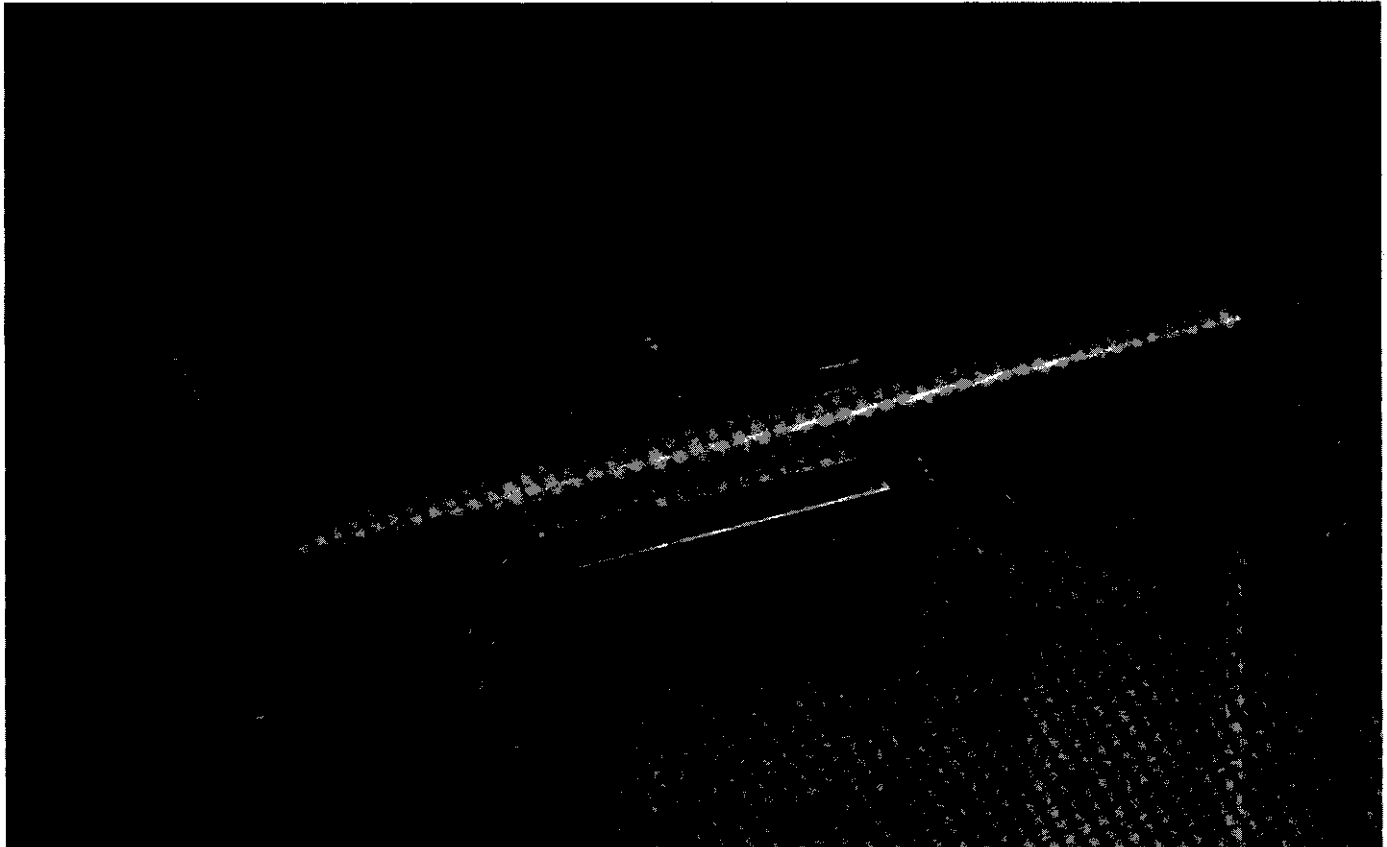


# HP Series 200 Models 16, 26 and 36 Programmable Datacomm Interface

 HEWLETT  
PACKARD

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The Programmable Serial Interface product for the Hewlett-Packard Series 200 Computers provides a spectrum of capabilities that can be tailored to meet your special datacomm and/or serial interfacing needs. The Programmable Serial Interface consists of two pieces - the Development package (98690A) and the interface card (98691A).

