

VzW MPE25K Installation Manual

2008. 04



Modified Manual LIST

| Manual issue | DATE | Modified List | Remark |
|--------------|---------------|--|--------|
| Ver 0.2 | 2007. 08. 02 | First Draft Added Information | |
| Ver 0.3 | 2007. 09. 11 | Changed DIP S/W control method Appendix C. System Block Appendix D. Troubleshooting for the MPE25K Modified Image | |
| Ver 0.4 | 2007. 10. 12. | Bias-T CU Port DC Block+50 Term Added material name of each image | |
| Ver 0.5 | 2008. 04. 21 | Changed Installation Bracket Updated System Block | |

► Safety Precautions:

- Use the power plug at the adaptor to turn the power on and off.
- Please make sure that a ground wire is installed to connect the Antenna Unit to an appropriate earth ground.
- Refer servicing to a qualified technician who is familiar with NEC (National Electrical Code) and a related regulation for installation to reduce the risk of electrical damage when the unit does not appear to operate normally or exhibits a marked change in performance.

Radio Regulation Conformance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful and, if not installed and used in accordance with instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference. And (2) this device must accept any interference received, including interference that may cause understand operation.

FCC RF Radiation Exposure Statement

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

WARNING

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

<Table of Contents>

| | |
|--|-------------|
| 1. Installation Flow Chart | 7 |
| 2. Component Verification and Explanation | 8 |
| 2.1 DONOR UNIT(DU) | 9 |
| 2.2 COVERAGE UNIT(CU)..... | 10 |
| 3. Preparing for DU and CU Installation | ! 가 . |
| 4. BAND SETTING | ! 가 . |
| 5. DONOR UNIT(DU) SET Installation | 15 |
| 5.1 BRACKET -DU Image | 15 |
| 5.1.1. DU BRACKET – DU Connection Image | 15 |
| 5.1.2. BRACKET -DU Connection to Installation Place(WALL or POLE) Image..... | 15 |
| 5.2 BRACKET Connection to DU..... | 16 |
| 5.3 BRACKET Connection depending on Installation Place..... | 17 |
| 5.3.1. BRACKET/MTG POLE MOUNTING..... | 17 |
| 5.3.2. BRACKET/MTG LUMBER WALL Mounting..... | 17 |
| 5.3.3. BRACKET/MTG CONCRETE WALL Mounting | 18 |
| 5.4 Connection DU(same as 5.1) with BRACKET(same as 5.2) | 18 |
| 5.5 Installation Completion. | 20 |
| 6. CU Wall & Ceil Mount Installation | 21 |
| 6.1. MTG Bracket Image..... | 21 |
| 6.2 GYPSUM BOARD WALL MOUNTING..... | 22 |
| 6.3 CONCRETE WALL MOUNTING | 22 |
| 6.4 LUMBER WALL MOUNTING | 23 |
| 6.5 Install Bracket Connection with CU..... | 24 |
| 6.6 CU SET Installation Completion..... | 24 |
| 7. Power Connection and Optimization SETTING | ! 가 . |
| 8. Status Check | 30 |
| 8.1 DU FAULT LED | 30 |
| 8.2 CU FAULT LED | 30 |
| Appendix A. Product Introduction | 32 |
| A.1 Overview | 32 |
| A.2 Supported Frequency Range | 34 |
| Appendix B. System Specifications..... | 35 |
| Appendix C. System Block..... | 36 |
| Appendix D. Troubleshooting for MPE25K..... | 37 |

