Cables & Connectors

Classe 3IA
A.s.2014-`15

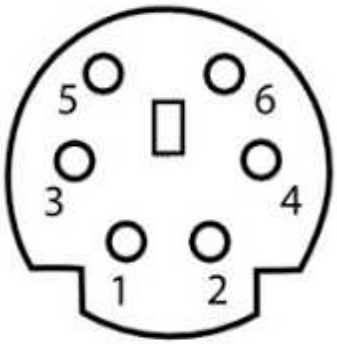
THE CABLE PS/2

The cable PS/2 allows transmission of data. This transmission is unidirectional. This cable connect mouse or keyboards to computer.
The cable is made of copper.

The pin out is composed from 6 pin but only 4 pin are used:

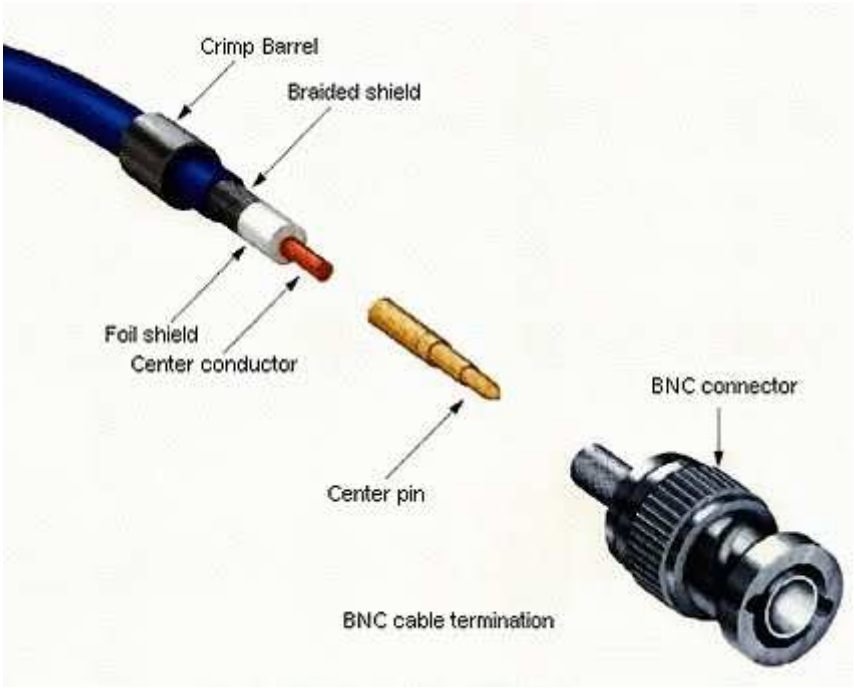
- Ground
- Power supply (+5V from Computer to peripheral)
- Signal (unidirecional)
- Clock (from computer to peripheral)

The two remaining pins can be used for a second device thanks to the use of an Y-adapter.This can be done because the power supply and ground pins can be shared.
With each click of the mouse the cable ps/2 sends a series of 3 bytes.



<u>Mouse now:</u>
The PS / 2 cable is less used to connect the mouse to computer and now have spread the USB mouse or Wireless mouse.

BNC connector



The BNC connector is a quick connect/disconnect connector used for coaxial cable. The material used to product this cable is copper.

It features two bayonet lugs on the female connector. They are used with television or security cameras to deliver a medium quality and analog video signal.

BNC connectors are made to match the characteristic impedance of cable at either 50 ohms or 75 ohms. It is usually applied for frequencies below 4 GHz and voltages below 500 volts. This cable isn't alimentated.

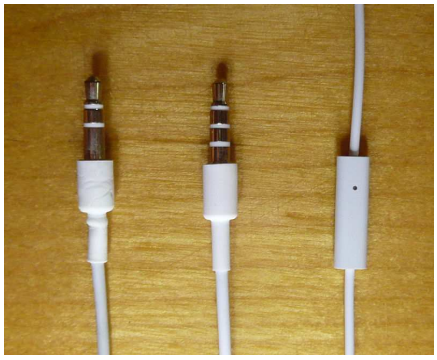
SCART - JACK cable

CAVO AV SCART
Direzione del segnale: Scart -> S-VHS
The type of material is Copper
Type : audio(Stereo bidirezionale) and Video composito (bidirezionale)
c**haracteristic:**
lenght medium is 1 metre

