

Sutron Voice Modem Operation Manual

Models: 8080-0005-1B and -2B

TABLE OF CONTENTS

Overview	1
Jumpers and Connections	2
DB-9 serial connector	2
External power and grounding	2
Recommended Jumper Settings	3
Operation with the Xpert/XLite	4
Operation with Xpert- NIFC option (-2 model)	6
Connection to BK Radio	6
Operation with a PC	7
Operation with SUTRON Sensors and loggers – SDR, Bubbler, Monitor	7
Auto power on mode	7
Testing/troubleshooting the modem with an Xpert or XLITE	8
Compliance Information	9
Specifications/Features	10
Selecting Country Codes	11

Overview

The 8080-0005-1B is a telephone modem designed for voice and data communications with Sutron's data recorders. (The 8080-0005-2B is a special version designed to interface to a radio instead of a telephone line and requires the Xpert/XLite to be configured for fire weather operations). The 8080-0005 offers the features commonly offered by standard modern modems along with some special power-saving features. These features include:

- RS232 interface, baud rate up to 115,200
- V.34, 33.6 kbps data sending and receiving
- Voice playback and record
- DTMF decode
- -40°C to +60°C extended operating temperature
- V.42, MNP 2-4 and 10-EC error correction
- V.42bis, and MNP-5 data compression
- Auto power up on ring with time out.
- Power up LED
- TX, RX, CD leds
- Jumper to select between DTR and RTS for power up signal
- Jumper to force DSR output to follow CD
- Capability to be powered over RS-232 cable.
- Wide input power supply of 5 to 16V.
- Digital Line Guard for protection if accidentally connected to digital telephone line
- Built in transient protection

Jumpers and Connections

DB-9 serial connector


The modem is designed with a DB9 Female DCE connection. This allows the modem to be connected directly to DTE devices such as the Xpert and XLite or a PC using a straight cable. Jumpers allow the DTE device to provide power to the modem through pin 9 of the DB9 connector. For connection to devices that can not provide power on pin 9, there is also separate power connector.

DB-9 PIN ASSIGNMENTS

Pin	Name	Direction
1.	CD	Out
2.	RD	Out
3.	TX	In
4.	DTR	Out
5.	GND	GND
6.	DSR	Out
7.	RTS	In
8	CTS	Out
9.	RI or PWR IN (set by J3)	Out or In

External power and grounding

The modem has a three position terminal block to provide easy connections for power and for earth grounding of the modem.

Label	Function
	Earth ground – ground for internal transient protection. Grounding can also be achieved by mounting the modem to a grounded metal plate via the two mounting screws on the back of the modem.
G	Power supply ground. Should be at the same potential as the RS-232 ground (Pin 5 of the DB-9).
+	Supply voltage, 5 to 16 VDC. Power can either be supplied via this terminal or via pin 9 of the DB-9 connector. If power is supplied from both, modem will pull power from the higher voltage.

Note: If using the two mounting screws on the rear of the modem to provide the earth ground for the unit, the screws threads should be 6-32. The two screws have a separation of 3 inches. In addition, the screws should protrude no more than on half inch into the case.

Note: While the internal transient protection provides a high degree of ruggedness to the unit, it is not intended to replace the heavy duty external telephone line transient protection that is needed in more remote locations.

Recommended Jumper Settings

JUMPER	JUMPER POSITION	Function	FACTORY DEFAULTS	XPERT XLITE	SDR MONITOR	8210
J5 DSR	1-2	DSR=CD			X	X
	2-3	DSR=DSR (normal)	X	X		
J4 Wake-up	1-2	Wake on RTS			X	X
	2-3	Wake on DTR	X	X		
J3 Pin 9 use	1-2	RI out				
	2-3	Power in	X	X	X	X

Note: Sutron's products do not require the RI signal and J3 should be left in the factory default position of 2-3. If using the modem with a device/software that requires RI to announce an incoming call, change J3 to position 1-2.

