NEWSLINE

Environmental Monitoring & Industrial Measurement No. 20, 2023

Inmarsat 6 Series and Iridium NEXT Satellites.

Communications networks don't last forever

Over the last couple of years, we have been reminded that communications networks do not last forever, and we should plan for the expected life of networks we use for data collection / telemetry / IoT.

The closure of the Globalstar Duplex Low Earth Orbit satellite data network in Australia and the soon-to-be-closed 3G Cellular networks in Australia are good examples of network closures. Both networks have served us well for about 15 years, but their closure reminds us that we need to plan for the operational life of the networks we use.

We should consider a 5 year forward look at the networks we use and plan for the updating of these networks based on their projected life. Cellular networks worldwide continue to have new additions and we have seen this in the recent introduction of the Narrow Band services (NB-IoT). There is bound to be new technology introduced in the next 5 to 10 years, so we need to keep a watch on the technologies as they emerge and remember to plan for obsolescence.

Satellite networks tend to last longer than cellular and other ground-based networks, however satellite providers like Inmarsat and Iridium add new satellites to their networks from time to time.

Inmarsat has a smaller number of high-capacity equatorial satellites in its constellation. We note the introduction of the first of the newer model Inmarsat I-6 satellites in the Indian Ocean region this year. That new satellite has significantly improved performance when compared to the older model Inmarsat I-4 satellites. When customers move to the newer Inmarsat Satellites, they may need to adjust the antenna pointing angle slightly.

Iridium has many satellites in its low earth orbit system, and it can retire old satellites and add new satellites easily, and there is no noticeable change to the service.

Starlink is now available, but it requires a 240-volt power source. It provides a great service for installations where there is 240-volt power. For example, remote farms. The need for this power supply makes it inappropriate for remote telemetry applications.

Iridium Certus arrives

This year we have a new service to use, the Iridium Low Earth Orbit Certus 100, with an 88kb data rate service and it is an excellent choice for telemetry / IoT. It is a great replacement for the obsoleted older Globalstar.

Iridium Certus is a flexible satellite service platform using the L-band frequency and Iridium's constellation of 66 satellites in Low Earth Orbit (LEO). It was commercially launched in 2019, which makes it Iridium's newest capability. The new satellites are called Iridium NEXT.

It is interesting to note that SpaceX was contracted to launch all the Iridium NEXT satellites. All the Iridium NEXT launches have taken place using a Falcon 9 rocket launch from Vandenberg Air Force Base in California.

Because the Iridium Certus is a Low Earth Orbit system, there is no need to point the antenna. The installation procedure is easier than equatorial Earth Satellite Systems.

There are also different modem choices, The Rock Remote and the Blue-Sky networks, both of which have the Iridium Radio Module component inside. Unidata has used both models of modems and both work very well. The Blue-Sky Networks modems are smaller and more suited to outdoor applications, while the Rock remote is less expensive and more suited to be mounted inside a separate enclosure.

Unidata will investigate building a system based on the base Iridium 9970 Radio Module over the next year.

The Iridium Certus service complements the current Iridium Short Burst data service (SBD) which Unidata has used for some time, especially with Groundwater applications where the data load is less.

The RockREMOTE

Australian Groundwater Conference and Exhibition - Perth 2022

Unidata exhibited and presented at the Australian Groundwater Conference in Perth in November 2022. This was the first face-to-face conference since Covid and was very well attended by customers all around Australia. It was held in the Perth Exhibition Centre.

We noted many mining and oil and gas customers seeking to monitor groundwater for mine sites and oil fields.

Kevin Chung and Matt Saunders attended and presented at this conference, with a focus on groundwater monitoring applications.

MEDIA **RELEASE**

2 June 2023

DPIRD weather stations upgrade ready for rollout

Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

An upgrade of the Department of Primary Industry and Regional Development's (DPIRD) automated weather station network will commence next month.

DPIRD's network of 170 automatic weather stations and radars provide important weather data to assist growers and regional communities make more-informed decisions.

The department's eConnect+ project manager Darren Gibbon said the project involved upgrading weather stations from 3G to a 4G 'sub-band', offering low power consumption and covering wide areas - making it ideal for WA's regions.

WA-based company Unidata has been awarded the contract to assist with the rollout.

"This work will ensure DPIRD's network of weather stations continues to provide ongoing near real-time weather information across WA," Mr Gibbon said.

"After Telstra announced the discontinuation of its 3G network, DPIRD undertook an extensive evaluation of new 4G equipment to ensure appropriate upgrades to enable continued service delivery from its State-wide weather network.

"Most of DPIRD's existing weather stations run on 3G and it is vital the upgrades are completed prior to June 2024.

"The technology is known as CatM-1, a form of Low Power Wide Area Network or LPWAN technology that provides 4G connectivity."

DPIRD station data includes air temperature, humidity, rainfall, wind speed and direction, with most stations also measuring incoming solar radiation to calculate evaporation.

