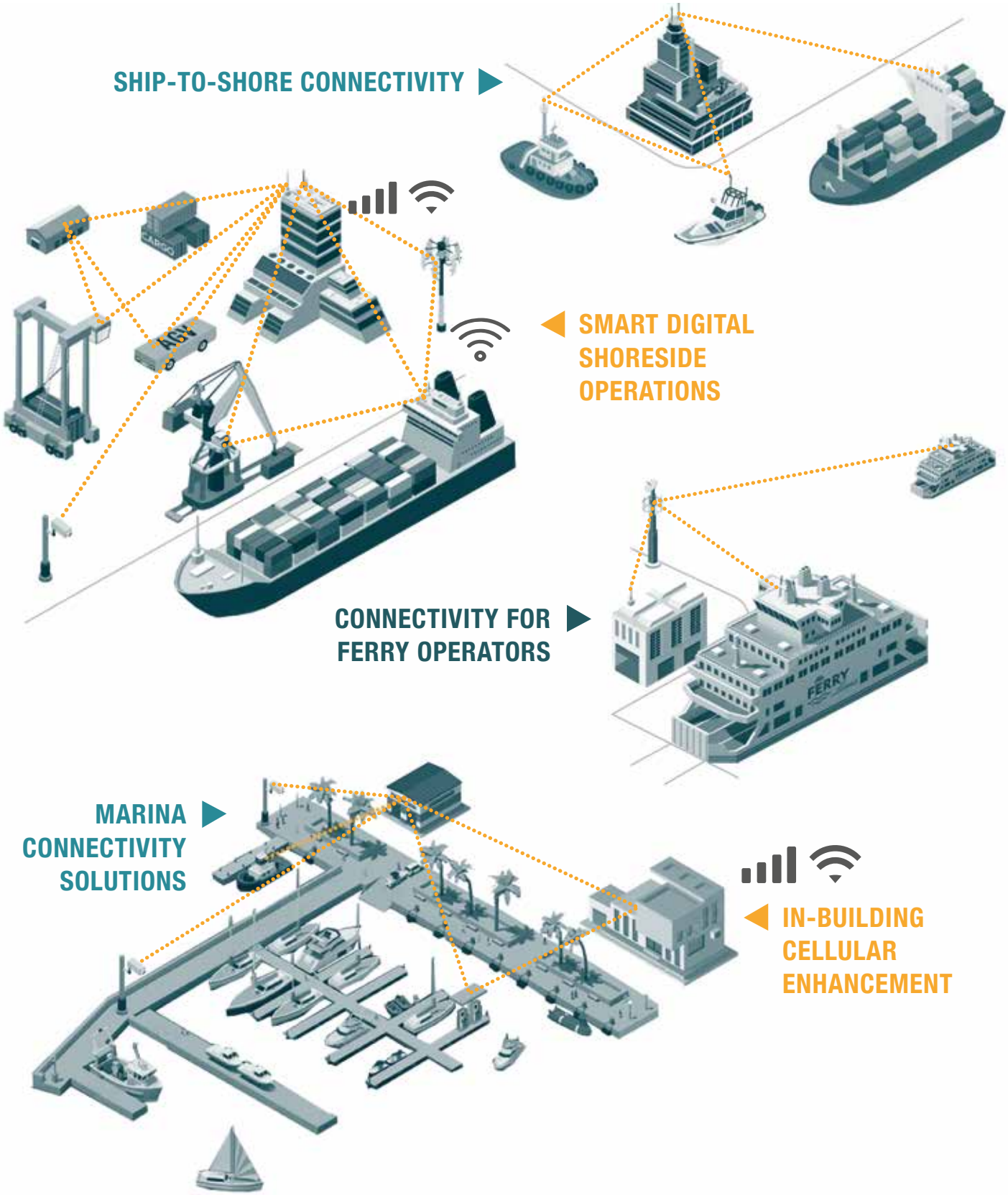
Wireless Networking & Connectivity Solutions *for the* Maritime Sector



RADWIN · TELTONIKA Networks · SAF · perle · RF ELEMENTS · Siklu · pepwave · NEXTIVITY Smarter by Design

Cogent Distribution

Cogent Distribution Ltd.,
Technology House,
Kennetside, Bone Lane,
Newbury, Berkshire, RG14 5PX

+44 (0)1635 917 722
solutions@cogentdistribution.com
cogentdistribution.com

Wireless Networking & Connectivity Solutions *for the* Maritime Sector

SHIP-TO-SHORE CONNECTIVITY

- Connecting ships in transit with shoreside port control, whilst entering/leaving a port and approaching or departing a berth. Connecting other port vessels, e.g. patrol vessels, tugs, pilot boats etc., with each other and the shore. (For: real time data connectivity, inventory access, voice communication, OCR (optical character recognition), ANPR (Automatic Number Plate Recognition), onboard CCTV, crew welfare etc.)

