<http://www.keil.com/forum/61825/>

**Want to interface USB printer to embedded device**

Hi Parbal,

Your question sounds like complete novice on current scene of USB printers.  
Here is a brief introduction of USB printers.

**1) Image printers**  
Nowadays, most of printers on the market belong to this category. For these printers, host (PC) renders page dot images. The images are sent over USB using printers' specific protocols. Host requires rich resources (CPU/GPU power, memories, font storages) to render page images. Also, dedicated drivers of the specific protocols. In these reasons, a Linux board is realistic choice for embedded to connect to these printers, as Hamish suggested.

**2) Character printers**  
Around 20 years ago this type was the majority, but survives just for specific purpose, such as slip/label printers on cache registers, dot impact printers for business form. For these printers, host sends (ASCII) character codes and their position using ESC/P or PCL protocol. Printers put the fonts of the character codes on the specified position in papers. A 16 bits MCU of USB host is enough.

**3) PostScript printers**  
Also survive in high-end laser printers for publishers.

If you are interested in character printers, Microchip USB team had good work on their legacy library.  
<http://www.microchip.com/mla>  
v2013-06-15  
<http://ww1.microchip.com/downloads/en/softwarelibrary/microchip-libraries-for-applications-v2013-06-15-windows-installer.exe>

These files are helpful to understand on character printers and its protocol.  
\microchip\_solutions\_v2013-06-15\Microchip\USB\Printer Host Driver\  
- Documentation\Printer Study.xls : list of printers which support ESC/POS, or HP PCLs  
- usb\_host\_printer\_esc\_pos.c : implementation of ESC/POS  
- usb\_host\_printer\_pcl\_5.c : implementation of PCL5

IMHO, this is the "smart" way of these days;  
the data to print is sent once to an Android phone/tablet over wireless BlueTooth/NFC/IR or wired USB PHDC (Personal Healthcare Device Class). When the user wants a handout, he connects the phone/tablet wirelessly to a printer directly.

Tsuneo

2017-8-9 10:32:09

1. STM32F407 系列芯片都自带了 USB OTG FS和 USB OTG HS（HS 需要外扩高速 PHY 芯片实现，速度可达 480Mbps）。在主机模式下， OTG FS 支持全速（FS， 12Mb/s）和低速（LS， 1.5 Mb/s）收发器，而从机模式下则仅支持全速（FS， 12 Mb/s）收发器。OTG FS 同时支持主机协商协议(HNP)和会话请求协议(SRP)。
2. 在 USB 主机上，D-和 D+都是接了 15K 的电阻到地的，所以在没有设备接入的时候， D+、 D-均是低电平。
3. 在 USB 设备中，如果是高速设备，则会在 D+上接一个 1.5K 的电阻到 VCC，而如果是低速设备，则会在 D-上接一个 1.5K 的电阻到 VCC。这样当设备接入主机的时候，主机就可以判断是否有设备接入，并能判断设备是高速设备还是低速设备。