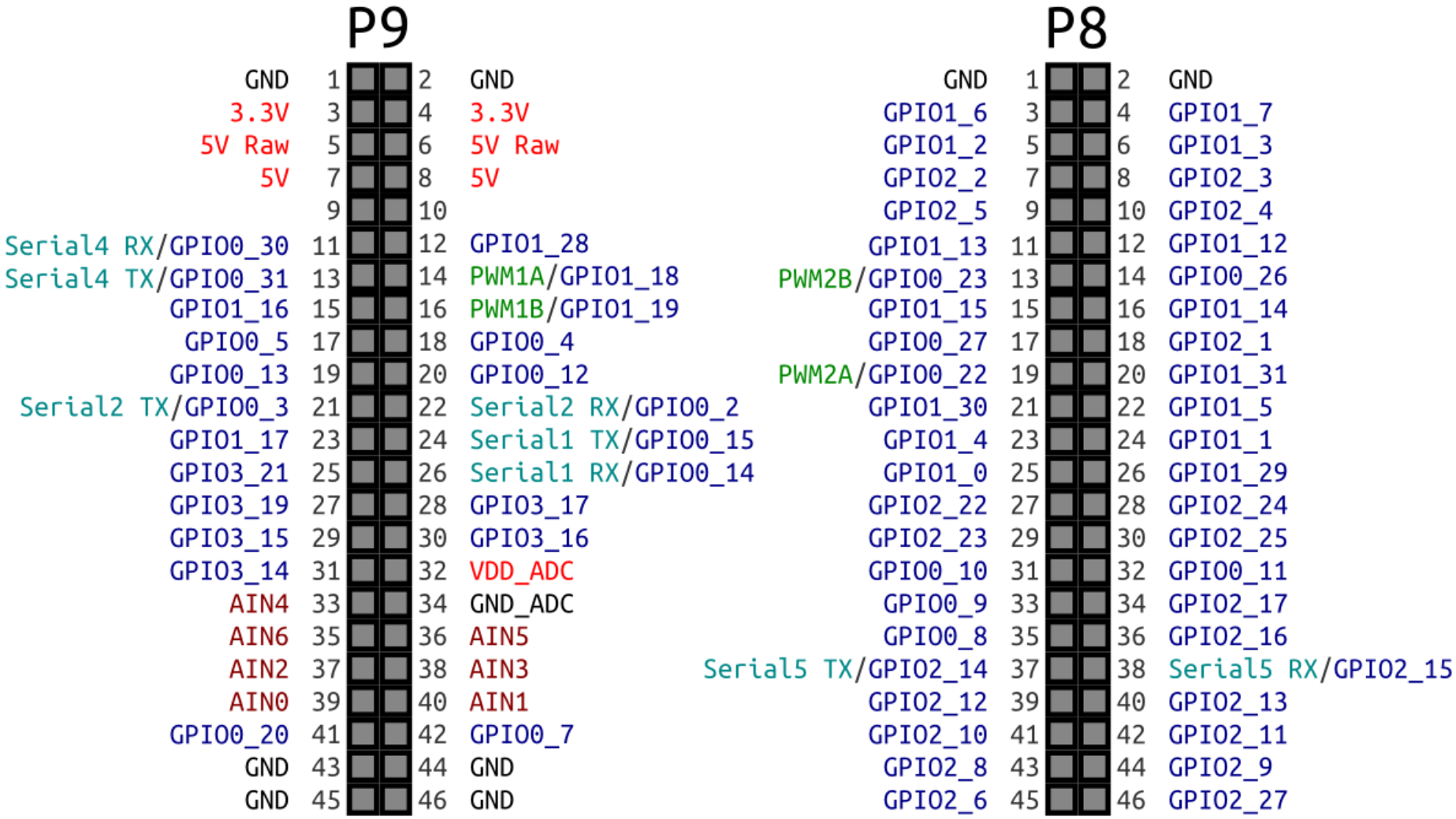
Beaglebone Black pinout



Beaglebone Black P8 Header

Head_pin	$PINS	ADDR/OFFSET	GPIO NO.	Name	Mode7	Mode6	Mode5	Mode4	Mode3	Mode2	Mode1	Mode0	PIN	Notes
P8_01				DGND										Ground
P8_02				DGND										Ground
P8_03	6	0x818/018	38	GPIO1_6	gpio1[6]						mmc1_dat6	gpmc_ad6	R9	Used on Board (Group: pinmux_emmc2_pins)
P8_04	7	0x81c/01c	39	GPIO1_7	gpio1[7]						mmc1_dat7	gpmc_ad7	T9	Used on Board (Group: pinmux_emmc2_pins)
P8_05	2	0x808/008	34	GPIO1_2	gpio1[2]						mmc1_dat2	gpmc_ad2	R8	Used on Board (Group: pinmux_emmc2_pins)
P8_06	3	0x80c/00c	35	GPIO1_3	gpio1[3]						mmc1_dat3	gpmc_ad3	T8	Used on Board (Group: pinmux_emmc2_pins)
P8_07	36	0x890/090	66	TIMER4	gpio2[2]					timer4		gpmc_advn_ale	R7	
P8_08	37	0x894/094	67	TIMER7	gpio2[3]					timer7		gpmc_oen_ren	T7	
P8_09	39	0x89c/09c	69	TIMER5	gpio2[5]					timer5		gpmc_be0n_cle	T6	
P8_10	38	0x898/098	68	TIMER6	gpio2[4]					timer6		gpmc_wen	U6	
P8_11	13	0x834/034	45	GPIO1_13	gpio1[13]			eQEP2B_in	mmc2_dat1	mmc1_dat5	lcd_data18	gpmc_ad13	R12	
P8_12	12	0x830/030	44	GPIO1_12	gpio1[12]			EQEP2A_IN	MMC2_DAT0	MMC1_DAT4	LCD_DATA19	GPMC_AD12	T12	
P8_13	9	0x824/024	23	EHRPWM2B	gpio0[23]			ehrpwm2B	mmc2_dat5	mmc1_dat1	lcd_data22	gpmc_ad9	T10	
P8_14	10	0x828/028	26	GPIO0_26	gpio0[26]			ehrpwm2_tripzone_in	mmc2_dat6	mmc1_dat2	lcd_data21	gpmc_ad10	T11	
P8_15	15	0x83c/03c	47	GPIO1_15	gpio1[15]			eQEP2_strobe	mmc2_dat3	mmc1_dat7	lcd_data16	gpmc_ad15	U13	
P8_16	14	0x838/038	46	GPIO1_14	gpio1[14]			eQEP2_index	mmc2_dat2	mmc1_dat6	lcd_data17	gpmc_ad14	V13	
P8_17	11	0x82c/02c	27	GPIO0_27	gpio0[27]			ehrpwm0_synco	mmc2_dat7	mmc1_dat3	lcd_data20	gpmc_ad11	U12	
P8_18	35	0x88c/08c	65	GPIO2_1	gpio2[1]	mcasp0_fsr			mmc2_clk	gpmc_wait1	lcd_memory_clk	gpmc_clk_mux0	V12	
P8_19	8	0x820/020	22	EHRPWM2A	gpio0[22]			ehrpwm2A	mmc2_dat4	mmc1_dat0	lcd_data23	gpmc_ad8	U10	
