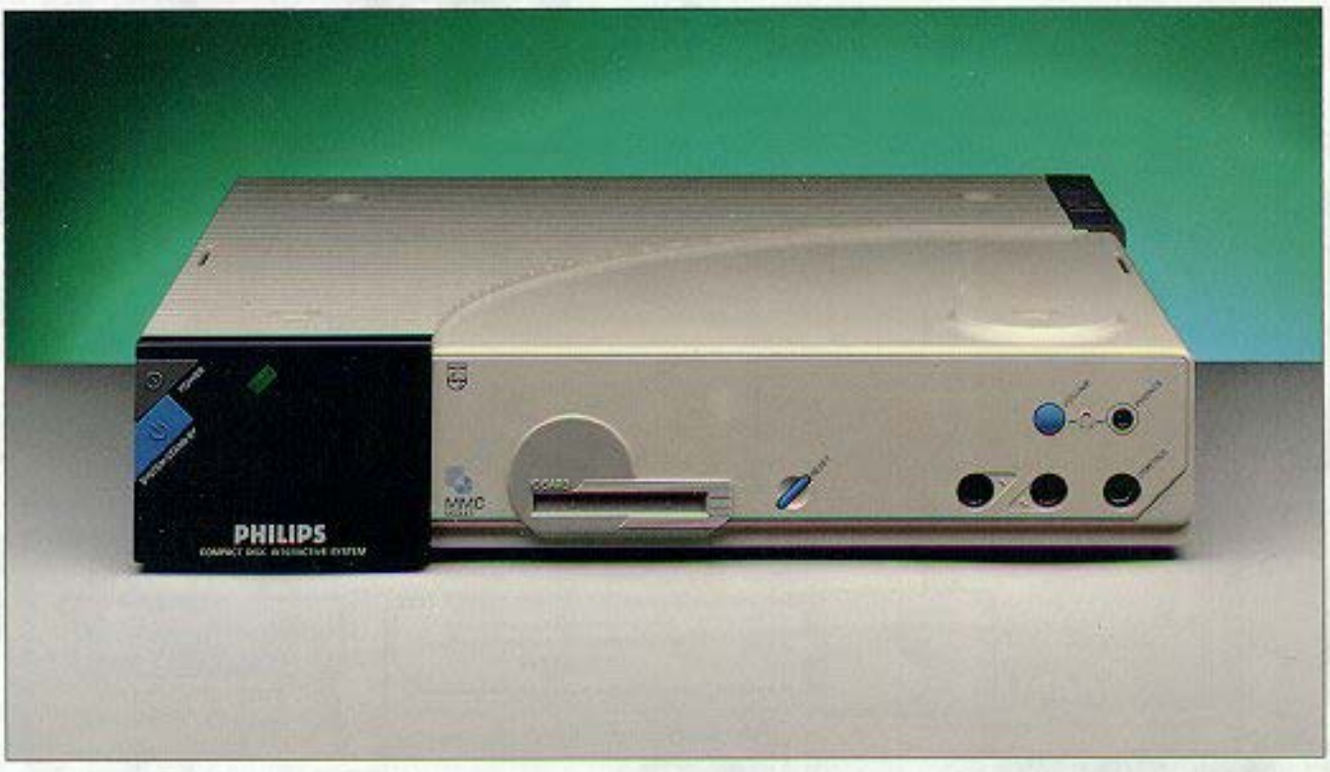
Interactive
Media
Systems

CD-I

CDI-181



Multi Media Controller CDI 181

Features

- **Part of Philips Modular CD-I system**
- **Operates with CDI 180 Player module**
- **Performs all system control, signal processing and interfacing functions**
- **Supplied with remote control pad and mouse for interactive control of disc playing**
- **Provides CPU bus interface for connection to CDI 182 Extension module**
- **RS232 serial communication option available**
- **Intended for professional and institutional use**

The CDI 181 Multi Media Controller (MMC) is the key module of the Philips advance-technology CD Interactive System. The heart of the system, it operates in conjunction with the Philips CDI 180 Player module. This two-module configuration forms the basic Philips stand-alone CD-I system. The memory capacity and communication capability of this basic system can be extended by adding a third, CDI 182 Expansion module, if required. The CDI 181 is supplied with its remote control unit and a mouse, as standard. The function of the CDI 181 is to undertake overall system control, signal pro-

