Cordless Serial Adapter User Guide

Revision 0.95

September 22, 2003

socket™

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CSA   BTCSA

FCC ID: LUBCSA-1

FC

**Tested To Comply
With FCC Standards**

FOR HOME OR OFFICE USE
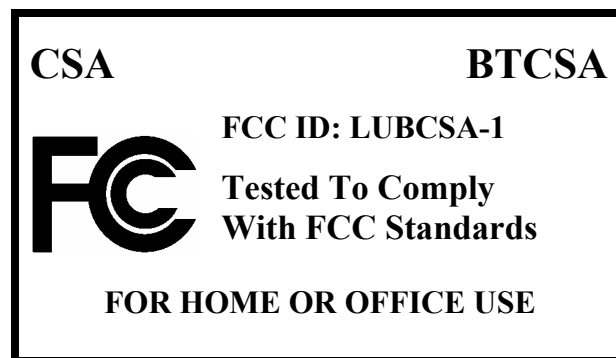
Regulatory Compliance

The Socket Bluetooth module is designed to be compliant with the rules and regulations in locations where they are sold and will be labeled as required. This product is type approved — users are not required to obtain license or authorization before using.

Radio Frequency Interference Requirements
This device complies with part 15 of the FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment is also ETS 300 328, ETS 300 826 and C-TICK compliant. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

This equipment generates and radiates radio-frequency energy. To comply with FCC RF exposure compliance requirements, the following antenna installation and device operating configurations must be satisfied: (1) Users are not permitted to make changes or modify the system in any way, and (2) connecting external antennas to the card is prohibited. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user may try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the radio or television.

- Increase the distance separating the equipment and the receiver.

- Connect the equipment to an outlet on a different branch circuit than that of the receiver.

- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet helpful: *How to Identify and Resolve Radio-TV Interference Problems.* This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402.

U.S. Regulatory Wireless Notice

This product emits radio frequency energy, but the radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna during normal operation is minimized.

Radio Frequency Interference Requirements – Canada

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Classe B respecte toutes les exigencies du Reglement sur le Matériel Brouilleur du Canada.

Canadian Regulatory Wireless Notice

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

CE Marking & European Union Compliance

Products intended for sale within the European Union are marked with a CEMark which indicates compliance to applicable Directives and European Normes (EN), as follows. Amendments to these Directives or ENs are included: Normes (EN), as follows:

European Union Notice

CE 0682 (!)

Products bearing the CE marking comply with the R&TTE Directive (1999/5/EC), EMC Directive (89/336/EEC), and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22)—Electromagnetic Interference
- EN 55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11)—Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN 60950 (IEC 60950)—Product Safety
- EN 300 328—Technical requirements for radio equipment
- ETS 300 826 or EN 301 489-17—General EMC requirements for radio equipment

This product may be used in all EU and EFTA countries.

Applicable Standards:
- EN 55 022 – Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.
- EN 50 082-1 – Electromagnetic Compatibility – General Immunity Standard, Part 1: Residential, Commercial, Light Industry.
- IEC 801.2 – Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment, Part 2: Electrostatic Discharge Requirements.
- IEC 801.3 – Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment, Part 3: Radiated Electromagnetic Field Requirements.
- IEC 801.4 - Electromagnetic Compatibility for Industrial Process Measurement and Control Equipment, Part 4: Electrical Fast Transients Requirements.
- EN 60 950 + Amd 1 + Amd 2 – Safety of Information Technology Equipment Including Business Equipment.

Revision Table

Revision	Date	Who	Comments
0.95	10-Sep-2003	C. Ader	Extract user guide from specification

Table of Contents

List of Tables

1. Introduction

1.1 Product definition

In the CSA product line there will be two versions:

Cordless Serial Adapter – External Power - Provide a basic Serial Cable replacement function with some user accessible command modes

1.2 Feature List

- Very small size

- Low Cost

- External Power device runs off 3.3-5V external power

- Parasitic power version uses power derived from the RS-232 signals to trickle charge internal batteries

- Customizable via Virtual Machine coding to support many RS-232 flow control configurations

- Firmware and VM code upgradeable in the field via programming cable interface

- Ability to configure certain Bluetooth and RS-232 parameters via a simple terminal interface or through a Windows based configuration utility. For example baud rates, Bluetooth friendly name, etc.

