ZyXEL U-1496P Portable Cellular Modem Summary

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The UNAVCO Boulder Facility has used the ZyXEL U-1496P Portable Cellular Modem, available from ZyXEL (http://www.zyxel.com), in remote communication applications. The cellular modem is used with a Motorola Cellular Phone and a 10dB directional Yagi antenna. The U-1496P is capable of transmission speeds up to 19.2 kbps full-duplex on a 2-wire dial-up line. Universal compatibility covers a broad range of CCITT and Bell standards and provides data compression, asynchronous and synchronous operations, MNP and V.42 error correction and data compression.

Below are the suggested settings of the Zyxel Cellular Phone Modem when directly attached to a Trimble 4000 SSE/SSI receiver and using the Trimble "rfile -f" program. The modem is set at 9600 baud and Zyxel Cell 9600 transfer protocol.

Remote Communications Configurations

If you are interested in more information about how the ZyXEL Cellular Modem is being used by the UNAVCO Boulder Facility in the field select the link below:

- Receiver to Cellular Modem to Cellular Phone to Cellular Modem to PC

Important notes: Optimizing the cellular connection to an acceptable level of data throughput can sometimes be difficult. Local cellular providers may perform operations that are undetectable for voice communication but are incompatible with high speed data transfers. The data communication should be tested by doing a receiver download from a remote site. At certain locations we found the V.32 (4800 bps) protocol (&N5) to work flawlessly while the recommended CELL4800 protocol (&N46) did not work at all or was at best intermittent. Switching the local cellular provider may also improve the cellular reception and thus the data throughput. As with the phone modem, echo should be turned off (E0) at the remote modem to avoid sending data back to the receiver that may cause it to freeze up. DTE/DCE rate is fixed at the DTE setting (see S18, S20, S44b6) to avoid connection at other DTE speeds than what is set in the receiver. We currently use RTS/CTS hardware flow control with our remote communications but no error control or data compression.

Troubleshooting tips:

- Make sure that the local cellular provider at the remote site is not performing any activities or operations such as multiplexing or data compression that will impact the connectivity and data throughput.

- To maximize reception the directional antenna must be turned until maximum reception is indicated on the cellular phone handset. Consult the manufacturer manual for details. Note that the direction of the best reception may change if you switch local cellular providers. Also, the directional Yagi antenna has a considerable front- and backlobe which can affect the GPS signal reception if the Yagi antenna is pointed towards (0 deg) or away from (180 deg) the GPS antenna.

- Longer waiting time for carrier (S7) and longer duration after loss of carrier (S10) before hanging up may increase the chances for a successful connection.

- The cellular (remote) modem transmit power can be adjusted for maximum reception. But an increased power level can saturate the modem and make it more difficult to make a connection.

- If repeated calls are being made, allow the modem to disconnect the previous call and reset itself before another attempt is made; or, a separate command should be sent to the local modem to bring the DTR line low if the originating software program does not perform this automatically. This is important when using an automated script to download the receivers. Consult the *ZyXEL U-1496 Series User's Manual* for details.

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