# nlt Digital Solutions

## N-Connex

### Networks for harsh environments

- Plug n' play, high speed modular network Pre-terminated fiber eliminates splicing underground
- Rapid deployment and easily maintained Turnkey data and voice communications solution
- Data networking via a gigabit backbone Monitoring and control systems
- Video surveillance and monitoring Personnel and vehicle tracking Emergency management and alarms Ventilation optimisation
- Install the modules you need as required Connect and future proof your mine or tunnel

# NLT Digital Solutions

NLT Digital is a proud industry expert in the design and installation of flexible communication, networking, monitoring and tracking systems for the underground mining and tunnelling industries. Our solutions are used every day on roadways, subways, railways, mines, hydro and other harsh industries. N-Connex is simple, reliable and rugged.

Our engineers will work with you to design a solution that's based on your individual needs and requirements – we offer the industry's most reliable and durable communication solutions. The goal for every project is to help maximize the safety, productivity and profitability for our customers.

NLT Digital can also provide full turn-key solutions to cover voice communications, tracking and visualisation solutions. Our software package is powerful, but user friendly designed for monitoring environmental conditions, emergency management and control functionality. N-Connex is the backbone that enables these proven solutions.

## N-Connex

N-Connex is NLT Digital Solutions award winning rugged, modular, IP67 rated networking solution for harsh environments.

From underground hard rock mines to process plants, from tunnels to heavy industry, N-Connex will provide a fit for purpose WiFi and Ethernet solution like no other. As your demand for data, communications and IoT grows, N-Connex fully modular modules ensure your network will grow with you.

N-Connex enables a range of solutions that make use of WiFi (802.11) and Ethernet connectivity.

Choose the functions and network configuration that meet your needs. Additional modules can easily be added to an existing installation to support growth.

Our award winning design makes installation and maintenance easy. The modules hook easily onto an expandable custom rail system and then lock in place using a thumb screw. Units can also be mounted in a stand-alone configuration.

N-Connex modules simply 'plug & play' using Power over Ethernet (PoE) and pre-terminated CAT6 Ethernet and fibre cables.

### Range:

- Distribution 2.0 Module
- Power 2.0 Module
- Battery Module
- Analog I/O Module
- Digital I/O Module
- Alarm Module
- Evacuation Module
- Bolt 2.0
- Lightning Bolt
- Extender
- Tracking Tags
- CAT6 & Fibre Cables

# Distribution 2.0 Module

The Distribution module is the core N-Connex component that delivers a high reliability, Gigabit Ethernet network. It supports many advanced network standards to optimize network performance, ease maintenance issues and secure network safety.

With the inclusion of eight managed PoE ports, two Non-PoE Ports and four Single Mode Fibre Ports it enables a range of solutions and network topologies. When combined with the N-Connex Bolt Access Points strong and reliable WiFi coverage in underground mines, tunnels and heavy industrial facilities is achievable.

## Key Features:

- Eight (8) 10/100/1000 Mbps RJ45 POE Ports
- Two (2) 10/100/1000 Mbps RJ45 Non-POE Ports
- Four (4) Fibre Optic Single Mode Ports
- Total PoE budget of 200W at 25°C or 160W at 40°C
- 52 Gbps Switching Capacity
- Optional Battery Backup Power
- Network Management Capabilities
- IP67 protected enclosure



# Power 2.0 Module

The Power Module provides power to the Distribution Module of the N-Connex system. The Power Module connects to a singlephase 110-240 VAC source and supplies an output load of 48 VDC at approximately 5 Amps.

Adding the optional (recommended) Battery Module will provide the Power Module with an Uninterrupted Power Supply (UPS) function. The Power Module will also provide a dedicated connection for the Battery Module.

## Key Features:

- Selectable AC Input Voltage 110 / 240 VAC, 47 ÷ 63 Hz
- Total Power Output of 200W at 25°C
- Status indicators
- IP67 protected enclosure
- UPS Functionality (optional)
- Up to 8 hours backup with the optional Battery Module
- Standalone or quick-fit rail mounting

# Battery Module

The Battery Module is designed specifically to provide backup power when the main 120/240 VAC power source is shut down. The Battery Module connects to the Power Module, to provide an uninterruptable power supply (UPS).

