# VersaNet2

RDT

## Remco Data Transmission

PROVEN PERFORMANCE

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Ever since its launch in 1990 VersaNet has led the field in low power radio telemetry systems. VersaNet2 maintains the versatility and flexibility of the original system whilst introducing up to the minute features for increased security and ease of use.

VersaNet2 saves the cost and disruption associated with the installation and maintenance of conventional data transmission methods such as cable , fibre optic or public telecom network.

VersaNet2 accepts signals from all types of standard industrial transducers (analogue, digital (on/off) or pulse count.). It then sends these signals , usually by uhf radio to one or more remote receiving points where they maybe output in their original form or to a computer based SCADA system or both.

What makes VersaNet2 unique is the highly intelligent communications controller in every unit and its truly modular structure.

## Secure Data Transmission

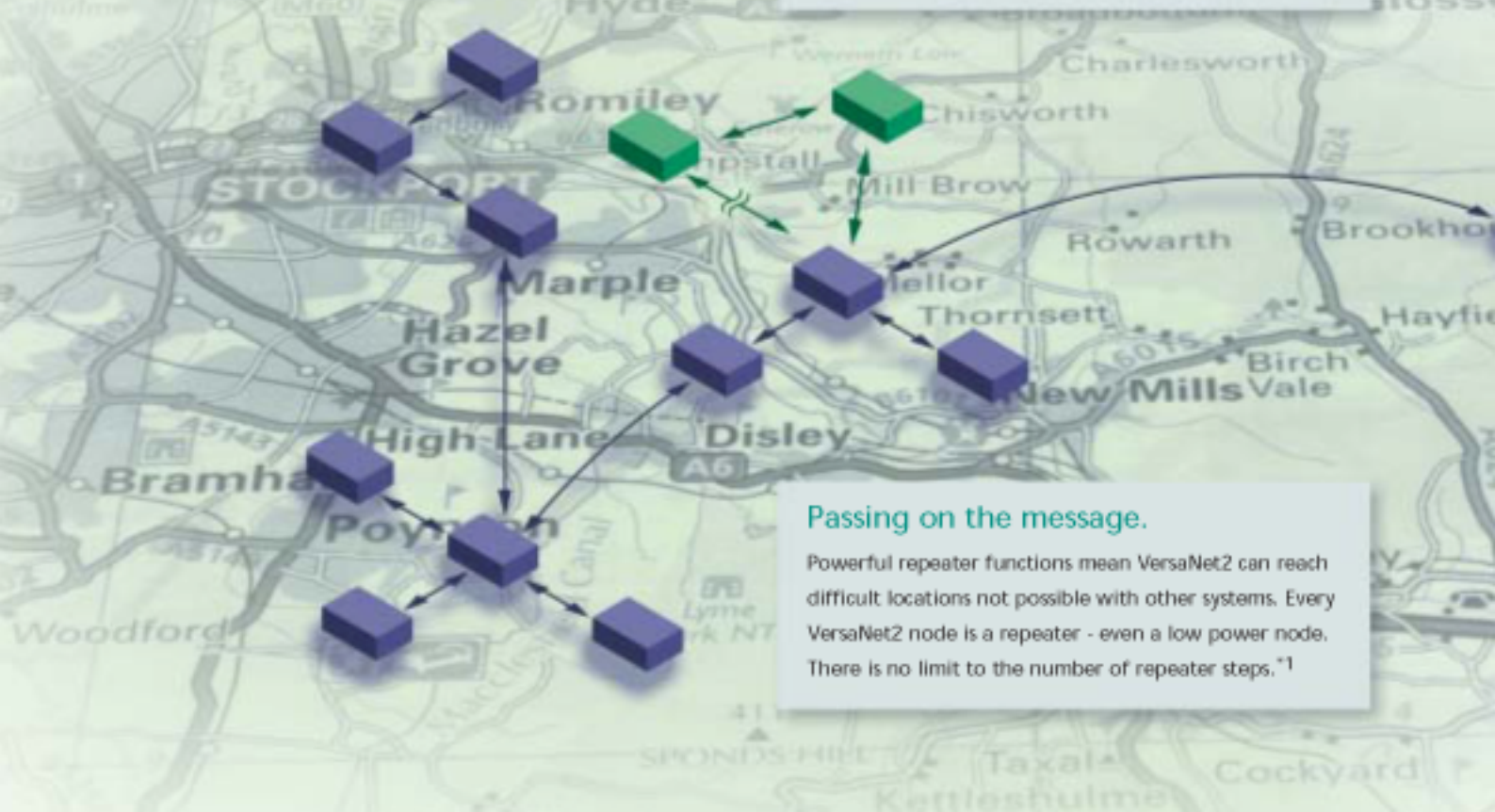
**VersaNet2 - The smart choice.**

The intelligent VersaNet2 controller ensures efficient and secure transmission you can rely on. Following are some of the features that make VersaNet2 the smart choice.

- **Listen before transmit - saves wasted transmissions on shared bands.**
- **Radio Protocol employing message acknowledgements and automatic re-tries provides transmission security.**
- **Multiple error checks - ensure data integrity at every stage.**

## VersaNet2 will find the way.

In the event of a unit in a network failing VersaNet2 will automatically take an alternative route through the system so maximising system security.




## Passing on the message.

Powerful repeater functions mean VersaNet2 can reach difficult locations not possible with other systems. Every VersaNet2 node is a repeater - even a low power node. There is no limit to the number of repeater steps.*1

## West Meath Council Telemetry Scheme.

Versanet is providing county wide telemetry with the West Meath Scheme in the Republic of Ireland.

The system, designed by Dr Paul McCool West Meath's Senior Executive Engineer and Cully Automation, provides complete information and control of the county's water supply and sewage system. The hub of the system is at the Council Buildings in Mulingar where there are two PC servers running 32bit 'Genesis' SCADA software.

Throughout the system six further PC servers are distributed. These maintain local area networks and send information to the central servers at Mulingar. They also allow council personnel to access information for operational purposes.

The current system employs 53 VersaNet outstations over a total range of over 70Km. The central SCADA system handles 300 Analogues and over 600 digital I/O. In addition there are numerous local links providing sub-system control. The system is continuously being expanded.

