

WILCOXON

PROCESS CONTROL

Industrial Strength Bluetooth WIRELESS TECHNOLOGY

BlueLynx™
WIRELESS

C1B Class 1 Radio Module Operating Manual

Revision: 97002-01

Revision Date: February 21, 2003

Due to the sensitive nature of this product, please read this manual in its entirety before installing the C1B module.

Contact Information:

Sales:

Wilcoxon Research, Inc
21 firstfield Road
Gaithersburg, MD 20878
USA
Tel 1.800.945.2696

Errata Sheet

C1B Class 1 Radio Module

Date: February 21, 2003

Revision 1

Due to the sensitive nature of this product, please read this manual in its entirety before installing the C1B module.

There are no errata statements at this time.

All information contained in this Operating Manual is property of Wilcoxon Research, Inc.

Safety Notices

C1B Class 1 Radio Module

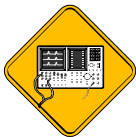
Date: February 21, 2003

Revision 1

Due to the sensitive nature of this product, please read this manual in its entirety before installing the C1B module.



WARNING: This symbol is used in the instruction manual where the safety of the operator must be considered. The instruction manual should be consulted and read carefully.



CAUTION: This symbol is used when caution is needed to prevent damage to equipment. It is used where careful attention to certain procedures described in the instruction manual is needed. This symbol is also used to emphasize procedures other than normal operating procedures.

UL Notices

UL pending.

Regulatory Requirements and Notices

C1B Class 1 Radio Module

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International Notices

 **CE Frequency Band**
2402-2480 MHz 0989

!Attention:

French CE standards for EMC (Electro-Magnetic Compatibility) are not harmonized with the Current 15 Member States.

!Attention:

See: CE Member states (Appendix A)

FCC/IC Notices

Note to Integrators:

The Operating Manual should NOT provide any instructions on how to remove or install the module.

!Attention: If the FCC ID is not visible when this unit is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. A sample label has been provided below. This label should be clearly legible and contain the text that reads:

Contains Transmitter Module FCC ID: QAQMAYMAN IC ID: 4531A-C1B56
--

Part 15 Interference Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two 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.

!Attention: In order to comply with FCC RF Exposure requirements, this device must be installed in such a way as to insure a minimum separation distance of 20 cm between the antenna and all persons, during normal operation. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter

Modular FCC Certification Notice

The module has been previously tested and received certification as a modular transceiver product from the FCC. No further testing of the module is necessary.

The pre-certified status of the module is valid only if all of the following are observed:

- No modifications to the module may be made.
- The module which has been certified for FCC compliance with the supplied antenna and must not be altered in any way.
- **The pre-certified status applies only to the *module*. The OEM must determine if additional certification or testing is required for their own circuitry or peripheral circuitry.**
- When the module is installed upon or inside another device, then that device must display an external label referring to the attached module or the wording should appear as part of the OEM's own label. The exterior label wording should appear as follows:

Contains Transmitter Module FCC ID: QAQMAYMAN IC ID: 4531A-C1B56
--

The OEM's product instruction manual must display the following three statements:

1. If the FCC ID is not visible when this unit is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. A sample label has been provided below. This label should be clearly legible and contain the text that reads:

Contains Transmitter Module FCC ID: QAQMAYMAN IC ID: 4531A-C1B56
--

2. Part 15 Interference Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two 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.

3. In order to comply with FCC RF Exposure requirements, this device must be installed in such a way as to insure a minimum separation distance of 20 cm between the antenna and all persons, during normal operation. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter

UL Certification

UL Certification Pending

Content Director

C1B Class 1 Radio Module

Date: February 21, 2003

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Hardware Brief goes here...

Manual Guide goes here...

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Intended Applications

C1B Class 1 Radio Module

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The C1B has been specifically designed for use by OEM equipment manufactures for integration into industrial applications requiring wide temperature ranges, high reliability and harsh EMI and ESD environments. This unit is not to be used for consumer home applications or in apparatus worn by people.

