The P8 & P9 Headers

P8 and P9 Expansion Headers ⑯⑰		There are 92 pins in two headers that are multiplexed. Not all of the functionality listed below is available simultaneously. Be very careful with current levels!
GPIO	65 x GPIOs	Maximum number of GPIOs is 65. All GPIOs are 3.3 V tolerant. Using buses and interfaces below reduces the number of available GPIOs.
Analog Output	8 x PWM	Pulse width modulated (PWM) outputs allow you to send a type of variable analog output (0 V to 3.3 V). PWM can be used to control servo motors. There are eight pins that can deliver this type of output.
Analog Inputs	7 x Analog Inputs	7 x 12-bit 1.8 V analog inputs that are always available on the headers. These can be used for reading sensor values, but be careful as they are only 1.8 V tolerant.
Power Supply	5 V, 3.3 V, 1.8 V	5 V and 3.3 V supplies and a 1.8 V reference supply (not a general supply!) for the analog inputs. Eight pins on the headers route to "regular" ground.
Timers	4 x Timers	Can be used to generate external clocks for interfacing to devices (Section 20 in the TRM).
Buses	2 x I^{2}C	I^{2}C is a digital bus that allows you to connect several modules to each of these two-wire buses at the same time. There are two public buses and one additional private bus.
	4 x UART	Used for serial communication between two devices. UART0 is the Serial Debug connector that is described in Figure 1-3.
	2 x CAN	CAN Bus is used for Controller Area Networks, often on industrial processes or vehicles to communicate between various networked systems. There is also a CAN cape available for the BeagleBone.
	2 x SPI	Serial peripheral interface provides a synchronous serial data link over short distances. It uses a master/slave configuration and requires four wires for communication on the BBB.
	GPMC	General-purpose memory controller is used to connect to external memory devices like FPGAs or ASICs. This fast bus will conflict with the eMMC on the board.
	2 x MMC	Interface buses that are used to connect the micro-SD card and the eMMC to the processor.
	LCD	Useful for LCD screens (e.g., LCD capes). This interface conflicts with the HDMI Framer (only one may be used simultaneously).
	2 x McASP	General-purpose audio serial port—multichannel audio serial port (McASP), connected to the HDMI framer.

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