West Meath County Council have now completely dropped the use of telecom lines for telemetry applications making very substantial saving on leased line costs and PSTN call charges. They have also noticed that the move away from cable-based telemetry has significantly reduced damage resulting from lightning strikes.

## One Product - Many Applications

VersaNet2's unique modular structure makes it suitable for any system from the simplest point-to-point link to large systems with many hundreds of I/O. Whatever the system size or type the same interchangeable building blocks will be used meaning simplified parts holding - just one of the ways we make life easy for our customers.

- **Minimum Node configuration - 1 dig and 1 pulse I/O**
- **Maximum Node capacity - 128 each of digital, analogue and pulse hardwire inputs and outputs.*1**
- **See specification for details of I/O card types**

Here VersaNet2 is being used to transmit tide level to control sluice gates where the river Beam enters the Thames at Dagenham. A single Communications Controller with its integral I/O at each node is all that is required to reliably transmit the analogue signal.

## The right connections.

VersaNet2's serial port allows connections to PLC's, Scada systems etc through standard industrial protocols. They can also be used to connect to alternative data transmission media.



## New Connectivity for VersaNet2

Powerful new VersaNet2 features allow users total flexibility in system planning and operation. As well as stand alone uhf radio VersaNet2 can now communicate through GSM or conventional land line modems. This facility may simply be used to reach locations not available to the uhf radio because of range or terrain.. Alternatively it may be used in conjunction with VersaNet2's powerful primary and secondary routing features to provide an automatic backup communication for total system security.

For maximum efficiency the user may determine the exact sets of conditions including combinations of elapsed time, digital status , analogue values and changes that cause a GSM connection to be made.

## Keeping in touch with VersaNet2

VersaNet2's new SMS feature will automatically send text messages to key personnel when prompted by up to 64 predefined sets of conditions anywhere in your VersaNet2 system. The content of the message is dynamic allowing the inclusion of I/O variables and engineering units to give an exact clear message.

### Example




VersaNet2 can hold up to 32 phone numbers so you can ensure that the right message gets to the right person.


VersaNet2 will even send text messages regarding its own status.

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## Keeping you informed

For simple fault finding and commissioning VersaNet2 provides a powerful package of facilities ranging from simple LED indications of system status to the free issue windows based "Node Manager" which will give access to system configuration details, monitors I/O status and facilitates system tests.

