

470318A
Nokia Flexi EDGE Base Station, Rel. EP1,
Product Documentation, v.1

Hardware Configuration
Reference Guide

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1 Overview

1.1 Overview of configurations

This document shows how to create the following configurations:

- 1+1+1/2+2+2 bypass 2UD configuration (*stack, wall, pole, FCIA and FCOA installation*)
- 3+3+3/4+4+4 2-way 2UD configuration (*stack, wall, pole, FCIA and FCOA installation*)
- *Cost-optimised 3+3 configuration*
- *Dual band 2+2+2 and 2+2+2 configuration*
- *6+6 configuration*
- *7 to 12 Omni RTC configuration*
- *Flexi EDGE/WCDMA multimode configurations*

This document also shows the installation location of optional power modules, see *Power modules (FPDA and FPMA) in Flexi EDGE BTS configurations*.

See also *Common configurations*.

For detailed instructions on how to install and cable the modules, see the following documentation, depending on the installation type:

- *Creating Stack, Wall and Pole Configurations*
- *Installing Flexi Cabinet for Indoor (FCIA) and Creating FCIA Configurations*
- *Installing Flexi Cabinet for Outdoor (FCOA) and Creating FCOA Configurations*

Expansion configurations

You can expand from a 1+1+1/2+2+2 bypass 2UD to a 3+3+3/4+4+4 2-way 2UD configuration. For instructions, see

- *Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with 48V DC power*
- *Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with AC or 24V DC power*

1.2 Common configurations

This section provides HW configuration details about common, symmetrical configurations. For details about asymmetric configurations, see *Appendix A Common sector configurations*.

For details about RF cable autodetection and SCF template files, refer to Flexi EDGE BTS software release documentation.

1.2.1 Common stack configurations

Table 1. Common stack configurations

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ESMA	# of FPDA ¹⁾	# of FPAA (FPMA) ¹⁾	# of antennas	EP1 ²⁾
1+1	Bypass	No/ 1UD	1	1	0	1	1	1	2	Yes
1 to 2 Omni	Bypass	2UD	1	1	0	1	1	1	2	Yes
2	2-way	1UD	1	1	1	1	1	1	1	Yes
3 - 4	4-way	1UD	2	1	3	1	1	1	1	Yes
3 Omni	2-way	2UD	2	1	2	1	2	1	2	Yes
4 Omni	2-way	2UD	2	1	2	1	1	2	2	Yes
5 to 6 Omni	4-way	2UD	3	1	5	1	1	2	2	Yes
7 to 8 Omni	4-way	2UD	4	1	6	1	1	2	2	Yes
1+1	Bypass	2UD	2	2	0	1	1	1	4	Yes

Table 1. Common stack configurations (cont.)

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ESMA	# of FPDA ¹⁾	# of FPAA (FPMA) ¹⁾	# of antennas	EP1 ²⁾
2+2	Bypass	2UD	2	2	0	1	1	1	4	Yes
3+3 (upgrade opt.)	2-way	2UD	4	2	4	1	1	2	4	Yes
3+3 (cost opt.)	2-way	2UD	3	2	4	1	1	2	4	Yes
4+4	2-way	2UD	4	2	4	1	1	2	4	Yes
1+1+1/ 2+2+2	Bypass	2UD	3	3	0	1	1	1 to 2	6	Yes
3+3+3 (upgrade-opt.)	2-way	2UD	6	3	6	1	2	3	6	Yes
4+4+4	2-way	2UD	6	3	6	1	2	4	6	Yes
3	DP	2UD or 4UD	3	2	3	1	1	2	3 or 4	No
4	DP	2UD or 4UD	4	2	4	1	1	2	4	No
1+1+1	DP	2UD	3	3	3	1	1	2	6	No
2+2+2	DP	2UD	6	3	6	1	1	2	6	No
1+1+1	IDD/DP	4UD	6	6	0 to 3	1	1	2	12	No
2+2+2	IDD/DP	4UD	6	6	0 to 6	1	2	3	12	No
2+2+2 & 2+2+2	Bypass	2UD	6	6	0	1	2	3	12	Yes

¹⁾ Optional depending on the external power source.

²⁾ Supported in EP1 (Yes/No)

1.2.2 Common pole and wall configurations

Table 2. Common pole and wall configurations

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ESMA	# of FPDA ¹⁾	# of FPAA/ (FPMA) ¹⁾	# of stacks	# of antennas	EP1 ²⁾
1+1	Bypass	No/1UD	1	1	0	1	1	1	2	2	Yes
1 to 2 Omni	Bypass	2UD	1	1	0	1	1	1	2	2	Yes
2	2-way	1UD	1	1	1	1	1	1	2	1	Yes
3 - 4	4-way	1UD	2	1	3	1	1	1	2	1	Yes
3 Omni	2-way	2UD	2	1	2	1	1	1	2	2	Yes
4 Omni	2-way	2UD	2	1	2	1	1	1	2	2	Yes
1+1	Bypass	2UD	2	2	0	1	1	1	2	4	Yes
2+2	Bypass	2UD	2	2	0	1	1	1	2	4	Yes
3+3 upgrade opt.)	2-way	2UD	4	2	4	1	1	2	3	4	Yes
3+3 cost opt.)	2-way	2UD	3	2	4	1	1	2	3	4	Yes
4+4	2-way	2UD	4	2	4	1	-	2	3	4	Yes
4+4	2-way	2UD	4	2	4	1	1	-	4	4	Yes
1+1+1/ 2+2+2	Bypass	2UD	3	3	0	1	1	1/2	3	6	Yes
3+3+3 AC (upgrade opt.)	2-way	2UD	6	3	6	1	-	2	4	6	Yes
3+3+3 24DC (upgrade opt.)	2-way	2UD	6	3	6	1	2	-	5	6	Yes
4+4+4 AC	2-way	2UD	6	3	6	1	-	3	4	6	Yes
4+4+4 24DC	2-way	2UD	6	3	6	1	2	-	5	6	Yes
3	DP	2UD or 4UD	3	2	3	1	1	2	3	2UD=3, 4UD=4	No

Table 2. Common pole and wall configurations (cont.)

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ESMA	# of FPDA ¹⁾	# of FPAA/ (FPMA) ¹⁾	# of stacks	# of antennas	EP1 ²⁾
4	DP	2UD or 4UD	4	2	4	1	1	2	3	4	No
1+1+1	DP	2UD	3	3	3	1	1	2	3	6	No
2+2+2 AC	DP	2UD	6	3	6	1	-	3	4	6	No
2+2+2 24DC	DP	2UD	6	3	6	1	2	-	5	6	No
1+1+1	DP	4UD	6	6	3	1	1	2	4	12	No
2+2+2 AC	DP	4UD	6	6	6	1	-	3	4	12	No
2+2+2 24DC	DP	4UD	6	6	6	1	2	-	5	12	No
1+1+1	IDD	4UD	6	6	0	1	1	2	4	12	No
2+2+2 AC	IDD	4UD	6	6	0	1	-	3	4	12	No
2+2+2 24DC	IDD	4UD	6	6	0	1	1	-	5	12	No
2+2+2 & 2+2+2 AC	Bypass	2UD	6	6	0	1	-	3	4	12	Yes

¹⁾ Optional depending on the external power source.

²⁾ Supported in EP1 (Yes/No)

1.2.3 Common FCOA and FCIA configurations

Table 3. Common FCOA and FCIA configurations

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ECxA	# of ESMA	# of ESEA	# of FPDA ¹⁾	# of FPAA/ (FPMA) ¹⁾	# of antennas	EP1 ²⁾
1+1	Bypass	No/1UD	1	1	0	0	1	0	1	1	2	Yes

Table 3. Common FCOA and FCIA configurations (cont.)

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ECxA	# of ESMA	# of ESEA	# of FPDA ¹⁾	# of FPAA/(FPMA) ¹⁾	# of antennas	EP1 ²⁾
1 to 2 Omni	Bypass	2UD	1	1	0	0	1	0	1	1	2	Yes
2	2-way	1UD	1	1	1	0	1	0	1	1	1	Yes
3-4	4-way	1UD	2	1	3	0	1	0	1	1	1	Yes
3 Omni	2-way	2UD	2	1	2	0	1	0	1	1	2	Yes
4 Omni	2-way	2UD	2	1	2	0	1	0	1	1	2	Yes
5 Omni	4-way	2UD	3	1	5	0	1	0	1	1	2	Yes
6 Omni	4-way	2UD	3	1	5	0	1	0	1	2	2	Yes
7 Omni	4-way	2UD	4	1	6	0	1	0	1	2	2	Yes
8 Omni	4-way	2UD	4	1	6	0	1	0	1	2	2	Yes
3 to 4 Omni	RTC	2UD	2	0	0	1	1	1	1	1	2	Yes
5 to 6 Omni	RTC	2UD	3	0	0	1	1	1	1	1 to 2	2	Yes
7 to 8 Omni	RTC	2UD	4	0	0	2	1	1	1	2	2	Yes
9 to 10 Omni	RTC	2UD	5	0	0	2	1	1	2	2	2	Yes
11 to 12 Omni	RTC	2UD	6	0	0	2	1	1	2	3	2	Yes
1+1	Bypass	2UD	2	2	0	0	1	0	1	1	4	Yes
2+2	Bypass	2UD	2	2	0	0	1	0	1	1	4	Yes
3+3 (upgrade opt.)	Bypass	2UD	4	4	0	0	1	0	1	2	6	Yes
3+3 (cost opt.)	Bypass	2UD	3	4	0	0	1	0	1	2	6	Yes
4+4	Bypass	2UD	4	4	0	0	1	0	1	2	8	Yes
6+12	RTC	2UD	9	0	0	3	1	1	3	4	6	No
1+1+1/ 2+2+2	Bypass	2UD	3	3	0	0	1	0	1	1/2	6	Yes
3	DP	2UD or 4UD	3	2	3	0	1	0	1	2	3 or 4	No

Table 3. Common FCOA and FCIA configurations (cont.)

Config.	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ECxA	# of ESMA	# of ESEA	# of FPDA ¹⁾	# of FPAA/ (FPMA) ¹⁾	# of antennas	EP1 ²⁾
4	DP	2UD or 4UD	4	2	4	0	1	0	1	2	4	No
1+1+1	DP	2UD	3	3	3	0	1	0	1	2	6	No
2+2+2	DP	2UD	6	3	6	0	1	0	2	3	6	No
1+1+1	IDD/DP	4UD	6	6	0 or 3	0	1	0	1	2	12	No
2+2+2	IDD/DP	4UD	6	6	0 or 6	0	1	0	2	3	12	No
3+3+3 (upgrade opt.)	2-way	2UD	6	3	6	0	1	0	2	2	6	Yes
4+4+4	2-way	2UD	6	3	6	0	1	0	2	3	6	Yes
5+5+5	4-way	2UD	9	3	15	0	1	1	2	3	6	No
6+6+6	4-way	2UD	9	3	15	0	1	1	3	4	6	No
7+7+7	4-way	2UD	12	3	18	0	1	1	3	5	6	No
6+6+6	RTC	2UD	9	0	0	3	1	1	3	4	6	No
8+8+8	4-way	2UD	12	3	18	0	1	1	3	5	6	No
2+2+2 & 2+2+2	Bypass	2UD	6	6	0	0	1	0	2	3	12	Yes

¹⁾ Optional depending on the external power source.

²⁾ Supported in EP1 (Yes/No)

2

Creating 1+1+1/2+2+2 bypass 2UD configurations

2.1 Creating a 1+1+1/2+2+2 bypass 2UD in a stack

Before you start

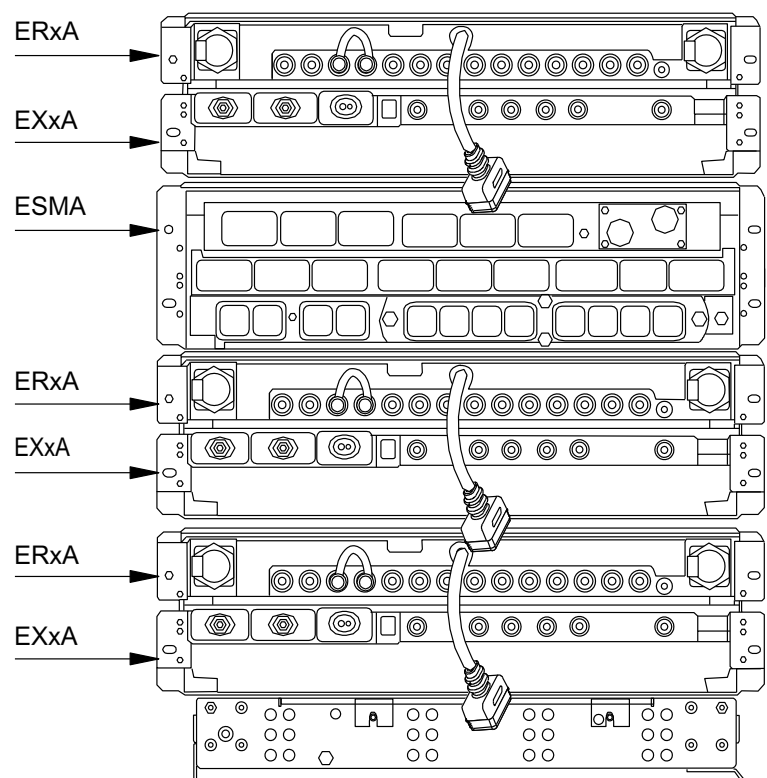
To create a 1+1+1 or 2+2+2 stacked configuration, you need:

- three Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)



Steps

1. Install the modules.



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Figure 1. Modules in a 1+1+1/2+2+2 stack configuration

2. Connect the cables.

The order to connect the cables is as follows:

- a. Grounding cables
- b. External power cables
- c. Dual Duplexer Module cable
- d. Bus cables
- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables

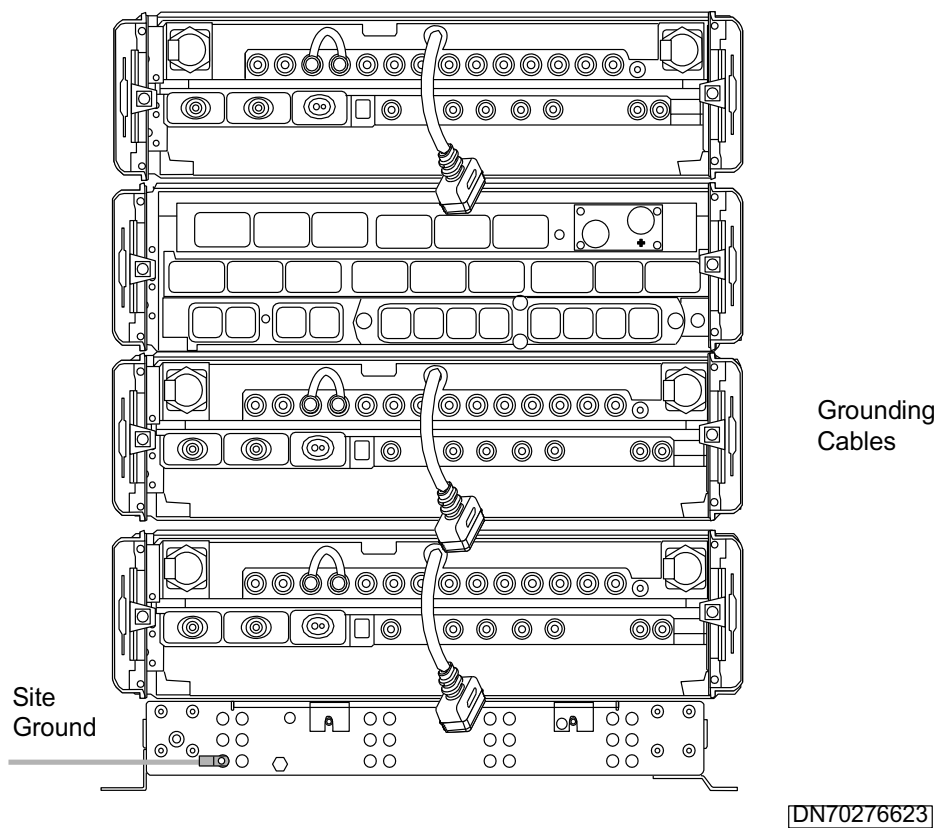


Figure 2. Grounding the plinth in a 1+1+1/2+2+2 stack configuration

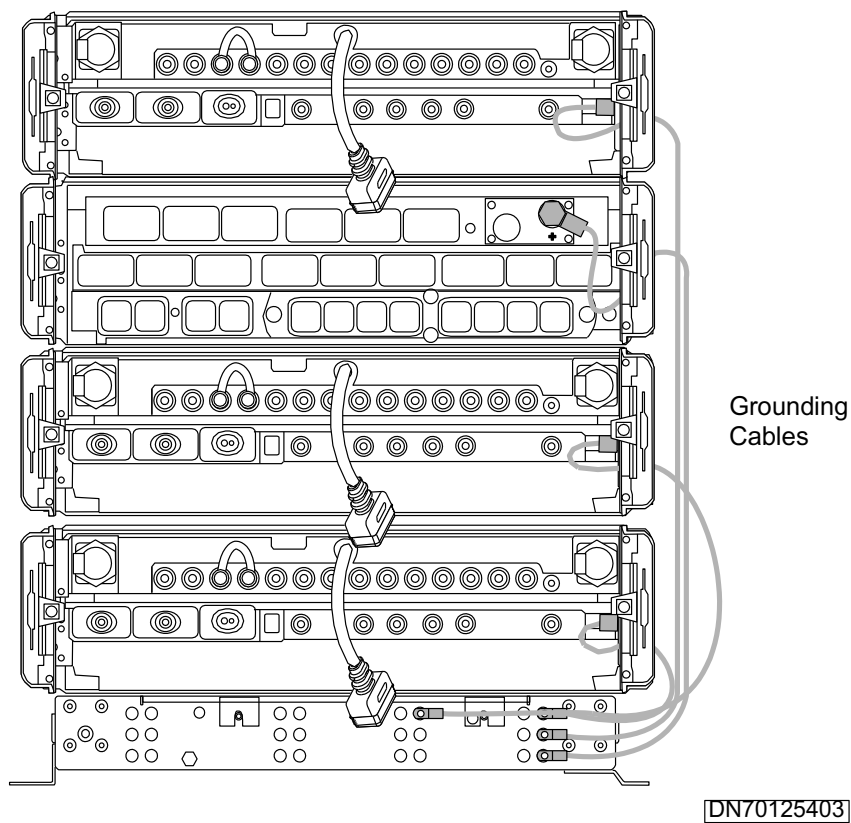


Figure 3. Grounding the modules in a 1+1+1/2+2+2 stack configuration

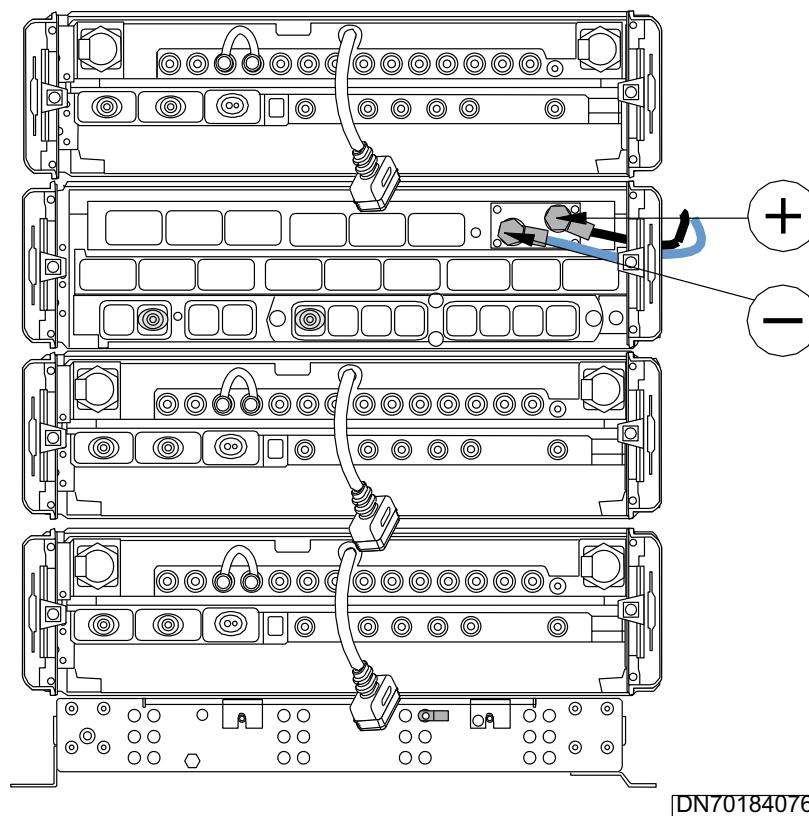


Figure 4. External power cables in a 1+1+1/2+2+2 stack configuration

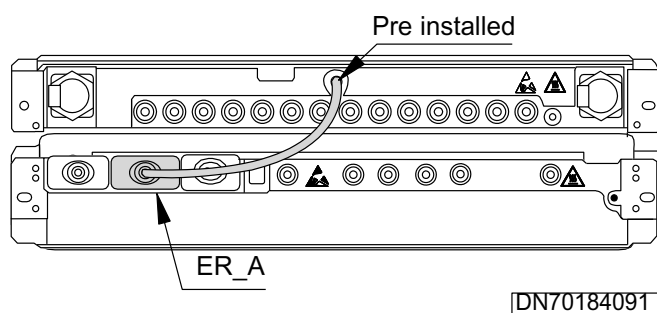


Figure 5. Dual Duplexer Module cable

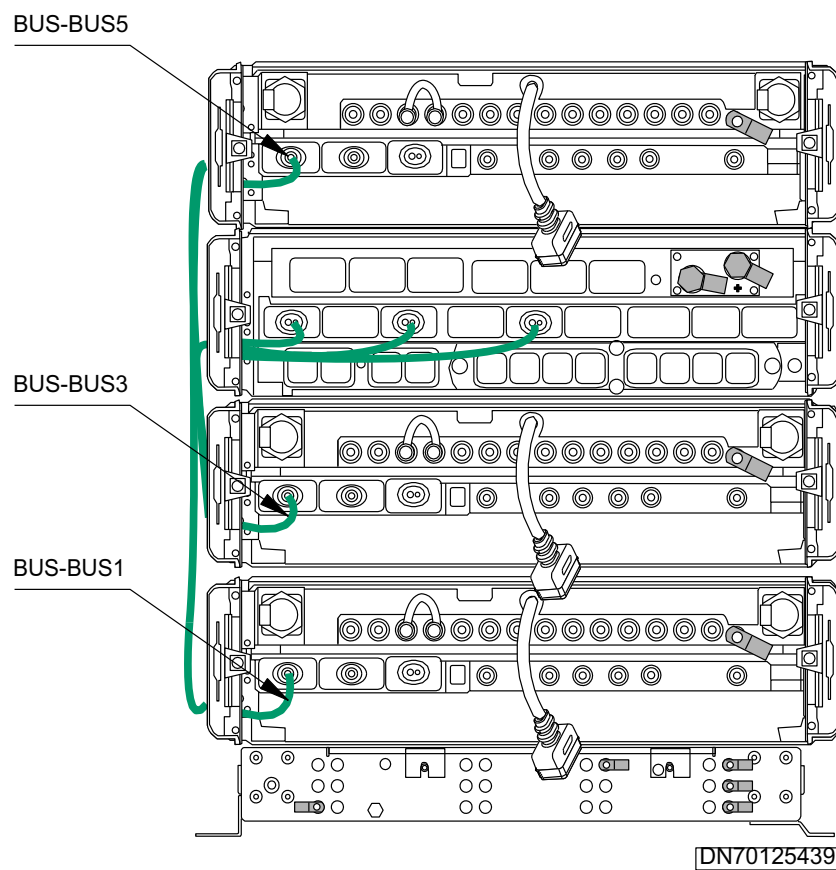


Figure 6. Bus cables in a 1+1+1/2+2+2 stack configuration

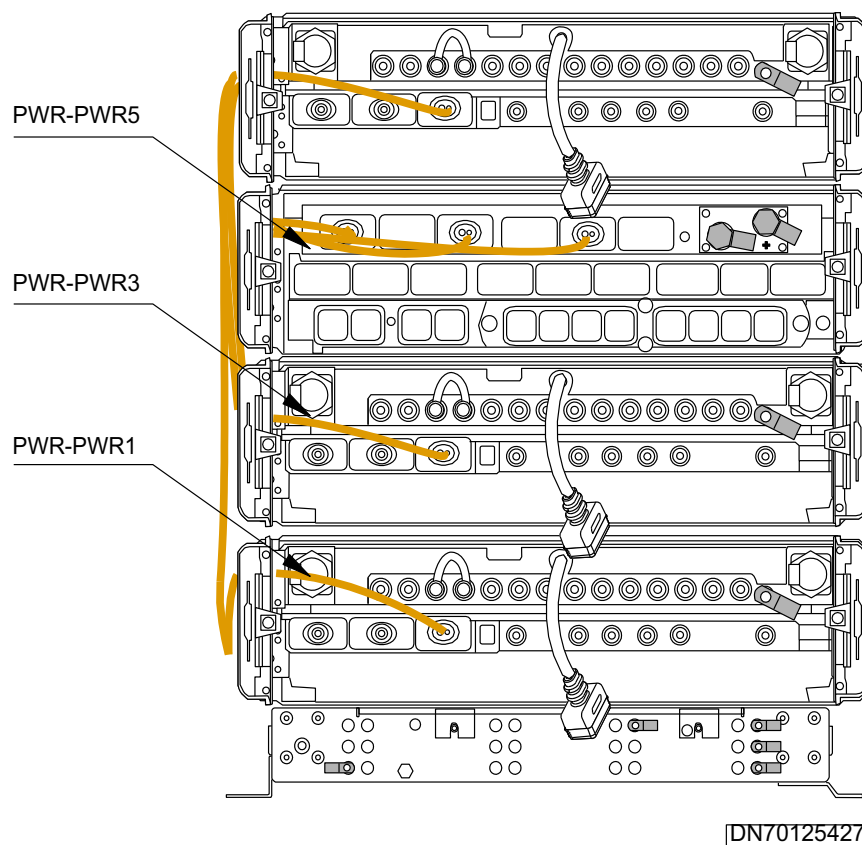


Figure 7. Internal power cables in a 1+1+1/2+2+2 stack configuration

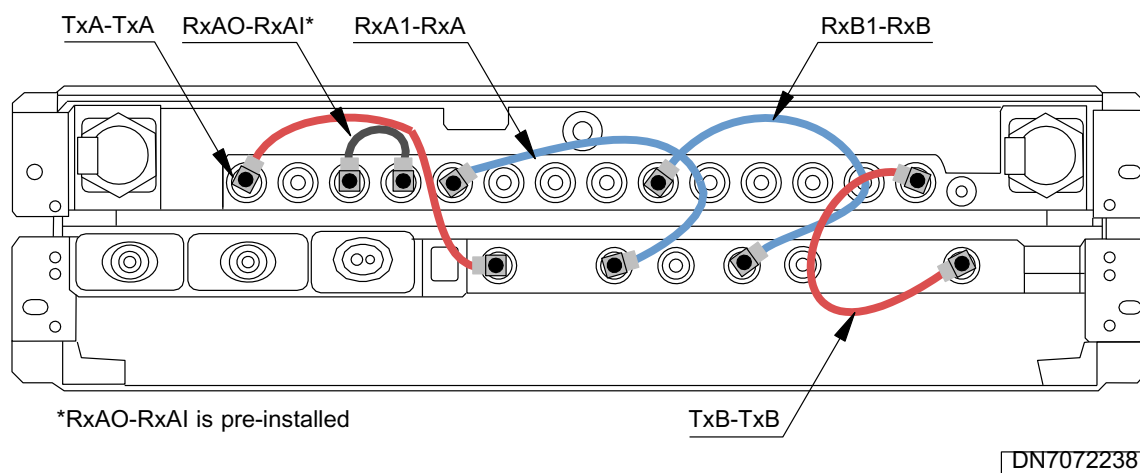


Figure 8. RF cables in a 1+1+1/2+2+2 stack configuration

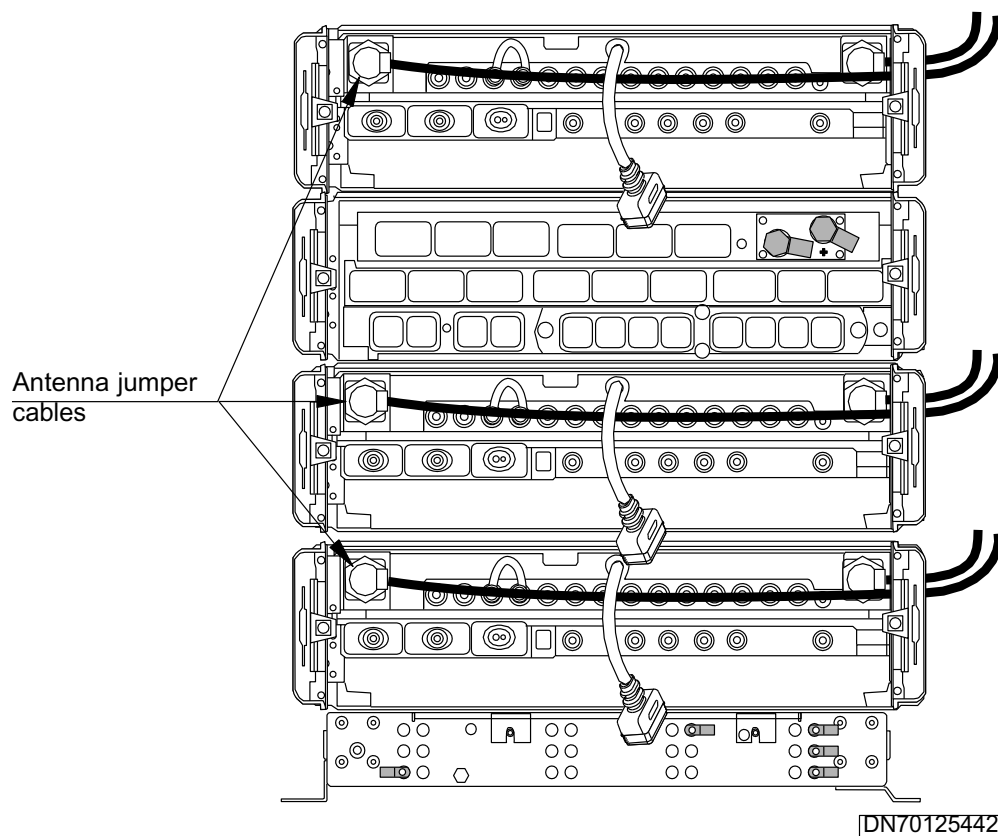


Figure 9. Antenna jumper cables in a 1+1+1/2+2+2 stack configuration

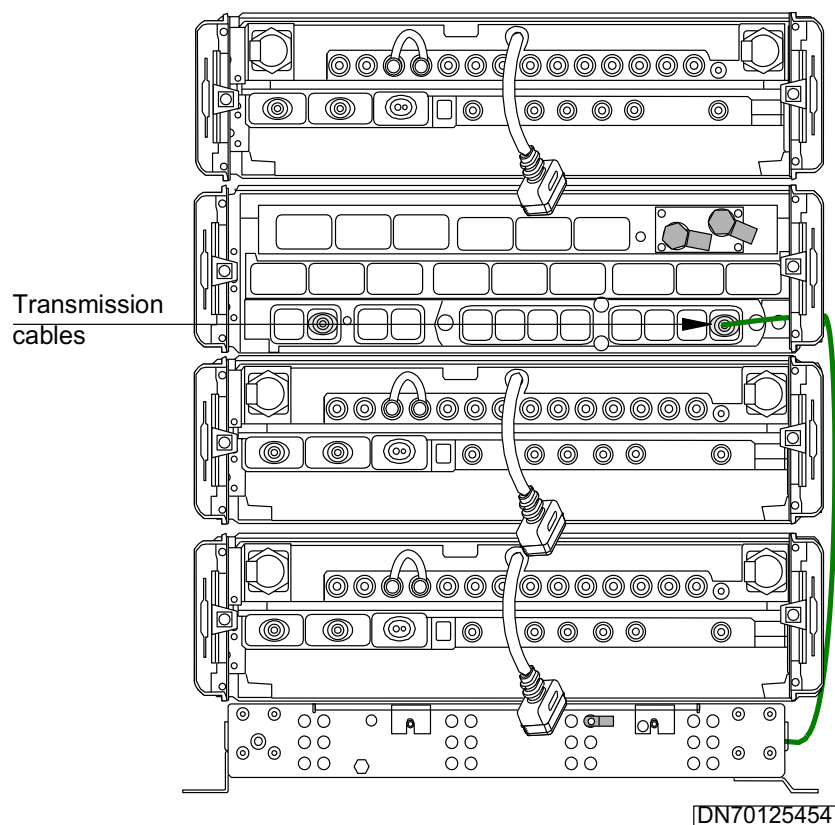


Figure 10. Transmission cables in a 1+1+1/2+2+2 stack configuration

2.2 Creating a 1+1+1/2+2+2 2-way 2UD on a wall

Before you start

To create a 1+1+1 or 2+2+2 wall configuration, you need:

- three Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)



Steps

1. Install the modules.

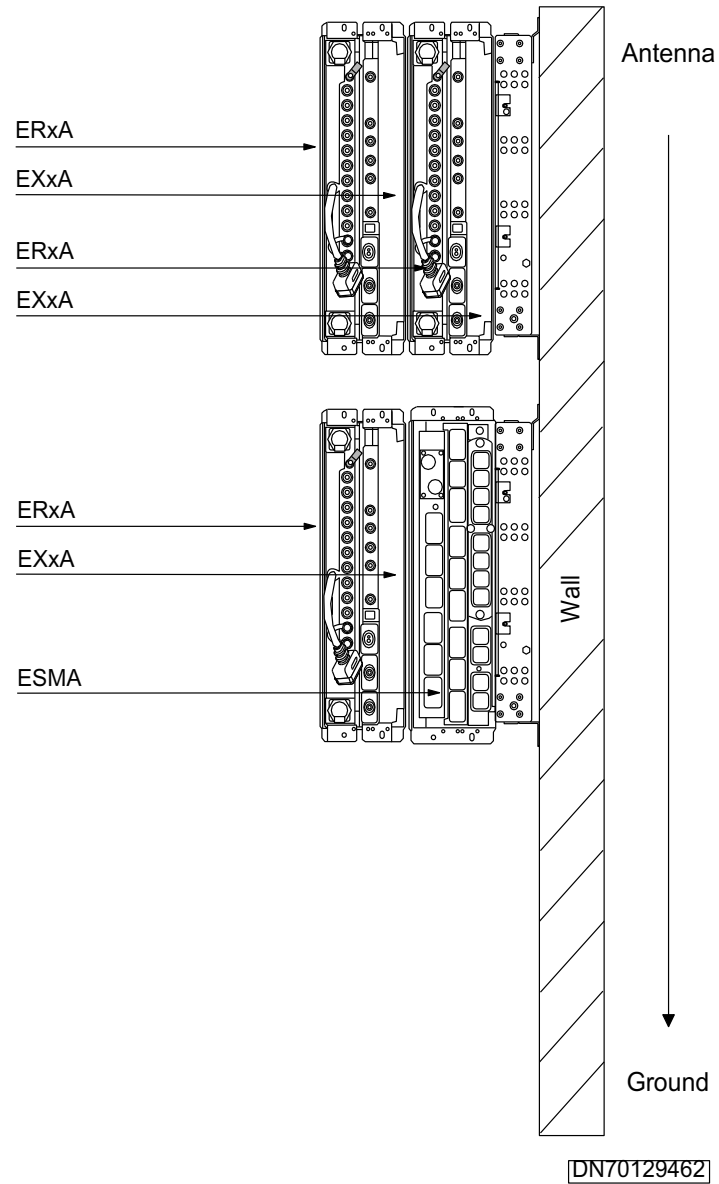
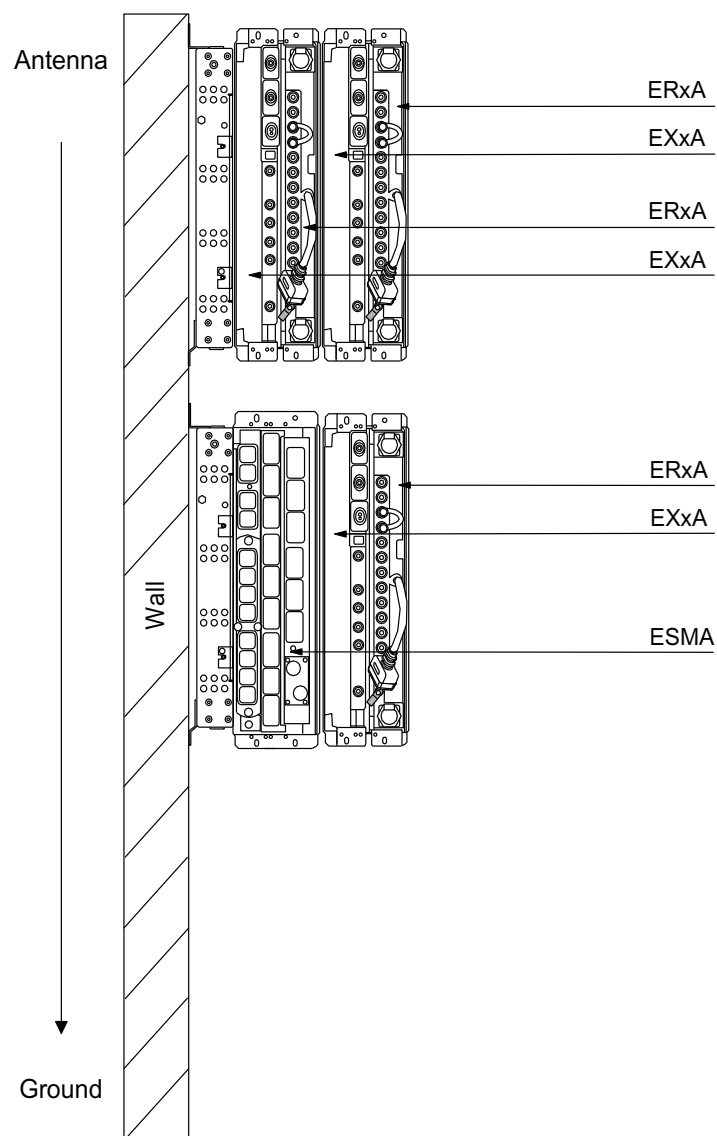


Figure 11. Modules in 1+1+1/2+2+2 wall configuration

! Caution

Risk of damage to equipment. If the base transceiver station (BTS) is exposed to weather conditions, install the modules so that the system module power terminals are facing down, as shown in the figure below.



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Figure 12. Module installation order in a 1+1+1/2+2+2 wall configuration, System Module power terminals facing down

2. Connect the cables.

The order to connect the cables is as follows:

- a. Grounding cables
- b. External power cables
- c. Dual Duplexer Module cable
- d. Bus cables
- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables

Caution

In outdoor installations, internal bus and power cables should be routed through the bottom cable entries and sloped down from the connectors to help prevent water ingress.

