Radio Data Networks Limited

CSO Monitoring
Blocked Sewer Alarms
Radio Telemetry Systems
PMR Telemetry with Voice Channel
Battery, Mains or Solar Powered
Serial Data Links
Remote Asset Security
Facility Management
Water Quality Monitoring
Flood & River Level Monitoring
Pollution Monitoring
CSO Containment Valves
Installation & Service
Site Surveys

www.radio-data-networks.com
Our Board have over 25 years experience in pioneering innovative Radio Telemetry and Smart Wireless Sensor solutions for the Water, Wastewater, Road, Rail, Facility Management and Environmental Sectors.

The Board have delivered numerous projects ranging in scope from single point flood warning systems, through to major projects such as wide area meter reading (AMR) for Paris, the establishment of the UK’s first National Rail Temperature Monitoring network, through to more recently the deployment of what is arguably now Europe’s largest real-time Blocked Sewer and CSO Event Duration Monitoring Network.

*Mission Statement:*

“The Protection and Enhancement of the Environment, Business and Humanity through the application of real-time Radio Telemetry whereby we facilitate Detection, Alarm Generation and Mitigation”

Brian M Back BEng(Hons) CEng FIET MIoD
Founder & Managing Director
Business Sectors

We operate across a wide range of business sectors including the public utility, health care, industrial, commercial and environmental protection.

Wastewater Industry  Water Supply  Health Care
Facility Management  Rail Transport  Electrical Supply
Flooding  Catchment Monitoring  Retail Outlets
Agricultural & Food  Pollution Control  Warehousing & Distribution
Our Communications Strategy

- Communicates to Existing SCADA / BMS
- Provides Real-Time Data for Local Control
- Cyber, DoS & DDoS Attack Immune
- Low Running Cost
- Improved Battery Life
- Includes Regular Health Checks
- Legally Protected Service
- Industry Proven

Over 100 Million Messages and Expanding
The majority of our communications are carried over our own exclusive Ofcom licenced data channel which is now arguably the largest of its type in the British Isles stretching from Northern Ireland right down to the Channel Islands. We are in total control of our infrastructure and our operating frequency has been optimised to permit us to deploy systems in both urban and remote location. Link distances can be anything from a few km to up to 100km.

Advantages Over Cellular
Our networks are robust and unlike GPRS, 3G, 4G and Whitespace are totally isolated from the internet and the associated risk of DoS, DDoS and Cyber Attack. Operational costs are low as we do not charge per message or per device, just a single fixed geographically based fee per annum.

Flexibility and Compatibility
We support a variety of data protocols and strategies including point-to-point, master-slave and enhanced long term battery operation. Our operating frequency is also fully compatible with existing utility UHF scanning telemetry permitting antenna to share the same masts.

Real-Time Data & Control
Our messages travel direct and do not rely upon third party hosting or web based applications. Data can be sent straight from sensors in real-time to local control devices and simultaneously back to SCADA.

Health Messages
Unlike cellular where both battery drain and cost would be prohibitive our networks carry health messaging automatically generated by our sensors and telemetry outstations. Typically for battery powered applications these are as frequent as five minute intervals, giving the constant assurance to customers that communications are sound.
Our Solutions

We can monitor almost anything and deliver data in real-time. Our solutions are innovative and flexible and hence can interface to a wide range of transducers and sensors using both standard and non-standard protocols.

- Blocked Sewer Alarms
- Flood Alarms
- CSO Event Duration
- Data Links/ Modems
- Lone Working/Spill Control
- Meter Reading (AMR)
- Warning Beacons
- Covert Telemetry & CCTV
- Environmental Reporting
- Portable Monitoring
- BMS & SCADA Gateways
- Containment Valves
Radio Telemetry

- Point to Point Links or Star Hub
- Battery, Mains or Solar Powered
- PMR Licenced or Licence Free
- Simple to Use - Plug & Play
- Up to 100km Range
- Includes Regular Health Checks
- Voice Channel Option

Interface Options:
- Analogue 4-20mA
- Analogue 0-2V
- SDI-12
- RS232/RS485
- Digital Volt Free
- Modbus
Fixed or Portable Telemetry

Systems can be configured to deliver a wide variety of data over distances ranging from a few km to up to 100km. Our particular expertise lies in making systems robust and deployable in the harshest of locations devoid of power making them ideal for both fixed and temporary deployment.

