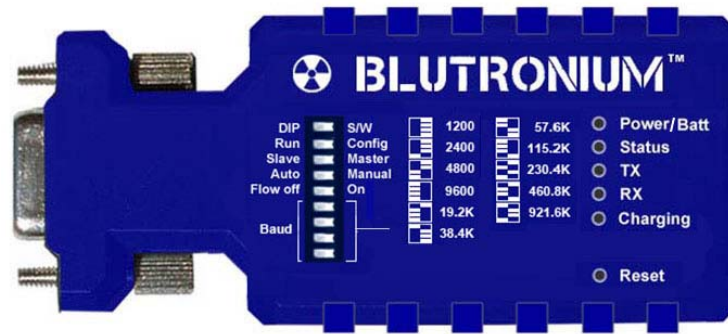


Blutronium™

Serial RS232 Bluetooth Adapter

Datasheet & Quick Reference



Overall features

- Advanced but user friendly functions
- State-of-the-art configuration software
- Can be configured over Bluetooth
- Internal rechargeable lithium battery
- Baud rates from 1200 to 921,600bps
- Basic configuration by DIP switches
- Communication range up to 300 feet
- Works with most mobile devices
- USB power cable included
- DCE/DTE controlled by switch
- Can be powered through the serial interface
- LED indication lights
- Works with most serial RS232 devices
- Full duplex, can send and receive at the same time
- Tested with Cisco routers and switches
- Power: USB, DB9, power supply or internal battery

| SPECIFICATIONS | |
|---|---|
| Part number | B-TRON 5000 (with internal chip antenna) B-TRON 5000A (with external di-pole antenna) |
| Operating systems | Windows 10, Windows 8.1, Windows 8, Windows 7, Vista, XP, 2000, ME, 98, Linux, Mac, Android |
| Interface type | RS232 |
| Works with iPad/iPod? | No, it will not work with iPads/iPods due to the restrictions Apple put on their Bluetooth chipset, however it does work with most other Bluetooth enabled smartphones, tablets and devices |
| Chipset | CSR BlueCore4 model BC417 |
| Baud Rate | 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600bps |
| Data bits | 7 or 8 |
| Stop bits | 1 or 2 |
| Parity | None, odd, even |
| Data buffer size | 4Kb |
| Operating distance | Up to 330 feet (100 meters) in open space |
| LED lights | Power/Batt, Status, TX, RX and Charging |
| Bluetooth stack | Serial Port Profile (SPP) |
| PIN | PIN code available for pairing |
| Connection type | Point-to-point |
| Flow control | CTS/RTS |
| DEC/DTE | Manual switch |
| Parameters configurable by | <ul style="list-style-type: none"> Downloadable free State-Of-The-Art configuration software Over Bluetooth Over serial port |
| RS232 Signals | TX, RX, CTS, RTS, GND |
| Echo | Configurable by software (on/off) |
| NMEA 183 compatible | Yes |
| Works with Cisco products | Yes, routers and switches (tested with Cisco Catalyst 3560) |
| Works with Windows 2008/20012 Server? | No, Windows Server does not have built-in Bluetooth drivers |
| Can pair while serial interface receives data | Yes |
| Full duplex RS232 | Yes, can send and receive simultaneously both when connected over Bluetooth and when used in pairs. |
| Number of slaves per master | 7 |
| Parameter configuration | Through the serial port or over Bluetooth |