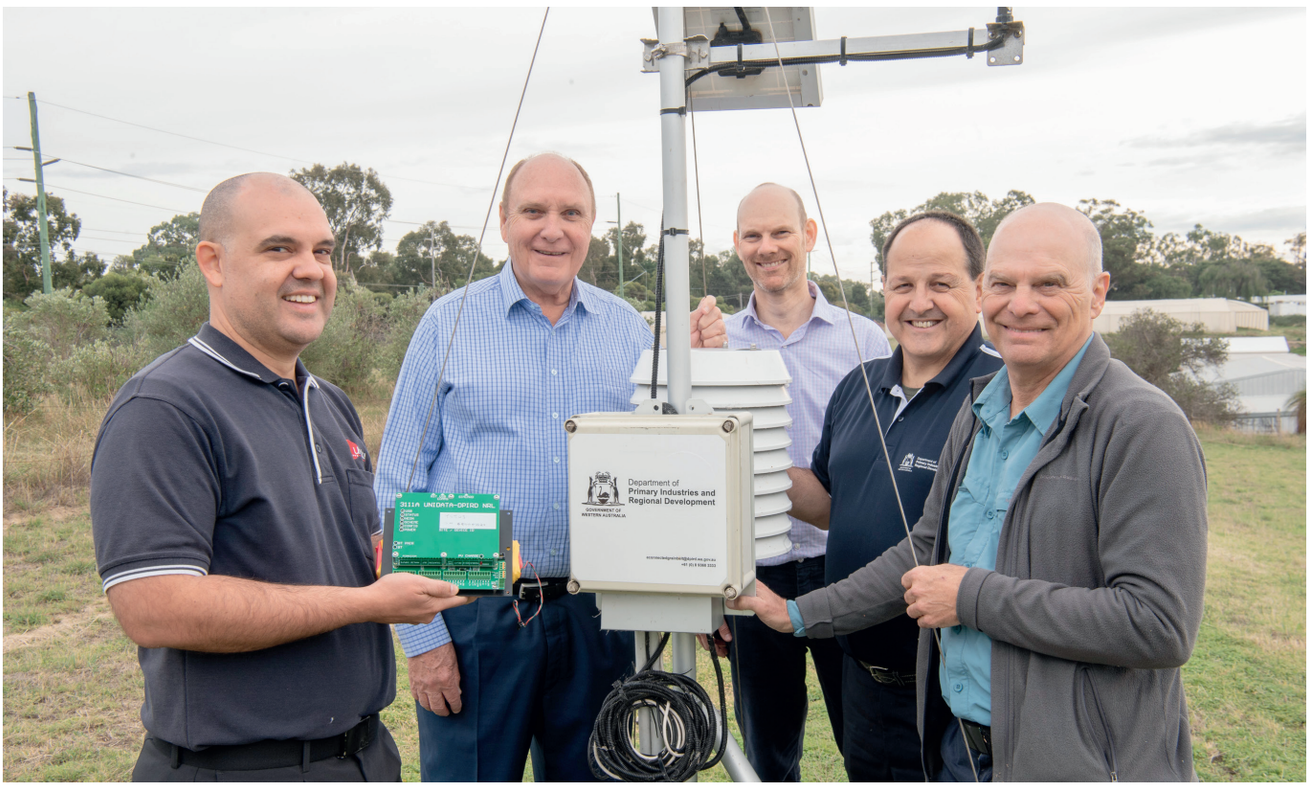
"Our network of automated weather stations and radars are important tools for growers and regional communities, as they provide timely, relevant and local weather data," Mr Gibbon said.

Mr Gibbon said the 4G rollout will start in July, with estimated completion by the end of the year.

"As each weather station is upgraded, we anticipate an outage of approximately an hour at that site, as old equipment is removed, the new hardware installed and existing sensor reconnected," he said.

Unidata General Manager Matt Saunders said Unidata would be manufacturing the equipment at its factory in O'Connor.

More information on DPIRD's weather station network is available from weather.agric.wa.gov.au



(l-r) Unidata senior communications engineer Clint Barnes and general manager Matt Saunders with the Department of Primary Industry and Regional Development's senior technical officer Phil George, eConnect+ project manager Darren Gibbon and research officer Ian Foster, at a weather station in Floreat. Photo credit to DPIRD.

How to choose an IoT satellite service

There are many different satellite services and how do you choose the one which is best for IoT / telemetry applications? This article highlights some important considerations.

1. Consider your data budget - Different applications need a different data budget.

If you are monitoring groundwater, for example, perhaps you need to read the sensors for water depth, perhaps water conductivity, and temperature four times a day and send that data once per day. For groundwater monitoring applications, perhaps a short burst data / message-based service is better, for example, the Iridium SBD service.

For weather monitoring or river monitoring, perhaps you need to read several sensors once per minute and send that data every 5 minutes. This is a much higher data load and data transmission frequency, hence a higher-end full IP service such as Inmarsat BGAN or Iridium Certus may be best.

2. Consider a shared data plan.

Most satellite providers offer either a single-unit data tariff plan or a shared/ group plan over many units. Shared/ group plans are always less expensive than single-unit plans. Data usage is across all units in the plan, some units may have small data, and other units may have large data.

3. Consider your financial budget trade-off with installation convenience.

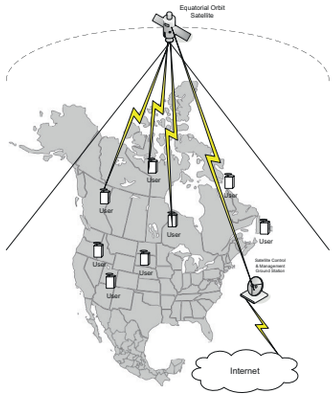
Different satellite providers have different ways of charging for services, some providers allow for an always-on service because their network topology (such as an equatorial satellite network provider) allows for that. Other providers, while allowing for an always-on service, charge regular session fees, (such as low earth orbit satellite network providers) because they need to pass data calls from one satellite to another satellite, and that requires additional satellite management bandwidth. Some low earth orbit providers may simply drop the connection as satellites pass out of view. They do not attempt to transfer the data call between satellites, which is less convenient and less expensive.