Product Description

C1B Class 1 Radio Module

Date: February 21, 2003

Revision 1

Wilcoxon Research's C1B series modules are designed specifically for industrial applications of Bluetooth (TM) systems. The modules are designed to simplify the design and integration of Bluetooth functionality into process monitoring and control systems. These modules are engineered to manage the harsh reality of industrial environments. Future industrial environments can be expected to generate even greater levels of electrical noise than they currently do. The frequency hopping modulation format used is an ideal choice to combat the effects of future noisy technologies.

Product Utilization/Installation

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Product Utilization/Installation Text goes here...

Product Operation

C1B Class 1 Radio Module

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Product Operation Text goes here...

Product Options

C1B Class 1 Radio Module

Date: February 21, 2003

Revision 1

Product Options go here...

Product Maintenance

C1B Class 1 Radio Module

Date: February 21, 2003

Revision 1

The C1B Class 1 Radio Module contains no user serviceable or operator replaceable parts. No maintenance should be attempted by the user. Opening the module and attempting any maintenance will void the user warranty and the Federal Communication Commission (FCC) certification.

There are no cleaning, cooling, or ventilation requirements for the C1B Class 1 Radio Module.

Product Repairs and Warranty

C1B Class 1 Radio Module

Date: February 21, 2003

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1. Extended Replacement of Our Sensors. Wilcoxon Research, Inc. will repair or replace any Wilcoxon vibration sensor (including the sensor element within our wireless transmitters) that fails to operate properly under its normally specified conditions, even if the failure is due to ordinary wear and tear, at any time within five (5) years from purchase. Failures due to external damage to the sensor or use outside specifications are excluded.

2. Total Satisfaction Guarantee. Write to Wilcoxon within one year of purchase, and Wilcoxon will repair, replace or exchange any product in the Wilcoxon catalog if you are not satisfied with the performance of the product for any reason. Alternatively, if within 30 days of purchase you write to Wilcoxon and return the product, Wilcoxon will refund the full purchase price.

3. Additional Limited Warranty on All Products. In addition to any coverage provided above, for a period of two years from purchase, Wilcoxon will repair or replace any product manufactured or sold by Wilcoxon that has any defect in design, materials or workmanship.

4. How to Make a Warranty Claim. Warranty claims are made by requesting a products return authorization from Wilcoxon's Customer Sales & Service Department. On receipt of the authorization, the customer is to ship the product to Wilcoxon's facility in Gaithersburg, Maryland. Wilcoxon will repair or replace covered products at its discretion.

5. THERE ARE NO WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EXCEPT AS SPECIFICALLY SET FORTH ABOVE. Wilcoxon will not be liable for any loss, injury or damages to persons or property, or products furnished by it, or for any delay in delivery, nor will Wilcoxon be liable for indirect, incidental, special or consequential damages of any kind sustained from any cause, including without limitation defect of any kind, installation or service problem, or delay in delivery. In no event may Wilcoxon's liability exceed the cost of the product. This warranty is governed and shall be construed under Maryland law. If any particular limitation of liability or restriction on warranty coverage contained herein is adjudicated to be invalid, the remainder of such limitations and restrictions continue in full force and effect, in order that these such provisions be interpreted to be effective to the fullest extent possible under applicable law. Wilcoxon reserves the right to modify warranty terms applicable to products sold in the future. Wilcoxon's entire warranty obligations for products sold herewith are embodied in this writing.

Product User Assistance

C1B Class 1 Radio Module

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Technical Assistance

For technical assistance, please contact Wilcoxon's Product Manager at 301-330-8811, fax to 301-330-8873, or email to techasst@wilcoxon.com.

Customer Service

To obtain a Return Goods Authorization (RGA) number, please contact customer service at 301-330-8811, or fax to 301-330-8873.

