

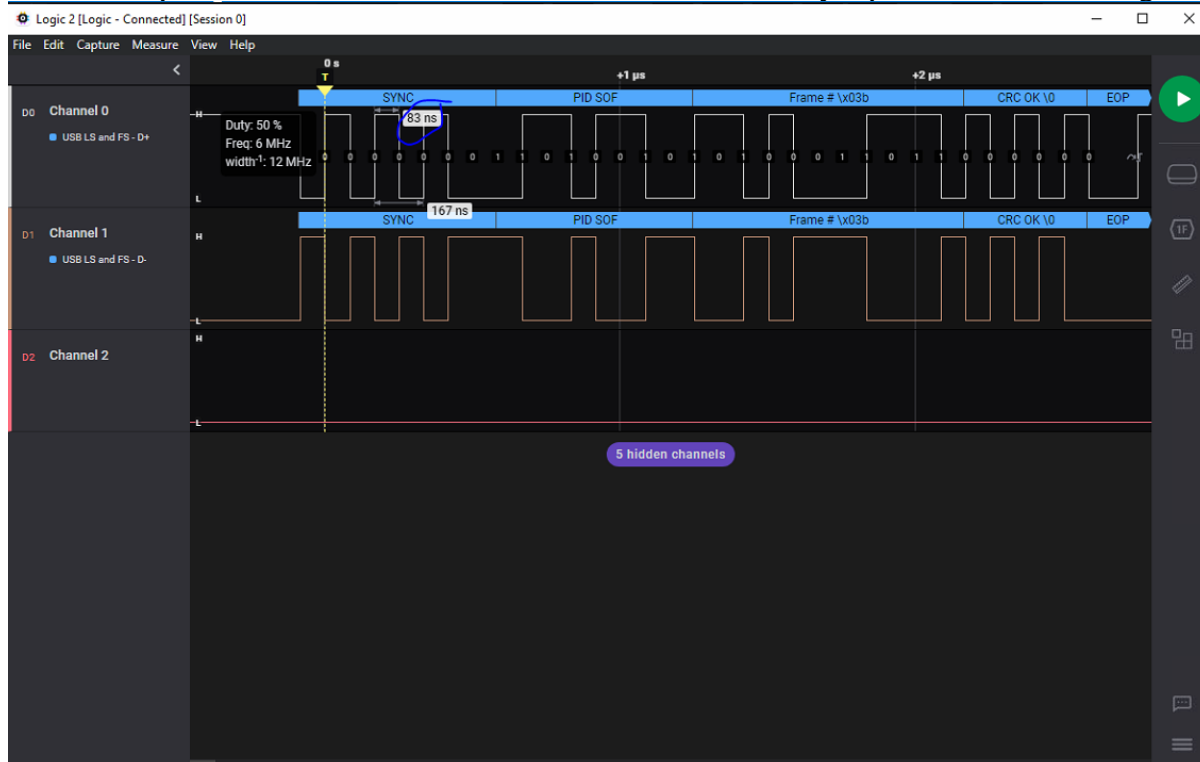
STM32 USB

-The Stm32 USB supports both High speed and full speed USB, but the ST board HW is limited to the full speed.

The USB speeds limitations are:

