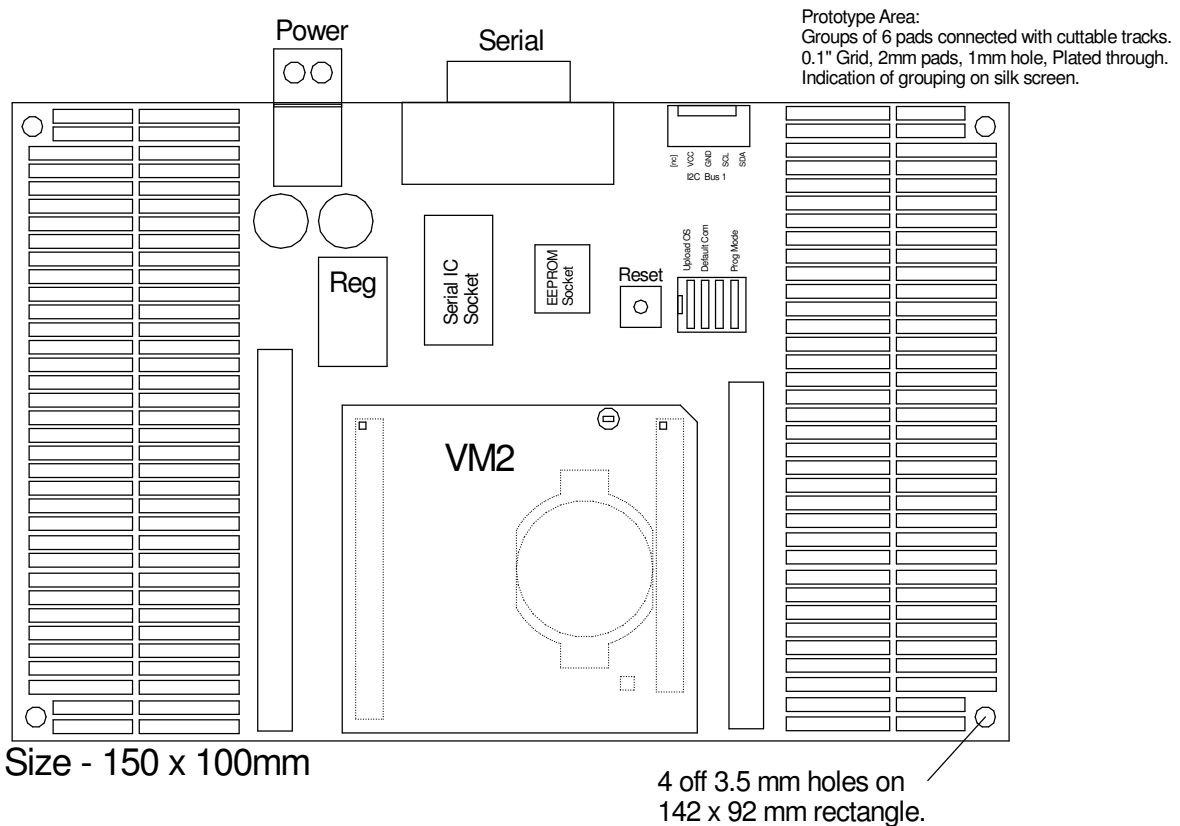


## VM2 Breakout Board

### Introduction

The 5905 Breakout Board for the VM2 Controller provides interfaces to the VM2's first RS232 serial port; the first I<sup>2</sup>C bus, and a regulated supply voltage. All of the VM2's connector pins are taken out to two prototyping areas so you can prototype your VM2 application.



### Unpacking

You should have:

- 5905 Breakout Board
- Power Connector
- These instructions

**WARNING:** Users of Micro-Robotics Control Equipment should be aware of the possibility of a system failure, and must consider the implications of such failure. Micro-Robotics Ltd. can accept no responsibility for loss, injury, or damage resulting from the failure of our equipment. Use of our products in applications where their failure to perform as specified could result in injury or death is expressly forbidden.

## What you will need

To start using the application board you will also need:

- VM2 Control Module (5900)
- 3.5 to 16V, 100mA, unregulated DC power supply.
- An RS232 serial lead to connect the 5905 to your host computer (you can use our product 5529)
- A PC running our VenomIDE development tool, or other terminal emulation software (for example, Hyper Terminal)

## Switches

There is a group of four DIP switches and a single pushbutton switch fitted to the Breakout Board. These are connected to several pins on the VM2's JP1.

### Reset button

Pressing this button shorts the VM2's Reset input to GND, which resets the VM2.

### DIP switches

Most of the time you are only likely to use the Prog Mode switch.

Prog Mode	This switch puts the VM2 into program mode by shorting JP1 pin 1 to GND. This allows you to develop your application program.
[Not used]	
Default Com	This switch forces the VM2 into its default communication mode by shorting JP1 pin 5 to GND. This is not normally necessary.
Upload OS	This switch puts the VM2 into Upload OS mode by shorting JP1 pin 4 to Vcc. This allows you to program the VM2 with a new version of the Venom2 Language using a special boot loader program on your PC, communicating over serial port 1.

## Serial Port 1 RS232

The 5905 has an RS232 level shifter IC to allow the VM2 to talk to a host PC. This IC is fitted in a socket in case you need to remove it for your application.

### Pinout

Connector: J1 - 9 way D-Type plug

Pin	1	2	3	4	5	6	7	8	9
Channel		13	14				12	11	
Signal	*	RXD	TXD	*	GND	*	RTS	CTS	N/C

\* - These pins are connected to each other on the 5905.

### Configuration

Serial port 1 is configured for you in the default startup procedure with something like the following line.

```
MAKE serial SerialPort(115200,1,1)
```

## I<sup>2</sup>C Bus

Connector J2. Pinout printed on the board.

