

BANDIT II C2C Hardware Description and Specifications

This chapter provides information on the hardware and specifications for the BANDIT II C2C™. See the following:

- [The BANDIT II C2C Chassis](#)
- [BANDIT II C2C Specifications](#)
- [Ventilation for BANDIT Products](#)

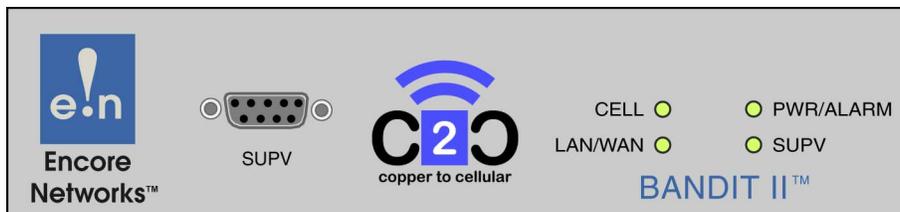
A.1 The BANDIT II C2C Chassis

The BANDIT II C2C is available in a chassis with a hard plastic cover, or in an environmentally hardened chassis, with a metal cover. Hardened construction allows the BANDIT II C2C to operate over wide temperature ranges at sites that do not use environmental control.

The BANDIT II C2C complies with the European Union's directive on restriction of hazardous substances (ROHS). This directive places strict controls on pollutants, including the elimination of lead in the manufacturing process.

[Figure A-1](#) shows the front of the BANDIT II C2C chassis. The BANDIT II C2C has a DB9 Supervisory (SUPV) port for connection to a management terminal (such as a PC).

Figure A-1. BANDIT II C2C Chassis, Front Panel



The front of the chassis also contains LED indicators that show states for ports, power, and alarms.

[Figure A-2](#), [Figure A-3](#), and [Figure A-4](#) show the back of the BANDIT II C2C chassis. The BANDIT II C2C is available in models that can accept -12, -24, or -48 volts DC from a DC power source, or in models that can accept +5 volts DC input at 2 amps from a 110/220 volts AC power supply.

Figure A-2. BANDIT II C2C Chassis, 12V/24V DC Power, Rear Panel

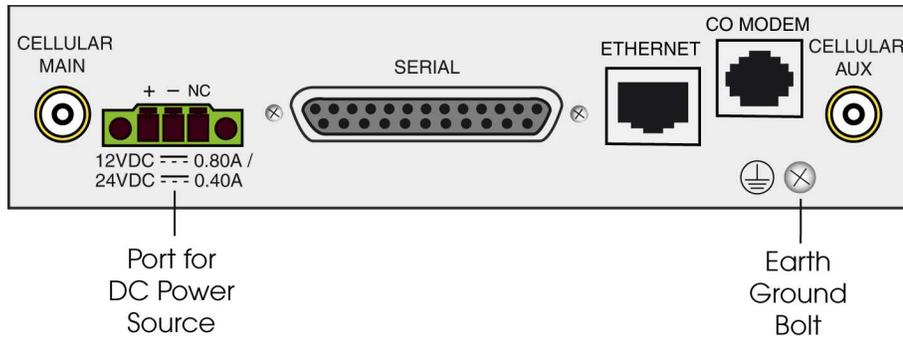


Figure A-3. BANDIT II C2C Chassis, 24V/48V DC Power, Rear Panel

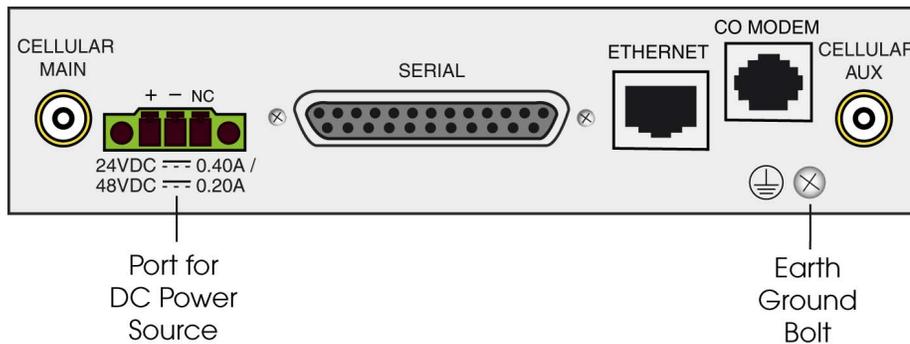
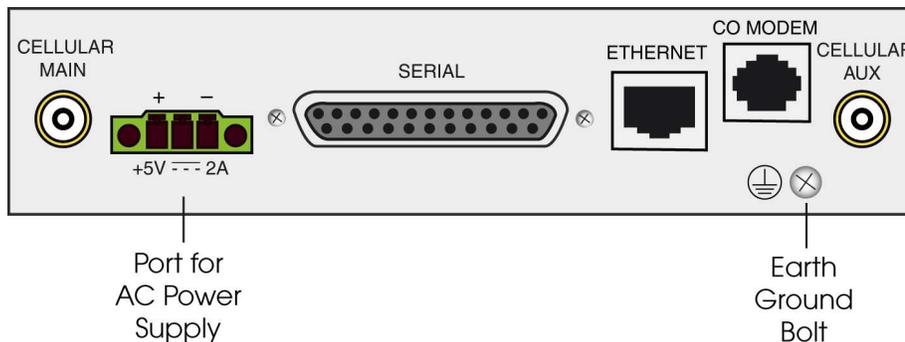