The Battery Module will provide 48VDC and will typically last for 8 hours or more. The actual time is dependent on the overall load, which is determined by the number and type of PoE devices connected to the module.

### Key Features:

- Nominal 48 VDC to support active PoE
- Status indicator
- Vented, aluminum enclosure provides durability and efficient thermal management
- Recharges automatically via the Power Module
- Weatherproof IP67 enclosure
- Up to 8 hours backup



# I/O Modules Digital & Analogue

The IO module is the answer to integrating sensors and instrumentation into the N-Connex network enabling the monitoring and control of a wide range of systems.

The IO is compatible with any PLC or control network using modbus TCP. When paired with NLT Digital's flagship software Digital Mine, the display of gas sensors, fan speeds, paste instrumentation or any other compatible device is made possible.

### Analogue I/O Key Features:

- Six (6) analog inputs
- Two (2) analog outputs
- Two (2) Digital inputs
- Two (2) Digital outputs
- IP65 Protection
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### *Digital I/O Key Features:*

- Eight (8) Digital inputs
- Eight (8) Digital outputs
- IP65 Protection

# Alarm 2.0 Module

The Alarm module provides an emergency warning solution for the N-Connex Network. It features a high intensity strobe light, a 110db siren and an illuminated emergency pushbutton.

The module is powered by PoE and is designed to be connected to N-Connex Distribution modules via CAT6 cables. Combined with NLT Digital Ethernet extenders, it may be positioned up to 300m away from the Distribution module.

## Key Features:

- Remote trigger via Digital Mine or Modbus/TCP
- Local trigger via illuminated push button
- Weatherproof IP67 enclosure
- 110dB siren and high intensity strobe
- Compatible with third party PoE equipment



# Evacuation Module

The Evacuation module is an enhanced Alarm module that has similar functionality but includes an additional yellow/amber strobe and siren arrangement.

This second strobe/siren can be used for warning, or testing purposes leaving the primary red alarm/ strobe to be used for true emergencies.

Features include a mute button so that the sirens can be momentarily muted to allow for voice communications.

## Key Features:

- Remote trigger via Digital Mine or Modbus/TCP
- Local trigger via illuminated push button
- Weatherproof IP67 enclosure
- Two 110dB sirens
- High intensity strobe
- Compatible with third party PoE equipment

# Bolt 2.0

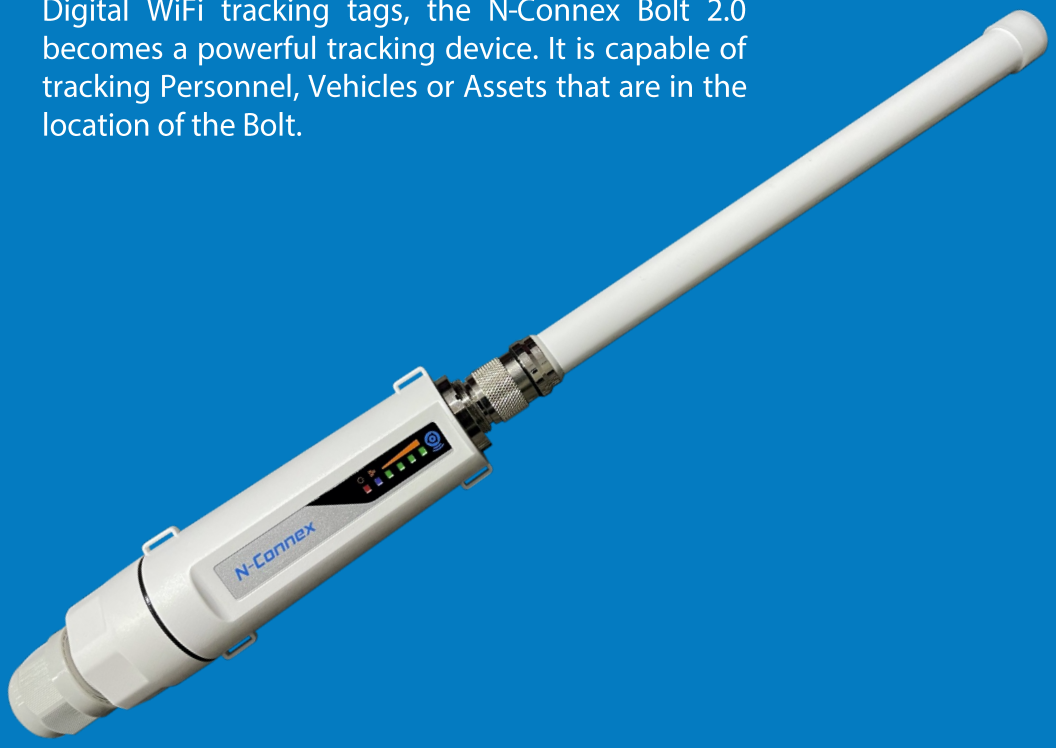
The N-Connex Bolt 2.0 is a compact 2.4 GHz outdoor and underground wireless access point. It is equipped with an N-Type antenna connector to fit an assortment of industry standard antenna options.