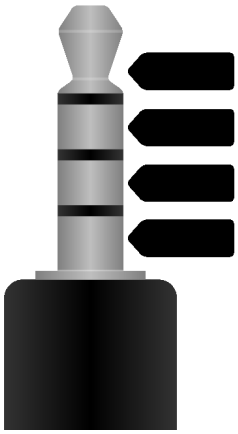
PIN OUT

Pin 1	Audio output (right)
Pin 2	Audio input (right)
Pin 3	Audio output (left/mono)
Pin 4	Audio ground
Pin 5	RGB Blue ground (pin 7 ground)
Pin 6	Audio input (left/mono)
Pin 7	RGB Blue up S-Video C down Component PBup
Pin 8	Status & Aspect Ratio up 0–2V→off +5–8V→on/16:9 +9.5–12V→on/4:3
Pin 9	RGB Green ground (pin 11 ground)
Pin 10	Clock / Data 2 Control bus (AV.link)
Pin 11	RGB Green up Component Y up
Pin 12	Reserved / Data 1
Pin 13	RGB Red ground (pin 15 ground)
Pin 14	Usually Data signal ground (pins 8, 10 & 12 ground)
Pin 15	RGB Red up S-Video C up Component PR up
Pin 16	Blanking signal up - RGB-selection voltage up 0–0.V → composite - 1–3V → RGB
Pin 17	Composite video ground (pin 19 & 20 ground)
Pin 18	Blanking signal ground (pin 16 ground)
Pin 19	Composite video output S-Video Y output
Pin 20	Composite video input S-Video Y input
Pin 21	Shell/Chassis

APPLE AUDIO DEVICE (3,5mm Mini-Jack)



1. Apple Stereo Mini-Jack (no AUX)
2. Apple Stereo TRRS Mini-Jack
3. Apple Mic & Control Button



Type	Copper, Plastic, Gold (plated)
Devices	Audio Devices (Apple)
Connector	Apple Mini-Jack (3,5 mm)
Features	Stereo TRRS Balanced Sound Max length of cables : 10 mt Mic & Control Button

Pin out

Tip	L	Left Audio
Ring 1	R	Right Audio
Ring 3	GND	Ground
Sleeve	AUX	Microphone

**There are two variants of TRRS standard: OMTP (L, R, AUX, GND) used in old mobiles, and CTIA/AHJ used in newest devices (Apple, HTC, latest Samsung and Nokia phones)

Other information	3,5 mm Mini-Jack were been used since 1981 and the latest Apple headset is the EarPod

DVI CABLE

Type — Copper, plastic and metal

Devices — Output video devices

Connector — DVI-I (single link), DVI-I (dual link), DVI-D (single link), DVI-D (dual link), DVI-A

Features
Maximum clock frequency: 25 .175 MHz
Maximum resolution supported: 2 .75 megapixels at 60 Hz
Maximum data rate: 4 .95 Gbps
General cable lengths :4 .6 m (display resolution up to 1920 x 1200)
Longer cables: 15 m (display resolution up to 1280 x 1024 or lower)
Bits for each pixels : 24 bits

Pin out

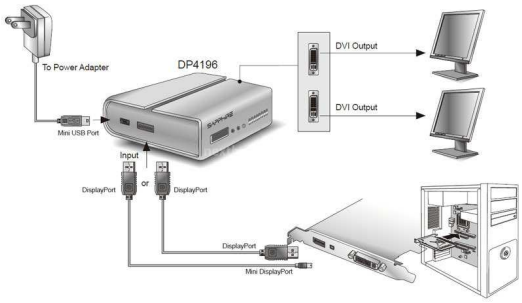
1	T.M.D.S DATA 2-	16	HOT PLUG DETECT
2	T.M.D.S DATA 2+	16	HOT PLUG DETECT
3	T.M.D.S DATA 2/4 SHIELD	17	T.M.D.S DATA 0-
4	T.M.D.S DATA 4-	18	T.M.D.S DATA 0+
5	T.M.D.S DATA 4+	19	T.M.D.S DATA 0/5 SHIELD
6	DDC CLOCK	20	T.M.D.S DATA 5-
7	DDC DATA	21	T.M.D.S DATA 5+
8	ANALOG VERT. SYNC	22	T.M.D.S CLOCK SHIELD
9	T.M.D.S DATA 1-	23	T.M.D.S CLOCK+
10	T.M.D.S DATA 1+	24	T.M.D.S CLOCK-
11	T.M.D.S DATA 1/3 SHIELD	C1	ANALOG RED
12	T.M.D.S DATA 3-	C2	ANALOG GREEN
13	T.M.D.S DATA 3+	C3	ANALOG BLUE
14	+5V POWER	C4	ANALOG HORZ SYNC
15	GND	C5	ANALOG GROUND

DDC = Display Data Channel
T.M.D.S. = Transition Minimized Differential Signal

Other information — The DVI is used to connect a video source, such as a display controller to a display device, such as a computer monitor. It was developed with the intention of creating a standard for the transfer of digital video content.

The cost of one connector is about from 10 euros to 50 euros for connector with an high data signal connection.
The DVI connector on a device is given one of three names, depending on which signals it implements:
-*DVI-D* (digital signal only, single link or dual link)
-*DVI-A* (analog signal only)
-*DVI-I* (integrated, combines digital and analog signal in the same connector; digital may be single or dual link)
The difference between the single- link and dual- link is that the single-link carries up to 165 million pixels for second using three digital signals (RGB) while in dual-link mode alongside the channel used by Single Link interface there is a second channel data.This new channel is always implemented with three digital signals (RGB) ; In this way you can carry twice as much data interface Single Link.
It is often placed on computers , televisions and video projectors that require high definition. DVI is implemented in all video cards of the latest generation, the images that use DVI interfaces are very sharp.