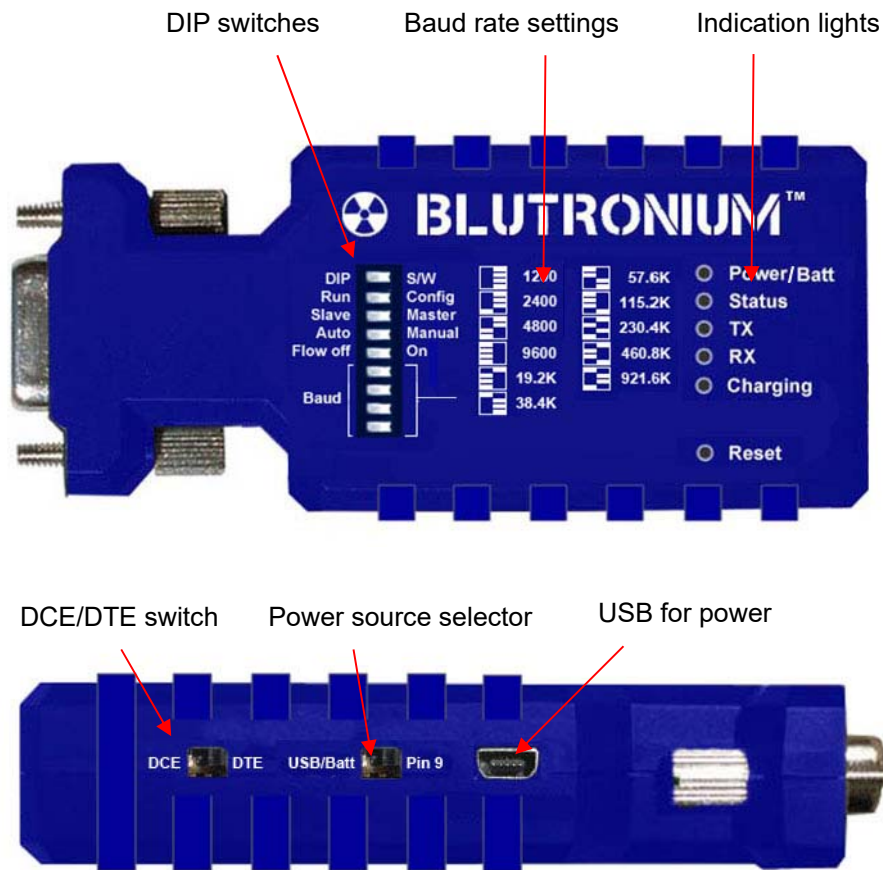
| | |
|--------------------------------|--|
| Serial port | 1-port female D-sub 9-pin |
| Bluetooth standard | V2.1 Class 1, + EDR |
| Frequency range | 2.4GHz – 2.4835 GHz ISM Band |
| Hopping | 1.600/sec, 1MHz channel space |
| Modulation | GFSK-1, DQPSK-2, 8-DPSK-3 Mbps |
| Tx power | Max. 18dBm (class 1) |
| Rx sensitivity | -86 dBm typical |
| Antenna | External 2dBi di-pole, Reverse Polarity SMA male (inside threads / center receptacle) |
| Antenna connector (on adapter) | Reverse Polarity SMA female (outside threads / center pin) |
| Power options | <ul style="list-style-type: none"> ● Mini USB cable (5VDC) ● DB9 connector Pin 9 (4.8 - 24VDC, 1.0A) ● Internal battery |
| Current consumption | Max 100mA |
| Operating temp. | -13°F to 185°F (-25°C to 85°C) |
| Dimensions | 97 x 37 x 20 mm |
| Certifications | CE, FCC, RoHS |

Package Contents:

- Blutronium™ Serial Bluetooth Adapter x 1
- DB9 male/male gender changer
- USB Cable x 1

Default factory settings:

- Baud rate: 9600 bps
- Data bit: 8
- Parity: none
- Stop bit: 1
- Flow control: none
- Mode: Slave
- Bluetooth PIN code: "1234"



DIP Switches:

NOTICE: The DIP switches must be set to the desired positions before the adapter is turned on.

DIP / S/W

- **Position "DIP":** The adapter is using the parameters set by the DIP switches. **IMPORTANT:** The DIP switches should be set in the desired positions while the adapter is turned OFF only. The reason is that the adapter 'reads' the DIP switches only in the moment the adapter is turned ON.
- **Position "S/W":** The adapter is using the parameters set by software (by default the PROMPT AND ECHO parameters are enabled in this position).

Run / Config

- **Position "Run":** The adapter is in Run mode and ready to use.
- **Position "Config":** The adapter is in configuration mode and the parameters can be configured over Bluetooth or through the serial port.

Slave / Master

- **Position "Slave":** The adapter is in Slave mode.
- **Position "Master":** The adapter is in Master mode.

IMPORTANT NOTE: The parameters cannot be configured over Bluetooth when the adapter is in Master mode.

Auto / Manual

- Position “Auto”: The adapter will automatically connect with a Slave adapter. This only works if the adapter is in Master mode.
- Position “Manual”: Master and Slave will need to be connected manually with the 'CONNECT' command.