## No special knowledge, No special equipment

The design of VersaNet2 has been focused on ease of installation and set-up. No specialist knowledge or equipment is needed for a successful implementation as free issue, Node Manager software helps you every step of the way. Node Manager tells you the channel occupancy, received signal strength, monitors the status of alarms, inputs and outputs, and turns on remote units for signal tests. You can even adjust the transmitter power to compensate for signal loss/gain associated with different cables and antennae.

## No power? - No problem!

Like it's predecessor, VersaNet2 is engineered to transmit Pulse, Analogue or Status signals from remote locations powered by battery or compact solar panel. New Power Save features allow you to control a digital output and even place a repeater node at an un-powered location.

## The world approves of RDT!

VersaNet2 conforms to Council Directive 1999/5/EC (R&TTE). In the UK it may be used without a license under regulations formerly known as MPT1329. In most countries VersaNet2 can be operated with minimal regulatory restrictions. RDT have gained specific approvals for VersaNet2 in Europe, Scandinavia, America, Africa and other countries, reducing formalities for the user. Our policy of continual development means new approvals for our product range are regularly being sought. We are happy to provide answers to detailed requirements.

## Unrivalled support and backup

RDT designs every element of VersaNet2 in-house. Only RDT can bring you this level of expertise as well as providing detailed, efficient and rapid reponse to all customer requests. Clear, well-presented and accurate manuals covering every aspect of system implementation support all RDT products. We also supply and advise on related items such as solar/wind power supplies, overseas approvals, antennae requirements, etc.

## Quality at every stage.

RDT are an accredited ISO9002 Company. As well as our products we take a pride in the quality of every aspect of our business including customer service and short reliable delivery promises.


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## Radio Specification

| | |
|---|---|
| Frequency Range | 800KHz band in the range 406 - 470MHz |
| Channel Spacing | 10, 12.5, 20 or 25KHz |
| Modulation | FFSK |

**Transmitter**

| | |
|---|---|
| Output power | 500mW (adjustable) |
| Adjacent Chan | -37dBm |
| Freq. Tolerance | +/- 1KHz |
| FM deviation | +/- 2KHz (12.5KHz chan.) |
| Intermod attenuation | >40dB |
| Spurious emissions | <-36dBm 0-1GHz<br><-30dBm 1-4GHz |

**Receiver**

| | |
|---|---|
| Sensitivity | (12.5KHz) -110dBm for 15dB SINAD |
| Co-channel rejection | >-12dB |
| Adj. Channel selectivity | >60dB |
| Spurious response rejection | >70dB |
| Intermod response rejection | >70dB |
| Blocking >84dB for any signal from tuned frequency. | >50KHz |
| Spurious emissions | <-57dBm 0-1GHz<br><-47dBm 1-4GHz |

**Meets R&TTE directive**
Contact RDT for details of other approvals.

## System features

Node to node Communications media.
- integral uhf radio - GSM - PSTN
System capacity - up to 250 nodes*1
Unlimited repeater functions

**Product features**
Modular architecture.
Single board solutions for simple systems
Indication of transmit, carrier detect & decode, alarm & run.

**Node manager features**
Fully widows compatible

Selects:- network name, node number, operating frequency, transmitter power, number of retries, report rate, alarm delay and low power operation.

Defines:- mapping of inputs to outputs, conditions for transmission, primary and secondary routes through the network

Diagnostic Functions:- displays I/O status, received signal strength, forced transmit mode, channel occupancy indication.
Saves node configurations and prints record sheets.

**GSM and SMS features**
Upto 128 dynamic messages
Up to 32 destinations.
Up to 64 multi level transmit triggers

## I/O

| | | |
|---|---|---|
| **Controller Card** | 1xdig in<br>1xpulse in | 1xdig out<br>1xpulse out |
| /A option | 1x0-20mA in<br>Comms fail alarm output. | 1x0-20mA out |

**I/O cards**
- up to 16 of each of the following per node:-

| | |
|---|---|
| 8 x Digital/ pulse inputs | 8 x Digital outputs |
| 8 x Analogue inputs | 4 x Analogue outputs |
| 8 x pulse inputs | 8 x Alarm outputs |

**Mixed type I/O cards:-**
4 analogue in plus 4 digital in with PSU.
4 analogue in plus 4 digital in (low power)
2 analogue out plus 4 digital out

Analogue resolution - 12 bit.

