ERICSSON

Radio Dot System Description

Description

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Contents

1 Introduction

The Radio Dot System (RDS) provides indoor broadband coverage for small-cell markets, mainly in medium to large buildings. Through its modular design, RDS offers scalable functionality and integration with outdoor networks.

RDS divides the radio into an Indoor Radio Unit (IRU) and up to eight Radio Dots (RDs).

The RDs are small and discreet, as shown in Figure 1. The IRU and RDs are connected with the Radio Dot Interface (RDI) cable, which is used for both communication and power supply.

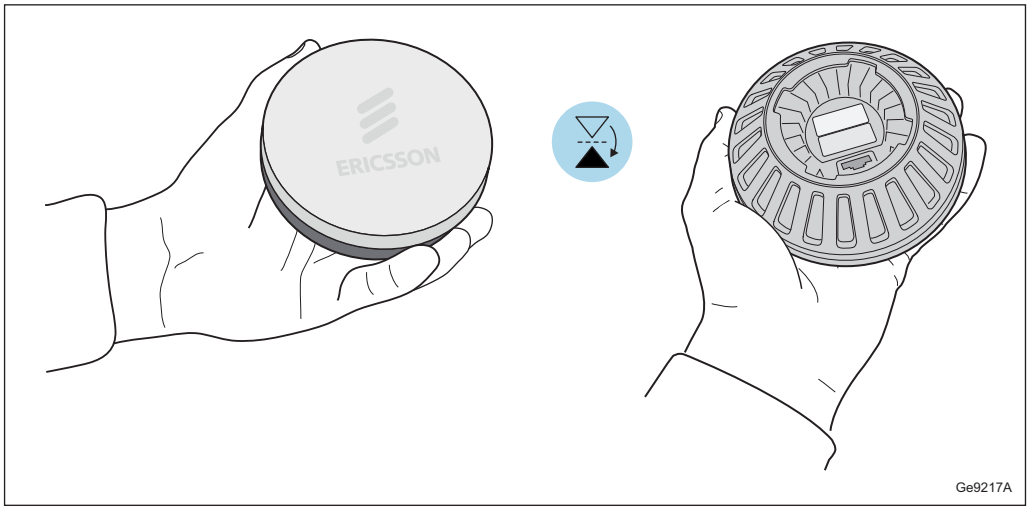

Figure 1 An RD Is Small and Discreet

1.1 About This Document

The purpose of this document is to give an overview of RDS and the documents that describe RDS.

2 System Overview

The RDS consists of the following three main subsystems:

— Digital Unit (DU) or Baseband unit

— IRU

— RD

The DU or Baseband unit processes baseband signals and provides digital transceiver functionality to the IRU through a CPRI cable, as shown in Figure 2. The IRU is an intermediate transceiver and a converter between the DU or Baseband unit digital radio signals and the RD radio signals. The RD is connected to the IRU over the RDI. The RD transmits and receives radio waves for indoor broadband coverage.