Figure A-4. BANDIT II C2C Chassis, AC Power, Rear Panel



The following items are on the back of the BANDIT II C2C chassis:

- Two ports for antennas for the cellular wireless card, for connection to a wireless network
 - Note:** A second antenna can provide diversity in data collection. This is helpful when radiofrequency signals might encounter barriers or interference, or when the signal level might be low.
- A port for -12, -24, or -48 volts DC power source input or a port for a 110/220 volts AC power supply, converting power input to +5 volts DC at 2 amps
- A DB25 serial port
- An Ethernet port that can function as one of the following:
 - A WAN port, typically used as the network uplink to the host
 - A LAN port, typically used for the intranet connection

- An analog modem port

Note: The BANDIT II C2C chassis also contains a wireless modem port (on the internal wireless card). However, because that port is internal, it cannot be seen on the back of the chassis. The internal wireless card can connect to a 2G, 3G, or 4G/LTE wireless network. External antennas support the wireless card.

- One earth ground connection bolt

For additional information, see the following:

- [Power Supply](#)
- [Ports](#)
- [LEDs](#)

A.1.1 Power Supply

The BANDIT II C2C is available in models that accept power from a DC power source at -12, -24, or -48 VDC or in models that accept power from an industry-standard autosensing 100/240 VAC adapter connected to an AC power source. The BANDIT II C2C's AC power supply converts the AC input power to 5 VDC at 2 amps output for use by the BANDIT II C2C chassis.

A.1.2 Ports

See the following:

- [Supervisory Port](#)
- [Modem Ports](#)
- [Standard Network Ports](#)

A.1.2.1 Supervisory Port

A DB9 cable connects the BANDIT II C2C's DB9 Supervisory port to the DB9 serial port of a computer functioning as a control console (such as a PC). The DB9 cable provides a direct connection to the BANDIT II C2C, for configuring and monitoring the device.

After you give the BANDIT II C2C an IP address, you can decide whether to configure and monitor the BANDIT II C2C via a remote connection over the LAN or WAN. This frees the serial DB9 port to support data connections.

For specifications of the DB9 serial port, see [Section A.2.1.2.1, DB9 Supervisory Port](#), in [BANDIT II C2C Specifications](#).

A.1.2.2 Modem Ports

The BANDIT II C2C has two modem ports. The modem port on the back of the chassis uses a standard RJ11 connector. (For specifications of the RJ11 port, see [RJ11 Modem Port](#) in [BANDIT II C2C Specifications](#).) The BANDIT II C2C's other modem port is internal, on the wireless card inside the chassis.

A.1.2.3 Standard Network Ports

Note: The BANDIT's data ports can be configured in the software. The data rates for synchronous and asynchronous data ports are shown in [Table A-9](#) and [Table A-10](#) in [BANDIT II C2C Specifications](#). See the following:

- [Ethernet Port](#)
- [Serial Port](#)
- [Wireless Port](#)

A.1.2.3.1 Ethernet Port

The BANDIT II C2C has one Ethernet port that can connect to a LAN or a WAN. A 10-Base-T/100-Base-T Ethernet connection is implemented over unshielded twisted-pair (UTP) wire, using a standard RJ45 connector. [Figure A-8](#) shows the RJ45 connector pins. [Table A-8](#) lists the RJ45 pin configuration. [Table A-4](#) shows the interface options for the Ethernet port.