Powered by PoE, a single Cat6 cable provides network connectivity and power, making installation easy and intuitive.

The secret power of the N-Connex Bolt 2.0 is the built-in WiFi tracking function. When paired with NLT Digital's flagship software Digital Mine and NLT Digital WiFi tracking tags, the N-Connex Bolt 2.0 becomes a powerful tracking device. It is capable of tracking Personnel, Vehicles or Assets that are in the location of the Bolt.

## Key Features:

- 802.11 B/G/N
- IP67 Enclosure
- Up To 4 SSIDS
- VLAN Capable
- POE Powered
- N-Type Antenna connector





# Lightning Bolt

The Lightning Bolt is a compact dual band outdoor and underground wireless access point. It is equipped with two N-Type antenna connectors to fit an assortment of industry standard antenna options.

Powered by gigabit PoE, a single Cat6 cable provides network connectivity and power, making installation easy and intuitive. Additionally, the low power design ensures 802.11AC WiFi can be achieved at up to 300m from the NLT Digital Distribution Module when paired with NLT Digital's Cat6 extenders.

The secret power of the Lightning Bolt is the built-in WiFi tracking function. When paired with NLT Digital's Digital Mine software and NLT Digital WiFi tracking tags the Lightning Bolt becomes a powerful tracking device. It is capable of tracking Personnel, Vehicles or Assets that are in the proximity of the Bolt.

## Key Features:

- 2.4 / 5 GHZ WIFI access point
- IP67 enclosure
- POE + gigabit ethernet
- Dual stream MU-MIMO
- Web based management
- Ethernet extender support (up to 300M)
- Rugged N-Type antenna connectors
- Bluetooth on board

# Extender

The NLT Digital Ethernet Extender provides a convenient system for extending ethernet beyond the 100-meter cat6 limit. The extender uses an active PoE connection to self-power and extend the cat6 ethernet connection up to an additional 100 meters.

A maximum of 3 Extenders can be used in a daisy chain configuration to extend the connection up to 400 meters, while still providing up to 4 watts of power to PoE peripherals.

When combined with an N-Connex Bolt wireless access point, WiFi coverage can be provided for an entire site. The Extenders are fitted with IP67 cat6 receptacles to ensure waterproof and dust free connections when using NLT Digital cat6 pre-terminated cables.

## Key Features:

- 10/100/1000 Mbps
- LED power indicator
- 100M Extended range
- 15/30W POE Power
- Rugged metal enclosure
- Easy installation
- IP67 Ingress Protection



# Industrial Switch

The NLT Industrial Switch provides connectivity to a Gigabit Ethernet backbone. The switch includes eight (8) managed PoE ports, two (2) Non-PoE Ports and four (4) Single Mode Fibre Ports to enable a range of solutions and network topologies .