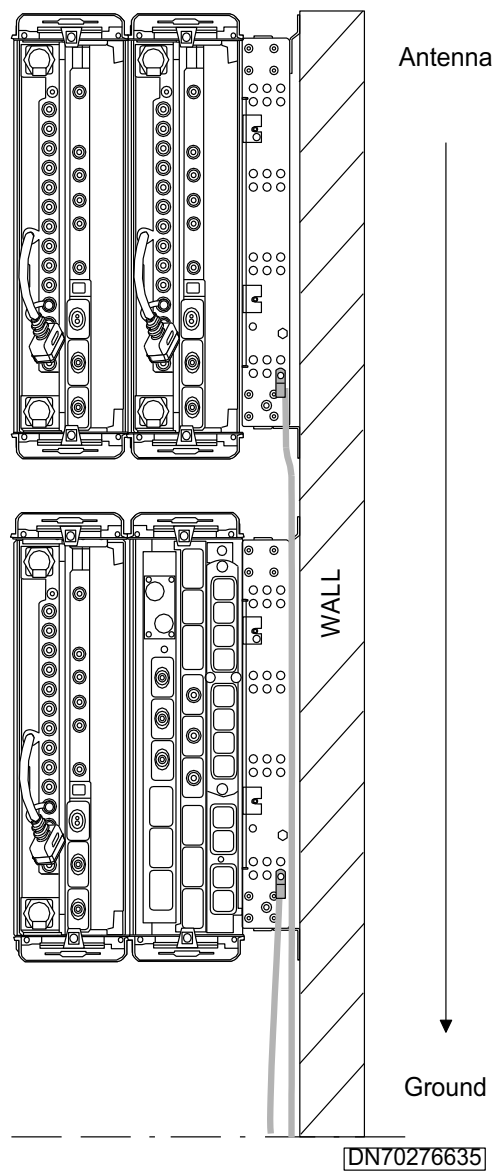


Figure 13. Grounding the plinth in a 1+1+1/2+2+2 wall configuration

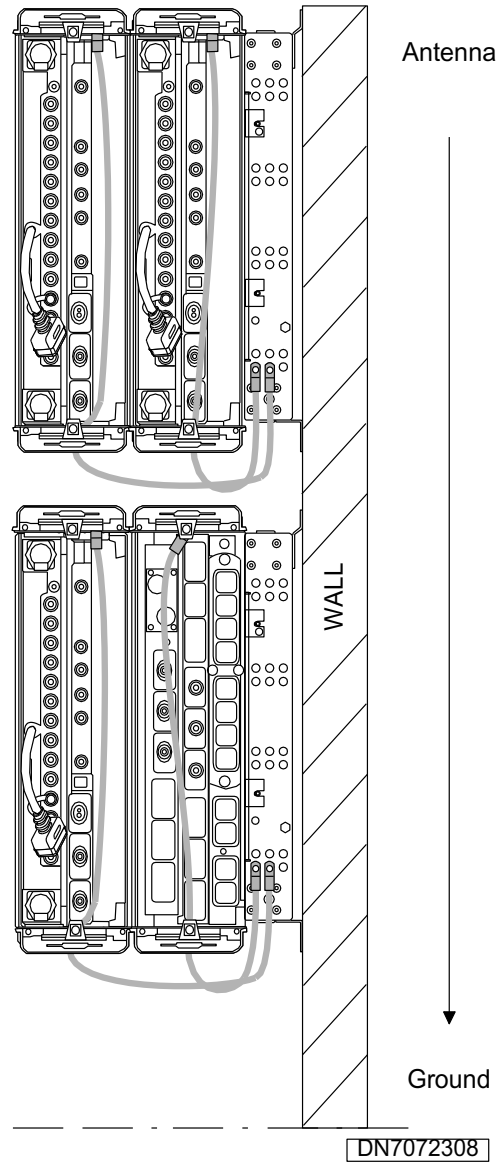


Figure 14. Grounding the modules in a 1+1+1/2+2+2 wall configuration

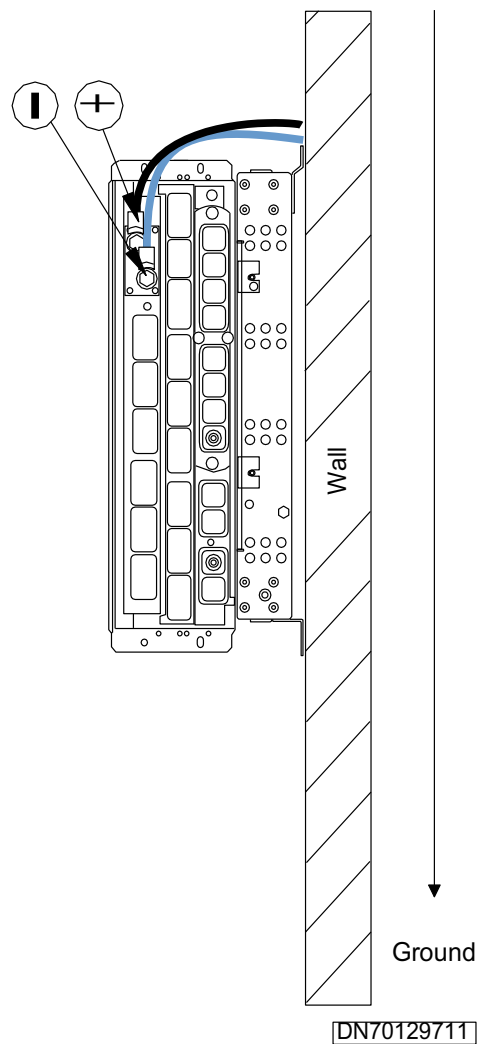


Figure 15. External power cables in a 1+1+1/2+2+2 wall configuration

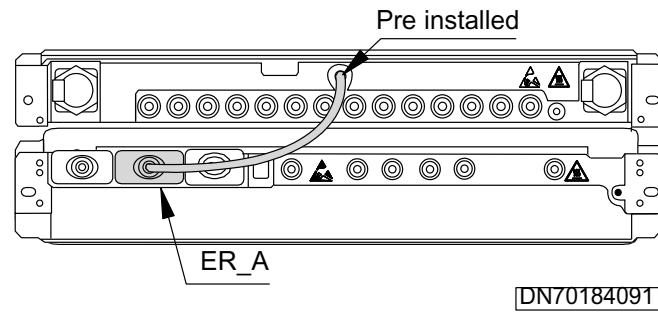


Figure 16. Dual Duplexer Module cable

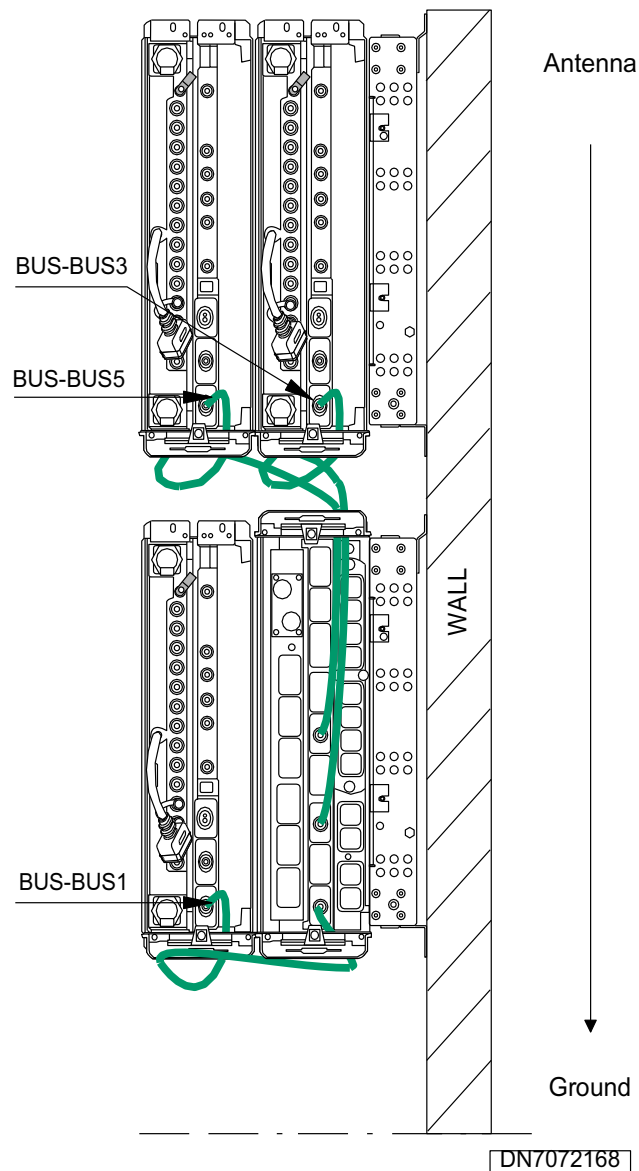


Figure 17. Bus cables in a 1+1+1/2+2+2 wall configuration

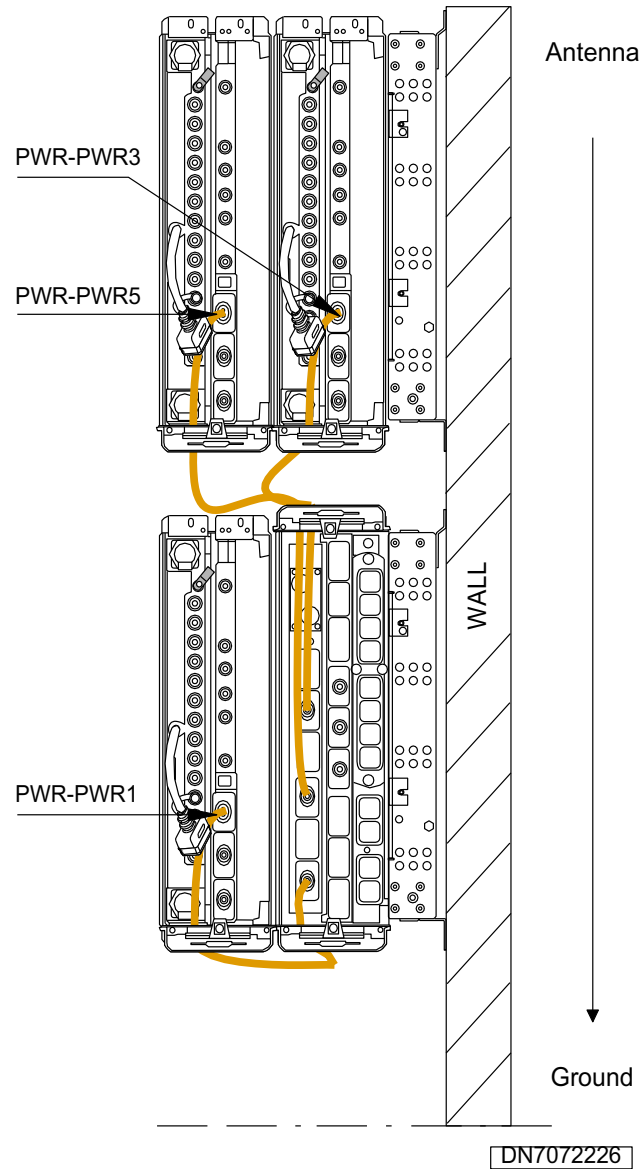


Figure 18. Internal power cables in a 1+1+1/2+2+2 wall configuration

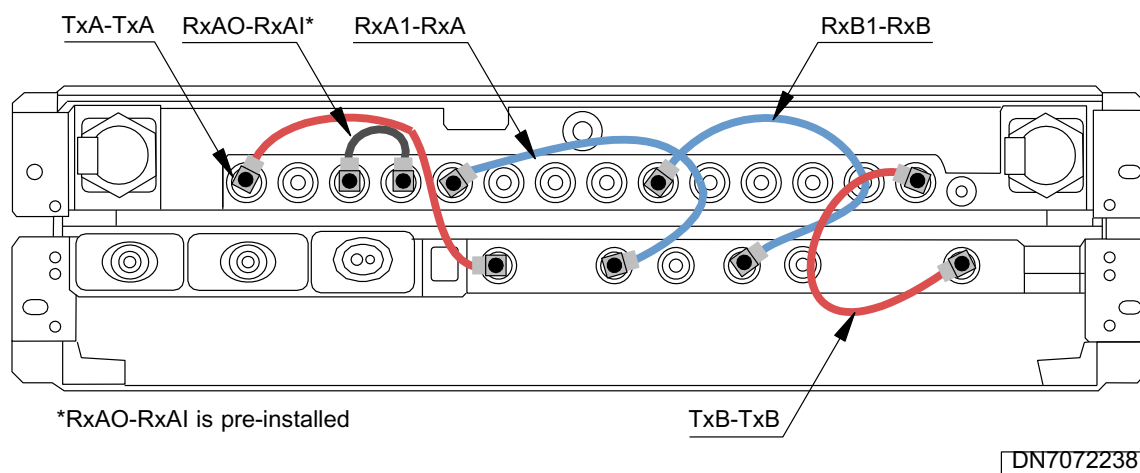


Figure 19. RF cables in 1+1+1/2+2+2 wall configuration

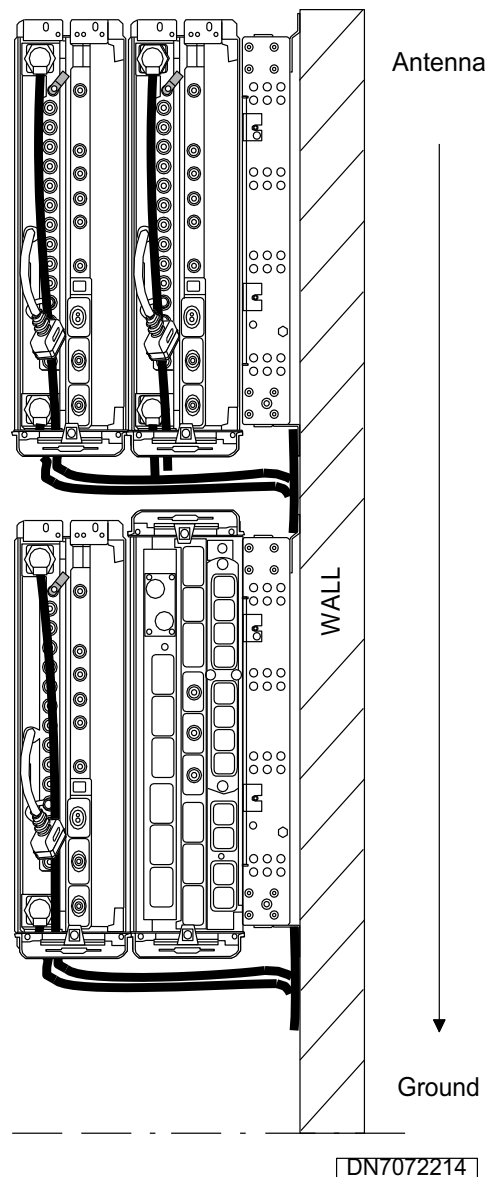


Figure 20. Antenna jumper cables in a 1+1+1/2+2+2 wall configuration

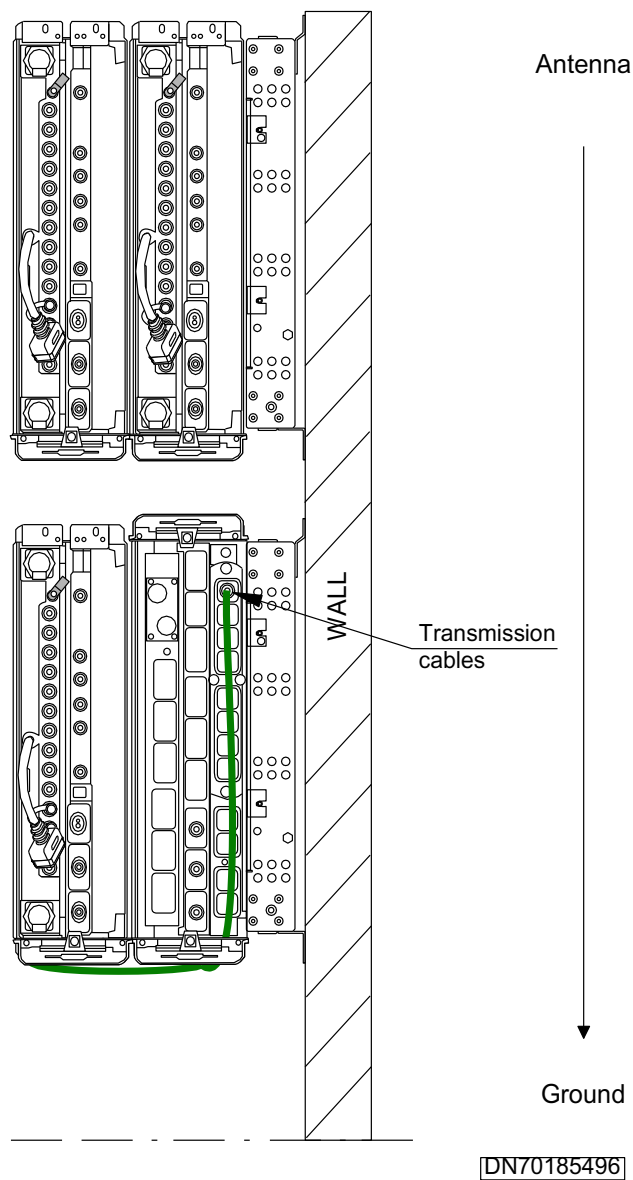


Figure 21. Transmission cables in 1+1+1/2+2+2 wall configuration

2.3 Creating a 1+1+1/2+2+2 2-way 2UD on a pole

Before you start

To create this configuration, you need:

- three Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)



Steps

1. **Install the modules.**

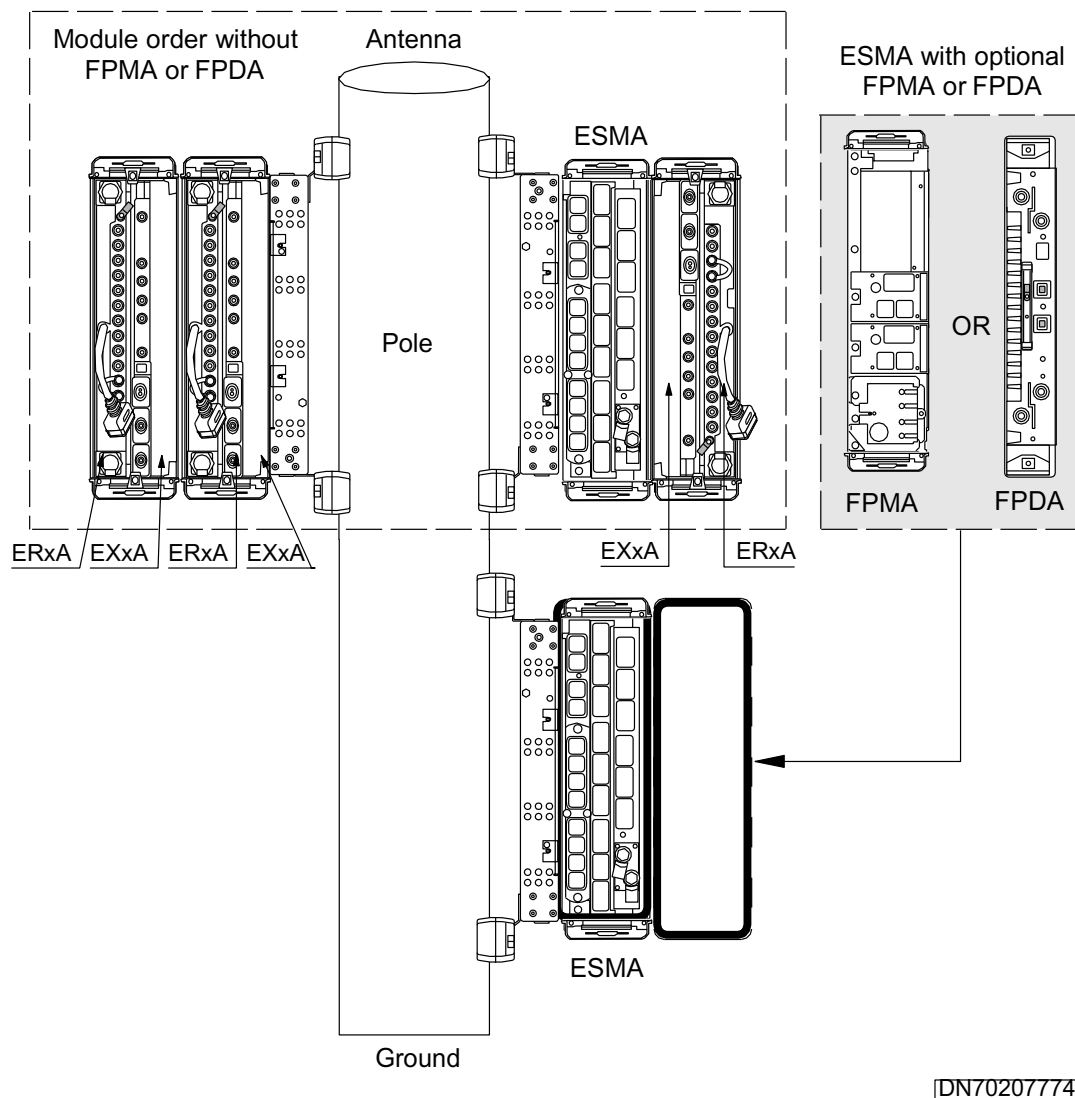


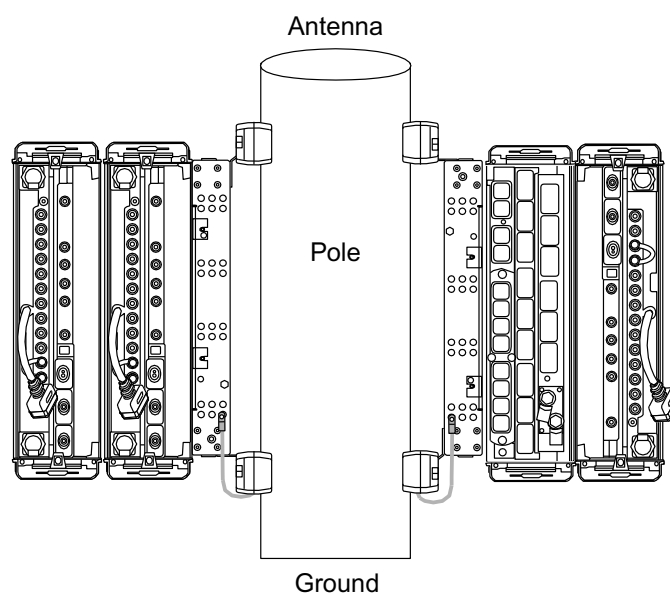
Figure 22. Module installation order in a 1+1+1/2+2+2 pole configuration

2. Connect the cables.

The order to connect the cable is as follows:

- Grounding cables
- External power cables
- Dual Duplexer Module cable
- Bus cables

- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables



DN70276647

Figure 23. Grounding the plinth in a 1+1+1/2+2+2 pole configuration

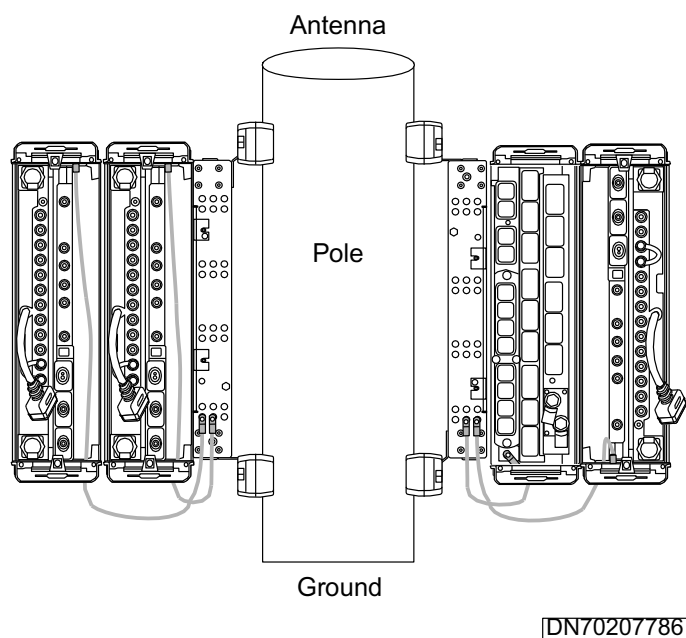


Figure 24. Grounding the modules in a 1+1+1/2+2+2 pole configuration

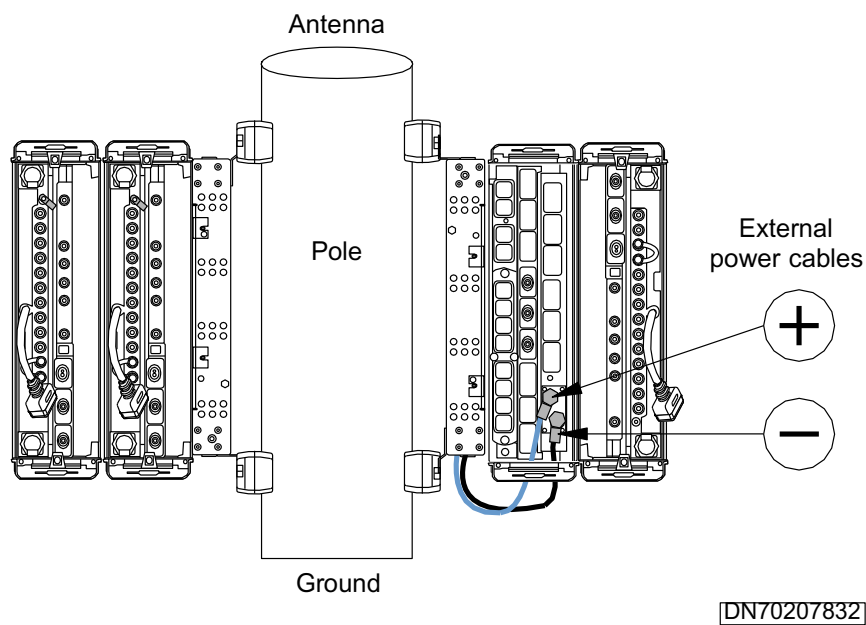


Figure 25. External power cables in a 1+1+1/2+2+2 pole configuration

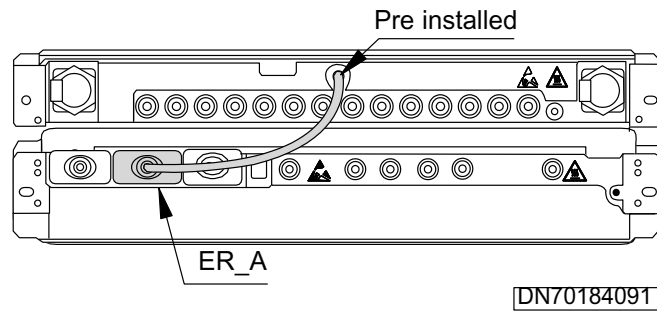


Figure 26. Dual Duplexer Module cable

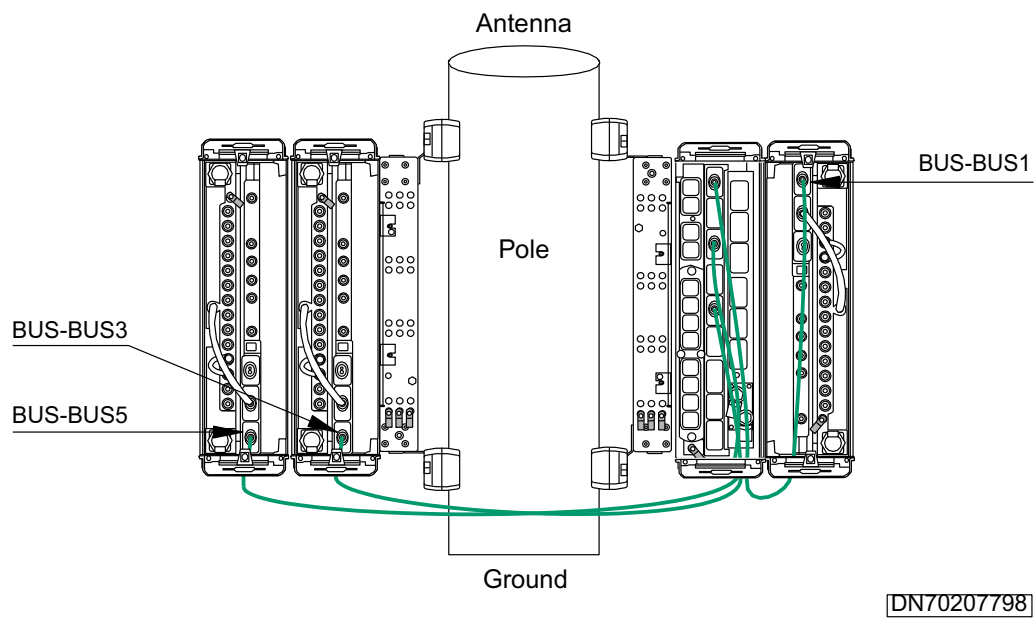


Figure 27. Bus cables in a 1+1+1/2+2+2 pole configuration

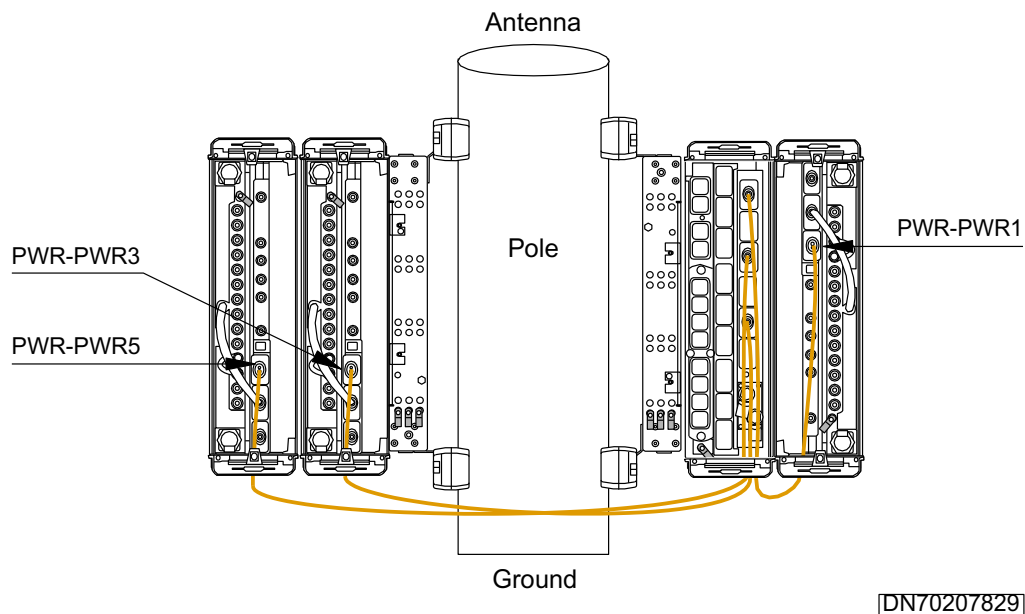


Figure 28. Internal power cables in a 1+1+1/2+2+2 pole configuration

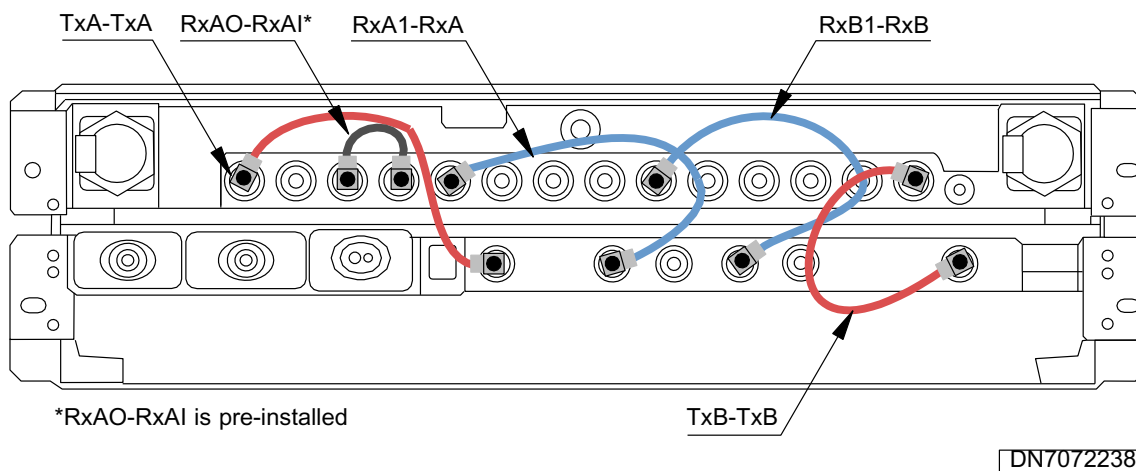


Figure 29. RF cables in a 1+1+1/2+2+2 configuration

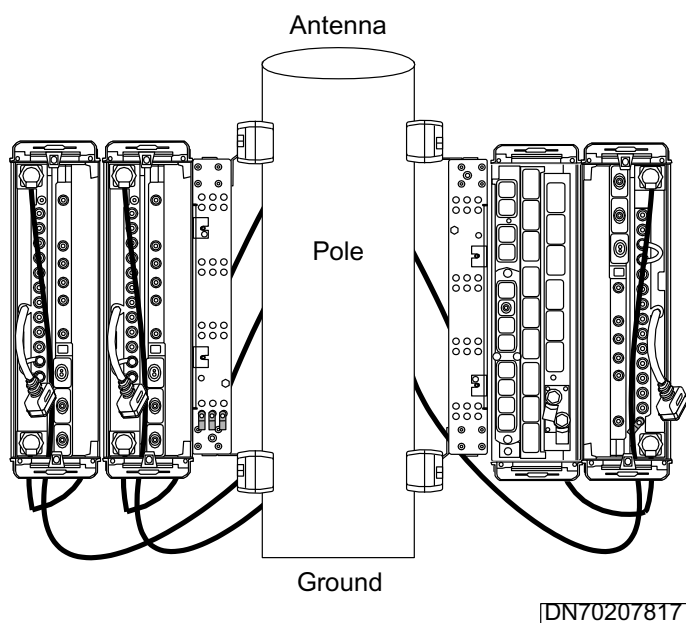


Figure 30. Antenna jumper cables in a 1+1+1/2+2+2 pole configuration

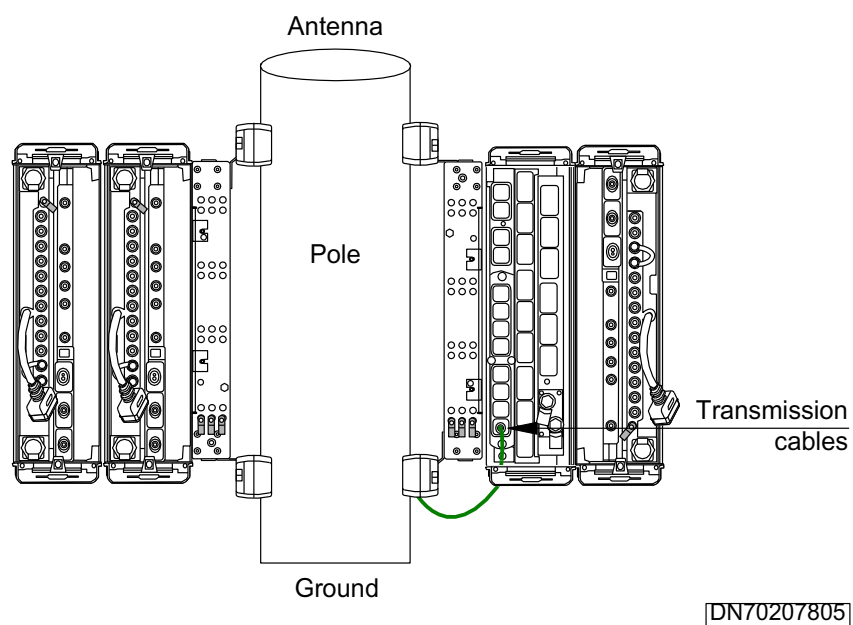


Figure 31. Transmission cables in a 1+1+1/2+2+2 pole configuration

Expected outcome

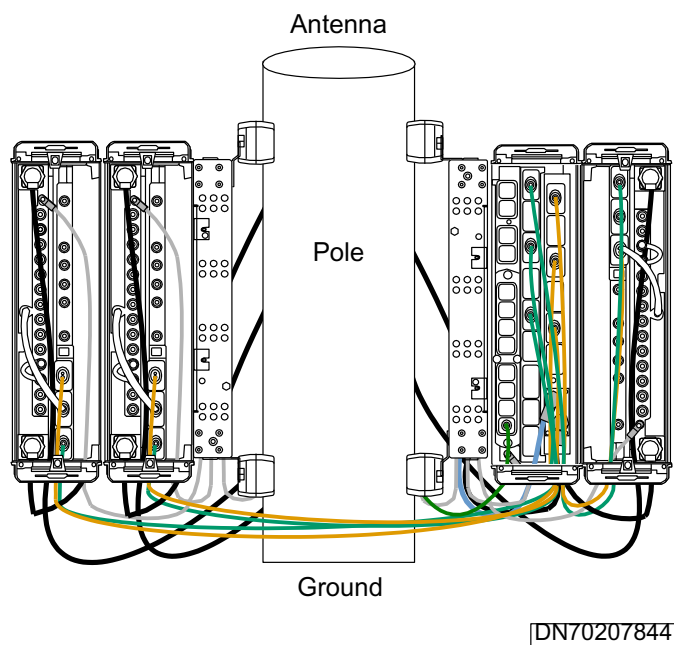
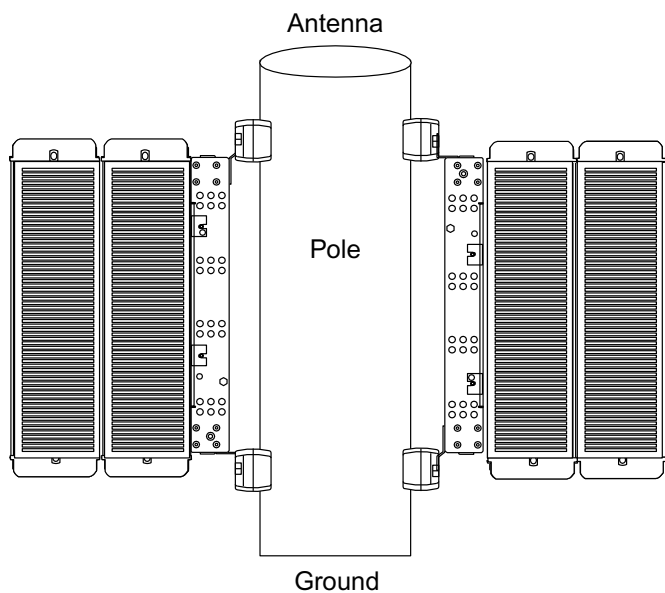


Figure 32. A 1+1+1/2+2+2 pole configuration: complete cabling (note: RF cabling as shown in figure *RF cables in a 1+1+1/2+2+2 configuration*)



DN70261474

Figure 33. A 1+1+1/2+2+2 pole configuration: covers on

2.4 Creating a 1+1+1/2+2+2 bypass 2UD in FCIA

Before you start

To create this configuration, you need:

- three Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)



Steps

1. **Install the modules.**

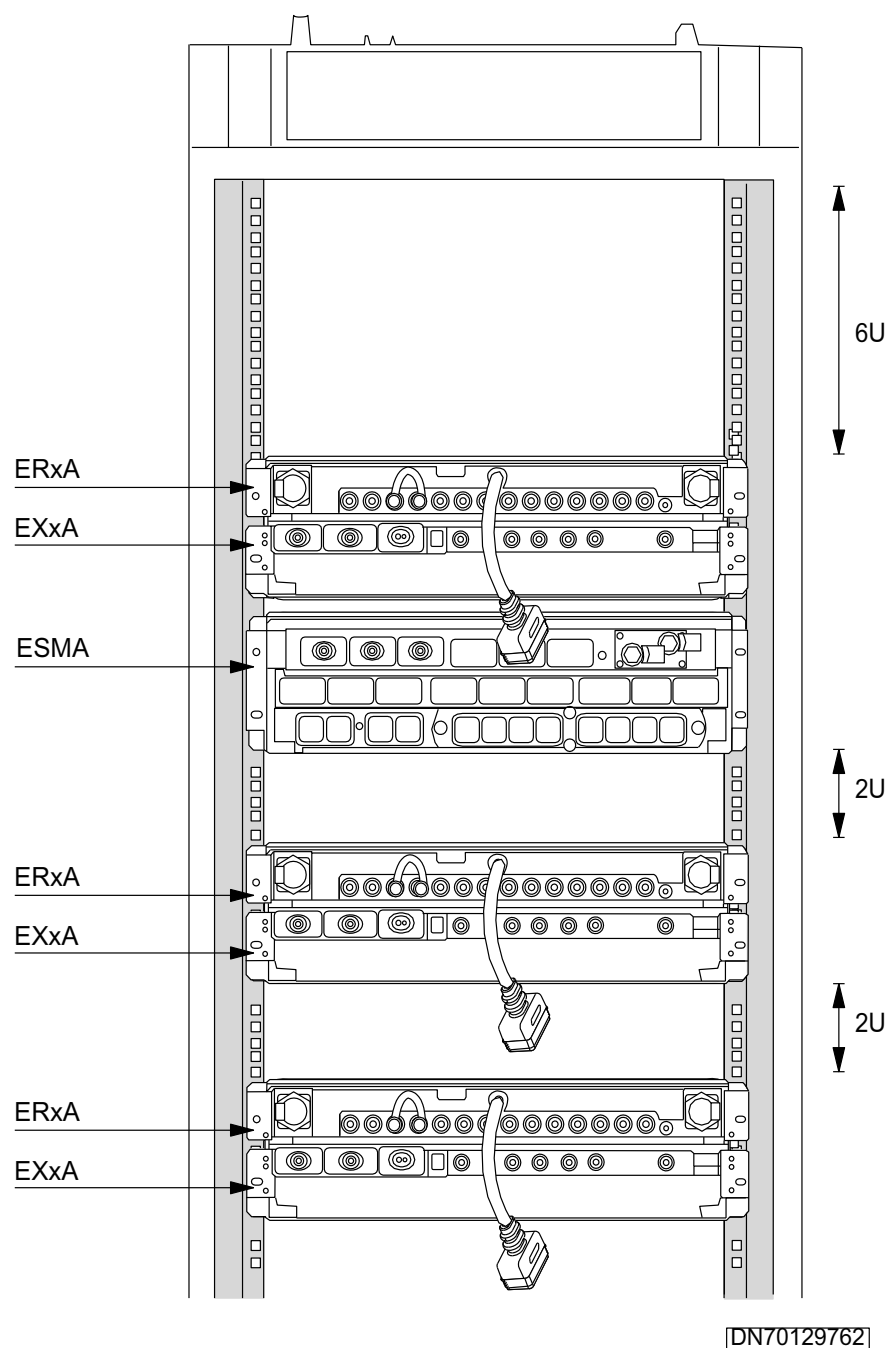


Figure 34. Module installation order in a 1+1+1/2+2+2 configuration in FCIA

2. Connect the cables.

The order to connect the cable is as follows:

- a. External power cables
- b. Dual Duplexer Module cable
- c. Bus cables
- d. Internal power cables
- e. RF cables
- f. Antenna jumper cables
- g. Transmission cables