Also see [Port Throughput](#).

The Ethernet port has the following IP features:

- Static routing
- Standard RIP V1, V2 routing
- Prioritization on Layers 2 and 3
- DiffServ marking and classification for end-to-end prioritization
- IP Quality of Service
- Dynamic bandwidth allocation
- 802.1q VLAN tagging
- VRRP (RFC 3768)
- Fragmentation and reassembly (MTU) LAN
- DHCP server, client, relay; Bootp
- SNMP, MIB II
- ARP; Proxy ARP
- Routing over VPN tunnels
- Dynamic split tunneling

A.1.2.3.2 Serial Port

The BANDIT II C2C chassis has one DB25 serial port. See [DB25 Serial Port](#) in [BANDIT II C2C Specifications](#).

Note: The DB9 Supervisory port is also a serial port. See [Supervisory Port](#).

A.1.2.3.3 Wireless Port

The BANDIT II C2C has one internal wireless port. The BANDIT II C2C can use a wireless card for 2G, 3G, or 4G/LTE transport.

A.1.3 LEDs

Light-emitting diodes (LEDs) on the front of the BANDIT II C2C™ chassis indicate states, connections, and activities. The following sections describe the LEDs.

- [General Status LEDs](#)
- [Protocol Status LEDs](#)

A.1.3.1 General Status LEDs

The following general rules apply to the BANDIT products' LEDs:

- A lit green Power/Alarm LED indicates that the unit is being supplied with power.
- Other lit green LEDs indicate that there is a connection to another device—for example, a terminal device, an Ethernet hub, a switch, or a cellular wireless tower.
- A flashing LED indicates a special state, which may vary for each type of LED. See [Table A-1](#) for information about blinking for specific LEDs.

[Table A-1](#) describes the LEDs on the BANDIT II C2C chassis.

Table A-1. BANDIT II C2C General Status LED Definitions (Sheet 1 of 2)

LED	Color	Description
Power/Alarm (System)	Green	Unit is receiving power.
	Green blinking	A port has an alarm or the system needs attention.
	Off	Unit is not receiving power.
Supervisory port	Green	Connection has been made to the management terminal (or to a network device, if the Supervisory port is used for data instead of management).
	Off	There is no connection.
LAN/WAN port	Green	Connection to the LAN or the WAN has been made. (That is, the BANDIT device is connected to another device that is powered on in the network.)
	Off	There is no connection to the network. Check cables and check that connected devices have power.
CO Modem port	Green	Connection to the analog device has been made. (The BANDIT device is acting as a modem to support an analog device.)
	Off	There is no connection to the analog device. Check cables and check that connected devices have power.

Table A-1. BANDIT II C2C General Status LED Definitions (Sheet 2 of 2)

LED	Color	Description
Cellular port	Green (Flashing)	<p>Connection has been made to a wireless carrier.</p> <p>The cellular LED flashes one to five times to show signal strength. The number of flashes in a set is equivalent to the same number of bars displaying signal strength on a mobile phone.</p> <p>Flashes display in one of the following patterns:</p> <ul style="list-style-type: none"> • A set of short flashes followed by a longer final flash indicates that connection to a cell tower has been authenticated. Sample flash pattern: - - • A set of short flashes followed by a pause indicates that there is a signal from a cell tower but that the connection has not been authenticated. The device may need to be activated. Sample flash pattern: <p>The number of short flashes in a set indicates the signal strength. A long flash is not counted as part of the signal strength.</p>
	Off	Not activated. The device has not been authenticated for a wireless carrier and is not receiving a signal.

A.1.3.2 Protocol Status LEDs

In addition to indicating general status, each port's LED indicates conditions for the protocol configured on that port. [Table A-2](#) describes the LEDs for protocols the BANDIT II C2C supports.

Table A-2. BANDIT II C2C Protocol Status LED Definitions (Sheet 1 of 2)

Protocol	Green LED
Frame Relay	If a Frame Relay Management protocol connection is up, the LED lights after 15–20 seconds. (If there is no connection, the LED remains unlit.)
Async Encapsulation	Characters, bidirectional TD/RD
Bit Sync Encapsulation	Frames in either direction
Async/Sync PPP	Frames to/from port
SLIP	Frames to/from port
SDLC Emulation, Terminal ¹	Sending or receiving data
SDLC Emulation, Host ¹	The host has a transport layer connection with a terminal listed in the device table.
SDLC Routing	Frames to/from port
Annex G	Good frames are passing through.