Flow Off / On

- Position “Flow On”: Enables the flow control signals (CTS/RTS)
- Position “Flow Off”: Disables the flow control signals (CTS/RTS)

Baud

The four Baud DIP switches sets the adapters baud rate in accordance to the pictogram shown on the front of the adapter.

Reset Button:

- Short press: The adapter disconnects and then reconnects a wireless link
- Long press (more than 3 sec.): Restores factory settings

Indication LED Status:

| Status | Description |
|---|---|
| Power/Batt | Indicates when the adapter is powered ON either by the internal battery, USB or pin 9. |
| Status LED off | No pairing |
| Status LED fast (0.1 sec) blinking | Pairing (slave or master mode) |
| Status LED fast (0.3 sec) blinking | Discoverable and waiting for a connection (slave mode) |
| Status LED slow (0.9 sec) blinking | Inquiring (master mode) |
| Status LED very slow (1.2 sec) blinking | Connecting (master mode) |
| Status LED steady on | Connection established |
| TX | Flash when data is transmitted |
| RX | Flash when data is received |
| Charging | Solid on: Indicates that the internal battery is charging. Flashing: Indicates that the battery is low. Less than 10% power remains. |

Power and Flow Switch:

On the side of the Blutronium adapter there are two switches and one mini USB port which has the following functions:

Power switch: “USB/Batt” / “Pin 9”, (power input selector).

This switch has 2 settings: “USB/Batt” (3.3 – 5 VDC) and “Pin 9” (4.8 – 24 VDC). When the switch is in the “USB/Batt” position the adapter is powered by the USB power source, if a USB power source is connected to the adapter. If no USB power source is connected to the adapter then the adapter will automatically be powered by the battery.

The battery can only be charged when the switch is in position “USB/Batt”.

When the switch is in “Pin 9” position the adapter is powered by pin 9, provide there is a power source connected to pin 9.

Flow switch: “DCE” / “DTE”.

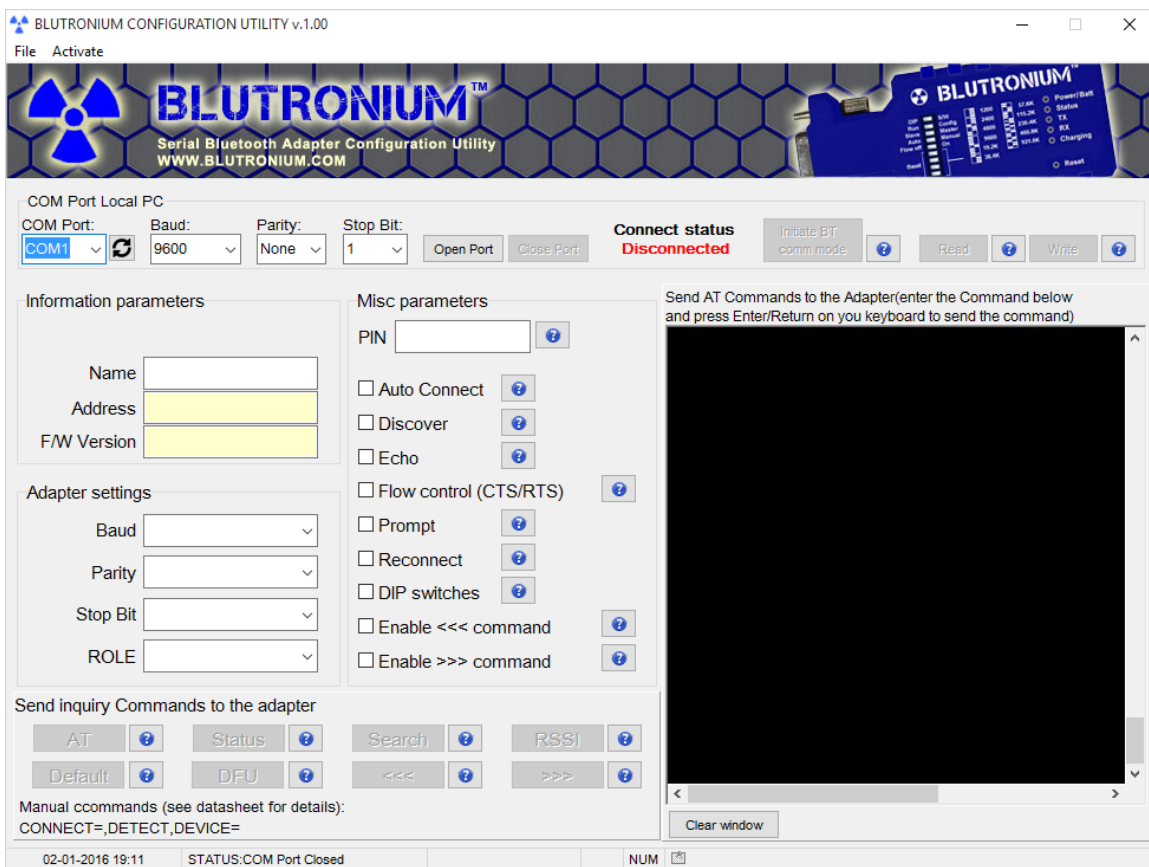
This switch changes the RS232 port between a DCE type interface and a DTE type interface.