Legal Notices

C1B Class 1 Radio Module

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WILCOXON'S STANDARD TERMS AND CONDITIONS ACKNOWLEDGMENT

PUBLICATION DATE : February 28, 2003

1. ACCEPTANCE: This acknowledgment is expressly conditioned on, and limited to, Customer's acceptance of all its terms and conditions. None of the terms and conditions contained in this Acknowledgment may be added to, modified, superseded or otherwise altered except by a written document signed by an authorized representative of Wilcoxon. Customer acknowledges that Wilcoxon sells the items covered by this acknowledgment solely pursuant to the terms and conditions set forth in this Acknowledgment. Accordingly any terms and conditions that may be contained in any purchase order or other form. Customer shall be absolutely without force or effect, regardless of when received by Wilcoxon. The terms and conditions of this Acknowledgment shall be deemed a binding contract between Customer and Wilcoxon upon delivery to Customer of this Acknowledgment.
2. FORCE MAJEURE: Wilcoxon shall not be liable for any delays in making delivery where occasioned by strikes or differences with workmen or by any causes beyond the control of Wilcoxon, such as but not limited to, fires, floods, accidents, action of any governmental authority, war, insurrection or riots, or shortages of labor, energy, raw materials, production facilities or transportation. Where delays or failures of delivery are caused by labor difficulties, Wilcoxon shall not be obligated to seek or obtain any settlement which, in Wilcoxon's sole judgment, is not in Wilcoxon's best interest.
3. PRICE CHANGES: The items ordered pursuant to this Acknowledgment may be invoiced at prices different from those shown dependent upon the cost to Wilcoxon at time shipment is made, and dependent further upon the freight rates and customs duties in effect at the time shipment is made and/or the goods imported into the United States.
4. WARRANTY: Customer shall have 14 days from receipt of the goods to notify Wilcoxon, in writing, of any claim for damage, errors, shortages, adjustments or rejections because of defective parts, construction or materials. Failure to make a claim within such period shall be conclusive evidence that the goods shipped were satisfactory in all respects and supplied in accordance with ordered specifications. Wilcoxon warrants that it will replace without charge goods proved to be defective or provide additional goods in case of shortages as soon as reasonably predictable. EXCEPT AS SPECIFICALLY PROVIDED OTHERWISE HEREIN, WILCOXON MAKES NOT WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL WILCOXON BE RESPONSIBLE FOR SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, EVEN IF WILCOXON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. WILCOXON'S LIABILITY FROM ANY AND ALL CAUSES PURSUANT TO THIS ACKNOWLEDGMENT SHALL BE LIMITED TO GENERAL MONEY DAMAGES IN AN AMOUNT NOT TO EXCEED THE TOTAL PURCHASE PRICE FOR THE GOODS COVERED BY THIS ACKNOWLEDGMENT, REGARDLESS OF THE FORM IN WHICH ANY LEGAL OR EQUITABLE ACTION MAY BE BROUGHT AGAINST WILCOXON.
5. SECURITY INTEREST: Wilcoxon reserves a purchase money security interest in the goods covered by this Acknowledgment in the amount of the unpaid balance of the purchase price until payment in full of the purchase price in accordance with the terms and conditions set forth on the front of this Acknowledgment. A financing statement under the Uniform Commercial Code may be filed with the appropriate public authorities and Customer agrees to sign any forms presented to it by Wilcoxon from time to time to protect Wilcoxon's security interest.
6. PAYMENT: TAXES: Unless otherwise specified in this Agreement, payment shall be in U.S. dollars and terms are net 30 days from date of Invoice. If shipments are in installments, Wilcoxon may separately invoice each installment. Payment shall be due 31 days from the date of invoice or the originally scheduled shipment date, whichever is earlier. If Customer fails to make any payment when due, Wilcoxon may add to the amount due a service charge equal to 2% per month Or the maximum rate allowed by law, whichever is less. In addition, Wilcoxon reserves all other rights granted to a Wilcoxon pursuant to the Uniform Commercial Code for Customer's failure to pay for the goods or other breach by Customer of the terms and conditions of this Acknowledgment. Customer agrees to reimburse Wilcoxon for any and all expenses Wilcoxon may incur, including reasonable attorney's fees, in taking any action contemplated by this Paragraph 6. There shall be added to the purchase price amounts equal to any sales, use or equivalent taxes levied or based upon the goods or their value, unless Customer provides Wilcoxon with an appropriate exemption certificate.