Pulse input can be sent to anologue ouput to give indication of flow rate.

**Serial I/O**
RS232 MODBUS ASCII or RTU
MODBUS address space 2048 each of Ain, Aout, Dig in and Dig out per node.

## Physical

**Size**
Standard Housing 190mmx280mmx130mm.
Larger housings available depending on I/O.
Units may be supplied without housing for mounting in control panels.

**Weight**
3.5 Kilo typical depending on I/O.

**Enclosure Material**
Grey UV resistant Polycarbonate.

**Temperature**
-20C to +60C

**Available Power Supplies**
12Vdc - 24Vdc - 110Vac - 240Vac
Specify at time of order.

**Options**
Battery Back-up
Solar Power

N.B. *1 - Overall system capacity is limited by the capacity of the radio channel. Although individual figures given are correct the amount of I/O, number of nodes, required update rate and radio path losses may combine to limit items marked thus *1`

Panorama screen provided by Europa Supervision

**Accessories**
RDT can supply a wide range of accessories including antennas & power amplifiers.

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# VersaNet2 Radio Data Network
## Digital/Pulse Input Module
## Part No.IRDN302

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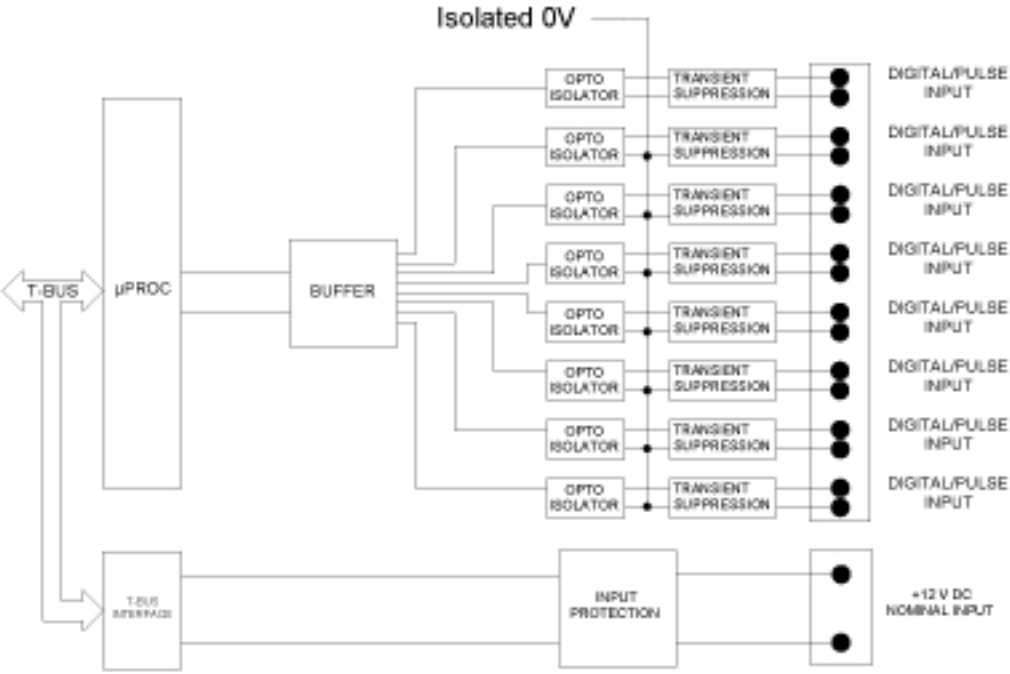
Publication IRDN302/1/Jan2004

## Features

- Collects 8 volt-free or open-collector inputs as steady-state or pulses
- Maximum of sixteen modules can be used per VersaNet2 node
- 8 input channels each programmable for Digital or Pulse collection
- Secure transmission with ARQ prevents Pulse counting errors




NOTE: This module is switchable betwen Digital inputs and Pulse inputs.