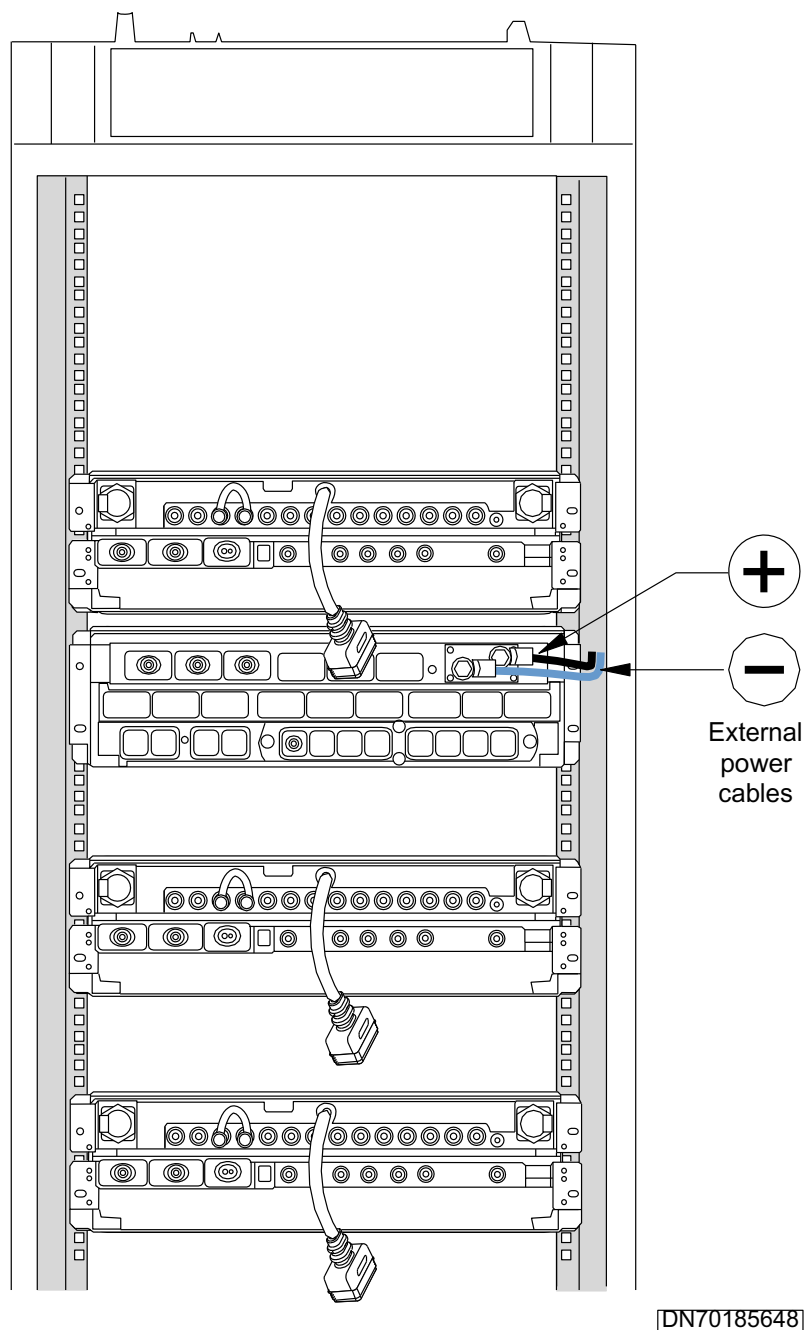


Figure 35. External power cables in a 1+1+1/2+2+2 FCIA configuration

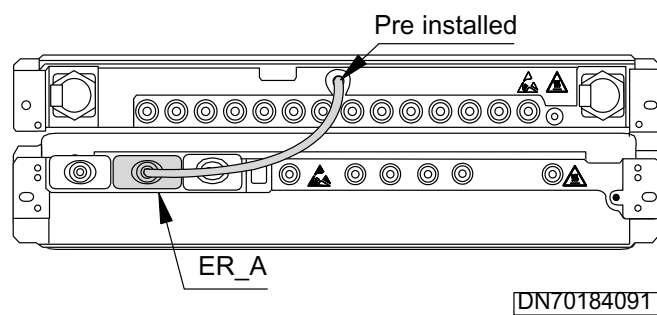


Figure 36. Dual Duplexer Module cable

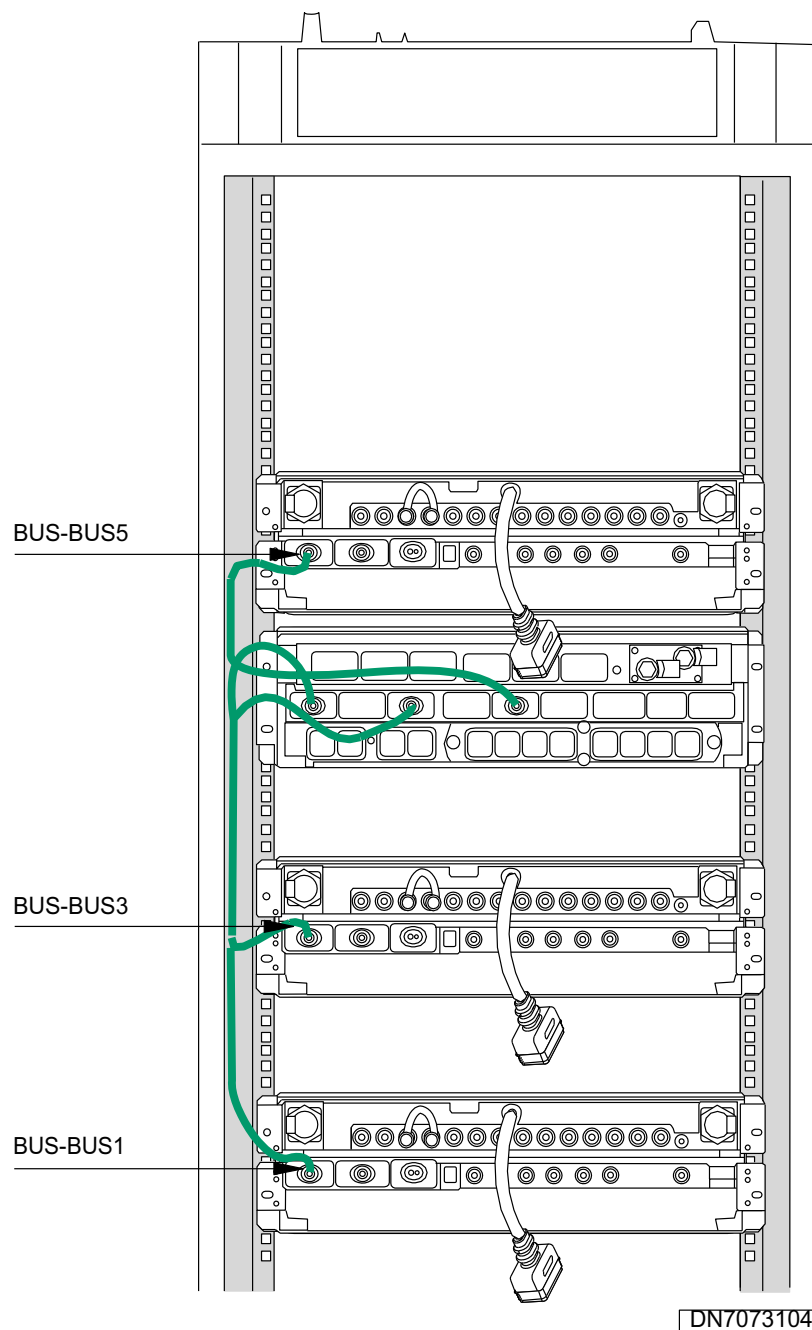


Figure 37. Bus cables in a 1+1+1/2+2+2 FCIA configuration

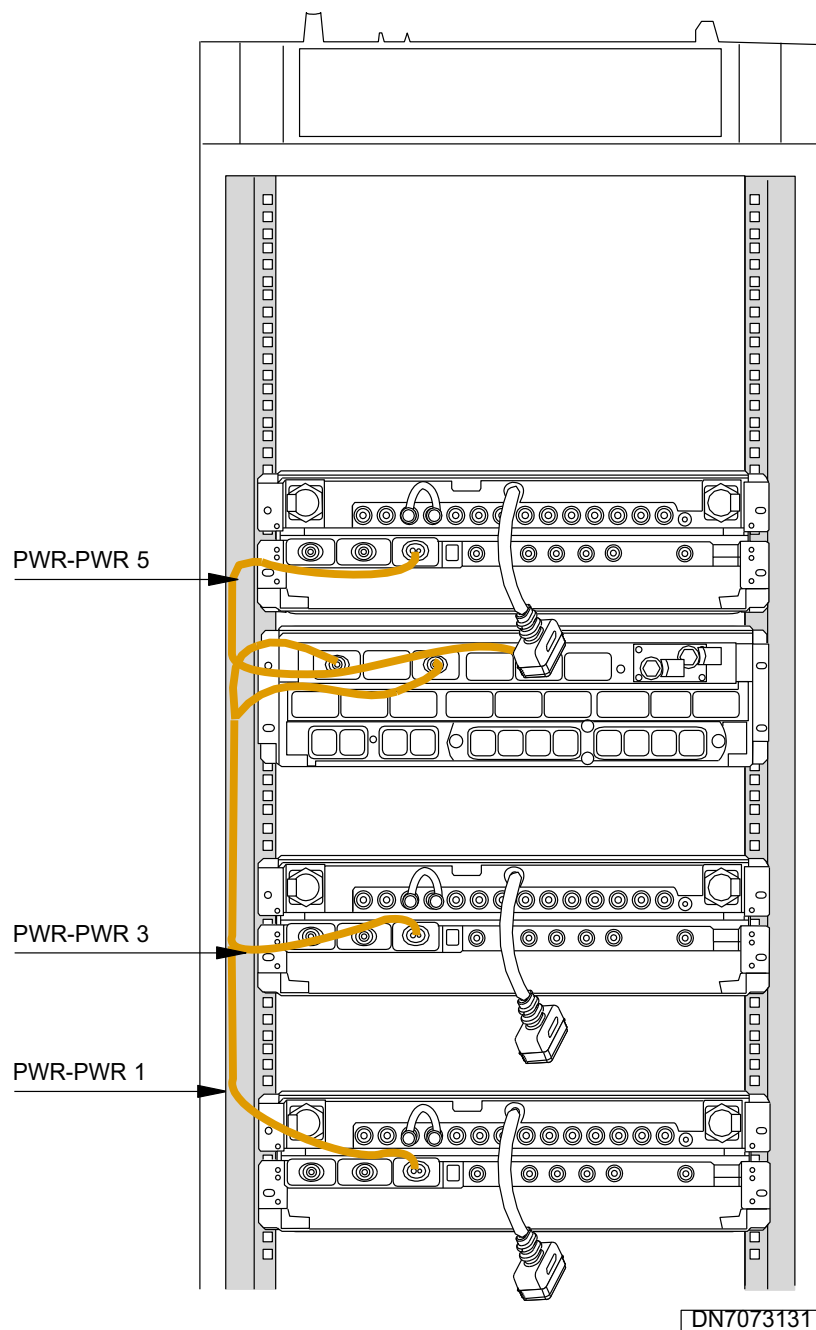


Figure 38. Internal power cables in a 1+1+1/2+2+2 FCIA configuration

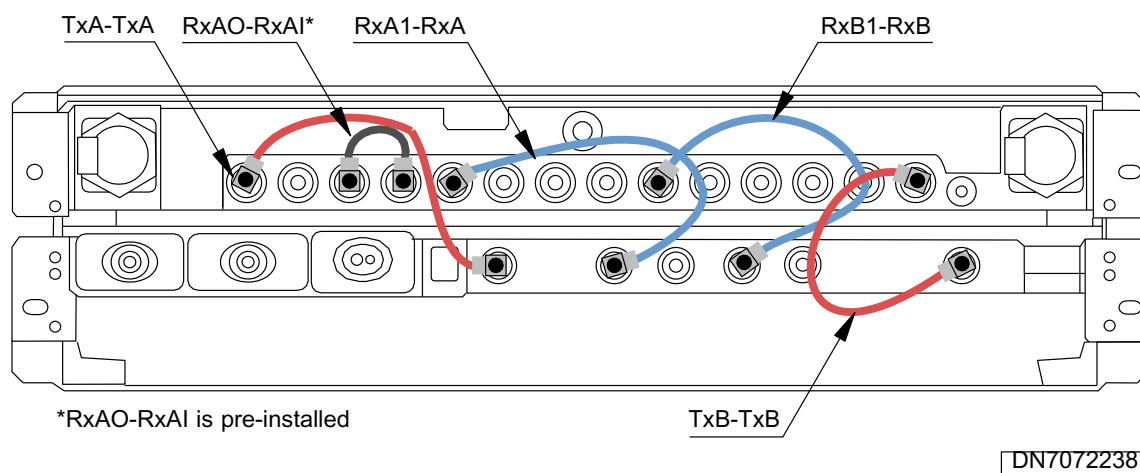


Figure 39. RF cables in a 1+1+1/2+2+2 configuration

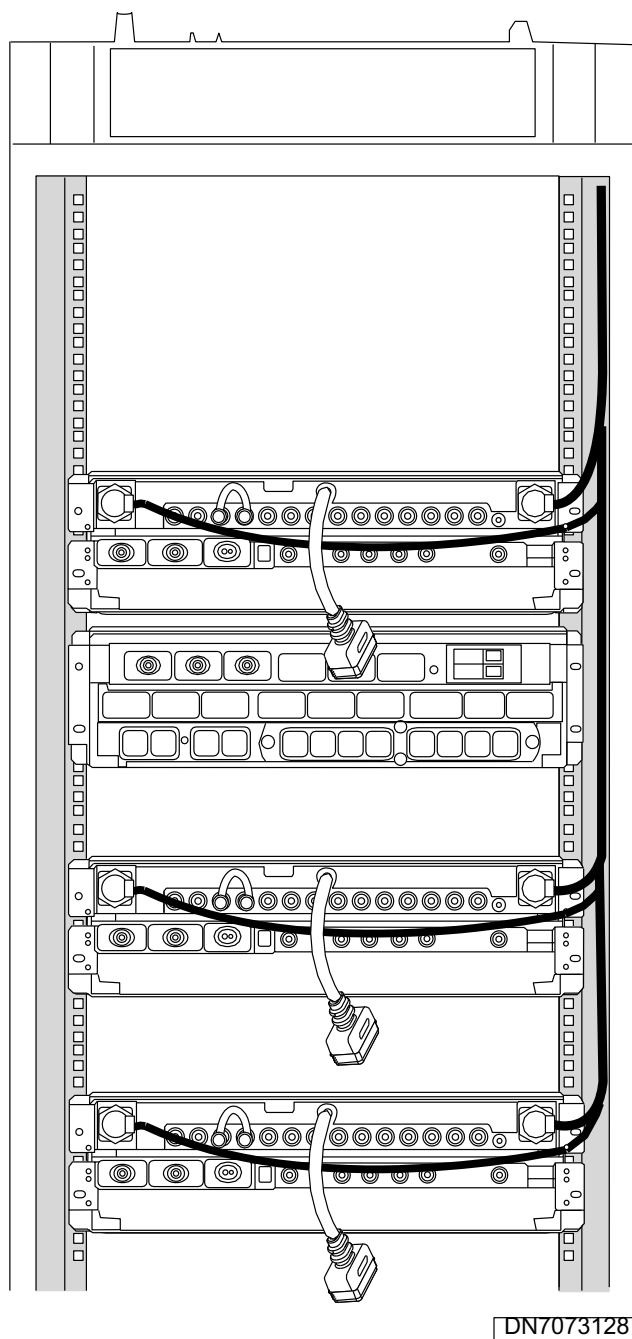


Figure 40. Antenna jumper cables in 1+1+1/2+2+2 FCIA configuration

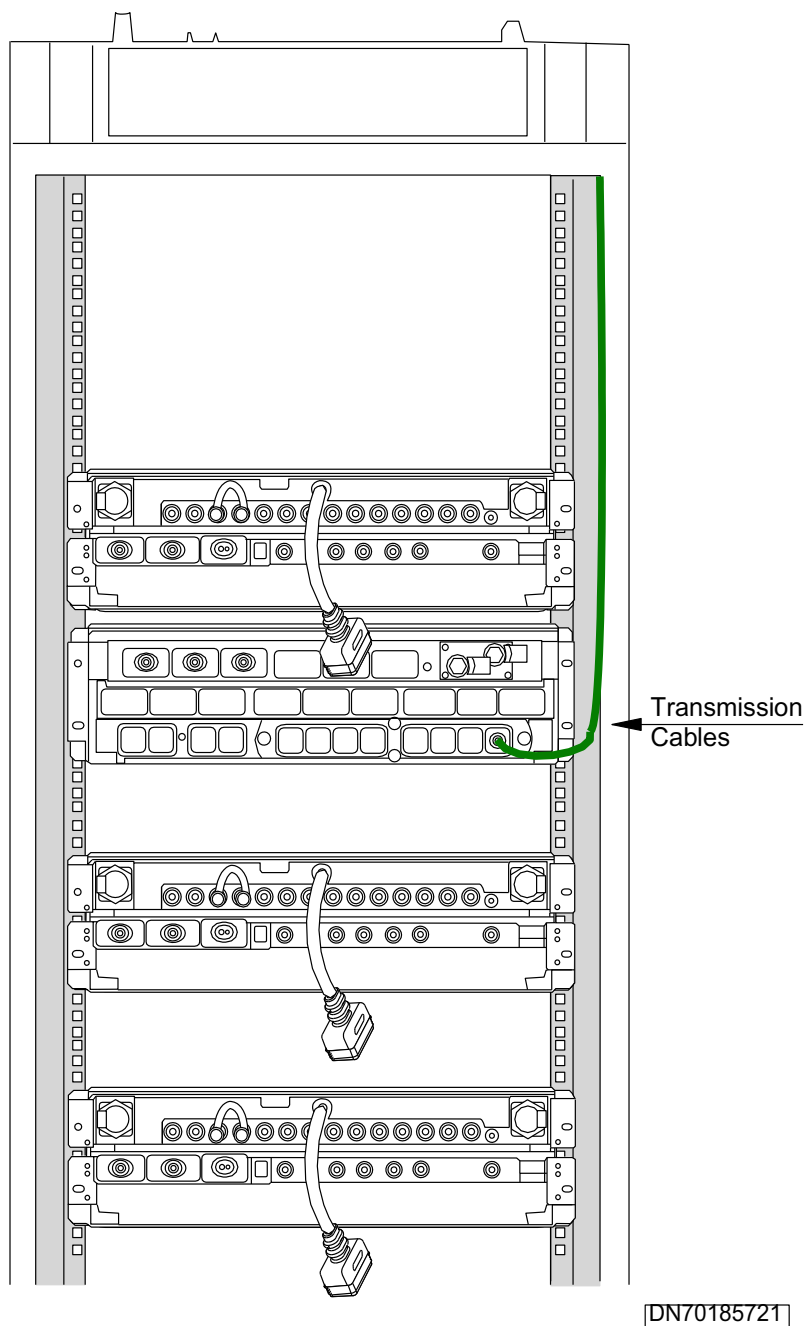
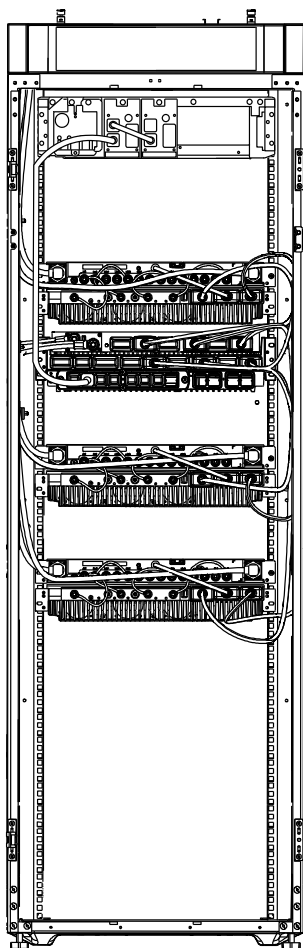


Figure 41. Transmission cables in 1+1+1/2+2+2 FCIA configuration

Expected outcome



DN70129786

Figure 42. 2+2+2 FCIA configuration: complete cabling (with optional FPMA).
Note: RF cabling as shown in figure *RF cables in a 1+1+1/2+2+2 configuration*.

2.5 Creating a 1+1+1/2+2+2 bypass 2UD in FCOA

Before you start

To create a 1+1+1 or 2+2+2 FCOA configuration, you need:

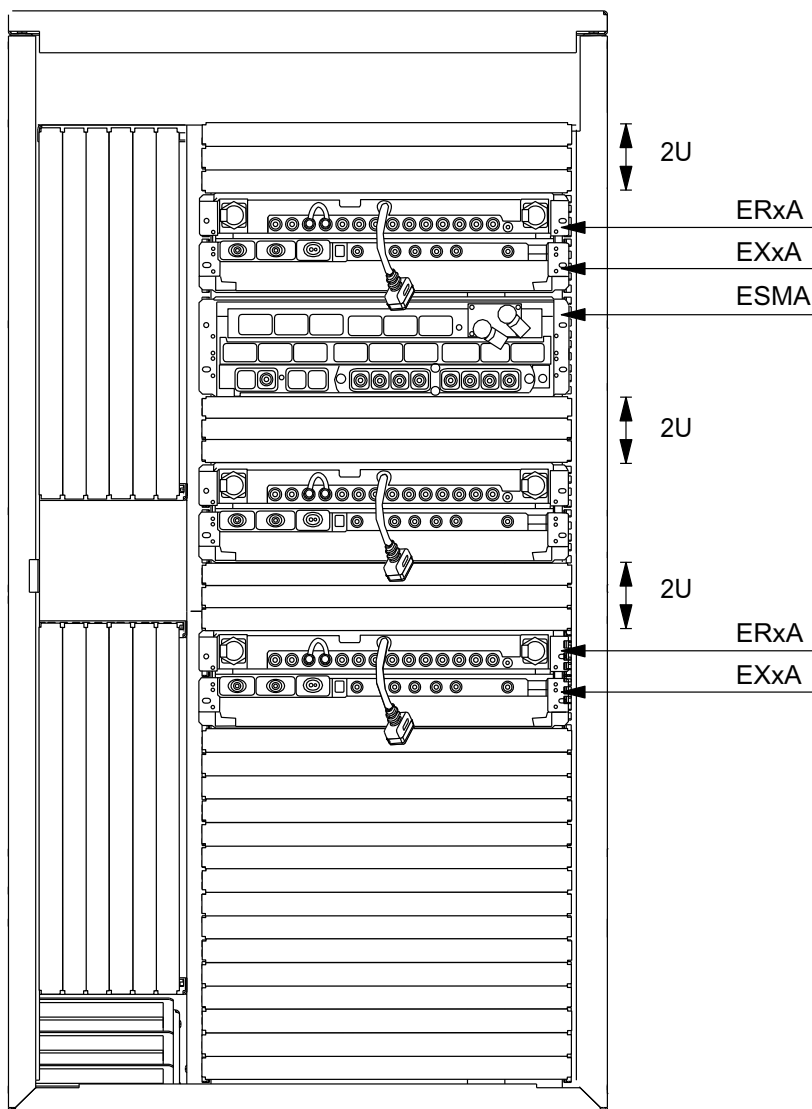
- three Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)



Steps

1. Install the modules and the dummy panels.

The System Module can be installed horizontally or vertically as shown in the figures below. Vertical installation is recommended if you are going to expand to an 8+8+8 configuration later, or if MIBBU is used.



DN70125696

Figure 43. Modules in a 1+1+1/2+2+2 FCOA configuration (ESMA horizontal)

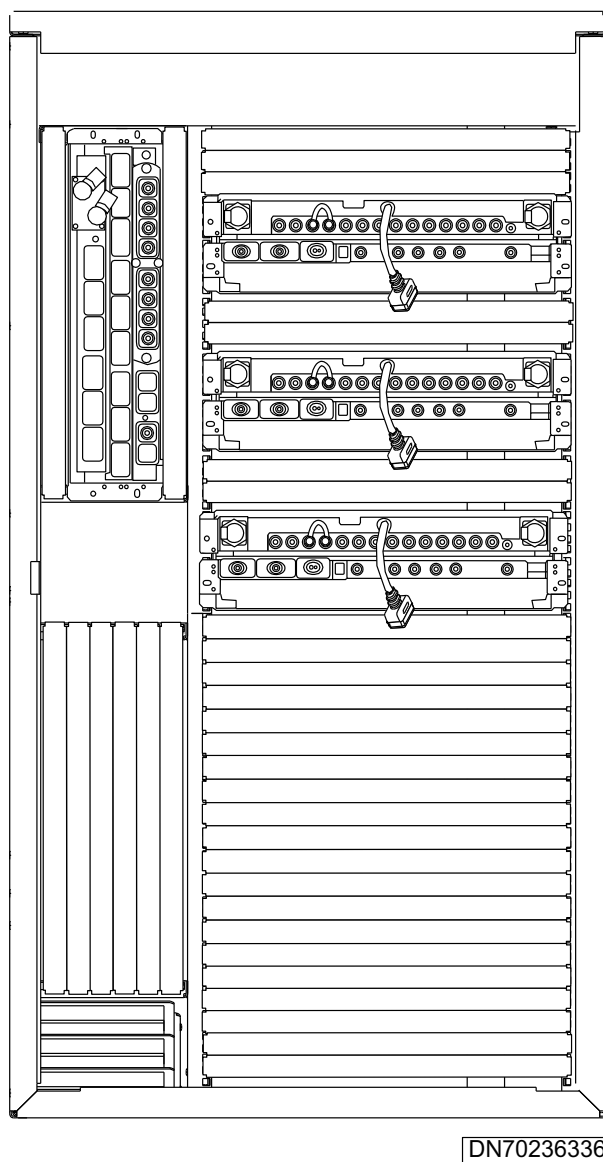


Figure 44. Module installation order in a 1+1+1/2+2+2 FCOA configuration (ESMA vertical)

2. Connect the cables.

The order to connect the cable is as follows:

- a. External power cables
- b. Dual Duplexer Module cable

- c. Bus cables
- d. Internal power cables
- e. RF cables
- f. Antenna jumper cables
- g. Transmission cables

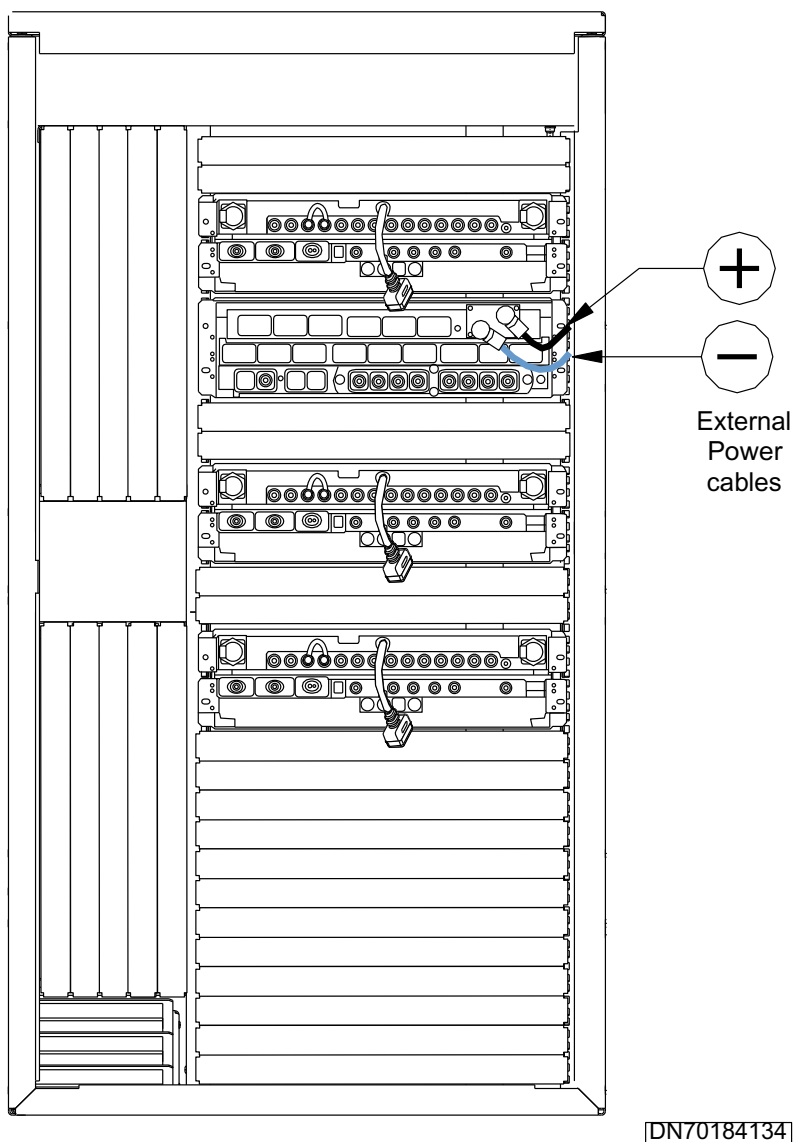


Figure 45. External power cables in a 1+1+1/2+2+2 FCOA configuration

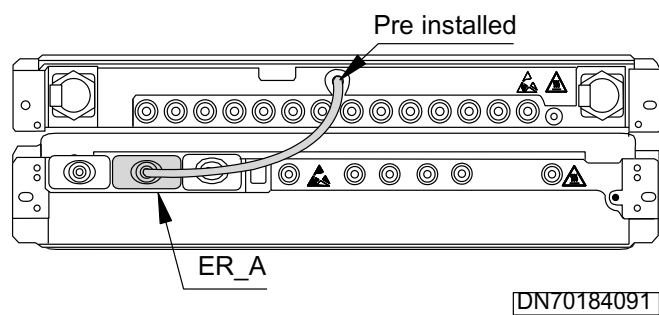


Figure 46. Dual Duplexer Module cable

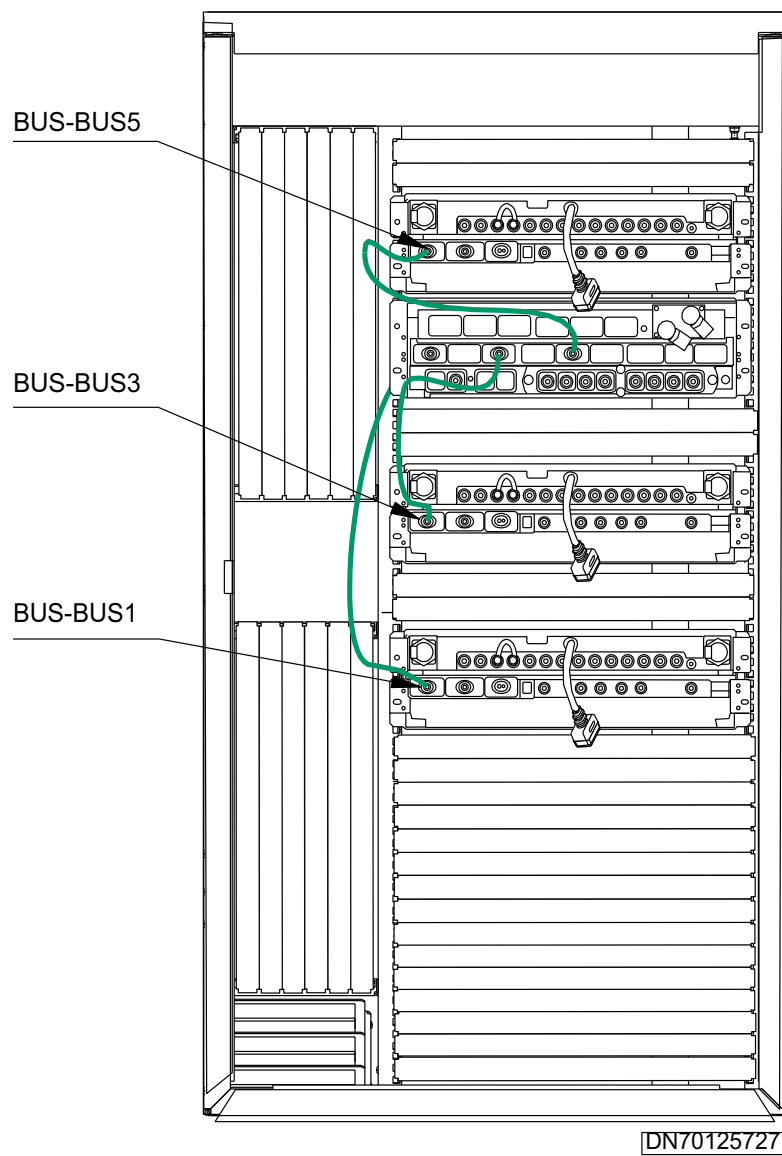


Figure 47. Bus cables in a 1+1+1/2+2+2 FCOA configuration

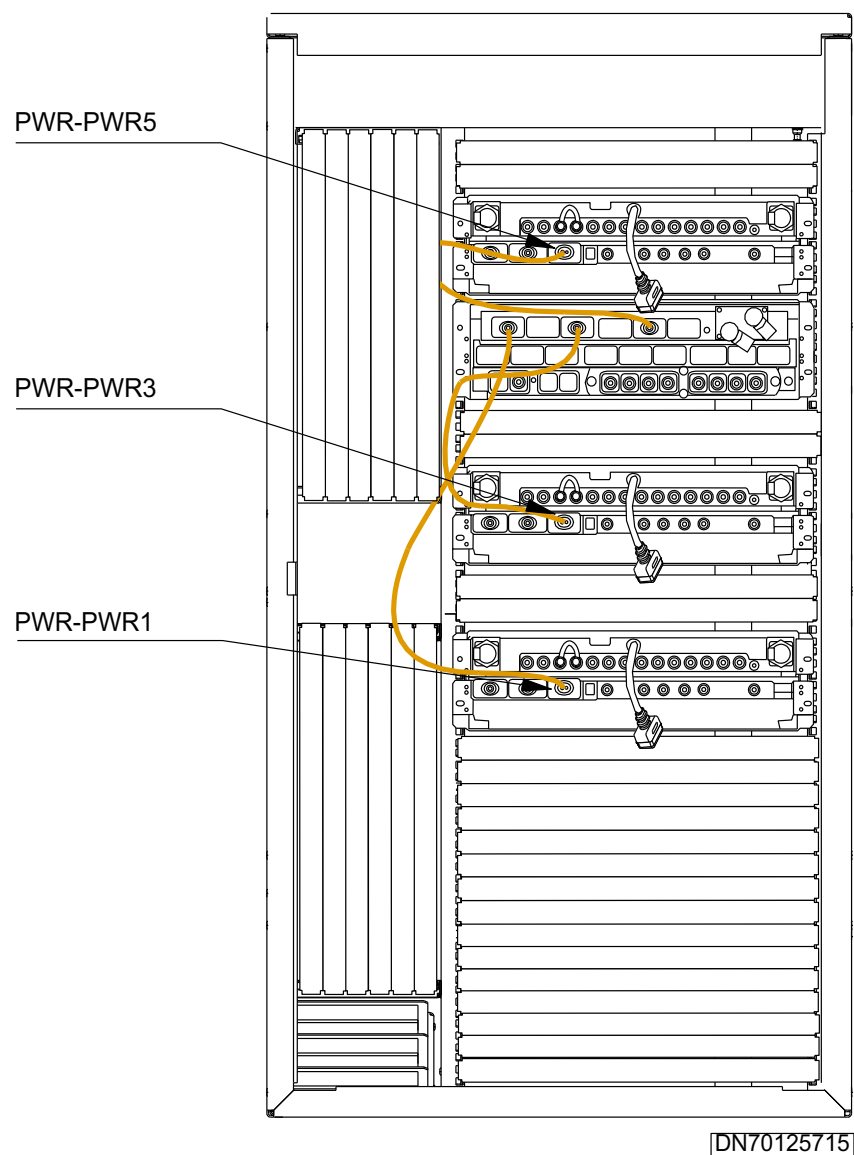


Figure 48. Internal power cables in a 1+1+1/2+2+2 FCOA configuration

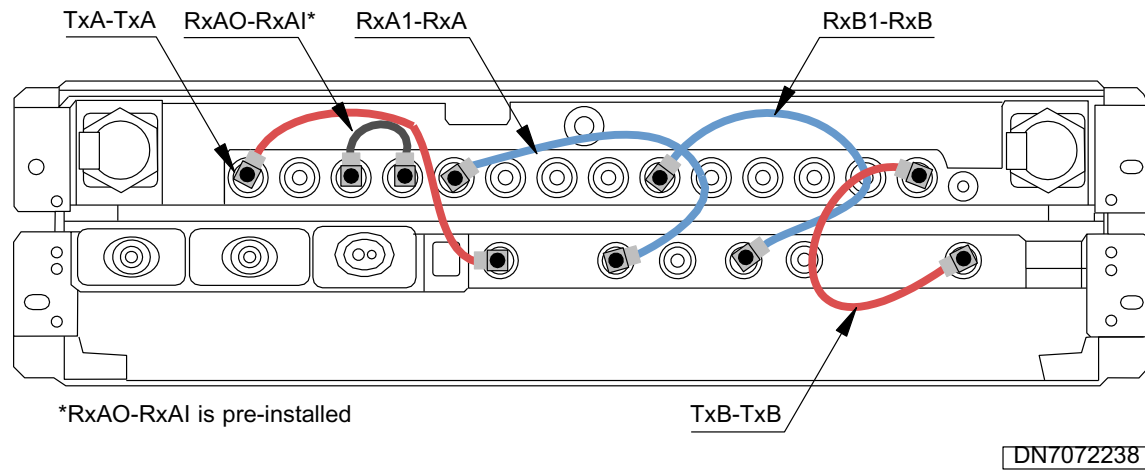
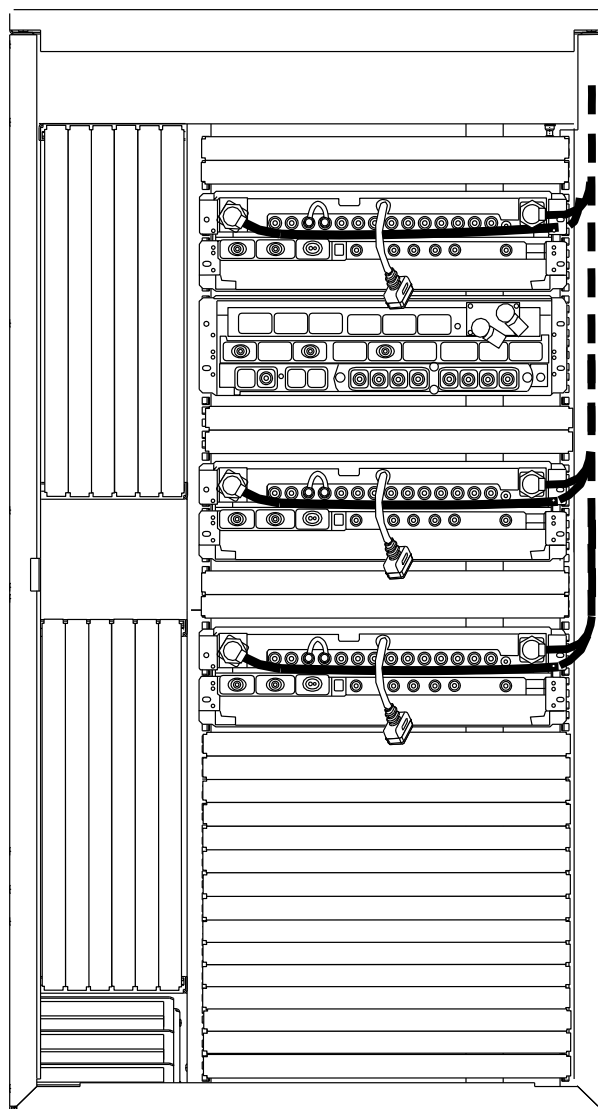


Figure 49. RF cables in a 1+1+1/2+2+2 configuration



DN70125739

Figure 50. Antenna jumper cables in a 1+1+1/2+2+2 FCOA configuration

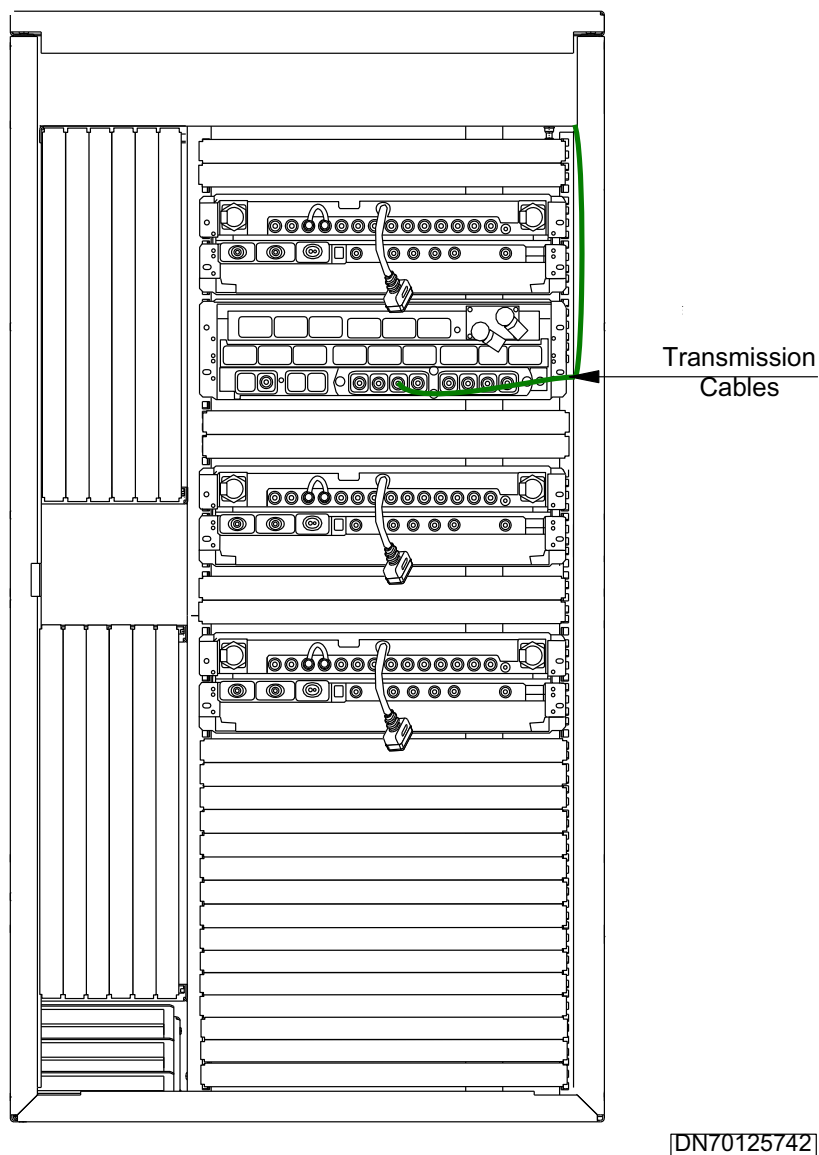
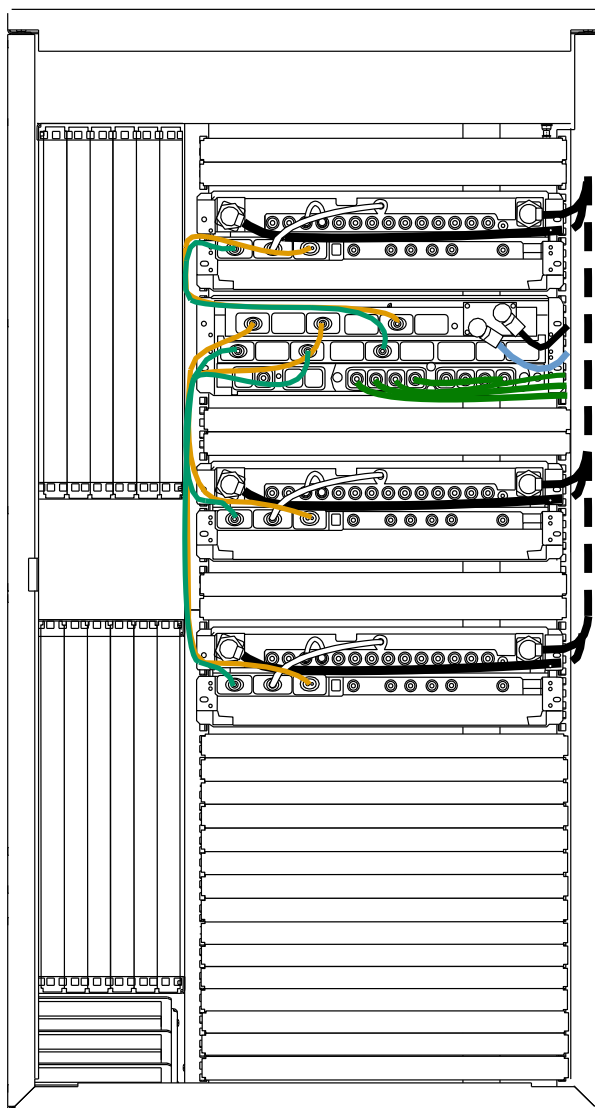


Figure 51. Transmission cables in a 1+1+1/2+2+2 FCOA configuration

Expected outcome



DN70125754

Figure 52. A 1+1+1/2+2+2 FCOA configuration: complete cabling (note: RF cabling as shown in figure *RF cables in a 1+1+1/2+2+2 configuration*)

3

Expanding to a 3+3+3/4+4+4 2-way 2UD configuration

3.1 Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with 48V DC power

Before you start

This section contains instructions for expanding up to three sectors from a 1+1+1/2+2+2 2-way 2UD configuration. You will need the following modules, depending on the number of expansion sectors:

- One sector
 - 1 Dual TRX Module (EXxA)
 - 2 Wideband Combiner Sub-module (EWxx)
 - With stack installation, one 2U casing kit (EMTA)
- Two sectors
 - 2 Dual TRX Modules (EXxA)
 - 4 Wideband Combiner Sub-module (EWxx)
 - With stack installation, two 2U casing kits (EMTA) and one upgrade cable kit (EUCA)
- Three sectors
 - 3 Dual TRX Modules (EXxA)
 - 6 Wideband Combiner Sub-module (EWxx)
 - With stack installation, three 2U casing kits (EMTA) and two upgrade cable kits (EUCA)

Summary

The figures below show the module installation order for expanding all three sectors for FCIA, FCOA, and stack installations. The modules that need to be added are indicated in the figures.

