



# SATELLITE TELEMETRY SERVICES



Unidata NEON satellite telemetry systems have integrated Globalstar, Inmarsat, Iridium, Thuraya Orbcom and microsatellite satellite systems. We have done modelling on the data latency and equally importantly, the costs of these services. We have also modelled power consumption of these services. It is now clear to us that while these services are all satellite technology there are subtle aspects of each service which need to be considered when choosing an appropriate service for your needs. There are three distinct applications, where some service providers are more suitable than others.

If you have the need for what we call “alert” function, services such as Iridium short burst data, Inmarsat ISAT Data pro or Orbcom are probably best option, especially Iridium and Inmarsat ISAT Data pro which are premium services. However the data transmission costs escalate greatly for these services when the data rate is anything more than an occasional transmission of a short packet of data.

If you have the need for a traditional logging & reporting function, such as regular hydrographic or industrial measurement data from a measurement site, perhaps water level, flow and quality services such as Globalstar and Inmarsat are probably best due to data transmission costs being more reasonable for larger volumes of data.

If you have a need for a low resolution/high resolution image or perhaps a video capture capability, then Inmarsat would be the best as the bandwidth requirements are higher.

Satellite services are also used for only the most remote locations. Another important consideration for such very remote locations is power consumption. The ability to turn off the satellite modem most of the time to conserve power is critical. Some services allow for this easily; however some services need to establish a “session” each time the modem is powered on. The communications overhead in establishing a session can be high and substantially increase the overall monthly cost to sometimes prohibitive levels.

The physical location of the measurement station is another consideration and there is a clear distinction between Low Earth Orbit Systems and Geostationary Systems. If a geostationary system is chosen, the satellite antenna must be located such that there is a clear view towards the Geostationary Satellite’s location in the sky. Sometimes this is impossible, especially in deep valleys. For Low Earth Orbit Systems satellites transit the sky regularly and satellite antennae, regardless of location, should be able to “see” a satellite most of the time.

The geographical location of measurement station is another important consideration, for example Iridium has coverage in the middle of the Pacific Ocean and in Antarctica, whereas Globalstar has coverage mainly over land areas. Inmarsat has worldwide coverage but you still need to ensure a good view towards the satellite. The antenna elevation in, say north east Australia may be 60 degrees elevation, however in south west Australia, the elevation may be only 40 degrees elevation.

Finally, it is always prudent to have a mix of services. In a flood alert system for example, perhaps it is best to have a mix of services from different providers and not to put all your eggs in one basket. The telecommunications industry calls this network diversity.