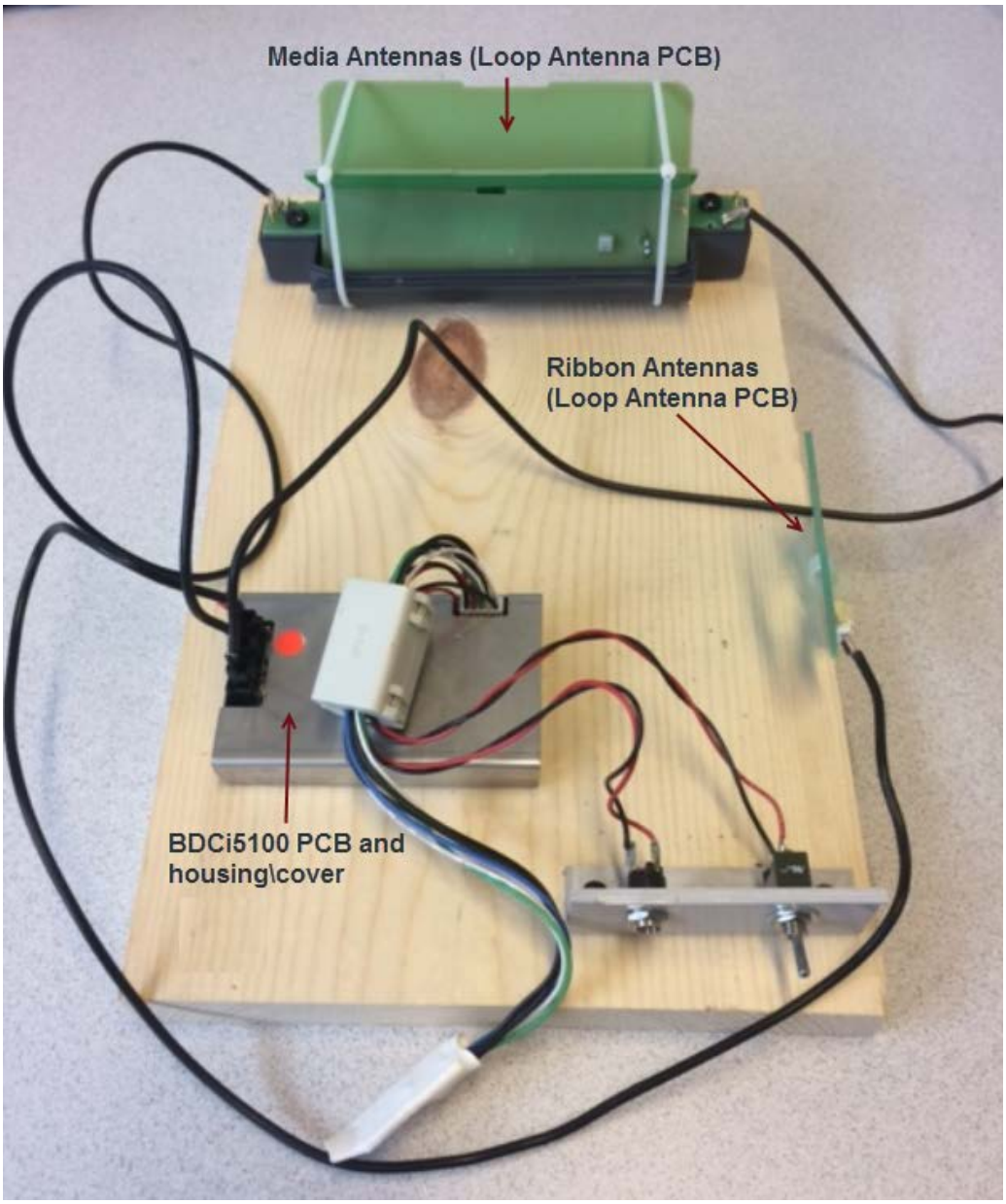
Brady BDCi5100 RFID Assembly



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Copyright

Trademarks

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Agency Compliance and Approvals