Standard & Custom Interfaces

Our in house UK based development team permits us to offer a custom development service whereby interfaces both physical and software can be constructed to permit the data extraction from sensors and instruments with proprietary interfaces.

Approval Standards

- EN300-113
- MPT1327
- FCC-Part 90
- EN300-220

Serial - Analogue - Digital - Proprietary
Radio Modems & Base Stations

**Features:**
- Point to Point Links or Master Slave
- Up to 100km Range
- Modbus Transparent
- PMR Voice Channel Option
- Up to 9600bps Half Duplex
- Integrated DSP
- Transmit and Receive Only Units

**FSK to 4-Level QFSK with DSP**

**Radio Modems**
Radio Modems offer a quick and cost effective way of connecting two or more devices that communicate serially normally over cables. Interface standards supported include RS232, RS422, RS485 and USB.

**PMR Radio Modems Licenced**
For critical applications and when especially communicating across third party land we offer a range of Radio Modems that can operate on secure licenced radio spectrum and with output powers of up to 25W. These modems include sophisticated digital signal processing (DSP) that permits robust links to be established over distances of up to 50km.

**Protocol Transparent - Modbus**
Our Radio Modems tend to be transparent - this means that they do not deliberately buffer or alter the data before transmission. This makes them ideal for linking together legacy devices that communicate serial using protocols such as Modbus and hence can be used as the backbone of scanning telemetry systems to MPT1327 / EN300-113.

**Base Station Receivers**
Base Station radios are usually receive only devices. They generally include protocol translation and / or checksum verification firmware. Base Station receivers can be used to feed data to SCADA or into a data concentrator before it is posted on the internet. Data is normally converted to ASCII 8-bit format and can be distributed over RS232 or a similar interface standards.

RS232 - RS422 - RS485 - USB
Flood Warning Systems
Civil & Commercial

• Surface Water
• Ground Water
• Sewer Flooding

Wide Area Flood Warning Systems
Civil or Commercial radio telemetry based flood alarm systems that can monitor and report the three most common types of flooding: Surface Water, Ground Water and Sewer Flooding.

Radio Telemetry Based Flood Monitoring
Cellular networks are not omni-present and similarly are both subject to change, outages and traffic overload in particular during a crisis. Our flood warning systems communicate using radio telemetry technology that is totally independent of the cellular networks.

Ofcom Licenced Communication Option
For larger communities, Councils and commercial applications we can enhance the durability even further by operating the system of an Ofcom licenced and protected radio channel where data can be either sent directly to an existing alarm/control system or customers can operate a system based upon our Windows Flood Sentinel™.

PC Software - Beacons - Sirens - SMS Text - Email

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Industry Proven Interface to Existing Telemetry, BMS and SCADA - No Software or Programming!

The Utility Gateway Receiver is by far the most popular interface between our systems and third party Telemetry, BMS or SCADA. Already used by 5-utility companies and countless commercial clients, the Gateway Receiver provides a high reliability interface to virtually any third party outstation of any vintage without risk of compromising security.

All Gateway Receivers includes a mains power supply with backup battery float charger housed in a tough industrial enclosure. For small deployments there are 4 and 8 slot units and for larger systems a modular version expandable to 128 ways via DIN rail mountable modules.

Key to the popularity of the Gateway is its modular plug and play configuration, whereby nothing other than inserting a card is required to setup the system to accept a new telemetry or alarm point. Each card also includes a dedicated communication watchdog feature with an independent relay that drops out in the event of either sensor or communications failure.

Normally Gateway Receiver plug in relay cards are optimised for interfacing to control circuits. However, when required power switching options are available.

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Wide Area Sensor Networks

The Booster/Repeater - The key to reliable real-time monitoring of below ground assets located in CSOs, Sewers, Drains or Cable Ducts.

Booster/Repeaters are battery powered and supplied in a variety of double skin enclosures ranging from lightweight pole mounted GRP through to bollards and faux bird houses.

Boosters are designed to intercept the coded transmissions emitted from our “binary” Smart Sensor Transmitters such as the BDT Blocked Sewer detector, FDT CSO Event Duration Monitor or our water meter DMA monitoring AMR transmitters and to relay the data over either a licenced or licence free radio carrier back to a nearby Gateway Receiver or data concentrator.