### Configuration

```
MAKE net I2Cbus ;creates the first bus
MAKE net I2Cbus(1) ;[does same as above]
```

## Power Supply

The 5852 may be powered from a supply voltage range of less than 4V, up to 16 volts unregulated DC. The current consumption depends upon what is attached to the unit and whether the processor is idle, but is usually around 25 – 50mA.

The board has a very low dropout regulator that can operate with a supply voltage just above it's output voltage. There is a silicon diode before the regulator to protect against reverse polarity on the supply input, but this may be bypassed using the link LK 1, if you want to run the board on as low an input voltage as possible.

The regulator doesn't have a high capacity heat sink – just a wide copper area on the board so can't support much more than 1 watt of power dissipation at room temperature. Be careful of the regulator – it can get very hot if you over load it.

To calculate the power dissipation in the regulator use  $P = I * (V_{in} - (3.3+0.7))$

Where I is the total current in Amps and  $V_{in}$  is the input voltage. Don't use the 0.7 value if you bypass the diode.

## Pinout

Connector: J3 - 2 way pluggable screw terminal. Plug provided.

## Prototyping areas

The two prototyping areas at each end of the board have sets of pads on a 0.1" pitch.

The pins of the VM2 have been expanded to two sets of connector positions, BC1 and BC2, in a one-to-one pattern. You can use these positions to take VM2 signals to the prototyping areas with hook-up wire, or fit 0.1" connectors into them.

Here is the VM2 pinout:

JP2		JP1	
EXT spare \$56	<input type="checkbox"/> <input type="checkbox"/> \$7D EXT RD or E	PROG	<input type="checkbox"/> <input type="checkbox"/> GND
EXT A0 \$52	<input type="checkbox"/> <input type="checkbox"/> \$7E EXT VPR or R/W	VCC	<input type="checkbox"/> <input type="checkbox"/> BOOT
EXT D0 \$60	<input type="checkbox"/> <input type="checkbox"/> \$68 EXT D8	DFLT	<input type="checkbox"/> <input type="checkbox"/> GND
EXT D1 \$61	<input type="checkbox"/> <input type="checkbox"/> \$69 EXT D9	LED \$7F	<input type="checkbox"/> <input type="checkbox"/> RESET
EXT D2 \$62	<input type="checkbox"/> <input type="checkbox"/> \$6A EXT D10	CAN TX \$1C	<input type="checkbox"/> <input type="checkbox"/> \$28 SCL1
EXT D3 \$63	<input type="checkbox"/> <input type="checkbox"/> \$6B EXT D11	CAN RX \$1B	<input type="checkbox"/> <input type="checkbox"/> \$29 SDA1
GND	<input type="checkbox"/> <input type="checkbox"/> GND	VCC	<input type="checkbox"/> <input type="checkbox"/> GND
EXT D4 \$64	<input type="checkbox"/> <input type="checkbox"/> \$6C EXT D12	TX5 \$3C	<input type="checkbox"/> <input type="checkbox"/> \$19 TX1
EXT D5 \$65	<input type="checkbox"/> <input type="checkbox"/> \$6D EXT D13	RX5 \$42	<input type="checkbox"/> <input type="checkbox"/> \$1A RX1
EXT D6 \$66	<input type="checkbox"/> <input type="checkbox"/> \$6E EXT D14	RTS5 \$38	<input type="checkbox"/> <input type="checkbox"/> \$72 RTS1
EXT D7 \$67	<input type="checkbox"/> <input type="checkbox"/> \$6F EXT D15	CTS5 \$78	<input type="checkbox"/> <input type="checkbox"/> \$73 CTS1
GND	<input type="checkbox"/> <input type="checkbox"/> GND	TIM1.1 \$18	<input type="checkbox"/> <input type="checkbox"/> \$3A TX4
TX2 \$12	<input type="checkbox"/> <input type="checkbox"/> \$14 SPI1 CS	TIM4.1 \$26	<input type="checkbox"/> <input type="checkbox"/> \$3B RX4
RX2 \$13	<input type="checkbox"/> <input type="checkbox"/> \$15 SPI1 CLK	TIM8.1 \$36	<input type="checkbox"/> <input type="checkbox"/> \$76 RTS4
RTS2 \$7B	<input type="checkbox"/> <input type="checkbox"/> \$16 SPI1 MISO	TIM8.2 \$37	<input type="checkbox"/> <input type="checkbox"/> \$77 CTS4
CTS2 \$43	<input type="checkbox"/> <input type="checkbox"/> \$17 SPI1 MOSI	VCC	<input type="checkbox"/> <input type="checkbox"/> GND
TIM5.2 \$11	<input type="checkbox"/> <input type="checkbox"/> \$70 SPI ADDR 0	TX3 \$2A	<input type="checkbox"/> <input type="checkbox"/> \$2C SPI2 CS
TIM5.1 \$10	<input type="checkbox"/> <input type="checkbox"/> \$71 SPI ADDR 1	RX3 \$2B	<input type="checkbox"/> <input type="checkbox"/> \$2D SPI2 CLK
GND	<input type="checkbox"/> <input type="checkbox"/> GND	RTS3 \$74	<input type="checkbox"/> <input type="checkbox"/> \$2E SPI2 MISO
ADC \$30	<input type="checkbox"/> <input type="checkbox"/> \$31 ADC	CTS3 \$75	<input type="checkbox"/> <input type="checkbox"/> \$2F SPI2 MOSI
ADC \$32	<input type="checkbox"/> <input type="checkbox"/> \$33 ADC		
ADC \$34	<input type="checkbox"/> <input type="checkbox"/> \$35 ADC		

You should also refer to the tables of pin functions in the VM2 datasheet.