2

Safety Guidelines

This chapter outlines general safety guidelines when installing the WipLL system.

This chapter includes the following sections:

- General Safety Guidelines
- Electrical Safety Guidelines
  - Handling Electrostatic Devices
  - Grounding
- Lightening Protection
- Installing Outdoor Units and Third-Party External Antennas
- Radio Interference Prevention
- Cabling
  - General
  - Labeling

2.1. General Safety Guidelines

The following lists general safety guidelines when working with the WipLL equipment:

- The user and the installer should be aware that changes and modifications not expressly approved by Airspan Networks could void the user's authority to operate the equipment.
- Never install equipment that is damaged.
- Only qualified personnel should be allowed to install, replace, and service the WipLL equipment.

2.2. Electrical Safety Guidelines

The following lists electrical safety guidelines when working with the WipLL equipment:

- Disconnect all power when installing
- Never install the equipment during stormy weather and lightening

2.2.1. Handling Electrostatic Devices

Electrostatic devices are those devices that may be damaged by the inadvertent discharge of static electricity from a charged body. The risk of damage, due to electrostatic discharge (ESD) to a device, may cause the device to fail suddenly, or it may induce a partial defect within the device, which will cause subsequent premature failure.

Static electricity can result from operators walking on floors, moving around on chairs, from the movement of operator's clothing or even casual brushing against racks, benches or walls.

Airspan recommends the following guidelines to be adopted to minimize the risk of component failure due to electrostatic discharge to the device:

- WipLL devices are provided typically in see-through anti-static bags. Wherever possible, checking and inspection of a unit should occur without removing it from the bag.
- All operators shall wear the approved conductive overall.
- Where operators come into direct contact with any piece of electronic hardware, operators must wear an **ESD-preventive wrist strap**. All straps and cords should be tested using a Wrist Strap Tester prior to use. The wrist strap cords shall have a 2 Meg Ohm resistor fitted at either end. Wrist straps should be worn in direct contact with bare skin and not over clothing.

Warning: Under no circumstances is it permissible for units to be handled by unprotected operators.

2.2.2. Grounding

Only certain WipLL devices require additional grounding. WipLL devices that do not require additional grounding have grounding at the main supply outlet. The following table lists the WipLL devices' grounding requirements.

Site	WipLL device	Grounding
Base Station	BSR	Through the mains (via BSDU)
	BSDU	Additional grounding required (grounding lug at rear end of chassis)
	BSPS	Additional grounding required (grounding lug at rear end of chassis)
CPE	SPR	Through the mains (via SDA)
	IDR	Through the mains

2.3. Lightening Protection

WipLL devices comply to the Surge Immunity standard: EN 61000-4-5. WipLL devices are protected from lightening surges as the outdoor devices (BSRs and SPRs) are encased in a plastic chassis. Therefore, if lightening strikes the device, an electrical circuit cannot be completed, and hence, no electrical surge can occur.

In addition, WipLL outdoor and indoor (SDA) devices provide high speed data line protection against direct and induced transient over-voltages surges on the cables. This capability is provided by the fact that all WipLL device are designed with TVS (transient voltage suppressor) components that maintain potential differences.

However, for geographical areas that have above normal lightening activity, Airspan can supply a surge protector composed of a 15-pin D-type adapter with a grounding wire.

2.4. Installing Outdoor & Indoor Units and Third-Party External Antennas

Warning: It is the responsibility of the person installing the WipLL system to ensure that when using the outdoor antenna kits in the United States (or where FCC rules apply), that only those antennas certified with the product are used. The use of any antenna other than those certified with the product is expressly forbidden in accordance with FCC rules CFR47 part 15.204. The installer should configure the output power level of antennas according to country regulations and per antenna type.

Warning : Outdoor, Indoor units and antennas should be installed ONLY by experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities. Failure to do so may void Airspan's WipLL product warranty and may expose the end user or the service provider to legal and financial liabilities. Airspan and its resellers or distributors are not liable for injury, damage or violation of regulations associated with the installation of outdoor units or antennas.

Warning: When operating in the 900 MHz band, the IDR model with an external antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Warnings:
1) The device cannot be sold retail, to the general public or by mail order. It must be sold to dealers.
2) Installation must be controlled.
3) Installation must be performed by licensed professionals.
4) Installation requires special training.

2.6. Radio Interference Prevention

The digital portion of the transceiver 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 on and off, the user is encouraged to try correct the interference by performing one or more of the following measures:

- Reorientate or relocate the receiving antenna
- Increase separation between the equipment and receiver
- Connect the equipment to 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: The WipLL transceivers emit microwave radiation; a minimum distance of 200 mm must be maintained from the front of the device, and a minimum separation of 1 meter must exists between adjacently installed WipLL transceivers.