Digital/Pulse Input Module Block Diagram

## Brief Description

The digital/pulse input module is used to collect eight channels of either steady state digital contacts or pulse counting inputs into a VersaNet2 node. Each input channel may be configured to accept digital or pulse counting signals. A maximum of sixteen modules may be used in the same node giving a total of 128 inputs which are user configured.
Each input channel consists of an opto-isolated DC supply for connection to the users volt free contacts or open collector transistor outputs. Transient suppression is provided on every input to protect against spikes and surges. The DC supply on these terminals is isolated from the VersaNet power supplies, but is common to all input channels.

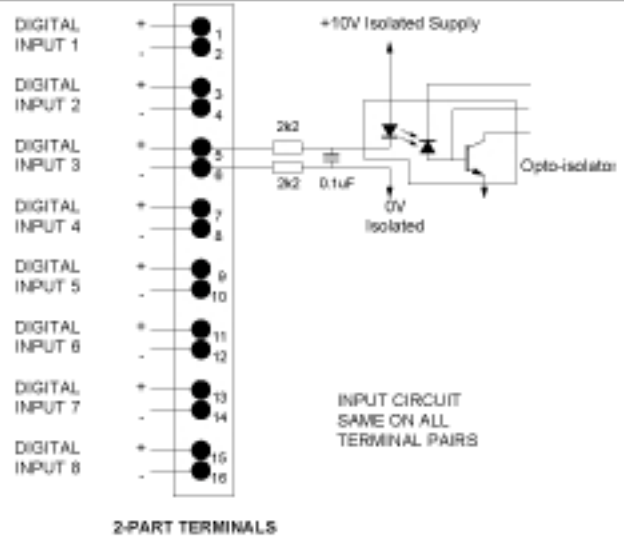
When used for pulse counting, only pulses wider than 5mS will be detected which eliminates switch bounce. Each input channel counter can store a maximum count of 65535. To avoid overflow an appropriate transmission interval must be selected.

## Low Power Option

The IRDN302 can be used as a low power digital input card by selecting the option with link 2 on the PCB. (Note that it cannot be used for pulse input in low power mode). In conjunction with a Communications Controller, a low power node can be configured for use in locations without mains power supplies. See the VersaNet2 Manual for full details of low power operation.

# Technical Specification

| | |
|---|---|
| Module Name | Digital/Pulse Input |
| Part Number | IRDN302 |
| No. of modules per Node | 16 max |
| Processor | 80C31 |
| Internal Interface | T2-BUS Slave Peripheral |
| Input Channels | 8 (programmable for Digital or Pulse) |
| Input terminal voltage | 10V DC |
| Input Pulse Width | 5 mS minimum |
| Input Pulse Frequency | 100Hz maximum |
| Maximum Pulse Count | 65535 |
| Scan Rate (Digital i/ps) | 1 second |
| Power Supply | 11-14V DC through T2-BUS |
| Current Consumption | Minimum 30 mA<br>Typical 50 mA<br>Maximum 70 mA<br>300µA in low power mode |
| Operating Temperature | -10°C to +55°C |
| User connection | 2 part screw terminals |
| Dimensions | 144 x 167x 22mm |
| Weight | 0.2kg |




Digital/Pulse Input Module Connection Chart

For exact configuration instructions please refer to the VersaNet2 User Manual (LIT0002) a copy of which is supplied with your VersaNet2 system.

### DIP Switch Settings

Switch 1 (4-way DIP switch) should be set to a unique address for each module of this type within a node. DIP switch setting should be performed without power connected. Switch positions are shown below.

| SW1 Setting | | | | Address |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | |
| on | on | on | on | 1 |
| off | on | on | on | 2 |
| on | off | on | on | 3 |
| off | off | on | on | 4 |
| on | on | off | on | 5 |
| off | on | off | on | 6 |
| on | off | off | on | 7 |
| off | off | off | on | 8 |
| on | on | on | off | 9 |
| off | on | on | off | 10 |
| on | off | on | off | 11 |
| off | off | on | off | 12 |
| on | on | off | off | 13 |
| off | on | off | off | 14 |
| on | off | off | off | 15 |
| off | off | off | off | 16 |

## Rack Mounting

A rack mount version of the IRDN302 is available – Part code IRDN302R.
This card is fitted with a DIN 41612 connector to allow direct fitting into a 4U rack and connection to a back plane.

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