The NLT Industrial Switch is designed to seamlessly integrate with various data acquisition systems including SCADA and HMI systems. It supports MEF service delivery, and offers timing over packet solutions such as IEEE 1588 and synchronous Ethernet. With its robust construction and small footprint, the NLT Industrial Switch is an ideal choice for critical applications that require reliable and secure networking capabilities.

## Key Features:

- Eight(8) 10/100/1000 MBPS RJ45 POE ports
- Two (2) 10/100/1000 MBPS RJ45 NON-POE ports
- Four (4) fibre optic single mode ports
- Total POE budget of 240W
- L2+ features
- Support for spanning tree STP, RSTP, MSTP
- Optional UPS monitoring
- Web based management
- DIN rail mount
- 52 GBPS switching capacity

# Vehicle Tag

The Wifi Vehicle Tag is the market's leading tracking tag with more units deployed than any other tag of its kind. These rugged battery powered tags can be attached to a variety of vehicles such as light vehicles, trucks or loaders.

Tagged vehicles can be accurately located in real-time and in any environment. WiFi Vehicle Tracking Tag beacons are received and processed by NLT's WiFi access points, keeping infrastructure costs low and installation simple. Optionally, a beacon can be forced using a tag reader where very high resolution tracking is required.

### Key Features:

- Rugged design
- IP65 Protection
- Vehicle powered
- WIFI Tracking
- Customisable beacon rate
- Optimised for Digital Mine software suite



# WIFI Tracking Tag

The Wifi Tracking Tag is the market's leading tag, with more units deployed than any other tag of its kind. These IP65 rugged, battery-powered tags can be attached to people and to a variety of equipment, such as tools, containers, manufacturing equipment and vehicles. This enables tagged items to be accurately located in real-time and in any environment.

WiFi Tracking Tag messages are received and processed by NLT Digital's WiFi access points, keeping infrastructure costs low and installation simple. As with all tags, location determination is performed through a unique beaconing method that keeps network impact low and ensures scalability and long battery life.

Wifi Tracking Tags are ideal for personnel tracking and enable you to streamline business processes and improve operations, while also promoting a safer environment.

### Key Features:

- Long life
- Rugged design
- Motion sensor
- WIFI tracking
- Customisable beacon rate
- Optimised for Digital Mine software suite
- IP65 Ingress Protection

# Kiosk

The NLT Kiosk is an intuitive touch screen station that connects with Digital Mine. It assigns NLT cap lamps and tracking tags to personnel, contractors and guests. The Kiosk is NLT's solution for rapid and convenient assignment of safety equipment, removing the administrative burden and allowing devices to be used by multiple people.

The touch-enabled interface and exciter technology allows mine staff to quickly assign a tracking and safety device to their user credentials at the beginning of their shift. Powered by NLT's Digital Mine Tracking Software and the N-Connex mine industrial network, the Kiosk helps ensure accurate tracking data, enhancing mine safety with efficiency.

The Kiosk may also be outfitted with an RFID card reader to be integrated with a mine's existing security or HR systems, simplifying the assignment of tracking tags and lamps to personnel. Once assigned, the lamp or tag can remain assigned to a worker for a pre-configured period, ensuring operational policies are observed.

### Key Features:

- Touch screen
- Windows 10
- Optional card reader
- IP55 protection
- Intuitive interface
- Quickly assign personnel, vehicles or assets
- Digital Mine software integration



# Active Tag Tester

The Active Tag Tester is a vital tool to keep your tracking system healthy. It is capable of testing reverse tracking tags, or standard RFID tags. Simply push and hold the button to activate the tag tester. If there is a tag in the area, the green LED will blink to show the tag is active.

### Key Features:

- IP65 Protection
- RFID Tag Read LED
- Programable for individual site
- Reverse tracking or RFID tag
- Power LED
- Long battery life

# Fibre Patch Cable

NLT Digital's Fibre Patch Cables provide backbone connectivity to our range of network devices. Pre-terminated lengths are available for ease of installation and custom lengths can be supplied for special applications.

