Sense Box

VOICE RECORDING SYSTEM
ISDN PRI / BRI / Analog SUB-SYSTEM

ISDN2, ISDN30

Sense Box USER MANUAL

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FIGURES

1. STATUTORY INFORMATION

This document describes usage of the Retell Sense Call Recording Box (Aka Sense Box or SB).

1.1 Safety Warning

- This apparatus contains no user serviceable parts
- If the mains adapter shows signs of damage or malfunction immediately stop using the adapter (disconnect it from the mains if applicable) and contact the supplier for repair or replacement
- This apparatus does not contain a designated mains disconnect device. To disconnect this device from mains power, extract the power supply from the power outlet.
- Do not expose the unit or the mains adapter to rain or moisture.
- Do not operate in the proximity of water
- Avoid using the product during an electrical storm. There is remote risk of electric shock from lighting
- Caution – To reduce the risk of fire, use only No.26 AWG or larger for the telecommunication line cords

1.2 Safety Extra Low Voltage and Telecom Network Voltage Ports

Port Descriptions	Port Declaration
ISDN Terminal Equipment (TE) ports	TNV-1
ISDN Network Termination (NT) ports	TNV-1
Analogue User / Network ports	TNV-3
Human Machine Interface (HMI) port	SELV
USB ports	SELV
Power-In	SELV

All TNV-1 ports are user ports where the normal operating voltages do not exceed the limits for a SELV circuit. Accessible ports declared as SELV accessory ports are solely for the connection of accessories that do not use or generate voltages greater than that defined for a SELV circuit (42.4V peak AC or 60V DC).

1.3 Conformance

The SB unit conforms to the following standard:
- EN60950
- EN41003
- EN55022 (Class B)

2. ENVIRONMENTAL CONDITIONS

Operation Temperature	: 0°C to 40°C
Storage Temperature	: -20°C to 70°C
Humidity	: 5% to 95% non-condensing
Operating Atmospheric Pressure	: 86KPa to 106KPa
Weight	: 1 Kg (max)
Dimensions	: 146mm x 225mm x 41mm (WxDxH)

3. POWER

3.1 Power Consumption

Power Input	: +5V DC
Max. Power Consumption	: 2.8A

Typ. Power Consumption (ISDN30): 494mA

Typ. Power Consumption (ISDN2) : 719mA

3.2 External Power Supply Rating

Input Voltage	: 90 – 264VAC 50/60Hz
Output Voltage	: +5VDC
Output Current (ISDN2 & ISDN 30)	: 2.8A
Output Current (Analogue)	: 4A

4. MANUFACTURERS DETAILS

Retell Limited
53 Thames Street,
Sunbury on Thames,
Middlesex TW16 5QH
England
United Kingdom

5. PRODUCT DESCRIPTION

This document describes both the Retell ISDN30 and ISDN2 communication systems known as Sense Box (SB).
Both ISDN30 and ISDN2 systems are free standing mains powered devices and require a +5V DC power input. The unit is shipped with an approved external Universal Power Supply Unit (PSU).

5.1 ISDN

The products provide interfaces to both the ISDN PSTN (as Terminal Equipment, TE) as well as Customer Premise Equipment (CPE) normally represented by an ISDN Digital PBX (as a Network Terminal, NT). The products operate as semi-passive devices monitoring all calls both to and from the PBX. The SB captures call signaling data as well as full-duplex voice data and passes this to a host PC through a connecting USB port. Third party software post-processes the received call information and related voice data and archives it to the PC disk for any subsequent analysis
The ISDN2 SB supports four ISDN Basic Rate Interface (BRI) TE and NT ports and can handle up-to eight simultaneous ISDN calls. The ISDN30 SB provides a single TE and NT port supporting a full 30 ISDN channels (calls) when in ISDN Primary Rate Interface (PRI) E1 mode.
A USB 2.0 connection is available on the rear of the SB.
A serial port is available for management purposes and can be connected directly via a serial port of a Personal Computer.

5.2 Analogue

The product provides interfaces to both the Plain Old Telephone System (POTS) Public Switch Telephone Network (PSTN) (as a Foreign eXchange Office – FXO) as well as Customer Premise Equipment (CPE) normally represented by an analogue PBX (as a Foreign eXchange Station – FXS). The product operates as semi-passive devices monitoring all calls both to and from the PBX. The CS captures call signaling data as well as full-duplex voice data and passes this to a host PC through a connecting USB port. PC software post-processes the received call information and related voice data and saves it to the PC disk.
The Analogue SB supports eight FXO and FXS ports and can handle up-to eight simultaneous voice calls.

