IP Arcnet Interface Module

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This note describes an Arcnet interface, implemented as an IndustryPack™† module. This design uses the Standard Microsystems COM 20020 Universal Local Area Network Controller, a single chip controller that contains the Arcnet protocol logic, a 2 kbyte message buffer and a byte-wide computer interface.

Physically, the IndustryPack Module is a 1.8" by 3.9" circuit board that contains two high density 50-pin female connectors as defined by the GreenSpring IndustryPack specification. This specification is a public domain definition of a small mezzanine board for use in microprocessor-based systems. Figure 1 is a diagram of the IP Arcnet module showing the parts placement including the two 50-pin connectors, one logic interface and one for user I/O signals. The IP logic interface includes:

D0-D15	16 bit data
IOSEL/	I/O Addr space select
INTSEL/	Interrupt Select
INTREQ0	Interrupt request
ACK/	Acknowledge
R-W/	Read-Write control
Addr 1..6	I/O space Address lines
Reset/	Clears all registers, inhibits triggers (low active)

Contained on the module are:

- COM 20020 Arcnet controller chip
- Arcnet Transceiver for Coax cable
- 20 MHz Oscillator
- IP Identification (ID) PROM
- IP Logic Interface, a 22v10 PAL
- Interrupt vector 8-bit dipswitch
- Arcnet address 8-bit dipswitch
- Driver for offboard byte of LEDs
- Buffer for offboard byte of switches

This module is designed to allow word accesses to the onboard registers. All registers are one byte wide and data are returned on the least significant, odd, byte of the data lines. The memory map is shown below:

Address	Register Accessed
Base + 0..E	COM 20020 Registers
Base + 10	Byte of Switches
Base + 12	Byte of LEDs
Base + 14	Arcnet Address
Base + 16	Interrupt Vector

The COM 20020 controller contains eight registers that are accessed as the low order bytes of the first eight words of the IP I/O space. The Base address of the IP I/O space is determined by the IndustryPack carrier board.

In some applications, it is convenient to have program switches and LEDs available for use by the system software. For this reason, an octal LED driver and an octal buffer are included on the module. The LEDs and switches will be mounted externally. Pullup resistors for the sense switches are included onboard the module, so only switch closures are required offboard.

Under certain programmable conditions, the COM 20020 controller asserts an interrupt request signal, but does not provide an interrupt vector needed to service an IP interrupt, so an octal dipswitch is included on the module. The value set into this switch will be returned on the low byte of the data bus during an INTSEL IP cycle.

An internal COM 20020 register holds the Arcnet node address that is stored in the chip by the processor during initialization. An octal switch is provided to supply a hardware address for the processor to read and store in the COM 20020 Arcnet address register. In some installations, it may be advantageous to have the hardware address switch available on the front panel of the chassis. All eight lines of the Arcnet address buffer are brought to the 50-pin I/O connector so they may be accessed from offboard. In this case the onboard switches would be set to $FF so the address set into external switches could be read. Pullup resistors on the module cause an open switch to read a "1".

The pinout of the carrier board 50-pin connector is shown in Figure 2.

Chip selects, write strobes and IP ACK signals are generated by the 22V10 PAL. On IDSEL cycles, the selected contents of the ID PROM will be returned on the low byte of the data IP lines.

