

ENVIRONICS TECHNICAL BULLETIN #103

OPERATING GEN2 INSTRUMENT WITH A MODEM

This bulletin describes how to operate a series 2XXX or 9100 instrument with a modem. This bulletin supersedes any conflicting information in the user manual.

Remote Modem Configuration

It is important to configure the remote modem correctly. The remote modem is the one connected directly to the instrument. To configure the modem, connect it to a PC serial port and set the appropriate modem settings using any Terminal Emulation software (such as Windows Terminal). The configuration codes given are for a Practical Peripherals 9600SA and US Robotics Sportster 14.4 modem. Configuration codes vary with different models and manufacturers, so consult your modem's owners manual for the correct code which matches the given description.

Description	Practical 9600SA	USR Sportster 14.4
Load Factory Defaults	AT&F	AT&F
Auto answer on 1st ring	ATS0=1	ATS0=1
Set Modem DCE speed to 9600	ATS37=9	AT&B0 (see note below)
Set Standard ASYNC operation - Disable data compression and error control.	AT&Q0	AT&K0&M0
Carrier Detect signal (DCD) tracks carrier.	AT&C1	AT&C1
Modem Ignores DTR	AT&D0	AT&D0
Disable Flow Control	AT&K0	AT&H0&I0
DSR Always ON	AT&S0	AT&S0
Local Echo OFF	ATE0	ATE0
Disable Result Codes	ATQ1	ATQ1
Write settings to NVRAM profile 0	AT&W0	AT&W
Select NVRAM profile 0 on powerup	AT&Y0	Set DIP Switch #7 to OFF

NOTE: For USR 14.4, the "AT&B0" setting sets the DCE speed (modem to instrument communication speed) to match the speed of the modem to modem connection. This requires the local modem to connect at the same speed as the instrument's baud rate (typically 9600). Be sure to configure the local modem to connect ONLY at the correct speed, otherwise you will not establish a connection correctly.

Be sure to save these settings in the modems nonvolatile RAM, as indicated above. Here is a typical example of modem initialization settings. Note that the "AT" can be dropped when combining commands:

AT&F (reset factory defaults)
ATS0=1S37=9&Q0&C1&D0&K0&S0E0Q0 (configure modem)
AT&W0 (save configuration data in nonvolatile RAM)
AT&Y0 (modem uses nonvolatile RAM setting #0 when powered up)

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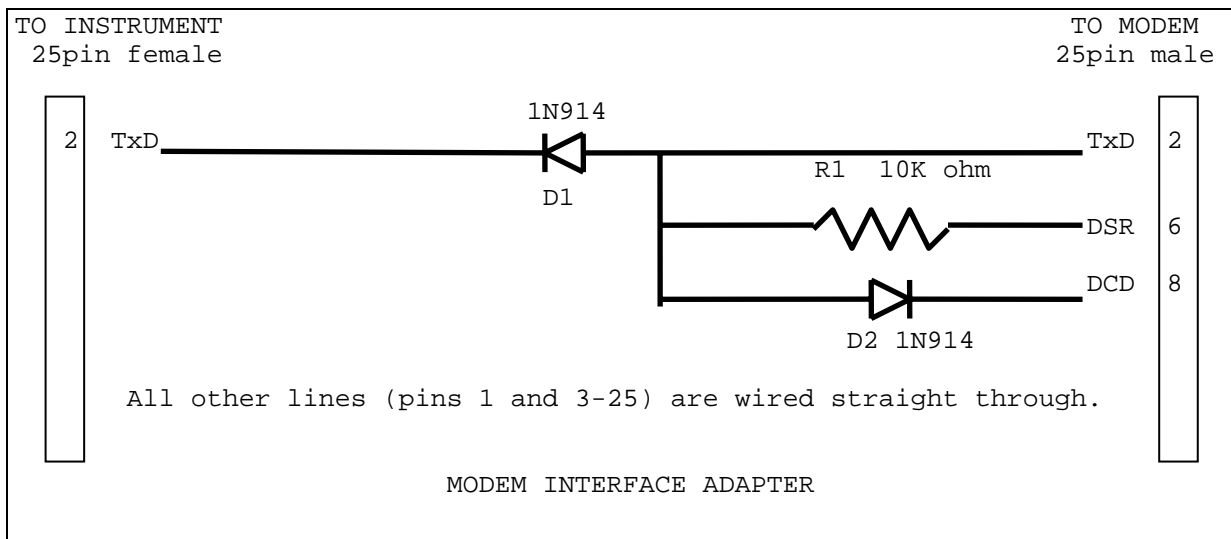
Instrument Configuration

Using the RS232 SETUP menu of the instrument, set the desired communication port as follows:

Baud rate = 9600
Terminal type = VT100
Modem connected = OFF (yes, set this to **OFF**)

Cabling Configuration

The interface between the instrument and modem requires a normal modem cable (straight through wiring) and a special adapter. This adapter is required to enable the modem to answer the phone. The diagram below shows the internal wiring of the adapter. This requires 2 diodes (1N914 or equiv.) and 1 resistor (10K ohm). Wires not shown (pins 1 and pins 3-25) are wired straight through. Connect the adapter between the instrument and the modem with a standard modem cable.



This adapter prevents data sent by the instrument from reaching the modem, unless a modem to modem connection has been established. Without the adapter, the modem will attempt to answer an incoming call, but will immediately hang up if the instrument sends any data to it. In order for the adapter to work correctly, the DSR signal must always be asserted. This is the reason for the "AT&S0" code listed above. When there is no modem to modem connection, DCD is low. This pulls the modems TxD line low, reverse biasing diode D1. This prevents data from the instruments TxD line from reaching the modem. When a connection is established, DCD goes high, reverse biasing D2. TxD is pulled high by DSR through R1, forward biasing D1 and allowing the data from the instrument to reach the modem.