

Section 1 General Information

1.1 Introduction

VersaNet2 is a secure radio data network used for a variety of data transfer applications, including process monitoring and control. The use of radio for such tasks can permit a more cost-effective and flexible solution than offered by cabled methods.

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

Every unit (Node) contains a highly intelligent, fully programmable communications controller, which coupled with the unit's modular structure, offers true flexibility. The intelligent controller ensures efficient and secure transmission with features such as, Listen Before Transmit – which saves wasted transmissions on shared bands; Multiple Error Checks – ensuring data integrity at every stage; a proprietary Radio Protocol – employing message acknowledgements and automatic retries, improving transmission security. There are many other features, which are covered in the relevant sections of this manual.

Powerful repeater functions mean VersaNet2 can reach difficult locations not possible with other point to point systems. Every VersaNet2 Node can act as a repeater – even a low power Node and there is virtually no limit to the number of repeater steps in a chain. (There are some overall system size limitations discussed later).

For locations outside of the range of the UHF radio, VersaNet2 has the capability of using standard wire line modems or GSM. Using this facility, there is virtually no limit to the coverage area of the system. Each Node can be configured to work with either a UHF radio, a GSM modem or both. This is particularly useful to enable GSM to be used as a back-up (secondary route) in case of failure of the radio link. Using a GSM modem, SMS messages can also be sent for example, to an engineer to advise of a problem.

All VersaNet2 nodes are constructed and configured from standard modules to handle various data Input/Output (I/O) combinations, including analogue, digital and pulse signals. A serial data highway is also available for direct connection to PC's and equipment used within SCADA systems. Where appropriate, a Node may also be configured as a Low-Power Node utilising the battery economizer system

By operating in the low-power Industrial, Scientific and Medical (ISM) bands, VersaNet2 may be used in some countries without the need for a license (UK MPT1329), or on licensed frequencies, where no license free allocation exists. VersaNet2 meets the European R&TTE Directive 1999/5/EC and most worldwide radio standards for both radio performance and EMC regulations such as ETS 300 220, ETS 300 113 and ETS 300 683.

1.2 How to use this Manual

Section 1 - General Information

This section should be studied by all users as it gives a good introduction to the system and contains important safety and warranty information to be followed when using a VersaNet2 System.

Section 2 – System Description

In this section you will find details of how the VersaNet2 system operates, including a description of the data handling, I/O addressing and message construction. There is also a brief overview of the VersaNet2 software modules and how to load and run them.

Section 3 – Designing and Building a System

This section covers the steps required to successfully plan a reliable and efficient VersaNet2 Radio Data Network. It helps the reader understand how VersaNet2 operates and how all the component parts interact. It also covers selection of the correct I/O Modules, Power Supplies, Enclosures and Antennas. The section finishes with a brief overview of programming a Node, which is described in detail in section 4.

Section 4 – Versanet Manager (VNMGR)

This section begins with the configuration of the Node hardware and how to programme the parameters into the Node. There is then a detailed explanation of all the features programmable through the Node Manager software.

Section 5 - Installation

This section should be followed when constructing, installing and configuring a VersaNet2 system. It takes the reader through logical steps enabling VersaNet2 to be operated successfully with minimum effort. The section assumes the desired system has been properly planned, an I/O scheme drawn-up and the necessary modules and accessories have been procured.

Section 6 - Commissioning

This section covers the setting up and testing of a VersaNet2 system on site, once the hardware has been installed. It mainly deals with the radio communications, selecting RF channels and checking signal strength.

Section 7 – Technical Specifications

There is a general introduction followed by a detailed specification for each module. Details include mechanical dimensions, circuit block diagrams and connection charts.

Section 8 – Accessories

This section includes details of a full range of accessories to support VersaNet2, including, enclosures, antennas, power supplies and modems.

Section 9 – Appendices

Details of the various external interfaces including Modbus are given in this section.

1.3 Safety and Limitations of Use

VersaNet2 has been designed to the highest standards to enable it to be used in a wide range of demanding applications. It is not, however, infallible and should always be complemented by fail-safe mechanisms in the overall system in which it operates. VersaNet2 is not authorised for use in life-support or airborne civil defence applications without express written approval from RDT.

1.3.1 Electrical Safety

The equipment has been manufactured and tested according to ISO9001 guidelines and has been supplied in a safe condition. When operated from mains power supplies, the equipment should be properly earthed. It is important that the following precautions are followed to ensure safe operations:

1.3.2 Physical Damage

If the equipment appears or is suspected of having suffered physical damage due to extremes of transit or storage it should not be connected to an electrical supply unless comprehensively checked by an authorised representative of the supplier.

1.3.3 Access to Circuitry

The nature of the product means that live parts may be exposed when the enclosure lid is removed or if an open mounting arrangement has been used. For this reason, only qualified personnel aware of the potential hazard should be permitted access to operational equipment for configuration or maintenance purposes. If it is necessary to add or remove modules, the power supply should be completely isolated beforehand. Note that capacitors on the power supply module may still be charged after the supply has been disconnected.

VersaNet2 makes use of electronic solid state devices, many of which are static sensitive. Should there be a need to handle the modules, care should be taken to ensure only the edges are touched and standard precautions for static sensitive devices should be followed.

1.3.4 Fuses

Fuses are fitted to all power supply modules and should be replaced with new fuses of the equivalent type, if failure occurs. The use of repaired fuses or short circuiting fuse holders should be strictly avoided and this will also invalidate the warranty.

1.3.5 Mechanical Safety

In order to construct a VersaNet2 node, the Basic Enclosure may need to have polycarbonate panels removed to take cables or accessories. This involves the use of some force and may result in small particles of polycarbonate being a potential hazard to unprotected eyes. For this reason, it is strongly suggested that in addition to observing good workshop practice, eye protection is used throughout the node construction process.

1.4 Warranty

1.4.1 Guarantee

a. The Seller guarantees at its discretion to refund the price of the goods or to repair or replace free of charge any of the goods found to its satisfaction to be defective within 12 months of the date of delivery owing to faulty design, materials or workmanship, provided that the goods have not been modified or repaired other than by the Seller and have been operated, stored and maintained within the Seller's recommendations for use.

b. Goods returned under this guarantee shall be delivered to the Seller's premises at the Purchaser's expense.

c. The Seller's obligation herein to refund repair or replace the goods is the sole liability of the Seller as regards the quality fitness or description of the goods and their correspondence with sample. All other representations warranties conditions terms and statements as regards the same express or implied, statutory or otherwise are excluded save where not capable of exclusion at law. The Seller is under no further liability in contract tort or otherwise for any loss damage or injury arising directly or indirectly from or in relations to the quality fitness or description of the goods and their correspondence with samples.

d. The Purchaser shall inspect the goods and notify the Seller of any defects or other non conformance within 30 days from the date of delivery.

1.4.2 Limitations of Use

Suppliers products are not authorised for use in devices or systems for life support applications or airborne civil aviation applications without the express written approval of RDT. RDT does not assume any responsibility for the use of the products described. No product patents are implied and RDT reserves the right to change the said products without notice at any time.