7. CANCELLATION: Cancellation or modification of orders are subject to Wilcoxon's prior written consent in each instance that orders may be canceled or modified on the condition that Customer pay the company for all costs resulting from the cancellation or modification.
8. INDEMNIFICATION: Customer agrees to indemnify Wilcoxon and hold Wilcoxon harmless from and against any and all claims, damages, liabilities, judgments, costs and expenses (including attorney's fees) arising out of or related to the use or performance of the Goods or this Agreement.
9. NON-WAIVER OF DEFAULT: In the event of any default by Customer, Wilcoxon may decline to make further shipments. If Wilcoxon elects to continue to make shipments, Wilcoxon's action shall not constitute a waiver of any default by Customer or in any way affect Wilcoxon's remedies. Wilcoxon's failure to insist upon strict performance of any provision of this Agreement shall not be deemed a waiver of any subsequent default by Customer.
10. NO LICENSE: The sale of goods covered by this Acknowledgment shall not confer upon Customer any license to manufacture under any patents owned or controlled by Wilcoxon, its subsidiaries, affiliates or suppliers. It being specifically understood and agreed that all such rights are reserved to Wilcoxon, its subsidiaries, affiliates or suppliers.
11. ARBITRATION: Any controversy relating to this Acknowledgment shall be settled by arbitration in accordance with the rules then obtaining in the American Arbitration Association. Such arbitration shall be held in Gaithersburg, Maryland, and judgment upon the award rendered may be entered in any court having jurisdiction, and the parties consent to the jurisdiction of the Maryland courts for this purpose.
12. RISK OF LOSS: Wilcoxon shall not be liable for any goods lost, damaged or destroyed in transit whether Wilcoxon is to pay the freight for such transit or Customer is to pay the same, it being agreed that all risk of such loss, damage or destruction is assumed by Customer.
13. ENTIRE AGREEMENT, HEADINGS, VALIDITY: Customer acknowledges that it has not been induced to purchase goods from Wilcoxon by any representation or warranty not set forth in this Acknowledgment. This Acknowledgment contains the entire agreement of Wilcoxon and Customer and supersedes all existing agreements and all other oral or written communication between them concerning its subject matter. This Acknowledgment shall not be modified in any way except by a writing by Wilcoxon and Customer. The paragraph headings contained herein are intended for convenience of reference only and shall not affect the interpretation of any provision. If any provision herein shall be held to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall in no way be affected or impaired.
14. ORDER ACCEPTANCE: Wilcoxon reserves the right to accept or reject any order. Possession of a price list by Customer does not constitute an offer to sell. On orders for non-stock goods, or special orders, or where manufacturing processes make it difficult to provide the exact quantity specified, Wilcoxon reserves the right to under ship or over ship and invoice Customer accordingly, provided that such under shipment or over shipment does not exceed 10% of the total quantity ordered by Customer.
15. MODE OF PACKAGING OR SHIPMENT: Wilcoxon reserves the right to pack or ship orders in the most economical manner. However, where Customer request special packaging or shipping, any additions cost will be billed to and be the responsibility of the Customer.
16. DESIGN CHANGES: Wilcoxon reserves the right to alter, modify or redesign its goods without any obligation to replace similar goods previously shipped to Customer.
17. DELIVERY: Customer is advised that quoted delivery dates are based on estimates at the time of quotation and that Wilcoxon will devote its best efforts to meeting such schedules. However, Wilcoxon assumes no liability for additional cost or damages resulting from late deliveries.
18. LIFE SUPPORT POLICY: Wilcoxon products are not intended for use in, nor authorized for use in any life support system. A life support system is defined as a product or procedure intended to support or sustain life and whose failure to perform can be reasonably expected to result in significant injury to the user.