DISPLAYPORT



Type Copper alloy or optic fiber

Devices Video card to Display

Connector Audio and Video connector

Features High speed transfer rate
Bit rate : version 1.1: 8.64 Gbit/s - version 1.3: 32.4 Gbit/s
Max length of cables : 15 mt Protocol : Micro packages

Pin out

1	ML_Lane 0(p)	Signal "true" for Lane 0	10	ML_Lane 3(p)	Signal "true" for Lane 3
2	GND	ground	11	GND	ground
3	ML_Lane 0(n)	"Complementary"signal for lane 0	12	ML_Lane 2(n)	"Complementary" signal for lane 3
4	ML_Lane 1(p)	Signal "true" for Lane	13	GND	ground
5	GND	ground	14	GND	ground
6	ML_Lane 1(n)	"Complementary" signal for lane 1	15	AUX_CH(p)	"true" signal for auxiliary channel
7	ML_Lane 2(p)	Signal "true" for Lane 2	16	GND	ground
8	GND	ground	17	AUX_CH(n)	"complementary" signal for auxiliary channel
9	ML_Lane 2(n)	"Complementary" signal for lane 2	18	Hot Plug	Hot Plug notice
10	ML_Lane 3(p)	Signal "true" for Lane 3	19	DP_PWR Return	Ground supply connector
11	GND	ground	20	DP_PWR	Supply connector

The principal link of DisplayPort connector is organized in 1,2 or 4 pair of differential lines for data, that transport also audio and clock signal, in addiction to video signal.

Other information The standard DisplayPort it's a standard of video interface, promoted by VESA (Video Electronics Standards Association) for replace the old connectors (like HDMI, VGA...)

FIREWIRE

Type — Interface standard for a serial bus for high-speed

Devices — Media devices

Connector — Alpha FireWire 400

Features — Max length of cables 4,5m
noone don't have to do the identification
Max speed: 400Mbps for the first version and 800Mbps for the second
it works on every platform

Pin out — IEEE 1394 with 6 pin:

Pin 1	Power	Unregulated DC; 30 V no load
Pin 2	Ground	Ground for power and inner cable shield
Pin 3	TPB-	Twisted-Pair B, differential signals
Pin 4	TPB+	Twisted-Pair B, differential signals
Pin 5	TPA-	Twisted-Pair A, differential signals
Pin 6	TPA+	Twisted-Pair A, differential signals
Shell	Outer	Cable shield

IEEE 1394 with 4 pin:

Pin 1	TPB-	Twisted-Pair B, differential signals
Pin 2	TPB+	Twisted-Pair B, differential signals
Pin 3	TPA-	Twisted-Pair A, differential signals
Pin 4	TPA+	Twisted-Pair A, differential signals
Shell	Outer	Cable shield

It transfers data in serial or parallel way and it shares data in real time

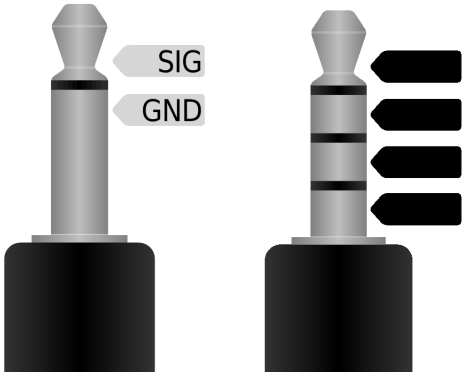
Other information — There are a lot of cables in the market but, if you can, take the most flexible.

JACK

Features Max length of cables : 50 mt

Pin out

Pin 1	GND	Ground
Pin 2	SIG	Signal Output (Mono)
Pin 3	L	Left Channel (Stereo)
Pin 4	R	Right Channel (Stereo)
Pin 5	AUX	Auxiliar



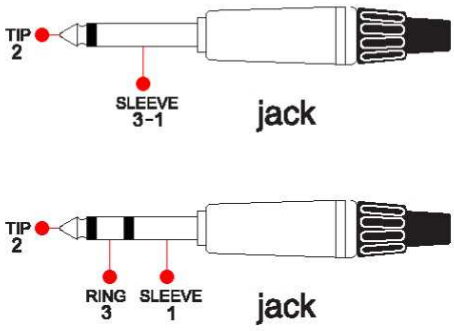
Other information

Version:

Jack 7,13 mm
Jack 6,3 mm
Jack 4,4 mm
Jack 3,5 mm
Jack 2,5 mm

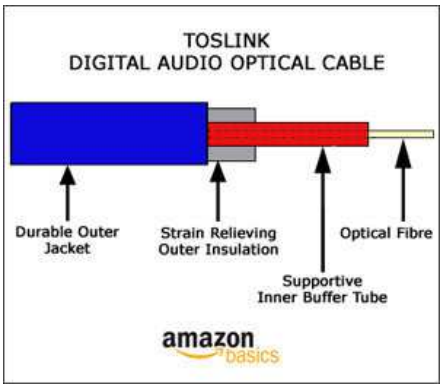
AUDIO CONNECTORS

Phone Jack



Type	Metal and rubber
Devices	Audio devices like computers, phones, MP3, radios, portables devices...
Connectors	Female jack connectos
Features	There are 3 versions: - TS (Tip Sleeve): sends mono signal or unbalanced signal - TRS (Tip Ring Sleeve): sends stereo signal or balanced signal - TRRS (Tip Ring Ring Sleeve): used for send video and audio Every version could be a - jack, diam. 6,3mm - mini-jack, diam. 3,5mm - supermini-jack, diam. 2,5mm There are, for everyone, a female jack connector and a male jack connector
Pin out	- In the TS version the sleeve is the ground and the tip sends the signal - In the TRS stereo the sleeve is the ground, the ring sends the right channel and the tip sends the left channel - In the TRS balanced the sleeve is the ground, the ring is the negative pole and the tip is the positive pole - In the TRRS there are two variants. In the firts one the sleeve is the ground, the second ring is the auxiliary channel (AUX), the first ring is the right channel and the tip is the left channel. It's used in the old phones with the OMTP (Open Mobile Terminal Platform) standard In the second one the sleeve is the auxiliary channel, the second ring is the ground, the first ring is the right channel and the tip is the left channel. It's used in new phones with the CTIA standard
Other informations	

OPTICAL CABLE



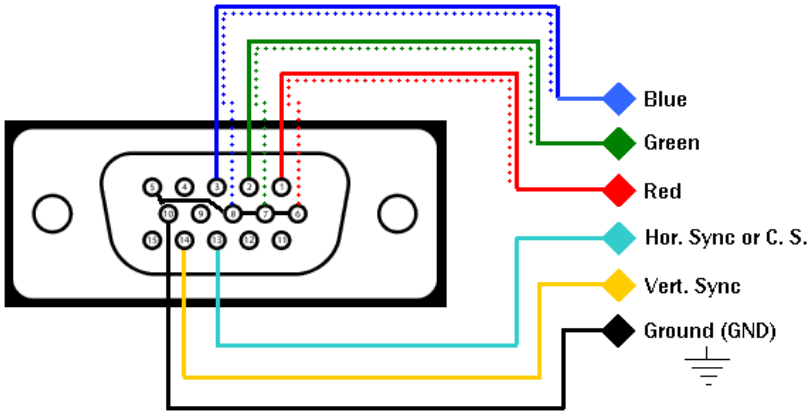
TYPE	Optical digital fiber connectors system.
DEVICES	Storage devices (AUDIO)
CONNECTO	TOSLINK cable with a round connector.
FEATURES	**Audio signal:** Digital audio bitstream. Originally limited to 48 kHz at 20 bits. Extended to support all modern formats (Depending on manufacture and specification). **Cable :** optical fiber ~10m (33 ft) maximum **Pins** : 1 **Connector:** JIS F05 (JIS C5974-1993 F05) **Width** : 32-bit audio packets **Bitrate** : Originally 3.1Mbit/s; now 125Mbit/s **Max. devices** :1 **Protocol** :Serial
PIN OUT	THE OPTICAL AUDIO CONNECTORS HAVE ONLY ONES PIN
Other informations	TOSLINK can use cable make by ottical fiber in plastic(1mm) the cheaper or cable in plastic multilayer or also in quartz glass, this depending of the bandwidth.

Type	Metal, fiber optic
Devices	Audio/ Video connector
Connector	RCA Connector
Features	Bit rates: 6,144 Mbs High resolution audio Protocoll: NTSC, PAL and SEAM
Pin out	

Pin 1	G	Ground
Pin 2	Y	Video
Pin 3	L	Left audio channel
Pin 4	R	Right audio channel

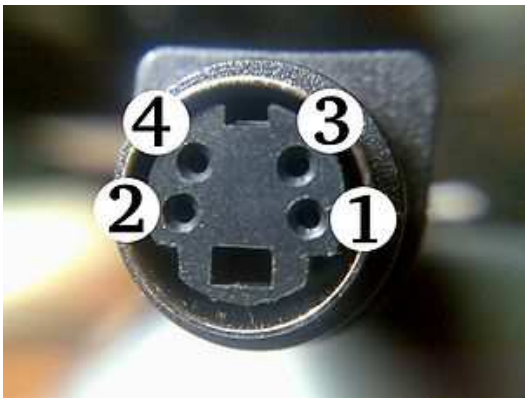
Other information	It cannot support uncompressed lossless formats require much greater bit-rates