6. INTERFACE PORTS DESCRIPTION

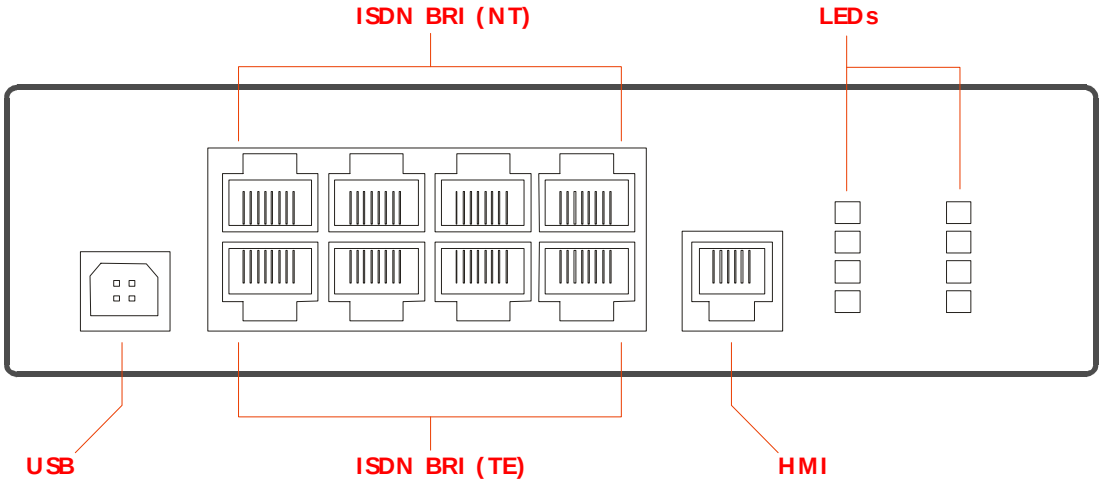


Figure 1 ISDN2 SB - Front Panel

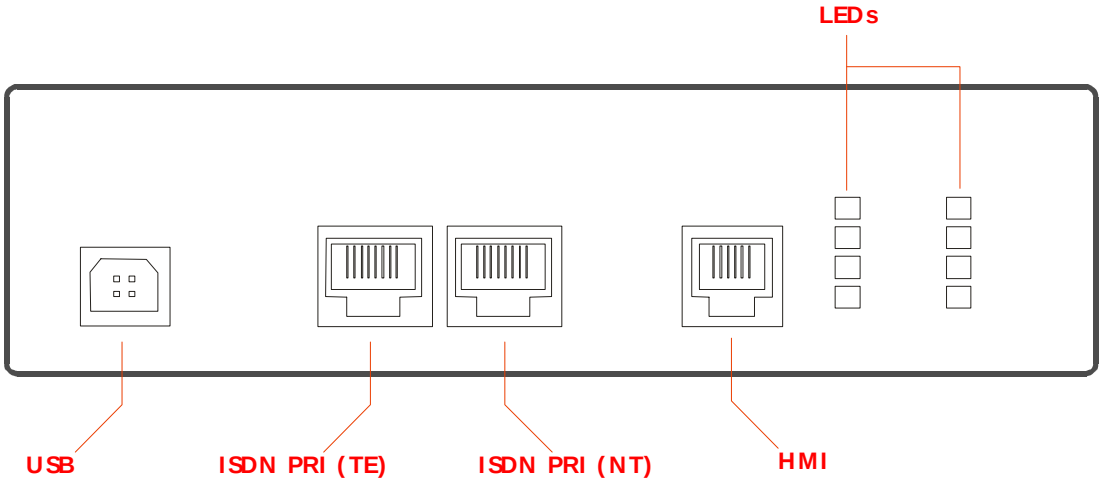
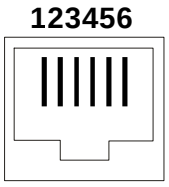


Figure 2 ISDN30 SB Front Panel

Figure 3 ISDN2 / ISDN30 SB - Back Panel

6.1 Serial Port

The serial port, available via a 6 pin RJ11 modular jack connector, is used for system and configuration management, and for diagnostic purposes. Its usage is restricted to Retell's Authorized personnel only. The serial port employs an industrial standard RS232 serial communication interface and can be connected directly to the serial port of a personal computer (PC). The figure below shows the pin-out of the HMI port. An RJ45 to DB9 converter is needed. Communication Software such as PC-anywhere or Hyper-terminal should be used emulating a VT100 type, dumb terminal.