The 98690A Development Package contains the essential information and tools required by the sophisticated user to do firmware programming of the 98691A Programmable Datacomm Interface. The 98690A contains the Firmware Development Guide that describes the hardware and software, an extender board that allows access to the card while it is connected to the Series 200 Desktop Computer, one balanced and one unbalanced loopback connector, and a Starter Firmware Disc that provides the ASCII source code of the Z-80 routines listed in the Firmware Development Guide. The Starter Firmware Disc also contains a utility to download

the Z-80 ASCII source code to an HP 64000 Logic Development Station or similar Z-80 development station.

The Firmware Development Guide is intended for the OEM or End User as a foundation for designing applications-oriented communications products, and presupposes the ability of the user to understand and program Z-80 Assembly language/machine code and digital hardware. The manual, written with the programmer's perspective in mind, leads the reader from a general overview of the 98691A hardware and firmware capabilities to detailed specifics of the card.

The 98691A is a microprogrammable interface for the HP Series 200 Computer family. It is intended to be a foundation for designing application-oriented communications products. Firmware modules must be developed by the user to use this interface. By designing firmware unique to a particular application, the user has almost unlimited scope in the number of customized products that are feasible.

## 98628A Opt. 710 Programmable Datacomm Interface Card

One Z80A-SIO/serial I/O channel "USART" controller

- On full-duplex channel
- Synchronous and asynchronous communications
- CRC-16 or CCITT block frame check for synchronous operation
- Vectored interrupts

4K bytes of Static RAM for tables and/or buffers

One EPROM/ROM socket capable of using 2732s, 2764s or similar ROMs or any EPROM/ROM compatible with the JEDEC pinout. However, use of a particular EPROM may require installing a jumper on the board.

One Z80A-CTC Counter Timer Chip providing one system timer, and a programmable baud rate for the SIO channel

- Synchronous: Max 460K baud; Min. 50 baud
- Asynchronous: Max 57K baud; Min. 50 baud
- The maximum speed with an external clock is 736K baud for synchronous communications

Multidrop capability

Eight switches, accessible as two nibbles, which can control firmware functions

Physical Description

- size: 13.5 cm by 17 cm
- weight: 310 grams (11 oz)

Electrical Interface Compatibility

- RS-232C, V.24/V.28
- RS-449
- RS-423, V.10
- RS-422, V.11 (with user built cable)

Electrical Specifications: Interface Power Consumption

+ 5 volts	720 mA typical
+ 12 volts	37 mA typical
- 12 volts	60 mA typical

Accessory Power Consumption (supplied by the mainframe)

Accessory	+5 Typ	+12 Typ	-12 Typ
HP 13264A Current Loop Adapter	200 mA	90 mA	80 mA
HP 13265A 300 Baud Modem Adapter	100 mA	45 mA	45 mA
HP 13266A Data Link Adapter	30 mA	160 mA	23 mA

(If these pods are used, care must be taken not to exceed the power specification of the Series 200 I/O backplane)