<Figures>

| | | | |
|--|---|---|----|
| Fig. 1 Installation Flow Chart | | | 7 |
| Fig. 2 List of all the Components in the System | ! | 가 | . |
| Fig. 3 Additional CU Components..... | ! | 가 | . |
| Fig. 4 DONOR UNIT(DU) Image | ! | 가 | . |
| Fig. 5 CU Image..... | ! | 가 | . |
| Fig. 6 DIP S/W Basic Setting | ! | 가 | . |
| Fig. 7 MTG Bracket Image..... | | | 15 |
| Fig. 8 MTG BRACKET Mounting (Pole, Lumber Wall, Concrete Wall) Connection Image..... | | | 15 |
| Fig. 9 DU Bracket Connection Diagram | | | 16 |
| Fig. 10 POLE MOUNTING MTG BRACKET-DU Connection Sequence..... | | | 17 |
| Fig. 11 LUMBER WALL MOUNTING MTG BRACKET-DU Connection Sequence..... | | | 17 |
| Fig. 12 CONCRETE WALL MOUNTING MTG BRACKET-DU Connection Sequence..... | | | 18 |
| Fig. 13 DU Unit Wall Mounting | | | 19 |
| Fig. 14 DU Unit POLE Mounting Installation Completion Diagram | | | 20 |
| Fig. 15 DU Unit LUMBER WALL Mounting Installation Completion Diagram | | | 20 |
| Fig. 16 DU Unit CONCRETE WALL Mounting Installation Completion Diagram | | | 20 |
| Fig. 17 CU MTG Bracket Image & Hole distance..... | | | 21 |
| Fig. 18 CU Bracket Gypsum Wall Mounting..... | | | 22 |
| Fig. 19 CU Bracket Concrete Wall Mounting..... | | | 23 |
| Fig. 20 CU Bracket Lumber Wall Mounting | | | 23 |
| Fig. 21 CU MTG Bracket – CU SET Connection Image | | | 24 |
| Fig. 22 CU Installation Sequence | | | 24 |
| Fig. 23 Power PORT Connection Diagram | | | 25 |
| Fig. 24 POWER INJECTOR Installation Diagram | | | 26 |
| Fig. 25 DU ANT Tilt Diagram | | | 28 |
| Fig. 26 Verifying reception Status Diagram | | | 29 |
| Fig. 27 DIP S/W Diagram | | | 29 |
| Fig. 28 DU LED Diagram | | | 30 |
| Fig. 29 CU LED Diagram | | | 31 |
| Fig. 30 System Installation Diagram | | | 32 |
| Fig. 31 Basic Connection Diagram..... | | | 33 |

<Tables>

Table 1 Band Setting 14
Table 2 Cellular Frequency 34
Table 3 PCS Frequency 34
Table 4 RF Specifications 35
Table 5 Physical Specifications 35
Table 6 Antenna Specifications 35

1. Installation Flow Chart

This document will provide details on how to successfully install the Juni JR-20 Repeater system. The flow chart below provides a step by step guide for installing the JR-20 Repeater

