Data Transfer via UDP

Pinnacle 100 Cellular Modem

Application Note *v1.0*

1 SCOPE

This document shows how to establish a UDP connection from the Pinnacle 100 cellular modem via NB-IoT to a PC running Node-Red server as the UDP receiving side.

2 DISCLAIMER

This document is an example for a UDP connection that assumes that the ISP that is used for this setup allows for all necessary connections such as the ISP 'Arkessa' that was used in this example.

There is the possibility that ISPs will not allow to host servers or they might block ports. Also, some ISPs and networks might not assign a public IP address.

If in doubt, please check with the supplier of your SIM card and internet service provider.

3 PREREQUISITES

The following are prerequisites for this process of data transfer via a UDP connection:

- Pinnacle 100 DVK with micro-USB cable – https://www.lairdconnect.com/wireless-modules/cellular-solutions/pinnacle-100-cellular-modem
- NB-IoT capable SIM card such as the following – https://www.arkessa.com/
- PC running Lairds UwTerminalX – https://github.com/LairdCP/UwTerminalX/releases
- Node-Red installation on a PC in your network – https://nodered.org/docs/getting-started/
- DynDNS address and port forwarding in your router to the corresponding port

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4 NODE-RED UDP STATION PREPARATION

To prepare the Node-Red UDP station, follow these steps:

1. Install Node-Red onto your PC or your network.
2. Create a simple UDP receiving server with only two nodes:

 and

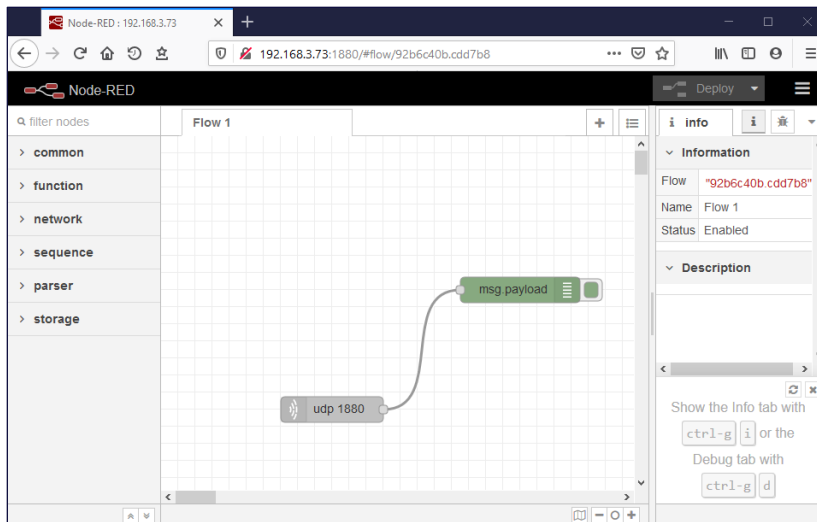The final result should look something like the following (Figure 1).

Figure 1: Two nodes on the UDP receiving server

Note: The Node-Red default port 1880 was used.

5 PREPARING THE PINNACLE 100 DVK

To prepare the Pinnacle 100 DVK, follow these steps:

1. If not already done, load the Hosted Mode – AT Command firmware to your Pinnacle 100 by following the necessary steps in this user guide: https://connectivity-staging.s3.us-east-2.amazonaws.com/2020-04/CS-GUIDE-Converting-Pinnacle-100-AT%20v1_0.pdf
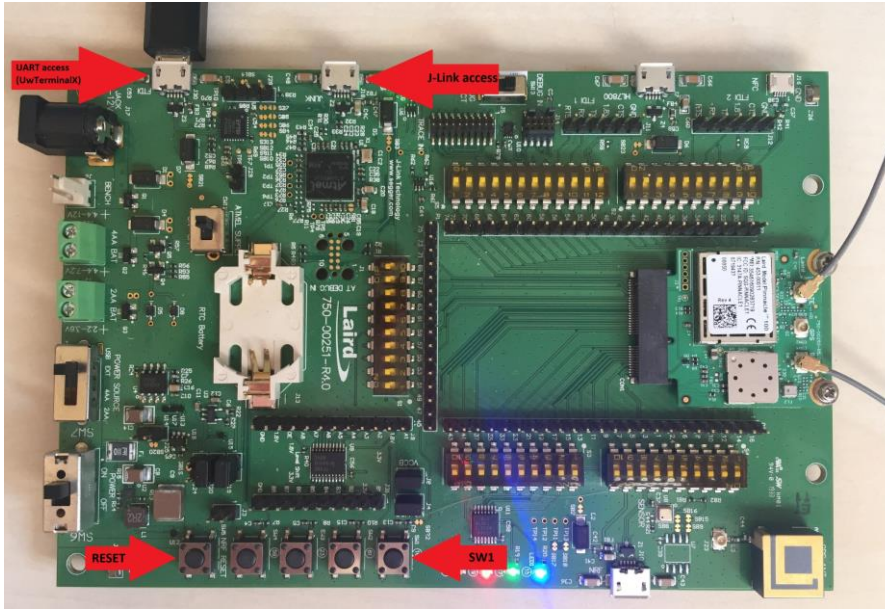

