIT_DONE
185	R7SEG0_P	IO	49	L7SEG1_P	IO	127	A13	IO / nCEO
186	R7SEG0_G	IO	57	L7SEG1_G	IO	128	A12	IO
187	R7SEG0_F	IO	56	L7SEG1_F	IO	130	A11	IO
188	R7SEG0_E	IO	55	L7SEG1_E	IO	131	A10	IO
189	R7SEG0_D	IO	54	L7SEG1_D	IO	149	A1_D1	IO
184	R7SEG0_C	IO	50	L7SEG1_C	IO	150	A0_D0	IO
178	R7SEG0_B	IO	51	L7SEG1_B	IO	17		GND
177	R7SEG0_A	IO	52	L7SEG1_A	IO	129		VCCIO6

Table 1b: Cyclone II EP2C20Q240C8 pins (part 2) in function order.

Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function
129		VCCIO6	89		GND	43		GND
142		VCCIO6	85		GND	40		VCCINT
138		GND	240		VCCA_PLL3	59		GND_PLL1
25		TDO	206		GND	53		VCCIO1
24		TMS	227		GND	36		VCCIO1
133		GND	225		GND			
123		VCCD_PLL4	205		GND			
169		GND	207		VCCIO4			
158		VCCINT	201		VCCINT			
122		GND_PLL4	181		GND_PLL2			
121		VCCA_PLL4	220		VCCINT			
124		GND_PLL4	219		VCCIO3			
4		ASDO	224		VCCINT			
3		GND_PLL3	180		VCCD_PLL2			
32		GND	229		VCCIO3			
12		GND	179		GND_PLL2			
2		VCCD_PLL3	193		GND			
1		GND_PLL3	196		VCCINT			
28		VCCINT	176		VCCIO5			
23		TCK	172		GND			
22		TDI	239		GNDA_PLL3			
27		DATA0	211		VCCINT			
26		DCLK	202		GND			
29		nCE	204		VCCINT			
148		VCCINT	198		GND			
120		GNDA_PLL4	215		GND			
108		VCCINT	190		VCCIO4			
107		GND	217		GND			
77		VCCIO8	76		VCCINT			
83		VCCIO8	75		GND			
82		VCCINT	62		VCCA_PLL1			
101		VCCIO7	143		nSTATUS			
104		VCCINT	74		GND			
103		GND	71		GND			
115		VCCIO7	19		VCCIO2			
112		GND	10		VCCIO2			
102		GND	5		nCSO			
144		CONF_DONE	61		GND_PLL1			
147		MSEL0	69		VCCIO8			
146		MSEL1	63		GNDA_PLL1			
163		GND	60		VCCD_PLL1			
160		VCCIO5	48		GND			
145		GND	45		GND			
98		GND	182		VCCA_PLL2			
93		VCCINT	221		GND			
81		GND	183		GNDA_PLL2			
99		VCCINT	33		nCONFIG			
89		GND	43		GND			

Table 2a: Cyclone II EP2C20Q240C8 pins (part 1) in pin order.