P8_20	33	0x884/084	63	GPIO1_31	gpio1[31]					mmc1_cmd	gpmc_be1n	gpmc_csn2	V9	Used on Board (Group: pinmux_emmc2_pins)
P8_21	32	0x880/080	62	GPIO1_30	gpio1[30]					mmc1_clk	gpmc_clk	gpmc_csn1	U9	Used on Board (Group: pinmux_emmc2_pins)
P8_22	5	0x814/014	37	GPIO1_5	gpio1[5]						mmc1_dat5	gpmc_ad5	V8	Used on Board (Group: pinmux_emmc2_pins)
P8_23	4	0x810/010	36	GPIO1_4	gpio1[4]						mmc1_dat4	gpmc_ad4	U8	Used on Board (Group: pinmux_emmc2_pins)
P8_24	1	0x804/004	33	GPIO1_1	gpio1[1]						mmc1_dat1	gpmc_ad1	V7	Used on Board (Group: pinmux_emmc2_pins)
P8_25	0	0x800/000	32	GPIO1_0	gpio1[0]						mmc1_dat0	gpmc_ad0	U7	Used on Board (Group: pinmux_emmc2_pins)
P8_26	31	0x87c/07c	61	GPIO1_29	gpio1[29]							gpmc_csn0	V6	
P8_27	56	0x8e0/0e0	86	GPIO2_22	gpio2[22]						gpmc_a8	lcd_vsync	U5	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_28	58	0x8e8/0e8	88	GPIO2_24	gpio2[24]						gpmc_a10	lcd_pclk	V5	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_29	57	0x8e4/0e4	87	GPIO2_23	gpio2[23]						gpmc_a9	lcd_hsync	R5	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_30	59	0x8ec/0ec	89	GPIO2_25	gpio2[25]						gpmc_a11	lcd_ac_bias_en	R6	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_31	54	0x8d8/0d8	10	UART5_CTSN	gpio0[10]	uart5_ctsn		uart5_rxd	mcasp0_axr1	eQEP1_index	gpmc_a18	lcd_data14	V4	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_32	55	0x8dc/0dc	11	UART5_RTSN	gpio0[11]	uart5_rtsn		mcasp0_axr3	mcasp0_ahclkx	eQEP1_strobe	gpmc_a19	lcd_data15	T5	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_33	53	0x8d4/0d4	9	UART4_RTSN	gpio0[9]	uart4_rtsn		mcasp0_axr3	mcasp0_fsr	eQEP1B_in	gpmc_a17	lcd_data13	V3	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_34	51	0x8cc/0cc	81	UART3_RTSN	gpio2[17]	uart3_rtsn		mcasp0_axr2	mcasp0_ahclkr	ehrpwm1B	gpmc_a15	lcd_data11	U4	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_35	52	0x8d0/0d0	8	