Operation with the Xpert/XLite

You must configure the Xpert/XLite in order to use the modem connected to one of the serial ports. The modem can connect to any of the serial ports; however, Sutron recommends using COM3. COM2 is typically used for SATLINK and COM1 is typically used for a direct laptop connection.

From the factory, the Xpert and XLite will be configured to supply +5V from pin 9 of COM 3 and the modem will be configured to be powered through the DB-9. This arrangement will make it possible to use one RS-232 cable to both power the modem and to communicate.

Refer to the Xpert manual for details if power needs to be configured on for the comport or for more detailed instructions on the following steps.

The following example assumes the modem will be connected to COM3.

The first thing to do is to edit the autoexec.bat file to support the modem. This is done by adding or editing the line where the "remote" program is run. Note: you create or edit the file on your PC and then use XTERM to transfer the file to the Xpert. Adding the text "voice3:115200" tells remote that there will be a Sutron modem connected to COM3 and to use a baud rate of 115200. A typical autoexec.bat appears as follows:

```
\\windows\remote com1:115200 voice3:115200  
\\flash disk\xpert
```

OPTIONAL: For advanced customization of how the modem works, create an initialization file for the modem (e.g. scom3.ini). The modem by default is initialized so that when it powers up it will not echo characters, will not provide result codes, and will ignore DTR. Remote.exe will send the contents of the init file to the modem when it starts. A typical init file for the Sutron modem is:

```
ATS0=1  
ATE0Q1&D0&W
```

Be sure there is a CR at the end of the last line in the file or the program will ignore the line. Again, you create or edit the scomx.ini file on your PC and then use Xterm to transfer the file to the Xpert.

The meaning of each setting is:

```
S0=1  answer on first ring  
E0    don't echo characters  
Q1    don't send result codes  
&D0   ignore DTR  
&W    save settings into profile.
```

In the Setup of the Xpert/XLite, add a COMS TAG to each data point that is needed, optionally add an ALARM block in front of the COMS TAG to trigger and send alarm data. Edit COMS TAG/ALARMS with appropriate data.

Next, set up the Xpert/XLite control panel COMS entry. Select Coms and change COM3 to VOICE.

Once the VOICE is selected for COM3, a plus sign will allow the VOICE3 to be configured.

Set answer mode, number of rings and language.

Set phone number(s), number of redials and the redial delay (for alarms)

For voice mode:

- Select/add additional voice files for specific sensors(Prefix) and units(Suffix).
- Edit the dial-out message (for alarms)
- Edit the dial-in message

Example dial-in message. Speak prefix, data, suffix and alarm status for three sensors, then to hang up.

```
SpeakPhrase Hello welcome to the Sutron xpert
Pause 2.0
SpeakTag RAIN
Pause 2.0
SpeakTag ELEVATION
Pause 2.0
SpeakTag LEVEL
Hangup
```

For data mode:

- Nothing else needs configured.

Operation with Xpert- NIFC option (-2 model)

When using the NIFC version (-2) the modem becomes an interface between an Xpert and a radio. It allows an operator to remotely "wake up" an Xpert Station with a remote Radio with DTMF keypad. The operator enters the unique station id of interest, and then listens to a pre-programmed set of sensor values. The modem decodes the DTMF tones and provides the speech playback capabilities for the Xpert Station.

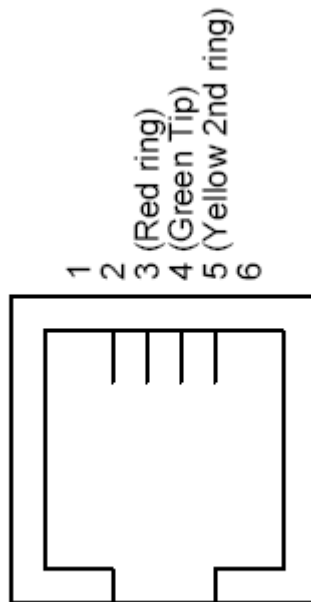
With this option, the modem DOES NOT operate as a normal phone line modem and SHOULD NOT be connected to a phone line.

The validation of the Station ID and the configuration of the sensors to read back are all handled by the Xpert application software. Refer to the appropriate Xpert or 9210 Users manual for detailed set-up instructions.