USB mini power port.

Power input only w/o data communication.

Command List and Configuration

The parameters can be configured over Bluetooth or through the adapter’s serial port by using the Blutronium Configuration Utility which can be downloaded from <https://www.usconverters.com/activate>, or by sending AT commands to the adapter.



Please see the 'Setup Guide' for how to setup and use the adapter and Configuration Utility.

If configuring by sending AT commands please refer to the table below.

Note 1: Commands should be typed in either all CAPITAL letters or all lowercase letters.

Note 2: Commands cannot be received by the adapters if they are paired/linked, only when the adapter is in command mode.

| Command | Value | Description |
|---------|-------|--|
| <<< | | Change the local adapter from “Data mode” to “Command/configuration mode”. A minimum of 500ms data silence must appear before the command is entered and minimum 1500ms data silence after the command is entered. The time interval between each entered characters |

| | | |
|-----------|-----------------|--|
| | | should be: [500ms] "<" [500ms] "<" [500ms] "<" [1500ms] |
| <<<= | ? | Inquire the setting status of the "<<<" command. |
| (Default) | Y | Enable the "<<<" command |
| | N | Disable the "<<<" command |
| >>> | | Change the remote adapter from "Data mode" to "Command/configuration mode". A minimum of 500ms data silence must appear before the command is entered and a minimum of 2000ms data silence after the command is entered. The time interval between each entered characters should be: [1 sec] ">" [1 sec] ">" [1 sec] ">" [2 sec] |
| >>>= | ? | Inquire the setting status of the ">>>" command. |
| (Default) | Y | Enable the ">>>" command |
| | N | Disable the ">>>" command |
| ADDRESS= | | This command is used to display the Bluetooth address of the local adapter. |
| | ? | Inquire the Bluetooth address of the local adapter. |
| AT | | Checks the connection status between control terminal and the RS-232 adapter. Response: "OK" when the connection is ok. "ERROR" when the connection is unsuccessful. |
| | | |
| AUTO= | | This command is used to enable/disable the auto-connection feature. It is available only when the adapter is in Master mode and only when DIP=N. The system will not re-start after changing this parameter. |
| | Y | Master and Slave will connect automatically. |
| (Default) | N | Master and Slave will need to be connected manually with the 'CONNECT' command. |
| | ? | Inquire the current setting. |
| BAUD= | | This command is used to specify the baud rate of the COM port. The command will need 200 ms delay. |
| | 1200 | 1200 bps |
| | 2400 | 2400 bps |
| | 4800 | 4800 bps |
| *Default | 9600 | 9600 bps *serial number 14090200 or lower has 19200 baud as default |
| | 19200 | 19200 bps |
| | 38400 | 38400 bps |
| | 57600 | 57600 bps |
| | 115200 | 115200 bps |
| | 230400 | 230400 bps |
| | 460800 | 460800 bps |
| | 921600 | 921600 bps |
| | R | Restore the default settings. (Baud rate = 9600 bps) |
| | ? | Inquire the current baud rate. |
| CONNECT= | | This command is used to establish a connection manually. It is available only when the adapter is in the Master role. |
| | DEVICE | Connect the adapter to a specified Bluetooth device manually. It is available only when "DEVICE=xxxxxxxxxxx" is executed. |
| | 1~8 | Connect the adapter to a Bluetooth device in the neighborhood found through "SEARCH=?" |
| | xxxxxxxx xxx | Connect the remote adapter by typing the MAC address directly without searching. |