Disclaimers:

Wilcoxon Research's products are not designed, manufactured or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as the operation of nuclear facilities, aircraft navigation, communication systems, air traffic control, medical, health and life support machines, weapons systems, remote motion control or any device or any industry or application in which technology failure could lead directly to death, personal injury, severe physical or environmental damage, or property damage.

CE Member States (Appendix A)

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Current Countries Recognizing CE Mark:

EU 15 Member states:

Austria (became member in 1995), **Belgium** (Founder Member in 1957), **Denmark** (1973), **Finland** (1995), **France** (FM 1957), **Germany** (FM 1957), **Greece** (1981), **Ireland** (1973), **Italy** (FM 1957), **Luxembourg** (FM 1957), **the Netherlands** (FM 1957), **Portugal** (1986), **Spain** (1986), **Sweden** (1995) and **United Kingdom (Great Britain)**(1973).

Candidate States:

Some are requiring CE Marks. Check with Appropriate agencies for details regarding use in country in question .

CE Marking and EU/EFTA

The 15 EU Member states legally require CE-Marking. The European Free Trade Association (EFTA*) countries, with the exception of Switzerland, also enforce CE-Marking. The 12 European countries on application to become EU Member states have started to adopt the CE-Marking requirements to ensure that their products can freely move throughout the EU member States in the future. Check with Appropriate agencies for details regarding use in country in question .

*-Iceland, Liechtenstein, Norway and Switzerland are EFTA countries

Note:

France is not completely harmonized in frequency allocation for the standard ISM band this product utilizes from 2402 MHz to 2480 MHz. Check with the vendor for a product with a restricted frequency range suitable for use in France.

Absolute Maximum Ratings (Appendix B)

C1B Class 1 Radio Module

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Table 1 Absolute Maximum Ratings

Parameter	Ratings	Units	Notes
Supply Voltage	-.45 to + 3.6	VDC	Vcc
Logic Levels	0-Vcc-.45 V	VDC	
RF at RF input	+23 dBm	1 milli-Watt ref.	From 2400-2500 MHz
RF at RF input	+30 dBm	1 milli-Watt ref.	From 200-1900 MHz
RF at RF input	+27 dBm	1 milli-Watt ref.	From 2600-4500 MHz
ESD at RF input	10	KV	Human body model (EN 61000-4-2) With gnd connection at antenna and I/O connector
Storage Ambient Temp.	-55 to +125	Deg Centigrade	
Operating Ambient Temp.	-40 to +85	Deg Centigrade	

Caution: This device is ESD sensitive until properly connected.

Specifications (Appendix C)

C1B Class 1 Radio Module

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Brief Form

RF Frequency	2402 – 2480 MHz ISM band
Operating Range.....	100 meters (300 feet)
Output Power	Bluetooth Class 1
Number of Channels	79
Data Interface.....	1.5 Mbit UART, full speed USB (12 Mbit), PCM
Over the Air Data Rate	500 Kbps
20 dB Bandwidth	900 KHz
Adjacent Channel	–20 dBm
Power Offset	–40 dBm
Maximum Input Level	–20 dBm
Receiver Sensitivity	–85 dBm
Operating Voltage	3.3 VDC $\pm$ 5%
Power Consumption	250 mA average (SCO, HV1), 3 mA stand-by
Operating Temperature	–40 to 85 C
Humidity	0 – 95%
Size	19 mm x 48 mm x 5 mm (excluding RF connector)
Weight.....	6.5 g

EX Form

Due to continued research and development, the Manufacturer reserves the right to amend this specification without notice.

Functional Compliance/Limitations (Appendix D)

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1. Set the event mask (using H4), get error code.