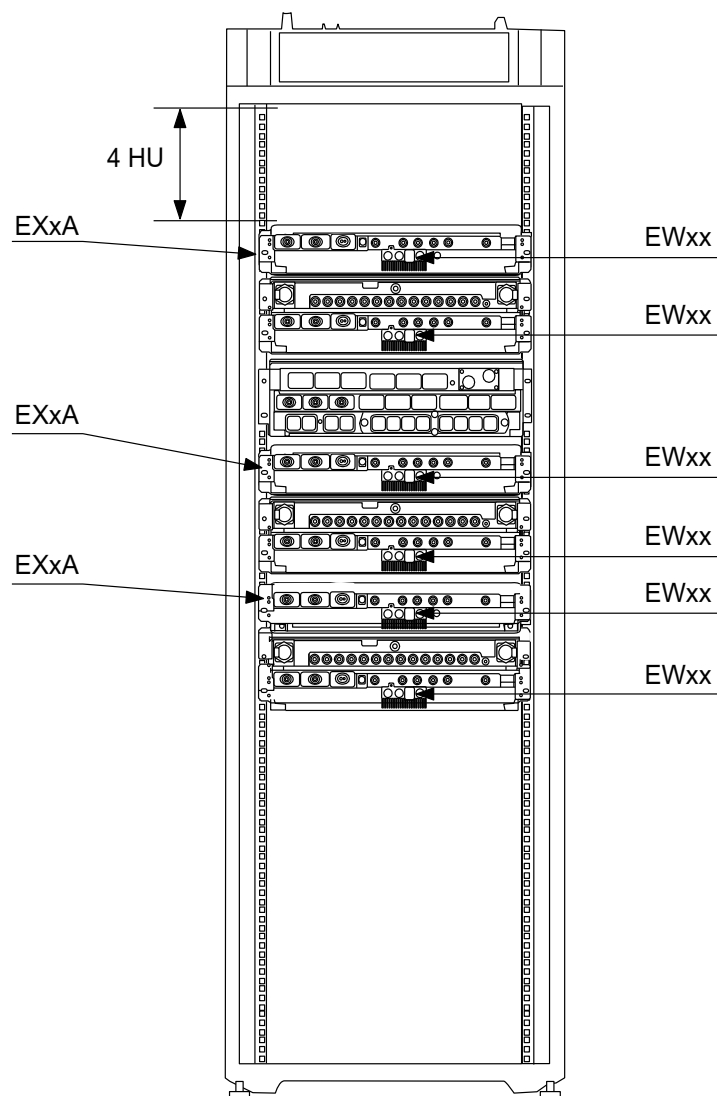


Figure 53. Modules for 3+3+3/4+4+4 expansion in FCIA

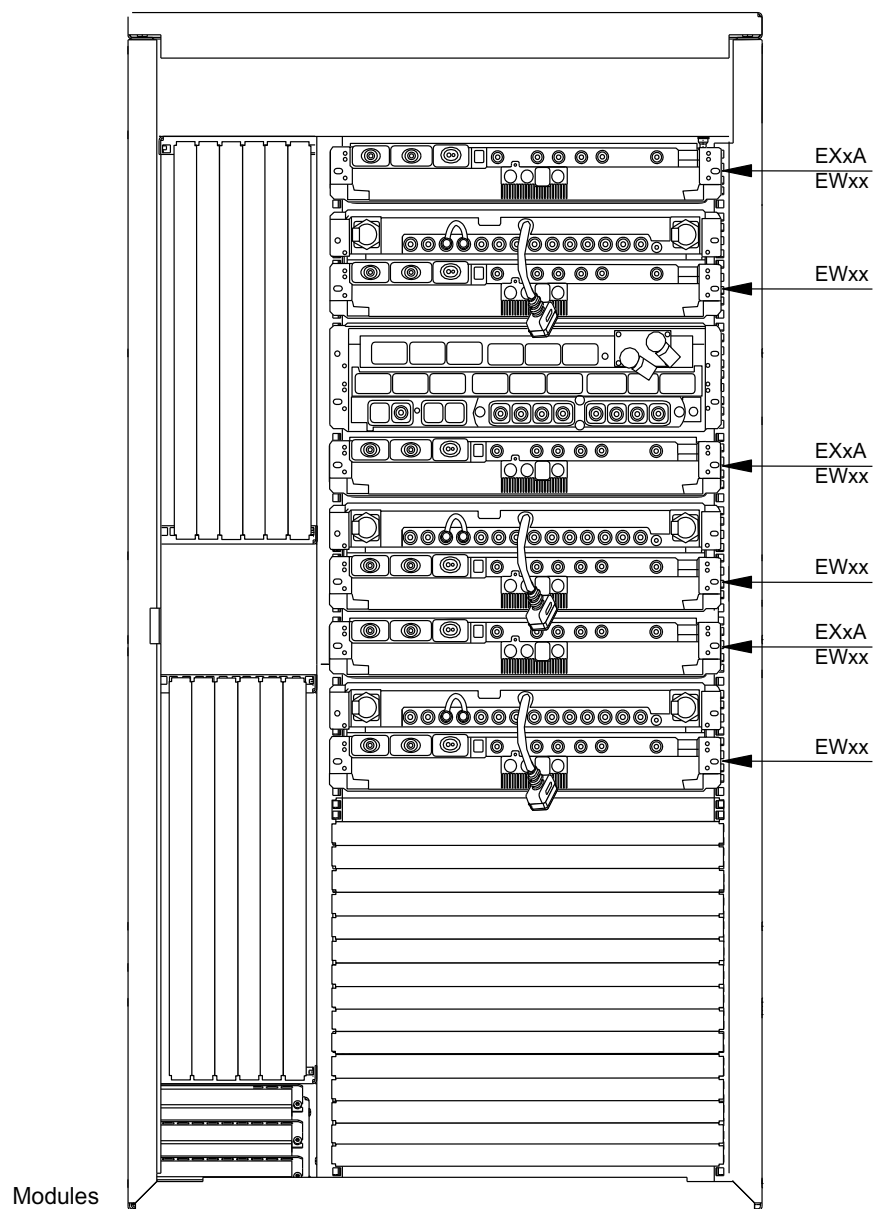


Figure 54. Modules for 3+3+3/4+4+4 expansion in FCOA

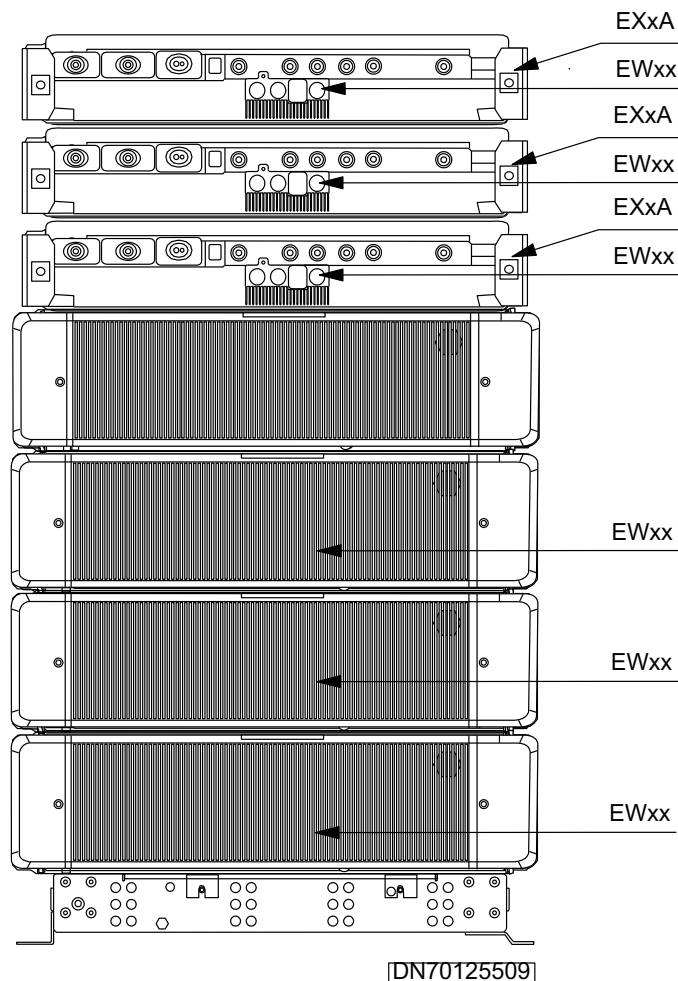


Figure 55. Modules for 3+3+3/4+4+4 expansion in stacks



Steps

1. If this is a stack installation, install the casing for the new Dual TRX Module.
2. If this is a stack installation, remove the front covers from the System Module and Dual TRX Module in the sector being expanded.
3. Install the new Dual TRX Module.

4. **If this is a stack installation, install the cable entries on the new Dual TRX Module.**
5. **Install the Wideband Combiner Sub-modules.**

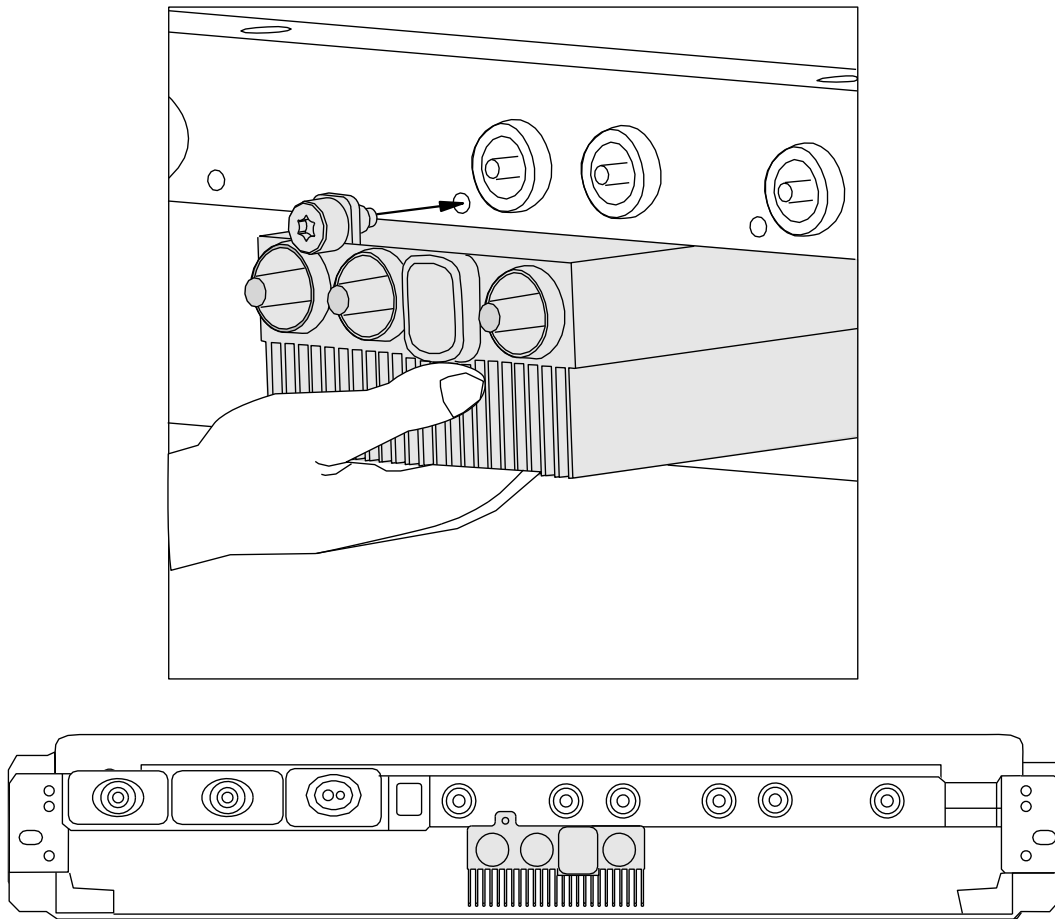


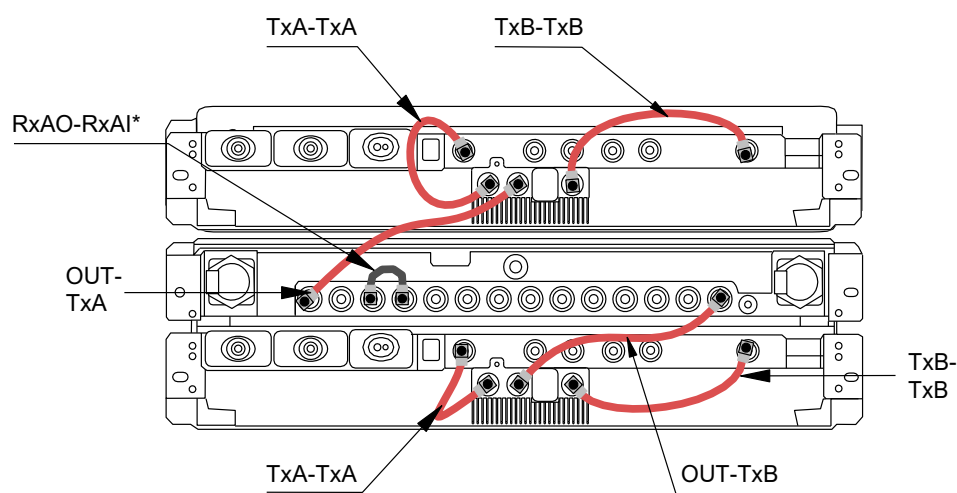
Figure 56. Installing Wideband Combiner Sub-module

6. **Connect the bus cable for the new Dual TRX Module.**
7. **Notify the appropriate personnel and block the sector with Nokia Flexi EDGE BTS Manager.**

Alternatively, you can request a sector lock from the BSC.

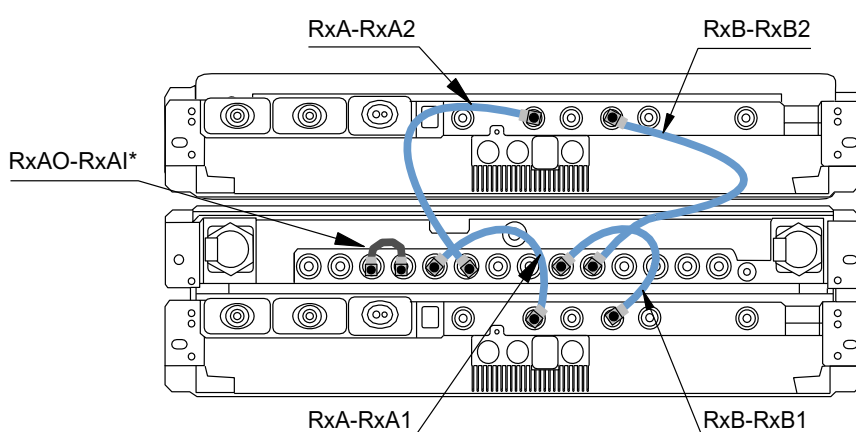
8. **Wait for stable yellow LED to be displayed on the existing Dual TRX Module.**

9. Using Nokia Flexi EDGE BTS Manager, disable power to the System Module port on the existing and new Dual TRX Modules.
10. Connect the power cable for the new Dual TRX Module.
11. For sectors using standard RF cables, connect the cables as shown in the picture below.



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 57. RF cables in 3+3+3/4+4+4 2-way 2UD

Table 4. Expansion kits needed

From	To	Expansion cable kits needed
2+2+2	2+2+4	0
2+2+2	2+4+4	1
2+2+2	4+4+4	2

12. For sectors using the Upgrade Cable Kit (EUCA), connect the cables as shown in the picture below.

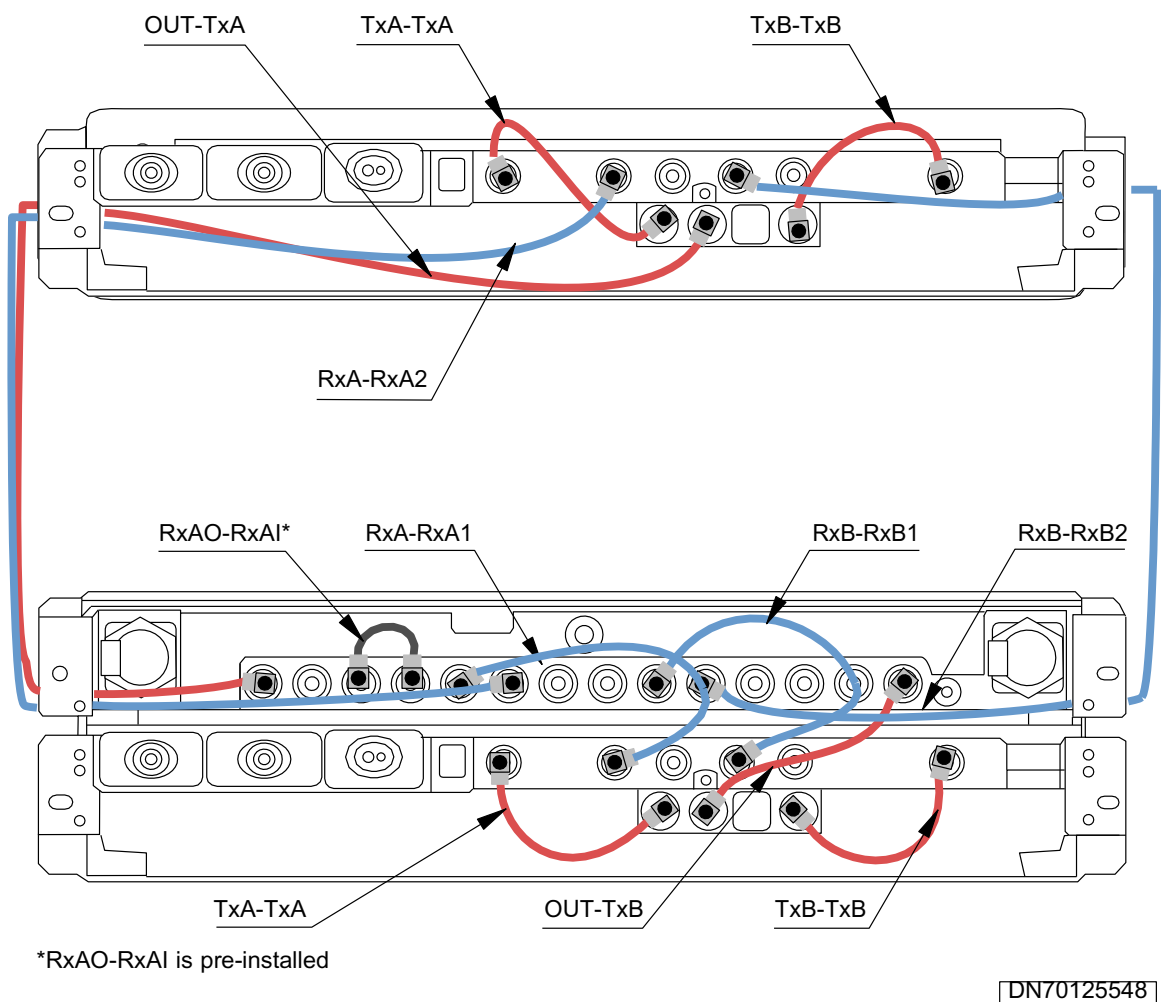


Figure 58. RF cables in 3+3+3/4+4+4 2-way 2UD expansion

Table 5. Connecting TX cables

Number	Cable	From - to
1	994931	TxA (ERxA) - TxA (EWxx)
2	994931	TxB (ERxA) - TxB (EWxx)
3	994931	OUT (EWxx) - TxB (ERxA)
4	994931	TxA (EXxA) - TxA (EWxx)
5	994931	TxB (EXxA) - TxB (EWxx)
6	994936	OUT (EWxx) - TxA (ERxA)

Table 6. Connecting RX cables

Number	Cable	From - to
7	994936	RxA (EXxA) - RxA1 (ERxA)
8	994936	RxB (ERxA) - RxB4 (EXxA)
9	994931	RxA (ERxA) - RxA2 (EXxA)
10	994931	RxB (ERxA) - RxB1 (EXxA)

13. Enable power to the Dual TRX Modules.

14. Unblock the sector with Nokia Flexi EDGE BTS Manager.

Alternatively, you can request to unlock the sector from the BSC.

15. Reset the sector with Nokia Flexi EDGE BTS Manager.

16. If front covers are used, re-install them.

3.2 Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with AC or 24V DC power

Before you start

This section provides instructions for expanding all three sectors from a 1 +1+1/2+2+2 2-way 2UD configuration with 24V DC or AC power.

Separate instructions are needed because an additional power module needs to be installed, which requires mains power to the BTS to be turned off.

Note that if only 1 or 2 sectors are being expanded, then an additional power module is not needed and you should follow same the instructions in *Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with 48V DC power*.

The following HW is needed, depending on the configuration:

- 3 Dual TRX Modules (EXxA)
- 6 Wideband Combiner Sub-module (EWxx)
- If 24 V DC power is used, an additional FPDA and three upgrade cable kits (EUCA) are needed
- If AC power is used, then an additional FPAA is needed and two upgrade cable kits (EUCA) are needed.
- If the BTS is using short-term battery backup (FPBA), then an FPBA needs to be added, along with the FPAA. Follow the same instructions for adding FPAA.



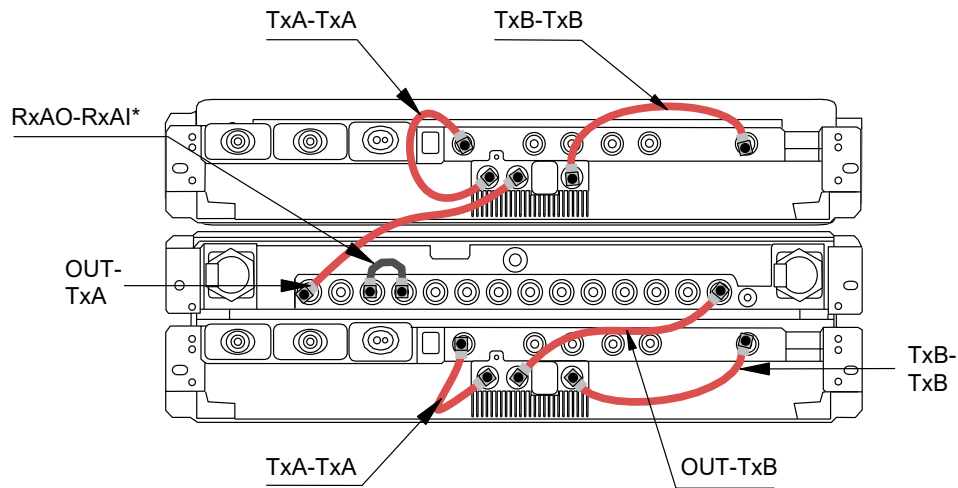
Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

Alternatively, you can request a BCF lock from the BSC.

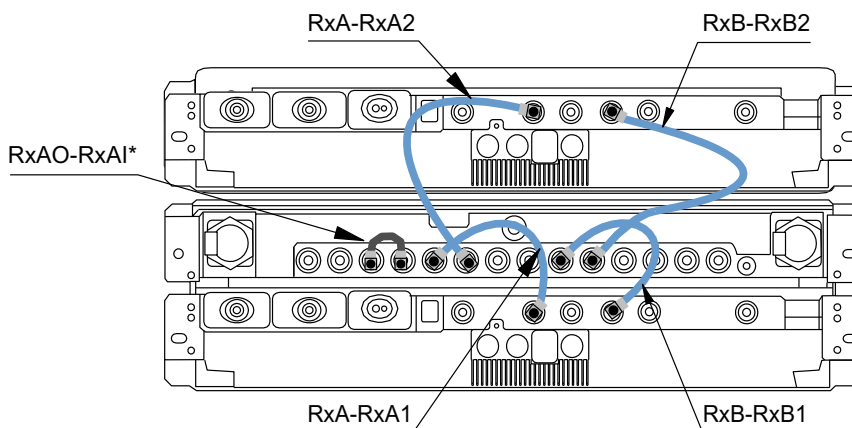
2. **Disconnect the mains power breaker.**
3. **Connect the ESD wrist strap.**
4. **If this is a stack installation, remove the front covers.**
5. **If 24V DC power is used, do as follows:**
 - a. Install the new FPDA directly on top of the existing FPDA.
 - b. Connect the external DC power cables to the DC inputs of the new FPDA.
 - c. Connect the DC output of the new FPDA to the DC output of the existing FPDA. Route the cables using the double rubber boot provided in the FPDA delivery.
 - d. Chain the alarm cable for the new FPDA to the existing FPDA.

6. **If AC power is used, install and cable the new FPAA sub-module as described in Replacing AC DC sub-module FPAA.**
7. **If this is a stack installation, install the casing for the new Dual TRX Module.**
8. **Install the new Dual TRX Module.**
9. **If this is a stack installation, install the cable entries.**
10. **Install the Wideband Combiner Sub-modules.**
11. **Connect the power and bus cable for the new Dual TRX Module.**
12. **For sectors using RF cables, connect the RF cables as shown in the figure below.**



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 59. RF cables in 3+3+3/4+4+4 2-way 2UD

13. For sectors using the Upgrade Cable Kit (EUCA), connect the cables as shown in the picture below.

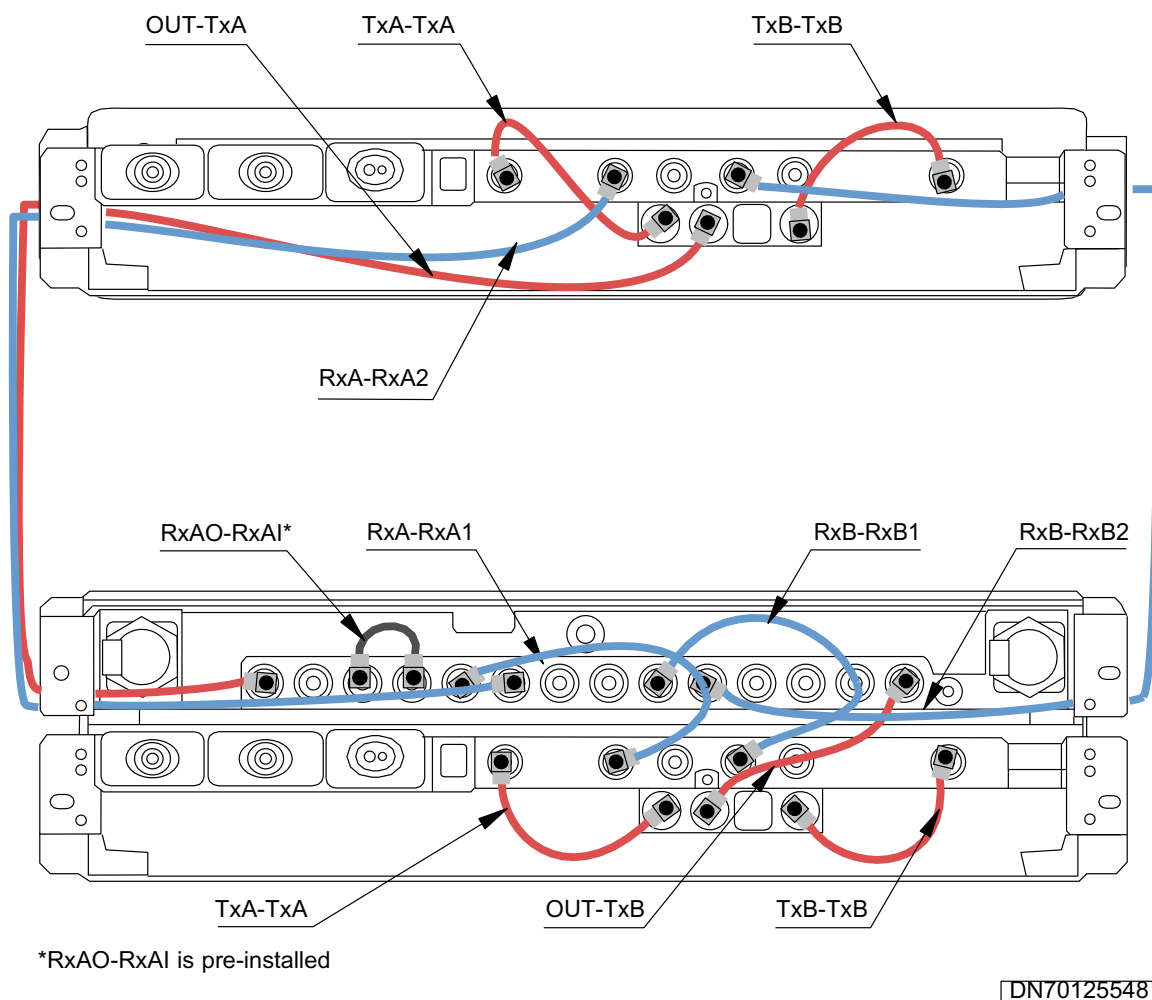


Figure 60. RF cables in 3+3+3/4+4+4 2-way 2UD expansion

Table 7. Connecting TX cables

Number	Cable	From - to
1	994931	TxA (ERxA) - TxA (EWxx)
2	994931	TxB (ERxA) - TxB (EWxx)
3	994931	OUT (EWxx) - TxB (ERxA)
4	994931	TxA (EXxA) - TxA (EWxx)
5	994931	TxB (EXxA) - TxB (EWxx)

Table 7. Connecting TX cables (cont.)

6	994936	OUT (EWxx) - TxA (ERxA)
---	--------	-------------------------

Table 8. Connecting RX cables

<i>Number</i>	<i>Cable</i>	<i>From - to</i>
7	994936	RxA (EXxA) - RxA1 (ERxA)
8	994936	RxB (ERxA) - RxB4 (EXxA)
9	994931	RxA (ERxA) - RxA2 (EXxA)
10	994931	RxB (ERxA) - RxB1 (EXxA)

- 14. Connect the mains power breaker.**
- 15. Switch on the power to the FPDAs or FPAA's.**
- 16. Unblock the BCF with Nokia Flexi EDGE BTS Manager.**
Alternatively, you can request to unlock the BCF from the BSC.
- 17. Reset the sector with Nokia Flexi EDGE BTS Manager.**
- 18. If this is a stack configuration, re-install the front covers.**

4

Creating 3+3+3/4+4+4 2-way 2UD configurations

4.1 Creating a 3+3+3/4+4+4 2-way 2UD in a stack

Before you start

For creating this configuration, you need:

- six Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)
- six Wideband Combiner Sub-modules (EWxx)



Steps

1. **Install the Wideband Combiner Sub-module in the Dual TRX Module, and install the modules.**

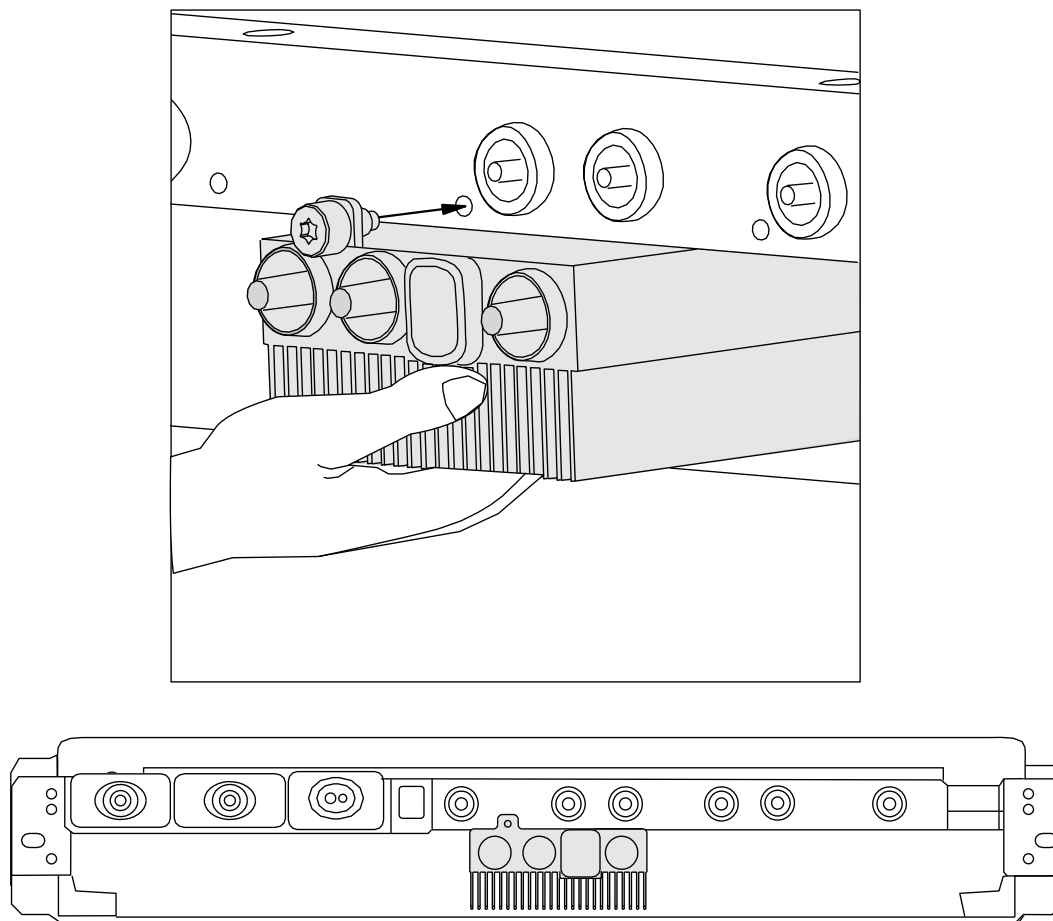


Figure 61. Installing Wideband Combiner Sub-module

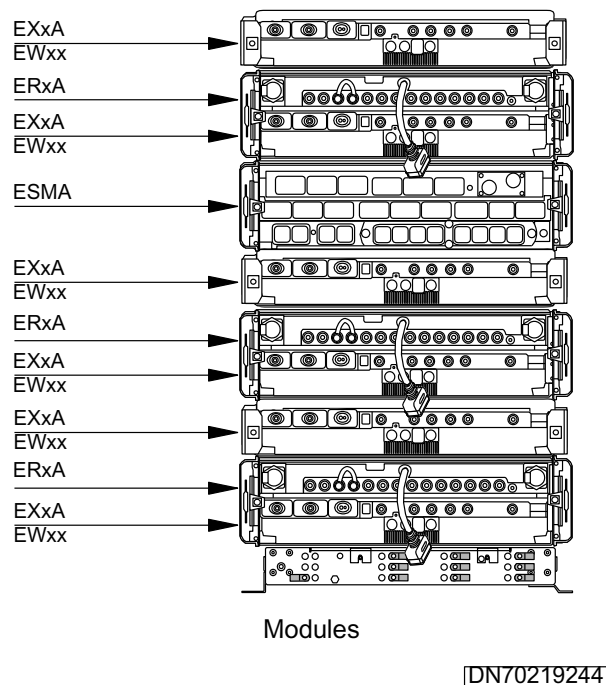
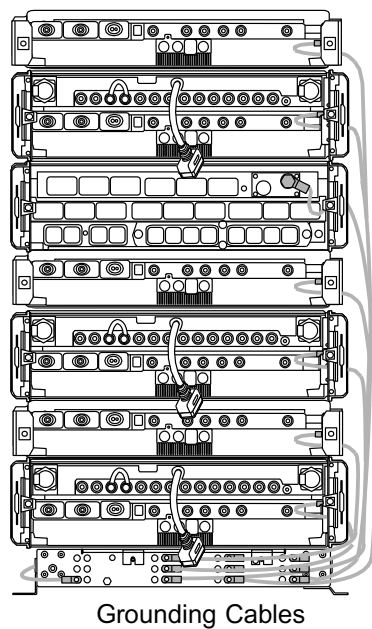


Figure 62. Modules in a 3+3+3/4+4+4 stack configuration

2. Connect the cables.

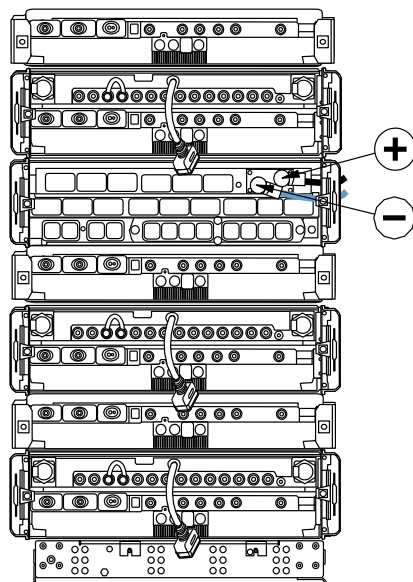
The order to connect the cables is as follows:

- a. Grounding cables
- b. External power cables
- c. Dual Duplexer Module cable
- d. Bus cables
- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables



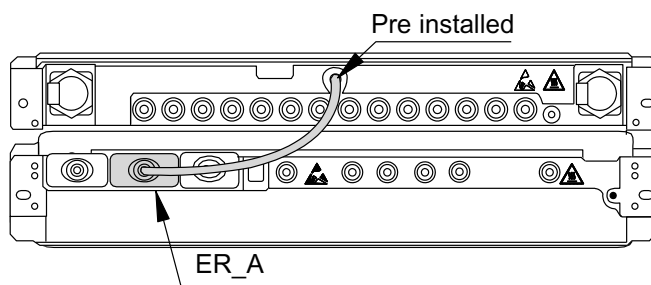
DN7073825

Figure 63. Grounding cables in a 3+3+3/4+4+4 stack configuration



DN70219256

Figure 64. External power cables in a 3+3+3/4+4+4 stack configuration



DN70184091

Figure 65. Dual Duplexer Module cable

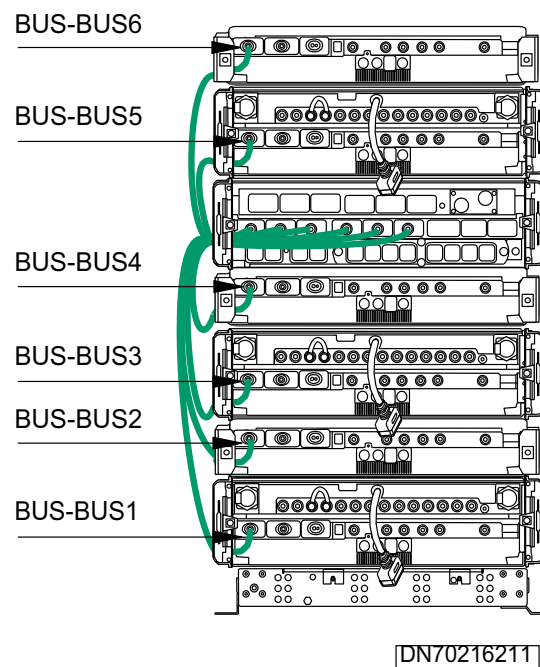


Figure 66. Bus cables in a 3+3+3/4+4+4 stack configuration

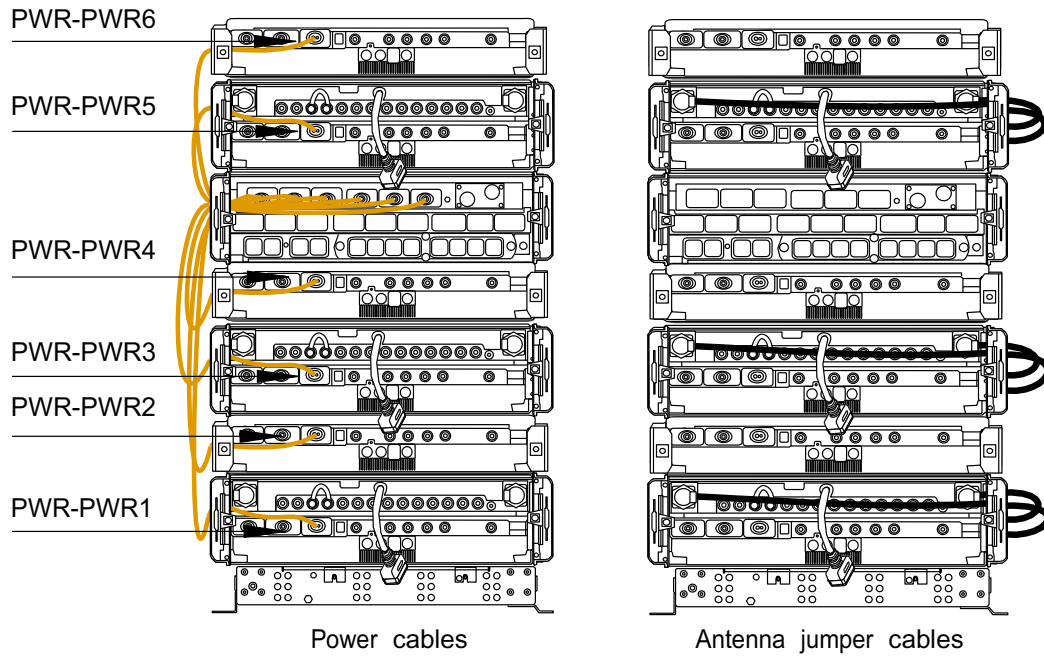
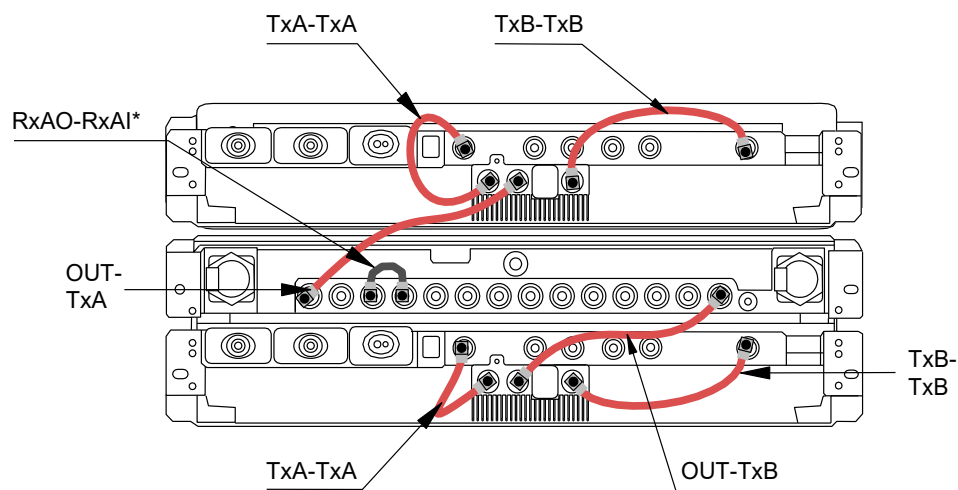
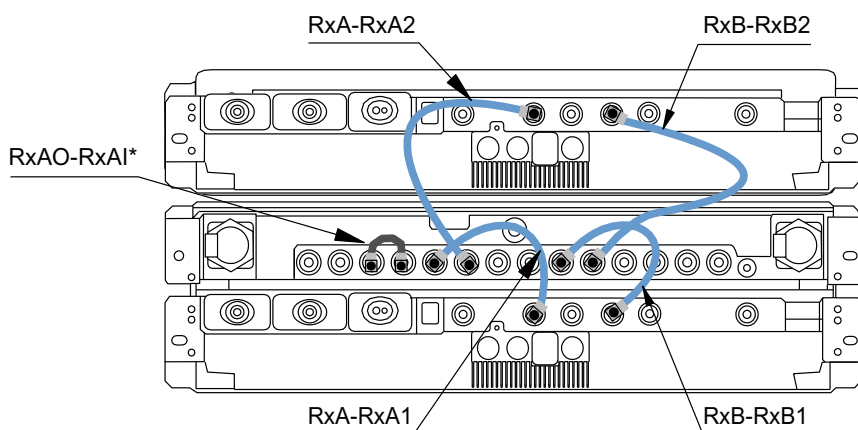


Figure 67. Internal power cables and antenna jumper cables in a 3+3+3/4+4+4 stack configuration



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 68. RF cables in a 3+3+3/4+4+4 2-way 2UD configuration

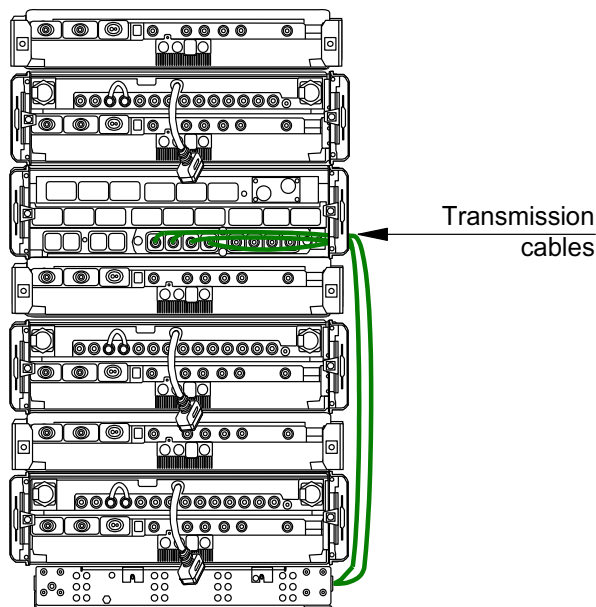


Figure 69. Transmission cables in a 3+3+3/4+4+4 stack configuration

4.2 Creating a 3+3+3/4+4+4 2-way 2UD on a wall

Before you start

For creating this configuration, you need:

- six Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- six Wideband Combiner Submodules (EWxx)
- Extension Ethernet and Power Cable Kit (EPCA)



Steps

1. **Install the Wideband Combiner Sub-module in the Dual TRX Module, and install the modules.**