VGA



type	copper
devices	Video devices
connector	DE-15
features	software-based image alignment with certain graphics cards
Pin out	Pin 1 RED red video pin 2 GREEN green video pin 3 BLUE blue video pin 4 N/C not connected pin 5 GND ground(HSync) pin 6 RED_RTN red return pin 7 GREEN_RTN green return pin 8 BLUE_RTN blue return pin 9 SENSE +5 v DC from gfx adapter pin 10 GND ground (Vsync, DDC) pin 11 N/C not connected pin 12 SDA PC data pin 13 Hsync horizonal sync pin 14 Vsync vertical sync pin 15 SLC PC clock
Other information	widely it extended by the numerous extensions to VGA made by other manufacturers , such as Super VGA

S-VIDEO



Type	Copper
Devices	Video devices
Connector	Mini DIN
Features	Bit rate : date unavailable because S-video cable transmits analog signal Protocol : NTSC, PAL or SECAM Standard Max length of cables : 5 mt (otherwise you lose transmission quality)

Pin out

Pin 1	GND	Ground (Y)
Pin 2	GND	Ground (C)
Pin 3	Y	Intensity (Luminance)
Pin 4	C	Color (Chrominance)

The S-video cable carries video using two synchronized signal and ground pairs, called Y and C. Y is the luma signal, which carries the luminance. Luma represents the achromatic image, while the chroma (C) components represent the color information of the picture. C signal contains both the saturation and the hue of the video.

Other information

S-Video means Separate video (not Super video), in many European Union countries, S-Video is less common because of the dominance of SCART, usually fitted to every TV. It is not usual to find S-Video outputs on video equipment.
Non-standard 7-pin mini-DIN connectors are used in some computer equipment . A 7-pin socket accepts, and is pin compatible, with a standard 4-pin S-Video plug. The three extra sockets may be used to supply composite (CVBS), for compatibility with devices that don't support S-video input. The pinout usage varies among manufacturers. In some implementations, the remaining pin must be grounded to enable the composite output or disable the S-Video output.
9-pin connectors are used in graphics systems that feature the ability to input video as well as output it (Video In Video Out (VIVO)). Again, there is no standardization between manufacturers as to which pin does what.

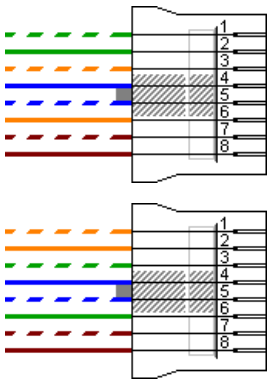
MINI JACK

Type	Copper, plastic and nickel
Devices	Amplifier device
Connector	Mini Phone
Features	High speed transfer rate Bit rate : 10 Gbps Max length of cables : 5 mt

Pin out

Pin 1	Ground	Ground
Pin 2	Ground	Negative / “Cold”
Pin 3	Signal	Positive / “Hot”

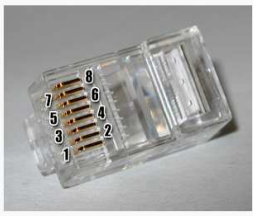
Other information: these cables are very popular today and are used in most devices: phones, computers, iPods etc. They are used to amplify sounds. Cable 3.5 mm is the most widespread



RJ 45

Type	Copper; Contact : Brass Plating Area : 10-20m inches Nickel over selective gold plating 6µ inches Housing → Thermoplastic Specification → UL 94 V-0
Devices	Ethernet Computer Network cables
Connector	RJ45 (T-568A or T-568B)
Features	- Maximum Bit Rate: 3 Mbit/s to 100 Gbit/s - Max length of cables : 100 mt - It has two paired components: the male plug and the female jack, each with eight equally-spaced conducting channels - It features eight pins to which the wire strands of a cable interface electrically - Fast,reliable and easy termination system - Conductors push all the way through the connector - Wire sequence is easy to verify before crimping - Results in reduced scrap – no wasted crimps - Tools crimp and trim conductors in one operation - Clean, ultra flush trim (blades are replaceable) - Minimal training required - Saves time - Saves cost

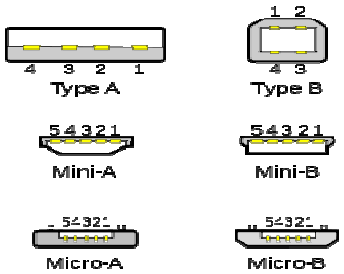
Pin out

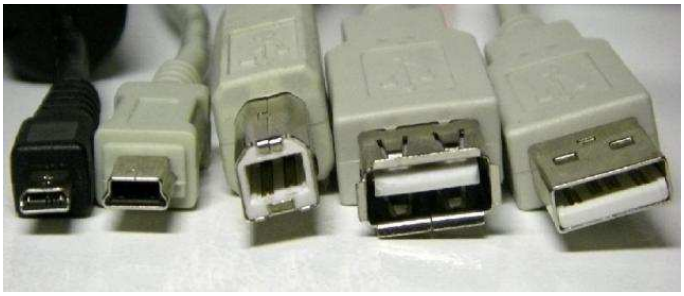
Pin	T568A Pair	T568B Pair	1000BASE-T Signal ID	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	DA+	tip	white/green stripe	white/orange stripe	
2	3	2	DA-	ring	green solid	orange solid	
3	2	3	DB+	tip	white/orange stripe	white/green stripe	
4	1	1	DC+	ring	blue solid	blue solid	
5	1	1	DC-	tip	white/blue stripe	white/blue stripe	
6	2	3	DB-	ring	orange solid	green solid	
7	4	4	DD+	tip	white/brown stripe	white/brown stripe	
8	4	4	DD-	ring	brown solid	brown solid	

Other information

8P8C modular connectors are also commonly used as a microphone connector for
PMR, LMR, and other transceivers. Frequently the pinout is different, usually mirrored
(i.e. what would be pins 1 to 8 in the TIA/EIA-568 standard might be pins 8 to 1 in the
radio and its manual.

