



## **Braille2000, LLC**

6801 Southfork Cir, Lincoln, NE 68516  
Phone: (402) 423-4782, Fax: (402) 423-5154  
<http://www.braille2000.com>

# "HTTP-type" Embossers

## Instructions for Setting Up A Braillo HTTP Connection

Braille embossers have long had "serial" and "parallel" kinds of data connections. Newer models also have "USB" connections. Now some units have "network" connections and things become much less obvious.

A "network" connection is one in which communication is in the form of addressed data packets that travel over a (potentially) shared connection (the network). An Ethernet network is one such scheme in which addressed data packets travel between computers and servers and printers. Addressing of packets is done using IP (Internet Protocol) using either the IPV4 scheme (addresses such as 55.23.104.10) or the IPV6 scheme (addresses such as 2001:0db8:85a3:0000:0000:8a2e:0370:7334). Sometimes the numerical IP address is replaced by a name that is known to the computer. The name may be a purely local name or it may be a registered domain name known world-wide. The computer has to look up the name and replace it with a numerical IP address. The IP address for a packet also has a socket number. The socket number is often supplied automatically by the computer based on the protocol being used. For example, HTTP packets used by your Internet browser use socket 80. Secure HTTPS packets use socket 443. If you need to specify a particular socket number, attach it to the IP address with a colon, such as 55.23.104.10:631 (the socket number is 631, that of the IPP service).

Embossers are printer-class devices. For network connections there are several protocols to choose from to handle the data transmission. Naturally you must use the protocol a given printer understands, or you need to install a Print Server box that is an adapter that offers a network connection on one side and which passes network data out the other side on a serial or parallel cable.

### Network Printing Protocol "TCP"

Although called "TCP Printing", "TCP" actually refers to a general network data transmission technique called Transaction Control Protocol. TCP Printing does use the TCP protocol (but so does many more uses of the network). TCP Printing is a one-way transmission of raw printer data from the computer to the printer, much as if you plugged in a parallel or USB cable. In Windows you need to know the IP address of the printer (or a print server adapter box) and you create a

printer port whose type is "Standard TCP/IP Port". The system knows that this kind of communication uses socket number 9100 (you don't tell it any socket number).

## Network Printing Protocol "IPP"

Internet Printer Protocol (IPP), like so many network transmissions uses the TCP/IP communication mechanism, but unlike TCP Printing, it is a bi-directional communication channel and its data stream uses HTTP transactions similarly to how a web browser talks to a web server (i.e., it uses the transactions Get, Put, and Post). Because the underlying command protocol is HTTP, this technique is sometimes called "HTTP Printing". Although web servers use sockets 80 and 443 for browsing, IPP uses socket 631 and because of this you don't print to a web server nor browse your printer!

Support for IPP is built into the Windows network printer tool. To set up an IPP printer you use "Add Printer" and then "Add a Network Printer". You need to give the tool the IP address or name of the printer and the printer must be powered on and must respond to live interrogation by the network printer tool (or else a connection will not be established... you cannot easily create a link in the abstract). Several Braillo embosser models use this protocol, some as their only protocol.

## IPP over USB

IPP is a network protocol. USB is not a network. But Microsoft has a clever extension known as RNDIS (Remote Network Driver Interface Specification) which is a proprietary Microsoft protocol that layers on top of USB to emulate an Ethernet connection via the USB cable. The connection is normally just to one other system, but it handles packets as if on a network, the point being that with RNDIS you can use IPP on a USB cable. And that is precisely one way Braillo embossers communicate.

When you follow the setup instructions for a Braillo embosser, one of the things you do is to activate RNDIS and give it a fake IP address for the computer side of its little network. You can then set up a network printer using a fake IP address of the printer that (by similarity of numerical address values) lies on the RNDIS network, and then the Braillo and the computer can communicate. As with an Ethernet network setup, the embosser must be powered on so it can respond live as you configure the network printer.

## Braillo Embossers and Braille2000

With all Braillo embossers, the basic data stream is ASCII-braille character data, whether it be transmitted via serial cable, parallel cable, plain USB cable, or via Ethernet TCP Printing or Ethernet IPP Printing or via RNDIS USB IPP Printing. Some of those connections wrap the data with other control information, but the useful data is the same, and all the control extras are handled by the Windows print mechanism, not by Braille2000 or its embosser driver.

Braille2000 uses its own printer driver because its driver knows the nature of the embosser, such that when you choose a different embosser printer, that act changes the nature of what the embosser can do, just as when you change to a different ink printer (MS Word does not know about all printers in the world, the selected print driver tells it the attributes of the selected

printer). Braille2000, via its smart printer driver works this same way; the so-called Generic Text Only driver knows nothing about any embosser.

Because embosser manufacturers are content using the deficient generic driver, their own setup process is by itself insufficient for Braille2000. The normal solution is to complete the manufacturer's setup and to then add a second printer to the system for the same device but using the smart Braille2000 driver. For enumerated ports (those not requiring a live network response), the second printer is created from within Braille2000 as follows:

1. right-click the Emboss button
2. select Setup
3. select Install New Embosser
4. fill in Name (the legend on a new printer icon), Model (the kind of embosser), Port.  
For Port, use the same name as the Port assigned to the printer as set up by the manufacturer, ports can be shared.

For the newer Braillo embossers using IPP Printing, the above is not sufficient because the HTTP kind of port is not an enumerated type. For the Braillo the following procedure should be used:

1. follow the manufacturer's instructions and check (via Print Test Page) that the newly created printer can communicate with the embosser
2. The embosser should be powered on and connected (Ethernet or USB)
3. If there are Braille2000 embossers already on the computer, the necessary driver software has already been installed. If the Braillo will be the first Braille2000 embosser, then perform the above procedure for an enumerated port embosser now. That will install the driver software. You can pretend you have a Braillo 200 on port LPT1. Give it a Name such as "dummy" and later you can delete that printer from Devices and Printers. After you have installed the dummy embosser, close Braille2000 and continue with step 4.
4. Go to 'Devices and Printers' (Start > Control Panel > Devices and Printers)
5. Click 'Add Printer'
6. Select 'Add a network printer (...)'
7. Click 'The printer is not in the list'
8. Tick the 'Select a shared printer by name' and enter the following URL  
<http://10.1.100.1:631/printers/Braillo>
9. Click 'Next' and choose 'CASC' under 'Manufacturer' and 'Braille2000 Embosser Driver' under 'Printers'.
10. Press 'OK' and 'Next'.
11. Deselect it as the Default Printer (a Braille2000 embosser should never be the system default printer)
12. Click 'Finish'.
13. Launch the Braille2000 application.
14. Right-click the Emboss button
15. Select Setup
16. Click "Scan for embossers"