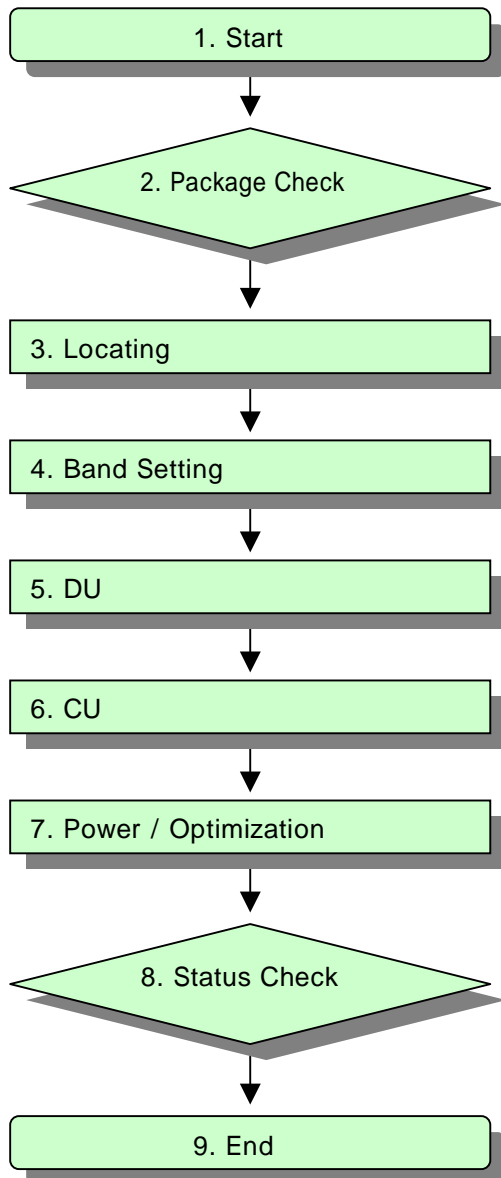


Fig. 1 Installation Flow Chart

2. Component Verification and Explanation

The first step when installing the repeater is to check that all components are present and that the parts do not have any visible faults. The figure below illustrates the items included in the Juni JR-20 Repeater Kit.