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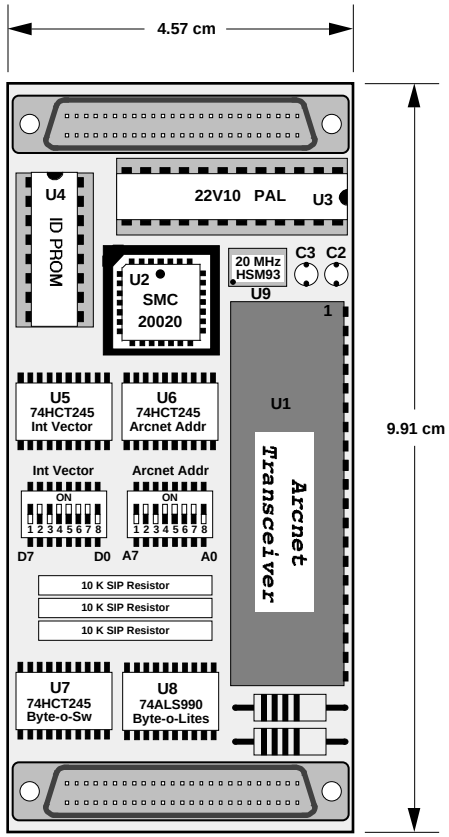
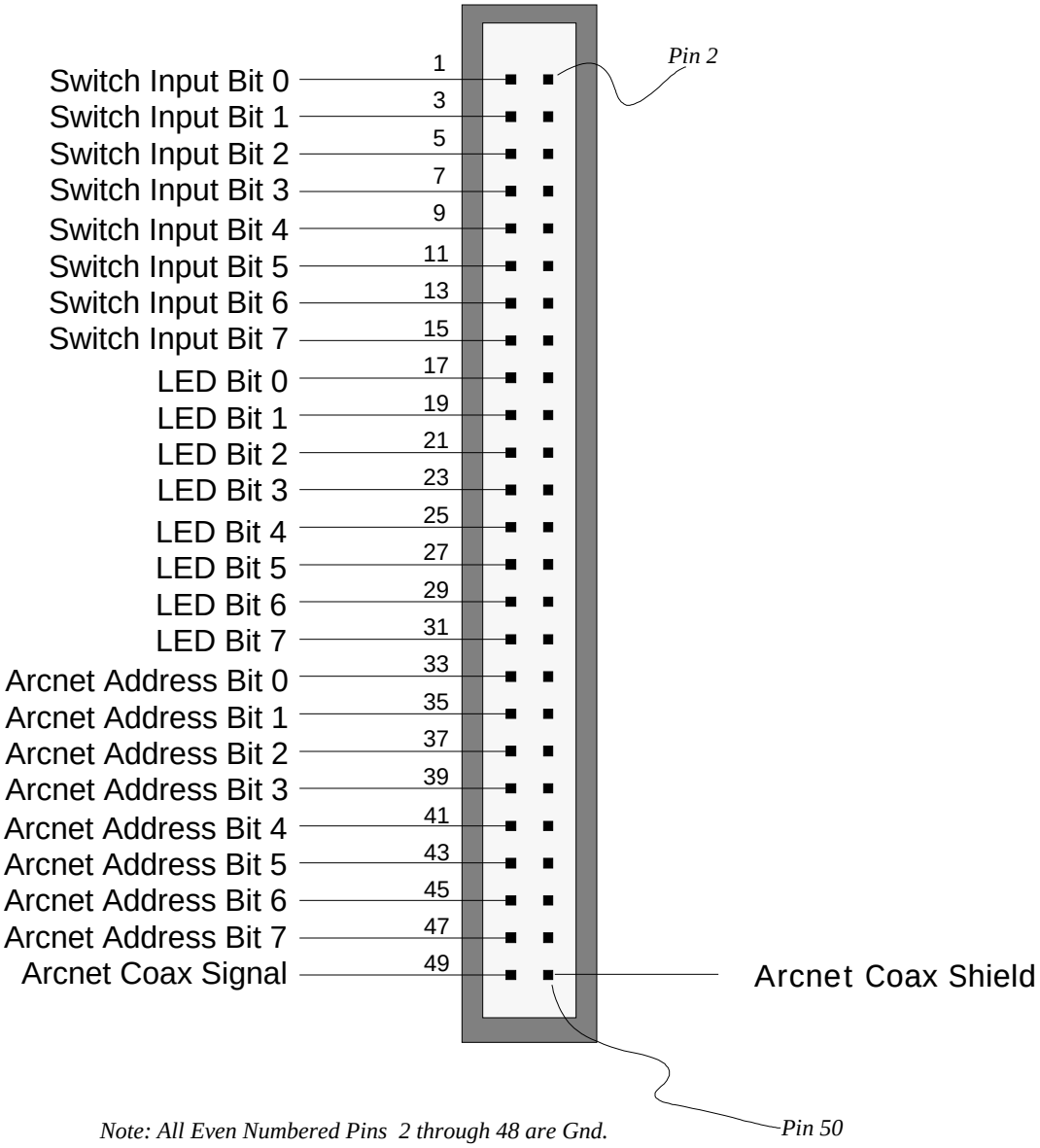


Figure 1. *IndustryPack*™ Based Arcnet Module



Note: All Even Numbered Pins 2 through 48 are Gnd.

Figure 2. Pinout of the IP Arcnet I/O Connector