Pin	Function
2	Data Terminal Ready (DTR)
3	Transmit Data (TD)
5	Signal Ground
6	Receive Data (RD)

Figure 4 HMI Connector Pin Out

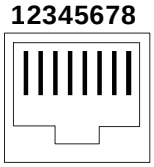
6.2 ISDN2 BRI Ports

ISDN2 BRI ports are presented as "IN" and "OUT" port pair. Four pairs of BRI ports are provided via a 4 by 2 stacked RJ45 modular jack. The "IN" port operates as a Terminal Equipment (TE) port for connection to the ISDN Public Switch Telephone Network (PSTN) whilst the "OUT" port is the Network Terminal (NT) port which can be connected to ISDN terminal equipment or PBX.

All the “IN” (TE) interface ports are presented on the bottom row of the stacked RJ45 modular jack whilst all the “OUT” (NT) ports are available on the top row.
In the event of power outage to the ISDN2 SB, each of the port pair will be connected through to allow downstream terminal equipment to continue to operate directly with the network.

6.2.1 ISDN2 BRI TE (IN) Ports

Four ISDN BRI TE ports are used for connection to the ISDN network. The TE ports are presented on the bottom row of a 4 by 2 stacked RJ45 modular jack. The ISDN2 SB does not consume power from the ISDN network from either Restricted or Normal Power Source 1 (PS1) but re-directs the power onto the corresponding NT (OUT) port.

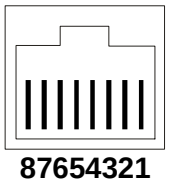


Pin	Function
3	TX+
4	RX+
5	RX-
6	TX-

Figure 5 ISDN2 BRI TE Connector Pin Out

6.2.2 ISDN BRI NT (OUT) Port

The ISDN2 BRI NT port provides an ISDN2 Basic Rate Interface (BRI) Network Termination (NT) type interface for connection to an ISDN2 BRI terminal equipment or PABX. Four BRI NT ports are available on the top row of the stacked RJ45 connector.

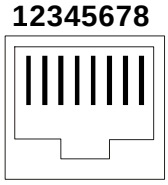


Pin	Function
3	RX+
4	TX+
5	TX-
6	RX-

Figure 6 ISDN BRI NT Connector Pin Out

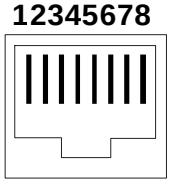
6.3 ISDN PRI Ports

The ISDN30 SB provides only one pair of ISDN PRI “IN” and “OUT” interface port. Similar to the ISDN2 SB, the “IN” port is the Terminal Equipment (TE) port and is used to connect to the ISDN PSTN whilst the “OUT” port operates as a NT port providing a PBX connection.
In order to maintain service, the ISDN “IN” and “OUT” ports are connected together transparently upon a power outage.
The following diagrams show the pin-out of the PRI interface ports.



Pin	Function
1	Rx Ring
2	Rx Tip
4	Tx Tip
5	Tx Ring

Figure 7 ISDN30 PRI TE Connector Pin Out



Pin	Function
1	Tx Ring
2	Tx Tip
4	Rx Tip
5	Rx Ring

Figure 8 ISDN30 PRI NT

6.4 Power-In

Both ISDN30 and ISDN2 SB are powered by a +5V DC supply. A 4-pin PC disk drive type connector is used to connect to the external power adaptor. A DC DIN type connector is available as an optional connector. ***It must be noted that the external PSU must only be connected to one of the two connectors not both. Also the optional power connector must not be used to power other equipment.***