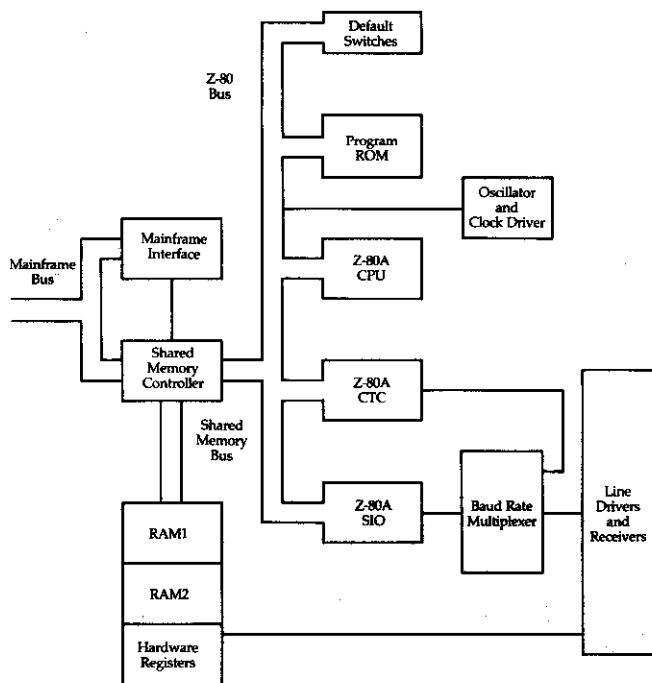


Figure 1

## Features

### 98690 Development Package

(all of the components of this package may be ordered separately)

#### Firmware Programming Guide

- PDI card block level description
- Operating characteristics of the Z-80 chip set in the PDI architecture
- Programming examples of each chip's features
- Detailed description of the PDI Modem and Control subsystem
- Hardware definition and operation of the Series 200 backplane interface
- Diagnostics information
- Reference material listings

#### Extender Board

- Allows access to the PDI hardware while it is connected to the Series 200 Desktop Computer

#### Starter Firmware Disc

- ASCII source code of all the routines listed in the manual in ASCII
- Download utility to download Z-80 assembly routines to an HP 64000 or similar Z-80 development station using a serial interface

#### Loopback Connectors

- Both balanced and unbalanced are provided
- Operate in conjunction with the 98628A exerciser on the System Test Disc.

