STANDARD
MICROSYSTEMS
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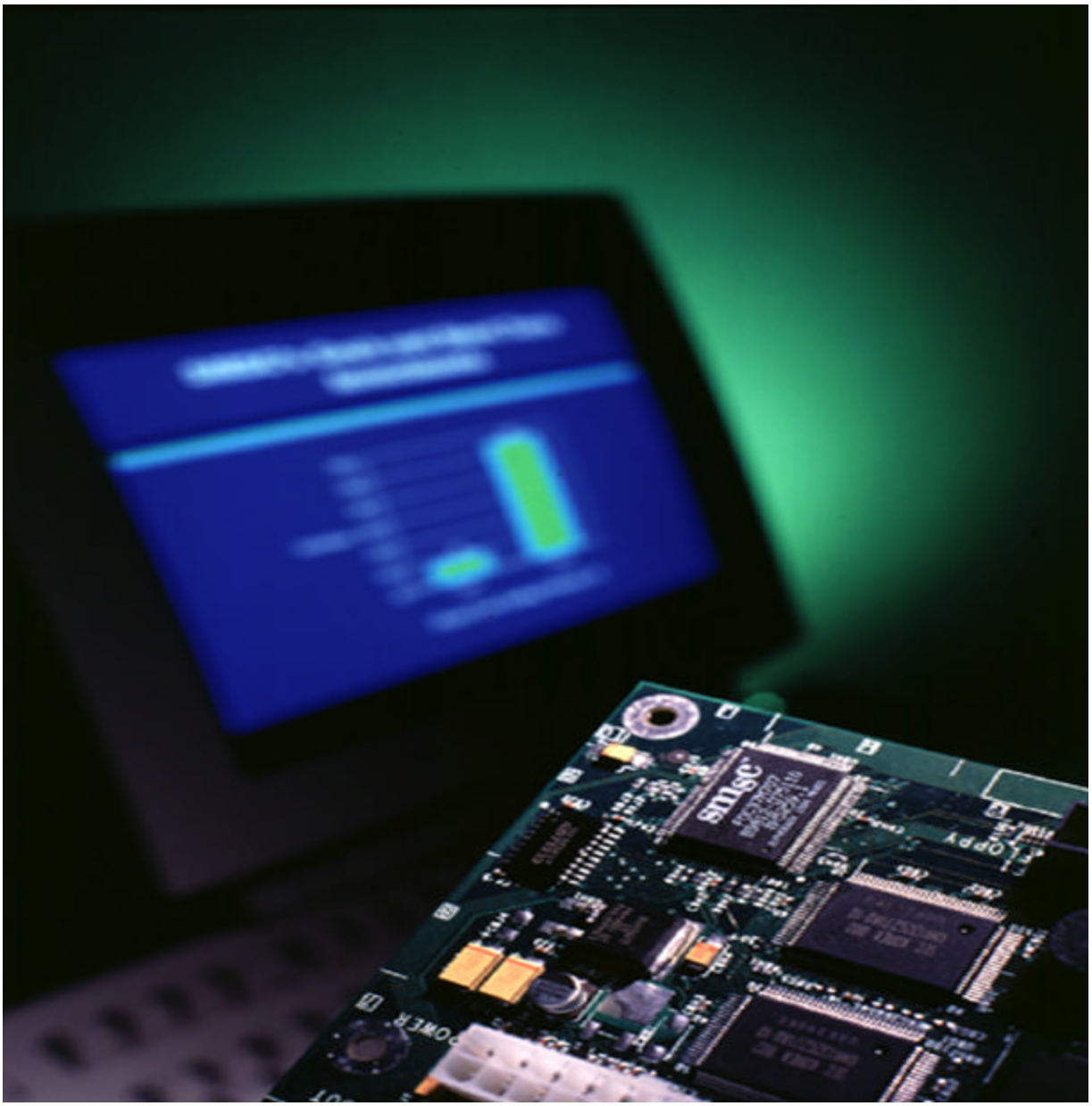
# EVB-20020
# Industrial ARCNET
# AT Adapter Card



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- Based on COM20020 Industrial Network Controller
- Supports both standard and backplane signaling schemes
- COAX and UTP support for standard ARCNET signaling in both bus and star topologies
- Isolated and direct RS485 interfaces
- All media interfaces are jumper selectable
- Data rates from 156 Kbps to 5 Mbps
- 8 bit, I/O mapped bus interface, I/O address is switch selectable
- On-board node ID switch
- Capable of receiving all packets
- Includes demo software
  - Sample driver, network monitor and mapping routes