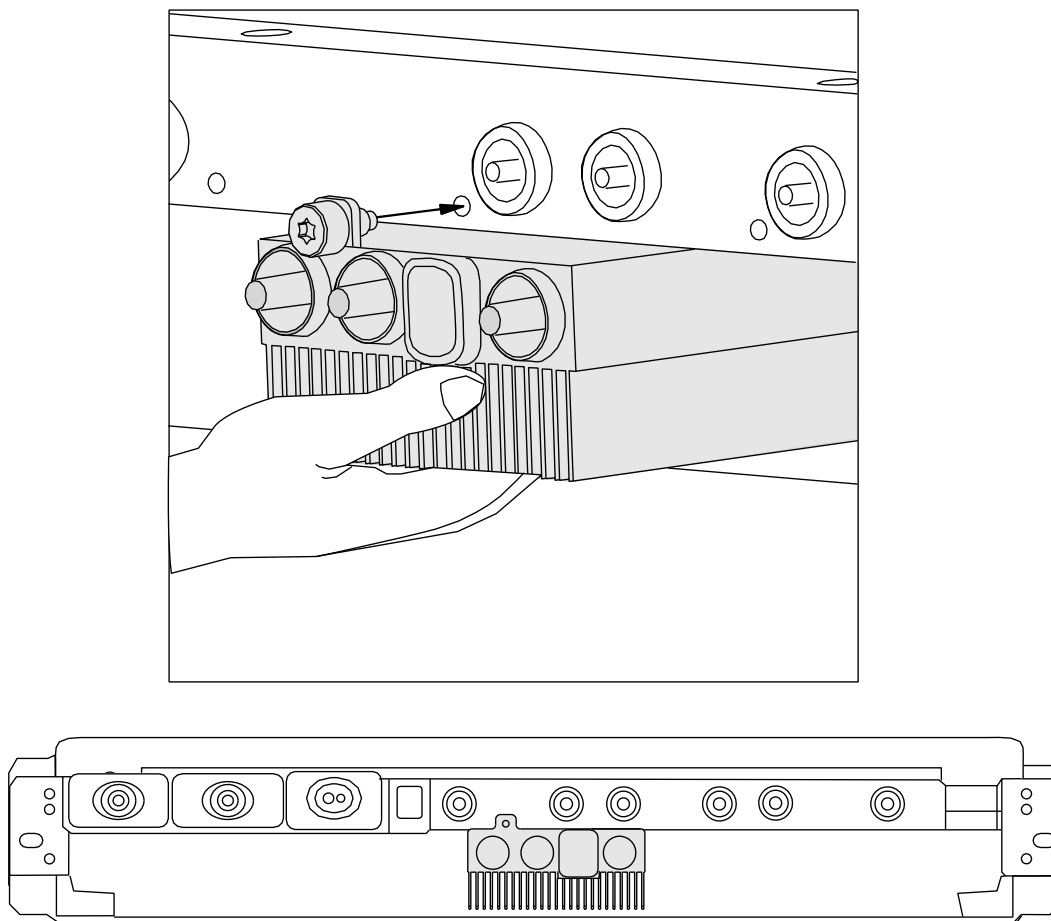


Figure 70. Installing Wideband Combiner Sub-module

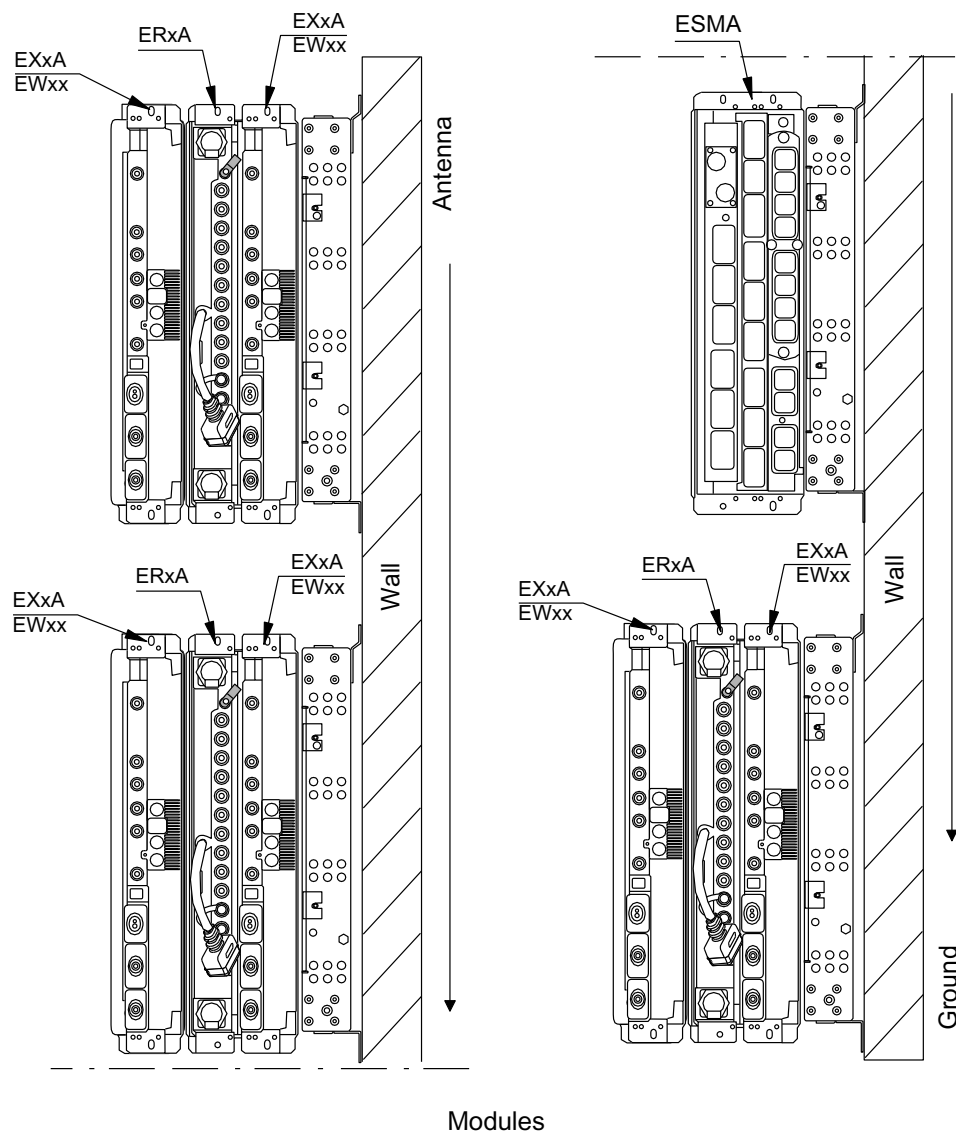


Figure 71. Modules in a 3+3+3/4+4+4 wall configuration

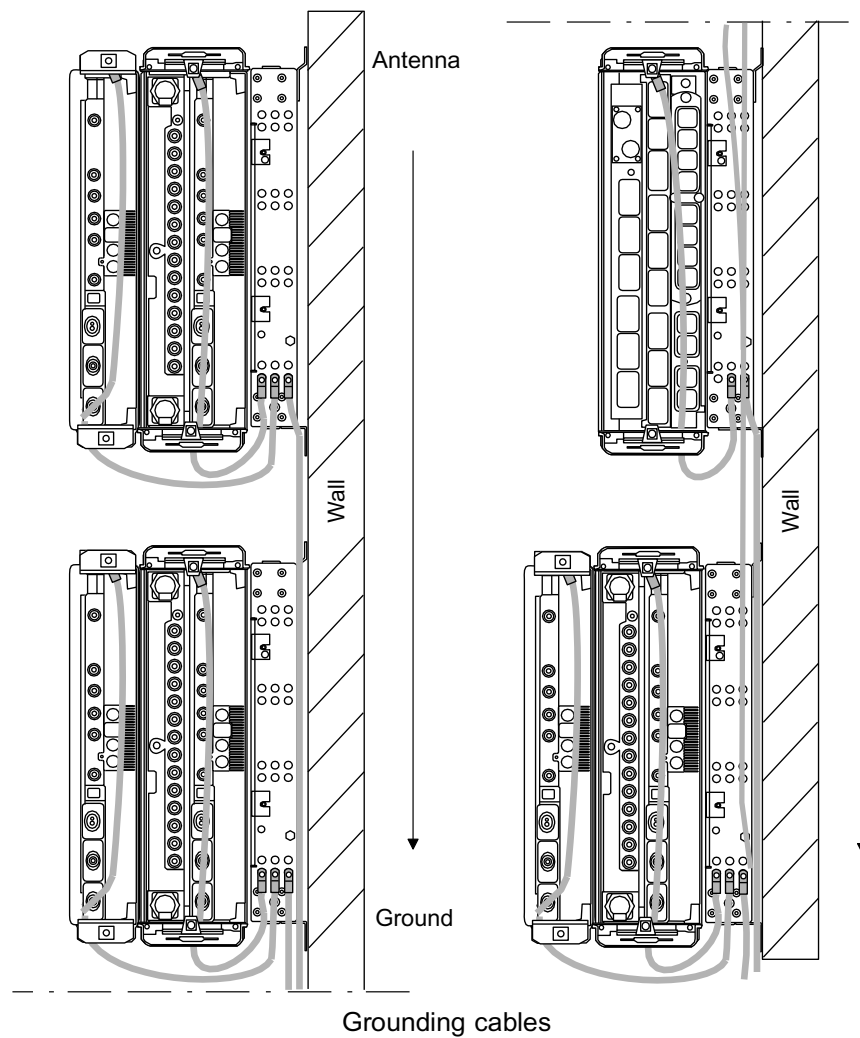
! Caution

Risk of damage to equipment. If the base transceiver station (BTS) is exposed to weather conditions, install the modules so that the system module power terminals are facing down.

2. Connect the cables.

The order to connect the cables is as follows:

- a. Grounding cables
- b. External power cables
- c. Dual Duplexer Module cable
- d. Bus cables
- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables



DN7076943

Figure 72. Grounding cables in a 3+3+3/4+4+4 wall configuration

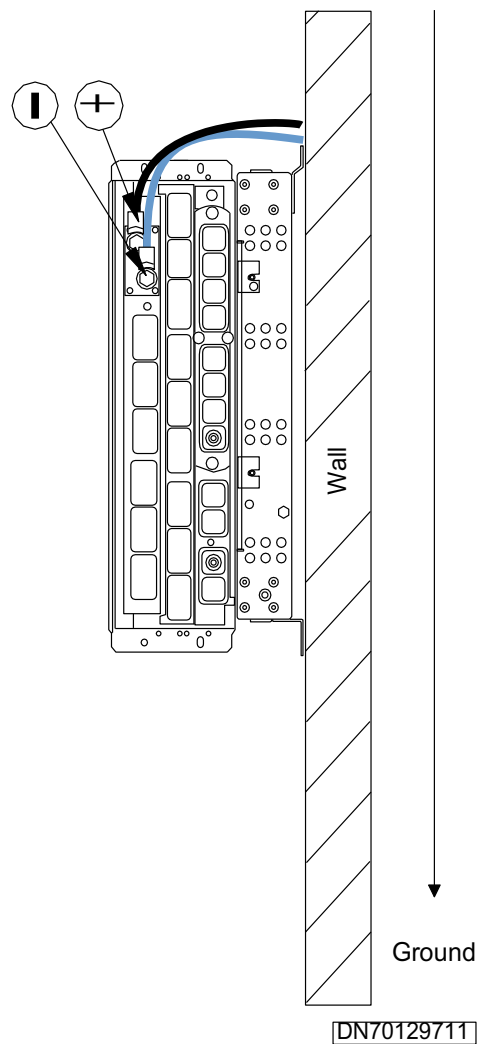


Figure 73. External power cables in a 3+3+3/4+4+4 wall configuration

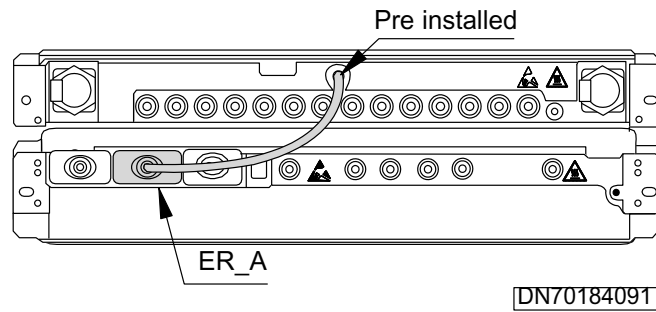
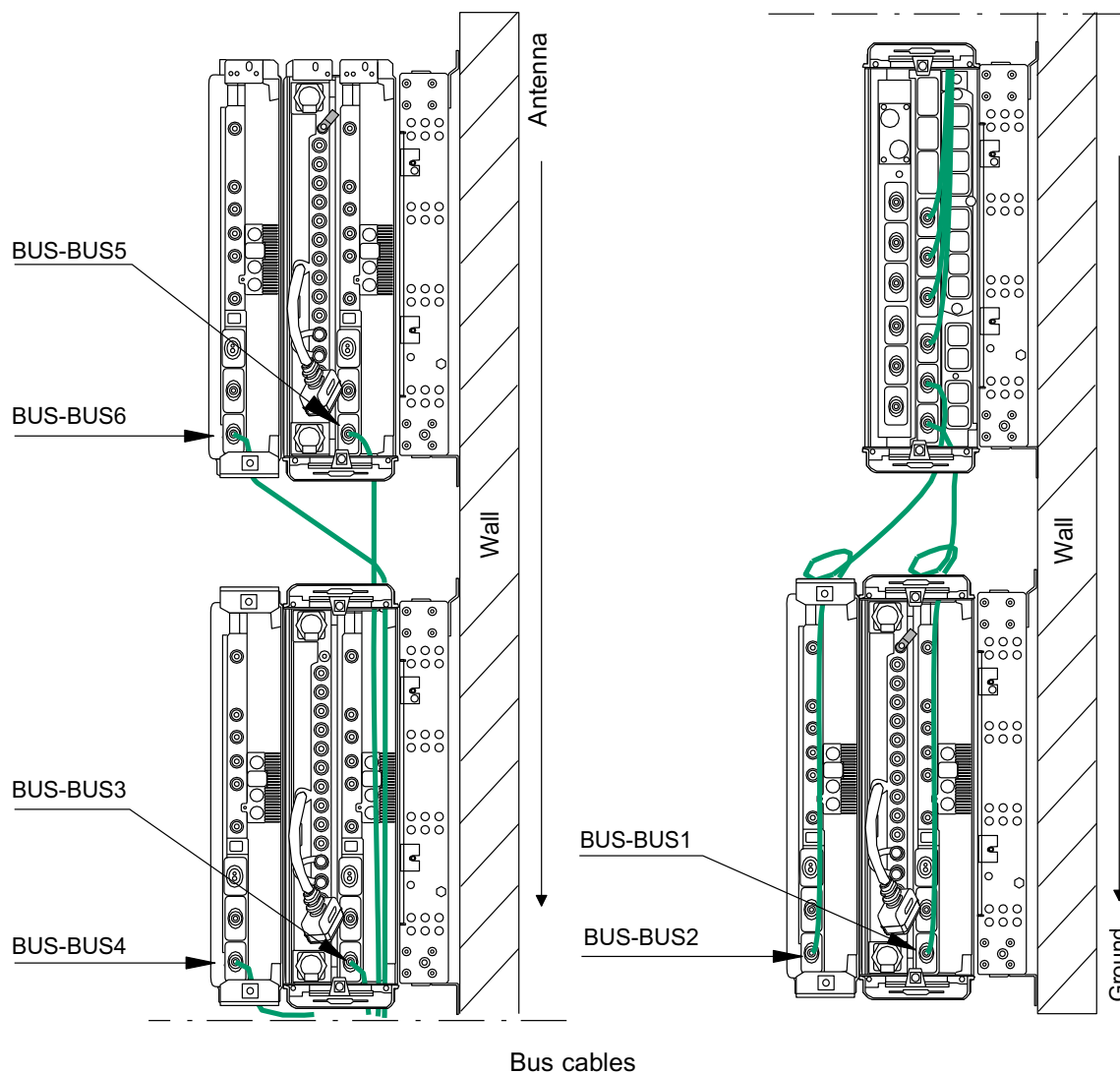
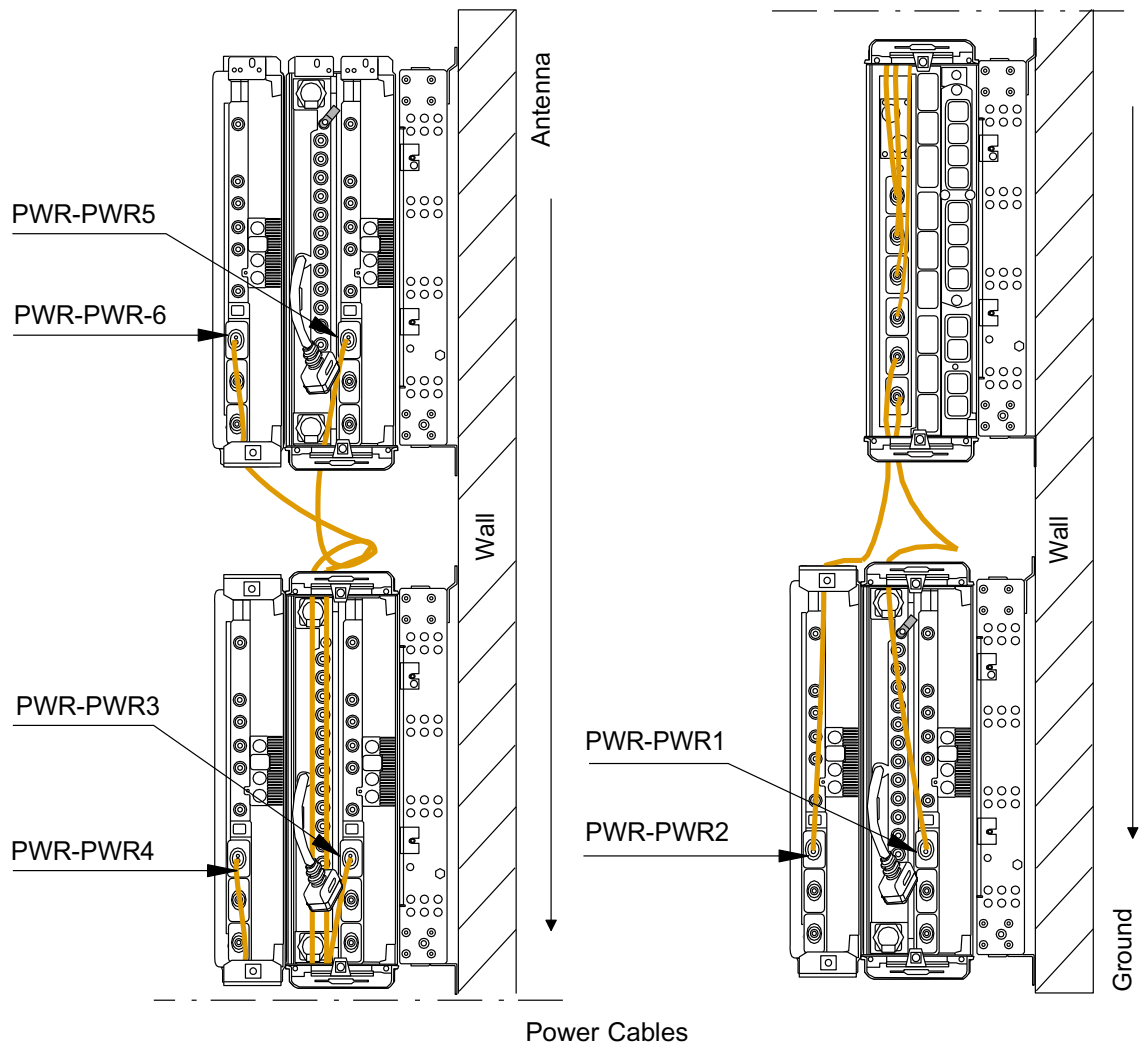


Figure 74. Dual Duplexer Module cable



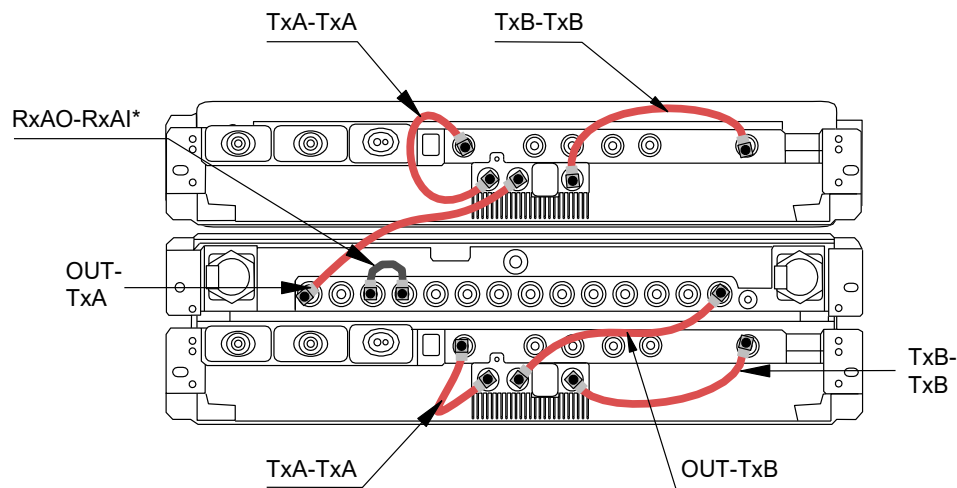
BUS5 and BUS6 are the extension cables.

Figure 75. Bus cables in a 3+3+3/4+4+4 wall configuration



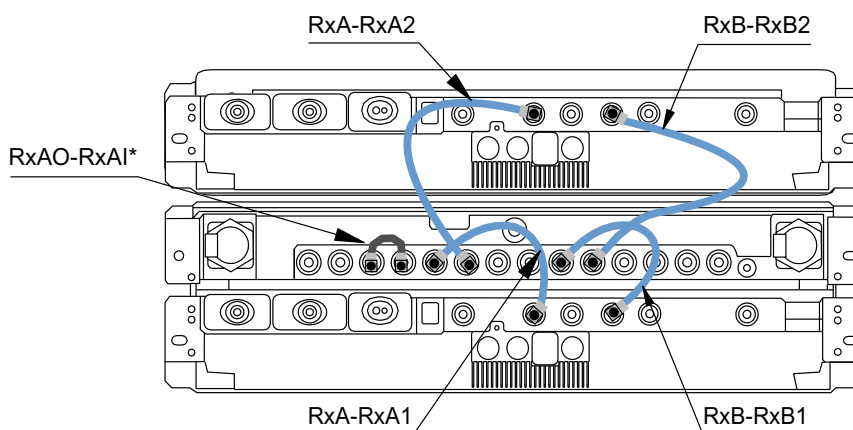
PWR5 and PWR6 are the extension cables.

Figure 76. Internal power cables in a 3+3+3/4+4+4 wall configuration



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 77. RF cables in a 3+3+3/4+4+4 2-way 2UD configuration

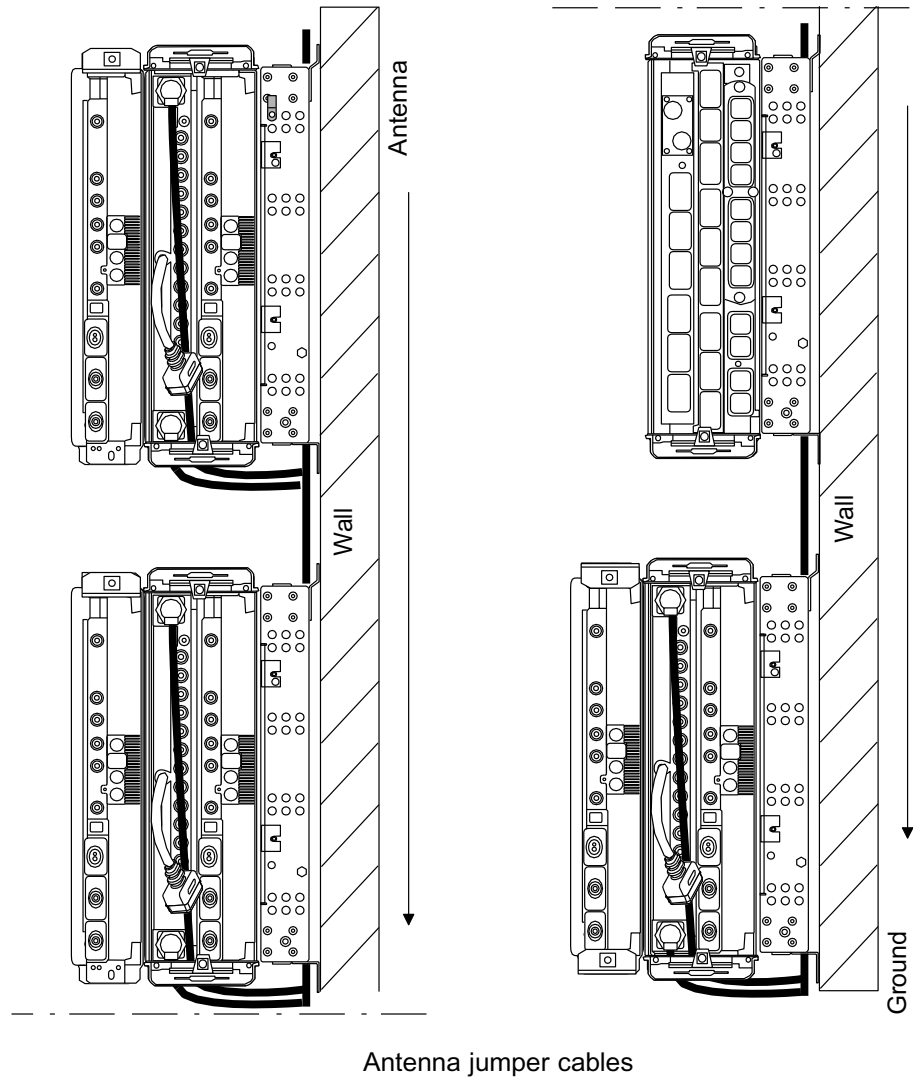


Figure 78. Antenna jumper cables in a 3+3+3/4+4+4 wall configuration

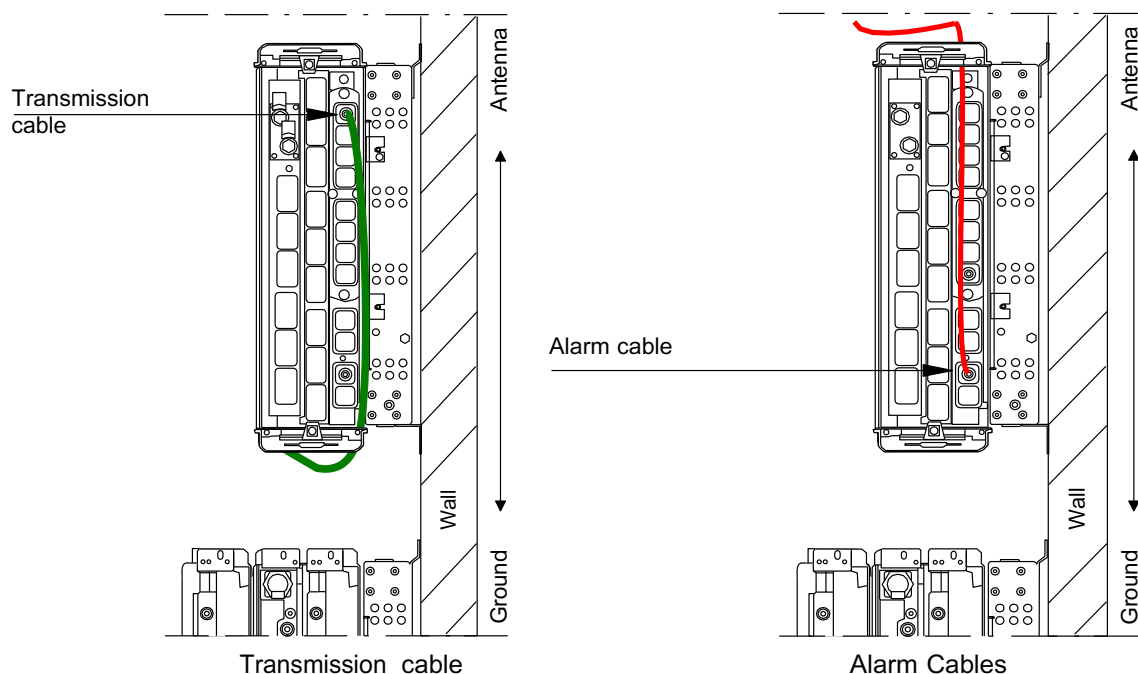


Figure 79. Transmission cables and optional alarm cables in a 3+3+3/4+4+4 wall configuration

4.3 Creating a 3+3+3/4+4+4 2-way 2UD on a pole

Before you start

For creating this configuration, you need:

- six Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- six Wideband Combiner Submodules (EWxx)
- Extension Ethernet and Power Cable Kit (EPCA)

The kit contains 2 x 2 m (6.6 ft) bus and power cables.



Steps

1. **Install the Wideband Combiner Sub-module in the Dual TRX Module, and install the modules.**

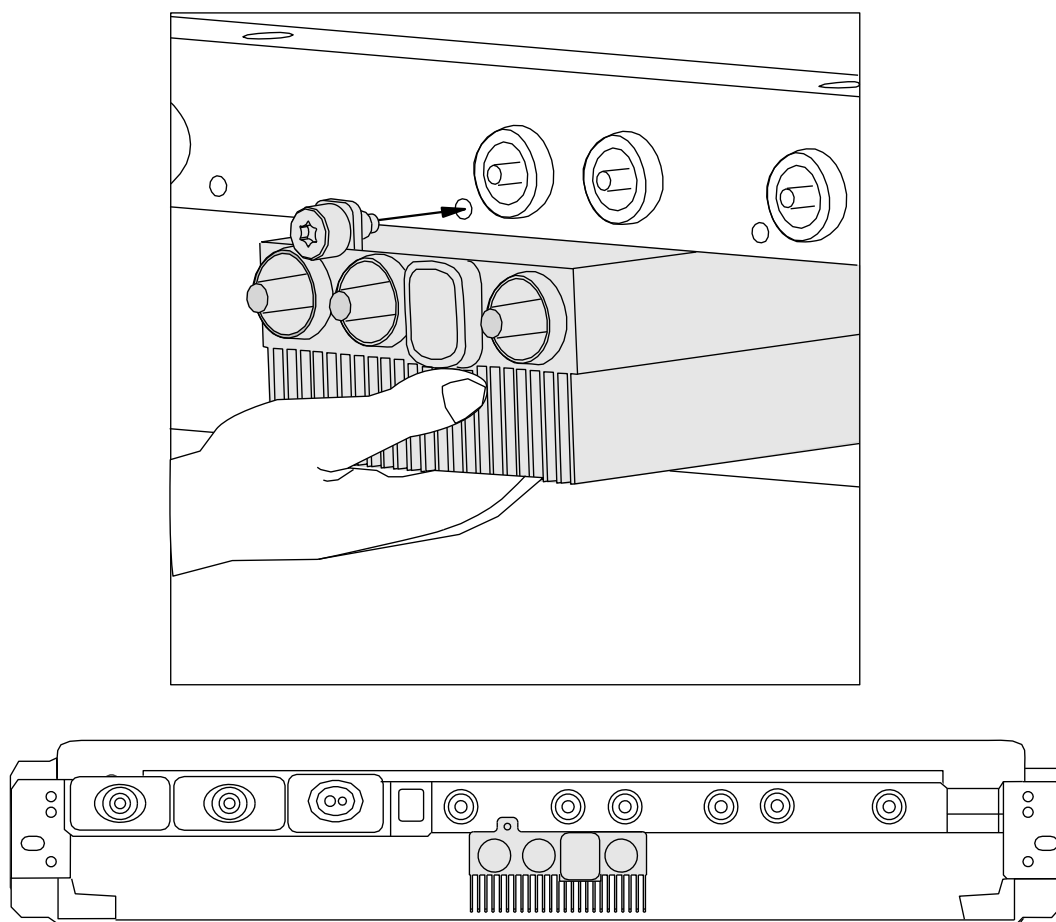


Figure 80. Installing Wideband Combiner Sub-module

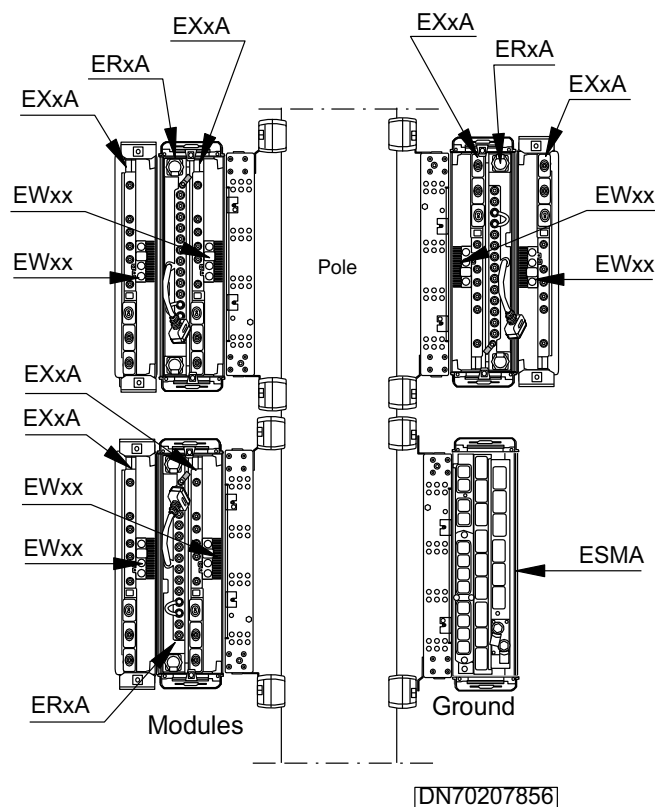


Figure 81. Modules in a 3+3+3/4+4+4 2-way 2UD pole configuration

2. Connect the cables.

The order to connect the cables is as follows:

- a. Grounding cables
- b. External power cables
- c. Dual Duplexer Module cable
- d. Bus cables
- e. Internal power cables
- f. RF cables
- g. Antenna jumper cables
- h. Transmission cables

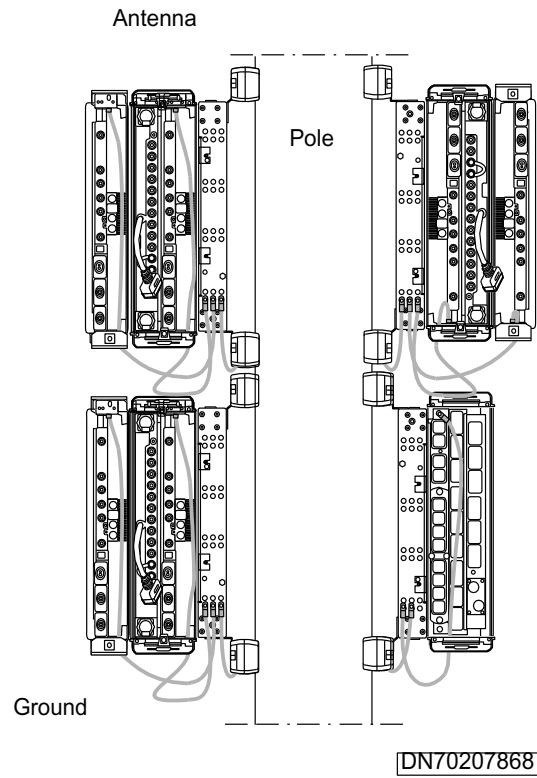
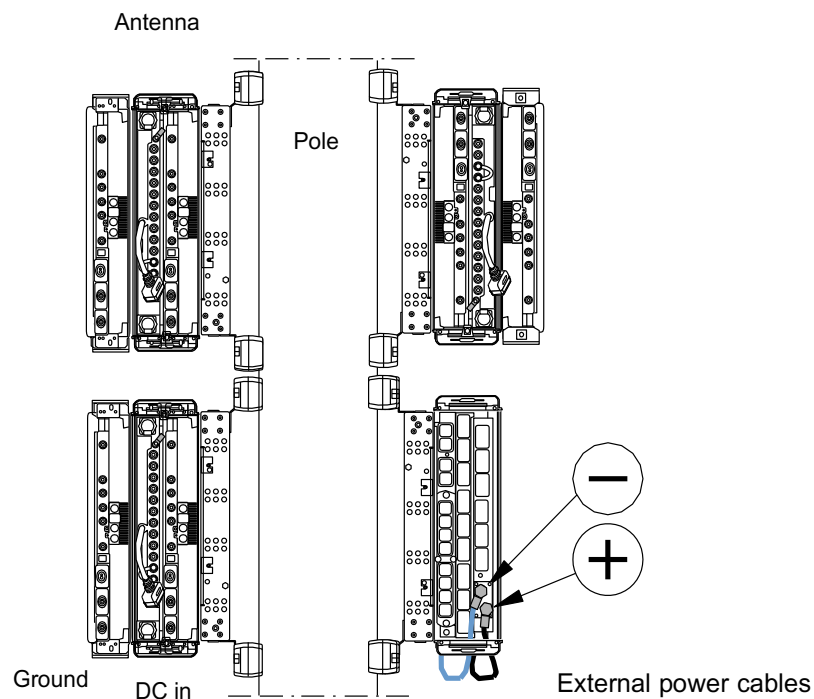
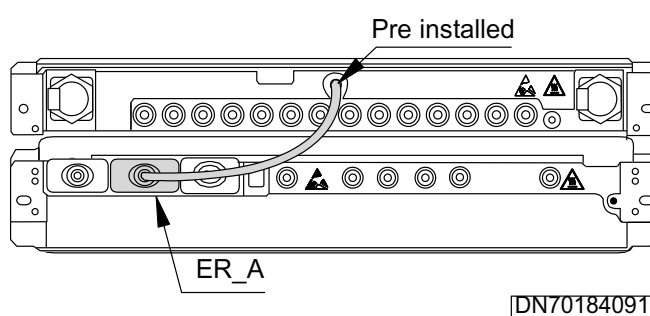


Figure 82. Grounding cables in a 3+3+3/4+4+4 pole configuration



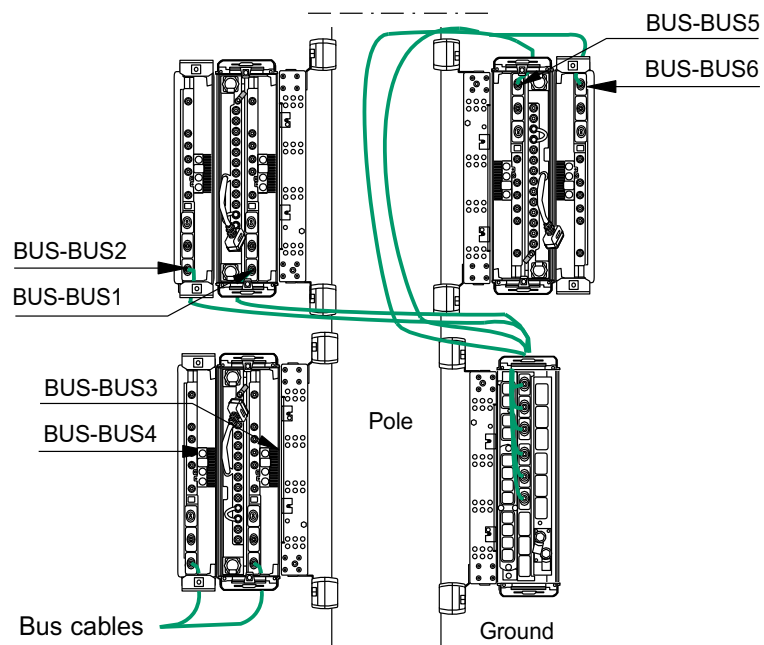
DN70270823

Figure 83. External power cables in a 3+3+3/4+4+4 pole configuration



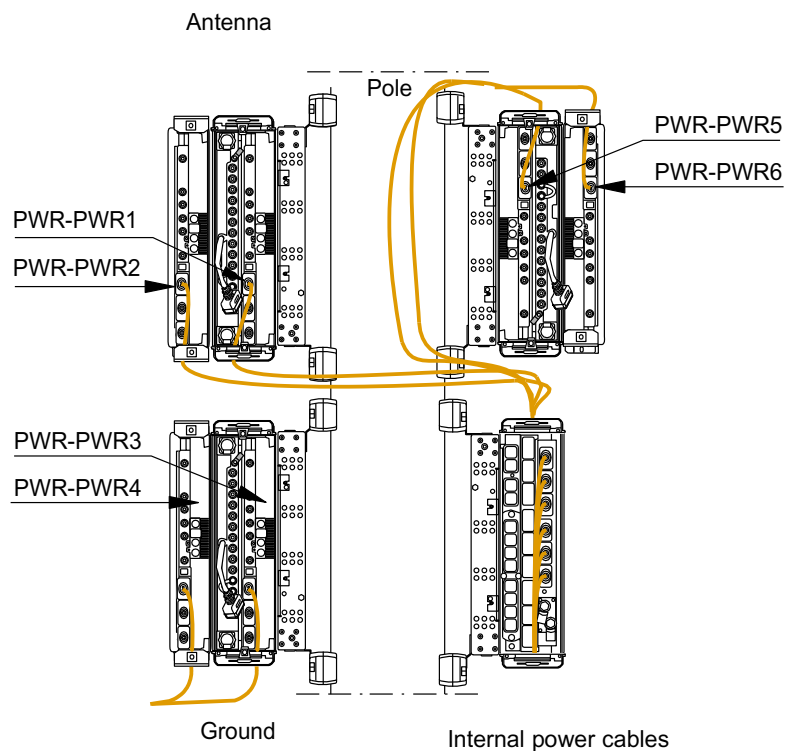
DN70184091

Figure 84. Dual Duplexer Module cable



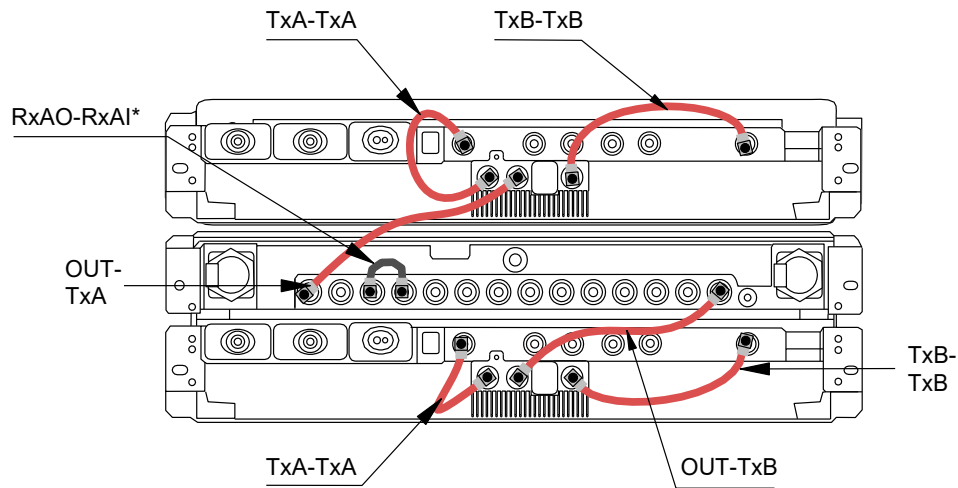
DN70207926

Figure 85. Bus cables in a 3+3+3/4+4+4 pole configuration



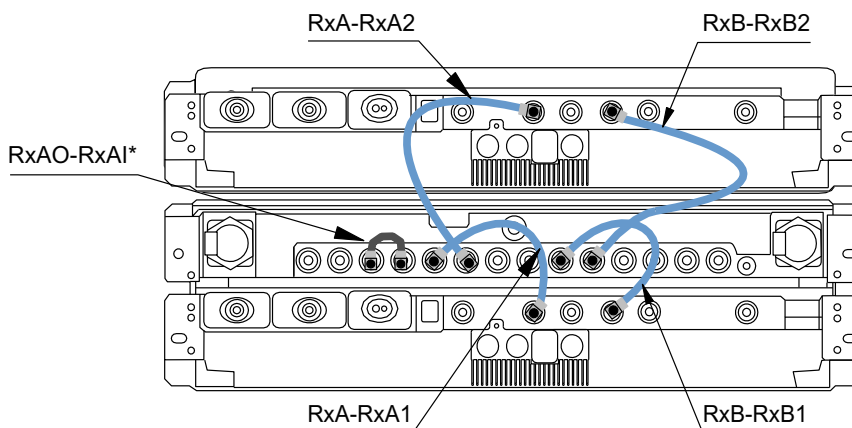
DN70207941

Figure 86. Internal power cables in a 3+3+3/4+4+4 pole configuration



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 87. RF cables in a 3+3+3/4+4+4 2-way 2UD configuration