UART4_CTSN	gpio0[8]	uart4_ctsn		mcasp0_axr2	mcasp0_aclkr	eQEP1A_in	gpmc_a16	lcd_data12	V2	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_36	50	0x8c8/0c8	80	UART3_CTSN	gpio2[16]	uart3_ctsn			mcasp0_axr0	ehrpwm1A	gpmc_a14	lcd_data10	U3	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_37	48	0x8c0/0c0	78	UART5_TXD	gpio2[14]	uart2_ctsn		uart5_txd	mcasp0_aclkx	ehrpwm1_tripzone_in	gpmc_a12	lcd_data8	U1	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_38	49	0x8c4/0c4	79	UART5_RXD	gpio2[15]	uart2_rtsn		uart5_rxd	mcasp0_fsx	ehrpwm0_synco	gpmc_a13	lcd_data9	U2	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_39	46	0x8b8/0b8	76	GPIO2_12	gpio2[12]				eQEP2_index		gpmc_a6	lcd_data6	T3	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_40	47	0x8bc/0bc	77	GPIO2_13	gpio2[13]			pr1_edio_data_out7	eQEP2_strobe		gpmc_a7	lcd_data7	T4	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_41	44	0x8b0/0b0	74	GPIO2_10	gpio2[10]				eQEP2A_in		gpmc_a4	lcd_data4	T1	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_42	45	0x8b4/0b4	75	GPIO2_11	gpio2[11]				eQEP2B_in		gpmc_a5	lcd_data5	T2	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_43	42	0x8a8/0a8	72	GPIO2_8	gpio2[8]				ehrpwm2_tripzone_in		gpmc_a2	lcd_data2	R3	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_44	43	0x8ac/0ac	73	GPIO2_9	gpio2[9]				ehrpwm0_synco		gpmc_a3	lcd_data3	R4	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_45	40	0x8a0/0a0	70	GPIO2_6	gpio2[6]				ehrpwm2A		gpmc_a0	lcd_data0	R1	Allocated (Group: nxp_hdmi_bonelt_pins)
P8_46	41	0x8a4/0a4	71	GPIO2_7	gpio2[7]				ehrpwm2B		gpmc_a1	lcd_data1	R2	Allocated (Group: nxp_hdmi_bonelt_pins)
P9 Header	cat $PINS	ADDR +	GPIO NO.	Name	Mode 7	Mode 6	Mode 5	Mode 4	Mode 3	Mode 2	Mode 1	Mode 0	CPU	Updates Available at www.derekmolloy.ie
		44e10000	(Mode 7)										PIN	
		Offset from:												
		44e10800												