| | | |
|-----------|-----------------|--|
| | ? | Display the MAC address of the latest paired device. |
| | Y | Recover the latest connection in the command mode. |
| | N | Disconnect the two adapters in the command mode |
| | P | Connect the previous connected adapter. |
| DEFAULT= | | This command is used to restore the default settings and originate a warm start. |
| | Y | Restore the default settings (e.g. 9600 bps). The command will re-start the system for 1 second. |
| DETECT= | | The command is used to detect the voltage of the power supply and set the alert value of low power. |
| (Default) | N | Disable the voltage detection |
| | Y | Enable the voltage detection |
| | R | Restore the default value (3.5 Volt) |
| | x.x | Setup the range of voltage detection from 3.0 to 3.7 Volt. The “x” indicates the number. |
| | ? | Inquire the setting status |
| DEVICE= | | For security purpose, this command is used to specify a unique remote Bluetooth serial adapter to be connected. In the Master mode, the adapter pairs and connects with the designated remote slave address. If the adapter is in the Slave mode, this command is a filter condition to accept the inquiry of the Master device. Notice: The DEVICE command only works with the CONNECT command to manually connect two adapters; it does not work in auto mode. |
| | xxxxxxxx xxx | “xxxxxxxxxxxx” is a string of 12 hexadecimal digits. |
| | R | Restore the status in which the adapter can connect with any remote address. |
| | ? | Inquiry the designated address that can be paired and connected. |
| DFU= | | Device Firmware Upgrade |
| | Y | |
| DIP= | | Enable / disable the DIP switch. |
| | ? | Inquire the setting status of the DIP switch function. |
| | Y | Enables the DIP switch. The “ROLE” and “AUTO” commands are not available to set the “Master” or “Slave”. |
| (Default) | N | Disable the DIP switch. The “ROLE” and “AUTO” commands are available when the DIP=N. |
| DISCOVER= | | This command is used to specify whether the adapter can be discovered or connected by remote devices. This command is available only when the adapter is in Slave mode. |
| | N | The adapter enters the discoverable mode. If a pair has been made, the original connection can be resumed. But other remote master device cannot discover this adapter. |
| (Default) | Y | The adapter enters the discoverable mode. |
| | ? | Inquire the current setting. |
| ECHO= | | This command is used to specify whether the adapter echoes characters received from the UART back to the DTE/DCE. |
| | N | Command characters received from the UART are not echoed back to the DTE/DCE. |
| (Default) | Y | Command characters received from the UART are echoed back to the DTE/DCE. |
| | ? | Inquire the current setting. |
| FLOW= | | This command enable or disable flow control signals (CTS/RTS) of the UART port. Note, the setting is not affected by DEFAULT. The command will need 1 second delay. |
| (Default) | N | Disable flow control. |
| | Y | Enable flow control. |
| | ? | Inquire the current setting |

