



industrial/wireless/performance

# APPLICATION BULLETIN

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**MAS PRODUCTS**

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## MODBUS™ PROTOCOL APPLICATION INFO

### INTRODUCTION

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MODBUS is one of the most popular PLC communications protocols in use today in the industrial control field. It is used by a number of other PLC manufacturers as well as AEG MODICON units for systems containing up to 247 remote devices. There are two possible transmission modes available to MODBUS compatible units, ASCII and RTU.

### IMPLEMENTING THE APPLICATION

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#### ASCII Mode:

Sends hexadecimal data in the form of two ASCII characters of 7 bits each representing one half of each 8 bit hex word. (eg. 00001111 in hex is transmitted as "0", "F") Each message is framed with a ":" as beginning and <cr><lf> as the end termination. Breaks are allowed in the data of up to one second in length making this nearly a true asynchronous protocol which can operate in a packetized environment or a slow processor environment where messages can be broken up. All factory default settings should work for ASCII mode as long as the correct byte size (10 or 11 bits) is selected on 9600 bps modems and Data Sync boards)

#### RTU Mode:

Sends straight hexadecimal data without beginning and end terminations. The beginning of a message is denoted by the first data received and the end is denoted by a 3 1/2 byte time gap. This means that significant data gaps cannot be tolerated and any noise (like a squelch tail) must be after the 3 1/2 byte time gap. RTU mode is less forgiving of noisy environments but has twice the throughput. RTU mode has been successfully used many times with MDS radios by the appropriate extension of SCD on all switched carrier radios. SCD should be set for an additional 4 ms at 9600 and 8 ms at 4800 bps over the factory default.

#### REMOTE RADIOS - 2300/4300:

Simply program SCD accordingly.

#### POLLING REMOTES - 2100/4100:

9600 SCD Jumper on modem to on. (J22 1-2)

4800 Call Systems Engineering for assistance.

Use Half Duplex (Application Bulletin 93001) to eliminate echo.

NOTE: There are as many host software implementations of MODBUS as there are software companies and some of these may not implement the MODBUS protocol as specified. These instructions may not work only if all devices are not truly MODBUS compliant.

**MODBUS PLUS:**

MODBUS PLUS is a 1 megabit/sec LAN implementation which cannot be directly interfaced with MDS radios. There is a standard MODICON device known as a BM85 Bridge Multiplexer which can act as a bridge or link between MODBUS PLUS and MODBUS for radio network implementations. This BM85 can also be used as a buffer located at an MDS Polling Remote where the local host does not support RTS. The BM85 correctly implements the MODBUS protocol and will accept messages on one port and provide the correct RTS/CTS handshaking on the radio port.

**BRIDGE MUX BM85** (See MODBUS PLUS)

This device has 4 MODBUS ports and 1 MODBUS PLUS port. It can bridge together and supply proper handshaking for radio as described above. It does not necessarily only have to be used in a MODBUS PLUS application.

For more information, contact MDS Technical Services at [techsupport@microwavedata.com](mailto:techsupport@microwavedata.com), or by phone at +1-585-241-5510.

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