Table A-2. BANDIT II C2C Protocol Status LED Definitions (Sheet 2 of 2)

Protocol	Green LED
Byte Sync Encapsulation	Good frames are passing through.
X.25	Level II connection exists.
Telnet Terminal	Data transfer in either direction

1. When using spoofed protocols such as SDLC, both LEDs can light up at the same time. On a terminal unit, both LEDs may be lit if some terminals are responding and some are not. On a host unit, both LEDs may light up if some terminals are being polled and some are not.

A.2 BANDIT II C2C Specifications

This section lists the specifications for the BANDIT II C2C™ hardware. See the following:

- [Section A.2.1, Chassis Specifications](#)
- [Section A.2.2, Management Support](#)
- [Section A.2.3, Compliance](#)

Specifications are subject to change without notice.

A.2.1 Chassis Specifications

The following sections cover the physical, power, and environmental specifications for the BANDIT II C2C chassis. See the following:

- [Section A.2.1.1, Physical Specifications](#)
- [Section A.2.1.2, Ports and Pin Configurations](#)
- [Section A.2.1.3, Power](#)
- [Section A.2.1.4, Environmental Specifications](#)

A.2.1.1 Physical Specifications

The products in the BANDIT family are designed for quick and easy integration with other equipment in a typical networking environment. [Table A-3](#) provides the physical specifications for the BANDIT II C2C.

Table A-3. BANDIT II C2C Physical Specifications (Sheet 1 of 2)

Item	Value
Installation Type	Desktop/Shelf Model
Length	6.0 in. (15.24 cm)
Width	4.4 in. (11.18 cm)

Table A-3. BANDIT II C2C Physical Specifications (Sheet 2 of 2)

Item	Value
Height ^{1, 2}	1.5 in. (3.81 cm)
Weight	Less than 1 lb. (Less than 0.45 kg)

1. The chassis must have adequate ventilation for cooling. There must be an open vertical space of 1 U (1.75 inches, or 44.45 mm) above the chassis, and there must be nothing between the chassis and the desk surface or shelf surface that the chassis feet rest on. Do not place anything on top of the chassis or under the chassis.

2. When the height of the chassis feet is included, the chassis stands 0.03 inches (0.076 cm) taller, at 1.53 in. (3.886 cm).

A.2.1.2 Ports and Pin Configurations

Table A-4 lists the port interfaces in the BANDIT II C2C. See the following for information about ports and pin configurations:

- ◆ Section A.2.1.2.1, *DB9 Supervisory Port*
- ◆ Section A.2.1.2.2, *DB25 Serial Port*
- ◆ Section A.2.1.2.3, *RJ11 Modem Port*
- ◆ Section A.2.1.2.4, *RJ45 10-Base-T/100-Base-T Ethernet Port*
- ◆ Section A.2.1.2.5, *Port Throughput*
- ◆ Section A.2.1.2.6, *Port Speeds*

Table A-4. BANDIT II C2C Physical Interfaces and Connectivity (Sheet 1 of 2)

Port	Quantity	Interface	Connectivity
Supervisory port	1	DB9	RS232
Analog modem port	1	RJ11	Analog modem: <ul style="list-style-type: none"> • Bell103, Bell212, V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34 • LS/GS • Polarity reversal • V.42 with error correction and MNP 2-4 • V.42bis with Data Compression and MNPS
Internal wireless port	1	integrated cellular wireless modem	2G, 3G, and 4G/LTE ¹ cellular wireless data networks

Table A-4. BANDIT II C2C Physical Interfaces and Connectivity (Sheet 2 of 2)

Port	Quantity	Interface	Connectivity
Ethernet port	1	RJ45, 10/100 Base-T Ethernet, with automatic failover, to connect to LAN or WAN	IP: <ul style="list-style-type: none"> • TCP, UDP/RTP Data Transport • TCP Port configuration • TCP Broadcast • RTP Packet Optimization • DLCI over IP configuration • Telnet (Client or Server)
serial port	1	DB25, RS232 (256 kbps sync, 230 kbps async)	Frame Relay: <ul style="list-style-type: none"> • Link Management <ul style="list-style-type: none"> - LMI, CCITT, Q.933 Annex A; - ANSI T1.617 Annex D • IP over Frame Relay • CIR Enforcement • Fragmentation FRF12 • Fast Connection • Prioritization • Unicasting • Multicasting PPP, Multilink PPP: <ul style="list-style-type: none"> • Sync PPP • Async PPP • MLPPP • PAP • CHAP • IP over PPP IP: All standard IP features X.25: All standard X.25 features

1. Consult manufacturer for availability.

A.2.1.2.1 DB9 Supervisory Port

Figure A-5 identifies the pin locations for a female DB9 connector. Table A-5 lists the standard DB9 pin configuration.