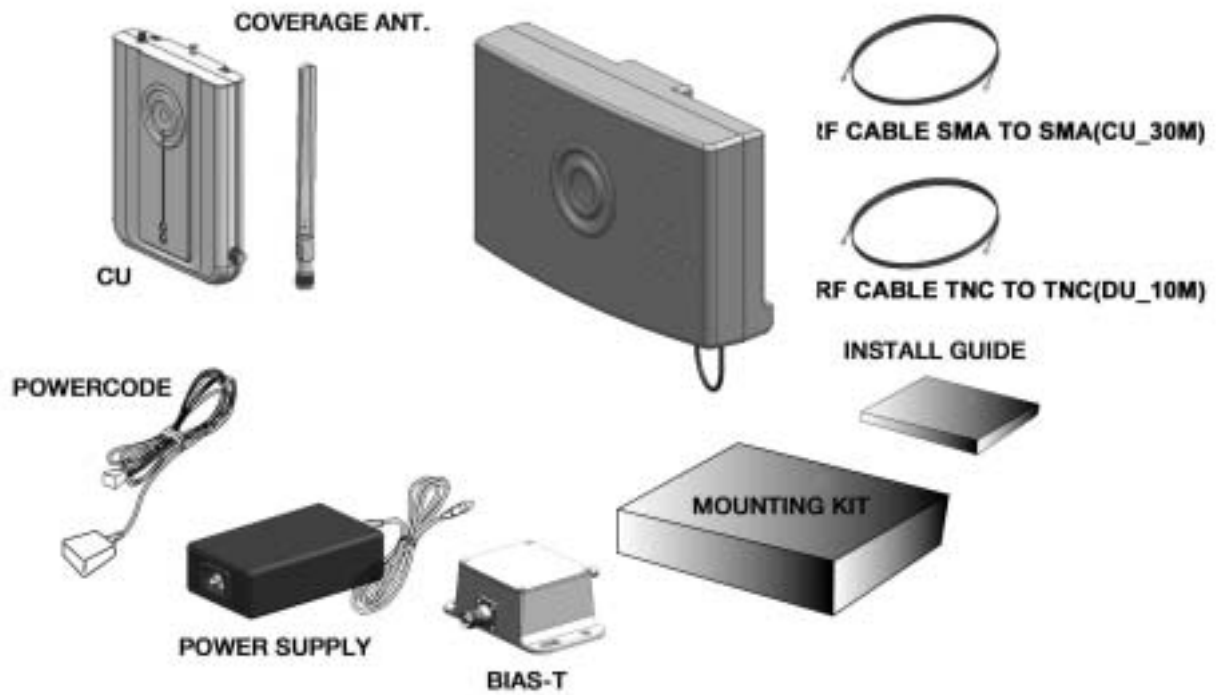


Fig. 2 List of all the Components in the System

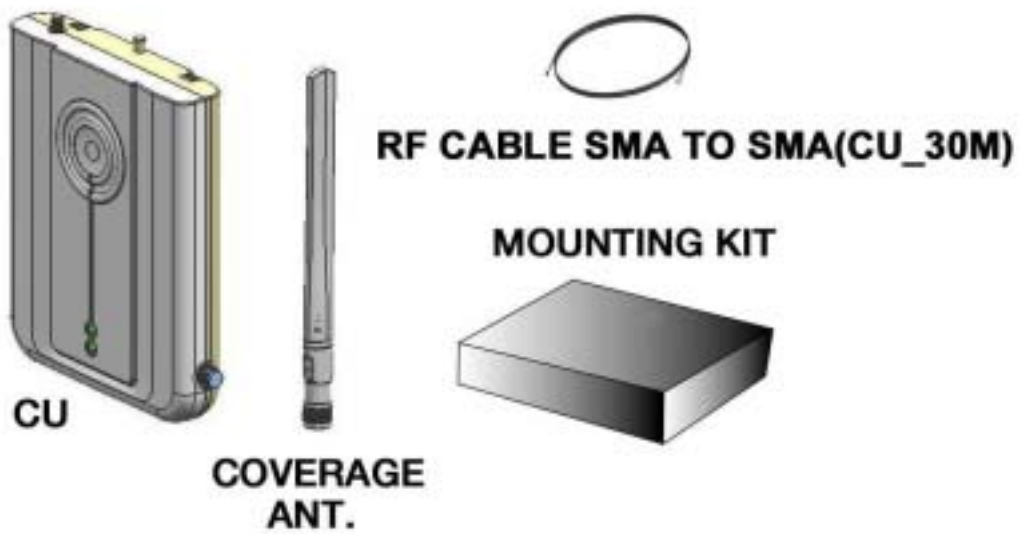


Fig. 3 Additional Coverage Unit Components

2.1 DONOR UNIT(DU)

The role of the Donor Unit is to communicate with the BTS. It is located outside the building where service is to be improved. The Donor Unit can be mounted onto a wall or a pole, depending on the specific installation needs.

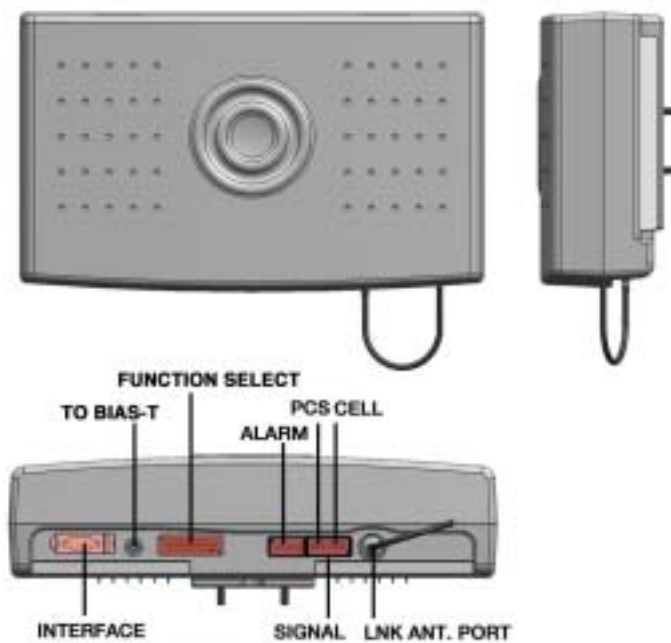


Fig. 4 DONOR UNIT(DU)

2.2 COVERAGE UNIT(CU)

The role of the Coverage Unit is to communicate with the mobiles within the building which needs improved coverage. It is intended for wall mounting.