For Users in the United States

FCC Notice-US Only

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,
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A 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.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada

ICES-003 Class A Notice, Class A
Industry Canada ICES-003: CAN ICES-3 (A)/NMB-3(A)

This device complies with Industry Canada license-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Mexico
IFETEL notice:
"The operation of this equipment is subject to the following two conditions: (1) it is possible that this equipment or device may not cause harmful interference and (2) this equipment or device must accept any interference, including interference that may cause its undesired operation."

IFETEL notice:
"La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada."

Europe
Warning – This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Waste Electrical and Electronic Equipment Directive

In accordance with the European WEEE Directive, this device must be recycled in the European Union country in which it was purchased.

RoHS Directive 2011/65/EU (RoHS 2), 2015/863/EU (RoHS 3)

This product is CE marked and complies with the European Union's Directive 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

EU Directive 2015/863 of 31 March 2015 (RoHS 3) amends Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.

Radio Equipment Directive (RED) 2014/53/EC

(a) Frequency band(s) in which the radio equipment operates; 13.56MHz

(b) Maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operate; < +23dBm (200mW)

Important:
Proper labeling for end-products using Brady BDCi5100 RFID Assembly:

1) When incorporating BRADY BDCi5100 PCB into a host device and the FCC & IC identification numbers are not visible, the outside of host device must display a label referring to the enclosed certified BDCi5100 RFID Assembly.
Specifically this should display wording such as:
“Contains FCC ID: NUC-BDCI5100”
“Contains IC: 3287A-BDCI5100”

2) The following statement must be placed in the end-device manual:

"This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSSs”. 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."

Important: For Canadian guidance for the user manual, all compliance information needs to be provided in BOTH French and English language.

3) FYI -The label on end-device shall be permanently affixed and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment enclosure or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

BRADY Warranty

Our products are sold with the understanding that the buyer will test them in actual use and determine for him or herself their adaptability to his/her intended uses. BRADY warrants to the buyer that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the product shown to BRADY's satisfaction to have been defective at the time BRADY sold it. This warranty does not extend to any persons obtaining the product from the buyer.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATIONS OR LIABILITY ON BRADY'S PART. UNDER NO CIRCUMSTANCES WILL BRADY BE LIABLE FOR ANY LOSS, DAMAGE, EXPENSE OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING IN CONNECTION WITH THE USE, OR INABILITY TO USE, BRADY'S PRODUCTS.

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS & CONDITIONS OF THIS LICENSE AGREEMENT. IF YOU DO NOT AGREE WITH THESE TERMS & CONDITIONS, PLEASE PROMPTLY RETURN THIS PACKAGE FOR A FULL REFUND.

Technical Support

Technical Support Numbers/On-line Help

For repair or technical assistance, find your regional Brady Tech Support office by going to:

In the Americas: www.bradyid.com
In Europe: www.bradyeurope.com
In Asia: www.bradycorp.com

Repair and Replacement Parts

Brady Corporation offers repair and replacement services. Contact Brady Technical Support for repair and replacement information.

1. Introduction

1.1 Description

The Brady BDCi5100 RFID Assembly consists of a qty 1 BDC IP (PCB), qty 2 Media Antennae (PCBs), qty 1 Ribbon Antenna (PCB), Coaxial cables connecting BDC IP to Media (qty 2) and Ribbon (qty1) loop antenna PCBs. The diagram below shows the Brady BDCi5100 RFID Assembly and its connection to a host such as a printer's main control board.