4. Consider your antenna installation requirements.

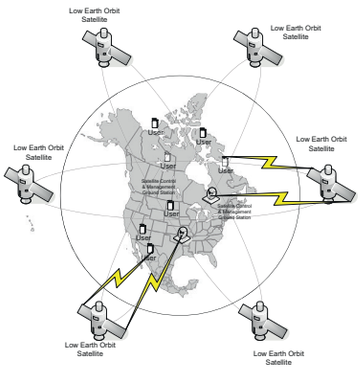
Different satellite providers have different antenna requirements.

Some antenna installations are more convenient, and some are less convenient. Equatorial satellite providers have a plate antenna which requires the installer to point the antenna towards the satellite in azimuth

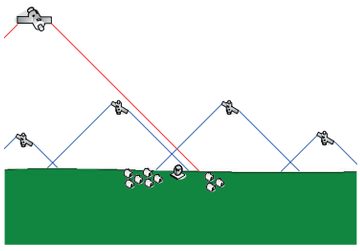
Geostationary Satellite

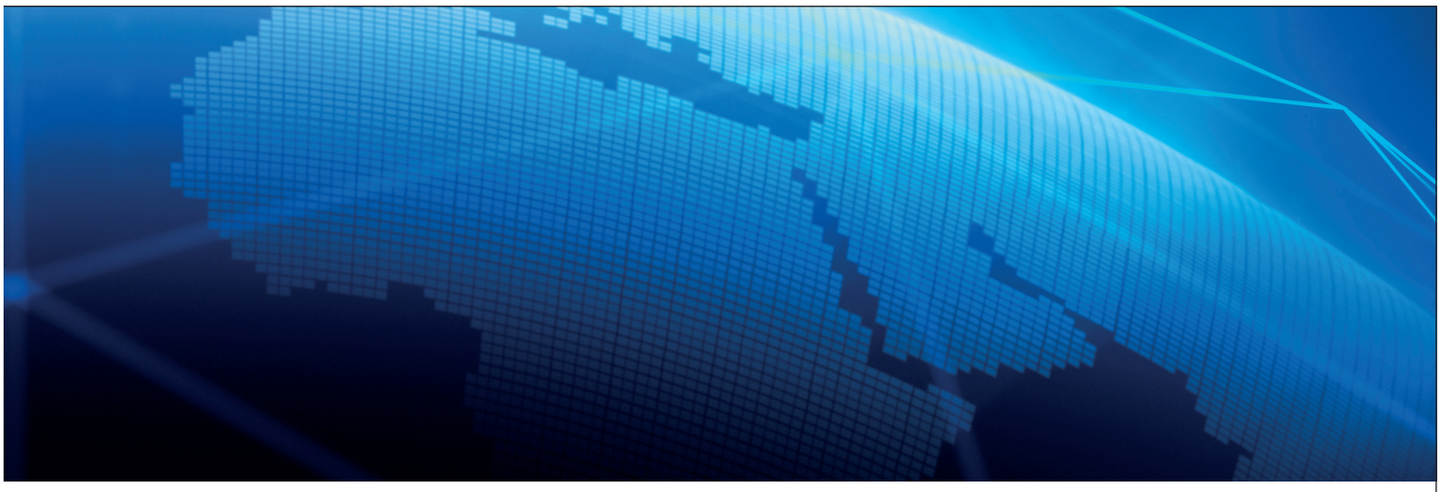


Low Earth Orbit Satellite



Geostationary and Low Orbit Satellites - flat plains





and elevation. While that is not difficult, it is another process an installer must do. Low-earth orbit satellite providers have a more convenient omnidirectional modem antenna. There is no need to do any antenna pointing during the installation process for these services.

5. Consider your installation location.

Different satellite providers have different requirements for the location of the satellite modem antenna.

The location for an equatorial satellite installation needs to be reviewed to ensure that the location has an unrestricted line of sight to the satellite they are seeking to use. In deep valleys, they may have that line of sight blocked by a hill. On flat plains, they are unlikely to have the line of sight to the satellite blocked. For low-earth orbit satellite providers that is not a consideration because the satellites in that low-earth orbit constellation essentially pass over the antenna on the ground and they can penetrate deep valleys, they can "see" both sides of the mountain when passing the antenna location on the ground. There is no need to review the installation location before installation.

6. Consider the way you plan to power the site.

A small groundwater monitoring site with Iridium SBD satellite service can survive on a lithium battery for 2 to 5 years, while a larger river monitoring site may need a 20 to 50-watt solar panel and battery. Power requirements need to be considered when choosing an appropriate service. Starlink requires a 240-volt power source, ok in a remote homestead, but not practical for most remote installations.

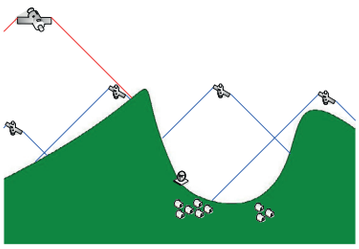
7. Consider the likely longevity of the satellite provider.