Operating at typically 5-minute intervals they can achieve up to 5-years battery life, which doubles with solar assistance. When used in CSO applications can be configured to accelerate automatically during an event to meet the new 2-minute reporting requirements.

Mountable on Street Furniture
Battery Powered
Solar Assisted Options
Real-Time Sewer Monitoring & Alarms

- Dielectric Sensor Technology
- 10-Year Battery Life
- Local or Remote Reporting
- Simple to Install & Set
- ATEX Zone 2
- IP68 Sealed to 10m
- No Software or Programming
- Multi Award Winning Design
Blocked Sewer Alarms - Utility & Commercial

With tens of millions of hours service no wonder the BDT has become the most widely deployed blocked sewer sensor across both the utility and commercial sectors. First introduced in 2010 the BDT with its set point “binary” switching has won numerous industry awards for its revolutionary design and ease of use. Today BDTs can be found in service protecting schools, universities, hospitals, rail infrastructure, multi-storey office blocks, retailers, restaurants and thousands of km of public sewers via our wide area licenced data networks.

In the battle for low Totex the BDT comes top. Firstly, BDTs can be installed anywhere as they do not need cellular coverage and data is delivered in real-time to existing infrastructure. Secondly, the BDT can be installed from the surface eliminating the need for confined space entry teams. BDTs have reduced service costs due to their 10-year battery life and enhanced testability whereby the status of the unit can be read without having to lift a manhole cover. Further, the elimination of field programming ensures that units can even be installed and serviced in almost any weather condition. Finally, there are the significant cost savings through eliminating SIM cards and third party data hosting contracts.

Messages from the BDTs can be used to trigger local alarms, flashing beacons, read on a handheld terminal and/or simultaneously be read over a fixed network spanning many km with data delivered centrally back to an existing BMS, SCADA or web portal via our Booster/Repeaters and Utility Gateway Receivers and/or Data Concentrators.

Interface to BMS & SCADA
Audible Alarms
Visual Local Alarms
PC Sentinel Software
Handheld Readers
Texts & Emails
CSO Event Duration Monitoring & Mitigation Solutions
Inland and Coastal

EDM Dynamic Reporting - Rates 1 to 5-Minutes
Simple Integration with Existing SCADA and Reporting Systems to Deliver Live Text Warnings to Bathers, Surfers and Shellfisheries

- Award Winning Flow Detection Technology (FDT)
- EDM Based on Flow Duration not Level
- Widely Deployed and Industry Proven
- Simple to Install & Set
- Reporting Rate Auto Acceleration During Events
- No Software or Programming
- Robust Industry Leading MTTF
- Deployable in all Areas - no Cellular Network Required
- Real-Time Radio Telemetry Data for Control & Mitigation
- Optional RDN Sentinel™ Windows Desktop Based GIS Software with Logging + Alarms + Display + SMS + E-mail
Unique Proven Flow Detection Technology
Micro power flow detection technology that reports actual flow in real-time thus eliminating the false reports associated with level derived techniques.

Can Monitor from Either Side of a Weir
Can be installed on either or both the wet or dry side of a weir - wide or narrow.

Install in Deep Chambers
Can be installed in Chambers up to 25m deep.

Ignores Steps, Ledges, Foam & FOG
Cannot be triggered by ledges, foam, steps, rags or FOG. Can tolerate 100% submersion and caking with debris.

Real-Time Control & Mitigation
Data is Radio Telemetry based - data can be delivered both locally and remotely in real-time for control and mitigation techniques such as dry weather spill containment and pump control.

Deployable in Remote Areas
Does not require power or access to the cellular networks. Data can be brought back over our secure wide area radio telemetry system in real-time using our Booster/Repeaters, Gateway Receivers or Data Concentrators.