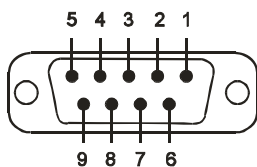
| | | |
|------------|----------------|--|
| NAME= | | This command is used to specify a name for the adapter. You can specify a friendly name using 0 to 9, A to Z, a to z, space and –, which are all valid characters. Note that “first space or -, last space or – isn’t permitted”. The default name is “Serial Adapter”. |
| (Default) | Serial Adapter | Default device name |
| | xx...xx | “xx...xx” is a character string with the length from 2 to 30. |
| | R | Restore the default settings name=“Serial Adapter”. |
| | ? | Inquire the name of the local adapter. |
| PARITY= | | This command is used to specify parity bit setting of COM port. The command will need 200 ms delay. |
| (Default) | N | None parity bit |
| | O | Odd parity |
| | E | Even parity |
| | ? | Inquire the current setting. |
| PIN= | | This command is used to specify a PIN. The default PIN is “1234”. Paired adapters should have a same PIN. The length must be 4 – 16 alphanumeric characters. Notice: this function currently only works with Windows versions prior to Windows 8.1 |
| (Default) | 1234 | |
| | xx...xx | “xx...xx” is a 4 - 16 digit string of alphanumeric characters (in capital or lower case) |
| | N | Cancel authentication by PIN. |
| | R | Restore the default settings PIN=“1234”. |
| | ? | Inquire the current PIN. |
| PROMPT= | | This command is used to decide whether status messages are prompted when Setup commands are executed. The status messages are: OK/ERROR for command execution, or CONNECT/DISCONNECT/Try Connect Device for connection status. |
| (Default) | Y | Prompt result messages. |
| | N | Not prompt result messages. |
| | ? | Inquire the current setting. |
| RECONNECT= | | The command is used to re-connect the lost link for the Master adapter. |
| | ? | Inquire the current setting. |
| (Default) | Y | Re-connect is disable |
| | N | Re-connect is Enable |
| ROLE= | | This command is used to specify whether the adapter is in the master or slave mode. If the device mode is changed, the adapter will reboot and all paired addresses will be cleared. The command is available when the adapter is in DIP=N status. The command will need 1 second delay. |
| | M | Set the adapter to the master mode. |
| (Default) | S | Set the adapter to the slave mode. |
| | ? | Inquire the current mode of the adapter. |
| RSSI= | | Received signal strength indication |
| | ? | Display the Received signal strength indication in command mode when connected. 1. Strong: RSSI>-9 2. Medium: -9>RSSI>-20 3. Weak: RSSI<-20 |
| SEARCH= | | This command is used to search for any Bluetooth device in the neighborhood within one minute. If any device is found, its name and its 12-digit-address will be listed. The search ends |

| | | |
|-----------|---|---|
| | | with a message "Inquiry ends. xx device(s) found." This command is available only when the adapter is in the master role by manual. |
| | ? | Inquire Bluetooth devices in the neighborhood, listing 8 devices the maximum |
| STATUS= | | Inquire all the current setting of the adapter. |
| | T | Inquire the inner temperature of the IC in centigrade |
| | ? | Display the current setting of the adapter |
| STOP= | | This command is used to specify one or two stop bits of COM port. The command will need 200ms delay. |
| (Default) | 1 | One stop bit. |
| | 2 | Two stop bits. |
| | ? | Inquire the current setting. |
| VERSION= | | This command is used to inquiry the firmware version. |
| | ? | Inquire the version codes. |

Some commands are unavailable under certain conditions:

| If this command is set to | These commands are unavailable |
|---------------------------|---|
| ROLE=S | SEARCH=?, CONNECT=?, CONNECT=P , CONNECT=xxxxxxxxxxx , CONNECT=DEVICE |
| AUTO=Y | SEARCH=?, CONNECT=?, CONNECT=P , CONNECT=xxxxxxxxxxx , CONNECT=DEVICE |
| DIP=Y | ROLE=M, ROLE=S , AUTO=Y , AUTO=N ,DISCOVER=Y,DISCOVER=N |
| <<< | SEARCH=?, CONNECT=?, CONNECT=P , CONNECT=xxxxxxxxxxx , CONNECT=DEVICE , DFU=Y |
| >>> | SEARCH=?, CONNECT=?, CONNECT=P , CONNECT=xxxxxxxxxxx , CONNECT=DEVICE , DFU=Y |
| Not connected | RSSI=?, CONNECT=Y , CONNECT=N |

RS232 Interface:



| Pin | Signal | DTE Direction | DCE Direction | Description |
|-----|--------|---------------|---------------|---|
| 1 | CD | Input | Output | Not connected |
| 2 | TxD | Output | Input | Transmitted data |
| 3 | RxD | Input | Output | Received data |
| 4 | DSR | Input | Output | Not connected |
| 5 | GND | N/A | N/A | Signal ground (and power GND if powered by pin 9) |
| 6 | DTR | Output | Input | Not connected |
| 7 | CTS | Input | Output | Clear to send |
| 8 | RTS | Output | Input | Request to send (Default) |
| 9 | Vcc | Input | Input | Power supply (4.8 – 24VDC) |

Remarks: The default hardware flow control is CTS/RTS.

Federal Communications Commission (FCC) Statement

RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been 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 correcting the interference by one or more of the following measures:

- Reorient 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.
-

Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Declaration:

1. The information contained in this document is subject to change without notice.
2. Document Release Date: January 2016
3. Firmware Version: v. 1.0.0

FFC ID: 2AGZKBTRON5000

CE: 1177