Issue ID H18.37.

The bug is present in HCI firmware builds HCI 15.3, HCI 16.4, HCI 17.2, and possibly, HCI 16.7. The latter two builds are still in test. It does not affect HCI 14.X or earlier builds.

The bug has been fixed for any future HCI 15.X (?), 16.X, 17.X and 18.X builds.

Block Diagrams (Appendix E)

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Mechanical Drawings (Appendix F)

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Mechanical Drawings go here...

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Doc Version : May 20, 2002

C1B Series

Preliminary

Bluetooth (TM) Modules

General Description

Wilcoxon Research's C1B series modules are designed specifically for industrial applications of Bluetooth (TM) systems. The modules are designed to simplify the design and integration of Bluetooth functionality into process monitoring and control systems. These modules are engineered to manage the harsh reality of industrial environments. Future industrial environments can be expected to generate even greater levels of electrical noise than they currently do. The frequency hopping modulation format used is an ideal choice to combat the effects of future noisy technologies.

Features

- Conforms to Bluetooth Specification Version 1.1
- Class 1 device. (100 mW, +20 dBm)
- Sensitivity -85 dBm max. (BER 10-3)
- -40 - +85 Deg. C. Operating temperature
- Power supply 3.3 VDC +/- 5%
- PCB module, 19 mm X 48 mm X 5 mm
- Available with clip or remote leaded antenna
- Casira Format for ease of eval and integration

General Specifications

Parameter	Specification	Notes / Conditions
Bluetooth Specification	Version 1.1, Class 1	
Bit Rate	1 Mbps Max	500 Kbps average indust. Environment
Power Requirements	3.3V DC @ 250 mA	SOC, HV1 Continuous
Operating Temperature	-40 to + 85 Deg. C	
Absolute maximum ratings	Table 1	
Recommended Operating Conditions	Table 1	
Electrical Specifications, Transmitter	Table 2	
Electrical Specifications, Receiver	Table 3	
Functional compliance / limitations	Table 4	
Block Diagram	Figure 1	
Terminal assignment	Figure 2	
Mechanical dimensions	Figure 3	
Typical Configuration	Application Note 1	
Modular FCC Certification Notice	Notices 1	
Regulatory Certifications	Notices 2	
Legal	Notices 3	

Bluetooth is a Trademark owned....., Casira is a Trademark owned.....

Wilcoxon Research's reserves the right to make changes at anytime and without notice due to product improvement and development.

Wilcoxon Research

Doc Version : May 20, 2002

C1B Series

Preliminary

Bluetooth (TM) Modules

Table 1 Absolute Maximum Ratings

Parameter	Ratings	Units	Notes
Supply Voltage	-.45 to + 3.6	VDC	Vcc
Logic Levels	0-Vcc-.45 V	VDC	
RF at RF input	+23 dBm	1 milli-Watt ref.	From 2400-2500 MHz
RF at RF input	+30 dBm	1 milli-Watt ref.	From 200-1900 MHz
RF at RF input	+27 dBm	1 milli-Watt ref.	From 2600-4500 MHz
ESD at RF input	10	KV	Human body model (EN 61000-4-2) With gnd connection at antenna and I/O connector
Storage Ambient Temp.	-55 to +125	Deg Centigrade	
Operating Ambient Temp.	-40 to +85	Deg Centigrade	

Caution: This device is ESD sensitive until properly connected.