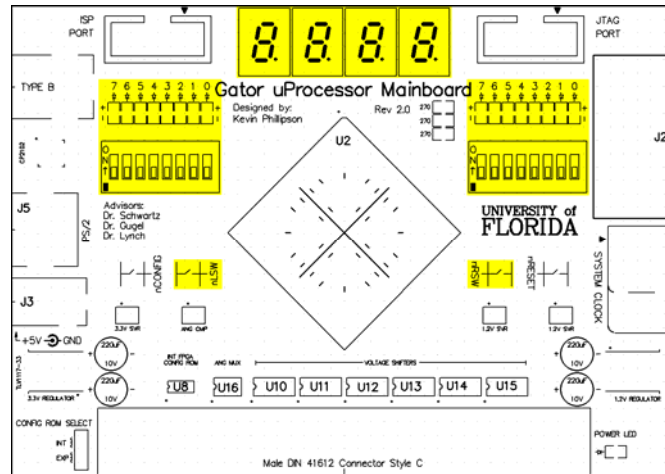
Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function
1		GND_PLL3	48		GND	95	ADC_CMP	CLK12
2		VCCD_PLL3	49	L7SEG1_P	IO	96	ADC_SEL0	IO
3		GND_PLL3	50	L7SEG1_C	IO	97	ADC_SEL1	IO
4		ASDO	51	L7SEG1_B	IO	98		GND
5		nCSO	52	L7SEG1_A	IO	99		VCCINT
6	LLED7	IO / CRC_ERROR	53		VCCIO1	100	ADC_SEL2	IO
7	LLED6	IO / CLKUSR	54	L7SEG1_D	IO	101		VCCIO7
8	LLED5	IO	55	L7SEG1_E	IO	102		GND
9	LLED4	IO	56	L7SEG1_F	IO	103		GND
10		VCCIO2	57	L7SEG1_G	IO	104		VCCINT
11	LLED3	IO	58	T7	IO	105	ADC_DAC7	IO
12		GND	59		GND_PLL1	106	ADC_DAC6	IO
13	LLED2	IO	60		VCCD_PLL1	107		GND
14	LLED1	IO	61		GND_PLL1	108		VCCINT
15	LLED0	IO	62		VCCA_PLL1	109	ADC_DAC5	IO
16	LDIP_SW7	IO	63		GNDA_PLL1	110	ADC_DAC4	IO
17		GND	64	T6	IO / DEV_OE	111	ADC_DAC3	IO
18	LDIP_SW6	IO	65	T5	IO	112		GND
19		VCCIO2	66	T4	IO	113	ADC_DAC2	IO
20	LDIP_SW5	IO	67	T3	IO	114	ADC_DAC1	IO
21	LDIP_SW4	IO	68	T2	IO	115		VCCIO7
22		TDI	69		VCCIO8	116	ADC_DAC0	IO
23		TCK	70	T1	IO	117	nWR	IO
24		TMS	71		GND	118	nRD	IO
25		TDO	72	T0	IO	119	AS	IO
26		DCLK	73	CS7	IO	120		GNDA_PLL4
27		DATA0	74		GND	121		VCCA_PLL4
28		VCCINT	75		GND	122		GND_PLL4
29		nCE	76		VCCINT	123		VCCD_PLL4
30	LDIP_SW3	CLK0	77		VCCIO8	124		GND_PLL4
31	LDIP_SW2	CLK1	78	CS6	IO	125	A15	IO
32		GND	79	CS5	IO	126	A14	IO / INIT_DONE
33		nCONFIG	80	CS4	IO	127	A13	IO / nCEO
34	LDIP_SW1	CLK2	81		GND	128	A12	IO
35	LDIP_SW0	CLK3	82		VCCINT	129		VCCIO6
36		VCCIO1	83		VCCIO8	130	A11	IO
37	L7SEG0_P	IO	84	CS3	IO	131	A10	IO
38	L7SEG0_C	IO	85		GND	132	A9	IO
39	L7SEG0_B	IO	86	CS2	IO	133		GND
40		VCCINT	87	CS1	IO	134	A8	IO
41	L7SEG0_A	IO	88	CS0	IO	135	A7_D7	IO
42	L7SEG0_G	IO	89		GND	136	A6_D6	IO
43		GND	90	USB_RXD	IO	137	A5_D5	IO
44	L7SEG0_F	IO	91	USB_TXD	CLK15	138		GND
45		GND	92	PS2_DATA	CLK14	139	A4_D4	IO
46	L7SEG0_E	IO	93		VCCINT	140	A3_D3	IO
47	L7SEG0_D	IO	94	PS2_CLK	CLK13	141	A2_D2	IO
48		GND	95	ADC_CMP	CLK12	142		VCCIO6

Table 2b: Cyclone II EP2C20Q240C8 pins (part 2) in pin order.

Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function	Pin	Signal Name	Pin Name / Function
142		VCCIO6	189	R7SEG0_D	IO	236	RLED2	IO
143		nSTATUS	190		VCCIO4	237	RLED1	IO
144		CONF_DONE	191	R7SEG1_P	IO	238	RLED0	IO / DEV_CLRn
145		GND	192	R7SEG1_C	IO	239		GNDA_PLL3
146		MSEL1	193		GND	240		VCCA_PLL3
147		MSEL0	194	R7SEG1_B	IO			
148		VCCINT	195	R7SEG1_A	IO			
149	A1_D1	IO	196		VCCINT			
150	A0_D0	IO	197	R7SEG1_G	IO			
151	SYS_CLK_3.3V	CLK7	198		GND			
152	nRESET	CLK6	199	R7SEG1_F	IO			
153	nLSW	CLK5	200	R7SEG1_E	IO			
154	nRSW	CLK4	201		VCCINT			
155	PB7	IO	202		GND			
156	PB6	IO	203	R7SEG1_D	IO			
157	PB5	IO	204		VCCINT			
158		VCCINT	205		GND			
159	PB4	IO	206		GND			
160		VCCIO5	207		VCCIO4			
161	PB3	IO	208	RDIP_SW7	IO			
162	PB2	IO	209	RDIP_SW6	CLK8			
163		GND	210	RDIP_SW5	CLK9			
164	PB1	IO	211		VCCINT			
165	PB0	IO	212	RDIP_SW4	CLK10			
166	PA7	IO	213	RDIP_SW3	CLK11			
167	PA6	IO	214	RDIP_SW2	IO			
168	PA5	IO	215		GND			
169		GND	216	RDIP_SW1	IO			
170	PA4	IO	217		GND			
171	PA3	IO	218	RDIP_SW0	IO			
172		GND	219		VCCIO3			
173	PA2	IO	220		VCCINT			
174	PA1	IO	221		GND			
175	PA0	IO	222	VGA_VSYNC	IO			
176		VCCIO5	223	VGA_HSYNC	IO			
177	R7SEG0_A	IO	224		VCCINT			
178	R7SEG0_B	IO	225		GND			
179		GND_PLL2	226	VGA_BLUE	IO			
180		VCCD_PLL2	227		GND			
181		GND_PLL2	228	VGA_GREEN	IO			
182		VCCA_PLL2	229		VCCIO3			
183		GNDA_PLL2	230	VGA_RED	IO			
184	R7SEG0_C	IO	231	RLED7	IO			
185	R7SEG0_P	IO	232	RLED6	IO			
186	R7SEG0_G	IO	233	RLED5	IO			
187	R7SEG0_F	IO	234	RLED4	IO			
188	R7SEG0_E	IO	235	RLED3	IO			
189	R7SEG0_D	IO	236	RLED2	IO			

The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. The are _____

LEDs & Switches



The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. The are _____

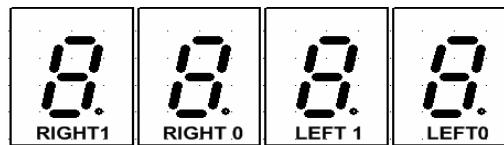
Left LED Bank	
FPGA Pin #	LED Signal
6	LLED7
7	LLED6
8	LLED5
9	LLED4
11	LLED3
13	LLED2
14	LLED1
15	LLED0

Right LED Bank	
FPGA Pin #	LED Signal
231	RLED7
232	RLED6
233	RLED5
234	RLED4
235	RLED3
236	RLED2
237	RLED1
238	RLED0

Left DIP Switch Bank		
FPGA Pin #	DIP_SW Signal	DIP_SW #
16	LDIP_SW7	1
18	LDIP_SW6	2
20	LDIP_SW5	3
21	LDIP_SW4	4
30	LDIP_SW3	5
31	LDIP_SW2	6
34	LDIP_SW1	7
35	LDIP_SW0	8

Right DIP Switch Bank		
FPGA Pin #	DIP_SW Signal	DIP_SW #
208	RDIP_SW7	1
209	RDIP_SW6	2
210	RDIP_SW5	3
212	RDIP_SW4	4
213	RDIP_SW3	5
214	RDIP_SW2	6
216	RDIP_SW1	7
218	RDIP_SW0	8