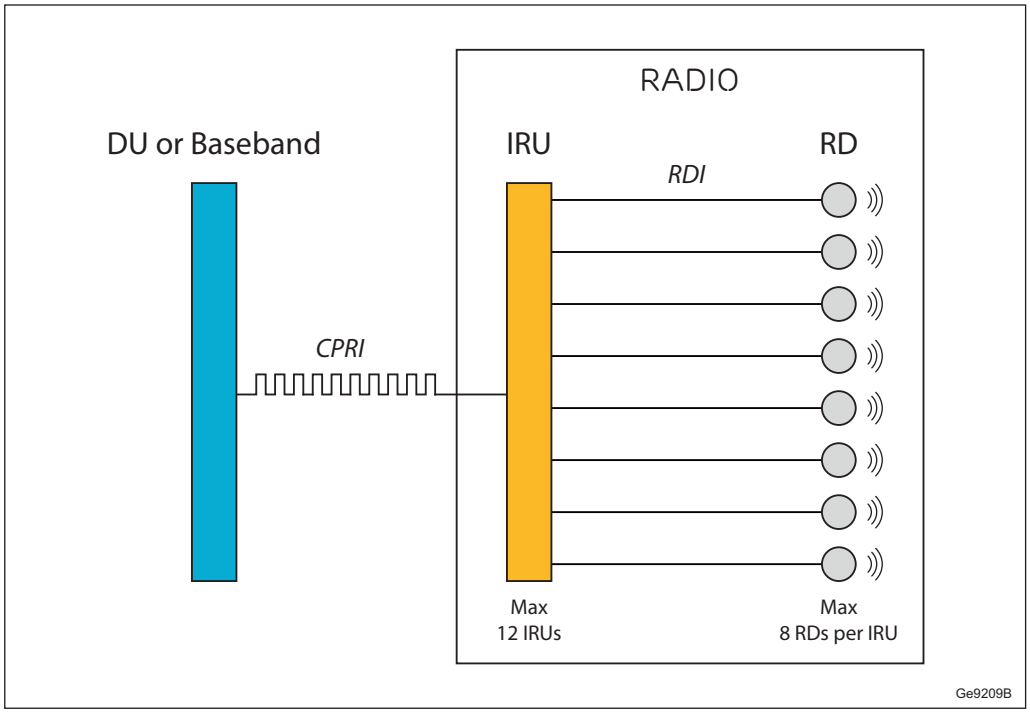

Figure 2 RDS Components

A basic RDS installation is shown in Figure 3.

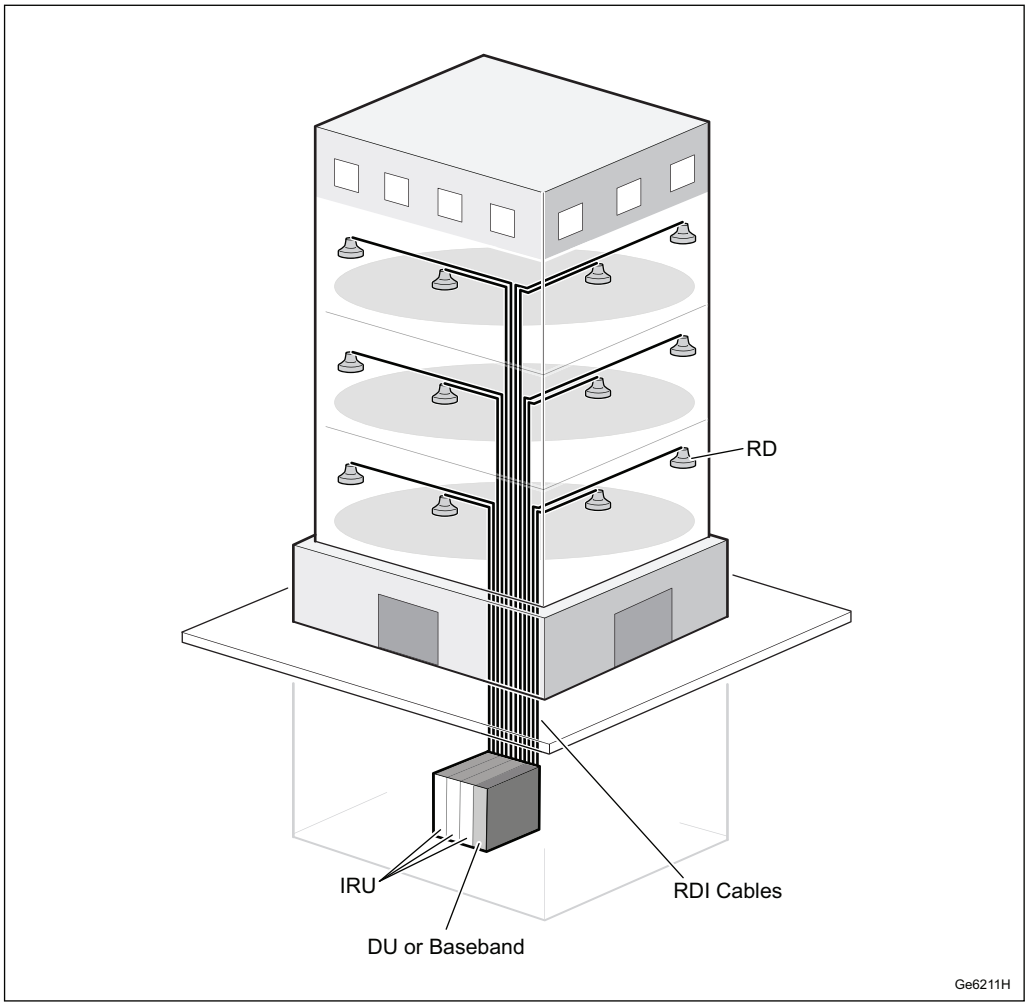

Figure 3 Basic RDS Installation

2.1 Indoor Radio Unit

The IRU has two purposes:

— Provide a digital interface to the DU or Baseband unit through a CPRI cable.