Figure 2: location of the relevant USB ports as well as RESET and SW1 push-buttons

2. Open UwTerminalX and select **Pinnacle 100** from the Device drop-down menu.
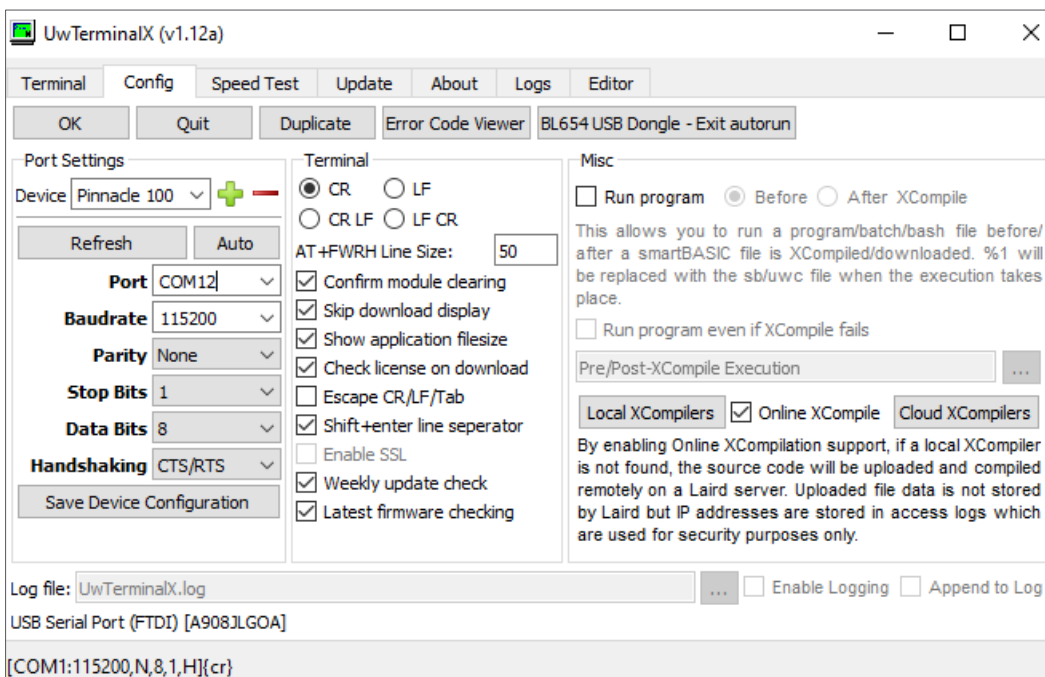3. Select the corresponding COM-port from the drop-down menu.

Figure 3: UwTerminalX setup

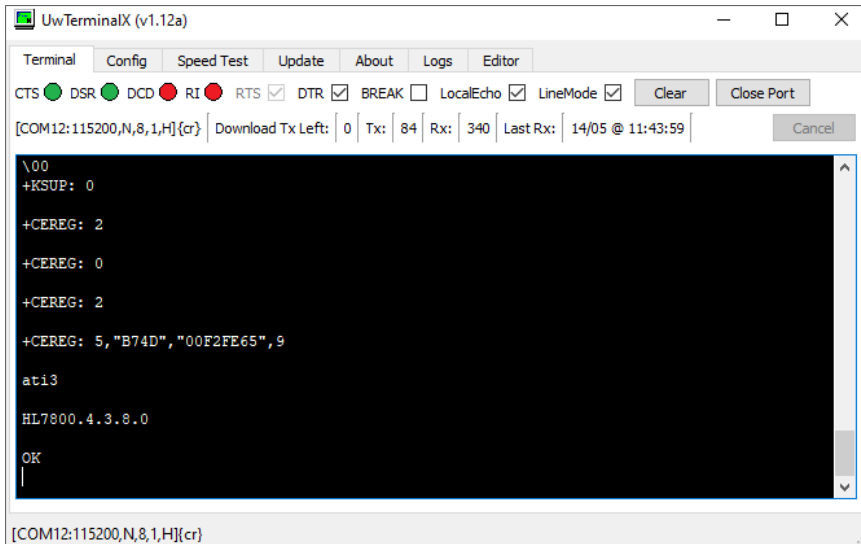4. After RESET, your output window should look something like the following.

Figure 4: UwTerminalX response

Note: You can enter AT command <ati3> to test. This retrieves the version of the HL7800 firmware.