Difference between Straight and Cross cable:
Straight cable are often used to connect different type of devices. This type of cable can be used to:
1) Connect a computer to a switch/hub's normal port.
2) Connect a computer to a cable/DSL modem's LAN port.
3) Connect a router's WAN port to a cable/DSL modem's LAN port.
4) Connect a router's LAN port to a switch/hub's uplink port. (Normally used for expanding network)
5) Connect two switches/hubs with one of the switch/hub using an uplink port and the other one using normal port.
If you need to check how straight cable looks like, it's easy. Both sides (side A and side B) of cable have wire arrangement with same color.
Some other times is also used the **crossover cable**, it's usually used to connect same type of devices. A crossover cable can be used to:
1) Connect two computers directly.
2) Connect a router's LAN port to a switch/hub's normal port. (Normally used for expanding network)
3) Connect two switches/hubs by using normal port in both switches/hubs.
In you need to check how crossover cable looks like, both side (side A and side B) of cable have wire arrangement with following different color.
This cable (either straight cable or cross cable) has total 8 wires (or we can say lines), i.e. four twisted pairs (4x2=8) with different color codes. Right now just forget about color codes. It doesn’t matter what color is given to the cable (but there is a standard).





USB

Type Universal Serial Bus (USB)

Devices Peripheral Connectors

Connector

USB 1.1- 2.0

-Type A → connectors downstrem (4 pin)

-Type B → connectors upstream (4 pin)

-Mini-USB A/B → 5 pin -Micro-USB A/B → 5 pin

USB 3.0

-Type A → 5 pin -Type B → Extra height

-Micro-USB Type B -Type C → 24 pin

USB 3.1

Signal → 5V

Max. voltage → 5.00±0.25 V (pre-3.0) and 5.00+0.25/−0.55 V (USB 3.0)

Max. current → 0.5-0.9 A(General) and 5 A (charging devices)

Data signal → Packet data,definited by specifications

Width → One bit

Bitrate → 1.5/12/480/5,000/10,000 Mbit/s (depending on mode)

Max devices → 127

Protocol → Serial

Pin out

Pin	Name of signal	Cable color	Description
1	VBUS	RED	+ 5 V
2	D-	WHITE	Data −
3	D+	GREEN	Data +
4	GND	BLACK	GND

Additional pins introduced by USB 3.0:

Pin	Name of signal	Description
6	SSTX+	The transfer of data from the host device
7	SSTX−	SSTX− return
8	GND	GND
9	SSRX+	Transferring data from the device to the host
10	SSRX−	SSRX− return

Introduced additional pins in the connector type C:

	Name of signal	Description
11	VBUS	+12V
12	VBUS	+20V

Other informatio n It is designed to allow multiple devices to be connected using a single standardized interface and only one type of connector, as well as to improve the plug-and-play, allowing you to connect or disconnect devices without having to restart the computer (hot swap).

HDMI

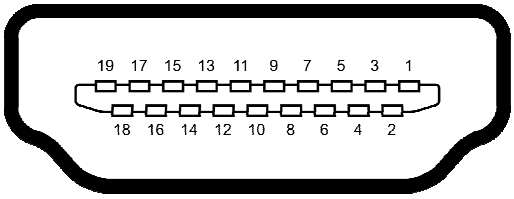
Type: Metallic material – Usually copper

Devices: Sound/Video

Connector: Video Connectors

Features: To transfer digital audio and video in a single cable, to the post of three cables.
Bit rate : 18 Gb/s
Max length of cables : 20 mt
Protocol : TMDS (It is a technology of data transmission at high speed).

Pin out



	Signal		
Pin 1	TMDS data 2+	Pin 10	TMDS clock+
Pin 2	TMDS data 2 shield	Pin 11	TMDS clock shield
Pin 3	TMDS data 2-	Pin 12	TMDS clock-
Pin 4	TMDS data 1+	Pin 13	CEC
Pin 5	TMDS data 1 shield	Pin 14	No connected
Pin 6	TMDS data 1-	Pin 15	DDC clock
Pin 7	TMDS data 0+	Pin 16	DDC data
Pin 8	TMDS data 0 shield	Pin 17	Ground
Pin 9	TMDS data 0-	Pin 18	+5V power
Pin 19	Hot plug detect		

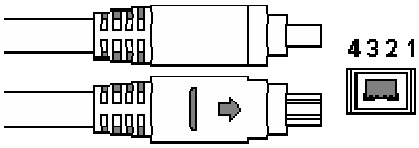
Runs *parallel*, not serially.
HDCP(High-Bandwidth Digital Content Protection) it manages permissions for viewing of HD content, preventing the piracy carried out through the method Man in the middle(cryptographic attack).