— Provide signaling and power interface to the RD over the RDI.

For information about RDI, see Radio Dot Interface (Cabling) on page 9.

Table 1 lists the main IRU documents.

Table 1 Main IRU Documents

Document	Description
Antenna and RF Connections	Describes the cable connections for RDS Radio Building Blocks (RBBs).

Document	Description
Indoor Radio Unit Description	Describes the IRU for RBS 6000 systems.
Install Indoor Radio Unit 2242	Describes how to install the IRU 2242 in a subrack or in a support system.
Non-RF Connections	Describes power and EC-bus cabling for the IRU.
RBS Description	Describes the IRU placement in the RBS cabinet.
RDS Site Products Overview	Lists necessary cables and installation materials.
Replace Indoor Radio Unit 2242	Describes how to replace an installed IRU 2242.
Remote IRU Enclosure 2242 Description	Describes the Remote IRU Enclosure 2242.
Install Remote IRU Enclosure 2242	Describes the steps to install the Remote IRU Enclosure 2242.
Replace Remote IRU Enclosure 2242	Describes how to replace a faulty Remote IRU Enclosure 2242.

2.1.1 Distributed IRUs

The IRU and the DU or Baseband unit can be installed in separate cabinets. The IRU is then referred to as a distributed IRU. Distributed IRUs are installed in RBS 6601 cabinets called support systems.

Distributed IRUs can be used when RDs are to be placed in excess of the maximum RDI cable length.

Figure 4 shows the following three configuration examples of RDS:

— IRU and DU or Baseband unit are installed in the same cabinet (1).

— A distributed IRU is separately installed in a support system (2).

— A combination or IRUs and distributed IRUs (3).

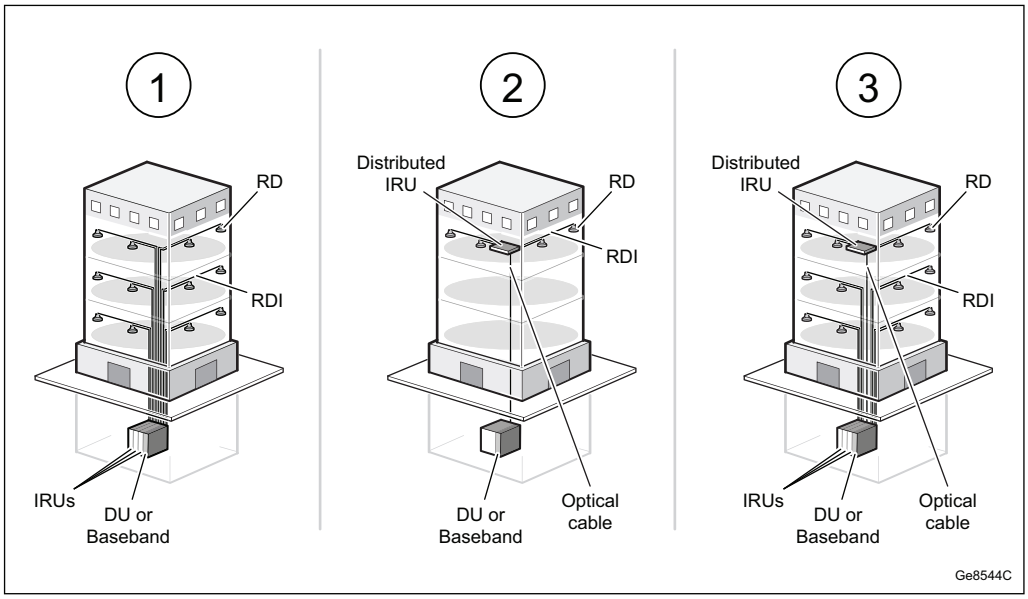

Figure 4 Configuration Examples

2.1.2 Remote IRU Enclosure 2242 Option

The Remote IRU Enclosure 2242 is a housing option for the remote IRU that hosts a single IRU 2242 per enclosure. It is AC powered and includes an AC-DC converter to supply the IRU 2242. It also includes fans to keep the IRU 2242 within normal operational temperature range.

