

Z80 PIO

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The Zilog **Z80 PIO** chip (aka Z84C20) is a **Dual 8bit** I/O Port (not to be confused with the **Triple 8bit** 8255 PPI chip, which is sometimes referred to as PIO, too).

Contents

- 1 Register Addressing
- 2 Data Registers A and B
- 3 Control Registers A and B
- 4 Usage in CPC
- 5 Datasheet

Register Addressing

The chip has B/A (Port B/A Select) and C/D (Control/Data Select) pins, which may be connected to the CPUs A0 and A1 pins (or vice-versa, A1 and A0) (or other pins like A3 and A4). Anyways, no matter how the addressing is done:

There are 4 registers - 2 Data registers, and 2 Control registers.

Data Registers A and B

Data direction can be configured in the corresponding control register. Depending on the direction, the data bits are inputs or outputs with following meaning:

7-0 Data (0=Low, 1=High)

Aside from the 8 data lines, each port additionally supports automatic /STROBE and READY handshaking signals (whereas, unlike as in printer ports, STROBE can act as an input, not an output), the handshaking stuff isn't used in Mode3.

Control Registers A and B

When D0=0:

7-1 Interrupt Vectors Bit7-1 (Vector Bit0 is fixed = zero)
0 Must be 00h

When D0..D3=03h:

```

7   Interrupt Enable (1=Enable) (same as when D0..D3=0Fh)
6-4 Not used (should be zero)
0-3 Must be 03h

```

When D0..D3=07h:

```

7   Interrupt Enable (1=Enable)
6   Interrupt AND/OR (0=OR, 1=AND) ;\
5   Interrupt High Low (1=High)    ; used in Mode3 only
4   Interrupt Mask Follows          ;/    ;<--- also ACK interrupt?
0-3 Must be 07h

```

When D0..D3=0Fh:

```

7-6 Mode (0=out, 1=in, 2=bidirectional,3=control) (mode2 on PortA only)
5-4 Not used (should be zero)
0-3 Must be 0Fh

```

After Mode3 (control mode) was set, then next control write is:

```

0-7 Direction bits, separately for each pin (0=out, 1=in)

```

After InterruptMaskFollows was set (in Mode3 only?), then next write is:

```

0-7 Select bits to be monitored (in OR mode: 0=Select)

```

Usage in CPC

A **Z80 PIO** is used by the following CPC hardware expansions:

- ACU Real Time Clock (DIY)
- Dk'tronics Real Time Clock
- PDS development system

Datasheet

- Media:Z80pio z84c20.pdf - Zilog Z80 PIO Datasheet

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