PHILIPS

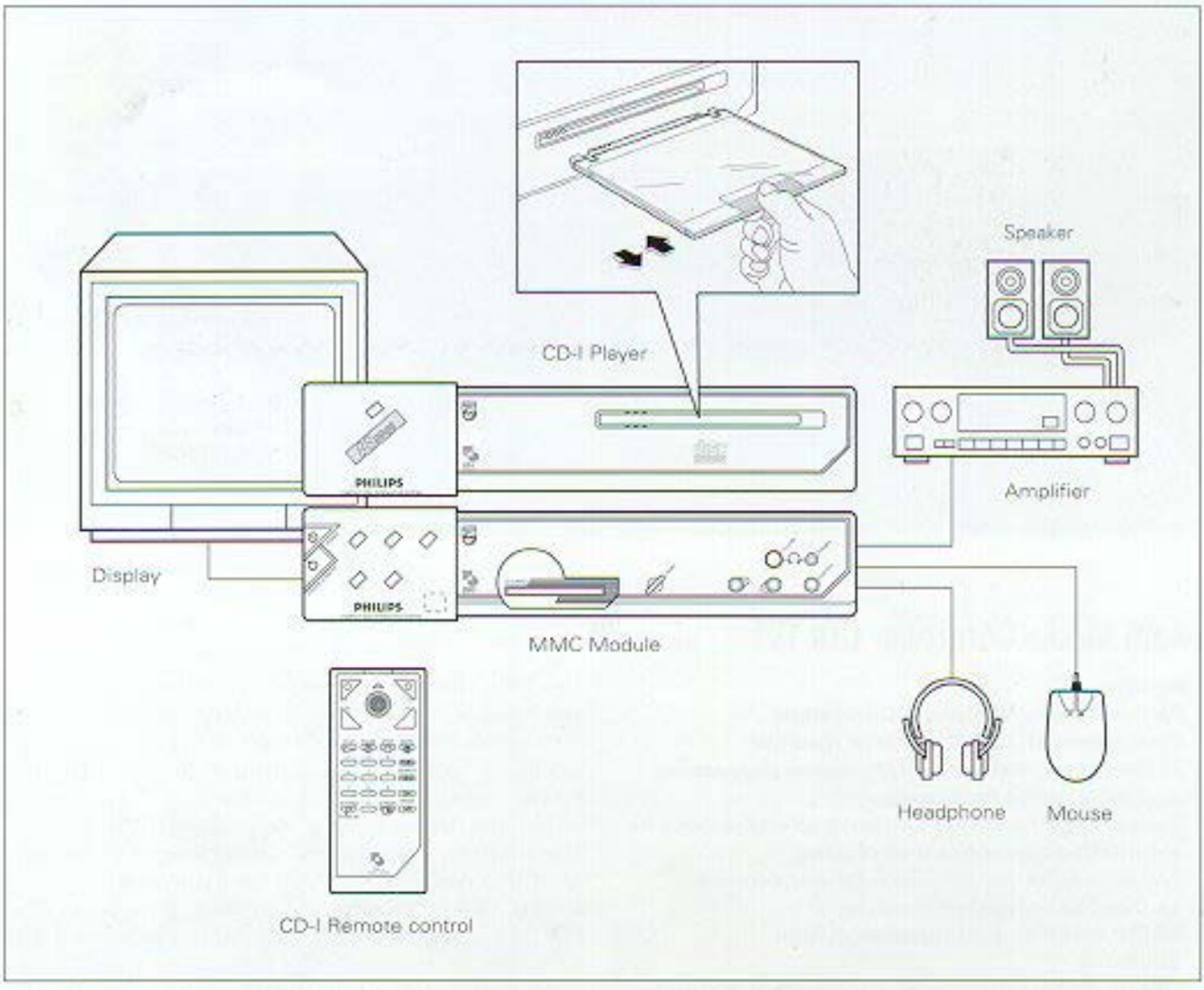
PHILIPS

cessing and system interfacing functions. It provides all the control signals for the CDI 180 Player module and then processes the output digital signal from this unit. Its ultimate function is to provide analog signal outputs to the video/TV monitor and the associated audio system. As the control unit for the system, it can be used in a standby mode if required, for fast switch-on.

INTELLIGENT MODULE

The CDI 181 Multi Media Controller is a microprocessor-controlled intelligent module. Resident system software ensures fast system access to offer a precise, meaningful man/machine interface. This provides the user with quick-action, wide-ranging control over all the essential CD-I playing functions. The monitor, audio system and headphone connections are directly connected to this module. It also provides the display and adjustment controls for the clock/data settings.