Note: The Remote IRU Enclosure 2242 supports only the IRU 2242.

This enclosure can be installed in three different ways:

— Horizontally, in a 19 inch rack

— Vertically, single enclosure on a wall

— Vertically, dual enclosure on a wall

Using IRU cascading, up to twelve enclosures can be connected.

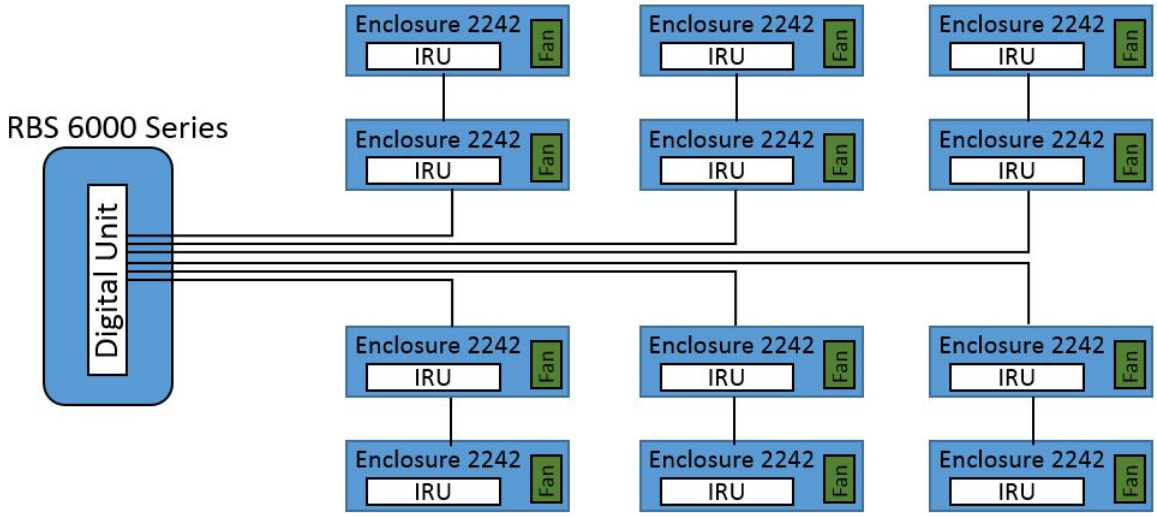

Figure 5 Remote IRU Enclosure Supported Configuration

2.1.3 Cascaded IRUs

One DU can support 12 radios and a Baseband unit can support up to 24 radios, however each DU or Baseband unit has only six CPRI ports used to connect to a radio (except for Baseband 6620/6630 which have 15 CPRI ports). To overcome this limitation, the radios can be successively cascaded, that is, connected in series. For more information about cascading radios, refer to RBS Configurations.

Figure 7 gives schematic examples of cascaded and distributed radios, with explanations in Table 2.