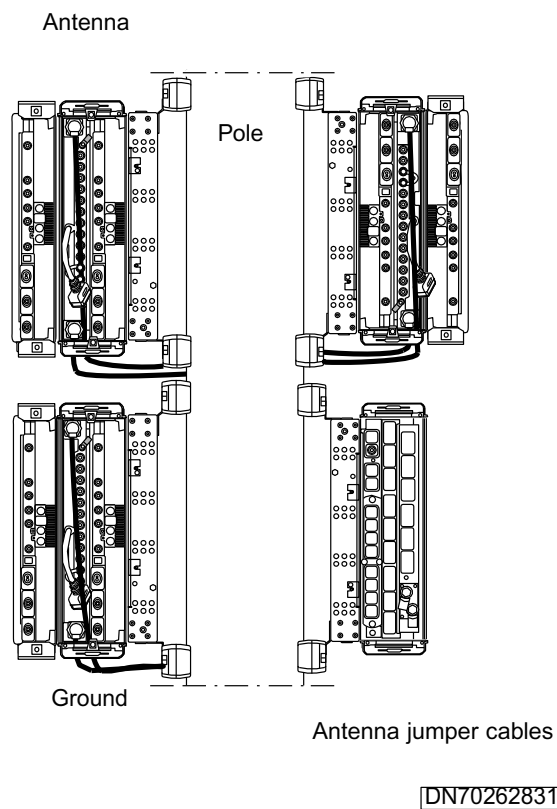


Figure 88. Antenna jumper cables in a 3+3+3/4+4+4 pole configuration

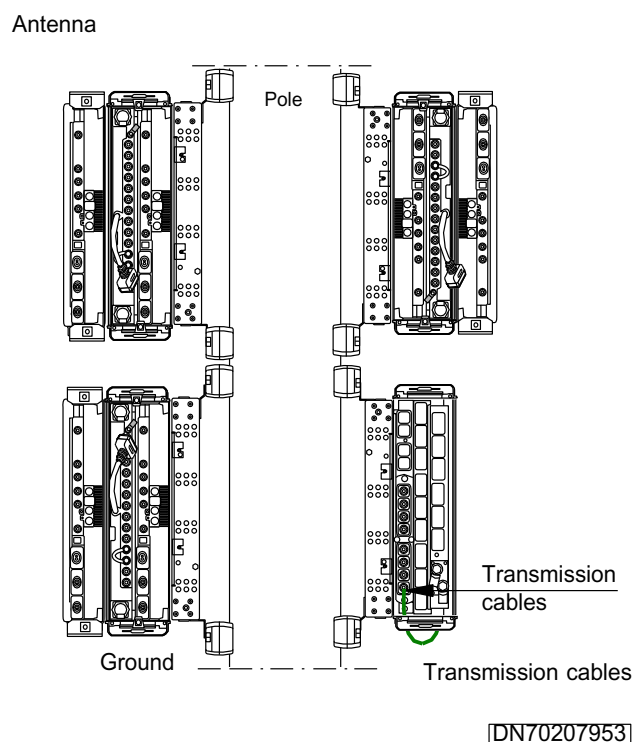


Figure 89. Transmission cables in a 3+3+3/4+4+4 pole configuration

4.4 Creating a 3+3+3/4+4+4 2-way 2UD in FCIA

Before you start

For creating this configuration, you need:

- six Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- six Wideband Combiner Submodules (EWxx)



Steps

1. **Install the Wideband Combiner Sub-module in the Dual TRX Module, and install the modules.**

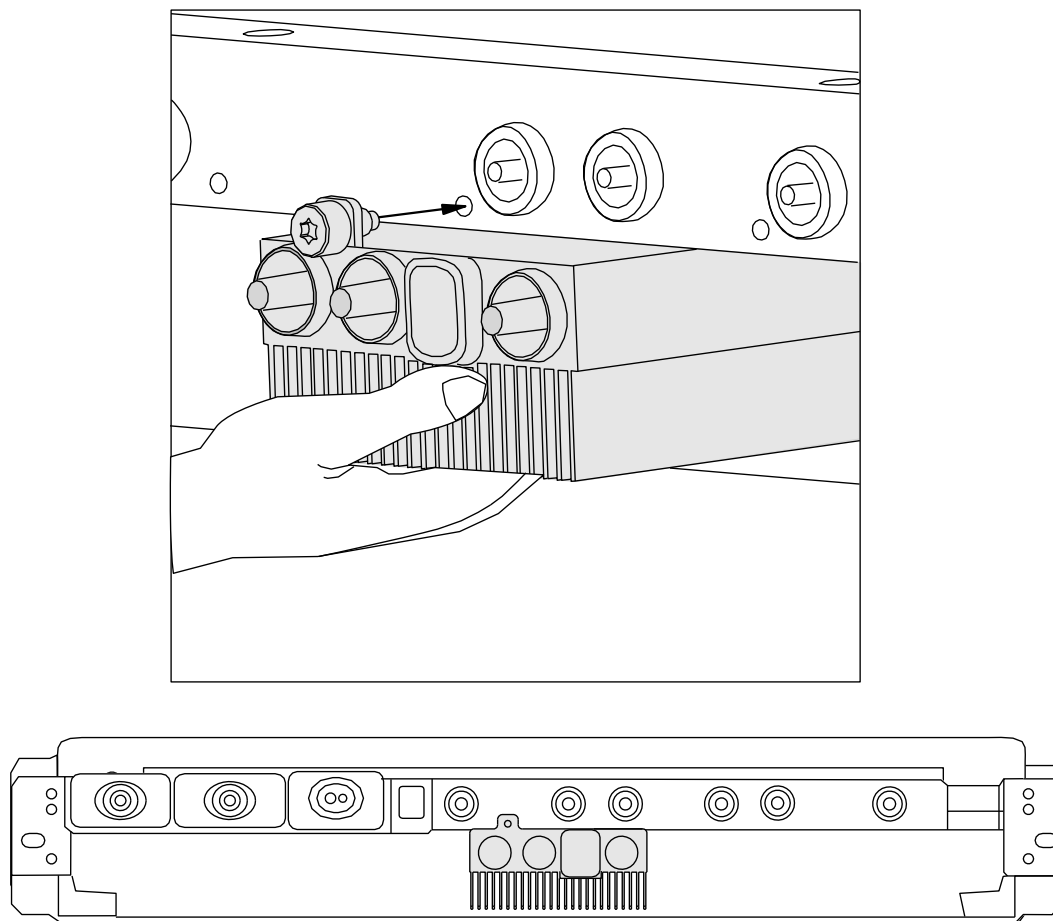


Figure 90. Installing Wideband Combiner Sub-module

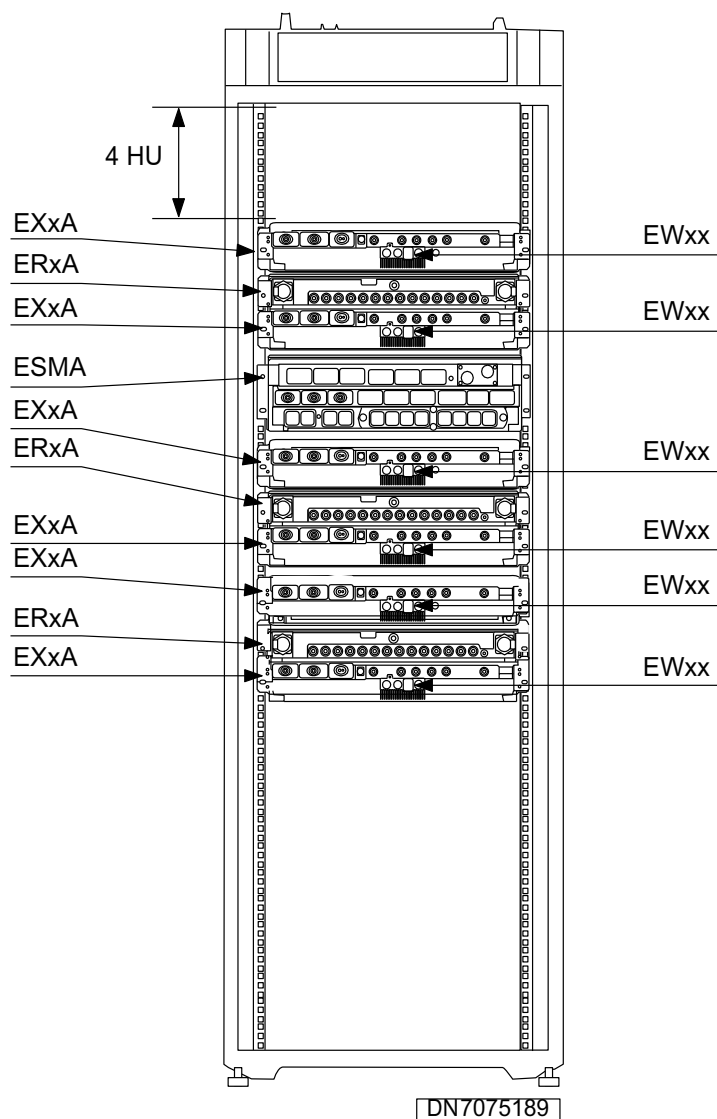


Figure 91. Modules in a 3+3+3/4+4+4 2-way 2UD FCIA configuration (with EWxA)

2. Connect the cables.

The order to connect the cables is as follows:

- a. External power cables
- b. Dual Duplexer Module cable
- c. Bus cables

- d. Internal power cables
- e. RF cables
- f. Antenna jumper cables
- g. Transmission cables

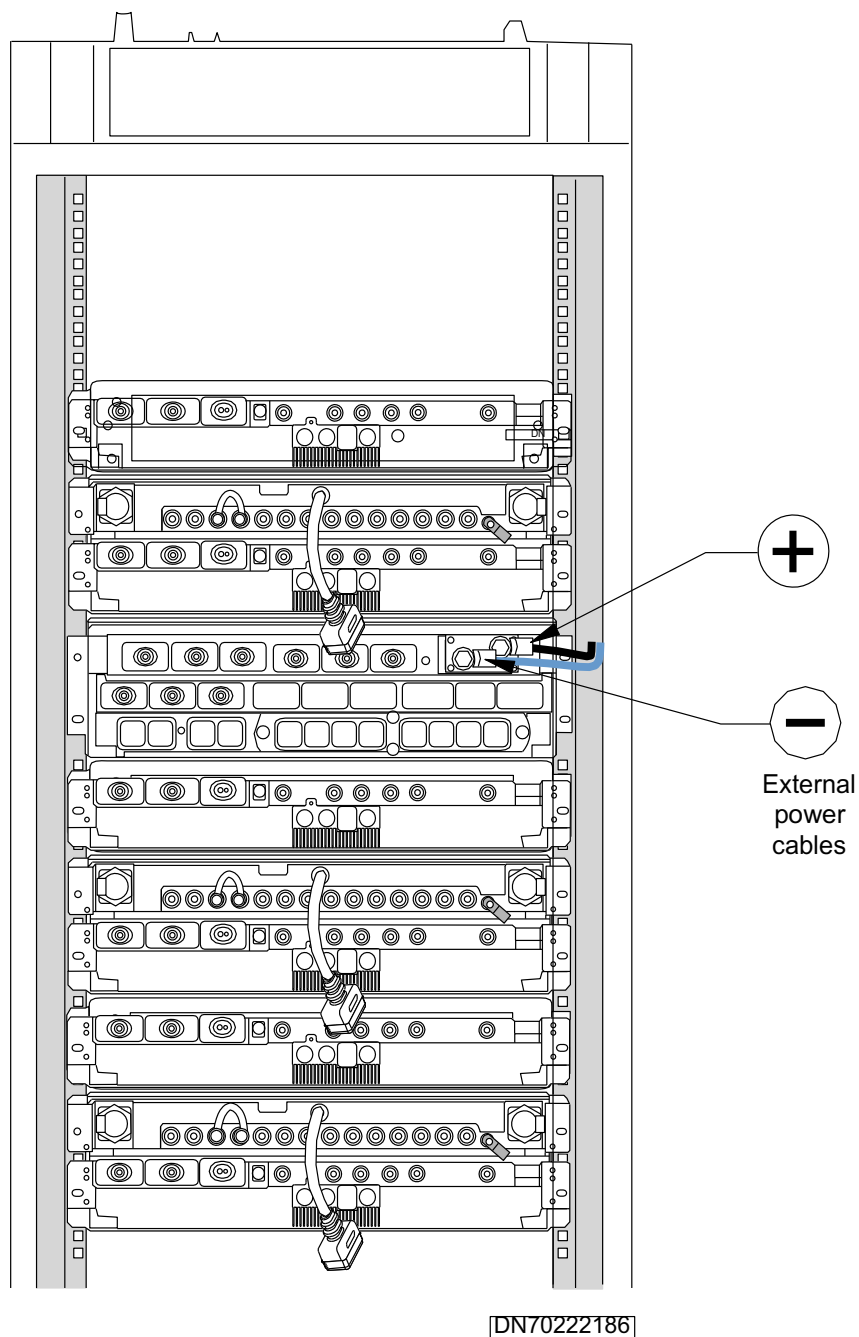


Figure 92. External power cables in a 3+3+3/4+4+4 FCIA configuration

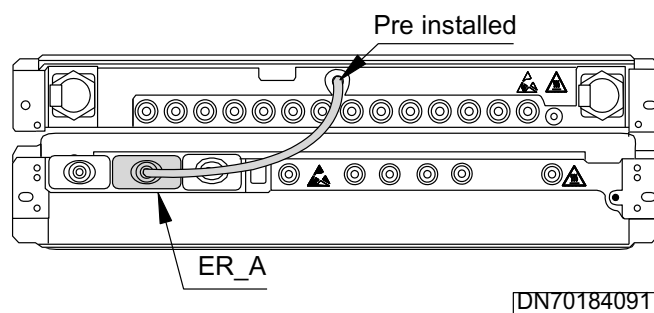


Figure 93. Dual Duplexer Module cable

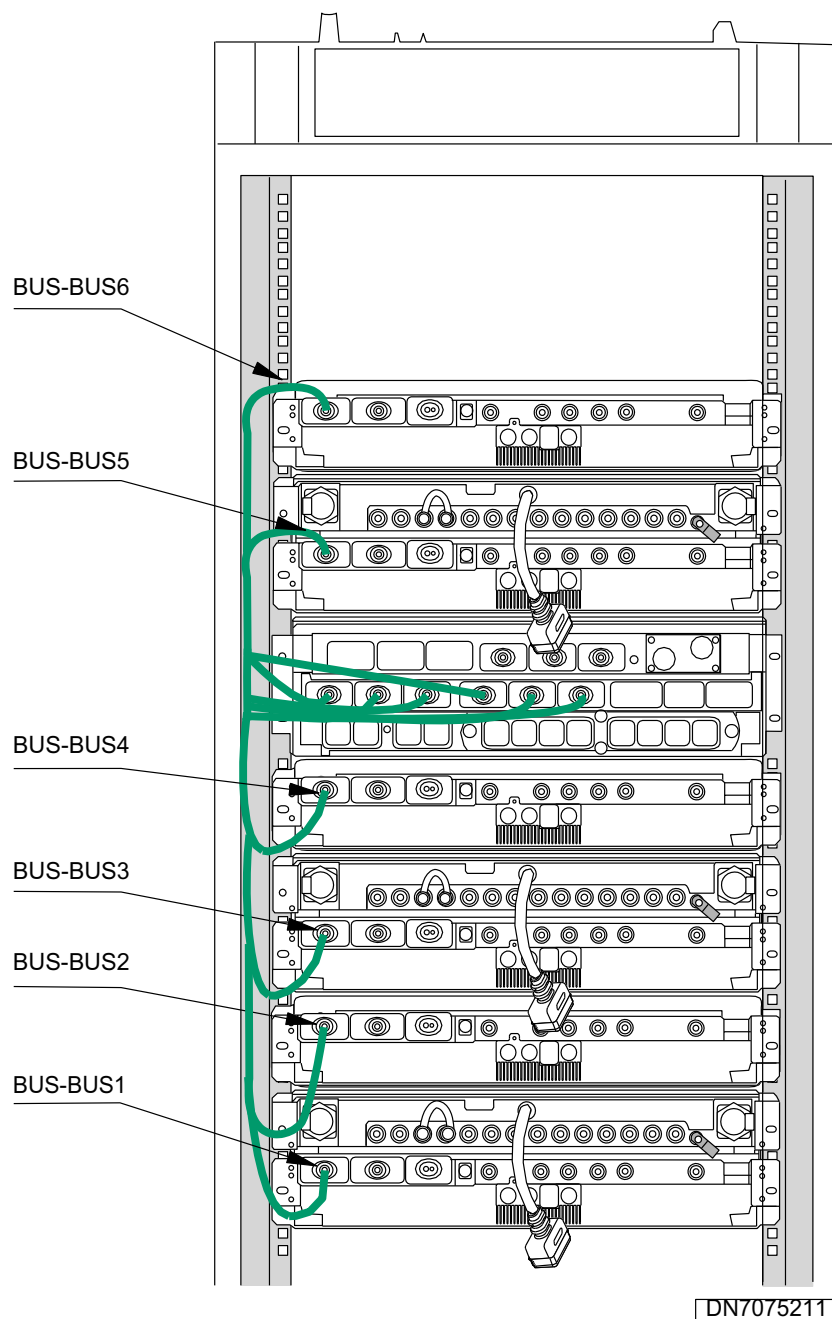


Figure 94. Bus cables in a 3+3+3/4+4+4 FCIA configuration

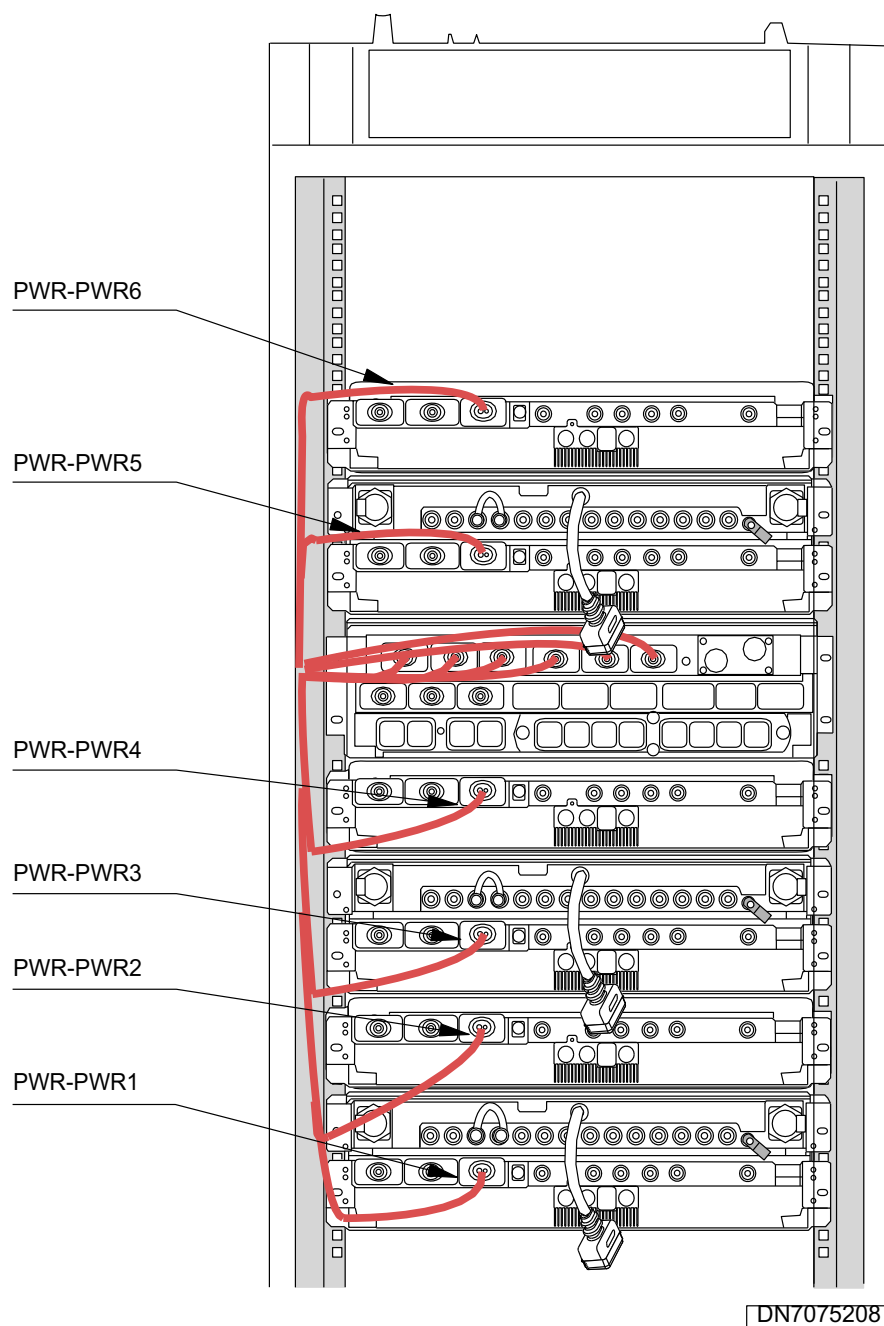
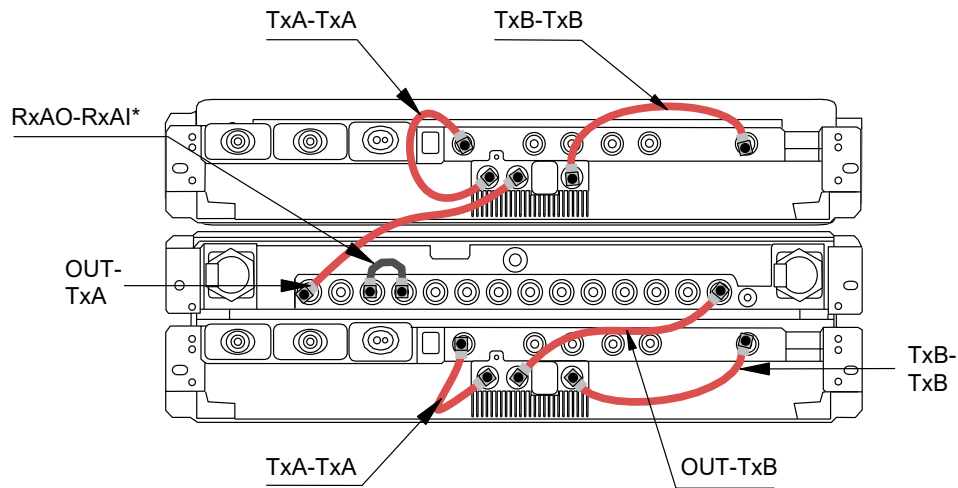
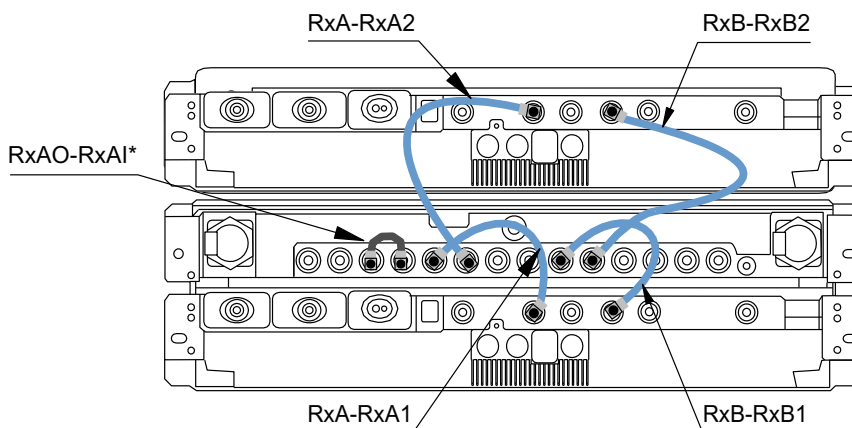


Figure 95. Internal power cables in a 3+3+3/4+4+4 FCIA configuration



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 96. RF cables in a 3+3+3/4+4+4 2-way 2UD configuration

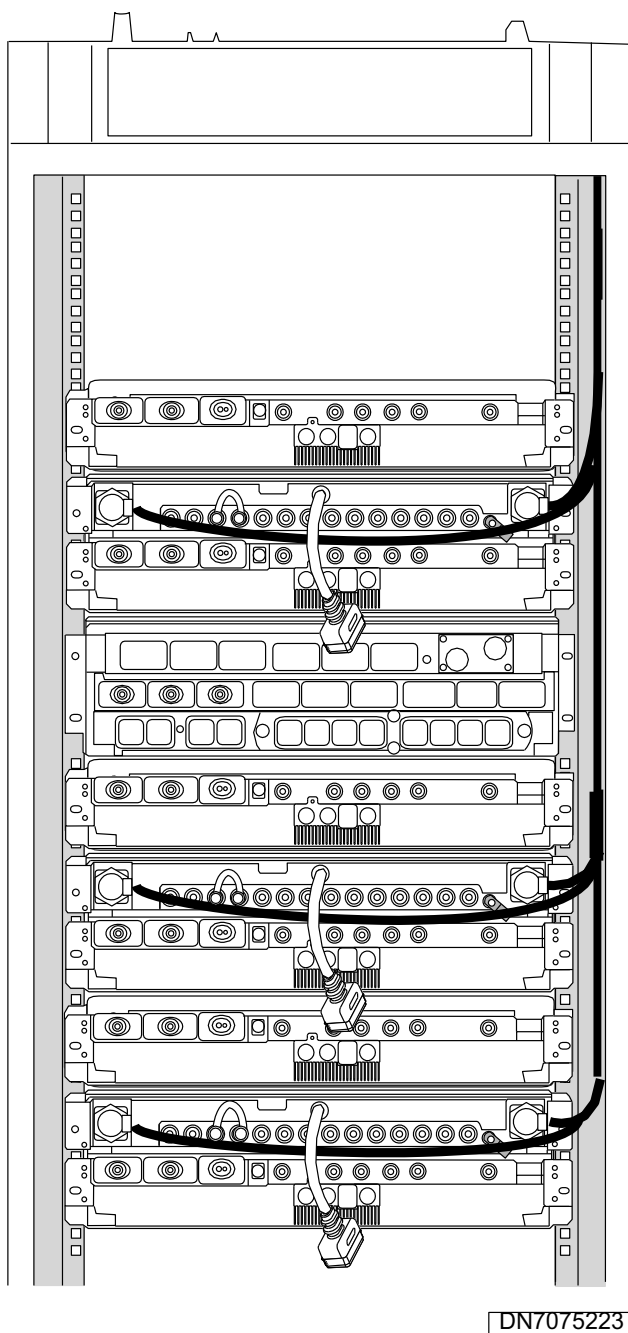


Figure 97. Antenna jumper cables in a 3+3+3/4+4+4 2-way 2UD FCIA configuration

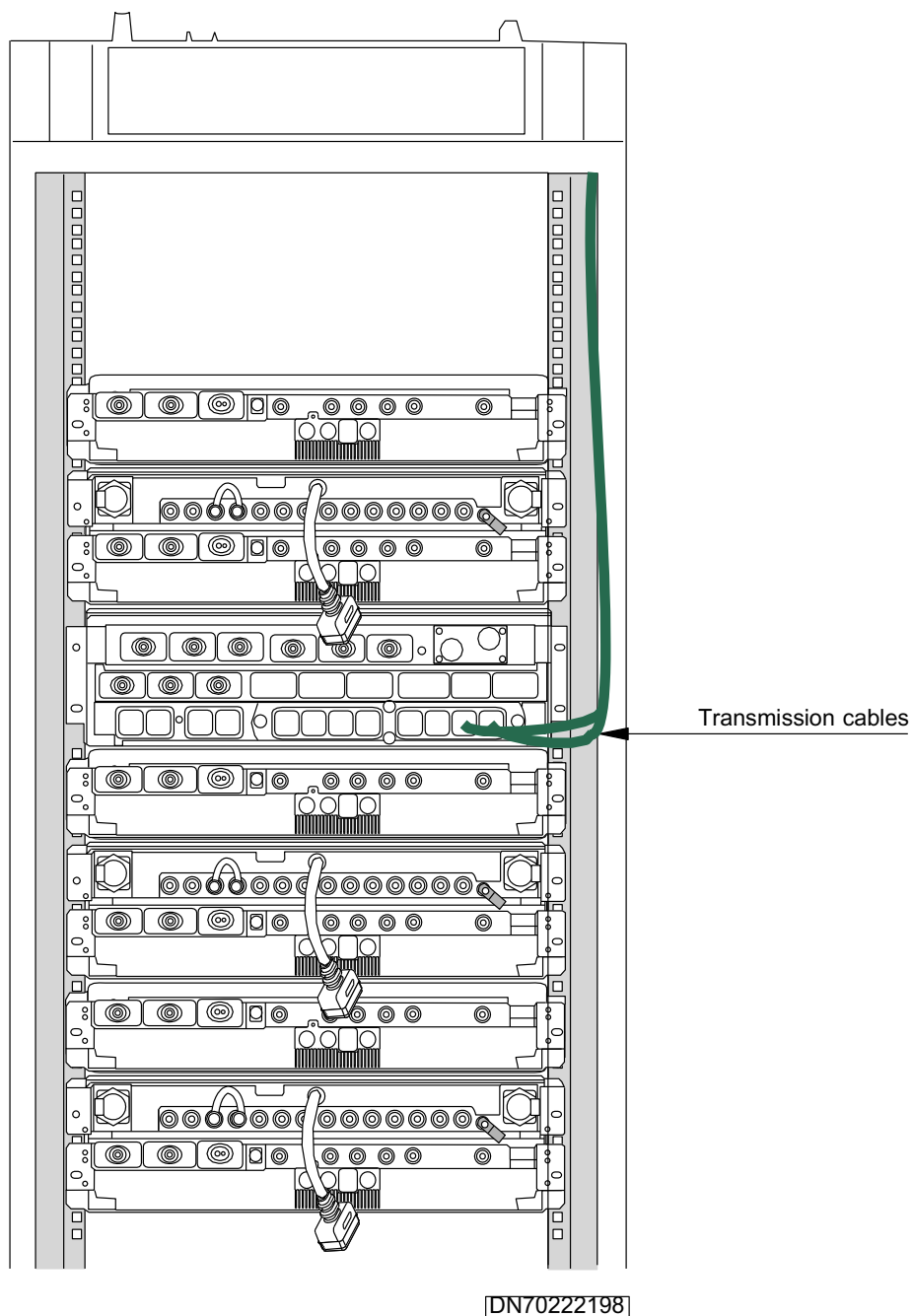


Figure 98. Transmission cables in a 3+3+3/4+4+4 2-way 2UD FCIA configuration

4.5 Creating a 3+3+3/4+4+4 2-way 2UD in FCOA

Before you start

For creating this configuration, you need:

- six Dual TRX Modules (EXxA)
- three Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- six Wideband Combiner Submodules (EWxx)



Steps

1. **Install the Wideband Combiner Sub-module in the Dual TRX Module, the other modules and the dummy panels.**

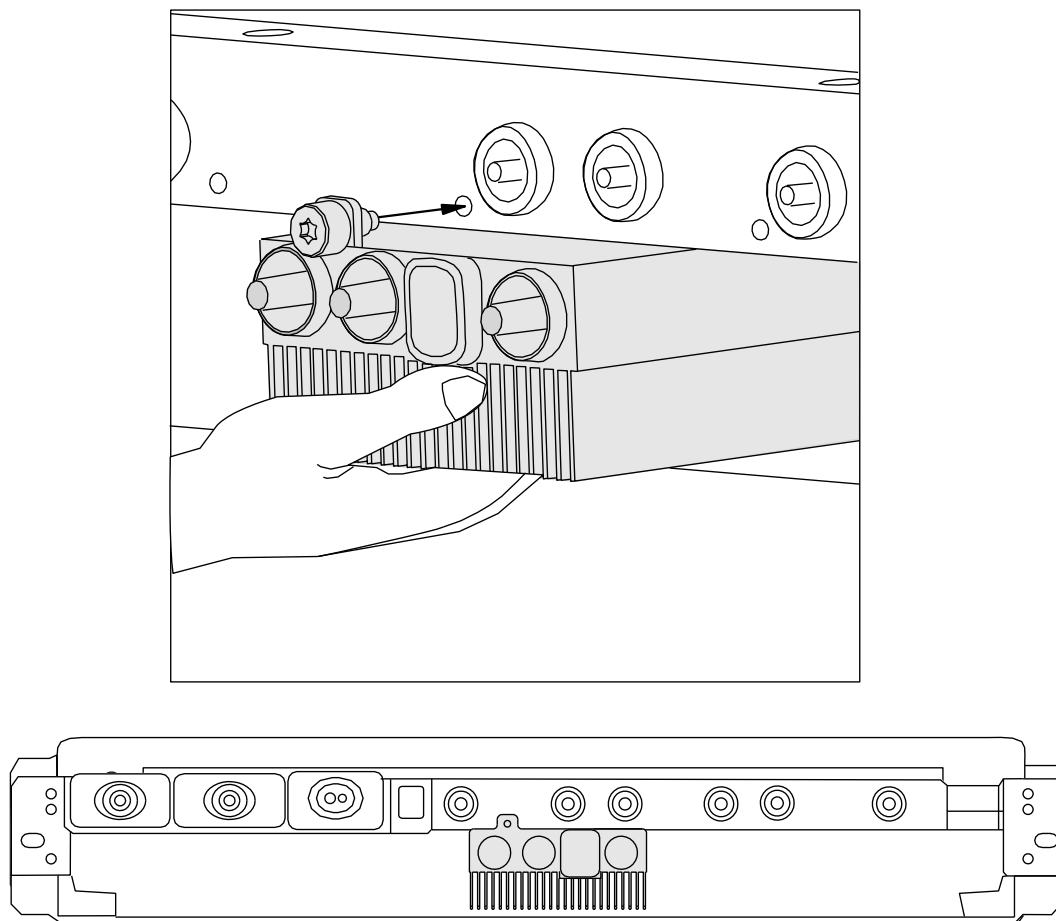


Figure 99. Installing Wideband Combiner Sub-module

The System Module can be installed horizontally or vertically as shown in the figures below. Vertical installation is recommended if you are going to expand to an 8+8+8 configuration later.

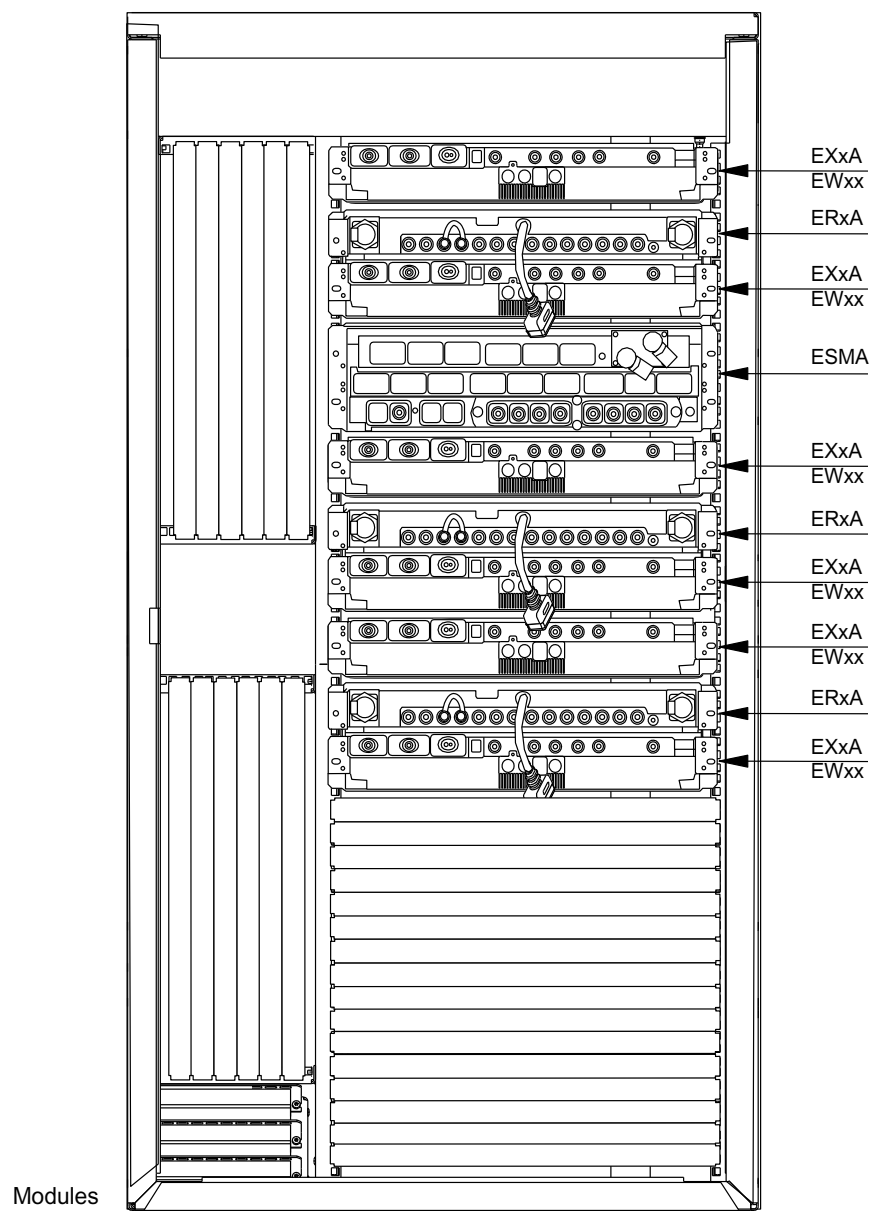


Figure 100. Modules in a 3+3+3/4+4+4 FCOA configuration, ESMA horizontal

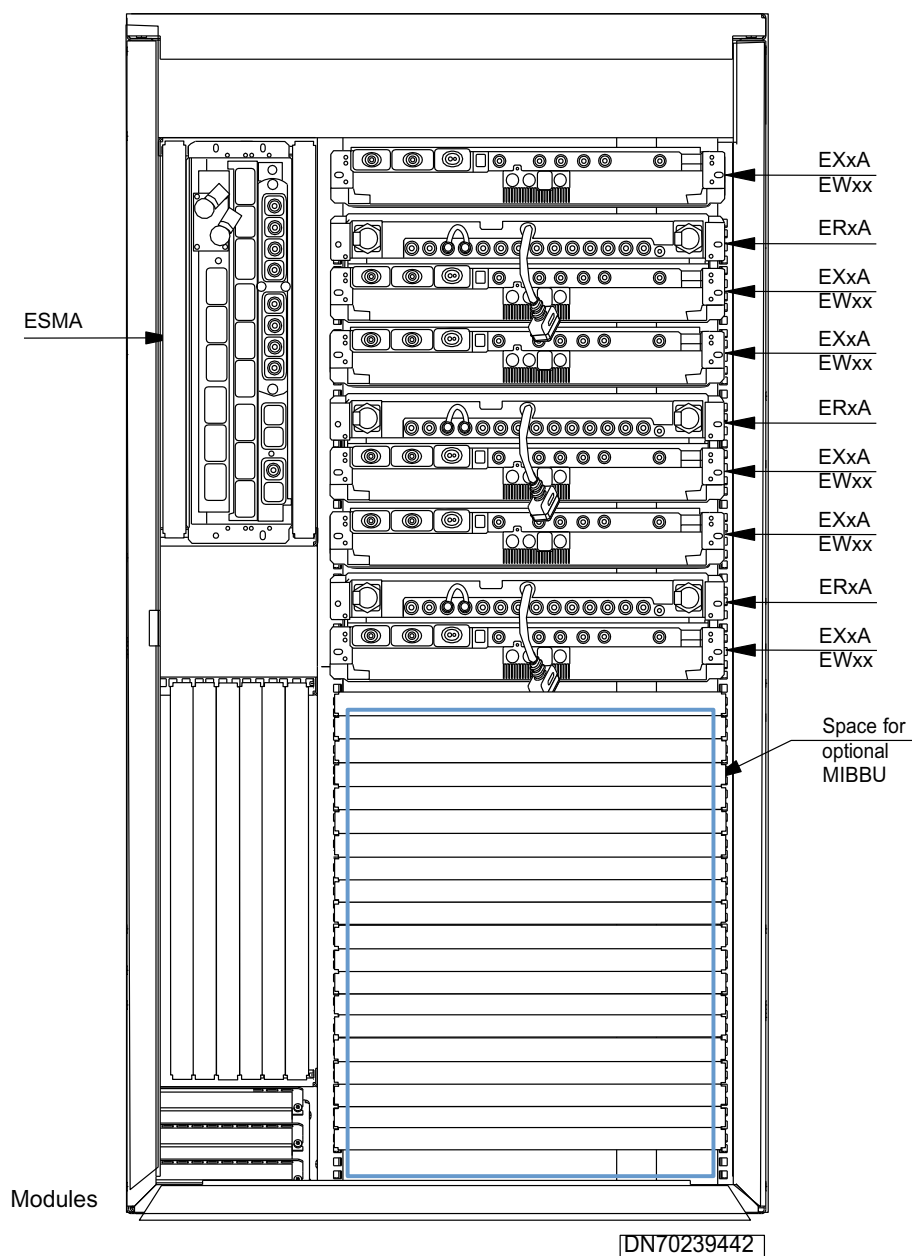


Figure 101. Modules in a 3+3+3/4+4+4 FCOA configuration, ESMA vertical

2. Connect the cables.

The order to connect the cables is as follows:

- a. External power cables
- b. Dual Duplexer Module cable
- c. Bus cables
- d. Internal power cables
- e. RF cables
- f. Antenna jumper cables
- g. Transmission cables