All user control devices - remote control or mouse - are also connected to the MMC module. For this reason, it also houses the IR receiver for the remote control pad. The MMC is, by virtue of its function, the terminal unit for all system components external to itself. So, in addition to those already mentioned must be included, all digital or analog input/output signals (including the output from the CDI 180 Player module) any 'add-on'options such as RS232 serial communication interface, printer, keyboard, joystick, etc. The CDI 182 Expansion module is also connected to the MMC if added to the system. To complete thislist of items is the master power on/off switch and the standby switch, located on the front panel.



CHOICE OF AUDIO BANDWITHS

The CD-I program producer has the choice of several audio quality levels, depending on the application requirement. The critical factors are bandwidth related to the (percentage) volume of the data stream that will be taken up. The four available options allow the disc producer/creator a wide range of possibilities. These are listed in the associated table.

For example, A-level audio with its flat frequency response up to 17kHz will utilize 50% of the data stream in stereo playback. Yet C-level will produce excellent quality for most applications, using only 12% (in stereo) of the data stream. The range of options provided (see table) allows a wide choice from high quality speech to super Hi-Fi; a range that will satisfy all practical CD-I audio requirements. Another feature of interest to the CD-I producer is the 16-channel mono facility (item C in table). This allows, for example, an extensive multi-language capability.
These and other audio features provide the program producer with unlimited possibilities for the achievement of the best possible results.

VIDEO COMPRESSION

A series of different video compression techniques are available. These provide the program creator with the opportunity to optimize the quality of all types of video material to achieve the best possible visual results. This facility also provides the parallel advantage of be able to make the most economical use of digital storage space.

For example, where conventionally-coded RGB graphics would occupy 300kbyte of digital storage space and take two seconds to load, video compression can reduce these figures to 100kbyte and less than one second.

The compression techniques provided include;
DYUV (for photographic images) RGB and CLUT (for text and complex graphics), as well as run-length (for text cartoons/graphics with large colour blocks) are possible.These features are of great benefit to the user in terms of excellent video presentation of whatever visual material is used and, with a gain of approximately 20% data storage, optimal program content per disc.

Level	Bandwidth	No. of channels	Fraction of CD-I data rate used per ch.
• CD digital audio 16b PCM (super Hi-Fi)	20kHz	1 stereo	1/1
• CD-I ADPCM audio level			
A (Hi-Fi music mode-equiv. to HiFi)	17kHz	2 stereo 4 mono	1/2 1/4
B (HiFi music mode-equiv. to FM broadcast)	17kHz	4 stereo 8 stereo	1/4 1/8
C (quality speech mode-equiv. to AM broadcast	8.5kHz	8 stereo 16 mono	1/8 1/16

OVERLAY

The video planes can be made visible or transparent, as dictated by the program. As an example, text in run length code could be overlaid with, say, a natural picture that has been produced in the most convenient way. This allows the program creator the op-portunity for providing the user with the best possible, easy-to-read displays.