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C1B Series

Preliminary

Bluetooth (TM) Modules

Table 2 Electrical Specifications, Transmitter at Module connector

Parameter	Specifications			Units	Notes:	Conditions
	Min.	Typ.	Max.			
Output Power -40 to +85 C.	+11	+12	+14	dBm	FH off, Burst on Packet type DH5 Payload PRBS9	Measured at connector into 50 ohms load (RF)
Load VSWR			5:1		No damage. Frequency pull less than +/- 5 ppm	Measured at connector
*1 Frequency Accuracy -40 to +85 C.			+/- 10	ppm	TCXO Version 1, FH off, Burst on Packet type DH5 Payload PRBS9	Measured at connector into 50 ohm load (RF)
*2 Frequency Accuracy -40 to +85 C.			TBD	ppm	XTAL Version, FH off, Burst on Packet type DH5 Payload PRBS9	Measured at connector into 50 ohm load (RF)
In-Band Spurious Emissions: Freq. Offset +/- 500 kHz Freq. Offset +/- 2.00 MHz Freq. Offset +/- > 3.0 MHz			-20 -20 -40	dBc dBm dBm	FH off, Burst on Packet type DH1 Payload PRBS9	Measured at SMA with 50 ohm load
Out Of Band Spurious Emissions: .03-1 GHz 1.0-12.75 GHz 1.80-1.90 GHz 5.15-5.53 Ghz			-36 -30 -47 -47	dBm dBm dBm dBm	FH off, Burst on Packet type DH1 Payload PRBS9	Measured at SMA with 50 ohm load

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C1B Series Preliminary

Bluetooth (TM) Modules

Table 3 Electrical Specifications, Receiver

Parameter	Specifications			Units	Notes:	Conditions
	Min.	Typ.	Max.			
Receiver Sensitivity	-85	-92		dBm	BER 10-3, PRBS9	

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C1B Series Preliminary

Bluetooth (TM) Modules

Table 4 Functional Compliance and Limitations

Parameter	Specifications			Units	Notes:	Conditions
	Min.	Typ.	Max.			
Receiver Sensitivity	-85	-92		dBm	BER 10-3, PRBS9	

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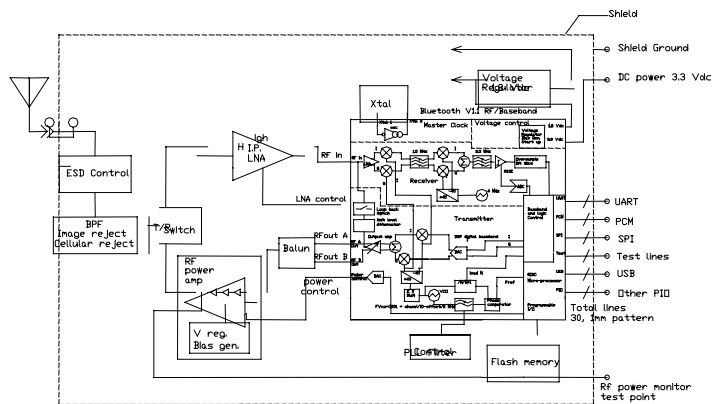
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Bluetooth (TM) Modules

Figure 1 Block Diagram



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Bluetooth (TM) Modules

Figure 2 Terminal Assignments

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Bluetooth (TM) Modules

Figure 3 Mechanical Dimensions

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Bluetooth (TM) Modules

Certifications 1

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Bluetooth (TM) Modules

Application Note 1 Typical Configuration

A drawing appears here

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C1B Series

Preliminary

Bluetooth (TM) Modules

Modular FCC Certification Notice

The module has been previously tested and received certification as a modular transceiver product from the FCC. No further testing of the module is necessary.

The pre-certified status of the module is valid only if all of the following are observed:

- No modifications to the module may be made.
- The **module** which has been certified for FCC compliance has the antenna encapsulated within the molded body of the **module** and must not be altered in any way.
- **The pre-certified status applies only to the module. The OEM must determine if additional certification or testing is required for their own circuitry or peripheral circuitry.**
- When the module is installed upon or inside another device, then that device must display an external label referring to the attached module or the wording should appear as part of the OEM's own label. The exterior label wording should appear as follows:

**This device contains a previously certified RF Transceiver
module FCC ID: MAYMAN**

The OEM's product instruction manual must display the following statement:

INSTRUCTION TO THE USER

This equipment contains an RF module which has been previously tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. 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 is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.