User LEDs				
USR0	21	0x854/054	53	GPIO1_21
USR1	22	0x858/058	86	GPIO2_22
USR2	23	0x85c/05c	87	GPIO2_23
US3	24	0x860/060	88	GPIO2_24

GPIO Settings				
Bit 6	Bit 5	Bit 4	Bit 3	Bit 2,1,0
Slew Control	Receiver Active	Pullup/Pulldown	Enable Pullup/down	Mux Mode
0 Fast	0 Disable	0 Pulldown select	0 Enabled	000 Mode 0 to
1 Slow	1 Enable	1 Pullup select	1 Disabled	111 Mode 7

e.g. OUTPUT GPIO(mode7) 0x07 pulldown, 0x17 pullup, 0x?f no pullup/down

e.g. INPUT GPIO(mode7) 0x27 pulldown, 0x37 pullup, 0x?f no pullup/down

Beaglebone Black P9 Header

Head_pin	$PINS	ADDR/OFFSET	Name	GPIO NO.	Mode7	Mode6	Mode5	Mode4	Mode3	Mode2	Mode1	Mode0	PIN	Notes
P9_01			GND											Ground
P9_02			GND											Ground
P9_03			DC_3.3V											250mA Max Current
P9_04			DC_3.3V											250mA Max Current
P9_05			VDD_5V											1A Max Current (only if DC jack powered)
P9_06			VDD_5V											1A Max Current (only if DC jack powered)
P9_07			SYS_5V											250mA Max Current
P9_08			SYS_5V											250mA Max Current
P9_09			PWR_BUT											Has a 5V Level (pulled up by TPS65217C)
P9_10			SYS_RESETn									RESET_OUT	A10	
P9_11	28	0x870/070	UART4_RXD	30	gpio0[30]	uart4_rxd_mux2		mmc1_sdcd	rmii2_crs_dv	gpmc_csn4	mii2_crs	gpmc_wait0	T17	NB: GPIOs limit current to 4-6mA output
P9_12	30	0x878/078	GPIO1_28	60	gpio1[28]	mcasp0_aclkr_mux3		gpmc_dir	mmc2_dat3	gpmc_csn6	mii2_col	gpmc_be1n	U18	and approx. 8mA on input.
P9_13	29	0x874/074	UART4_TXD	31	gpio0[31]	uart4_txd_mux2		mmc2_sdcd	rmii2_rxerr	gpmc_csn5	mii2_rxerr	gpmc_wpn	U17	
P9_14	18	0x848/048	EHRPWM1A	50	gpio1[18]	ehrpwm1A_mux1		gpmc_a18	mmc2_dat1	rgmii2_td3	mii2_txd3	gpmc_a2	U14	
P9_15	16	0x840/040	GPIO1_16	48	gpio1[16]	ehrpwm1_tripzone_input		gpmc_a16	mii2_txen	rmii2_tctl	gmii2_txen	gpmc_a0	R13	
P9_16	19	0x84c/04c	EHRPWM1B	51	gpio1[19]	ehrpwm1B_mux1		gpmc_a19	mmc2_dat2	rgmii2_td2	mii2_txd2	gpmc_a3	T14	
P9_17	87	0x95c/15c	I2C1_SCL	5	gpio0[5]				ehrpwm0_synci	I2C1_SCL	mmc2_sdwp	spi0_cs0	A16	
P9_18	86	0x958/158	I2C1_SDA	4	gpio0[4]				ehrpwm0_tripzone	I2C1_SDA	mmc1_sdwp	spi0_d1	B16	
P9_19	95	0x97c/17c	I2C2_SCL	13	gpio0[13]			spi1_cs1	I2C2_SCL	dcan0_rx	timer5	uart1_rtsn	D17	Allocated (Group: pinmux_i2c2_pins)
P9_20	94	0x978/178	I2C2_SDA	12	gpio0[12]			spi1_cs0	I2C2_SDA	dcan0_tx	timer6	uart1_ctsn	D18	Allocated (Group: pinmux_i2c2_pins)
P9_21	85	0x954/154	UART2_TXD	3	gpio0[3]	EMU3_mux1			ehrpwm0B	I2C2_SCL	uart2_txd	spi0_d0	B17	
P9_22	84	0x950/150	UART2_RXD	2	gpio0[2]	EMU2_mux1			ehrpwm0A	I2C2_SDA	uart2_rxd	spi0_sclk	A17	
P9_23	17	0x844/044	GPIO1_17	49	gpio1[17]	ehrpwm0_synco		gpmc_a17	mmc2_dat0	rgmii2_rxdv	gmii2_rxdv	gpmc_a1	V14	
P9_24	97	0x984/184	UART1_TXD	15	gpio0[15]				I2C1_SCL	dcan1_rx	mmc2_sdwp	uart1_txd	D15	