LEDs & Switches (continued)



Left Seven Segment Digit 1	
FPGA Pin #	7SEG Signal
49	L7SEG1_P
57	L7SEG1_G
56	L7SEG1_F
55	L7SEG1_E
54	L7SEG1_D
50	L7SEG1_C
51	L7SEG1_B
52	L7SEG1_A

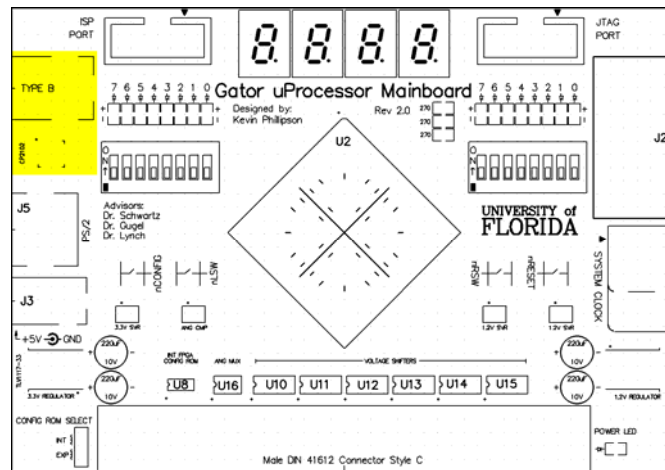
Right Seven Segment Digit 1	
FPGA Pin #	7SEG Signal
191	R7SEG1_P
197	R7SEG1_G
199	R7SEG1_F
200	R7SEG1_E
203	R7SEG1_D
192	R7SEG1_C
194	R7SEG1_B
195	R7SEG1_A

Left Seven Segment Digit 0	
FPGA Pin #	7SEG Signal
37	L7SEG0_P
42	L7SEG0_G
44	L7SEG0_F
46	L7SEG0_E
47	L7SEG0_D
38	L7SEG0_C
39	L7SEG0_B
41	L7SEG0_A

Right Seven Segment Digit 0	
FPGA Pin #	7SEG Signal
185	R7SEG0_P
186	R7SEG0_G
187	R7SEG0_F
188	R7SEG0_E
189	R7SEG0_D
184	R7SEG0_C
178	R7SEG0_B
177	R7SEG0_A

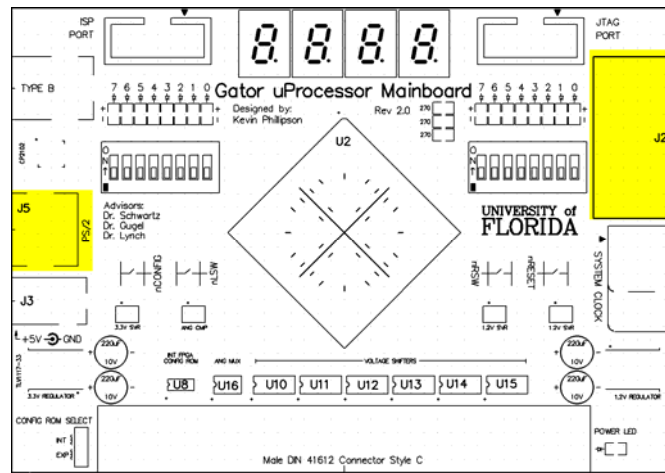
The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. The are _____

USB to UART Interface



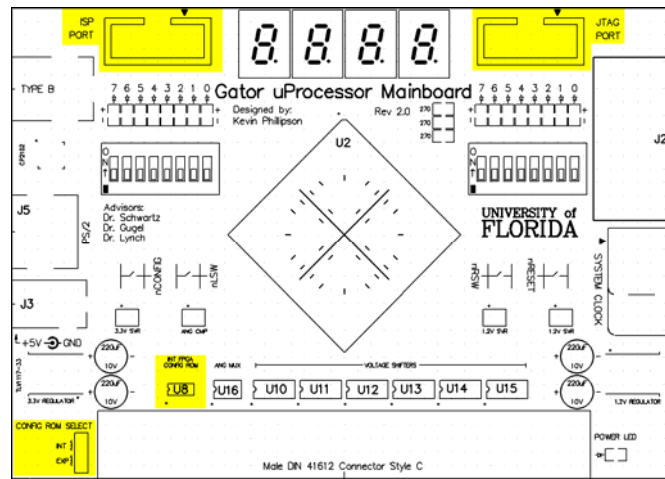
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VGA & PS/2 Keyboard Interface