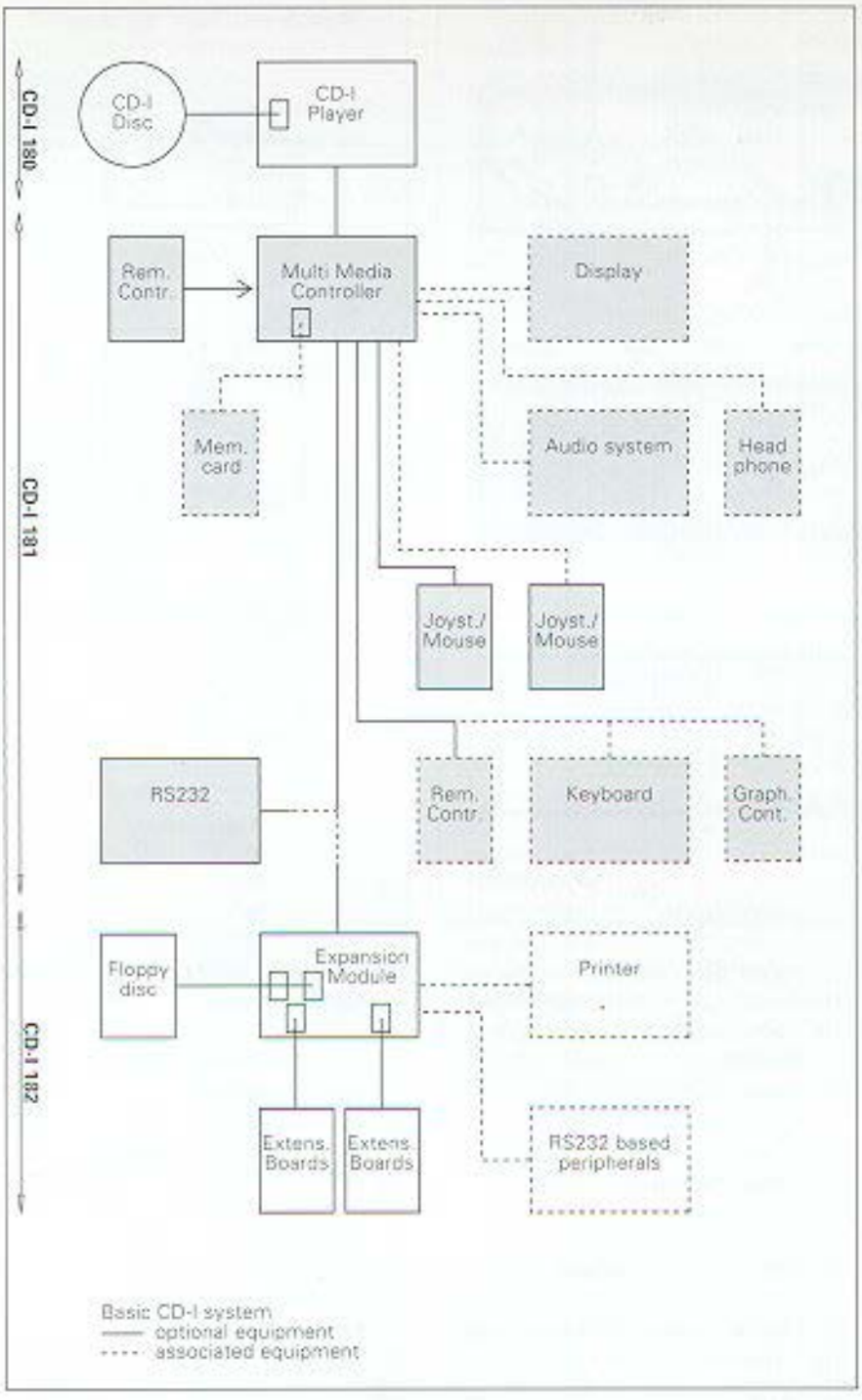
Two of the four video planes are used for the graphic cursor and background colour, respectively. The remaining two are for the CD-I video display, allowing the program producer to make full use of cuts, dissolves, smooth X-Y scrolling, CLUT animation and other facilities. These include updating any part of a visual field (independently of the rest) and trading-off picture resolution against visual data throughput.

MOVING VIDEO INTEGRATION

Any display in use can be simultaneously supported by full motion video images or scenes in real time. This is yet another feature which allows the program producer maximum exploitation of the CD-I principle.

PERSONAL MEMORY CARD

There will be occasions when a program producer wishes to protect work already accomplished during the creation of a program. The Personal Memory Card allows this to be done. It can also be used to store, for instance, a musical score, or other valuable data. And the situation may arise when a user wishes to keep a certain program secure - possibly for a restricted viewing group. The card can also be used in this way. In practice it becomes an extension to the resident non-volatile RAM memory. To utilize this feature, the card holder simply inserts the PMC into a slot conveniently located on the front panel of the MMC.



RESIDENT USER PROGRAM

The MMC contains a system control program which has the function of providing a simple, consistent and easy-to-use man/machine interface to start CD-I applications, to display and adjust clock/data settings, and to execute some system maintenance functions. The standard control screen offers the user the choice of a number of operating modes and functions, after an initial graphic lead-in:

- Clock/calendar - perpetual calendar showing local date and time and a 'world clock'. Includes time/date set mode.
- CD-I system functions showing selection capabilities, if valid, for e.g. functions for use of the personal memory card.
- CD audio play with functions for display and selection of play sequence plus play/pause and time-related sleep/wake-up facilities.
- Start CD-I capplication.