Other information: Invented in December 2002. Replaced DVI , SCART , VGA , composite video, S - Video, Component Video.

Type	Fiber optic, copper conductor, dielectric material
Devices	Storage devices (it allows the connection of cameras and/or camcorders
Connector	1394 R/A flat connector X3
Features	High-speed connections
	Bit rate : 100, 200 or 400 Mbps Max length of cables : 4.5 mt (optimal distance: 72 mt) Protocol : Serial Bus Protocol 2 (SBP-2)

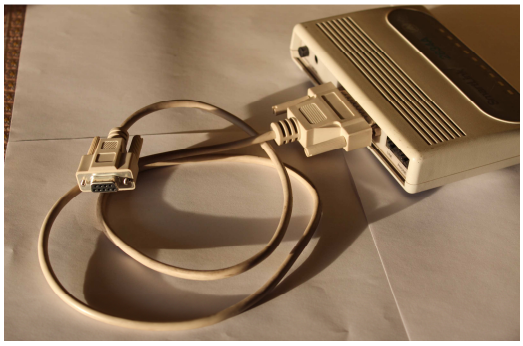
Pin out

Pin	Name	Description
1	TPB-	Twisted-pair B, differential signals
2	TPB+	Twisted-pair B, differential signals
3	TPA	Twisted-pair A, differential signals
4	TPA+	Twisted-pair A, differential signals
Shell	Outer	Cable shield



Other information

This type of cable is easy of use and offers a bandwidth at low cost.
IEEE 1394 fully supports both isochronous and asynchronous applications.
The asynchronous mode is when the data sent is received from the cable.
In the case in which the line was not free, it is sent again.
The synchronous mode includes a sending data through the continuous flow in real time.

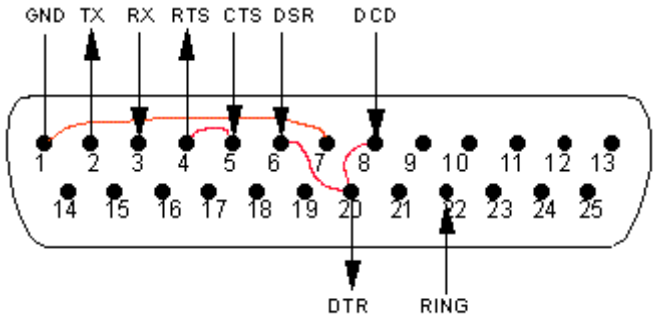


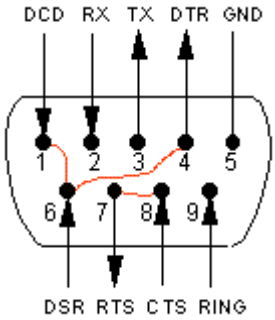
here an example of connectors 232

RS232

Type	The pin of brass and the structure of metal
Devices	Device communication
Connector	RS232
Features	low transmission speed bit rates : lower than 20,000 bits per second Max length of cables : 300 MT Protocol : SDLC, HDLC, DDCMP, and X.25.

Pin out



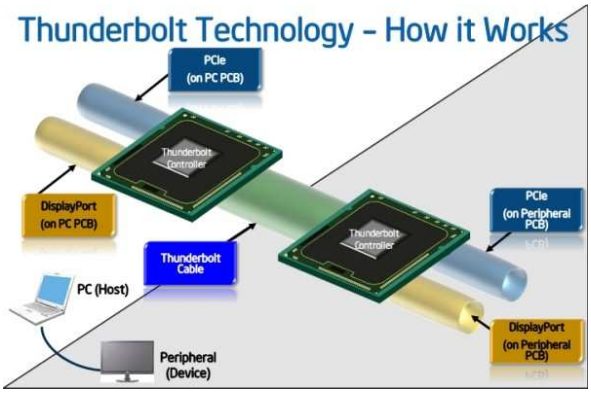


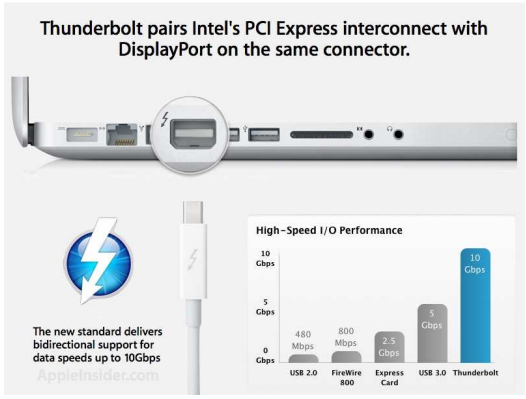
Pin 1	Tx	Transmitted data
Pin 2	Rx	Data received
Pin 3	RTS	Request To Send
Pin 4	CTS	Clear To Send
Pin 5	DTR	Data Terminal Ready
Pin 6	DSR	Data Terminal Ready
Pin 7	RI	Ring Indicator
Pin 8	DCD	Data Carrier Detect
Pin 9	GND	Ground

- The RS232 interface uses an asynchronous serial protocol
- the electrical signal is not balanced
- The connection is point-to-point
- serial interface at low speed transmission

Other information

to receive and transmit a signal only serve three wires: reception, transmission and ground. The other wires are used to synchronize in hardware communication.
This cable is disappearing now .