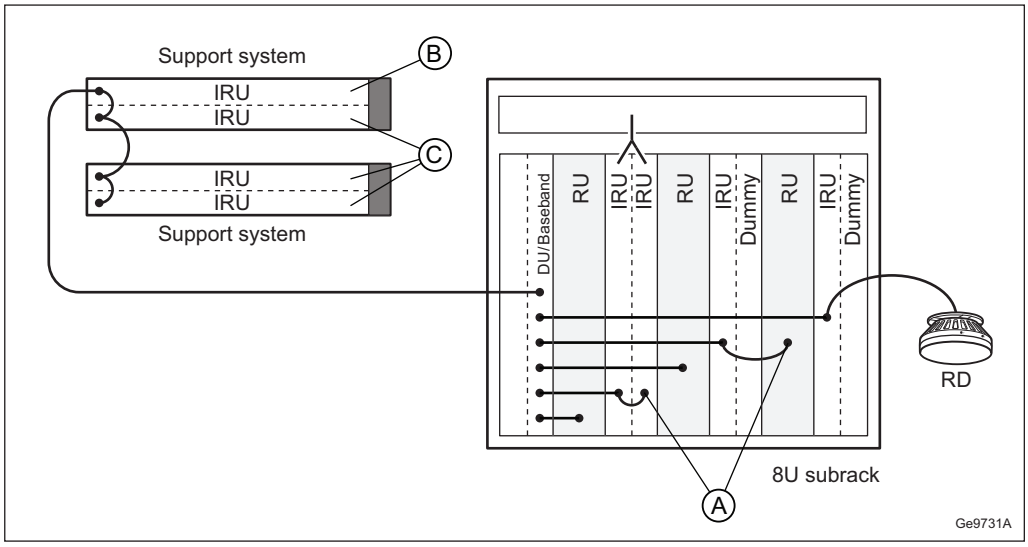

Figure 6 Examples of Distributed and Cascaded Radios

Table 2 Examples of Distributed and Cascaded Radios

Position	Cascaded Radio	Distributed Radio
A	x	
B		x
C	x	x

2.1.4 Cables and Components

Figure 7 contains document references for cables and components that are used when distributing or cascading radios, with explanations in Table 3.

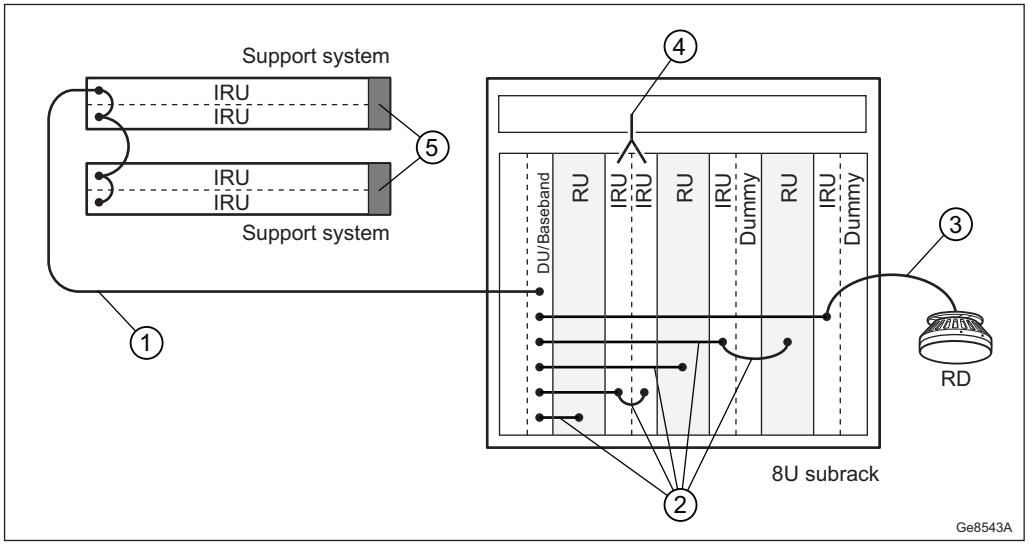

Figure 7 Document References for RDS Cables and Components

Table 3 Document References for RDS Cables and Components

Position	Document	Description
1	Antenna and RF Connections	Describes CPRI cables for RDS.
	SFP Module Selector Guide	Lists recommended SFP modules that are compatible with IRUs.
2	Antenna and RF Connections	Describes CPRI cables for RDS.
	RBS Description	Describes IRU allocation.
	RBS Configurations	Describes possible radio configurations.

Position	Document	Description
3	RDI Cabling Guidelines	Describes recommended installation methods and procedures for the RDI.
4	Non-RF Connections	Describes IRU power supply cabling.
5	Non-RF Connections Install Indoor Radio Unit 2242	The documents describe power cables and the EC Bus that is used for controlling the climate in the cabinet.

2.2 Radio Dot

The RD is a low-power radio transmitter that is connected to the RDI cable network.

The purpose of the RD is to produce radio waves for indoor broadband coverage. The RD uses the signal and power interface from the IRU over the RDI.

Radio Dots are available in different types and variants that are band-specific. The following types of RDs are available:

— RD 2242: Single Band Radio Dot

— RD 2243: Single Band Radio Dot

— RD 2253: Single Band Radio Dot

— RD 4442: Dual Band Radio Dot

— RD 4453: Dual Band Radio Dot

The Dual Band RD has two sides that are managed independently. For more information on RD types, refer to Radio Dot Description.

Different brackets are available for installing the RDs. For more information about brackets, refer to Radio Dot Description.

Table 4 lists the main RD documents.

Table 4 Main RD Documents

Document	Description
Install Radio Dot	Describes how to install an RD.
Radio Dot Description	Describes, for example, the frequency variants, technical data, and different installation possibilities of the RD.