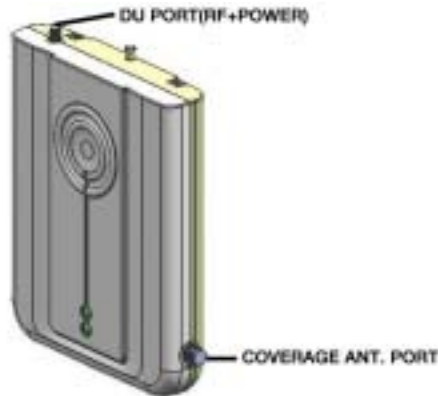


Fig. 5 Coverage Unit (CU)

3. Preparing for Donor Unit and Coverage Unit Installation

Determining the proper installation location for the Donor and Coverage Units is very important, since their position will determine the overall performance of the repeater.

The authorized installer should determine where it will be mounted in accordance with the instructions received by Juni for best reception by the BTS.

When determining the position of the Donor Unit, the following points should be considered.

- ➔ Where is the target Donor BTS?
- ➔ Will the Donor Unit be mounted on a wall or a pole? (99% will be wall mounted)
- ➔ Try to avoid areas where may possibly hinder the communication between the Donor Unit and the BTS such as large walls.
- ➔ The Donor Unit should not be located any more than 10 feet away from the wall penetration or window which will allow access to the inside of the building.

When determining the position of the Coverage Unit, the following points should be considered.

- ➔ Try to position the Coverage Unit at the center of the desired indoor coverage area.
- ➔ Try to position the Coverage Unit so that it is clearly visible throughout the desired indoor coverage area.
- ➔ Make sure that the distance from the Coverage Unit to the power source is less than 20 feet.

4. BAND SETTING

Once the planning of the location and positioning of the Donor and Coverage Units is finalized, the authorized installer should proceed with installing the Donor and Coverage Units. But first, the installer should set the appropriate frequency band(s) for the repeater. The figure and table below show the DIP Switch and the functions for each section. Usually both the PCS and Cellular bands have to be set up.

After DIP S/W setting, turn power ON/OFF or DIP S/W 12# PIN ON/OFF.

→ DIP Switch Functions

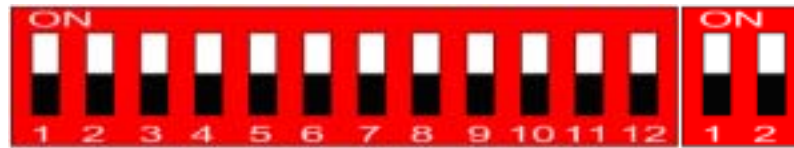
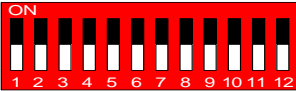
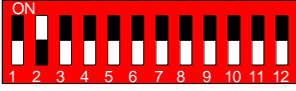










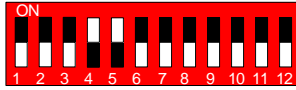



Fig. 6 DIP Switch General Settings

| PIN NO. | FUNCTION | STATUS |
|---------|-------------------------------|---|
| 1 | Cellular Band Selection | ON : Cellular B Band OFF : Cellular A Band |
| 2 | PCS Band Selection | See the next tables below |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | PCS EVDO OFFSET | ON : PCS Gain OFFSET 3dB(increase) ON OFF : PCS Gain OFFSET 3dB(reduction) OFF |
| 9 | Cellular EVDO OFFSET | ON : Cellular Gain OFFSET 3dB(increase) ON OFF : Cellular Gain OFFSET 3dB(reduction) OFF |
| 10 | Band Selection Mode | ON : Software Band Selection Mode OFF : Hardware Band Selection Mode |
| 11 | Uplink RF OFF | ON : Reverse RF Power OFF OFF : Reverse RF Power ON |
| 12 | Hardware Reset | ON : Reset OFF : Normal Operation |
| PIN NO. | FUNCTION | STATUS |
| 1 | PCS PATH HARDWARE ON/OFF | ON : PCS UL/DL PATH HARDWARE ON OFF : PCS UL/DL PATH HARDWARE OFF |
| 2 | CELLULAR PATH HARDWARE ON/OFF | ON : CELLULAR UL/DL PATH HARDWARE ON OFF : CELLULAR UL/DL PATH HARDWARE OFF |

