

CELL TOWER MONITORING



APPLICATION BACKGROUND

Cell towers are abundant worldwide and they are usually high and as such, can be a threat to low flying aircraft.

There are strict regulations which make sure the cell tower is clearly visible at all times to minimize any danger of collision.

In Australia regulatory requirements for tall structures and hazardous plume sources are managed by Airservices Australia in conjunction with Geoscience Australia. Any company/person that owns, controls or operates tall structures need to report:

- gaseous effluxes with a velocity of more than 4.3 m/s
- the construction, extension or dismantling of tall structures if the top is 100m or more above ground level

- structures that are 30m or more above ground level – within 30km of an aerodrome or 45m or more above ground level elsewhere

Further more, there are requirements to have appropriate lights, low intensity, medium intensity and high intensity lights, or a combination of such lights installed.

These regulations are the reason it is important to independently monitor cell towers.

APPLICATION DETAIL

Cell towers have antennae at the top or side of a structure and an enclosure for the communications equipment and primary or backup power supply. Depending on the tower height, cell towers can have flashing or steady, white or red, medium or high intensity lights installed.

As high intensity obstacle lights have a significant environmental impact on people and animals, it is necessary to consult with interested parties about their use.

A Neon Remote Logger complete with an independent power supply, typically a battery, small solar panel and solar controller can be set up to monitor important operational and regulation requirements.

While there is a communications channel available at the cell tower, often authorities consider using a different / independent communications system to keep the monitoring system completely independent from the actual cell phone network using the tower.

The Neon Remote Logger may have analog and digital inputs to monitor tower light states, communications equipment status and primary and backup power system status. Some more complex

equipment may also have Remote Terminal Units (RTUs) which have Modbus registers that can be read routinely and reported, perhaps every 5, 10 or 30 minutes to a Neon Server so that data on the overall status of the cell tower can be displayed on a standard web browser.

To maintain network diversity / network independence, it is better to report the status using a satellite communications channel, either geostationary or low earth orbit, so the monitoring does not rely on the actual cell tower being operational.

The status of the cell tower can be displayed on a Google Map display and a mimic diagram can provide an easy visual representation of the tower and the status of the key monitoring points.

The Neon Server Applications software can display each cell tower on a Google maps interface with a mimic icon colour based on operational status, green for normal and amber or red for set off alarm condition.

Alarms can be set up on key parameters. If an alarm condition is reached, an SMS alarm alert with escalation or an email is sent to key staff alerting them of a problem or failure.





TYPICAL CONFIGURATION

APPLICATION SPECIFIC INSTRUMENTS/INPUTS

Options	Unidata Part Number	Description
Analogue Inputs/Modbus RTU	Custom part	Telco provided RTU / sensors

NEON TELEMETRY - NRL / RTU / FIELD UNITS

Options	Unidata Part Number	Description
Ethernet	3016A-000 / 3008A-000	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G/4G	3016A-C00 / 3008A-C00	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G/4G and LoRa	3016A-CL0 / 3008A-CL0	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite-Inmarsat	3016A-00I / 3008A-00I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite-Inmarsat & 3G/4G	3016A-C0I / 3008A-C0I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Low Earth Orbit Satellite - Globalstar	3016A-00G / 3008A-00G	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Satellite - Iridium Short Burst Data	3016A-00R / 3008A-00R	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Standalone RTU/NRL - Industrial	3004A-00 / 3004A-0L	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
Cellular RTU/NRL 3G/4G - Industrial	3004AC0 / 3004A-CL	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
M – Series Standalone RTU/NRL	3004A-M000 / 3004A-M0B0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Cellular RTU/NRL 3G/4G	3004A-MC00 / 3004A-MCB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series LoRa RTU/NRL	3004A-ML00 / 3004A-MLB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Ethernet RTU/NRL	3004A-MEBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Microsatellite RTU/NRL	3004A-MHBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Iridium Short Burst Data RTU/NRL	3004A-MIBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional

NEON APPLICATION SOFTWARE - CUSTOMER SERVER

Options	Unidata Part Number	Description
Neon Applications Software	2302A	Neon Server Software Licence Incl 5 NAL
Neon Applications Software	2302A-10	Additional 10 NRT Access Licence
Neon Applications Software	2302A-20	Additional 20 NRT Access Licence
Neon Applications Software	2302A-50	Additional 50 NRT Access Licence

NEON HOSTING SERVICE - UNIDATA SERVER

Options	Unidata Part Number	Description
Neon Hosting Service	2301A	Neon Data Initial Subscription Setup Fee
Neon Hosting Service	2301A-01	Neon Data Service Fee for 1-50 NRT
Neon Hosting Service	2301A-02	Neon Data Service Fee for 51-100 NRT
Neon Hosting Service	2301A-10	Neon Data Service Fee Metering

DATALOGGER MANAGEMENT SOFTWARE

Options	Unidata Part Number	Description
Starlog V4 Management Software	6308A-AUE	STARLOG V4 Full Licence Key