Mainstream providers such as Inmarsat and Iridium are likely to be around for many years, while some of the low earth orbit and microsatellite providers may not have the financial resources to continue service for a ten-year period, which is generally considered the minimum life for commercial satellite services.

Please see the illustrations of low earth orbit and equatorial orbit satellite services below. Unidata can engage on projects for satellite connectivity and discuss these trade-offs before you decide on a satellite service.

Unidata has a Technical White Paper on Satellite Airtime Models, which is on our website and it would be useful when comparing different satellite systems.

Geostationary and Low Orbit Satellites - hills and valleys



Geostationary Satellites

Inmarsat BGAN
Inmarsat growing BGAN Capacity with new Inmarsat 6 Satellites- good / service / low price.

Inmarsat future direction low data rate IP services.

Low Earth Orbit Satellites

Iridium Certus and Iridium SBD
Very good / higher price data rate IP services.

Both are good choices for Hydrographers

Updated Unidata evaporation systems

Unidata has been manufacturing and supplying the Unidata Automatic and Semi-Automatic Evaporation systems for many years. This year we updated this important system, replacing the older model Unidata Micro logger with the recently released 3004N Neon Remote Logger.

We also refreshed all other components, wiring and documentation. The new system is easier to prepare for installation and it allows for all active components to be inside one main enclosure. It is also easier to install, and it now has the Neon telemetry function included as one package.

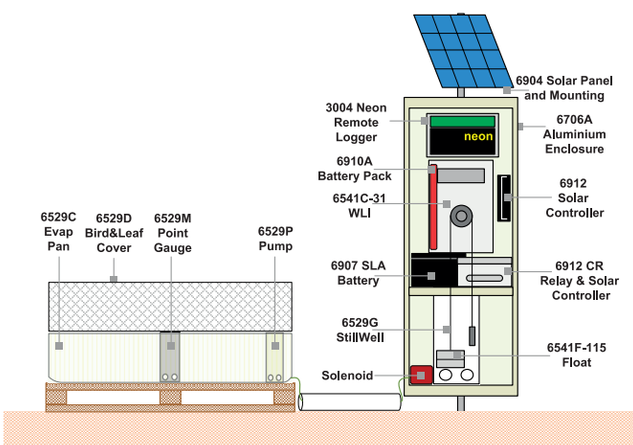
Evaporation Systems are used by many companies, especially mining companies to determine the evaporation profile of their mine sites and to maintain regulatory approvals for the operation of mines and industrial plants. They are also used for scientific research.

The rate of evaporation is defined as the amount of water evaporated from a unit surface area per unit of time. This parameter is an important indicator of the need for water of agricultural area's and also for hydrologists to monitor the water balance of an area.

Measuring the level of evaporation is especially important in mine sites to determine the rate of improvement in water quality.

All Unidata's evaporation systems measure how much water evaporates from a US Class A evaporation pan by measuring the water level in an adjoining still well.

In agricultural application, people talk of evapotranspiration, meaning the combined evaporation of the soil and the transpiration of plants.



3004 Ethernet logger and comparison chart

Unidata has increased the connectivity for the 3004 Neon Remote Logger by adding an ethernet interface to all the standard 3004 NRL Models. Adding the ethernet interface allows us to connect standard ethernet wired connections and the Iridium Certus satellite and the Inmarsat BGAN satellite services using this smaller, more compact model of the Neon Remote Logger series.

We also have the recently released 3004N, which is designed to be the same physical same-form factor replacement for the older metal case NRT Models, allowing customers with older Metal case NRT models to upgrade to the new NRL without having housing or wiring changes.

The standard 3004M polycarbonate enclosure models remain and are often more convenient for a larger enclosure where solar regulators and additional sensor wiring is needed.

Please see the images of the 3004 Models with the ethernet interface and a comparison chart summarising the current 3000 series Neon Remote loggers.