TECHNICAL DATA

Interfaces

- Digital output (DO):
  -Connector - Cinch
  -Signal - sampling frequency 44.1kHz +/- 5%
- Control signal (RS):
  -Connector - Cinch
  -Signal - asynchronous at 1200 baud
- Clock signal (clock):
  -Connector - Cinch
  -Signal - 22.5792MHz

Video

With TV line selector in position

- 525 lines (NTSC):
  -CVBS - Cinch - 1Vpp 75 Ohm
  -Y/C - Mini DIN - 1Vpp 75Ohm
  -RGB - D-shell 15 - 1Vpp 75 Ohm
- 625 lines (PAL/SECAM):
  -RGB - D-shell 15 - 1Vpp 75 Ohms

Audio output

Connectors 2 x Cinch - 2Vrms typical at 10k Ohm

Mouse/joystick input

ports (2):
-Connector - mini DIN 9-pin

- Remote control input
  -Connector - mini DIN 8-pin
- Headphone (stereo)
  -Connector - 3.5 mm socket
- CPU bus
  -Connector - 100-pin board edge

Optional RS 232

Connector - D-sub 9-pin

Optional Personal Memory Card

Slot in front

Power supply

CDI 181/20 - 220V 50/60Hz
/25 - 240V 50/60Hz
/37 - 120V 50/60Hz

Consumption

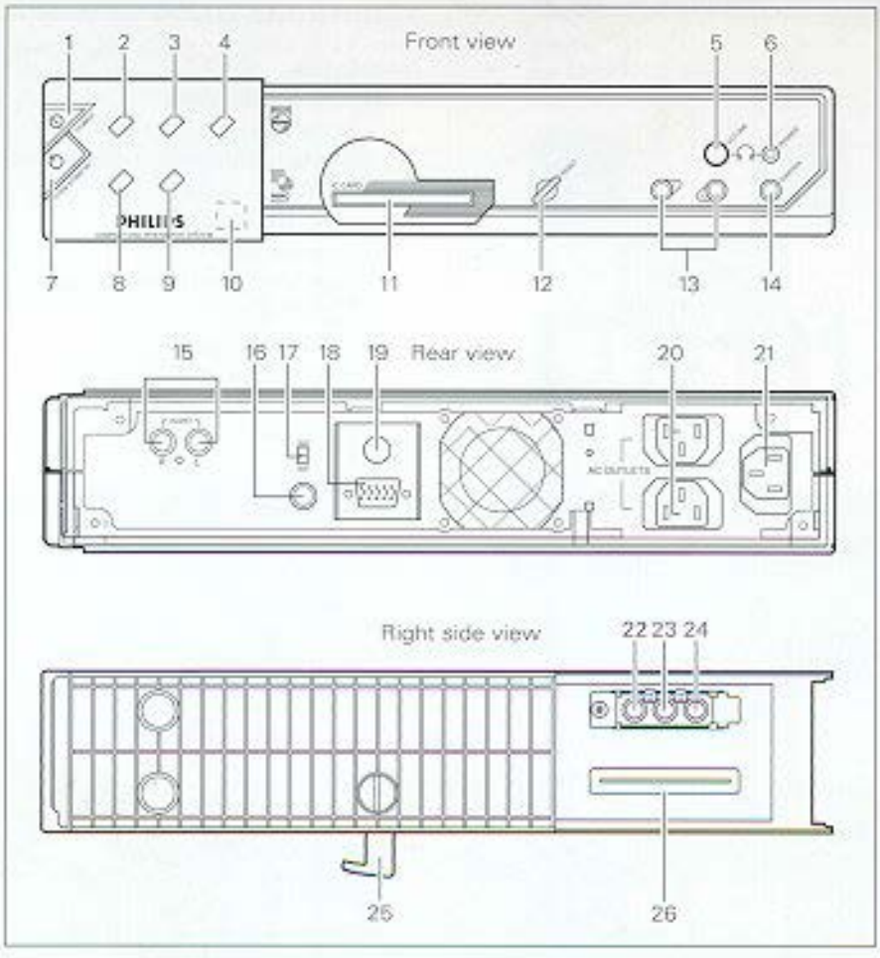
40W approx.