- Supports security and bonding

- Low power Bluetooth modes: Sniff, Park and Hold

- Raw serial module, class 2

- Internal antenna

- Adapter will be a serial port profile acceptor as default. It can be reprogrammed to be an initiator but will require a specific BD address that it will connect with to be programmed in.

- If the Adapter is in 'imitator' mode, it will be a Bluetooth Master device, and when it connects to another device and that device requests a role reversal, the Adapter must accept the reversal and become a slave. If the Adapter is in 'acceptor' mode, it will be a slave and will not request any role reversal.

- Default baud rate 19,200

- Baud rates configurable from 9,600 – 230,000

2   Operational Specifications

2.1   Operating Range

10 meters at T=25ºC, open office conditions

2.2   Electrical Requirements

DC voltage levels				
Vcc = 5 volts ±10%				
	Description		Minimum	Maximum
VIH	High level input voltage		2.0 V	12V
VIL	Low level input voltage		-12 V	0.8 V
VOH	High level output voltage*		3 V	-------
VOL	Low level output voltage*		------	-3 V

Table 1: DC Voltage Levels

2.3   Power Consumption

Expect ±10% variation over temperature.

$T_{ambient}= +20º C$

Mode	Average	Max	Units
Connected	40.5	76.5	mA
Connected standby (RS232 transceiver off)	3.5	53.0	mA
Waiting to connect	39.1	55.9	mA
Waiting to connect standby (RS232 transceiver off)	2.3	19.1	mA

Table 2: Power Consumption

3 Hardware Interface

3.1 CSA Pin Assignments

The pin assignments are per the DB9 RS-232 convention but offer some options for non-standard configurations.

Signal Name	Function	Direction	Pin #
PIO_2	DCD – Carrier detect	IN	1
UART_RXD	RXD serial data from local host	IN	2
UART_TXD	TXD serial data to local host	OUT	3
PIO_4	DTR Data terminal ready	OUT	4
GND	Ground		5
PIO_3	DSR Data set ready	IN	6
UART_RTS	RTS Request to send to local host	OUT	7
UART_CTS	CTS Clear to send from local host	IN	8
CABLE_POWER	Optional power input (3.3 to 5.0 Vdc)		9

Table 3: DTE Pin Assignment

3.2 Power Supply

Power over pin 9 (must be able to supply a minimum of 160mA at 3.3V to 5V)

External – use the same power adapter as GPS (includes 2 European and one Australian power connectors)

3.3 Indicator LEDs

Bluetooth LED (one LED only in different states):

- LED flashing one time every two seconds CSA is powered but not discoverable or connectable.

- LED flashing two times every two seconds CSA is waiting to connect.
  If acting as ACCEPTOR connectable. If acting as INITIATOR waiting for local host to issue command to initiate the connection.

- LED flashing three times every two seconds CSA is connected.

4   Hardware Interface Protocol

4.1   Initialization status

Module pin 4 (PIO_1) is used as a status indicator. This line is LOW (zero) indicates that the module has not completed initialization. This line HIGH (one) indicates that the module has completed its initialization and is ready to accept commands or Bluetooth connections.

4.2   Connection enable

Module pin 9, serial pin 6, (PIO_3), is used to enable the module's connectability and discoverability.

If the module is configured in software to be an Acceptor (see Serial Port Profile in the Bluetooth 1.1 Profiles document) device, when this line is high the module is not discoverable or connectable, regardless of the software settings. When this line is low the module *can* be discoverable and connectable, depending on the software settings. If this line is changed from low to high, any existing connections are dropped and the module will not be discoverable or connectable.

If the module is configured in software to be an Initiator device, when this line is high the module will not attempt to connect to its Acceptor device (if it has one).   When this line is low the module will attempt to connect to its Acceptor device.

