technical explanation
what does SATA stand for?

SATA (Serial ATA) is the successor to IDE (or P-ATA) interface for hard drives and disk drives.

The connection between the SATA device and the mainboard happens with a smaller SATA cable. The PSU supplys the device directly. For this purpose, individual connectors are located in the cable branch from the power supply unit.

FOTO SATA Kabel / NT Stecker standart

With the first SATA generation, up to 1.2 Gbit/s could be transmitted, while the following 2nd generation already reaches up to 2.4 Gbit/s. Current PCs and notebooks use SATA 3 interfaces, in which the data transmission rates are possible over 4.8Gbit/s.

Heres an overwiev of the individual SATA designations and transmission speeds:

official designation	inofficial designation	netto trans
		Gbit/s
Serial ATA 1,5 Gbit/s	SATA I	1,2
Serial ATA 3,0 Gbit/s, SATA Revision 2.x	SATA II, SATA-300	2,4
Serial ATA 6,0 Gbit/s, SATA Revision 3.x	SATA III, SATA-600	4,8
SATA Express 8,0 Gbit/s (PCIe 3.x), SATA Revision 3.2		7,8
SATA Express 16,0 Gbit/s (PCIe 4.0), SATA Revision 3.2		15,7

While most of the current drives are not able to reach transmission rates of SATA 3 to a certain extent, SSD's already approach the limits of the interface.

Several SATA connectors have been developed due to various heights and application areas:

Slimline SATA
This connector is designed for smaller devices with a low current power requirement and is often used in notebooks and for optical drives (slimline drives):

External SATA / eSATA
With an eSATA port, SATA hard disks and drives can be connected in an external case without having to dispense with the high data output of SATA compared to

technical explanation

USB.

SATA Express

For SATA Express, a PCIe interface is used for the transfer. Transmission rates of up to 8 Gbit/s can be achieved. SATA compatible cables are used.

M.2

M.2 is the successor to SATA Express and, like its predecessor, it uses an PCIe interface for data transmission. In the M.2 standard, the M.2 SSD or PCIe expansion card (such as WLAN or LTE cards) is plugged and attached to an separate M.2 Slot. Due to the small size of memory and epxansion cards for M.2, these are especially suitable for notebooks, ultrabooks etc.