Figure A-5. Pin Locations for Female DB9 Serial Port

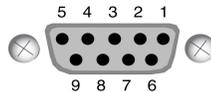


Table A-5. DB9 Serial Port Pin Configuration

Pin Number ¹	EIA ² Signal (only DCE)	Description
1	DCD	Data carrier detect
2	RXD	Received data
3	TXD	Transmitted data
4	DTR	Data terminal ready
5	GND	Signal ground
7	RTS	Request to send
8	CTS	Clear to send

1. Unused pins are not listed.

2. EIA = Electronic Industries Alliance

A.2.1.2.2 DB25 Serial Port

Figure A-6 identifies the pin locations for a female DB25 connector.

Note: On the BANDIT II C2C, you use the ELIOS™ software to set the DB25 serial port as DCE or DTE.

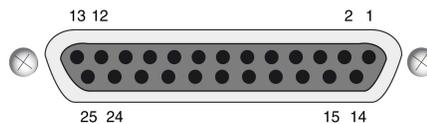
Figure A-6. Pin Locations for Female DB25 Serial Port

Table A-6 lists the pin configuration for the BANDIT II C2C's standard DB25 port.

Table A-6. DB25 Serial Port Pin Configuration

Pin Number ¹	EIA ² Signal (DCE or DTE ³)	Description
Pin 1		Shield (Earth Ground)
Pin 2	TXD	Transmitted data
Pin 3	RXD	Received data
Pin 4	RTS	Request to send
Pin 5	CTS	Clear to send
Pin 6	DSR	Data set ready
Pin 7	GND	Signal ground
Pin 8	DCD	Data carrier detect
Pin 15	TXC	Transmit clock
Pin 17	RXC	Receive clock
Pin 20	DTR	Data terminal ready
Pin 24	SCTE	External clock

1. Unused pins are not listed.

2. EIA = Electronic Industries Alliance

3. You use the BANDIT II C2C's ELIOS software to select DCE or DTE for this port.

A.2.1.2.3 RJ11 Modem Port

Figure A-7 shows the pin locations for the modem port. Table A-7 lists the pin configuration for the BANDIT II C2C's RJ11 modem port.

Figure A-7. Pin Locations for Female RJ11 Modem Port

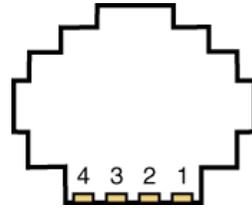


Table A-7. RJ11 Modem Port Pin Configuration

Pin Number ²	Function
2	Ring
3	Tip

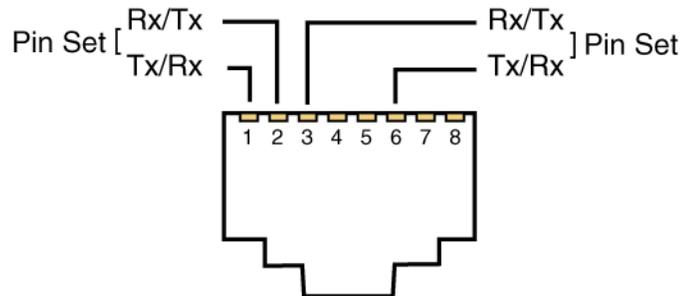
2. Unused pins are not listed.

A.2.1.2.4 RJ45 10-Base-T/100-Base-T Ethernet Port

Figure A-8 shows the pin locations on an RJ45 Ethernet port. Table A-8 lists the pin configuration for the BANDIT II C2C's 10/100-Base-T Ethernet ports.

Note: The BANDIT II C2C senses the pin configuration at the remote end of the connection and sets its own pin configuration accordingly.

Figure A-8. Pin Locations for Female RJ45 Ethernet Port



Each pin set autosenses and adjusts to signals from the device at the remote end of the connection.

Table A-8. RJ45 10-Base-T/100-Base-T Ethernet Port Pin Configuration

Pin Set ¹	Description ²
Pin 1 and Pin 2	Tx or Rx
Pin 3 and Pin 6	Rx or Tx

1. Unused pins are not listed.

2. The BANDIT II C2C Ethernet connectors are autosensing and will adjust to the signals from the device at the remote end of the connection.

