DataTrace® RF

DTLinc Network – The DataTrace RF Advantage

A real time RF data logger system is only as good as its communication network. You need a radio network that is reliable, easy to set up, fast, and robust. Mesa's proprietary DTLinc RF network provides a reliable communication protocol that is uniquely designed for high performance data loggers

But how does it work? Without getting too technical, it helps to understand a little about radio data logger systems to really appreciate the advantages of DTLinc and the DataTrace RF system.

Frequency

Unlike some other data logger systems, DTLinc operates on 2.4 GHz, which is usable worldwide without a special license. Some other data logger systems operate in the 420 to 450 MHz range, which is only available in Europe on a license free basis, or at 902 to 928 MHZ, which is only available in North America and Australia on a license free basis.

Interference

Many other electronic devices transmit RF frequencies, either as a way to communicate, or as a by product of poor electromagnetic (EM) shielding. These interfering RF signals can cause communications problems, including data loss, unless methods are employed to sort out the true DTLinc communications from the "noise". The DTLinc Network employs a variety of techniques to reduce interferences, including:

- **DSSS** – Direct Sequence Spread Spectrum technology to spread the RF communication over a narrow range of frequencies, reducing noise
- **Clear Channel** – DTLinc verifies that the transmission channel is clear prior to initiating communication
- **Specific Acknowledge** – All communication from the data loggers is specifically acknowledged by the host and if the ID is not verified, the communication is ignored. Additionally, if a proper acknowledgement is not received, the transmission is repeated by the logger

Range

Range is defined as the maximum distance between the data logger transmitter and the host receiver. Range is typically a function of the radio power and the frequency. (The higher the power, the longer the range and the higher the frequency, the shorter the range.) Obstructions that come between the transmitter and the receiver reduce the range, while metal stops the signal entirely.

An important design consideration for maximum range is the battery lifetime. The use of a high powered radio may increase the range, but it reduces battery life, possibly to a degree that the data logger system has limited utility. In designing the DataTrace RF system, all of these variables were considered and the system was designed to provide a "line-of-sight" range of approximately 100 ft (30 m). Of course, for most applications, the usable range will be much shorter due to obstructions in the communications path. A DataTrace RF Repeater may be added to the system to increase the usable range. For the vast majority of target applications for the DataTrace RF system, the range will be adequate, either with or without a repeater.

Network Architecture

The Network Architecture refers to the pathways by which RF communication occurs between the various components in the RF system, including:

- Data Loggers (Transmitters)
- Repeaters (Signal Relay Devices)
- Host (Receivers)

DataTrace RF's DTLinc network uses an energy efficient, robust "Point-to-Point" configuration. In this configuration, the data loggers act primarily as transmitters of their data, without "logger-to-logger" communication. An alternative network architecture is a "Mesh" network in which each of the data loggers can act either as a transmitter or a repeater to relay the signal, thus increasing the network range. While there are some advantages to a Mesh network in terms of flexibility, it is poorly suited to validation applications. DTLinc's "Point-to-Point" network uses much less energy than a Mesh network, maximizing battery lifetime, and is ideally suited to its target applications.

AutoRecover™ – a DTLinc Exclusive

There will be times when RF communication from the data loggers is interrupted. In most RF systems, this will result in data loss. For your critical validation applications, any data loss is unacceptable. With DTLinc's exclusive AutoRecover feature you never have to worry about data loss again. The DataTrace RF system continuously monitors for 100% integrity in the real time data received at the PC. If missing data is detected, a command is sent out over the DTLinc network to re-transmit this missing data from the data logger's internal memory. The result is that you get 100% of your data, all the time, every time.

MESA LABS

Providing high-quality measurement instruments and consumables

Mesa Laboratories, Inc. develops, manufactures and markets high-quality measurement instruments, consumables and accessories relied upon by businesses worldwide, from Fortune 500 companies to high tech start-ups. Mesa's products are used to assure product quality, control manufacturing processes, and to solve problems in niche markets in industrial, pharmaceutical and medical applications, and are characterized by technical excellence and superior industry reputations.

Mesa's products include:

DATATRACE – patented, wireless data loggers for measuring and recording temperature, humidity and pressure

– Meters, standard solutions, and related accessories used by hemodialysis clinics worldwide to ensure quality care and patient safety

Raven – Raven Labs, a division of Mesa Labs, manufactures Biological Indicators for validating sterilization processes. Raven has been involved in the production of sterility assurance products since 1949 and is committed to providing the highest quality products and services to its clients.

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