Document	Description
Replace Radio Dot	Describes how to replace an installed RD.

2.3 Radio Dot Interface (Cabling)

The RDI refers to the cabling, connectors, patch cables, and patch panels between the IRU and the RD.

Figure 8 shows the RDI components, named in Table 5. Some of the components are optional. Setup 1 is most minimalistic. Setup 2 includes a connector box and an RDI jumper cable.

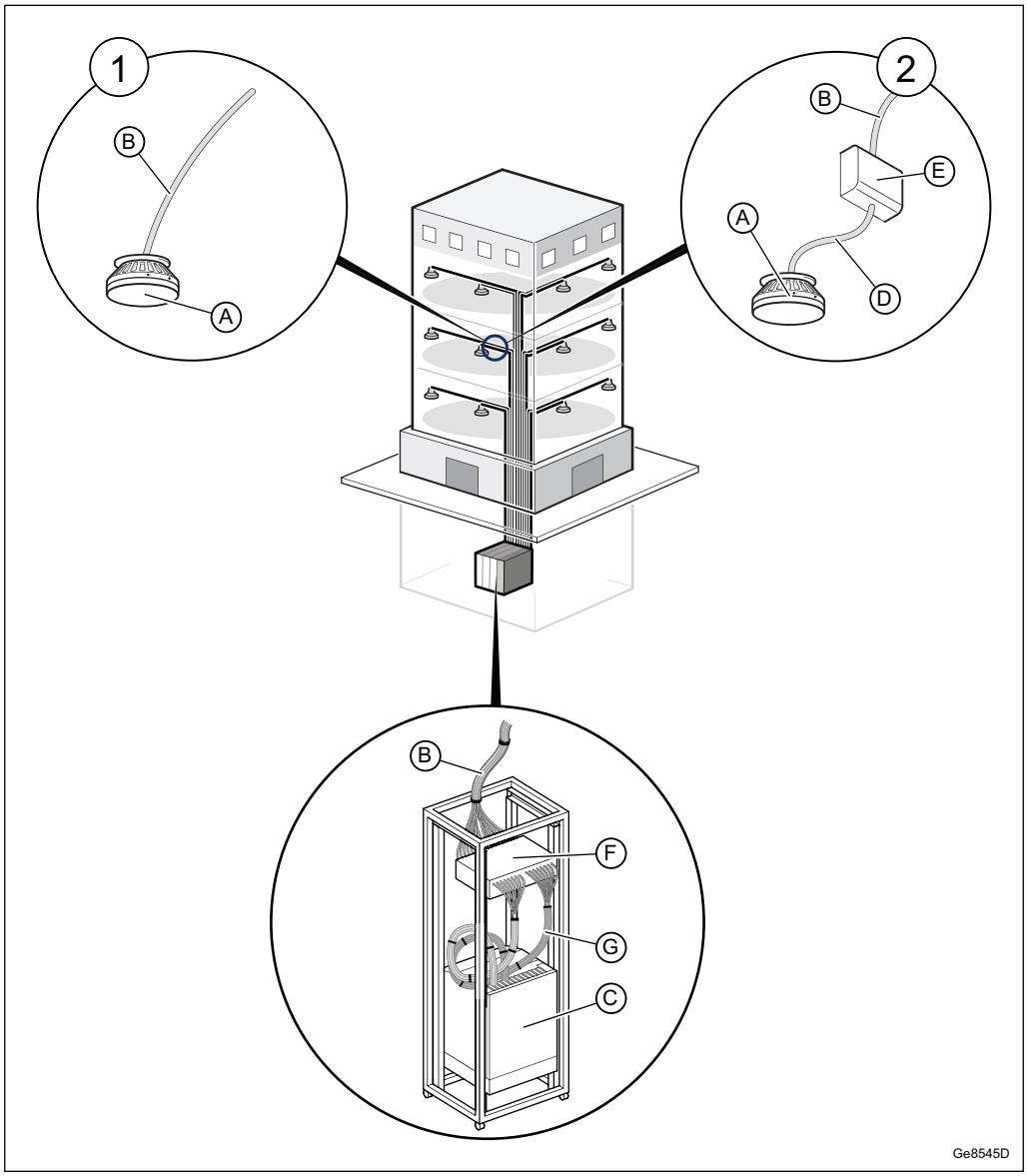

Figure 8 RDI Components in Two Setups

Table 5 RDI Components

Position	Component
A	RD
B	RDI Feeder Cable
C	RBS cabinet with 8U subrack for IRU, DU, or Baseband unit
D	RDI Jumper Cable (optional)
E	Connection Box (optional)
F	Patch Panel

Position	Component
G	RDI Patch Cables

Table 6 lists the main RDI documents.