3000 SERIES COMPARISON CHART

MODEL	**3001** **BOREHOLE NEON REMOTE LOGGER**	**3004** **NEON REMOTE LOGGERS**	**3004M** **NEON REMOTE LOGGER**	**3004N** **NEON REMOTE LOGGER**	**3008** **NEON REMOTE LOGGER**	**3016** **NEON REMOTE LOGGER**
MATERIAL	Polycarbonate	Powder Coated Aluminium Enclosure	Polycarbonate	Powder Coasted Aluminium Enclosure	Powder Coated Aluminium Enclosure	Powder Coated Aluminium Enclosure
SIZE	L115mm x L90mm x L80mm or L120mm x L85mm x L71mm, 300g	L182mm x W110mm x H46mm, 400g	L190mm x W80mm x H55mm, 300g	L108mm x W97mm x H81mm, 330g	L282mm x W122mm x H40mm, 650g	L295mm x W160mm x H40mm, 850g
OPERATING TEMPERATURE	-20°C to 60°C. Not affected by humidity	-20°C to 60°C. Not affected by humidity	-20°C to 60°C. Not affected by humidity	-20°C to 60°C. Not affected by humidity	-20°C to 60°C. Not affected by humidity	-20°C to 60°C. Not affected by humidity
ANTENNA	Model dependant	Model dependant	Model dependant	Model dependant	Model dependant	Model dependant
SCAN RATE	Programmable from 1 second to 5 minutes	Programmable from 1 second to 5 minutes	Programmable from 1 second to 5 minutes	Programmable from 1 second to 5 minutes	Programmable from 1 second to 5 minutes	Programmable from 1 second to 5 minutes
LOG RATE	Programmable from 1 second to 24 hours	Programmable from 1 second to 24 hours	Programmable from 1 second to 24 hours	Programmable from 1 second to 24 hours	Programmable from 1 second to 24 hours	Programmable from 1 second to 24 hours
TIME CLOCK	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)	Battery Backed Real Time Clock, Accuracy ±10 sec/month (non-Neon version), locked to server time clock (Neon)
CPU	16 Bit, 20MHz, Ultra Low Power	16 Bit, 20MHz, Ultra Low Power	16 Bit, 20MHz, Ultra Low Power	16 Bit, 20MHz, Ultra Low Power	16 Bit, 20MHz, Ultra Low Power	16 Bit, 20MHz, Ultra Low Power
STORAGE MEMORY	7.5Mbytes Flash (non-volatile), 3.75 Million log data points	7.5Mbytes Flash (non-volatile), 3.75 Million log data points	7.5Mbytes Flash (non-volatile), 3.75 Million log data points	7.5Mbytes Flash (non-volatile), 3.75 Million log data points	7.5Mbytes Flash (non-volatile), 3.75 Million log data points	7.5Mbytes Flash (non-volatile), 3.75 Million log data points
EXTERNAL POWER	9 to 30V DC	9 to 30V DC	9 to 30V DC	9 to 30V DC	9 to 30V DC	9 to 30V DC
EXTERNAL BATTERY	Optional: 3901 2 x Li D Cell Battery Pack	Optional: AUX BAT connector to suit non-rechargable 6910A Battery Pack	Optional	Optional	Optional: AUX BAT connector to suit non-rechargable 6910A Battery Pack	Optional: AUX BAT connector to suit non-rechargable 6910A Battery Pack
INTERNAL BATTERY	Two 3.6 Volt Lithium D Cell	No	Single 3.6 Volt Lithium D Cell	Single 3.6 Volt Lithium D Cell	No	No
CURRENT DRAW	< 85µA Standby, Max 500mA Active	<1mA Standby, Max 500mA Active	< 65µA Standby, Max 500mA Active	< 65µA Standby, Max 500mA Active	<1.7mA Standby, Max 500mA Active	<1.7mA Standby, Max 500mA Active
RTC BACKUP BATTERY	3.6V Li Coin Cell (5 year life)	3.6V Li Coin Cell (5 year life)	3.6V Li Coin Cell (5 year life)	3.6V Li Coin Cell (5 year life)	3.6V Li Coin Cell (5 year life)	3.6V Li Coin Cell (5 year life)
CONFIGURATION PORT	USB B Micro Port and SD Micro Card	USB B Port and SD Micro Card	USB B Micro Port and SD Micro Card	USB B Micro Port and SD Micro Card	USB B Port and SD Micro Card	USB B Port and SD Micro Card
LCD	No	Optional 240 x 320, Colour, Touch Panel	No	Optional 240 x 320, Colour, Touch Panel	240 x 320, Colour, Resistive Touch Panel	240 x 320, Colour, Resistive Touch Panel
ANALOG CHANNELS	1 Single ended (0-2.5V DC) with 12 bit resolution	Default: 4 Single-ended (max) or 2 Differential (max), Different configurations on request, 24-bit resolution, 4 user-selectable gain ranges	Default: 4 Single-ended (max) or 2 Differential (max), Different configurations on request, 24-bit resolution, 4 user-selectable gain ranges	Default: 4 Single-ended (max) or 2 Differential (max), Different configurations on request, 24-bit resolution, 4 user-selectable gain ranges	8 Single-ended (max) or 4 Differential (max), 24-bit resolution, 4 user-selectable gain ranges	16 Single-ended (max) or 8 Differential (max), 24-bit resolution, 4 user-selectable gain ranges
COUNTER CHANNELS	1 x 16 bit, DC to 300Hz potential free contacts (C0). Shared with Digital Input	2 x 16 bit, DC to 20kHz potential free contacts (C0/C2); 2 x 16 bit, DC to 300Hz potential free contacts (C1/C3), Different configurations on request. Shared with Digital Input	2 x 16 bit, DC to 20kHz potential free contacts (C0/C2); 2 x 16 bit, DC to 300Hz potential free contacts (C1/C3), Different configurations on request. Shared with Digital Input	2 x 16 bit, DC to 20kHz potential free contacts (C0/C2); 2 x 16 bit, DC to 300Hz potential free contacts (C1/C3), Different configurations on request. Shared with Digital Input	2 x 16 bit, DC to 20kHz potential free contacts (C0/C2); 2 x 16 bit, DC to 300Hz potential free contacts (C1/C3), Different configurations on request. Shared with Digital Input	2 x 16 bit, DC to 20kHz potential free contacts (C0/C2); 2 x 16 bit, DC to 300Hz potential free contacts (C1/C3), Different configurations on request. Four shared with Digital Input