5. To check that you are connected to an LTE network, issue the following: **at+cops=?**
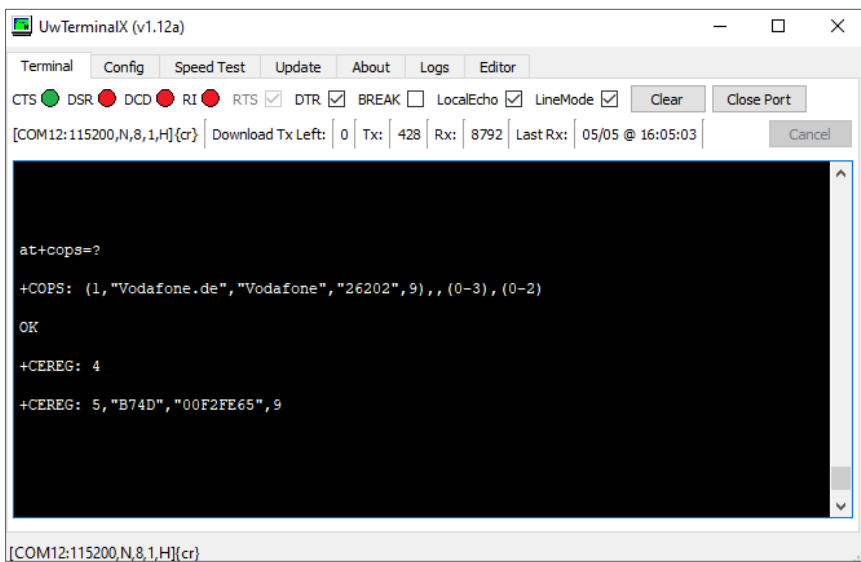

Figure 3: Issue at+cops=? command

Note: This command might take a long time complete. Depending on the number of enabled bands it may take from several seconds to up to 10 or even 15 minutes.

Note: If you do not get connected connect automatically, ensure that you're not in airplane mode by using the following command: **at+cfun?**. If necessary, use **at+cfun=1,0** to disable airplane mode.

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6 SET UP THE MODEM FOR UDP VIA NB-IOT

To set up the modem for UDP via NB-IoT, follow these steps:

1. Send the following commands to your modem:

at+ksrat=1	Sets radio access technology to NB-IoT

> **Notes:**
> If already configured, +CME ERROR: 3 is returned.
> To configure for LTE M, use **at+ksrat=0**.

at+kbndcfg=1,80000	Sets LTE band to 20.
at+cpsms=0	Disables Power Saving Mode (PSM).
at+cgdcont=1,"IP","<your access point>",,0,0,1,0	Defines PDP context.
at&k3	Activates hardware flow control.
at+kcnxcfg=1,"GPRS","<your access point>","","","IPV4","0.0.0.0","0.0.0.0","0.0.0.0"	Sets GPRS parameters.
at+kudpcfg=1,0	Create a new UDP socket with the parameters associated to the connection profile ID number 1.
at+kudpsnd=1,"<your DynDNS address>",1880,10	Send UDP data after **CONNECT**. 1880 is the port used in this example and 10 the data length.

Note: By default, the line ending in UwTerminalX is one character (<cr>). It can also be set to two characters.

Other terminal programs may use one or two characters.

Figure 4: Enter applicable commands

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2. After **CONNECT**, type characters to send via UDP to your Node Red setup.

Figure 5: Sending characters via UDP to Node Red setup
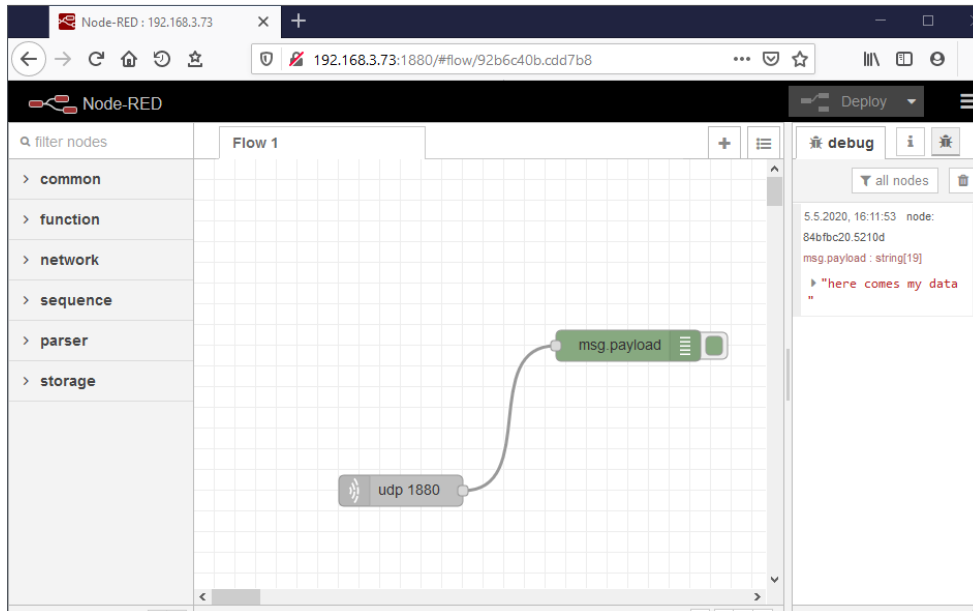
The following displays in the Node-Red debug output ().

Figure 6: Node-Red debug output

Note: To stop data transfer, enter the end of the file pattern **--EOF--Pattern--**

7 REVISION HISTORY

Version	Date	Notes	Contributor(s)	Approver
1.0	18 May 2020	Initial Release	Alexander Mohr	Jonathan Kaye

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