Stainless Steel armour ensures the fibre cables are protected from crushing, cuts and abrasions. Rugged IP68 connectors are supplied on the network devices and fibre cables to enable quick, simple connections in harsh construction environments.

### Key Features:

- Pre-Terminated for ease of use
- High chemical resistance
- Halogen free
- Crush resistant
- UV protected for outdoor use
- High tensile strength
- Abrasion and cut resistant
- Armoured stainless steel Axial tube cable
- IP68 Rating

# CAT6 Cable

The pre-terminated N-Connex CAT 6 cables enable simple connection and maintenance for the ethernet backbone of the N-Connex network solution.

The cables come pre-terminated in a variety of lengths and are fitted with a captive screw-on connector which mates with the RJ-45 connector on the Distribution module of the N-Connex system.

The pre-terminated CAT 6 makes installation simple, maintenance easy and stocking more manageable .

### Key Features:

- Rugged RJ-45 connectors
- IP65 with N-Connex products
- 23 AWG
- Low smoke, zero halogen

# NetPort

## Coal Solutions

Image credit: Peabody Energy, Inc.

nlt Digital Solutions

NLT Digital Solutions offers a comprehensive range of intrinsically safe products designed for use in hazardous environments. Our product range includes power supplies, communications, tracking systems, cap lamps, antennas, and access points, all engineered to prevent sparks and heat that could lead to explosions in flammable environments.

Our tracking systems work seamlessly with our IS access points and smart IS cap lamps, allowing you to monitor the location and status of your workers in real-time. This helps to improve safety and productivity by enabling more efficient management of your workforce. Our cap lamps are also designed to provide high-performance lighting in underground environments, while our antennas ensure reliable communication.

Our access points provide secure and reliable wireless connectivity for mining operations, enabling you to easily connect to your network and devices in a hazardous environment.

At NLT Digital Solutions, we are committed to providing high-quality and durable products that meet the unique needs of the mining industry. Our team of experts is available to provide support and assistance whenever it is needed, ensuring that you can rely on our intrinsically safe products to keep your workers safe and your operations running smoothly.

# NetPort Gigabit

The NetPort Gigabit represents the next frontier in underground coal mining. With 2x2 MU-MIMO underground wireless capability will increase substantially. This new capacity will drive innovation and growth for your business.

The NetPort Gigabit is a dual 802.11b/g/n access point with a built-in 4 port ethernet fibre switch. Backbone connectivity is through four SFP ports enabling a range of network options including 100Mbps backward compatibility, 1Gbps, SM and MM.

Wireless data is transmitted and received via four antenna ports from two separate radios, both operating in the 2.4 GHz band. The four antenna ports are N-type female connectors, to which a variety of antennas can be fitted to suit the most rugged radio environments.

## Key Features:

- Four (4) Gigabit fibre SFP Ports
- L2+ Features
- Dual 2.4 GHZ WIFI radios
- 2X2 MU-MIMO
- Support for spanning tree STP, RSTP, MSTP
- Web based management
- 100MBPS backward compatible
- Intrinsically safe IECEX



# NetPort Distribution

The Netport Distribution provides connectivity to one (1) Gigabit Ethernet backbone. The module includes eight (8) managed PoE ports, two (2) Non-PoE Ports and two (2) Single Mode Fibre Ports to enable a range of solutions and network topologies.

The Netport Distribution can actively manage 240W (at 25°C) of total Power over Ethernet (PoE) supply across the various Ethernet ports. This enables a large range of high power consuming PoE devices to be simultaneously connected.

When combined with NLT Digital's range of Access Points we can achieve strong and reliable WiFi coverage in underground mines, tunnels and heavy industrial facilities.