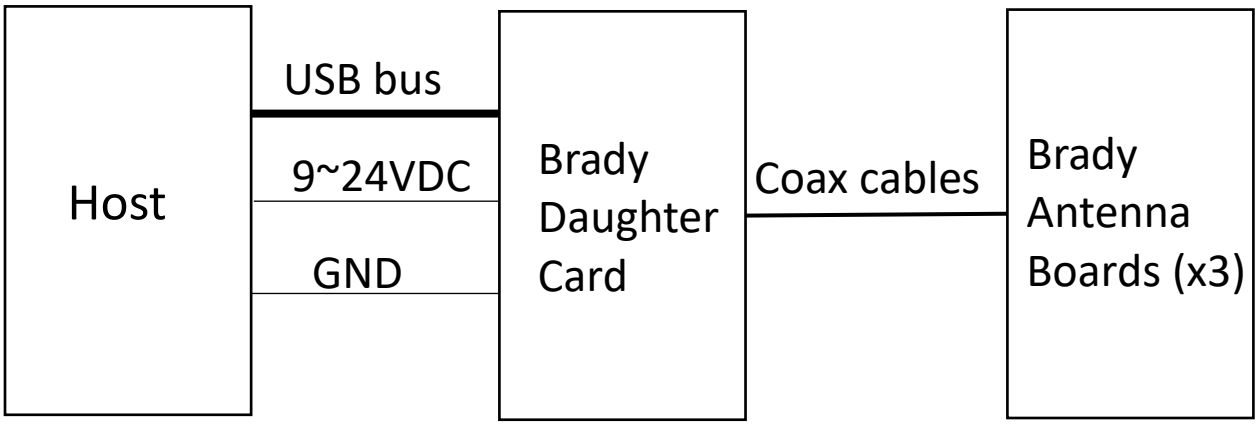

Figure 1. Block Diagram of Brady BDCi5100 RFID Assembly and its Connection to a Host

The Brady BDCi5100 RFID PCB has a radio module and MCU for control. The radio module communicates to an HF RFID tag that is located in proximity to Media and Ribbon loop antenna boards. The information from the RFID tag can be acquired by the host through the USB bus. The host also provides 9~24VDC and ground to the BDCi5100 RFID PCB.

1.2 Specification

The Brady BDCi5100 RFID Assembly specification is provided in Table 1.

Table 1. Specification of Brady BDCi5100 RFID Assembly

BDCi5100 RFID PCB	
Radio Fundamental Frequency	13.56 MHz
ISO Standard	ISO 15693
Type of Modulation	Amplitude
Antenna Type	PCB Loop Antenna 50 OHM
Antenna Impedance	50 OHM
Number of Channels	Three
Operation Range (M)	0.05
Power Output	RF power output < 200 mW
MCU	ATSAMD21E17A
MCU XTAL	12 MHz
DC Voltage	9 – 24VDC +/- 10%
DC Current Consumption	< 200mA
Communication Interface with Host	USB Bus
Operating Temperature Range	40 – 110 degF
Operating Humidity Range	20 to 80 % RH non-condensing
Size (mm x mm)	50 x 80
Weight (g)	18.5
Antenna PCBs, PCB Loop	
Media, Size (mm x mm)	120 x 62, 2pcs
Ribbon, Size (mm x mm)	65 x 62, 1pc
Length of Coax Cable (mm)	Up to 600

