








UNAVCO Resources: Communications Options

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UNAVCO has worked with and supports the following communications options for GPS and meteorological data transmission. Click on the photograph of the hardware for more information, including specifications, how-tos, and configuration examples. UNAVCO will work with individual groups to help determine the most effective communications option for each remote site or network.

	Cellular Modems	Cellular modems work anywhere there is adequate cell service, and do not require line-of-sight to another modem. Cost of hardware and ongoing cellular service varies. Cellular modems are currently used in the Boundary Observatory (Western Nevada), BARGEN (CA, NV, UT), and N. Peninsula (Costa Rica) networks.
	Radio Modems	Radio modems require line-of-sight between the modem and a repeater or master radio modem connected directly or via a repeater to a download computer. Radio modems can support either serial or Ethernet protocols, depending on make and model. There is no ongoing service fee as there is with many of the other communication options, making radio modems ideal for networks or sub-networks with significant line-of-sight visibility. Links can be effective over long distances depending on foliage, atmospheric conditions, and topography. Either serial or Ethernet radio modems are currently in use in the Boundary Observatory (Western Nevada), Negra (Galapagos), BARGEN (Costa Rica), and Peatland Bogs (MN) networks. Sites include CHPI (Brazil), TANZ (Tanzania), and BOGT (Colombia).
	Satellite Communications	Satellite communications options include Iridium and GPS. Iridium and GPS modems can work anywhere; no line-of-sight between modems is required. Because of high ongoing costs, satellite options are generally chosen only when cellular or internet availability is not possible.

		satellite communications allow data to be transferred from remote sites in sparsely or unpopulated areas. VSAT modems are currently used at the Plate Boundary Observatory (Western US) and Puerto Rico networks; Iridium modems are currently used in the POLENET network (Antarctica and Greenland).
	Wireless	Cisco Aironet Wireless Bridge.
	Analog (Dial-up) Modems	Analog (dial-up) modems work where a phone line is available. These modems are still useful for sites with direct phone lines to master download sites. Because there are generally faster options, analog modems are decreasingly used but still transfer data at many sites established in the past. Analog modems are currently in use in the BARGEN network (CA, NV, UT).
	Short-haul Modems	
	Serial to Ethernet	Serial to ethernet devices are typically used to interface older, serial-based receivers (e.g., Trimble 4000) with an ethernet connection. They are also used to connect serial devices directly to the internet or to tie into a network. Serial to ethernet devices are currently used in the BARGEN (CA, NV, UT) and Bogs (MN) networks and at IGS stations in India.