SMART DIGITAL SHORESIDE OPERATIONS

- Wireless mobility solutions for autonomous vehicles. (For: remote controlled RTGs (rubber-tyred gantry cranes), automated stacking cranes and straddle carriers, AVGs (automated guided vehicles) remote monitoring.)
- Ship-to-shore (StS) crane connectivity.
- Broadband ship-to-shore connectivity for vessels alongside.
- OCR (optical character recognition) for container search and location.
- CCTV safety and security around a port area.

CONNECTIVITY FOR FERRY OPERATORS

- Connectivity solutions for ferries in transit and/or berthed in a ferry terminal. Connecting ferries to the control network infrastructure from outside a port area, reaching speeds from 10Mbps to 1Gbps. (For: onboard connectivity, high-bandwidth passenger Wi-Fi, real-time monitoring of onboard systems, crew calling etc.)

MARINA CONNECTIVITY SOLUTIONS

- Connectivity between marina buildings and infrastructure such as CCTV sites, fuel berth, pontoon berthing, marina basins etc. (For: wireless broadband, internet backhaul, high speed data services.)
- Site or building access control for monitoring access and increased security.

IN-BUILDING CELLULAR ENHANCEMENT

- In-building cellular enhancement for mobile communications, the only solution conforming to Ofcom legislation and regulations. For small offices up to very large buildings, a complete in-building cellular enhancement solution catering for one to all four UK mobile network operators.

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Cogent Distribution Ltd – Wireless Networking & Connectivity Solutions *for the* Maritime Sector

Cogent Distribution Ltd offers a wide range of best-of-breed technology solutions applicable to digitalisation and automation projects in the maritime sector, encompassing ports and harbours, docks and terminals, shipping, services, engineering, and the leisure marine industries.

Our specialism lies in the field of wireless networks and connectivity, utilising products from a select number of specially chosen vendors and manufacturers, whose technologies can be deployed in isolation, or combined to complement each other to provide a comprehensive solution. Our product portfolio is particularly effective when used for applications in challenging and harsh environments.

To maintain a competitive edge, the maritime sector is looking to digitalisation technologies for better ways to improve productivity, as well as reduce costs and the negative impact on the environment. In this way, digitalisation becomes an enabler for decarbonisation with emerging technologies producing higher rates of efficiency and thereby lowering emissions.

The digital transformation of a port ecosystem improves infrastructure operations, vessel turnaround, cargo handling and passenger journey, with port automation becoming a key factor towards streamlining operations, increasing efficiency levels and raising productivity.

Port automation systems consist of intelligent solutions that allow the continuous and smooth operation of cranes, remotely monitored RTGs (rubber-tyred gantry cranes), AVGs (automated guided vehicles), automated containers, CCTV (closed-circuit television), OCR (optical character recognition) and more. These automation systems collect and transmit huge amounts of data in real time to operating personnel and the port operations control centre, enabling proactive management and meaning issues can be quickly identified and resolved. This type of data communications requires an ultra-high capacity and reliable wireless network so that data can be transmitted seamlessly, without loss, latency and/or jitter.

Many vessels will have existing communications systems already installed, including often satellite systems, or vessels are now looking at satellite technologies. The technology solutions provided by Cogent Distribution are easily integrated with existing communications systems and can be used in many types of modes, including failover or geofenced scenarios where communications methods can be switched to either faster, cheaper or preferred methods based on the criteria, location, performance, or data type.

Maritime companies that choose more advanced connectivity solutions will, over the coming years, see vast improvements in ship-to-shore communications, data exchanges, navigation, and safety, whilst also reducing their carbon emissions and impact on the environment. If adopted at a large scale, widespread, more advanced connectivity can help the maritime community make substantial headway towards the industry's decarbonisation and progress towards net zero by 2050.