Measurement Hybridisation
FDTs can be used to qualify or control the duration of level derived measurement systems where the initial start and stop point would otherwise be uncertain thus helping to reduce false positive and negative reporting.
Facility Management & MS Windows Sentinel™ FM

Wide Area FM

• Energy Monitoring
• Temperature Monitoring
• Blocked Sewer, Drain & Flood Alarms
• Access Control & Lone Working
• Water Distribution, Leakage Alarms and AMR
• Machine Temperature & Vibration Monitoring
• Tank Level Gauging, Bund Water Monitoring & Alarms
• Oil Interceptor Alarms
• Pollution & Firewater Containment Valves
• Windows Sentinel™ FM Desktop Based GIS Software with Logging + Alarms + Display + SMS + E-mail
Water Meter AMR & Leakage

Water Meter AMR

The Board of Radio Data Networks has extensive experience in designing and deploying water meter AMR systems. Over a decade ago they were behind Europe’s first wide area fixed network that was deployed in Paris in 2002, plus a more conventional walk-by system for Mecca, Kingdom of Saudi Arabia.

Today, we offer similar technology for industrial sub-metering applications for deployment in factories, multi-tenant occupancy offices, caravan parks, marinas and commercial estates where apportionment of water usage is desirable.

Leakage Management

Leakage within industry can be costly as often the sewage part of a bill is linked directly to the level of consumption but at a much higher unit rate.

In addition to the cost of the lost water and the sewage charge, there is the risk of contamination and lost production during outages that result from leakage.

Overall the cost of even a relatively small un-detected leak can be significant making the investment in leakage detection and/or AMR a sound investment.

Industrial Sub-Metering

The reading of water meters has always been a challenge as meters are often located below ground in pits or boundary boxes.

Our solutions include magnetically mounted transmitters that attach to the underside of covers, battery powered repeaters and solar assisted beacons that can flash if a leak is suspected.

Ultimately data can be fed into a BMS system or to our Windows Sentinel™ FM software.
Compliance with the Water Framework Directive requires real-time monitoring of catchments, the identification of potential sources of pollution and the provision of protection technology such as filters, containment valve and sediment traps.

Radio Telemetry Controlled Water Quality Sensors
We can measure and deliver readings in real-time concerning almost any parameter related to water quality, from DO, PH, conductivity, temperature through to turbidity.

Radar and Pressure Based Level/Flow Monitoring
Real-time flow measurement is essential in good catchment management. Our radio telemetry transmitters permit us to install a variety of flow measurement transducers at strategic locations throughout a catchment including those devoid of power or cellular coverage. This can include pressure transducers housed in stilling wells through to microwave radar ranger suspended from bridges.

Rainfall and Soil Moisture Deficit Monitoring
The monitoring of rainfall within catchment is essential if we are to understand its hydrology. Our telemetry transmitters can deliver data from virtually any type of commercial rain gauge or rainfall detector.

Industrial Spill and Firewater Control
We offer a wide range of industrial pollution containment devices (PCD) which are bespokely designed and fitted to protect receiving waters from spills and firewater. The valves can be activated manually via a call point or under the control of measurement transducer such as PH. Valves can also be supplied to tackle diffused pollution whereby runoff waters are stored on site in dry weather and only released during high flow periods thus reducing their impact on river life.
Monitoring of Asset Integrity & Security

We have the technology that can be applied to monitor and report the status of a wide variety of remote assets across a broad spectrum of industries from agriculture, rail through to water supply.

We can detect the presence of virtually anything from vermin, flooding through to humans. Further, we can equip staff or vehicles with tags to facilitate friend or foe reporting, arrival on site verification and lone worker monitoring.

Our systems can report faults such as high levels, tripped circuit breakers and power failure on for example adopted pumping stations.

Options include both the delivery of silent alarms and the triggering of covert battery powered CCTV to take snapshots of events for positive verification, such as suspected screen blinding.

- Human Intrusion
- Power Failure
- Metal Theft
- Intrusion by Vermin - Rats, Squirrels, Mice, etc
- Damage by Storm
- Flooding
- Blinding of Trash Screens
- High Oil Interceptor and Bund Levels
Suppliers to Utilities & Commerce:

- Anglian Water Services Limited
- Guernsey Water
- States of Jersey
- Southern Water plc
- Wessex Water plc
- Thames Water Utilities Ltd
- Kier Group
- Claret Civil Engineering Limited
- May Gurney
- Barhale Trant Utilities
- Z-Tech Controls
- NHS
- Redbridge Council
- Integral Group
- Carillion plc
- Natural Resources Wales
- University of York
- Environmental Innovations Limited
- One Housing Group
- WFC Contractors

“Innovative solutions for a challenging world“