INSTRUMENT POWER	5.5V (100mA) to 18V (60mA) regulated, User Programmable	5V regulated 100mA fused	5.5V (100mA) to 18V (60mA) regulated, User Programmable	5.5V (100mA) to 18V (60mA) regulated, User Programmable	12V regulated, 200mA fused, 5V regulated, 100mA fused	12V regulated, 200mA fused, 5V regulated, 100mA fused
INST. REFERENCE VOLTAGE	No	No	5V 10mA Max	2.5V 10mA Max	No	No
SDI-12	Single Channel, SDI V1.3 Compliant instrument and recorder modes supported	Single Channel, SDI V1.3 Compliant instrument and recorder modes supported	Single Channel, SDI V1.3 Compliant instrument and recorder modes supported	Single Channel, SDI V1.3 Compliant instrument and recorder modes supported	Two Independent Channels, SDI V1.3 Compliant instrument and recorder modes supported	Two Independent Channels, SDI V1.3 Compliant instrument and recorder modes supported
MODBUS	Single Channel, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16	Single Channel, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16	Single Channel, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16	Single Channel, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16	Two Independent Channels, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16	Two Independent Channels, RS485 RTU or ASCII protocol, 57600 baud (max) Functions 01, 02, 03, 04, 05/15, 06/16
HSIO	No	Yes	Yes	Yes	No	Yes
DIGITAL OUTPUT	No	Single - Open Drain FET 30VDC 250mA max	Single - Open Drain FET 30VDC 250mA max	Single - Open Drain FET 30VDC 250mA max	Single - Open Drain FET 30VDC 250mA max	Two - Open Drain FET 30VDC 250mA max
ETHERNET	No	Yes, 10/100 Mbit	No	No	Yes, 10/100 Mbit	Yes, 10/100 Mbit
ACCELEROMETER	Yes, Senses changes in logger orientation	Yes, Senses changes in logger orientation	Yes, Senses changes in logger orientation	Yes, Senses changes in logger orientation	Yes, Senses changes in logger orientation	Yes, Senses changes in logger orientation
BAROMETER	Optional-260-1260hPa Absolute, resolution: 0.1 hPa	Optional-260-1260hPa Absolute, resolution: 0.1 hPa	Optional-260-1260hPa Absolute, resolution: 0.1 hPa	Optional-260-1260hPa Absolute, resolution: 0.1 hPa	Optional-260-1260hPa Absolute, resolution: 0.1 hPa	Optional-260-1260hPa Absolute, resolution: 0.1 hPa
SOLAR CONTROLLER	No	Yes - Suitable for 12V up to 20W Solar Panels 12V 14Ah SLA Battery or smaller, 1A charge current limit"	No	No	Yes - Suitable for 12V up to 20W Solar Panels 12V 14Ah SLA Battery or smaller, 1A charge current limit	Yes - Suitable for 12V up to 20W Solar Panels 12V 14Ah SLA Battery or smaller, 1A charge current limit
BLUETOOTH	Optional - Yes	Optional - Yes	Optional - Yes	Optional - Yes	Optional - Yes	Optional-Yes
SERIAL INSTRUMENT	No	No	No	No	RS232 port, full implementation (all 9 signals available), baud rate 115200 max	RS232 port, full implementation (all 9 signals available), baud rate 115200 max
RELAY	No	1 x Normally Open and Normally Closed Contacts 1A 30VDC, 0.5A 125VAC	No	1 x Normally Open and Normally Closed Contacts 1A 30VDC, 0.5A 125VAC (with FTS 3110)	2 x Normally Open and Normally Closed Contacts 1A 30VDC, 0.5A 125VAC	2 x Normally Open and Normally Closed Contacts 1A 30VDC, 0.5A 125VAC
DIGITAL INPUT	1 x 0 to 5V DC Digital Input	4 x 0 to 5V DC Digital Input	4 x 0 to 5V DC Digital Input	4 x 0 to 5V DC Digital Input	4 x 0 to 5V DC Digital Input	8 x 0 to 5V DC Digital Input
MODEM OPTIONS	- Cellular 3G/4G/LTE - NBIoT - Satellite Iridium SBD	- Cellular 3G/4G/LTE - NBIoT - Satellite Iridium SBD - Satellite Inmarsat BGAN Hughes 9502 - Satellite Inmarsat BGAN Sabre Ranger - Satellite Certus Iridium RockRemote - Satellite Certus Iridium SkyLink	- Cellular 3G/4G/LTE - NBIoT - Satellite Iridium SBD	- Cellular 3G/4G/LTE, Supports 2 x SIM Cards - NBIoT, Supports 2 x SIM Cards - Satellite Iridium SBD	- Cellular 3G/4G/LTE, Supports 2 x SIM Cards - NBIoT, Supports 2 x SIM Cards - Satellite Iridium SBD - Satellite Inmarsat BGAN Hughes 9502 - Satellite Inmarsat BGAN Sabre Ranger - Satellite Certus Iridium RockRemote - Satellite Certus Iridium SkyLink	- Cellular 3G/4G/LTE, Supports 2 x SIM Cards - NBIoT, Supports 2 x SIM Cards - Satellite Iridium SBD - Satellite Inmarsat BGAN Hughes 9502 - Satellite Inmarsat BGAN Sabre Ranger - Satellite Certus Iridium RockRemote - Satellite Certus Iridium SkyLink

