

SCINI Main Bottle Microcontroller Pins

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This document describes the pin assignments by physical function and software name for the main bottle electronics microcontroller in the [SCINI ROV](#). The Crumb 128 [schematic](#) should be used to match up pin names to the actual pins on the device. The Atmel [manual](#) is the definitive reference and specification for how these pins function and their technical limitations.

Port Overview

Port C Digital outputs, such as laser and light control. These pins output either 0 or 5 volts and can be left floating when unused.

Port B and E Some of the pins on these ports are used for PWM generation. If properly reference to the microcontroller's ground, these outputs are suitable to be sent directly to a servo or electric speed controller.

Port F Analog inputs to the ADC converter. Voltage should be bounded between 0 and 5 volts, though accuracy is poor close to 5 volts. These inputs should ***not*** float; tie them to ground if unused.

Inputs

All analog inputs undergo crude software smoothing; the smoothed values are accessible as `smoothed_inputs[x]` in software and by the number plus 10 via the minimalist protocol (ie, smoothed humidity is available as number 21).

Pin	Number ¹	Variable	Function
F0	10	<code>analog_inputs[0]</code>	Temperature
F1	11	<code>analog_inputs[1]</code>	Humidity
F2	12	<code>analog_inputs[2]</code>	Depth
F3	13	<code>analog_inputs[3]</code>	Rotation (X?)
F4	14	<code>analog_inputs[4]</code>	Rotation (Y?)
F5	15	<code>analog_inputs[5]</code>	Acceleration (X?)
F6	16	<code>analog_inputs[6]</code>	Acceleration (Y?)
F7	17	<code>analog_inputs[7]</code>	Acceleration (Z?)

Outputs

Pin	Number ¹	Variable	Function
E3	00	PWM1	PWM ² output #1 (side thruster control)
E4	01	PWM2	PWM ² output #2 (side thruster control)
E5	02	PWM3	PWM ² output #3 (side thruster control)
B4	06	OC0	Analog output by means of signal rectification; 8-bit. Used for lights dimming.
B5	03	PWM4	PWM ² output #4 (side thruster control)
B6	04	PWM5	PWM ² output #5 (main thruster control)
C0	50	PORTC[0]	Laser control
C1	51	PORTC[1]	LED Lights control (on/off)

¹ Refers to the decimal number used for getting/setting in the minimalist ROV protocol used for serial communications.

² These PWM channels are theoretically 16 bit but are controlled with 8 bit signals (only a small range of the 16 bit space results in valid control signals). The pulses are between 1.5 and 2 microseconds with a 40 microsecond gap between (these figures are **approximate** based on my memory and should probably be nailed down with a scope). This standard is based on fiddling with a servo controller and scope.