2. Installation

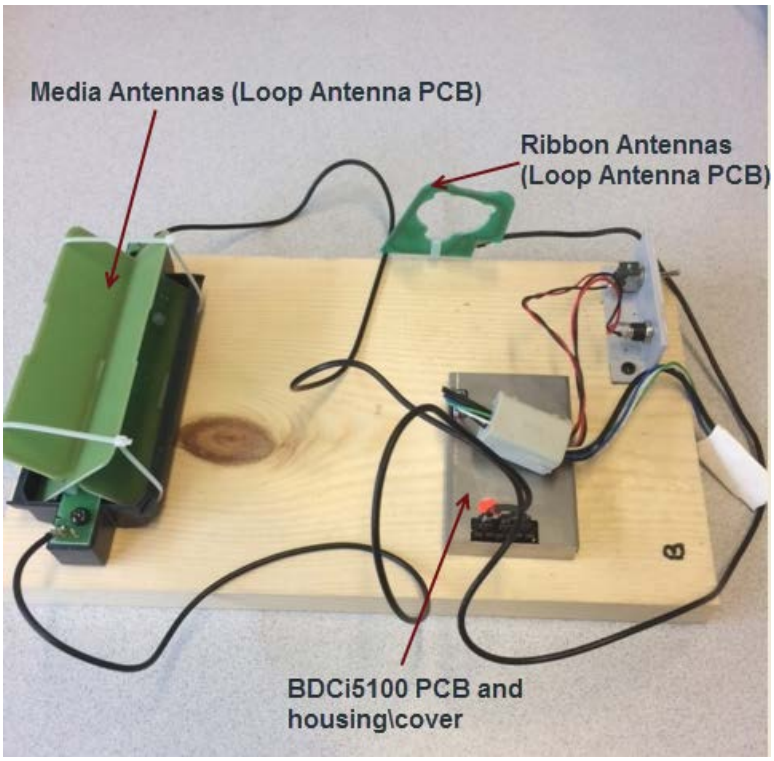

Figure 2. Photo of the Brady BDCi5100 RFID Assembly

Application requirements for installing the BDCi5100 modular approval circuit board assembly into final product.

1. The power supply from the host device must have a voltage output of between 9 to 24 VC and must be capable of supplying 200 mA.

2. The wiring to the 10 pin header (J2) must conform to the published pin descriptions.

3. The antenna assemblies must be connected to the correct connector positions on the BDCi5100 circuit board. CN1 and CN2 must be connected to the antenna associated with the media sensing. CN3 must be connected to the antenna associated with the ribbon sensing.

4. Four LEDs are provided for verification of operation:

LED # D13 will illuminate to show that the circuit board assembly is receiving power.
LEDs number D6 through D8 display successful RFID tag detection
D6 is associated with the media antenna connected to CN1
D7 is associated with the media antenna connected to CN2
D8 is associated with the ribbon antenna connected to CN3

These LEDs will dim when an RFID tag is being successfully decoded by BDCi5100 and the respective antenna.

5. The BDCi5100 circuit board assembly must be mounted in a metallic shield can which totally encloses the assembly.The board assembly must be mounted into the shield using metal stand-offs between the circuit board assembly and the metal shield can surface to establish a ground connection between the circuit board and the shield can. **The use of plastic stand-offs is not acceptable.**

6. A ferrite clamp-on core must be installed over the 10 conductor power/data wire harness which connects to J2. The part number for this core is Kitagawa SFC-8 or Laird #28A2025-0A.

   This core should be located as close to the 10 pin J2 header as possible. The core can be secured to the top of the shield can lid with double-stick tape.

7. Add required regulatory label(s) to the top of the BDCi5100 shield can assembly.

2.1 Connections

There are four connectors on the BDC.

- The three connectors for connecting co-ax cables to the antenna boards.
- The 10-pin JST B10B-PHDSS connector for USB, GND, and 9~24VDC.

The signal designations of the connectors are listed in Tables 2 to 4.

Table 2: CN1, CN2, CN3

Pin Number	Signal
1	RF
2	GND

Table 3: JST B10BPHDSS 10-Position Dual Row

Pin Number	Signal
1	GND
2	USB/DP
3	USB/DN
4	GND
5	USB-B-1 (NC)
6	GND
7	9~24V
8	GND
9	GND
10	3V3 (NC)

3.0 Operation

The Brady BDCi5100 RFID PCB reads ISO15693 compliant tags and converts and transmits the data to the Host upon request from the Host.

Firmware read out from the BDCi5100 RFID PCB is inhibited. Attempting to read out firmware will result in automatic erasure of flash program memory.

RFID configuration uses hard coded constants. Settings are locked down and are not configurable.