## Key Features:

- Eight (8) 10/100/1000 MBPS RJ45 POE ports
- Two (2) 10/100/1000 MBPS RJ45 Non-POE ports
- Two (2) fibre optic ports
- Total POE budget of 240W
- L2+ Features
- Support for spanning tree STP, RSTP, MSTP
- Optional battery backup power
- Web based management
- IP67 enclosure
- 52 GBPS switching capacity

# Bi-Directional Antenna

The Bi-Directional Antenna serves as a crucial link between a wireless LAN and a WiFi client, facilitating their connection. It operates in the 2.4 GHz ISM band, enabling Point to Point communication and wireless video transmission.

The antenna can be seamlessly integrated with NLT Digital access points to suit diverse 2.4 GHz wireless setups. Crafted without the use of aluminum and featuring a static-free design, this antenna is well-suited for IS applications, making it an optimal choice for Bi-Directional Antenna needs.

## Key Features:

- 2.4 - 2.5 GHZ Frequency
- Easy installation
- Circular polarisation
- Aluminium free
- Rugged Construction
- Suitable for IS applications
- Bi-Directional
- Anti-static

# Uni-Directional Antenna

The Uni-Directional Antenna serves as a critical tool in establishing a wireless connection between a wireless LAN and a WiFi client. It offers support for Point to Point communication and wireless video transmission in the 2.4 GHz ISM band, making it an excellent choice for directional wireless transmission needs.

In combination with NLT Digital access points, the Uni-Directional Antenna can be tailored to suit various 2.4 GHz wireless setups, providing flexibility and adaptability to the user. It is designed to be static-free and does not use aluminum, making it a safe and reliable choice for IS applications.

## Key Features:

- 2.4 - 2.5 GHZ Frequency
- Easy installation
- Circular polarisation
- Aluminium free
- Rugged Construction
- Suitable for IS applications
- Uni-Directional
- Anti-static

# IS Power Supply

The NLT Digital IS PSU is a reliable and durable intrinsically safe power supply designed for use in hazardous zones 0, 1, and 2 of coal mining applications. It features an auto-ranging input from 88VAC to 265VAC, making it suitable for a variety of power sources.

The IS-PSU is housed within a compact steel powder-coated enclosure measuring approximately 82mm wide, 150mm long, and 110mm deep, making it easy to integrate into your ExD equipment while saving valuable space.

## Key Features:

- Intrinsically safe
- Auto-ranging power input from 88VAC to 265VAC
- Compact steel enclosure
- Reliable and durable
- Ensures worker safety


# Vigilance Smart Lamp

NLT Digital's line of Smart lamps debuted with Messenger, the world's first cap lamp to accommodate bi-directional messaging. Our new Vigilance Smart Lamp is the culmination of years of experience and engineering to supply a Lamp unrivalled in its functionality, capabilities and design.

For use in the harshest environments, the intrinsically safe (IS) Vigilance has the capacity to accommodate a variety of tracking tag options while keeping the quality of the battery and light source at the forefront.

Two-way Messaging, the integrated camera and smart apps are where Vigilance shines. With a massive 3.5 inch touch screen and integrated smart apps, the Vigilance lamp aims to improve work flow and communication for the most demanding underground environments

## Key Features:

- WI-FI network connectivity
- Bluetooth
- 3.5" touch screen
- Button keypad
- Intuitive messaging
- RFID tracking
- Built in camera
- NLT Digital WIFI tracking

# N-Connex & NetPort Co-Deployment


NLT Digital's comprehensive range of networking equipment includes both intrinsically safe (IS) and non-IS products. By combining our N-Connex and NetPort range, mining operators can build a comprehensive network that covers all areas of their mine, including hazardous and non-hazardous zones.

With our IS networking equipment, mining operators can safely establish communications and tracking capabilities in hazardous areas of the mine, while our non-IS networking equipment provides reliable and efficient operation in non-hazardous areas.

The co-deployment of our IS and non-IS networking equipment is a cost-effective and flexible solution that maximizes productivity, minimizes risk, and enhances the overall efficiency of mining operations. Our engineering team can also assist with customized solutions that meet the unique requirements of each mine.