

### FEATURES

- IEEE 802.3 10BASE-T and 100BASE-TX compatible
- Full or half duplex at 10 or 100 Mbps
- Intel 82551QM Fast Ethernet PCI Controller
- IEEE 802.3u Auto-Negotiation support
- Adaptive equalization supported
- 3 Kbyte transmit and 3Kbyte receive FIFOs
- RJ-45 Ethernet interface connector
- Onboard EEPROM for configuration data storage
- Support for Windows® CE/NT/98/95, Linux, and drivers for DOS ODI, NDIS4, Novell Netware, QNX, VxWorks, NetWare, Linux, QNX, FTP TC/PIP and other popular software
- Link Status, Activity, and Speed LEDs
- Low power
- Single +5V supply
- RoHS compliant product
- Extended temperature range: -40°C to +85°C

WinSystems' PPM-10/100-G is a "Fast" Ethernet (10/100 megabits/sec), PC/104-Plus-compliant Ethernet module. It is based upon the Intel 82551QM controller that is supported by a wide range of operating systems including Windows 98, Windows NT, Windows CE, QNX, VxWorks, and Linux.

### FUNCTIONAL CAPABILITY

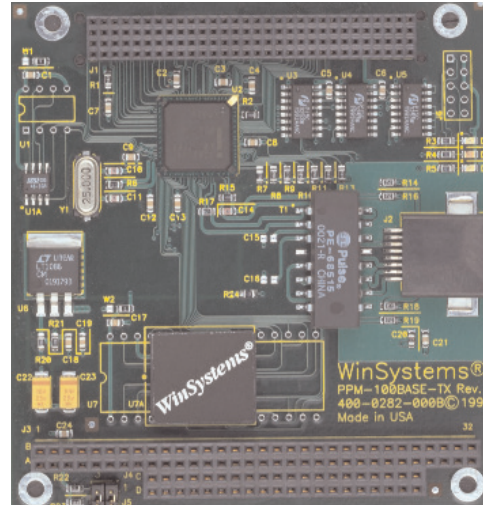
**PC/104-Plus Interface** - The PPM-10/100-G module is designed to offer flexible, high-performance Ethernet networking capability. It provides 32-bits of addressing and data, as well as the complete control interface to operate on the PC/104-Plus Bus. The chip has a PCI bus master interface and is compliant with the PCI Bus Specification.

Multiple PPM-10/100-G boards can be installed and supported on a single PC/104-Plus stack. There is a jumper block on board to select the module slot position.

There is also a PC/104 connector on the board. No power, control or data signals are wired to it. It simply feeds the signals through the connector to the next module in a stack.

**Ethernet Controller** - The PPM-10/100-G module uses the Intel 82551QM integrated controller. It consists of both the Media Access Controller (MAC) and the physical layer (PHY) on a single chip.

The 82551QM acts as both a master and a slave on the PCI bus. As a master, the 82551QM interacts with the system main memory to access data for transmission or deposit received data. As a slave, some 82551QM control structures



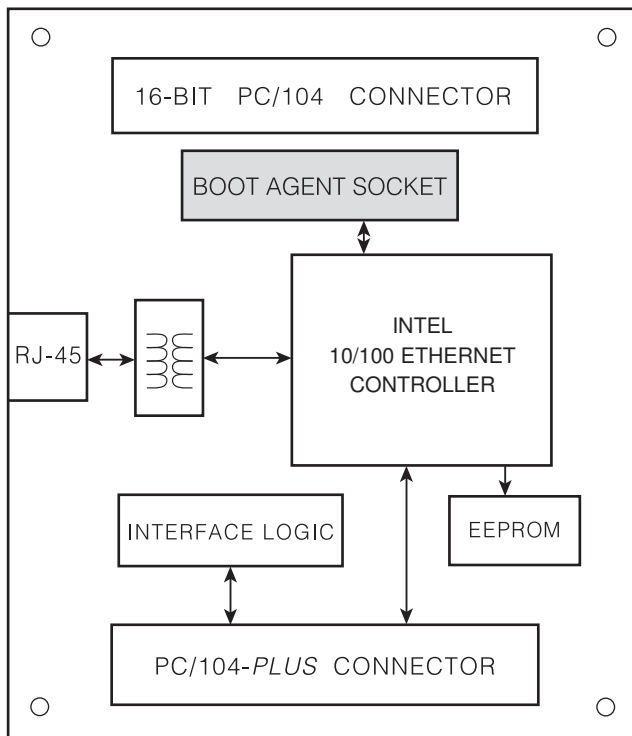
are accessed by the host CPU to read or write information to the on-chip registers. The CPU also provides the 82551QM with the necessary commands and pointers that allow it to process receive and transmit data.

