

## Ethernet Module Data Sheet

### Introduction

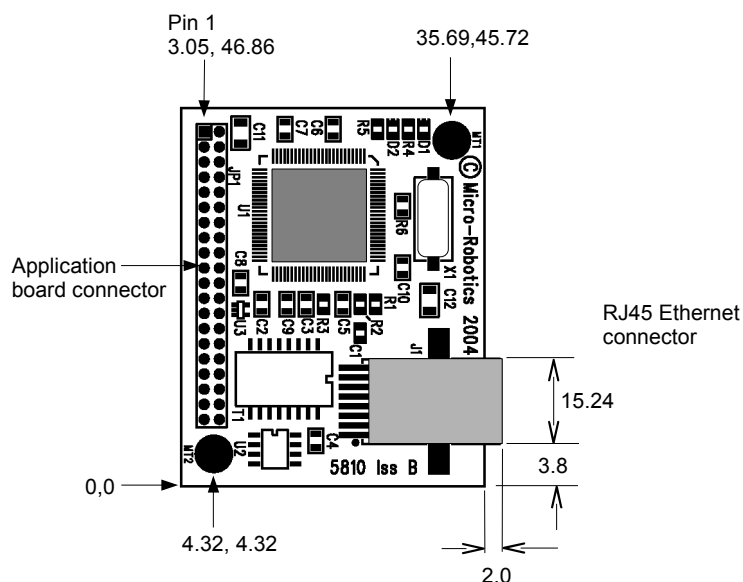
The 5810 ethernet interface is a module that connects to the VM-1 controller's system bus to provide 10baseT ethernet connectivity using a Cirrus Logic CS8900A ethernet controller IC.

It can be plugged into a board such as the 5811 Module Board.

An on-board EEPROM, accessed via the I<sup>2</sup>C Bus, is available for storing the 48 bit ethernet (MAC) address and other configuration information.

Two LEDs on the module can be used to indicate a valid ethernet link and data activity, or can be programmed for other purposes by software commands.

### Mechanical



All positions in mm

Board size 40mm x 50mm

Mounting Holes 2 x M2.5

Connectors: 20 x 2mm, RJ45 surface mount

Height under board: 6.8mm  
when using 4.6mm high socket headers

Max component height: 11.5mm

Board thickness 1.6mm

### Unpacking

You should have:

- 5810 Ethernet board
- 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.

© copyright 2006 Micro-Robotics Ltd  
The Old Maltings  
135 Ditton Walk  
Cambridge  
CB5 8QB

tel: +44 (0) 1223 523100  
fax: +44 (0) 1223 524242  
sales@microrobotics.co.uk  
www.microrobotics.co.uk

## Installation

To use the ethernet module you will need:

- VM-1 Control Module 5800 or 5801
- Suitable application board such as 5811 Application Board 3 (module board)
- Other components as required for use of application board (power supply, serial cables etc.)
- Network hub or switch with available port that can support 10Mb/s operation

## Connection

Mount the ethernet board on the application board securing with via mounting hole MT1 (see diagram) with a 6mm pillar and M2.5 screw and nut. Use of the other mounting hole MT2 is optional.

Connect the RJ45 socket to an ethernet hub or switch with a suitable length of CAT5 UTP cable. When properly connected and powered up, the red LED on the ethernet card should illuminate.

## Software Configuration

```
MAKE eth Protocol("eth", bus_number, address_select, ip_address)
```

`bus_number` is 1 or 2 denoting which I<sup>2</sup>C bus is used to address the EEPROM.

`address_select` is a number from 0 to 15 representing the bit pattern written to channels 34(lsb)-37(msb) in conjunction with the VM-1 OFF\_BOARD signal to enable the SELECT signal to the ethernet module.

The correct values of parameters `bus_number` and `address_select` depend on the application board that provides the connections between the VM-1 and the ethernet board.

`ip_address` optionally specifies an IP address. See the Venom help files for more information.

Note that VM-1 channels 30-37 are reserved for module addressing and should not be used for any other purpose if modules like the ethernet are being used.