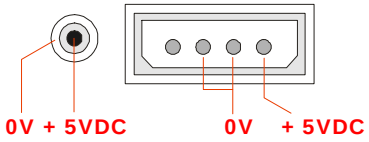


Figure 9 Power Connectors Pin Out

7. INSTALLATION GUIDES

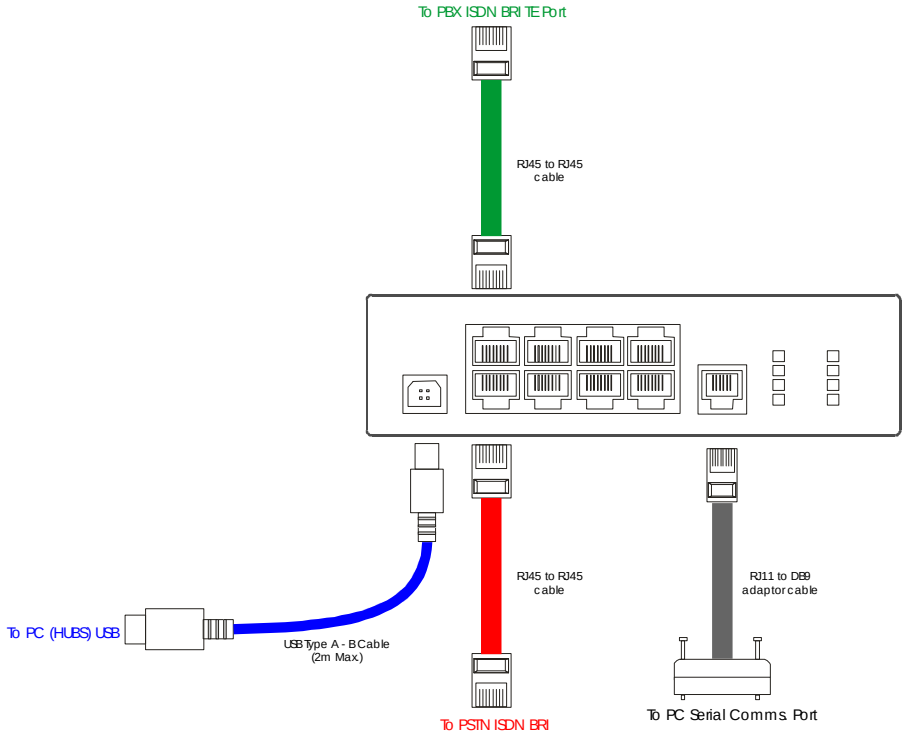


Figure 10 ISDN2 SB Installation

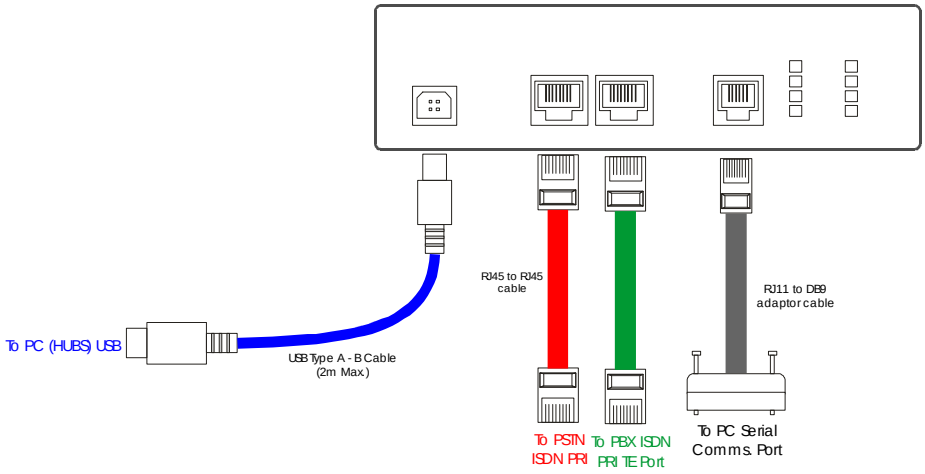


Figure 11 ISDN30 SB Installation

8. LIGHT EMITTING DIODES (LEDS)

Eight LEDs are used to indicate the operational status of the device. The "Power" LED indicates the presence of the power to the unit and should remain on continuously during normal operation. The function of the remaining seven LEDs depends upon the operating state of the SB. This is described in more detail below.

8.1 Normal Operation Mode

The LED names are as seen from the front view.

B	D
A	C
IN	OUT
POWER	USB

8.2 Boot Sequence

When first powered up or after a system reset has been activated, the SB boots up. The LEDs should light in green one after the other from the POWER-LED which remains green to IN, A, B, USB, OUT, D, and D. The complete cycle should take around 15 seconds. If any led lights red or LED D does not light green at the end of the boot sequence it is an indication of a major boot failure.