## APPLICATIONS:

Test equipment, network development and debug, network management/monitoring, network evaluation, performance analysis

## I/O Address Selection

The EVB-20020 is an 8 bit I/O mapped card. The I/O address is selected via DIP switch S1. The switch positions correspond to address bits A9 – A3. The switch is factory set for address 2E0h. If you encounter problems accessing the card then you must change the value of the address. To set the address simply set the switch according the binary representation of that address. For example, address 2E0h would be 1011100. Addresses XX0 – XX7 are used by the network controller and address XX8 selects the Node ID switch.

## Node ID Selection

The EVB-20020 is equipped with an on-board Node ID switch mapped at address XX8. The COM20020 network controller requires a software programmable ID, therefore the switch does not automatically provide a Node ID to the COM20020. The switch only provides a value to be programmed by the software.

## Media Interfaces (Transceivers)

The EVB-20020 supports four types of media interfaces : traditional ARCNET coax and twisted pair line interfaces, direct coupled RS-485, and isolated RS-485 (twisted pair) ports.

### Coaxial Interface

The Coaxial interface uses a standard 93 ohm BNC connector (the same as a 50 ohm BNC) and requires RG-62 type cable with 93 ohm terminations. The coaxial interface can be used in a bus topology within the following guidelines:

1. Max. distance 1000′ (without repeaters)
2. Min. distance between nodes 3′
3. Max. number of node per segment 8 (i.e. no repeaters)
4. Max. number of nodes with repeaters 255

Operation is valid only at 2.5 Mbps and uses the SMSC HYC9088 hybrid.

### Twisted Pair (TP) Interface

The twisted pair interface utilizes standard 105 ohm 24 AWG unshielded twisted pair cable. The connectors are RJ-11 modular telephone jacks and follow the ARCNET Trade Association (ATA) standard pinout for twisted pair with Phase A on pin 3 and Phase B on pin 2. The twisted pair interface can be used in a bus topology within the following guidelines:

1. Max. distance 400′ (without repeaters)
2. Min. distance between nodes 6′
3. Max. # of nodes 10 (without repeaters)

The line must be terminated at each end of the cable with a 105 ohm impedance resistor. Stubs or drops are not allowed in the TP interface, cable segments should be connected in a daisy chained fashion. Note that this TP interface can only be operated at 2.5 Mbps and uses the SMSC HYC9088 hybrid.

### Direct Coupled RS-485

The Direct Coupled RS-485 interface uses an RJ-11 connector with Phase A on pin 3 and Phase B on pin 4. Recommended cable is 24AWG unshielded twisted pair such as Belden #9562. Biasing resistors are provided (470 ohms) for squelching of reflections. A 75ALS176B transceiver is used. Short stubs or drops of less than 1 ft. can be accommodated but are not recommended. Data rates from 156 Kbps to 5.0 Mbps are allowed. Note that the Direct Coupled RS-485 interface is not compatible with either the isolated RS-485 or the standard ARCNET twisted pair interface.

### Isolated RS-485

The Isolated RS-485 interface employs transformer coupling to electrically isolate the data lines and make the connections insensitive to polarity. Isolation is provided up to 2KV. Data rates from 156 Kbps to 5.0 Mbps are accommodated. Connections are made via pin 2 and 3 of the RJ-11 connectors. Note that the isolated 485 transceiver utilizes a different modulation technique than the direct coupled scheme and should not be mixed with direct coupled interfaces or with the standard ARCNET twisted pair interface.

## Jumpers

There are three sets of jumper blocks on the EVB-20020 board. JP1-4 selects the clock speed of the network controller. JP1 and JP2 MUST BE INSTALLED for proper operation. JP3 and JP4 are for future use and should be left unconnected. JP9, JP10, and JP11 select the source of data for the network controller's receiver. JP12 – 17 are used to choose the media type. Refer to the following table for the correct jumper settings:

| MEDIA TYPE | CONNECT JUMPERS |
|---|---|
| Coax | JP11 |
| Twisted Pair | JP11, JP16, JP17 |
| Direct RS-485 | JP9, JP12, JP13 |
| Isolated RS-485 | JP10, JP14, JP15 |

## Interrupts

If your software is to be interrupt driven, the priority of the interrupt is selected through JP5-JP8 (IRQ3-6).