## Specification

The module board uses a Crystal LAN (Cirrus Logic) CS8900A ethernet controller IC in 8 bit polled I/O mode. Interrupts, DMA and other memory modes are not available. In this configuration the IC also does not support the use of an attached EEPROM for parameter storage, but the ethernet board has an I<sup>2</sup>C EEPROM type PCF8582 or M24C02 (256 bytes) for this purpose. This is factory-programmed to a preset ethernet ("MAC") address and should not be changed. If you think this information has become corrupted please contact Micro-Robotics for assistance and have the card's serial number available.

## Ethernet Connection

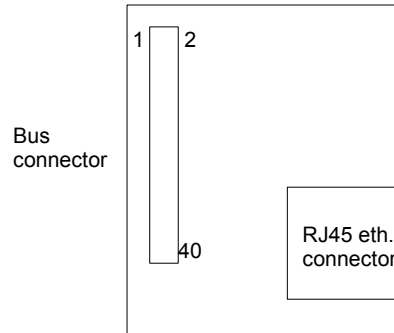
The ethernet side of the interface only supports 10base-T, i.e. 10Mb/s through an RJ45 connector and CAT5 UTP cable. This is the most commonly used type of ethernet connector. The ethernet hub or switch must support 10Mbit/s operation. In a network with 100Mbit or faster operation, the use of a dual-speed ethernet switch rather than a dual-speed hub is recommended for minimum impact on bandwidth in the rest of the network.

Exceptionally in a two node network, you can use a CAT5 "crossover" cable to link the ethernet module directly to the other node in the network and dispense with the need for a hub.

## Bus Connection

40 pin 2-row 2mm pitch connector

Pin	Signal	Description
1	VCC	+5V supply
2	GND	Ground
3	D1	Data bus
4	D0	
5	D3	
6	D2	
7	D5	
8	D4	
9	D7	
10	D6	
11	VCC	+5V supply
12	GND	Ground
13	A1	Address bus
14	A0	
15	A3	
16	A2	
17	A5	
18	A4	
19	A7	
20	A6	
21	A9	
22	A8	
23	VCC	+5V supply
24	GND	Ground
25	A11	Address bus
26	A10	not connected
27	A13	
28	A12	
29	A15	
30	A14	
31	HWR/	Write strobe
32	A16	not connected
33	WAIT/	not connected
34	RD/	Read Strobe
35	RESET/	System Reset
36	SELECT/	Selects this board
37	SDA	I <sup>2</sup> C data for EEPROM
38	SCL	I <sup>2</sup> C clock
39	VCC	+5V supply
40	GND	Ground



## Addressing

The CS8900A is activated by the combination of a low level on SELECT/ and an address range of \$300 to \$30F on address lines A0 to A11. Address lines A12 to A16 are ignored on this module and should be set to 0. In addition either HWR/ or RD/ is set low to write or read data respectively. The pulse width on WR/ should be 110ns minimum and the WAIT/ signal is not connected in the ethernet module.

For applications not using a Protocol object in Venom to control the ethernet interface, consult the Cirrus Logic CS8900A manuals.

