

### TSAN 050\_Serial\_Communications

#### Dataradio Technical Support

For additional assistance: [www.dataradio.com](http://www.dataradio.com)

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**Product:** Any Dataradio RS232 Serial port with control lines (T-96SR, Integra TR and Integra H, DL3282 modem)

**Application:** Various implementations of RS232 using control lines.  
(Submitted and used by permission- Radata Systems  
<http://www.radata.co.nz>)

#### RTU and PLC Serial Port Considerations:

Note: this document refers to *Peripherals* for use on *Real-Time* radio data networks. Real-Time radio modems provide the best possible performance for SCADA data communications using common SCADA protocols such as DNP3 and MODBUS. In this document *Peripherals* refers to PLC's, RTU's, Circuit Breakers, Meters, and Protection Devices etc.

#### Serial Port Type and Voltage Levels

- Preferred serial port is RS232. Voltage levels on all serial RS232 lines should comply with the RS232 standard. I.e. +3 to +25 volts for logic 0 and -3 to -25 volts for logic 1.

Note: Logic 0 refers to asserted, raise, ON, space, active. Logic 1 refers to unasserted, drop, OFF, mark, inactive.

#### Data Rate

- *Peripherals* must be capable of the following data rates, 4800, 9600, 19,200 bps 38,400 as a minimum. Higher and lower data rates may also be provided.

#### Hardware Lines

- *Must* support the following serial hardware lines as standard,
  - Receive data RXD
  - Transmit data TXD
  - Signal ground GND
  - Request to send; RTS (see control sequence below)
- Should *preferably* also support the following serial hardware lines
  - Data carrier detect DCD
  - Clear to send CTS

#### Preferred Connectors

- Preferred serial port connector is DB series. e.g. DB9 Male
- Acceptable serial port connectors include DB9, DB15, DB25, and DE15
- RJ type connectors may not be acceptable in some industrial environments.

#### Radio Control

- *Peripherals* must be able to control, or use the controls of, the radio as follows:

### Radio Control Receive data sequence

1. Collision avoidance: DCD should be monitored by the *Peripherals* as an indication of network busy. It must then provide a mode whereby RTS will not be asserted by the *Peripherals* if DCD is already asserted by the radio modem. This provides a network collision avoidance mechanism.
2. Ready for data: DCD should be monitored by the *Peripherals* as an indication that receive data is about to arrive. That is to say when DCD is asserted by the radio the *Peripherals* must immediately get ready to receive data from the radio modem.