A.2.1.2.5 Port Throughput

The BANDIT II C2C chassis has the following system throughput:

- Without encryption: 9,000 packets/second, with incoming and outgoing traffic at 64 bytes/packet
- With encryption and decryption: 1,800 packets/second, with incoming traffic at 50 bytes/packet and outgoing traffic at 100 bytes/packet

A.2.1.2.6 Port Speeds

For all serial ports, speeds of more than 230 kbps are not supported. The serial ports can support asynchronous speeds down to 50 bps.

For all ports, the synchronous speed range is 2400 bps (2.4 kbps) to 256 kbps.

[Table A-9](#) and [Table A-10](#) provide details for port speeds.

Table A-9. Synchronous Port Speeds

Synchronous (Bits/Second)
256,000
192,000
128,000
96,000
64,000
56,000
48,000
38,400
19,200
9,600
4,800
2,400

Table A-10. Asynchronous Port Speeds

Asynchronous (Bits/Second)
230,400
115,200
57,600
48,000
38,400
19,200
9,600
4,800
2,400
1,200
600
300
200
110
50

A.2.1.3 Power

The BANDIT II C2C chassis accepts DC input power from a DC power source or from an external power supply that uses AC input.

As shown in [Table A-11](#), the DC power source can provide -12, -24, or -48 volts DC. The AC power supply accepts input power at 110 to 220 volts AC, 50 to 60 Hz, auto-ranging, and delivers 5 volts DC at 2 amps output to the BANDIT II C2C chassis.

Table A-11. BANDIT II C2C Power Specifications

Item	Specification
BANDIT II C2C chassis with analog modem and integrated cellular modem	7.5 watt maximum
<ul style="list-style-type: none"> DC power supply 	-12 VDC, -24 VDC, or -48 VDC
<ul style="list-style-type: none"> AC power supply¹ 	100 VAC to 240 VAC, 50 Hz to 60 Hz

1. with external adapter to connect to AC outlet

A.2.1.4 Environmental Specifications

[Table A-12](#) provides the environmental specifications for the BANDIT II C2C.

Table A-12. BANDIT II C2C Environmental Specifications

Item	Chassis or Card	Range
Operating Temperature	Industrially hardened chassis ¹	DC: -40°C to +85°C (-40°F to 185°F) AC: -30°C to +70°C (-22°F to 158°F)
	Commercial grade chassis ²	0°C to +50°C (32°F to 122°F)
	Cellular wireless card	-40°C to +70°C (-40°F to 158°F)
Non-Operating (Storage) Temperature	All	-40°C to +85°C (-40°F to 185°F)
Humidity	All	5% to 95%, non-condensing
Altitude	All	Up to 10,000 ft. (up to 3,048 m)

1. All BANDIT II C2C chassis that use -12, -24, or -48 V DC power sources are industrial grade. Some BANDIT II C2C chassis that use AC power sources are industrial grade.

2. All commercial grade BANDIT II C2C chassis use AC power sources.

A.2.2 Management Support

Table A-13. BANDIT II C2C Software Management

Port	Management
Supervisory port	Local management via terminal emulation
WAN Ethernet port	Remote management via Telnet or SNMP

A.2.3 Compliance

The BANDIT II C2C complies with the North American Electric Reliability Corporation's provisions for critical infrastructure protection (NERC CIP). The BANDIT II C2C also complies with the agency standards listed in [Table A-14](#).

Table A-14. BANDIT II C2C Standards Compliance

Area	Specification
Product Materials	European ROHS
Electromagnetic Compatibility (EMC)	FCC Part 15 EN 55022: 1998 EN 55024: 1998
Product Safety	UL/CSA 60950-1 CAN/CSA-C22.2 No. 60950-1-03 EN 60950-1

A.3 Ventilation for BANDIT Products

There must be sufficient space for ventilation and cooling around each chassis in the BANDIT product family. Guidelines for ventilation include the following:

- Each desktop or tabletop chassis (for example, a C2C or a BANDIT II C2C) must sit on a smooth, flat, non-cloth, non-paper surface, so that there is adequate ventilation under the chassis.
- There must be 1 U (1.75 inches) of empty space above and below each BANDIT, VSR, or RDU chassis installed in an equipment rack.
- Do not place anything on top of any chassis.
- Do not place anything against any chassis, and do not allow anything to rest against the chassis.