4.3   Connection Status

Module pin 5, serial pin 4, (PIO_4) is used by the local host to determine the modules current connection state. When this pin is low, there is an active connection. When this pin is high, there is no connection currently active. This pin can be used by the host to determine when the module is in BT Link Active state or BT Link Inactive state.

4.4   RTS Flow Control Management

Module pin 12, serial pin 7, (RTS) is used by the module to hold of data or command transmissions from the host. When module pin 12 is low, data or commands can be sent to the module, when module pin 12 is high, data or commands shall not be sent to the module.

When the module is starting up after power up, RTS may go inactive for a short time. It will return to active when the module is ready to receive control commands or data.

4.5   CTS Flow Control Management

Module pin 14, serial pin 8, CTS is used to control data flow from the module to the local host. When module pin 14 is low the module will send any available data to the local host. When this pin is high the module will not send data to the local host.

5   Mechanical Specifications

5.1   Dimensions

Length 65mm
Width   35mm
Height 17mm

5.2   Weight

25 grams

5.3   Housing Material

ABS and Polycarbonate (50/50) combination material.

5.4   Physical Connectors

- External Power, AC In, uses same power supply as BT GPS

- 9 pin male connector, DTE

- Thumb screws

6   Environmental Requirements

6.1   Temperature/Humidity

Operating temperature range: -20º to 85º C

Humidity: 5% to 95% (non-condensing)

Storage temperature range: -40º to 95º C

6.2   Shock

Unit Mechanical Shock: The unit will function properly after 30 drops of 1 meter to a concrete floor at 23 C, consisting of 5 drops to each of the following surfaces: Top, bottom, both sides, nose and the contact end of the unit.   Physical repair is allowed only to the connector area for proper insertion into a DB9 connector.

Conditions: No degradation of functional performance.

No loose internal components.

6.3   Vibration

The unit shall withstand a sinusoidal vibration of 2Gs along each of the 3 mutually perpendicular axes for a period of 1 hour per axis, over a frequency range of 5 Hz to 2,000 Hz.

Conditions: No degradation of functional performance.

                         No loose internal components.

6.4   Connector Insertion Durability

The unit will continue to function after 5,000 insertions.

6.5   ESD

Meet the following criteria using measuring method based on IEC61000-4-2

6.5.1   Non-operating Test

Discharge through air (up, down, left, right, front, back):

- No erroneous operation at ±8kV

- No destruction at ±10kV

Discharge by contact (metal plate):

- No erroneous operation at ±6kV

- No destruction at ±10kV

6.5.2   Operating Test (connecting to PC, etc)

Discharge through air (up, down, left, right, front)

- No erroneous operation at ±8kV

- No destruction at ±10kV

6.5.3   Characteristics of electric static discharge generator

Energy Accumulation Capacitance (Cs+Cd):   150pF±10%

Discharge Resistance (Rd):   330ohm±10%

7 Software functionality

7.1 Bluetooth Profiles/Software

GAP, SDP, SPP

Separate programming application to allow a user to manually configure:

- baud rate

- stop bits

- parity

- flow control

The application needs to run on 98SE, 2000, XP and Windows Pocket PC 2002 & Pocket PC 2003

Cordless Adapter would need to be attached to the serial port of the notebook or desktop running the programming application. Application will include the ability to update firmware in the Adapter via an XP based system.

8 Country and SKU Requirements

Support for English only in this release.

9 Regulatory Certifications Required

9.1 Basic Agency Certifications

1) US FCC

2) Canada IC

3) European Union CE

4) Australia & New Zealand C-Tick

5) Japan JATE

9.2 Additional Certifications and Logos

In addition the Cordless Adapter will carry the following logo:

- Bluetooth Brand Logo as authorized by complying with the Bluetooth SIG Certification.

- The product must pass the "Bluetooth End Product" type certification.

10 Packaging

10.1 Accessory Item(s) to be included in final package

- US AC power supply (includes 2 European and one Australian power connectors)