New 6527L Starflow QSD now with internal logger function

The Unidata 6527L Starflow QSD has been upgraded to include a data logger, similar in function to the older Starflow products.

Using Starlog 4 software and the built-in logger, cross-section profiles can be defined to calculate flow rate and total flow.

For customers with the 6527L who also want it to operate as an SDI-12 sensor, we have a special scheme to stop the logger and allow SDI-12 to command to trigger the measurement while the internal Scheme is running. The measurement interval is controlled by the scheme scan frequency.

Some customers see this as a good backup solution, if the main, perhaps telemetered data logger stops for any reason, the Starflow QSD 6537L logger will continue logging, providing a fallback position so data is not lost. There is a large flash memory space available within the Starflow QSD. It can store perhaps years of data points in flash memory, and that memory is retained even if the power to the unit is interrupted.

The new 6527L comes with a USB RS485 converter and StarlogV4 (Lite) version to create a scheme for the internal logger and to download data from the internal logger to a PC.

The product was released in July 2023. The Starflow QSD 6527 manual details how to use the internal logger function. This manual is available on the Unidata website: www.unidata.com.au

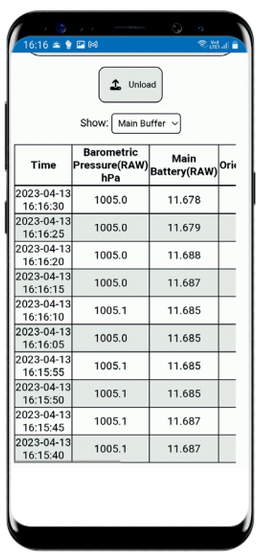
Unidata Bluetooth Web App

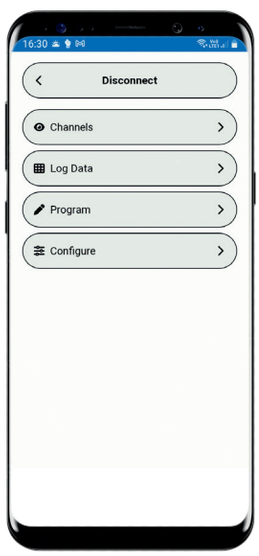
Unidata has released a Bluetooth Web Application (App) for use with Neon Remote Loggers. The implementation is browser-based to enable a wider set of computers and smartphones to easily use this new and important diagnostic tool.

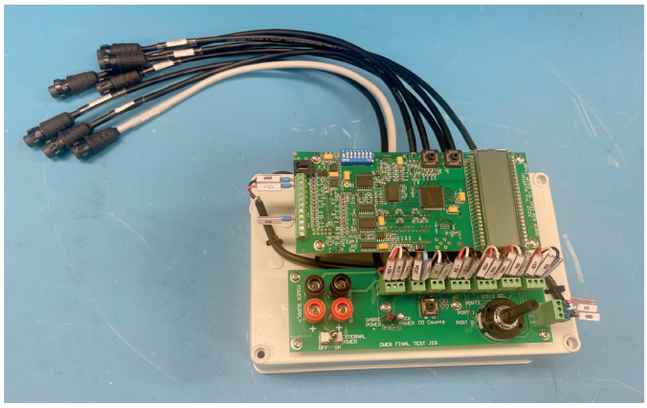
The App allows an NRL to be configured and initialised for telemetry using a wireless Bluetooth-BLE link or a USB cable. It currently works on Windows and Android. iOS devices require an internet connection for verification. An offline iOS App is in development.

The App can also be used to check the operation of schemes and download logged data. We plan to build on this app and add additional features over time.

The App is available from the Unidata Website at: https://neonperth.unidata.com.au/nrlutil/. Versions for Google Play and the Apple App Store are in development.







Manufacturing Automation

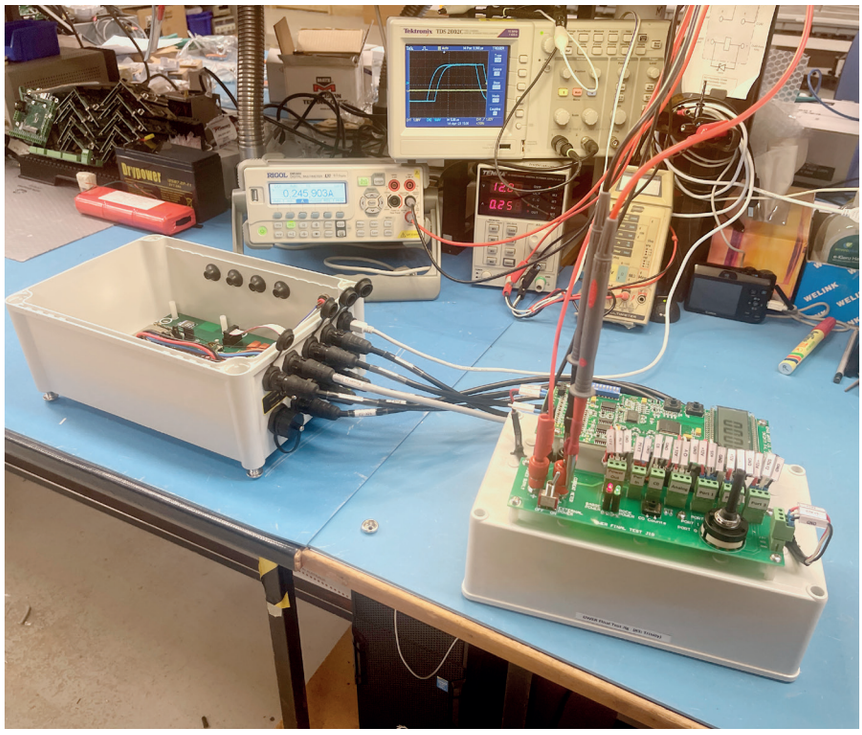
Unidata has over the last year developed automated production, test, and calibration facilities at the Unidata Factory. This work has been completed by our engineers and production technicians and we now have several automated test systems to test and calibrate systems we build.