Ship-to-Shore Connectivity

Next generation high-speed, low-latency networks are vital to improving data exchange, ship-to-shore communications, operational efficiency, and safety at sea. Cogent Distribution recommends **RADWIN** for their carrier-grade and marine-grade yet affordable solutions that deliver blazing-fast connectivity and unparalleled reliability. Using **RADWIN** 5GHz and 60GHz high-speed and high-capacity connectivity radios,

ships and other vessels can be connected to the port's network infrastructure as they approach or depart their berth, up to and far beyond the port's outer limits. Speeds between 10Mbps to 1Gbps can be achieved depending on the application and specific use case.

Vessels can connect and transfer or receive data prior to docking, ready for loading or unloading. This allows new information to be communicated to and from the vessel, enabling very high-speed connectivity from a vessel to shore-based operations. Navigational assessments and vessel updates can be processed efficiently without the requirement for personnel to board the vessel. Live CCTV and OCR can be accessed to aid docking and loading activities.

Connectivity can be established as far as 20km from a fixed location, either within the port jurisdiction or at other fixed locations along the vessel's route. This solution can also be combined with other technologies, such as satellite and cellular, to provide offshore and onshore connectivity in a seamless manner.

The ship-to-shore connectivity solution from Cogent Distribution and **RADWIN** can be used to provide enhanced connectivity for many other types of vessel activity in ports, such as pilot boats and patrol vessels, works vessels and tugs, offering onboard network (broadband) access and real-time communications between vessels and the shore. Additionally, this solution can be utilised for port projects, or port emergencies, without having an impact on other networks or port activity. The technology can also be deployed in other locations with relative ease to allow temporary wireless connectivity access for maritime projects, dredging operations, major events, or disaster recovery.

To ensure maximum coverage across all areas, Cogent Distribution can tailor a solution consisting of mobile data routing (MDR) solutions from **Peplink**, **Teltonika Networks** and **Perle Systems** to provide data connectivity (in 4G and/or 5G), alongside the **RADWIN** technology.

Smart Digital Shoreside Port & Terminal Operations
Ports, as well as freight and container terminals, require a cost-efficient way to increase operational efficiency through the implementation of remote connectivity, whilst also increasing safety and security control. High-capacity connectivity is required to deliver solutions for improved performance in vessel loading and unloading operations, container search and location, and crane movement.

Shoreside applications of smart digital operations include, for example, AGVs remote monitoring, remote controlled RTGs, automated stacking cranes and straddle carriers, OCR for container search and location, ship-to-shore crane connectivity, broadband ship-to-shore connectivity, and CCTV video surveillance for real time safety and security control, to aid docking and loading activities, monitor container movement and crane operators, enable mobile video transmission from rubber tyred gantry cranes, and ensure staff safety.

New technology is enabling a connectivity revolution, with point-to-multipoint radios from **RADWIN** allowing any crane, RTG, vehicle or associated port device to be connected directly to the port's network or to a third-party operator's network. In this application, a number of individual buildings or roaming vehicles will usually be connected over a large area, into a single or multisite network, providing network access to systems such as CCTV and OCR, with external connectivity via a secure internet network.

Where antennas need to be used with **RADWIN** radios, Cogent Distribution recommends external antennas from **RF elements**, which are selected for their exceptional performance and coverage over wide areas and long distances. **RF elements** antennas are robust, well-built products with features that help a radio unit perform at its best. The antennas only radiate signal in the direction in which they are pointed, and filter out other radio frequencies nearby, giving impressive performance in congested areas and high noise environments, such as a busy port area.

Cogent Distribution also supplies a wide range of robust, harsh environment IP-rated (Ingress Protection) and ATEX-rated (Atmosphères Explosibles) approved industrial-grade network connectivity devices (switches, routers, cable extenders etc.) from **Perle Systems**, which provide highly reliable connectivity in harsh environments or challenging locations, keeping networks operational without the need for maintenance or engineering intervention post-installation.

Building Management, Temporary Buildings, New Site & Resiliency Services
Most often, a port will already have cabled connections (fibre and copper) to all buildings that require network connectivity. Sometimes, these connections can become broken or damaged, or there may be obstacles to installing cabling. Alternatively, new or temporary buildings or facilities may need to be opened that require the same high-performance network connectivity as permanent infrastructure. In these circumstances, **RADWIN** 5Ghz, **Siklu** 60GHz or **SAF Tehnika** 80GHz radios (up to 10Gbps bandwidth) on a point-to-point or point-to-multipoint basis can be used to provide a main connection or a reserve or standby connection in the event of cable failure. This enables network resiliency and new site flexibility via carrier-grade solutions that deliver fibre-like connectivity with unrivalled speed, capacity and reliability.