8.2.1 SB LED Indications

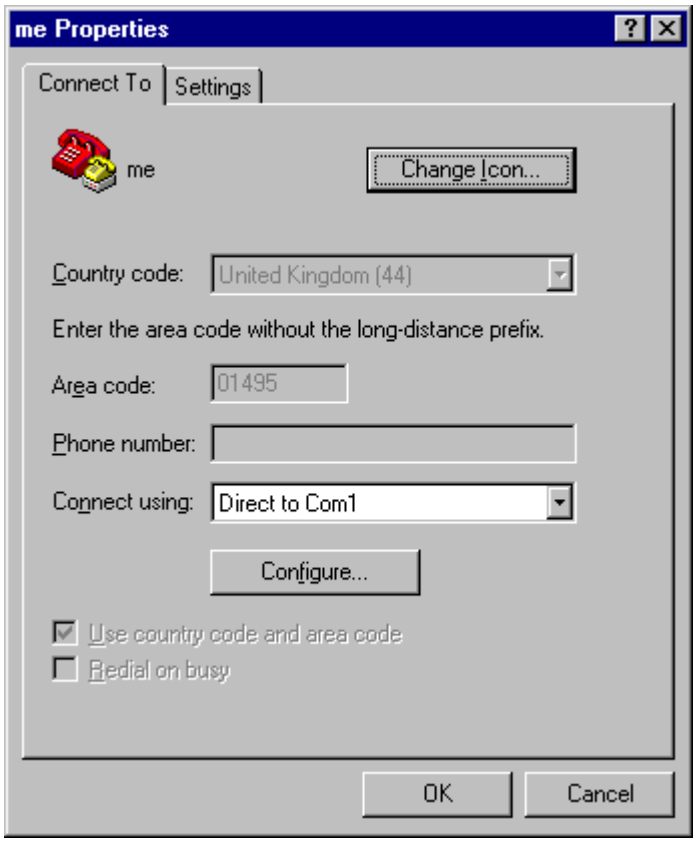
When the boot dequence is finished, the LEDs have

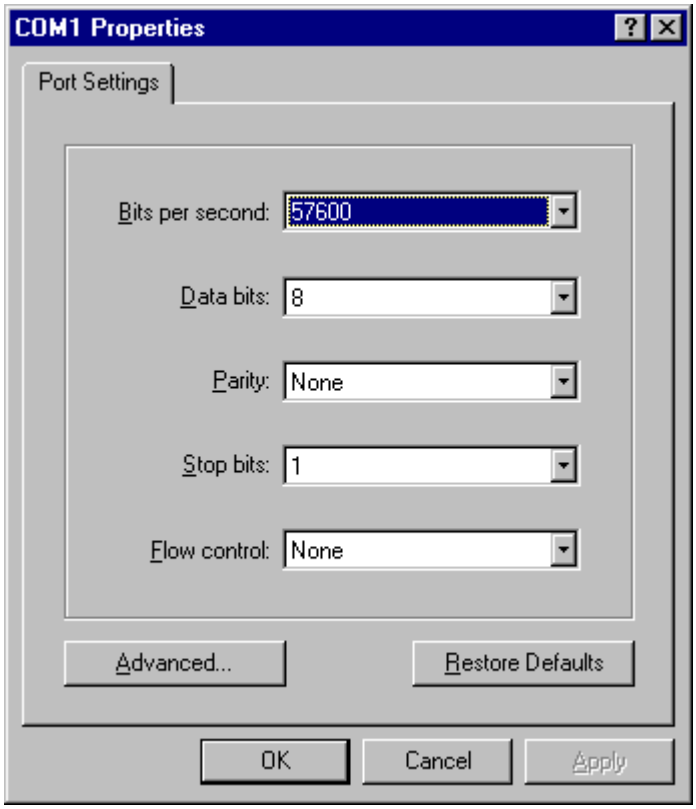
LED Designation	***Color***	***Meaning***
USB	Off	N/A (Not Applicable)
	Green	USB communication with the PC application is UP.
	Red	USB communication with the PC application is DOWN.
	Orange	N/A
IN	Off	N/A
	Green	All telephone connections towards the PBX are UP.
	Red	All telephone connections towards the PBX are DOWN.
	Orange	Some telephone connections towards the PBX are UP.
OUT	Off	N/A
	Green	All telephone connections towards the PSTN are UP.
	Red	All telephone connections towards the PSTN are DOWN.
	Orange	Some telephone connections towards the PSTN are UP.
A	Off	There are no active inbound calls.
	Green	There is at least one active inbound call.
	Red	N/A
	Orange	N/A
C	Off	There are no active outbound calls.
	Green	There is at least one active outbound call.
	Red	N/A
	Orange	N/A
B	Off	Reserved
	Green	Reserved
	Red	Reserved
	Orange	Reserved
D	Off	
	Green	Flashing Green: A firmware upload is in progress.
	Green	Steady Green: Firmware update succeeded.
	Red	Firmware update failed.
	Orange	Firmware burning to flash RAM is in progress.