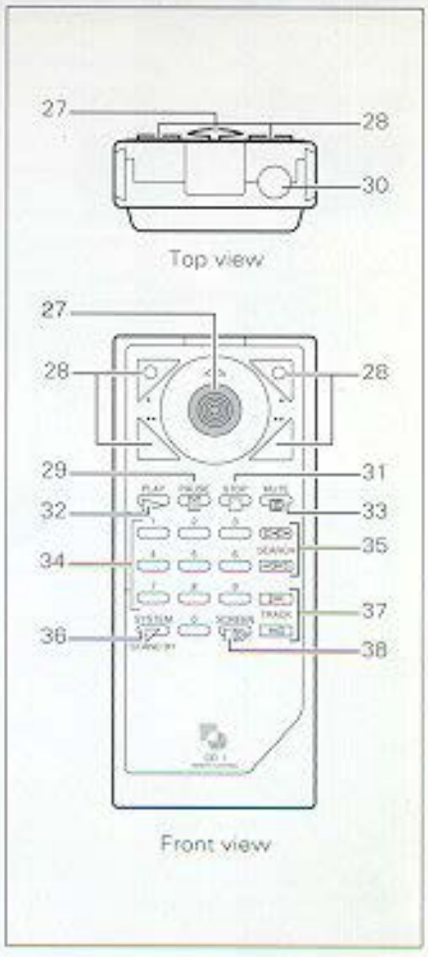
Dimensions (w x h x d)

-360 x 75 x 362 mm
-14.2 x 3 x 14.25 in.(approx.)

Weight

-6kg
-13.2lb (approx)





MMC CONTROLS AND CONNECTIONS

1 Power switch
2 Power on/off indicator
3 Standby indicator
4 IR sensor indicator
5 Headphone volume control
6 Headphone jack
7 Standby push button
8 CD-Interactive-indicator
9 CD digital audio indicator
10 IR receiver
11 Personal memory card slot
12 Reset switch
13 Joystick/mouse ports
14 Input device port
15 Audio L/R connector
16 Video output connector (CVBS)
17 Video output selector 625/525
18 Video connector (RGB)
19 Video connector (Y/C)
20 AC power outlets (2)
21 AC power input
22 Clock output (Clock)
23 Digital output (DO) interface
24 Control signal (RS) interface
25 Mechanical interlock
26 CPU bus interface/RS232 option

REMOTE CONTROL UNIT FUNCTIONS

27 Cursor control device
28 Action buttons
29 Pause
30 Input device connector
31 Stop
32 Play button
33 Mute button
34 0 - 9 numeric keys
35 Search button (forward/reverse)
36 Standby button
37 Track buttons (next/previous)
38 Screen button

PACKAGE CONTENTS

CDI 181 Multi Media Controller
Mouse
Remote Control Unit
Batteries R6 - 1.5V - for remote controller
Input device connecting cable
CVBS video cable (for NTSC version only)
Left and right audio cables
AC power cable

TABLE OF INTERFACES

DO

-Connector:	Cinch
-Signal:	sampling frequency 44.1kHz +/- 5%

RS

-Connector:	Cinch
	Signal serial, asynchronous at 1200 baud

RF

NTSC system

CVBS

NTSC system	
Connector:	Cinch
Signal:	1Vpp into 75 Ohms

RGB

Connector:	D sub-15
Pin-out:	
Pin No.	Name:
1	Red
2	Green
3	Blue
4	STATUS RGB
5	NC
6	Red GND
7	Green GND
8	Blue GND
9	STATUS CVBS
10	GND
11	NC
12	NC
13	C sync (TTL
14	NC
15	C sync

Audio

Connector:	Cinch (x 2) for left & right signals
Signal:	2Vrms

CPU bus

Connector:	100-pin board edge

IIC bus

Connector:	mini DIN 8-pin

Mouse/Joystick

Connector:	mini DIN 9-pin	
Pin-out:		
Pin No.	Name:	I/O
1	Data0	I
2	Data1	I
3	Data2	I
4	Data3	I
5	VCC	5V+/- 10%, 50mA
6	SW-L	I
7	SW-R	I
8	STB	O
9	GND	-

IC card

Connector:	40-pin (1mm pitch)

interface

Capacity:	max 265kb
Access time:	max 350ns

IR

Range:	20 - 700cm

interface

Receiving angle:	30 degrees either side of centreline

RS232-C

Connector: male type	D-sub 9-pin -

interface

Pin-out:		
Pin No.	Name	I/O
1	-	-
2	Receive data	I
3	Transmit data	O
4	-	-
5	Signal GND	-
6	-	-
7	Request to send	O
8	Clear to send	I
9	-	-

Headphone

Connector:	mini headphone jack, 3.5mm dia.

output

Controls:	manual volume control

Philips International B.V.
Interactive Media Systems
PO Box 218
5600 MD Eindhoven
The Netherlands

PHILIPS