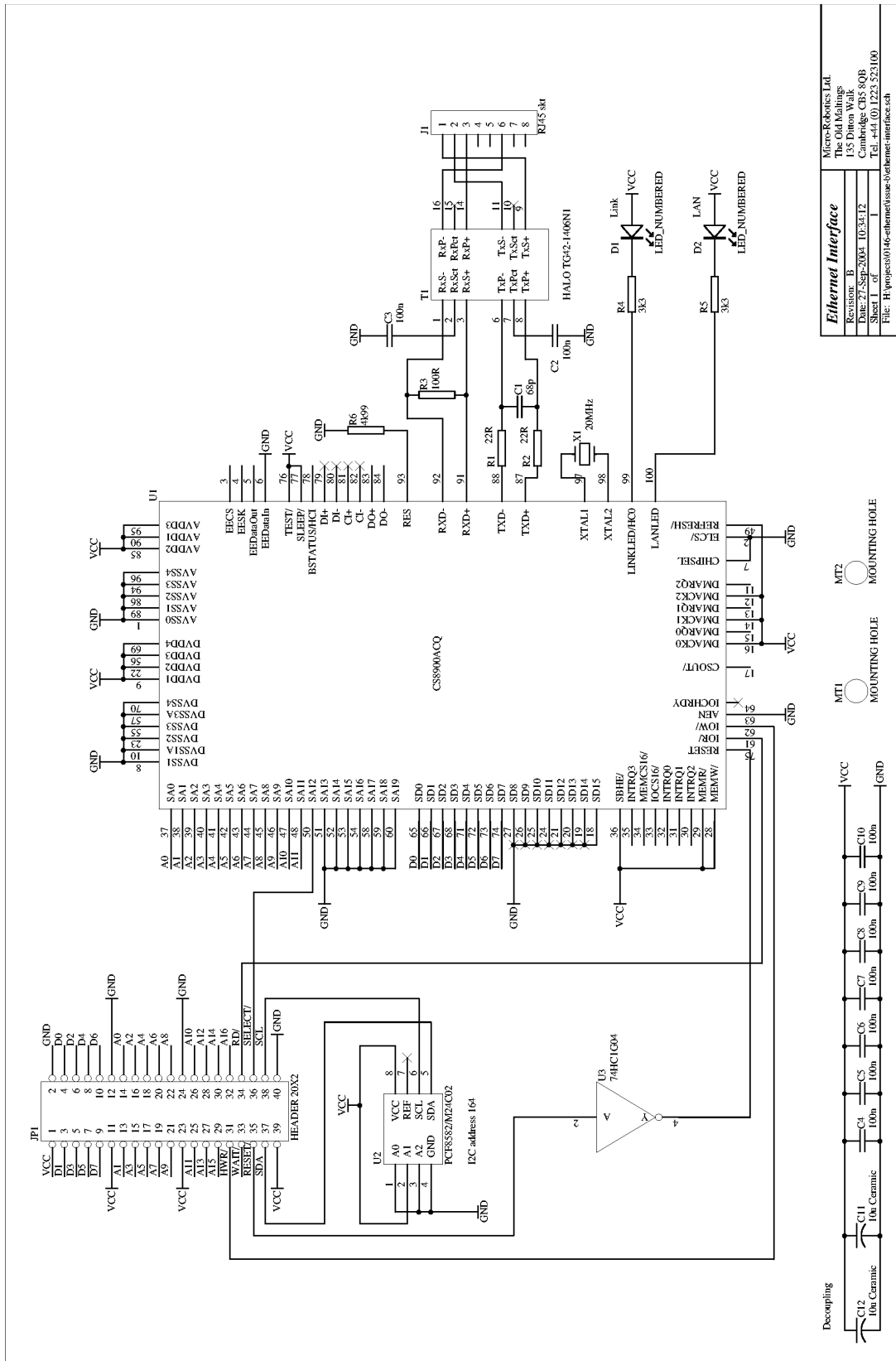
The EEPROM is set to I<sup>2</sup>C bus address 164. Venom applications should not attempt to address the EEPROM directly in case they corrupt the MAC address stored there. The ethernet Protocol object manages the EEPROM contents internally.

## Power

The power supply to the ethernet board, via the bus connector, is +5V DC.

The current consumption is approximately 55mA when active.

# Schematic



**Ethernet Interface**  
 Micro-Robotics Ltd.  
 The Old Millings  
 135 Dilton Wall  
 Malmesbury, Wiltshire, UK  
 SN6 2J  
 Tel: +44 (0)1293 252100  
 File: H:\projects\0146-ethernet\issue-0\ethernet-interface.dtl

Revision: B  
 Date: 27-Sep-2004 10:34:12  
 Size: 120,123,252,100  
 File: H:\projects\0146-ethernet\issue-0\ethernet-interface.dtl

Decoupling  
 C12 10k Ceramic  
 C11 10k Ceramic  
 C4 100n  
 C5 100n  
 C6 100n  
 C7 100n  
 C8 100n  
 C9 100n  
 C10 100n  
 VCC  
 GND

MT1 MOUNTING HOLE  
 MT2 MOUNTING HOLE