**Full Duplex** - The 82551QM can operate either in half duplex or full duplex mode. When operating the full duplex mode, it can transmit and receive frames simultaneously. The selection of duplex operation and flow control is done in two levels: MAC and PHY. The PHY duplex mode is set either by Auto-Negotiation or, if Auto-Negotiation is disabled, by setting the full duplex bit in a register. The MAC duplex selection is done only through CSMA configuration. The CSMA configuration should match the result of the Auto Negotiation.

**Flow Control** - The controller supports IEEE 802.3 frame based flow control frames only in both full duplex and half duplex switched environments. Flow control is optional in full-duplex mode and can be selected through software configuration. There are three modes of flow control that can be selected: frame-based transmit flow control, frame-based receive control and none.

**100BASE-T** - The PPM-10/100-G will auto detect and configure to the speed of the link partner. The PHY unit supports 10BASE-T half duplex, 10BASE-T full duplex, 100BASE-T half duplex, and 100BASE-T full duplex.

Since 10BASE-T and 100BASE-T have different filtration needs, both filters are implemented inside the 82551QM chip. This allows the two technologies to share the same magnetics.



**PPM-10/100-G BLOCK DIAGRAM**

**EEPROM** - The configuration information describing the device's architecture, address, interrupt, etc. can either be loaded from jumpers or from an EEPROM. The module is shipped with the EEPROM programmed and enabled so that no jumpers need to be installed by the user.

**Ethernet Network Connection** - The PPM-10/100-G is connected to the network through an onboard RJ-45 connector.

The 82551QM controller has adaptive channel equalization provided for greater functionality over long cables. It provides adaptation based on the shape of the received signal, equalizing that signal to meet superior Data Dependent Jitter performance.

**Monitor LEDs** - Light emitting diodes (LEDs) are on the PPM-10/100-G to provide a visual indication of the link status, network activity and network speed. The yellow Link Integrity LED is lit when there is a valid connection detected. The green Activity LED blinks on and off when activity is detected on the wire. The red LED is on only if a 10BASE-T link is detected and off if a 10BASE-T link is

detected. If the link fails while in Auto-Negotiation, the LED will keep the last valid link state. If 100BASE-T link is forced, the LED will be on, regardless of the link status.

**Software** - The board emulates the popular Intel Pro100+ PCI board. Intel has driver support for the most popular operating systems and real time operating systems for its 82551QM controller. Therefore most PCI-compatible drivers, utilities and 10/100 Ethernet supported operating systems will work directly with this module.

**RoHS Compliant** - This product is designed to meet the Directive on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS) European Union directive 2002/95/EC.

**Related Information** - To get Intel's latest 82551QM data sheet, technical manual, driver support or other product information, please visit [www.developer.intel.com](http://www.developer.intel.com).

## SPECIFICATIONS

### Electrical

Data rate: 10 or 100 megabits per second  
Protocol: CSMA/CD

### Power Requirements

Vcc = +5V ±5% @ 270 mA typical

### Mechanical

Dimensions: 3.6" x 3.8" (90 mm x 96 mm)  
Weight: 3.0 oz. (84 gm)

### Connectors

Ethernet: RJ-45  
PC/104-Plus: 120-pin (4 x 30; 2 mm) stackthroughs with shrouded header  
PC/104: 16-bit stackthrough (feed through only)

### Environmental

Operating Temperature: -40°C to +85°C  
Non-condensing relative humidity: 5% to 95%

## ORDERING INFORMATION

PPM-10/100-G PC/104-Plus 10/100 Ethernet module

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