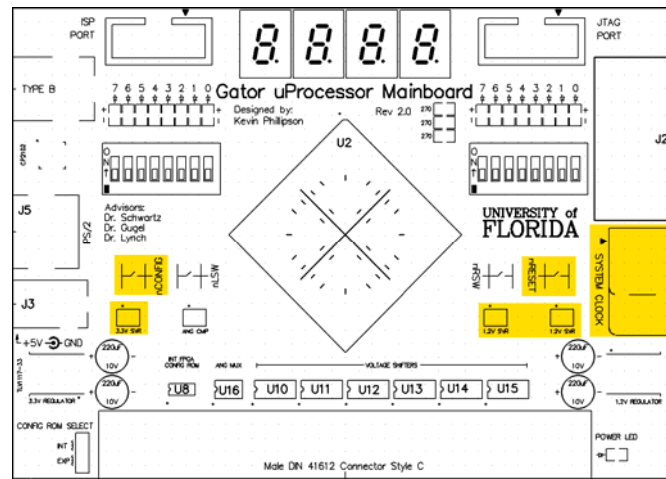
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ISP & JTAG Interface



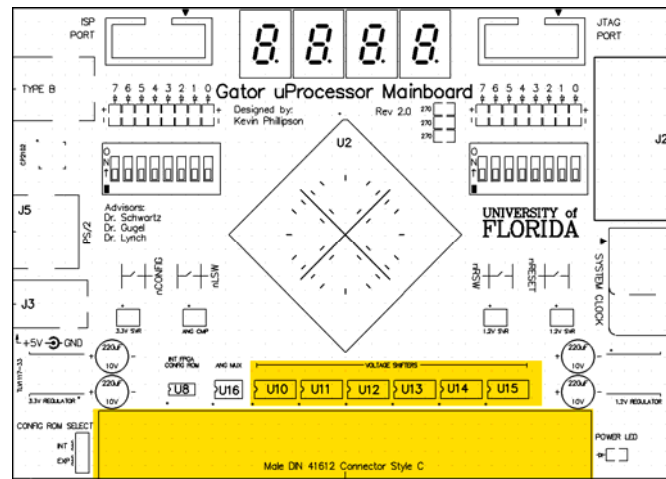
The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use.

Clock & Reset System



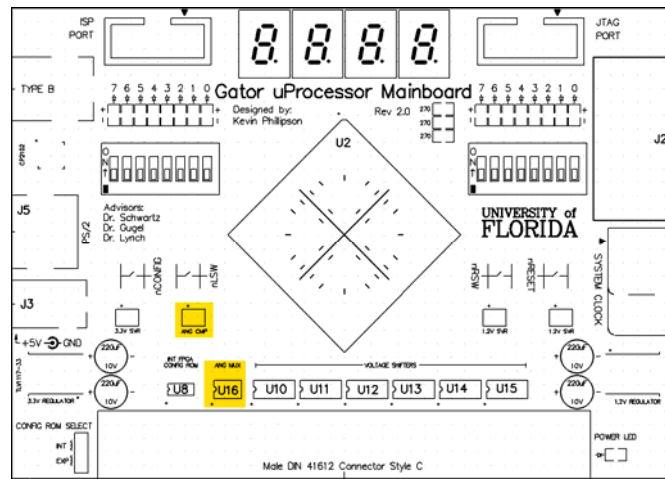
The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. _____

Power System



The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. _____

Analog to Digital Converter



The Gator uProcessor Mainboard provides 16 DIP switches, 2 push-buttons, 16 LEDs and 4 seven-segment displays for general use. _____