The modem jumpers should be set to connect to an Xpert (see jumper table above) to operate with the Xpert and BK radio.

Connection to BK Radio

The 8080-0005-2 can be connected to a BK radio. A drawing of the RJ11 connector on the modem and the connections to the radio are shown below:



RJ-11 connector	BK Radio Accessories Connector	Radio Ext Speaker	Signal direction
1			
2 (Black T2)	No Connect	No Connect	No Connect
3 (Red Ring)	3 (ground)		Ground reference
4 (Green Tip)		Ext Speaker signal	Audio into modem
5 (Yellow R2)	4 (mic audio)		Audio out of modem
6			

Operation with a PC

Connect modem to external power (5 to 16V DC) since a PC does not supply power on pin 9. Connect to a standard serial port on a PC. With the exception of the auto power on mode explained below, the modem will operate as a standard modem.

Operation with SUTRON Sensors and loggers – SDR, Bubbler, Monitor

The instructions here are the general instructions for configuring and connecting the 8080-0005-1B modem to these products written from the modem's perspective. For more in depth details on the specifics for each product when working with a modem, please refer to appropriate product manual. The default settings from Sutron for the modem will typically work. If the settings have been changed and need to be reset, connect the modem to a PC (see above) or other device and issue these commands to the modem:

```
AT&F
ATS0=1
ATE0Q1&D0&W
```

This is what the commands mean:

```
AT&F set to factory defaults
S0=1 answer on first ring
E0 don't echo characters
Q1 don't send result codes
&D0 ignore DTR
&W save settings into profile.
```

A null modem cable is needed between the device and the modem since they are both configured as DCE devices. If the null modem cable routes pin 9 through from end to end, you can power the modem from the device, but most null modem adapters leave pin 9 disconnected. In that case, just connect the power (5V-16V DC) to the power connector. Note: this can be done even if the cable routes power through pin 9. The modem will utilize which ever is providing the higher voltage. The modem also must be configured to power up in RTS instead of DTR and to output CD on the DSR pin.

```
Set J4 to pins 1-2 to have the modem wake up on RTS
Set J5 to pins 1-2 to route CD out the DSR pin
```

Auto power on mode

The modem enters a power-down mode when DTR is low (J3 in default 2-3 position. If in the 1-2 position, then RTS). In this mode, the power is turned off to the modem thus conserving the 360 mW that the modem would otherwise use. When a ring is detected on the phone line, the power is automatically turned on to the modem. This power-on sequence takes about 3 seconds, at which time the modem will be fully active. Typically, the modem will then answer the phone on the next ring (S0=1) to make a connection with the calling modem.

Testing/troubleshooting the modem with an Xpert or XLITE

If the modem does not seem to be working with an Xpert, try these following steps. If any tests fail, contact customer service for further help.

If the modem does not power up

- Check that the jumpers are configured for the correct input power and that the power is making it to the modem.
- To bypass the Xpert and see if the modem powers up, do the following:
 - Apply +12V power to the modem.
 - Modem should turn on and light up the power LED for up to two minutes and then power off.

If the modem does not answer an incoming call

- Check phone line using a handset. Check all cables between modem and Xpert.
- Via a P.C. and terminal program (HyperTerminal) connected to Xpert com1, issue the command "type autoexec.bat". Verify that remote.exe is being set for a modem connection on the correct com port (I.E a line that states "\windows\remote.exe com1:115200 voice3:115200")
- Make sure "remote.exe" is running by issuing the "Status" command. The Xpert should report that remote is running on COM1 and COMx where x is the port you have connected to the modem.
- Disconnect the modem from the Xpert.
- Connect a P.C. with a terminal program to the modem, and apply power via the external power connector.
- Issue an "AT&V" command to the modem. The modem should respond with the current profile and the stored profiles. Verify modem active profile and stored profile is set to: S0=1 E0 Q1 &D0
- Disconnect modem. Reconnect modem to Xpert.
- Dial into the modem either via a phone line or line simulator
- See prompt to login or flash disk if using a terminal program, or see login menu if using Xterm
- If the modem picks up the phone line, but does not speak: Check Dial-in message from Xpert/Xlite