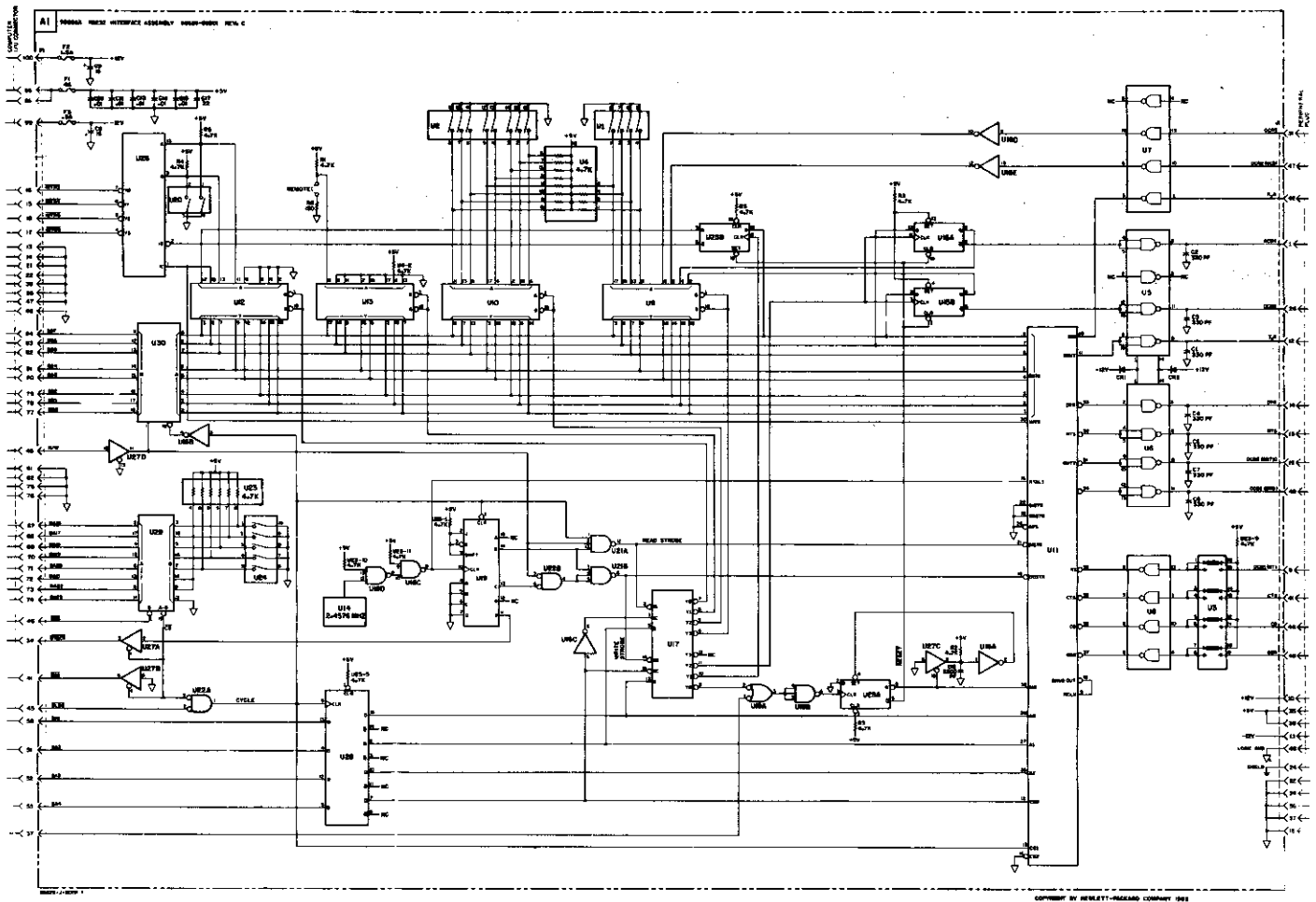


Figure 2 98691A Schematic Diagram

## Support

Because of the customizable nature of the Programmable Datacomm Interface, the support policies are as follows:

### Customer Support

- The 98690A PDI Development package will be included in the series 200 Software Notification Service. Notification of upgrades including ordering procedures to either the Firmware Development Guide or to the Starter Firmware Disc will be published in the Communicator Magazine.

### CE Support

- No monthly service contracts are offered, because if an HP Computer Engineer should accidentally damage a user ROM/EPROM, the liability incurred by Hewlett-Packard is ambiguous and potentially large. However, on-site hardware service can be specially arranged through the local HP office.
- No PDI card installation will be offered.
- The PDI board is eligible for exchange and repair, as long as all the firmware is removed.
- Except for the PDI board, systems including a PDI may still be covered by monthly maintenance contracts. HP Computer Engineers will service systems with PDIs installed. However, if the problem is isolated to the PDI card, the HP CE will not service the PDI card, and will charge for time and materials.

## Datacomm Licensing

Datacomm licenses for the 98628A Opt. 100 have been applied for in Germany, UK, Finland, Sweden, Norway and Denmark, and approved in Australia and by the German PTT. *These licenses do not apply to 98691A Programmable Datacomm Interface!* If you will be selling or using this product in any country requiring a datacomm license, you will have to submit a separate application for the PDI card with your personality ROM.

## Ordering Information

### Configuration Prerequisites

#### Hardware:

- Series 200 Desktop Computer with either a PASCAL 2.0 or BASIC 1.0 language system and standard memory or a custom driver for the 98628A interface.
- A microprogramming workstation such as the HP 64000 Logic Development Station.
- Optionally a Serial Link analyzer such as the HP 1640B

#### Expertise:

- You must be able to write, test and debug Z-80 firmware.
- Datacomm experience is highly desirable.



## Product Components

98690A Programmable Datacomm Interface Development Package (all components may be ordered separately)

98690-90001 Firmware Development Guide

09826-66544 Expander Board

5061-4248 Unbalanced Loopback Connector

5061-4247 Balanced Loopback Connector

## Media Options

Opt. 630 98690-10384 3½" Starter Firmware Disc

Opt. 650 98690-10584 5¼" External Format  
Starter Firmware Disc

Opt. 655 98690-10684 5¼" Internal Format  
Starter Firmware Disc

## 98691A Programmable Datacomm Interface

Opt. 001 RS-232 DTE (male) 4.6m cable with test connector

Opt. 002 RS-232 DCE (female) 4.6m cable with test connector

Opt. 003 RS-449/423 DTE (male) 4.6m cable with test connector

Opt. 099 No Cable