In addition, **Peplink** and **Teltonika Networks** offer a range of cellular routers that can also provide immediate and high-speed network connectivity, combining all the mobile network operators into one bonded, secure connection to enable external and internal network access. All our cellular solutions can be integrated alongside our other technology partners to ensure an always on connection.

Cellular routers can also provide connectivity-on-the-move to AGVs, cranes and other associated moving infrastructure across the port environment to provide inventory information or real-time access to CCTV and back-end systems. Cogent Distribution recommends **Peplink's** connectivity solutions for enhanced internet reliability, reduced connectivity cost, and enabling new deployment possibilities, along with the reliable, secure and easy to use industrial network devices from **Teltonika Networks**. The product portfolios of both **Peplink** and **Teltonika Networks** can be utilised independently, offering connectivity to a specific location (LAN) or as a much wider network (WAN) across multiple areas or locations within ports.

Connectivity for Ferry Operators
Cogent Distribution has developed advanced solutions for ferry operators by combining technologies from **RADWIN**, **Siklu**, **Teltonika Networks**, **Peplink** and **Perle Systems**. Ferries can be connected to the control network infrastructure from outside a port area, also reaching speeds from 10Mbps to 1Gbps depending on the specific application circumstances. By combining each technology, Cogent Distribution can provide all the benefits of traditional terrestrial networks in an offshore capacity, far beyond port boundaries. Onboard connectivity will enhance a wide variety of applications for crew, passengers, and ferry operators alike. By eliminating communications timeouts, ferries can offer users the high-bandwidth Wi-Fi they require without exorbitant cost or unacceptably high latency. Onboard wireless networks allow passengers

to enjoy video on demand, safety and passenger information, as well as live TV broadcasts. Additionally, this connectivity can provide reassurance and accessibility to crew and passengers through the ability to deliver onboard cellular access, crew calling, and mobile applications.

Real-time monitoring of onboard systems can also be controlled and viewed by combining multiple technologies from fixed, nomadic and cellular wireless systems allowing flexible coverage across ferry sailing routes.

Marina Connectivity Solutions
Marinas are often located close to populated areas with access to many internet service providers and options such as fibre and copper broadband services. However, the physical layout of marina infrastructure, its buildings, pontoons and walkways, quays and marina basins, can present challenges to installing cables for connecting the infrastructure and the necessary connectivity devices. For example, installing cabling from CCTV cameras and Wi-Fi access points can be challenging or impossible due to obstructions and the marina's site layout.

To remedy this, Cogent Distribution can provide point-to-point or point-to-multipoint wireless solutions from **RADWIN**, **Siklu** and **SAF Tehnika** for wireless broadband and internet backhaul access across the marina site. By utilising wireless backhaul connectivity, this removes the requirement for installing fibre or copper cabling to deliver connectivity services. Cogent Distribution can also tailor a solution for high-speed data services via 4G or 5G networks using routers and access points from **Peplink** and **Teltonika Networks** to provide Wi-Fi and network infrastructure access.

Increasingly, marinas are investing in infrastructure for access control to monitor and manage safety and security within the marina environment. Site or building access control is often via keypad, swipe card and/or key fob, with each of these technologies requiring connectivity back to a control unit to operate efficiently and effectively. By utilising the connectivity technologies on offer from Cogent Distribution, we can provide a secure backhaul network infrastructure for a range of access control solutions.

In-building Cellular Enhancement
Mobile phone connectivity is increasingly vital for port and marina operations to run in the most effective, agile and efficient manner. The expansion of 5G coverage is increasing the issues people have around obtaining good mobile coverage in buildings. 5G works at a higher frequency, so the signal penetrates buildings less effectively, making the need for new indoor cellular coverage solutions more apparent.

If there are indoor connectivity challenges or reliability issues with cellular coverage and signal strength within your port or marina buildings, then there is a tried and tested solution available. **Nextivity** are the market leaders worldwide in providing in-building cellular enhancement and offer the only solution that conforms to Ofcom legislation and regulations in this area. **Nextivity** have a range of solutions suitable for small offices up to very large buildings, providing a complete in-building cellular enhancement solution that caters from one to all four of the UK mobile network operators in one cohesive coverage installation. This solution is widely installed, and Cogent Distribution is ready to help you survey, measure, test and supply the full range for your needs.

To discuss these or any other connectivity solutions, please get in touch with our friendly team via: solutions@cogentdistribution.com or +44 (0)1635 917722 or contact us via our website.