Compliance Information

The Federal Communication Commission (FCC) has established rules, which permits this device to be directly connected to the telephone network. If this device is malfunctioning, it may also be causing harm to the telephone network. This device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service. The telephone company may make changes in its technical operations and procedures. If such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. If the telephone company requests information on what equipment is connected to their lines, inform them of the following:

- a) The telephone number and the device it connected to.
- b) The Ringer Equivalence Number (REN): 0.7B
- c) The device uses an RJ11 type jack.
- d) The FCC Registration Number ~ US: 3A4M507B336SM-T-W

The REN is used to determine the number of devices that may be connected to the telephone line. Excessive REN on a telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total REN, contact the telephone company.

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or any other electronic device, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time, it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. The telephone number provided may not be a 900 number or any number for which charges exceed local or long distance transmission charges. This equipment must not be used on party lines. Connection to party line service is subject to state tariffs. Contact state public utility commission for information. In order to program this information into your fax machine or fax / modem, consult your fax machine's user's manual for setup instructions.

Industry Canada CS-03: IC: 2377A-11813

This product meets the applicable Industry Canada technical specifications / Le present materiel est conforme aux specifications techniques applicables d'Industrie Canada

Specifications/Features

Features

- RS232 interface, baud rate up to 115,200
- V.34, 33.6 kbps data sending and receiving
- Voice playback and record
- DTMF decode
- -40°C to +60°C extended operating temperature
- V.42, MNP 2-4 and 10-EC error correction
- V.42bis, and MNP-5 data compression
- Auto power up on ring with time out.
- Power up LED
- TX, RX, CD leds
- Jumper to select between DTR and RTS for power up signal
- Jumper to force DSR output to follow CD
- Capability to be powered over RS-232 cable.
- Wide input power supply of 5 to 16V.
- Digital Line Guard for protection if accidentally connected to digital telephone line
- Built in transient protection

Agency Approvals (8080-0005-1B)

- FCC68 & IC CS-03 registered
- TBR21 (ETSI TS103 021-1, -2, -3)

Countries supported by the existing firmware:

Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, Hong Kong, India, Ireland, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, Norway, Poland, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, UK, US and TBR21 Generic.

Ratings @ 25° C

Parameter	Min	Max	Units
Tip / Ring Current Continuous	10	120	mA
Dielectric Withstanding Voltage	-	1500	VRMS
Operating Temperature	-40	+60	°C
Voltage Requirement	4.75	16	V
Power Consumption		500	mW
Transmit & Receive Level	-10 (Tx)	-43 (Rx)	dbm

Selecting Country Codes

Setting the modem's country code is done by with the +GCI command. To change to one of the 30 available countries, issue the "AT+GCI=n" command where "n" is one of the two digit country codes.

Example: **AT+GCI=3D<CR>** Meaning: Change country code to France.
OK Meaning: The modem has accepted the command and is now configured for operation in France.
AT+GCI?<CR> Meaning: Display current country code
+GCI:3D Meaning: 3D (France is the current country selected).
OK

Note: When a country code is changed, you do not have to store the setting with the AT&W command. The modem will automatically store the setting when the AT+GCI command is issued. It will remain in effect until overwritten with a new selection.

To view which countries are available in the modems firmware enter:

AT+GCI=?<CR>

The modem will display all of the possible two digit country codes available.

Country	Code	Country	Code	Country	Code
Australia	09			Poland	8A
Austria	0A	India	53	Portugal	8B
Belgium	0F	Ireland	57	South Africa	9F
Brazil	16			Singapore	9C
		Italy	59	Spain	A0
China	26	Japan	00	Sweden	A5
		Korea	61	Switzerland	A6
Denmark	31	Malaysia	6C	Taiwan	FE
Finland	3C	Mexico	73	United Kingdom	B4
France	3D	Netherlands	7B	United States	B5
Germany	42				
Hong Kong	50	Norway	82	TBR21	FD