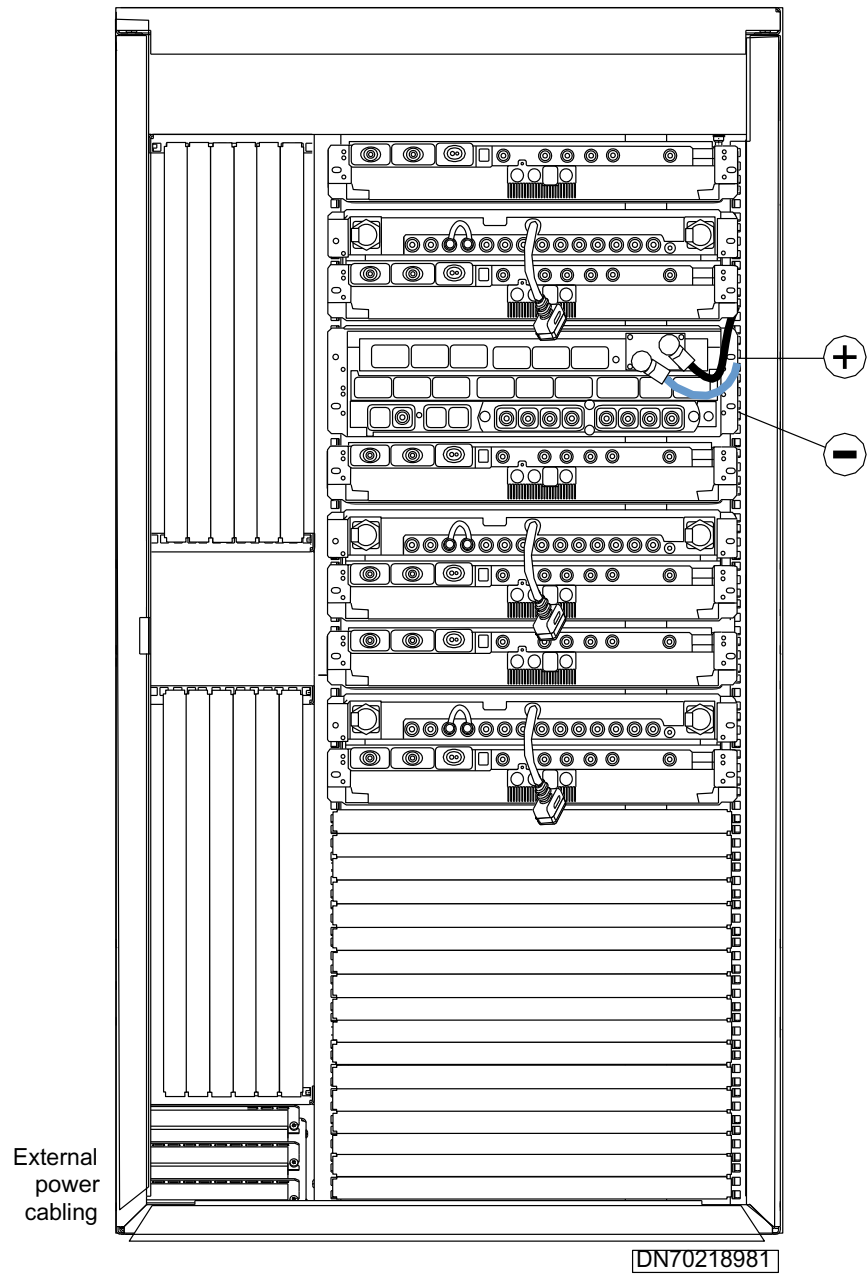


Figure 102. External power cables in a 3+3+3/4+4+4 FCOA configuration

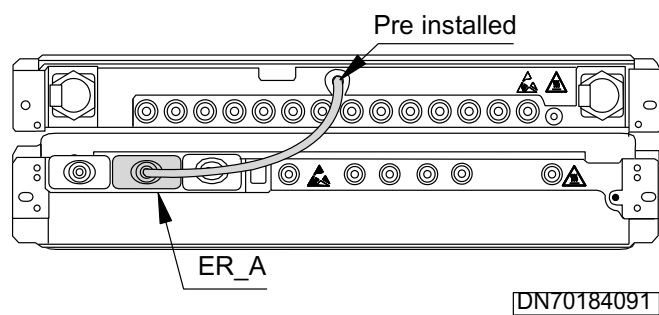


Figure 103. Dual Duplexer Module cable

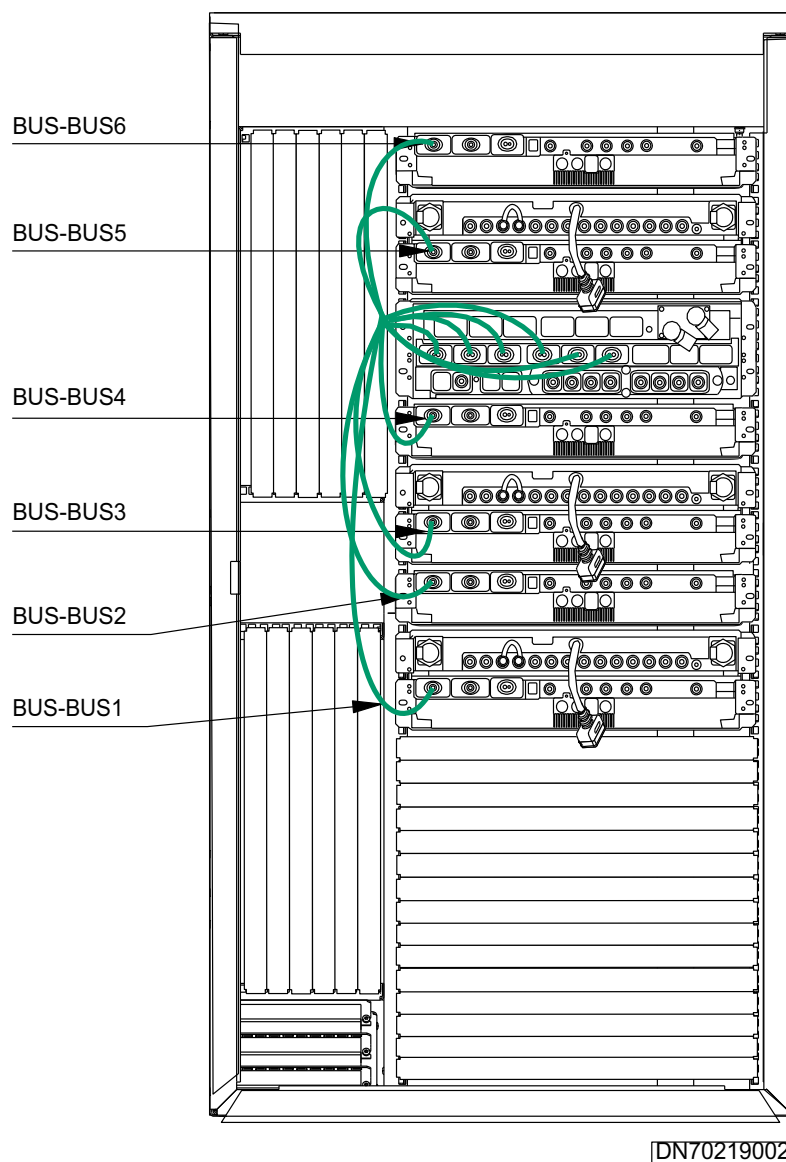


Figure 104. Bus cables in a 3+3+3/4+4+4 FCOA configuration

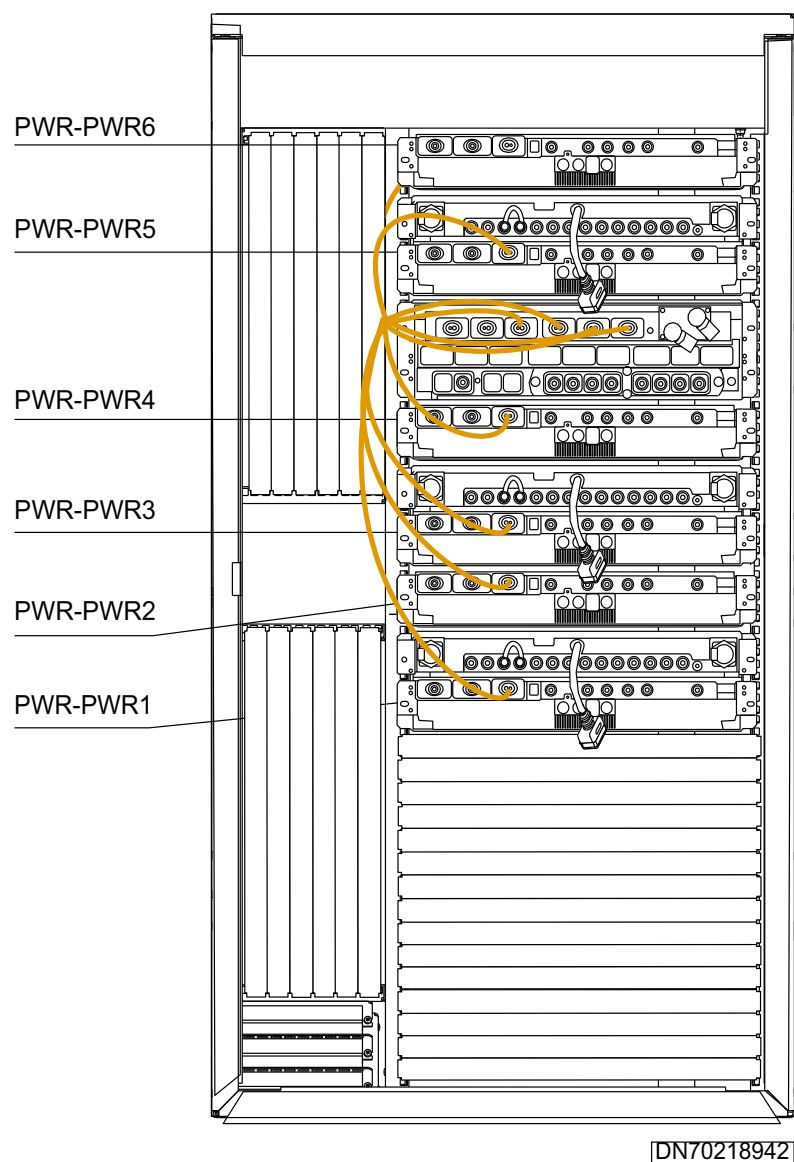
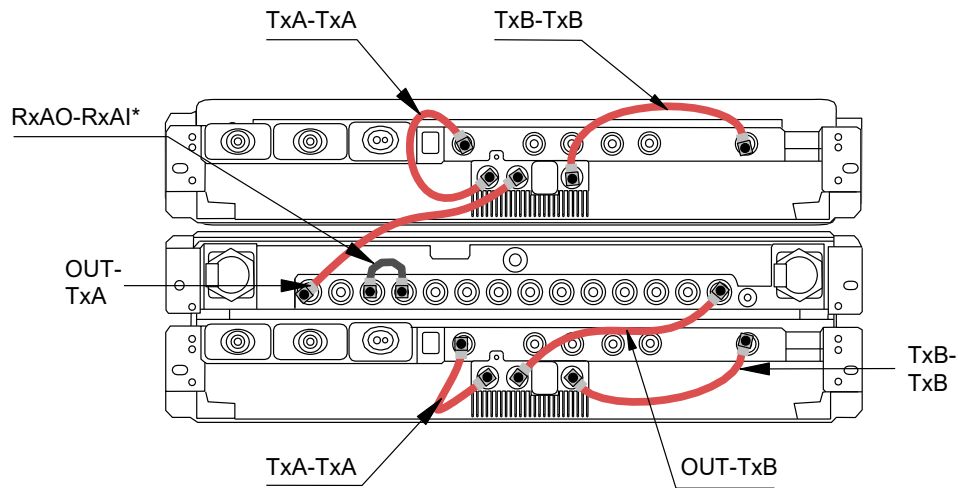
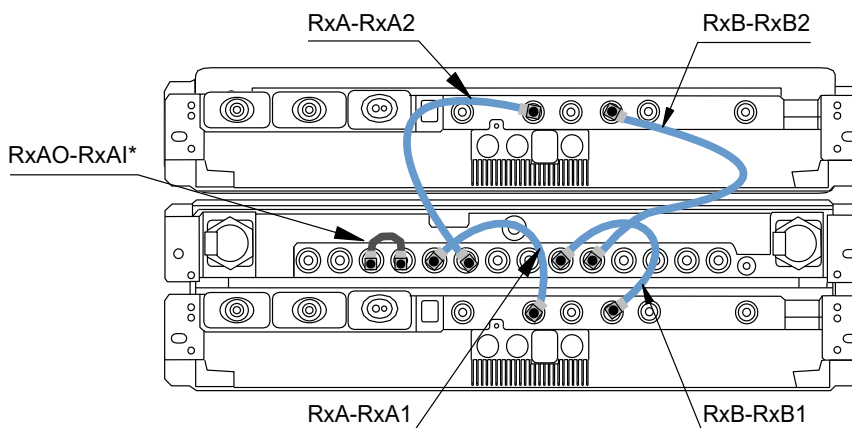


Figure 105. Internal power cables in a 3+3+3/4+4+4 FCOA configuration



TX Cables

*pre-installed



RX Cables

*pre-installed

DN70154222

Figure 106. RF cables in a 3+3+3/4+4+4 2-way 2UD configuration

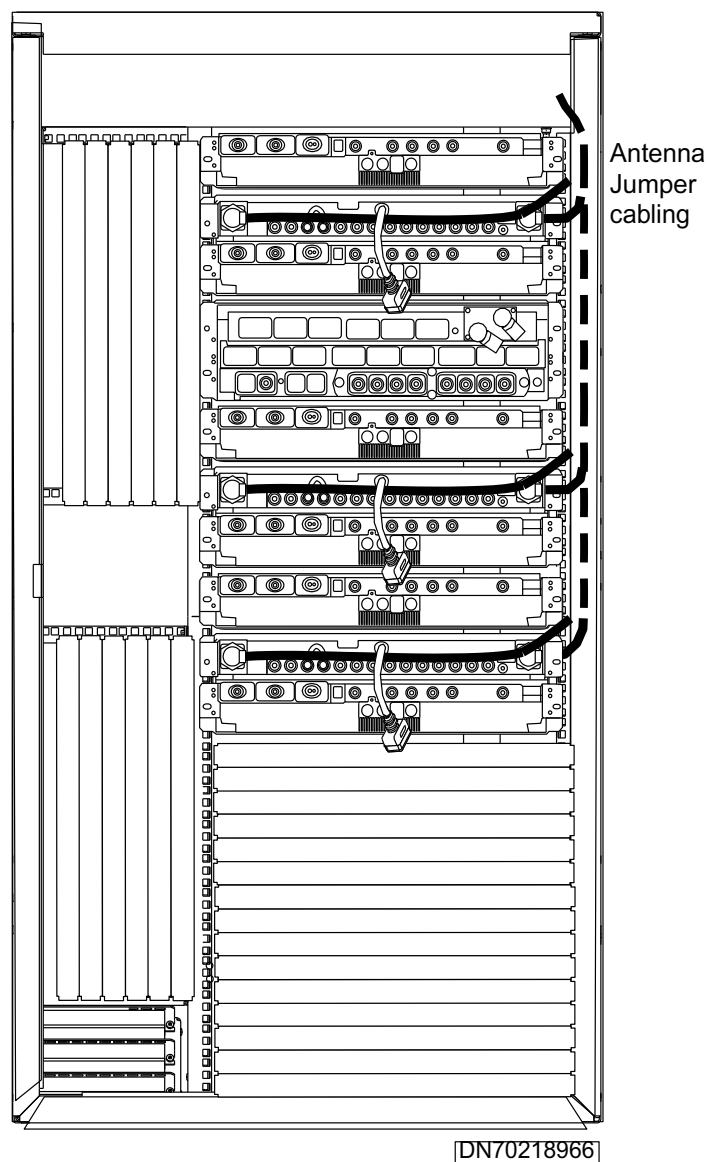


Figure 107. Antenna jumper cables in a 3+3+3/4+4+4 FCOA configuration

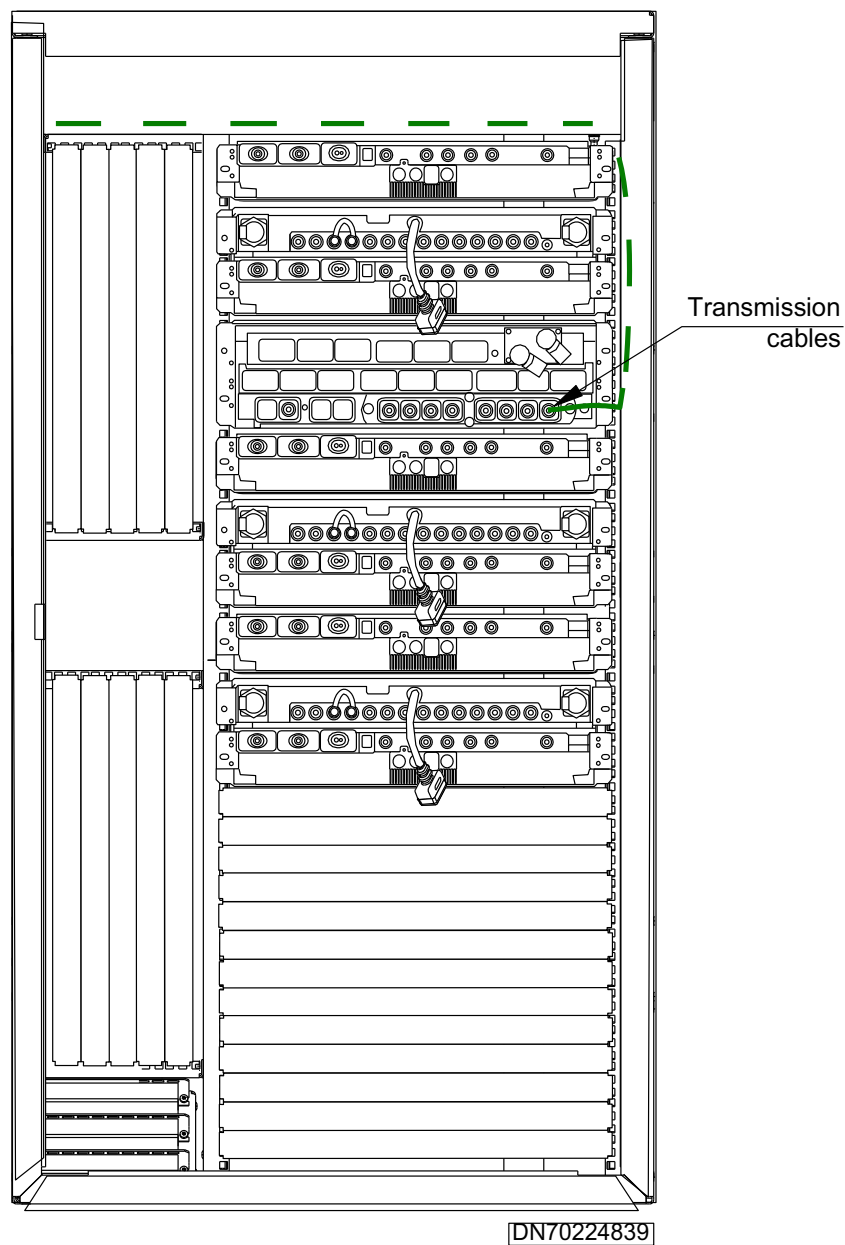


Figure 108. Transmission cables in a 3+3+3/4+4+4 FCOA configuration

5

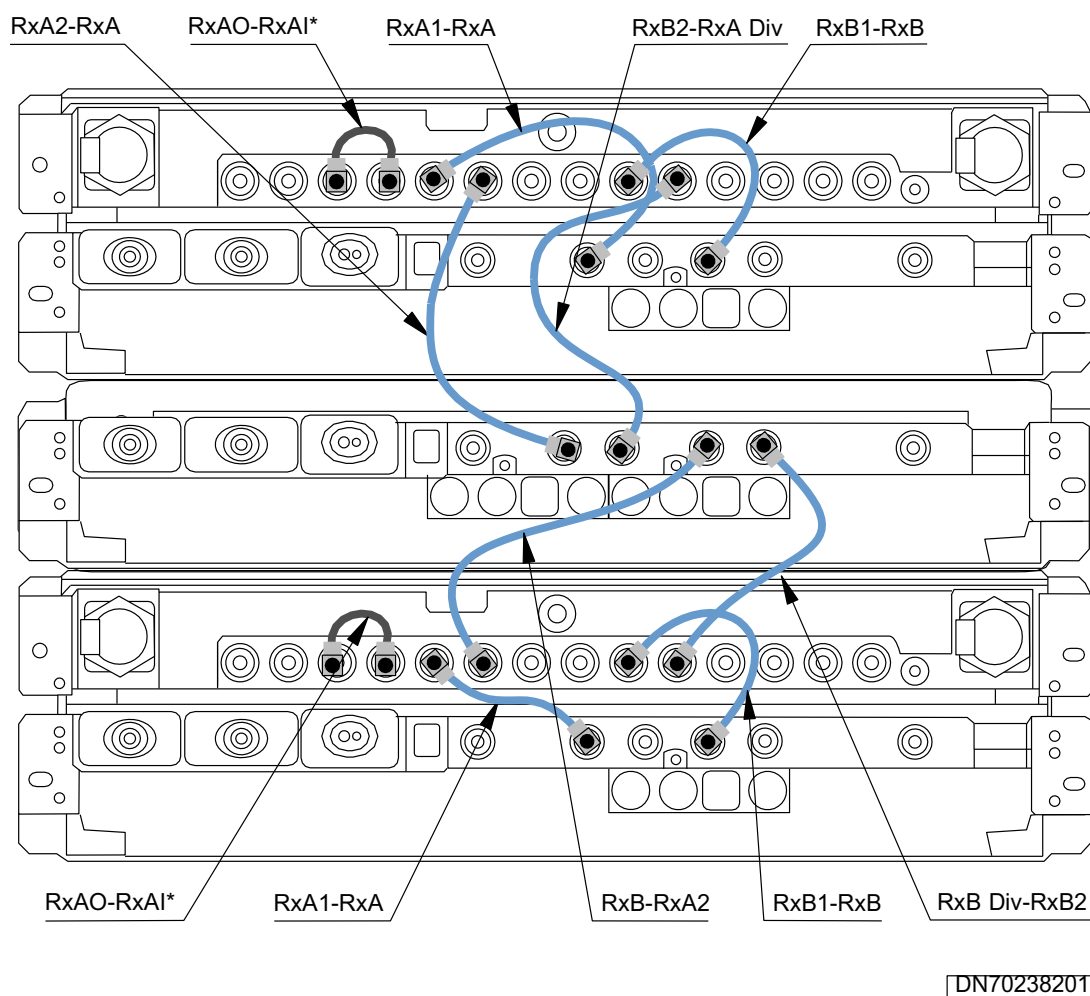
Creating a cost-optimised 3+3 configuration (splitting a sector)

A cost-optimised 3+3 Flexi EDGE configuration can be installed in a stack, in Flexi Cabinet for Indoor (FCIA) and Flexi Cabinet for Outdoor (FCOA).

For creating this configuration, you need:

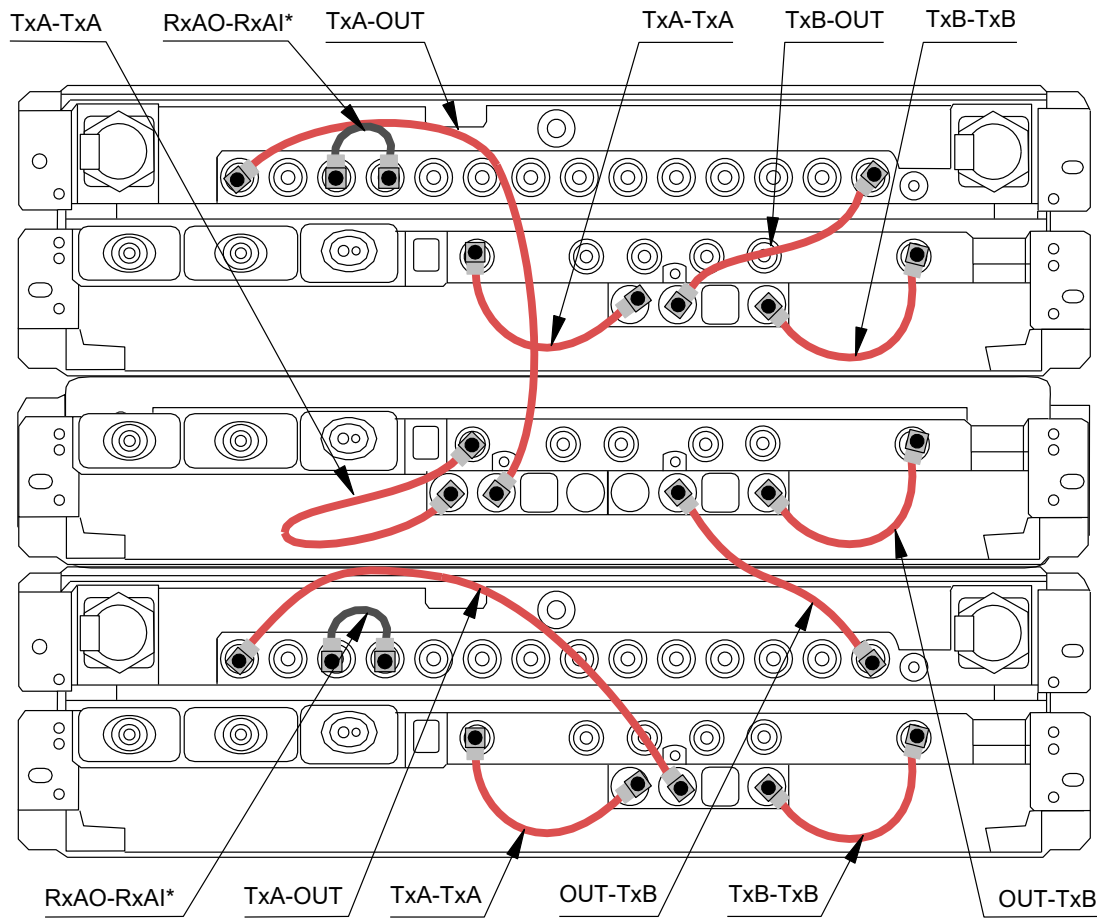
- one System Module (ESMA)
- three Dual TRX Modules (EXxA)
- two Dual Duplexer Modules (ERxA)
- one transmission sub-module (FlxA)
- four Wideband Combiner Sub-modules (EWxx)

The following figures show the RF cabling.



*) RxAO-RxAI is pre-installed

Figure 109. RX cables in a cost-optimized 3+3 configuration



DN70238213

*) RxAO-RxAI is pre-installed

Figure 110. TX cables in a cost-optimised 3+3 configuration

6

Creating dual band 1+1+1/2+2+2 and 1+1+1/2+2+2 configurations

A 2+2+2 and 2+2+2 dual band configuration can be installed on a wall, in Flexi Cabinet for Indoor (FCIA) and Flexi Cabinet for Outdoor (FCOA).

For creating a 2+2+2 and 2+2+2 dual band configuration, you need:

- six Dual TRX Modules (EXxA)
- six Dual Duplexer Modules (ERxA)
- one System Module (ESMA)
- Extension Cable Kit

The following figures show the module installation order for each installation type. For instructions on cabling, see the following:

- Bus and power cabling: follow the instructions for 3+3+3/4+4+4 2-way 2UD configuration.
- RF cabling: follow the instructions for 1+1+1/2+2+2 bypass 2UD configuration.

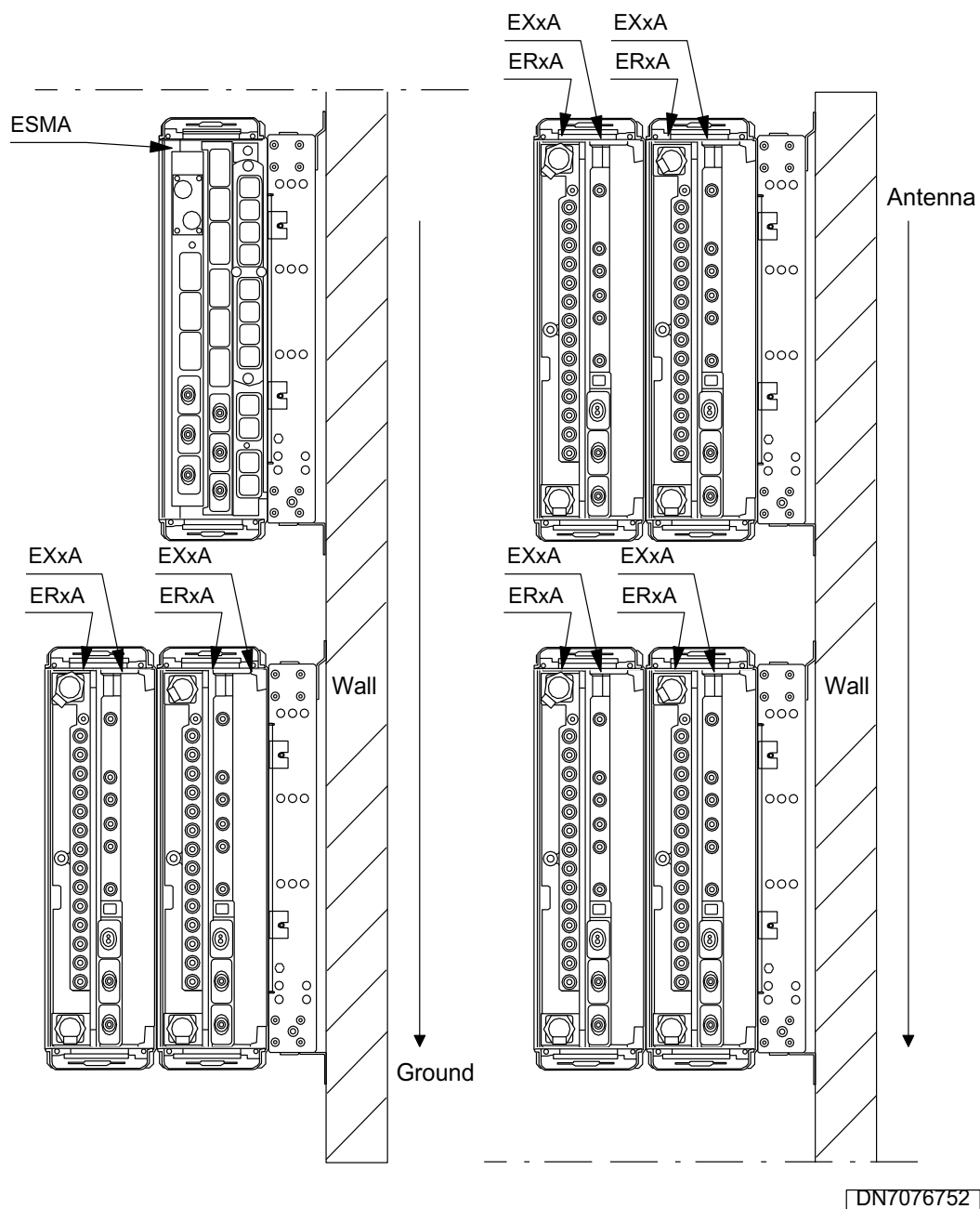


Figure 111. Module installation order in a 2+2+2 and 2+2+2 dual band configuration on a wall

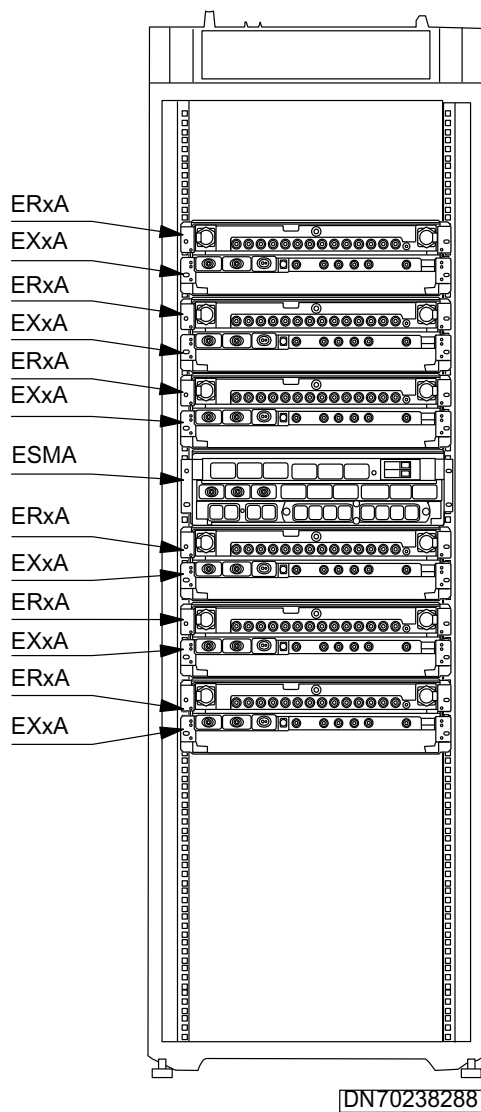


Figure 112. Module installation order in a 2+2+2 and 2+2+2 dual band configuration in FCIA

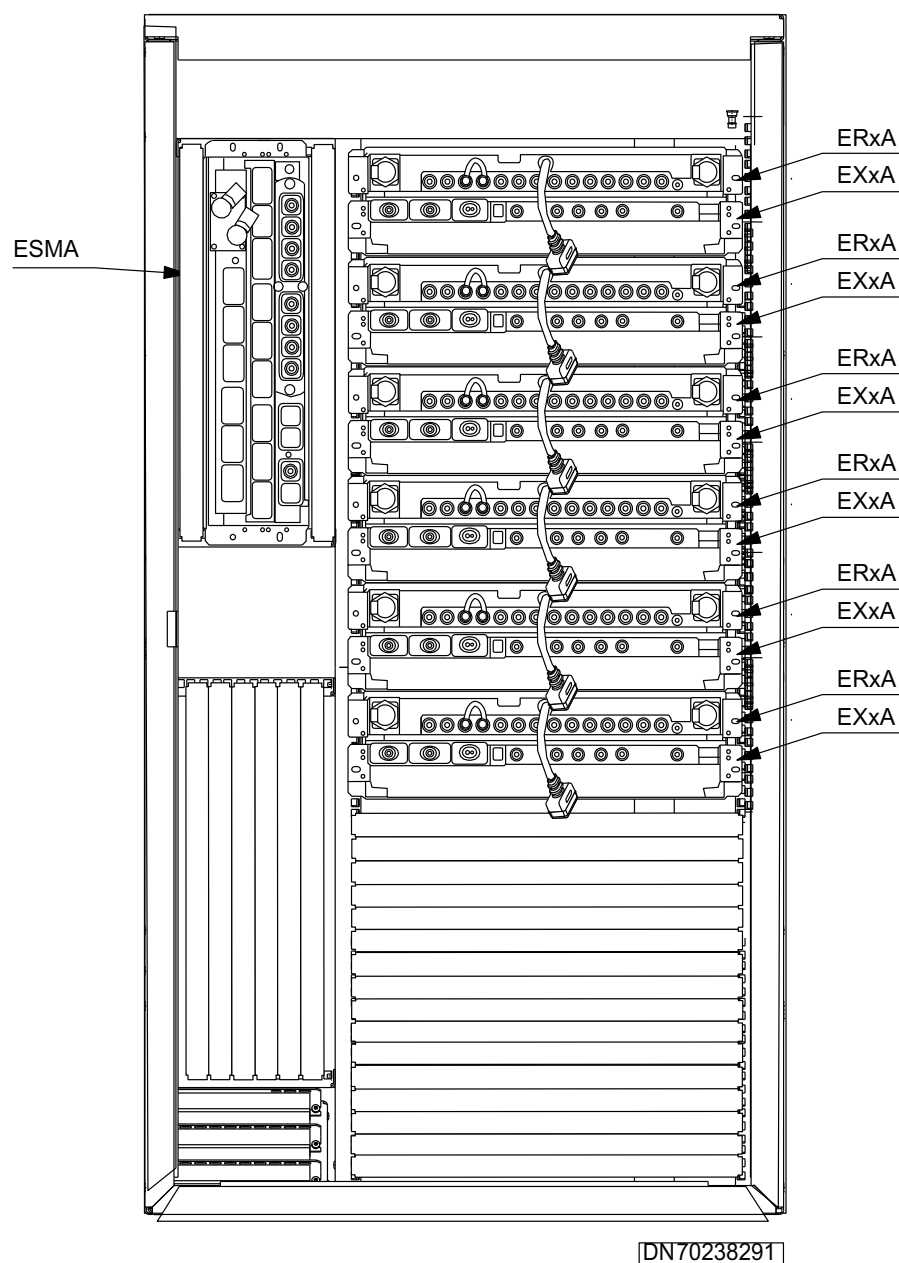


Figure 113. Module installation order in a 2+2+2 and 2+2+2 dual band configuration in FCOA

7

Creating 6+6 RTC configurations

Purpose

A 6+6 configuration can be created in Flexi Cabinet for Indoor (FCIA) or Flexi Cabinet for Outdoor (FCOA).

Before you start

To create this configuration, you need:

- six Dual TRX Modules (EXxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)
- two Remote Tune Combiner Modules (ECxA)
- one System Extension Module (ESEA)

All ECxA power and bus cables must be connected to the ESMA in RTC configurations. All EXxA bus cables must be connected to the ESEA.



Steps

1. **Install the modules.**

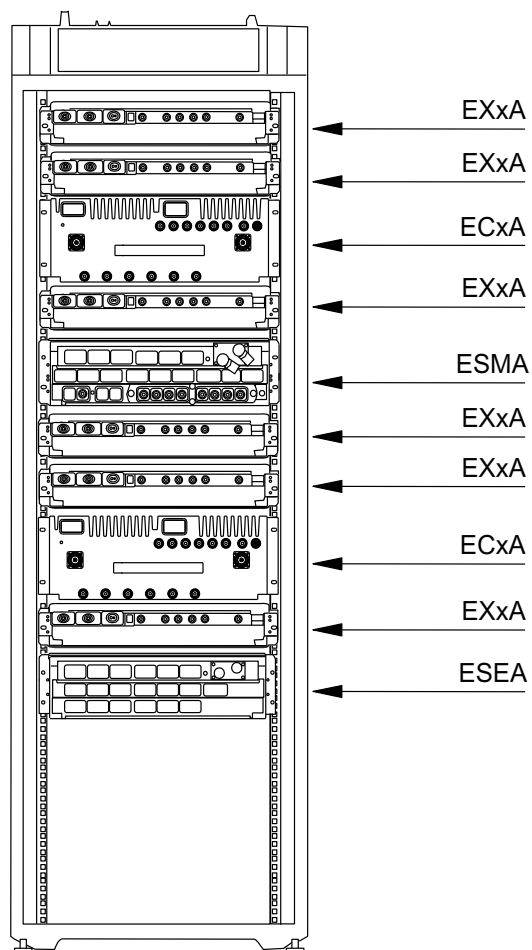


Figure 114. Module installation order in FCIA

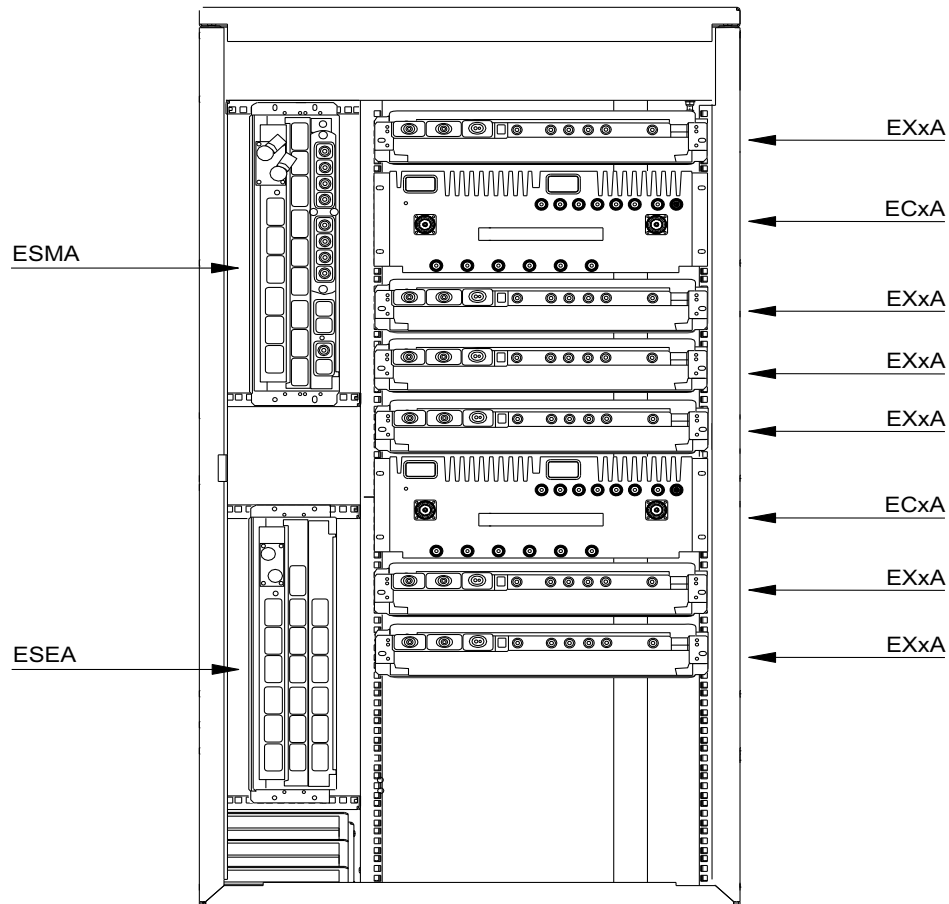


Figure 115. Module installation order in FCOA

2. Connect the cables.

The following figures show the RF cabling. For other cables, follow the instructions for a 3+3+3/4+4+4 2-way 2UD configuration.

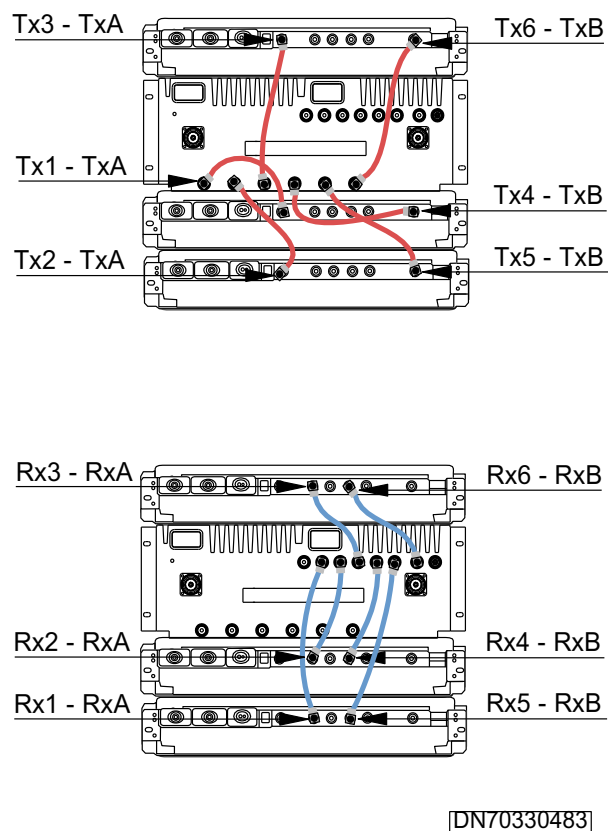


Figure 116. RF cabling

8

Creating a 7 to 12 Omni RTC configuration

Before you start

To create this configuration, you need:

- six Dual TRX Modules (EXxA)
- one System Module (ESMA)
- one transmission sub-module (FlxA)
- two Remote Tune Combiner Modules (ECxA)
- one System Extension Module (ESEA)
- one Upgrade Cable Kit (EUCA)

All ECxA power and bus cables must be connected to the ESMA in RTC configurations. All EXxA bus cables must be connected to the ESEA.



Steps

1. **Follow the installation steps in Creating 6+6 RTC configurations.**
2. **Connect the EUCA RF cables.**
 - Connect RX_ext_In of the top RTC to RX_ext_Out of the lower RTC.
 - Connect RX_ext_Out of the top RTC to RX_ext_In of the lower RTC.



Tip

Route the EUCA RF cables along the sides of the cabinet so that the cables do not block installation or removal of the EXxA.

9

Optional power modules (FPDA and FPMA) in Flexi EDGE BTS configurations

The following table shows the number of power modules needed in Flexi EDGE BTS configurations if AC or 24 VDC power supply options are used. The power modules are:

- Flexi Power DC/DC Module 24 V (FPDA) and
- Flexi Power Module (FPMA) with AC/DC 230 V Sub-modules (FPAA)

Table 9. Number of power modules needed

Configuration	Number of FPDAs	Number of FPMAs
1+1+1/2+2+2 2UD bypass	1	1 FPMA with 2 FPAA's
3+3+3/4+4+4 2UD 2-way	2 ¹⁾	1 FPMA with 4 FPAA's

¹⁾ For a cost-optimised 3+3 configuration, only one FPDA is needed.