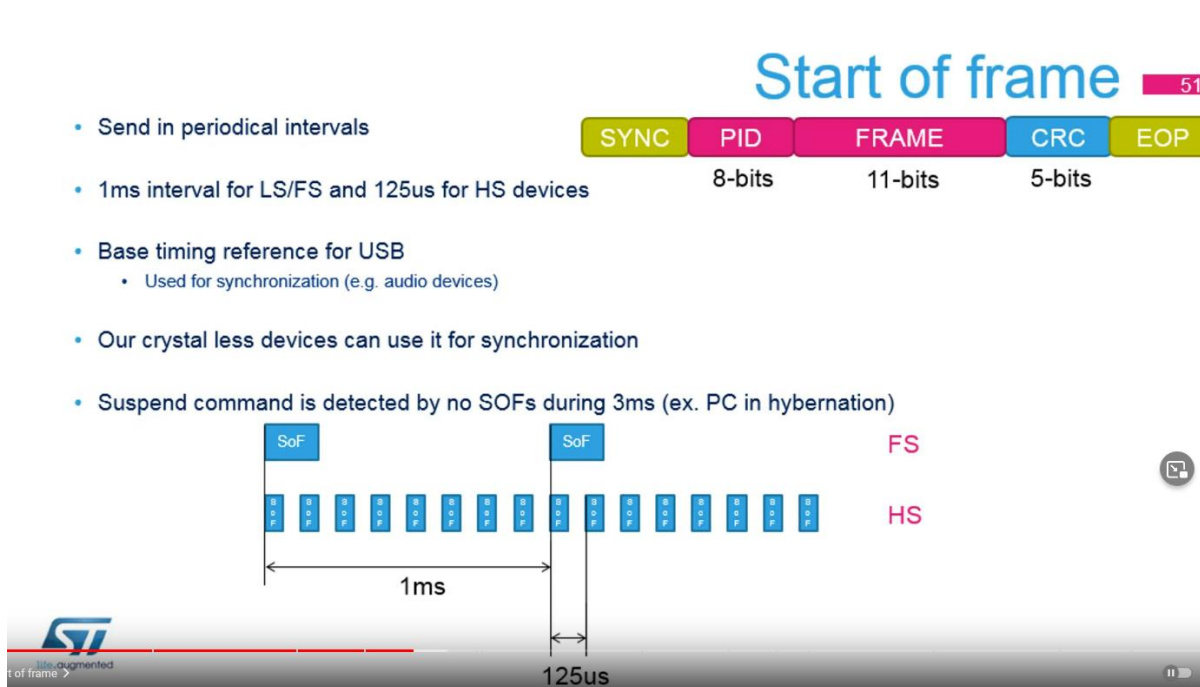
Mode ^[1]	Abbrev.	Gross data rate	Introduced in
Low speed	LS	1.5 Mbit/s (187.5 KB/s)	USB 1.0
Full speed	FS	12 Mbit/s (1.5 MB/s)	USB 1.0
High speed; also, Hi-speed	HS	480 Mbit/s (60 MB/s)	USB 2.0
SuperSpeed	SS	5 Gbit/s (625 MB/s)	USB 3.0
SuperSpeed+	SS+	10 Gbit/s (1.25 GB/s)	USB 3.1
SuperSpeed+	SS+	20 Gbit/s (2.5 GB/s)	USB 3.2

-But these speeds are different from the data rate transfer, it only represents the bit timing.



-The device transfers of data are driven by host so that the host start the frame by sending “SOF” packet which is sent every 1 millisecond in full speed.

<https://www.youtube.com/watch?v=DJiWi5aJA44&t=333s>



-There are many types of transfer for USB, the virtual comport class in SMT32CubeMX using the bulk transfer.

000915: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4576157 +0.0019798. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000917: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4596118 +0.0019762. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000919: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4616132 +0.0019815. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000921: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4636150 +0.0019819. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000923: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4655710 +0.0019361. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000925: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4676126 +0.0020153. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000927: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4696142 +0.0019816. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000929: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4716131 +0.0019789. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000931: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4736151 +0.0019820. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000933: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4755949 +0.0019598. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

000935: Bulk or Interrupt Transfer (UP), 2022-10-27 14:36:13.4776131 +0.0019980. (1. Device: STM32 Virtual ComPort (Virtual COM Port)) Status: 0x00000000
Pipe Handle: 0x63688af0 (Endpoint Address: 0x81)
Get 0x100 bytes from the device

Hint

Pipe Information (Handle 0x63688af0, Endpoint address 0x81)

Maximum packet size: 0x100
Endpoint address: 0x81
Interval: 0x0
Transfer Type: Bulk
Maximum transfer size: 0xffffffff

Close

As show, from the screen shot from “Device monitoring studio” software, the transfer type is bulk transfer, the packet size is limited to 64 k bytes/sec.

-The virtual comport in pc also has limitations of 230400 bytes/sec, check [https://learn.microsoft.com/en-us/previous-versions/windows/embedded/dd187599\(v=msdn.10\)?redirectedfrom=MSDN](https://learn.microsoft.com/en-us/previous-versions/windows/embedded/dd187599(v=msdn.10)?redirectedfrom=MSDN)

- PC usb max speed for USB 2.0 is 60 Mbytes/sec.

The conclusion of using stm32 USB in full speed mode, it that the max data transfer speed is 88 Kbytes per sec.