P9_25	107	0x9ac/1ac	GPIO3_21	117	gpio3[21]			EMU4_mux2	mcasp1_axr1	mcasp0_axr3	eQEP0_strobe	mcasp0_ahclkx	A14	Allocated (Group: mcasp0_pins)
P9_26	96	0x980/180	UART1_RXD	14	gpio0[14]				I2C1_SDA	dcan1_tx	mmc1_sdwp	uart1_rxd	D16	
P9_27	105	0x9a4/1a4	GPIO3_19	115	gpio3[19]			EMU2_mux2	mcasp1_fsx	mcasp0_axr3	eQEP0B_in	mcasp0_fsr	C13	
P9_28	103	0x99c/19c	SPI1_CS0	113	gpio3[17]			eCAP2_in_PWM2_out	spi1_cs0	mcasp0_axr2	ehrpwm0_synci	mcasp0_ahclkr	C12	Allocated (Group: mcasp0_pins)
P9_29	101	0x994/194	SPI1_D0	111	gpio3[15]			mmc1_sdcd_mux1	spi1_d0		ehrpwm0B	mcasp0_fsx	B13	Allocated (Group: mcasp0_pins)
P9_30	102	0x998/198	SPI1_D1	112	gpio3[16]			mmc2_sdcd_mux1	spi1_d1		ehrpwm0_tripzone	mcasp0_axr0	D12	
P9_31	100	0x990/190	SPI1_SCLK	110	gpio3[14]			mmc0_sdcd_mux1	spi1_sclk		ehrpwm0A	mcasp0_aclkx	A13	Allocated (Group: mcasp0_pins)
P9_32			VADC											Voltage Reference for ADC (NB: 1.8V)
P9_33			AIN4										C8	NB: 1.8V tolerant
P9_34			AGND											Ground for ADC
P9_35			AIN6										A8	NB: 1.8V tolerant
P9_36			AIN5										B8	NB: 1.8V tolerant
P9_37			AIN2										B7	NB: 1.8V tolerant
P9_38			AIN3										A7	NB: 1.8V tolerant
P9_39			AIN0										B6	NB: 1.8V tolerant
P9_40			AIN1										C7	NB: 1.8V tolerant
P9_41A	109	0x9b4/1b4	CLKOUT2	20	gpio0[20]	EMU3_mux0		timer7_mux1	clkout2	tclkin		xdma_event_intr1	D14	Both signals are connected to P21 of P11
P9_41B		0x9a8/1a8	GPIO3_20	116	gpio3[20]			emu3	Mcasp1_axr0		eQEP0_index	mcasp0_axr1	D13	Both signals are connected to P21 of P11
P9_42A	89	0x964/164	GPIO0_7	7	gpio0[7]	xdma_event_intr2	mmc0_sdwp	spi1_sclk	pr1_ecap0_ecap_capin_apwm_o	spi1_cs1	uart3_txd	eCAP0_in_PWM0_out	C18	Both signals are connected to P22 of P11
P9_42B		0x9a0/1a0	GPIO3_18	114	gpio3[18]				Mcasp1_aclkx	Mcaspo_axr2	eQEP0A_in	Mcasp0_aclkr	B12	Both signals are connected to P22 of P11 Allocated (Group:mcasp0_pins)
P9_43			GND											- See Pg.50 of the SRM
P9_44			GND											Ground
P9_45			GND											Ground
P9_46			GND											Ground
														For updates see: www.derekmolloy.ie
P9 Header	cat $PINS	ADDR +	Name	GPIO NO.	Mode 7						Mode 1	Mode 0	CPU	Notes
	Allocated	44e10000		(Mode 7)										Please e-mail me directly at:
		Offset from:												derek@derekmolloy.ie
		44e10800												If you notice a mistake

GPIO Settings				
Bit 6	Bit 5	Bit 4	Bit 3	Bit 2,1,0
Slew Control	Receiver Active	Pullup/Pulldown	Enable Pullup/Pulldown	Mux Mode
0 Fast	0 Disable	0 Pulldown select	0 Enabled	000 Mode 0 to
1 Slow	1 Enable	1 Pullup select	1 Disabled	111 Mode 7

e.g. OUTPUT GPIO(mode7) 0x07 pulldown, 0x17 pullup, 0x?F no pullup/down

e.g. INPUT GPIO(mode7) 0x27 pulldown, 0x37 pullup, 0x?F no pullup/down