The recommended optional power module locations are as follows:

- In Flexi Cabinet for Indoor (FCIA), the recommended location of the FPMA and FPDA is at the top of the cabinet.
- In Flexi Cabinet for Outdoor (FCOA), the recommended location of the FPMA and FPDA is in the vertical racks.
 - If the System Module is in the vertical rack, install the power module on the vertical rack at the bottom.
 - If the System Module is in the horizontal rack, install the power module(s) on the vertical rack on top.

- In stack installations:
 - The recommended location of the FPDA is on top of the stack. This is for possible future expansion - the new FPDA can be installed directly on top of the existing one.
 - The recommended location of the FPMA is at the bottom of the stack. There can only be one FPMA per stack, so placing the FPMA at the bottom of the stack allows for easier expansion of the top sector module. That sector can be expanded without the Upgrade RF Cable Kit EUCA.
- In pole and wall installations, the recommended location of the FPDA and FPMA is either on the same plinth as the ESMA or on an adjacent plinth.

The following figures show the installation location of the power modules for the 1+1+1/2+2+2 and 3+3+3/4+4+4 configurations, for each installation type.

Figure 117. 1+1+1/2+2+2 configuration in a stack, with FPDA

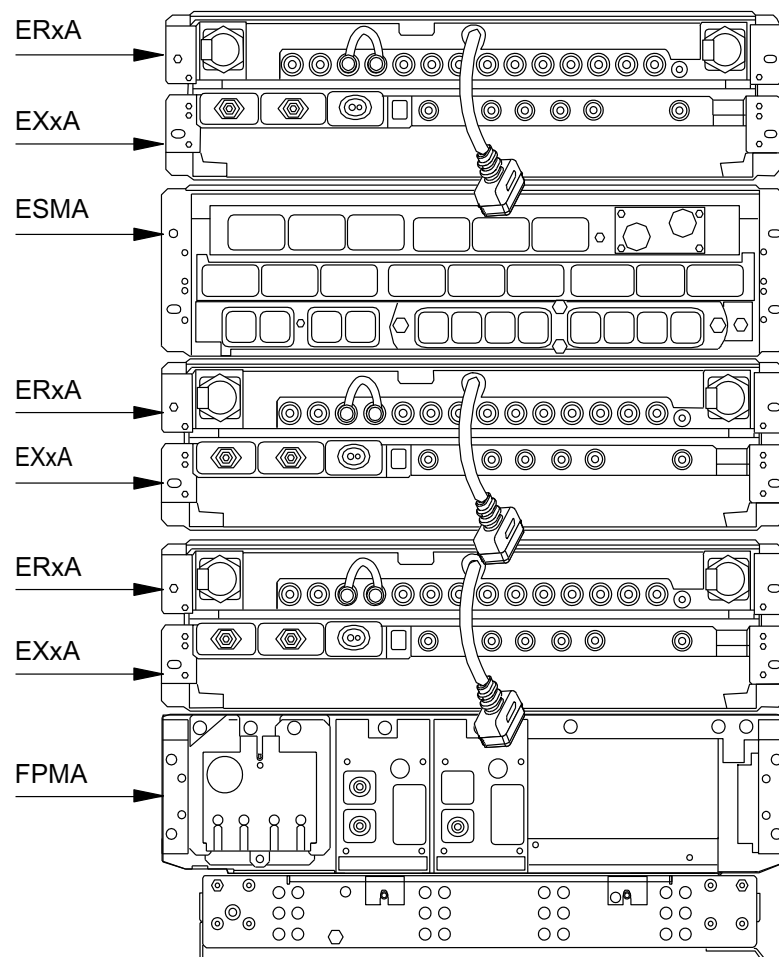


Figure 118. 1+1+1/2+2+2 configuration in a stack, with FPMA

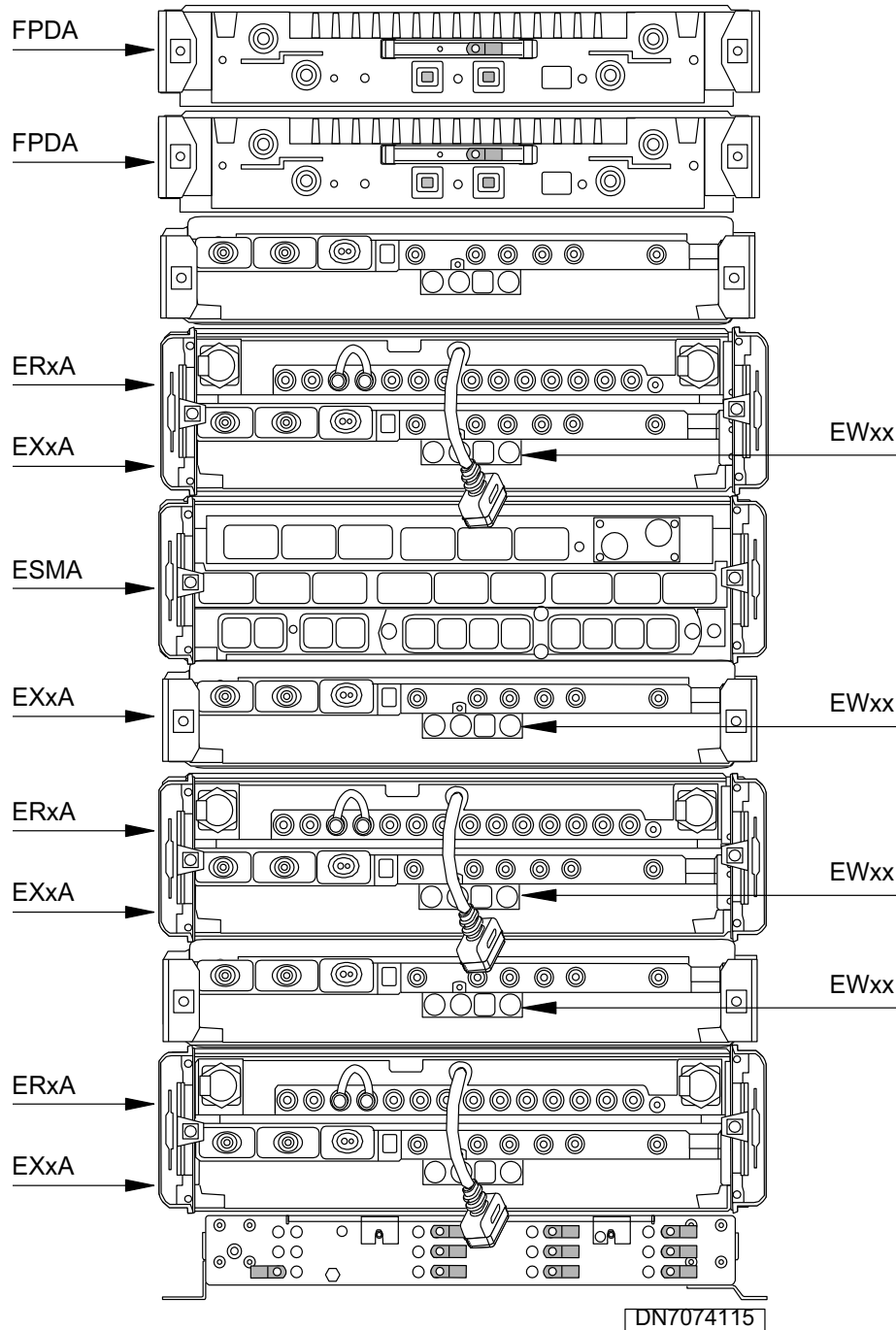


Figure 119. 3+3+3/4+4 configuration in a stack, with FPDAs

Wall installation

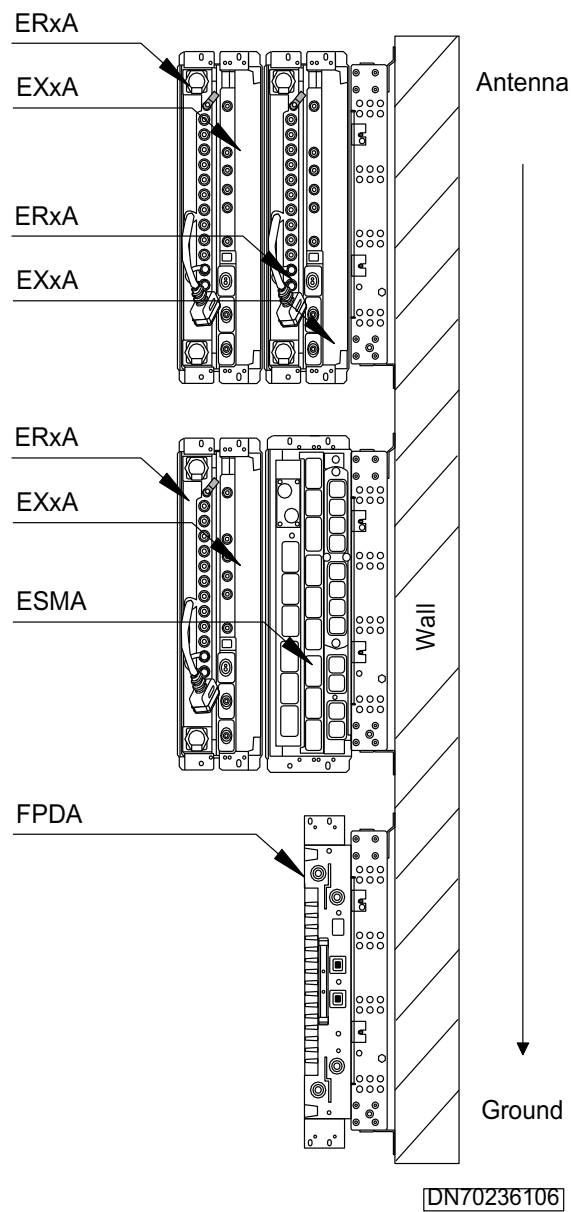
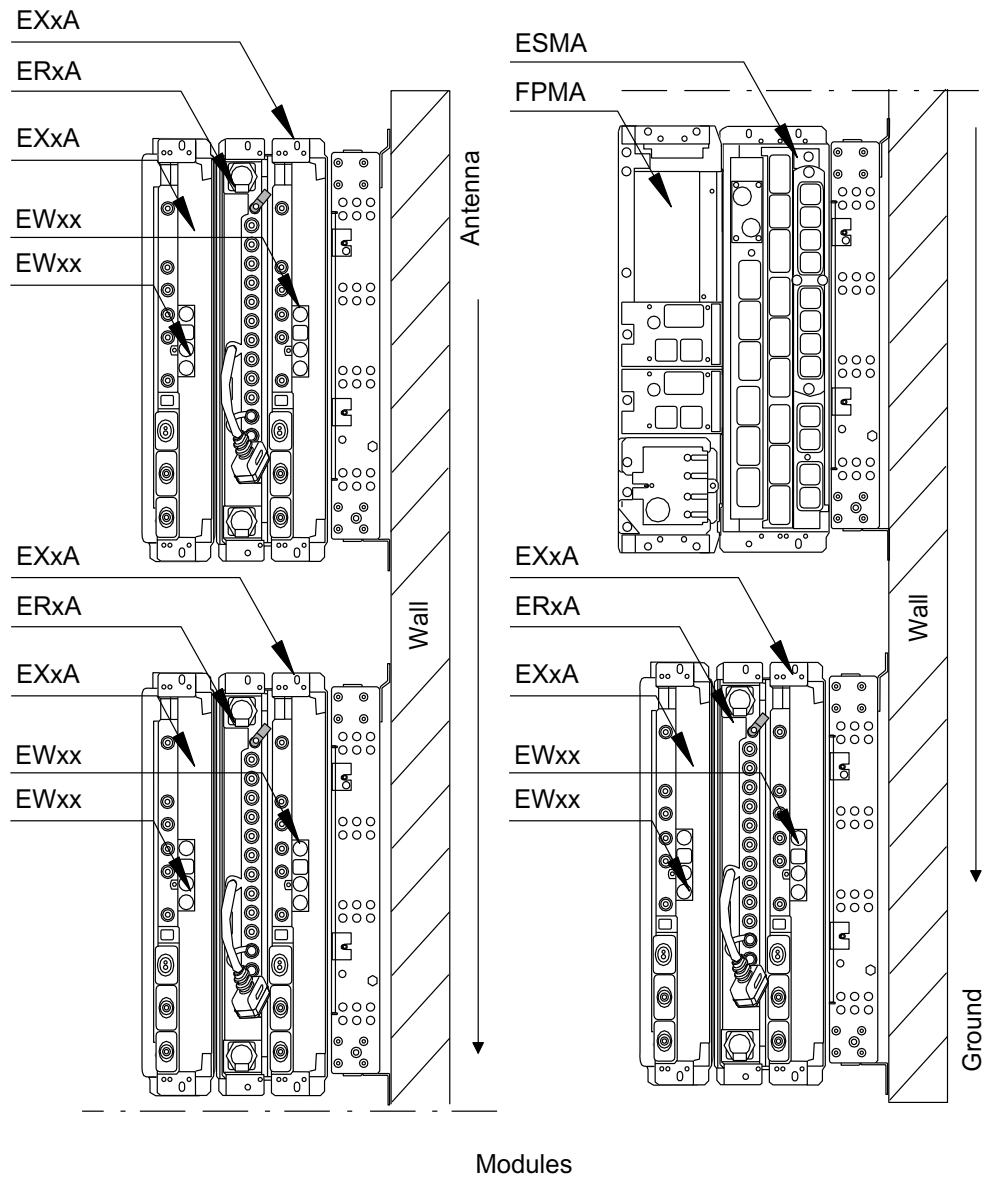


Figure 120. 1+1+1/2+2+2 configuration on a wall, with FPDA



DN70226118

Figure 121. 3+3+3/4+4 configuration on a wall, with FPMA

Pole installation

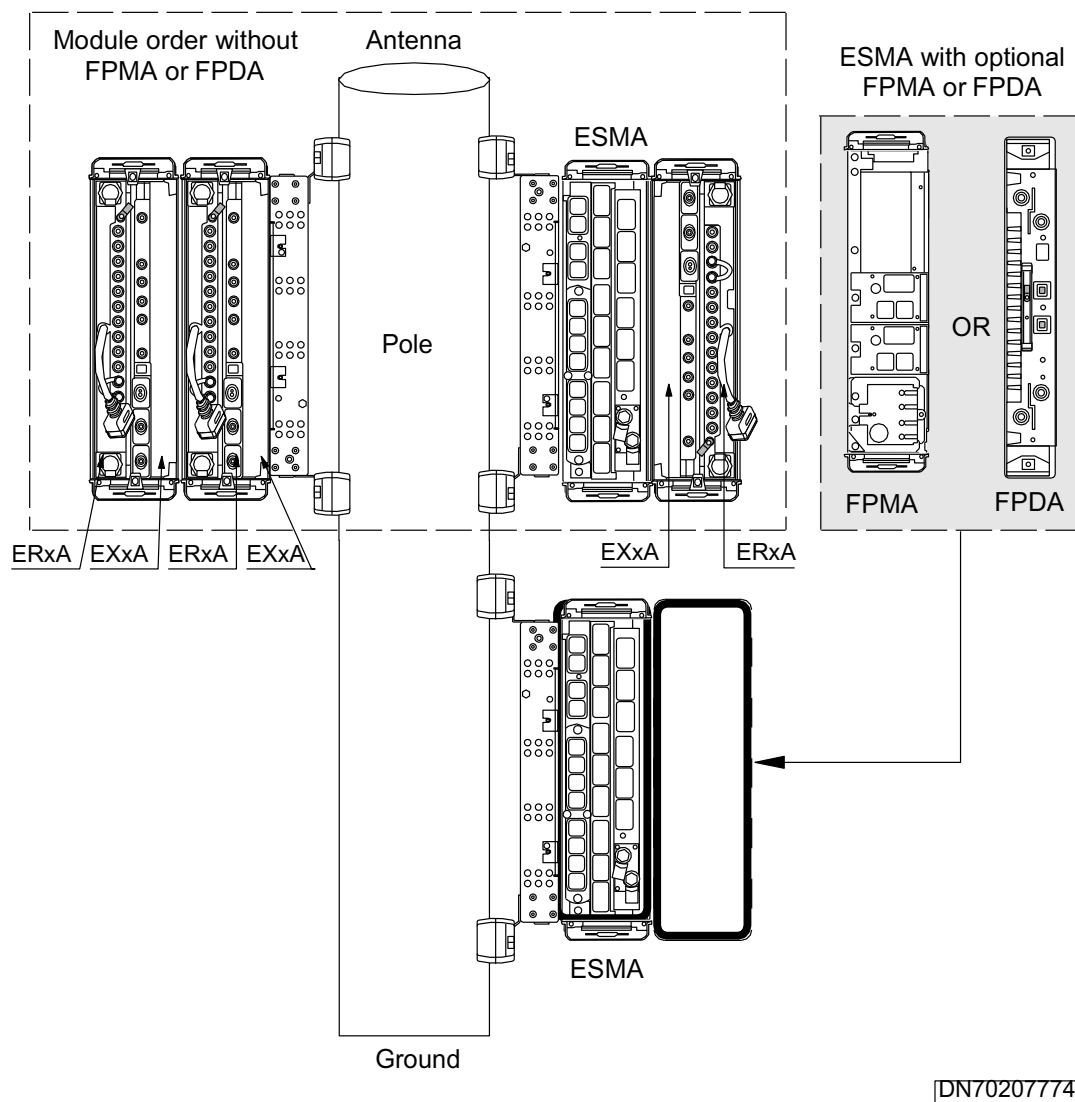
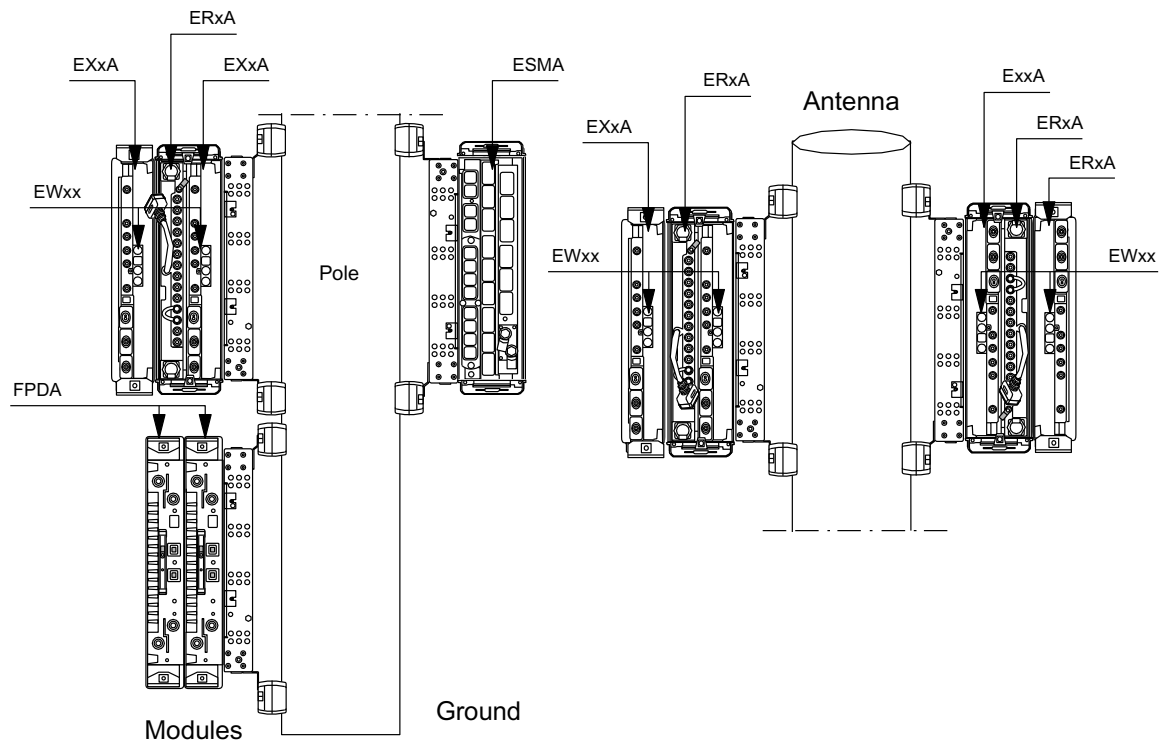


Figure 122. 1+1+1/2+2+2 configuration on a pole, with FPDA/FPMA



DN70236196

Figure 123. 3+3+3/4+4+4 configuration on a pole, with FPDAs

FCIA installation

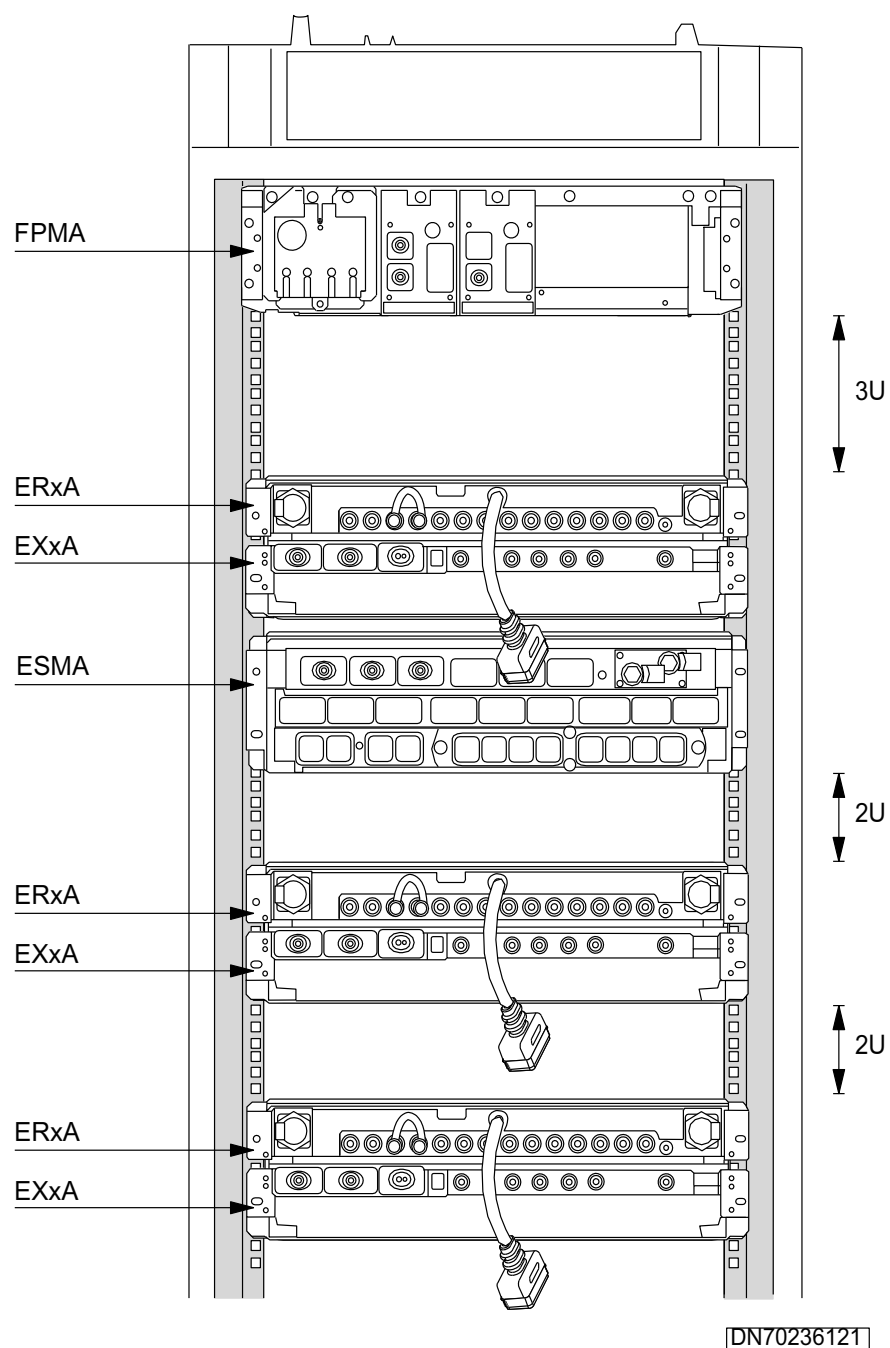


Figure 124. 1+1+1/2+2+2 configuration in FCIA, with FPMA

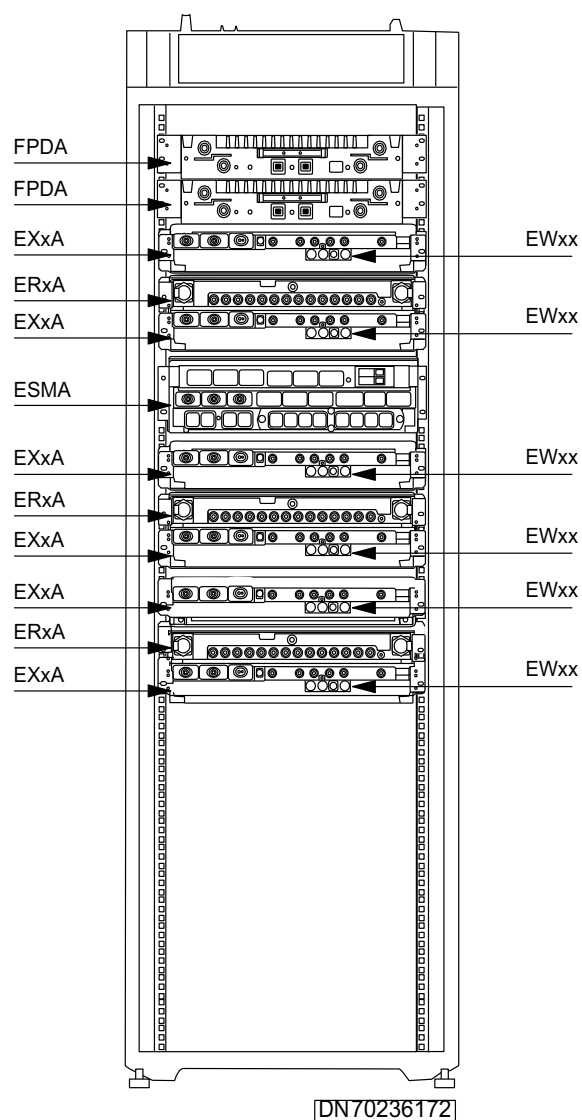


Figure 125. 3+3+3/4+4+4 configuration in FCIA, with FPDAs

FCOA installation

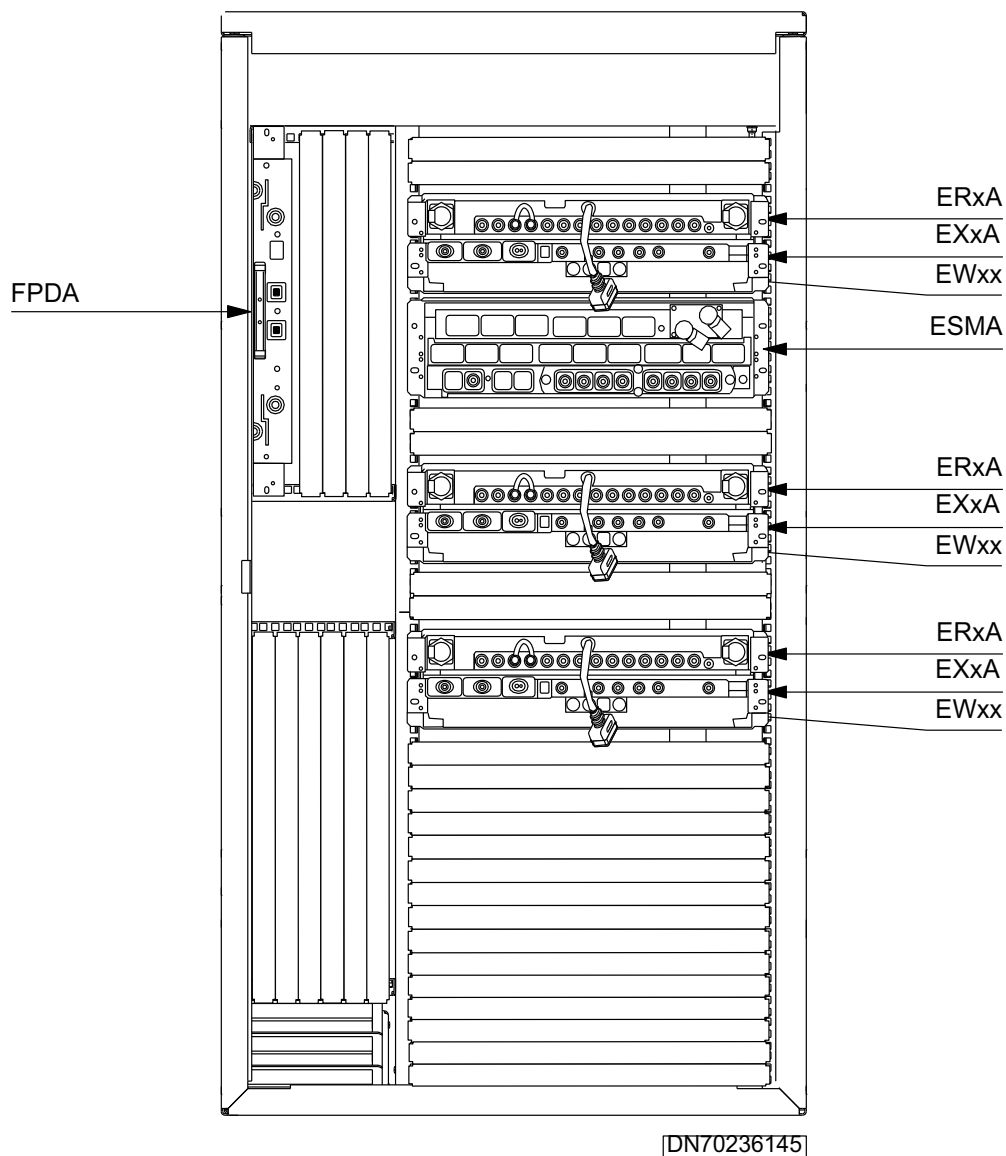


Figure 126. 1+1+1/2+2+2 configuration in FCOA, with FPDA (ESMA in horizontal rack)

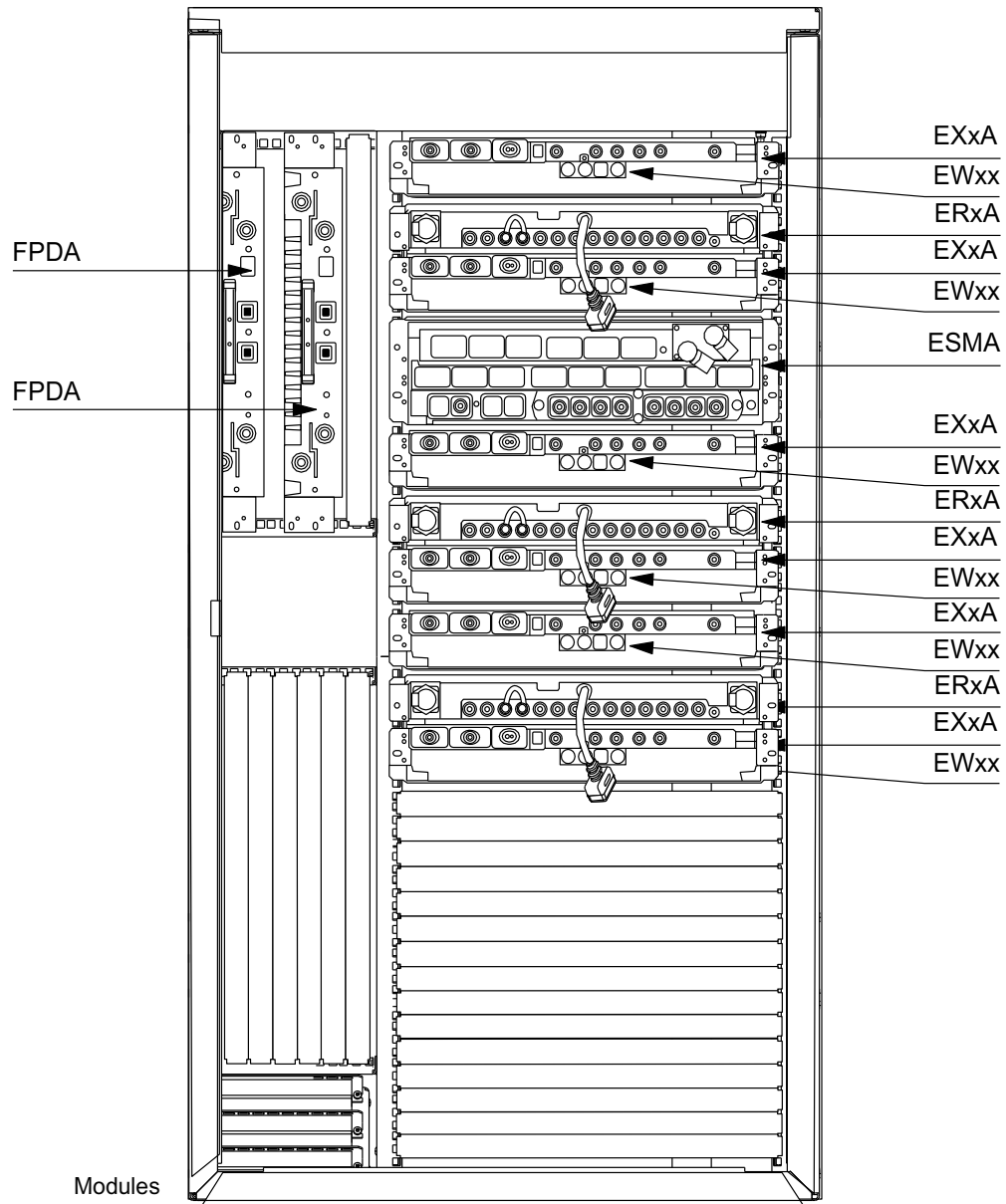


Figure 127. 3+3+3/4+4+4 configuration in FCOA, with FPDAs (ESMA in horizontal rack)

10 Flexi EDGE/WCDMA BTS multimode configurations

Overview

Nokia Flexi EDGE BTS and Nokia Flexi WCDMA BTS modules can be installed into the same stack or cabinet. Common installation kits and accessories can be used.

The same connection types and power supply types can be used. Flexi EDGE BTS and Flexi WCDMA BTS utilise the same Flexi power modules and can share the same site support system.

The BTSs can be interconnected with the $n \times E1/T1$ or Nokia FlexBus connection. The BTSs share a common physical transmission connection, but separate logical E1/T1-level connection to the upper network layer (BSC and RNC).

Antenna line sharing with Nokia Flexi WCDMA BTS can be arranged with a diplexer for combining and splitting of different antenna signals, if different frequency bands are used for GSM/EDGE and WCDMA/HSPA traffic.

Creating Flexi EDGE/WCDMA BTS multimode configurations

The following figures show how to install Flexi EDGE and Flexi WCDMA modules in Flexi Cabinet for Indoor (FCIA) and Flexi Cabinet for Outdoor (FCOA) in a 1+1+1/2+2+2 EDGE and 1+1+1 WCDMA configurations. Flexi WCDMA modules are installed on the bottom of the cabinet, and Flexi EDGE modules on top. The stickers on the cabinets show the installation location for Flexi EDGE and Flexi WCDMA modules.

For detailed instructions on installing and cabling Flexi WCDMA modules, see *Nokia Flexi WCDMA Base Station*, Product Documentation.

For detailed instructions on installing and cabling Flexi EDGE modules, see the configuration-specific instructions.

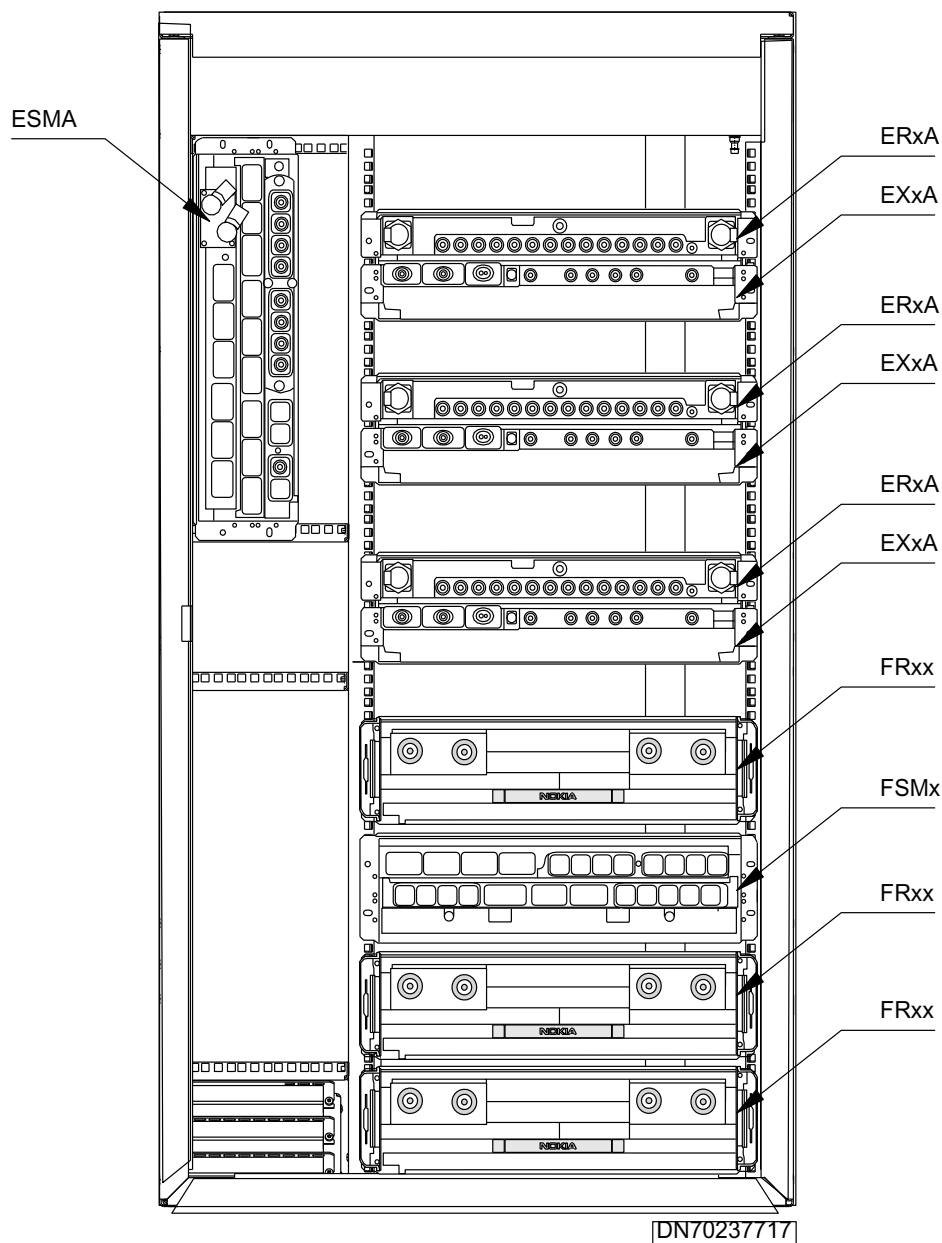


Figure 128. 1+1+1/2+2+2 EDGE and 1+1+1 WCDMA configuration in Flexi Cabinet for Outdoor (FCOA)

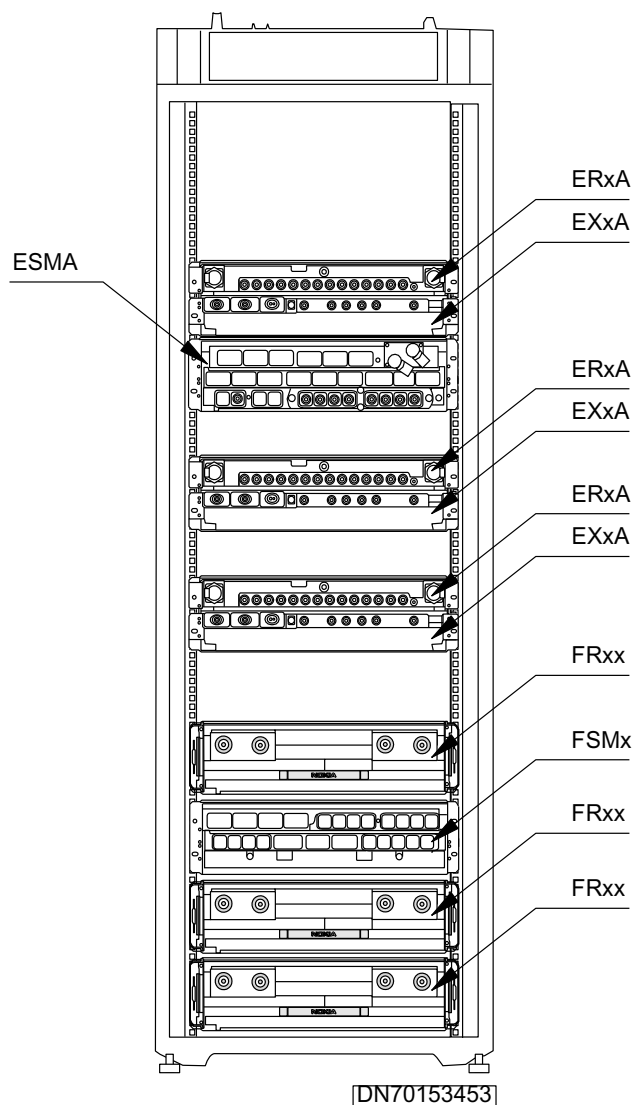


Figure 129. 1+1+1/2+2+2 EDGE and 1+1+1 WCDMA configuration in Flexi Cabinet for Indoor (FCIA)

Appendix A Common sector configuration

A.1 Common sector configurations

Table 10. Common sector configurations

# of carriers	TX combining	RX div.	# of EXxA	# of ERxA	# of EWxx	# of ECxA	# of ESMA	# of ESEA	# of antennas	EP1 ¹⁾
1	Bypass	1UD	1	1	0	0	1	0	1	Yes
1	Bypass	2UD	1	1	0	0	1	0	2	Yes
2	Bypass	2UD	1	1	0	0	1	0	2	Yes
3	Bypass	2UD	2	2	0	0	1	0	3	Yes
4	Bypass	2UD	2	2	0	0	1	0	4	Yes
1	DP	2UD	1	1	1	0	1	0	2	No
2	DP	2UD	2	1	2	0	1	0	2	No
3	DP	2UD or 4UD	3	2	3	0	1	0	2UD=3, 4UD=4	No
4	DP	2UD or 4UD	4	2	4	0	1	0	4	No
1	IDD or DP	4UD	2	2	IDD=0, DP=1	0	1	0	4	No
1	IDD	2UD	1	1	0	0	1	0	2	No
2	IDD or DP	4UD	2	2	IDD=0, DP=2	0	1	0	4	No
2	IDD	2UD	2	2	0	0	1	0	4	No
2	2-way	1UD	1	1	1	0	1	0	1	Yes
3	2-way	2UD	2	1	2	0	1	0	2	Yes
4	2-way	2UD	2	1	2	0	1	0	2	Yes
3-4	4-way	1UD	2	1	3	0	1	0	1	Yes
5 to 8	4-way	2UD	3 to 4	1	5 to 6	0	1	0	2	Yes
Up to 6	RTC (6-way)	2UD	Up to 3	0	0	1	1	1	2	Yes
7 to 12	RTC (6-way)	2UD	4 to 6	0	0	2	1	1	2	Yes

¹⁾ Supported in EP1 (Yes/No)