2.7. Cabling

This section defines the cabling procedures to be adopted during WipLL equipment installations at both base station and subscriber premises.

2.7.1. General

A summary of issues to be considered during cabling of WipLL base station and customer premises equipment is as follows:

- Cable routes are to be defined in the site-specific documentation.
- Data and DC power cables running parallel to AC power cables shall be separated by a minimum distance of 200 mm. However, it is permissible to allow these cables to cross each other at right angles.
- Observe recommended minimum bend radii when installing copper cables. Wherever a cable changes direction, ensure that it does so in a smooth curve with a radius of at least 50 mm to prevent damage.
- Plastic ties and wraps are to be used to secure cables to trays and guides. Ensure all trimmed ends are disposed of safely and at regular intervals.
- Data cables of less than 20 pair shall be mixed in bundles not exceeding 50 mm in diameter.
- Ensure cables are not trapped in cabinet doors, by slide-in equipment or support metalwork.
- Excessive stress on cable terminations caused by taught cables should be avoided. Connector strain relief, if not built into the connector used, shall be provided by means of a strategically located cable tie.
- A maintenance loop or a generous amount of cable slack shall be provided to allow for equipment removal without disturbance to adjacent cables.
- Cables run in guides or on trays shall be kept as flat as possible and secured at regular intervals using cable ties.

Note: Prior to the commencement of any installation, commissioning work at 'live' sites it is the responsibility of the Airspan engineer to advise the customers representative before any activity commences. If in doubt assume equipment is 'live'.

Warning: Disturbance of cables on an In-Service exchange can cause loss of service. Extreme care must be taken when installing cables at any customer or subscriber premises.

2.7.2. Labeling

The following labels are required to be fitted to WipLL equipment:

- Voltage Warning
- High Earth Leakage Current
- Signal Cable Designation

2.7.2.1. Voltage Warning

- Where mains power is fed from separate phases, then appropriate warning labels must be fitted to warn of the increased danger.
- The AC equipment used in the BSPS cabinet must carry a relevant voltage warning label specific to the country in which it is being installed. The label will be fitted to the cabinet doors displaying an electrical hazard symbol, the local operating voltage and the letters 'AC'.
- A power feed identification label (e.g. PWR 'A') shall be applied in the following locations:
  - On the rear of the main power rack adjacent to the terminal block
  - Attached to BSPS AC mains power plug or lead
  - Attached to the customer mains power socket or distribution rail
  - On the BSPS power circuit connection at the fuse board

Warning: Voltages over 30 Volts AC and 50 Volts DC are categorized as hazardous. Hazard warning labels should be fitted where required. Certain countries require equipment warning and instruction labels to appear in the local language. When installing WipLL equipment ensure that local requirements regarding labels are given consideration.

2.7.2.2. High Earth Leakage Current

If equipment earth leakage current exceeds 3.5 mA, a warning label as shown in Figure 2-1 will be fitted to the rear of the main power rack alongside the AC inlet terminal block.

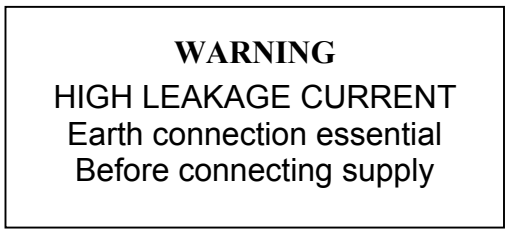

Figure 2-1: Warning label if earth leakage current exceeds 3.5 mA

2.7.2.3. Signal Cable Designation

A wrap around identification label, similar to that shown in Figure 2-2, is to be fitted to both ends of WipLL data cables. Care should be taken to ensure that the cable identification information is clearly visible. The labels are to be supplied with the installer's folder. Identify the cable as detailed in the CROL supplied by Contract Engineering. Fit the label 100 mm from the cable end. Wrap the label ensuring good adhesion to cable and itself.

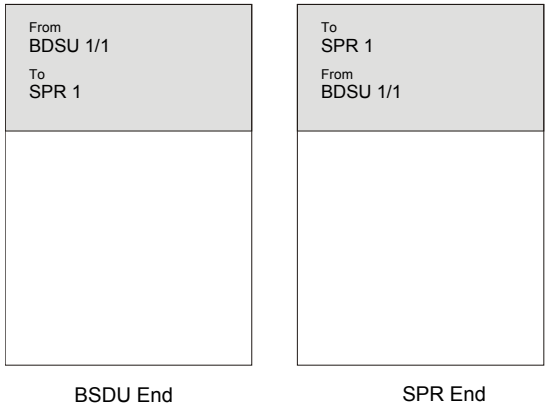

Figure 2-2: Typical signal cable identification label