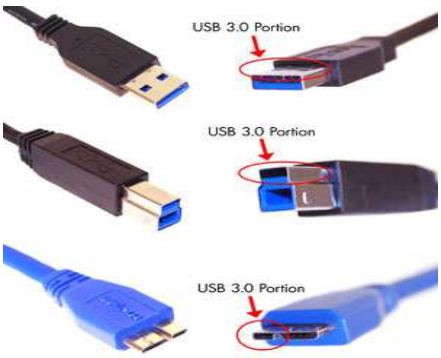
Type	Copper and optical fiber
Devices	Storage devices
Connector	Mini DisplayPort
Features	High speed transfer rate Bit rate : 10 Gbps Max length of cables : 100 mt Thunderbolt 2 : 20 Gbps Protocol : 4× PCI Express 2.0,[4] DisplayPort 1.1a

Pin out

Pin 1	GND	Ground
Pin 2	HPD	Hot plug detect
Pin 3	HS0TX(P)	HighSpeed transmit 0 (positive)
Pin 4	HS0RX(P)	HighSpeed receive 0 (positive)
Pin 5	HS0TX(N)	HighSpeed transmit 0 (negative)
Pin 6	HS0RX(N)	HighSpeed receive 0 (negative)
Pin 7	GND	Ground
Pin 8	GND	Ground
Pin 9	LSR2P TX	LowSpeed transmit
Pin 10	GND	Ground (reserved)
Pin 11	LSP2R RX	LowSpeed receive
Pin 12	GND	Ground (reserved)
Pin 13	GND	Ground
Pin 14	GND	Ground
Pin 15	HS1TX(P)	HighSpeed transmit 1 (positive)
Pin 16	HS1RX(P)	HighSpeed receive 1 (positive)
Pin 17	HS1TX(N)	HighSpeed transmit 1 (negative)
Pin 18	HS1RX(N)	HighSpeed receive 1 (negative)
Pin 19	GND	Ground
Pin 20	DPPWR	Power

It transfers data in serial way, as we can see in the pinout table, with 4 couples of send and receive lines.

Other information: someone says that this cable is called "thunderbolt" for joking Usain Bolt, world record runner of 100 mt, because the data can run faster than him !

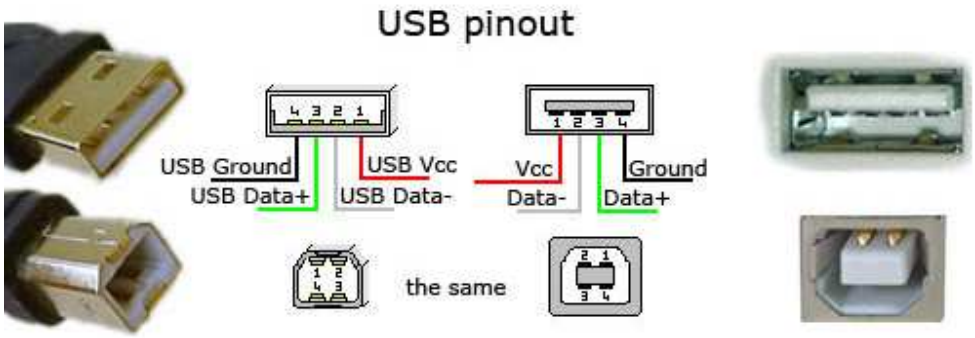


USB CABLES

Type	Copper and rubber
Devices	Storage devices: USB devices are among the easiest devices to connect to your PC. You can connect a wide variety of devices, such as keyboards, printers, and external drives. Some devices might use USB 3.0, a connection type that can run up to 10 times faster than USB 2.0 by using a new technology called **SuperSpeed**
Connector	Mini DisplayPort
Features	High speed transfer rate Bit rate : 5 Gbps Max length of cables : USB 3.0 does not Provides A Maximum length of the cable In the case of copper cables , the maximum length is about 3 meters. Protocol: Serial Bus

Pin out

Pin	Name	Description
1	VCC	+5 VDC
2	D-	Data -
3	D+	Data +
4	GND	Ground



USB is a serial bus. It uses 4 shielded wires: two for power (+5v & GND) and two for differential data signals (labelled as D+ and D- in pinout)

Other information	It is characterized by the blue color that distinguishes it immediately. There are 3 version: A,B,C The USB 3.0 connector is compatible with its predecessors USB 1.1 and 2.0 .