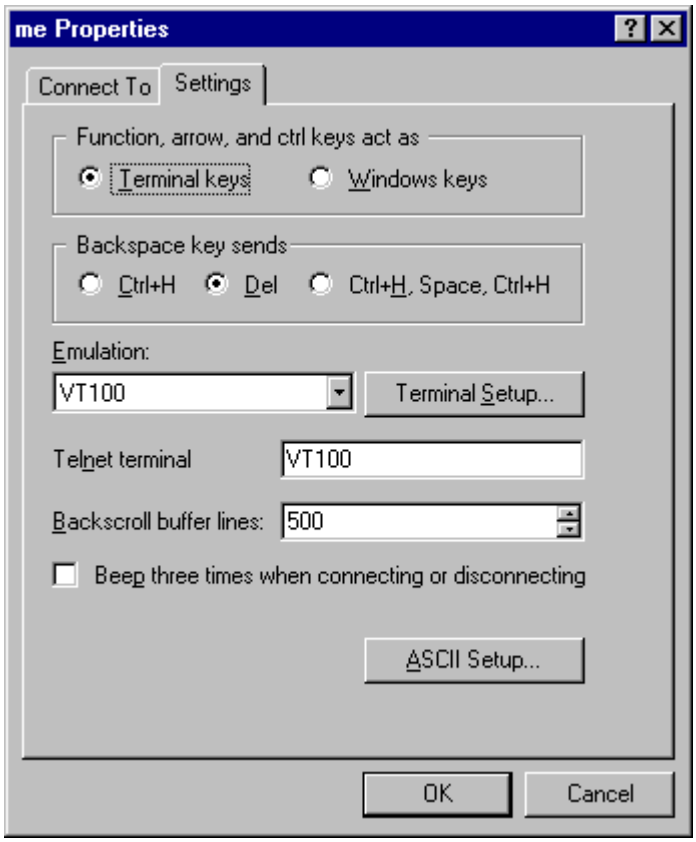
APPENDIX B

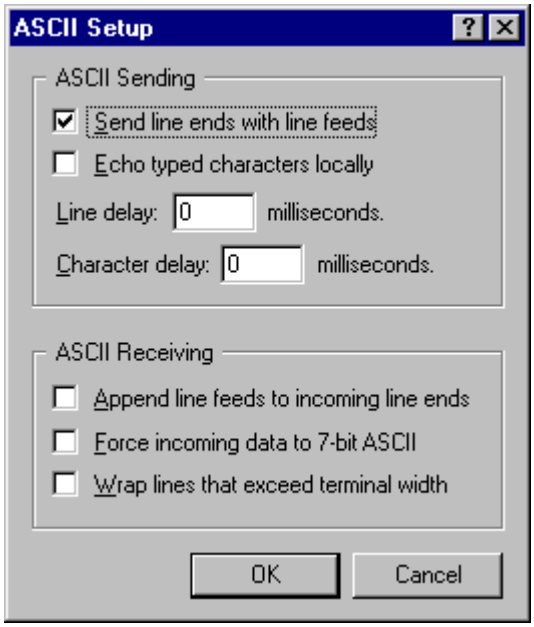
HYPERTERMINAL SETTINGS

The following is an example of how HyperTerminal should be set up to operate with the Retell SB and is for guidance only.




COM1 Properties
Port Settings
Bits per second: 57600
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None
Advanced...
Restore Defaults
OK
Cancel
Apply


me Properties
Connect To
Settings
Function, arrow, and ctrl keys act as
Terminal keys
Windows keys
Backspace key sends
Ctrl+H
Del
Ctrl+H, Space, Ctrl+H
Emulation:
VT100
Terminal Setup...
Telnet terminal
VT100
Backscroll buffer lines:
500
Beep three times when connecting or disconnecting
ASCII Setup...
OK
Cancel


ASCII Setup
ASCII Sending
Send line ends with line feeds
Echo typed characters locally
Line delay: 0 milliseconds.
Character delay: 0 milliseconds.
ASCII Receiving
Append line feeds to incoming line ends
Force incoming data to 7-bit ASCII
Wrap lines that exceed terminal width
OK
Cancel