Automation provides consistency in the test and calibration process for the production process in the first instance. It improves our quality and consistency in production.

The automated test facilities can also be used if units in the field are returned to our repair facility. They can be re-tested and re-calibrated in the same consistent way before being sent back to customers.

Production automation is a great tool for us, it is a good investment in consistency, and it reduces time and costs in production.

Please see the photos. We use programmable power supplies and instruments providing voltage sources, and voltage and current measurements throughout the process. We also use our own Microprocessor SDI 12 and Modbus interface units to simulate instruments and other digital instrument sources.



UNIDATA **STAFF PROFILE**

Cheryl Stevenson

Cheryl joined us at Christmas last year to assist with Finance and Accounting in the lead-up to Elena O'Neill's retirement.

Cheryl lives in Mandurah and likes cars. She drives her very nice Mercedes to work on the Kwinana freeway every day, the classiest car we have ever had in our car park.

In her spare time, you will find her with a drill or a paintbrush in hand – no piece of furniture is off-limits. Cheryl has a granddaughter (aka Smiling Assassin) who takes a lot of her time and tests her patience level.

Globalstar satellite and cell phone 3G replacement Systems

This year the older Globalstar Satellite Network and the older 3G Cell Phone systems are being phased out and replaced with up-to-date communications networks. Unidata is involved in several customer projects to achieve this objective and we have had a very busy factory over the last year as a result.

We have supplied several customers with upgrade options. The new Iridium Certus satellite products, with Rock Remote and Blue-Sky modem components and the new NB-IoT cell technology. NB-IoT provides increased cell tower range and is also lower power than the standard 4G and 5G which provide very high speed and higher power which is not needed for telemetry and IoT applications. The Inmarsat BGAN modems from Hughes 9502 and the Add Value Sabre Ranger remain popular as well.

The emphasis has been on manufacturing to allow for ease of installation in the field. More work in the factory means less work on-site and that saves time and money for our customers.

Use an NB-IoT Signal Analyser before selecting a cell phone service

We have many customers transitioning from older cell phone services, such as 2G and 3G to 4G to the newer low-power NB-IoT Services.

We have assisted several customers who are planning the change to their cell phone services, mostly towards the newer NB-IoT services, when they may have increased cell tower range with those new NB-IoT Services.

You can purchase a signal strength meter or analyser to take the guesswork out of deciding what service to use and what cell phone range you may have with various antenna combinations.

Unidata has used the ETM 770-PRO 3G/4G/CAT-M1/NB-IoT Signal Analyser which displays all available Frequency Bands, RSRP, RSRQ, RSSI, GPS Location, Cell ID, Neighbouring cells, Ping test data, and many other parameters.

This information is very useful for planning and there is a facility to send data to ETM's Cell NET cloud platform or to other 3rd party platforms/servers, to make it easier to record results.

You could also just write the results down in a book or set up your own spreadsheet for the results.

Check them out at https://etmpacific.com.au/products/cellular-signal-strength-analysers/etm-770-pro-3g-4g-cat-m1-nb-iot-signal-strength-analyser

Australian Hydrographers Conference (AHA) – Penrith NSW

In May this year, the 23rd Australian Hydrographers Conference was held in Penrith NSW at the NSW Rugby League Penrith Panthers Conference Facility. The conference was the first conference post-Covid. The last conference was held in Canberra in 2019. It is on the train line on the way to the Blue Mountains, a very picturesque part of Australia.

Unidata was the Platinum sponsor for the event, and this was done to show the AHA that we are a committed member, and we wanted to show our support to the AHA at the first major conference post-Covid. Unidata Staff Kevin Chung and Matt Saunders attended and presented at the conference and our NIWA colleagues Graham Elley and Evan Baddock also attended.

We were provided with presentations from key government and Industry people, including BOM and The Climate Change Research Centre. A key message from these researchers was that while climate change is real and upon us, we must remember that the extreme weather events we have experienced lately are more related to weather than climate.

Another clear message from the conference was that while traditional instruments, such as shaft encoders, and ultrasonic and radar instruments continue to measure streams and rivers, a fast-growing method to measure rivers is by using video analysis of the surface of the water in rivers. This new method is called Image Velocimetry. Unidata is now involved with some pilot programs to investigate this new method, which requires a high bandwidth from measuring sites for live video to be transferred to a central computer for analysis.

We had a conference dinner at the Penrith Panthers Stadium, and we got to understand the game of Rugby League a little more.

Mandarins at Unidata

Julian Shao and Elena O'Neill are good gardeners and recently both bought in mandarins to work to share with the Unidata staff.

Julian's mandarins were smaller and harder to peel but they were sweeter.

Elena's mandarins were large and easy to peel and tasted quite good.

We all enjoyed each gardener's produce, but there were no better or worse mandarins, they were just different.

It would be very dangerous to pick a winner, so both Julian and Elena agreed it was a draw.

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