Table 6 Main RDI Documents

Document	Description
Antenna and RF Connections	Describes RF and CPRI cables for RDS.
Non-RF Connections	Describes in-cabinet connections.
RBS Description	Describes connection interfaces of the RBS.
RDI Cabling Guidelines	Describes RDI cable requirements, typical cable installations, and formulas for calculating maximum cable lengths. The document also describes how to route and prepare RDI feeder cables, how to test RDI performance, and gives an example of a typical RD installation with two RDs connected to a connection box.
RDS Site Products Overview	Describes cables and installation material recommended for RDS installations.

2.4 Y-Splitter

The Y-splitter is an adapter that enables the sharing of the Radio Dot Interface (RDI) feeder cable. Two Y-splitters are used to enable the connection of two RD 2242s or RD 2243s or RD 2253s to the same RDI feeder cable. One Y-splitter is used to enable the two sides of an RD 4442 or RD 4453 to connect to the same RDI feeder cable.

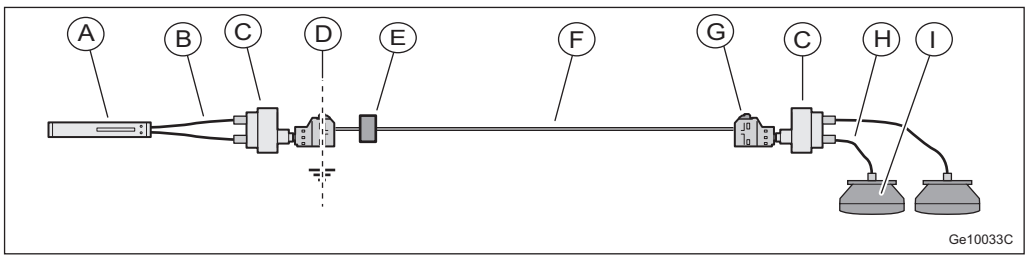

Figure 9 Basic Y-Splitter Configuration (RD 2242, RD 2243, RD 2253)

Table 7 Y-Splitter Configuration Components (RD 2242, RD 2243, RD 2253)

Position	Component
A	IRU
B	RDI Patch Cable
C	Y-Splitter
D	RJ45 Female Connector (Patch Panel)
E	Ferrite
F	RDI Feeder Cable
G	RJ45 Female Connector (Connection Box)
H	RDI Jumper Cable
I	RD

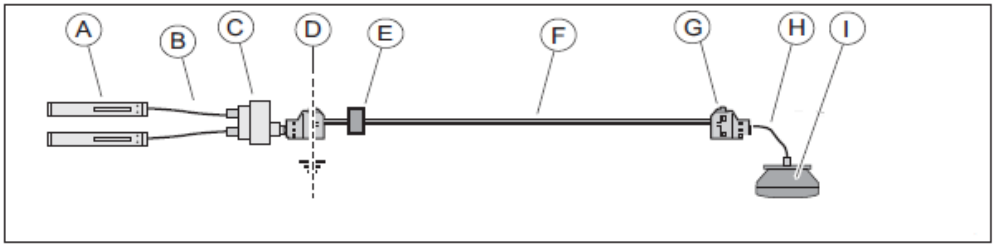

Figure 10 Basic Y-Splitter Configuration (RD 4442, RD 4453)

Table 8 Y-Splitter Configuration Components (RD 4442, RD 4453)

Position	Component
A	IRU
B	RDI Patch Cable
C	Y-Splitter
D	RJ45 Female Connector (Patch Panel)
E	Ferrite
F	RDI Feeder Cable
G	RJ45 Male Connector
H	RDI Jumper Cable
I	RD

Table 9 Main Y-Splitter Documents

Document	Description
RDS Site Products Overview	Describes RDS products recommended for installations and includes Y-splitter product ordering information.
Y-Splitter Guidelines	Describes the Y-splitter adapter that is used in the Radio Dot System. The document also details deployment options, recommendations for installation, and how to install the Y-splitter.