| BW | UP LINK | DOWN LINK | DIP SWITCH | REMARK |
|------|-------------|-------------|--|------------------------|
| 5MHz | 1850 ~ 1855 | 1930 ~ 1935 |  | White color is switch. |
| | 1855 ~ 1860 | 1935 ~ 1940 |  | |
| | 1860 ~ 1865 | 1940 ~ 1945 |  | |
| | 1865 ~ 1870 | 1945 ~ 1950 |  | |
| | 1870 ~ 1875 | 1950 ~ 1955 |  | |
| | 1875 ~ 1880 | 1955 ~ 1960 |  | |
| | 1880 ~ 1885 | 1960 ~ 1965 |  | |
| | 1885 ~ 1890 | 1965 ~ 1970 |  | |
| | 1890 ~ 1895 | 1970 ~ 1975 |  | |
| | 1895 ~ 1900 | 1975 ~ 1980 |  | |
| | 1900 ~ 1905 | 1980 ~ 1985 |  | |
| | 1905 ~ 1910 | 1985 ~ 1990 |  | |

| BW | UP LINK | DOWN LINK | DIP SWITCH | REMARK |
|-------|-------------|-------------|--|--------|
| 10MHz | 1850 ~ 1860 | 1930 ~ 1940 |  | |
| | 1855 ~ 1865 | 1935 ~ 1945 |  | |

| | | | | |
|--|-------------|-------------|--|--|
| | 1860 ~ 1870 | 1940 ~ 1950 | | |
| | 1865 ~ 1875 | 1945 ~ 1955 | | |
| | 1870 ~ 1880 | 1950 ~ 1960 | | |
| | 1875 ~ 1885 | 1955 ~ 1965 | | |
| | 1880 ~ 1890 | 1960 ~ 1970 | | |
| | 1885 ~ 1895 | 1965 ~ 1975 | | |
| | 1890 ~ 1900 | 1970 ~ 1980 | | |
| | 1895 ~ 1905 | 1975 ~ 1985 | | |
| | 1900 ~ 1910 | 1980 ~ 1990 | | |

| BW | UP LINK | DOWN LINK | DIP SWITCH | REMARK |
|-------|-------------|-------------|------------|--------|
| 15MHz | 1850 ~ 1865 | 1930 ~ 1945 | | |
| | 1855 ~ 1870 | 1935 ~ 1950 | | |
| | 1860 ~ 1875 | 1940 ~ 1955 | | |
| | 1865 ~ 1880 | 1945 ~ 1960 | | |
| | 1870 ~ 1885 | 1950 ~ 1965 | | |
| | 1875 ~ 1890 | 1955 ~ 1970 | | |





| | | | | |
|--|-------------|-------------|--|--|
| | 1880 ~ 1895 | 1960 ~ 1975 |  | |
| | 1885 ~ 1900 | 1965 ~ 1980 |  | |
| | 1890 ~ 1905 | 1970 ~ 1985 |  | |
| | 1895 ~ 1910 | 1975 ~ 1990 |  | |

Table 1 Band Setting

5. DONOR UNIT(DU) SET Installation

5.1 BRACKET-DU Image

5.1.1. DU BRACKET – DU Connection Image

1) The length unit is [mm].

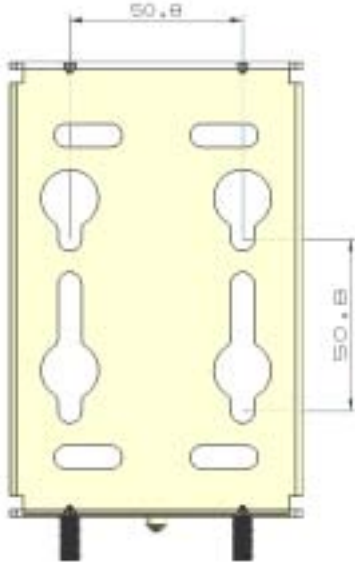
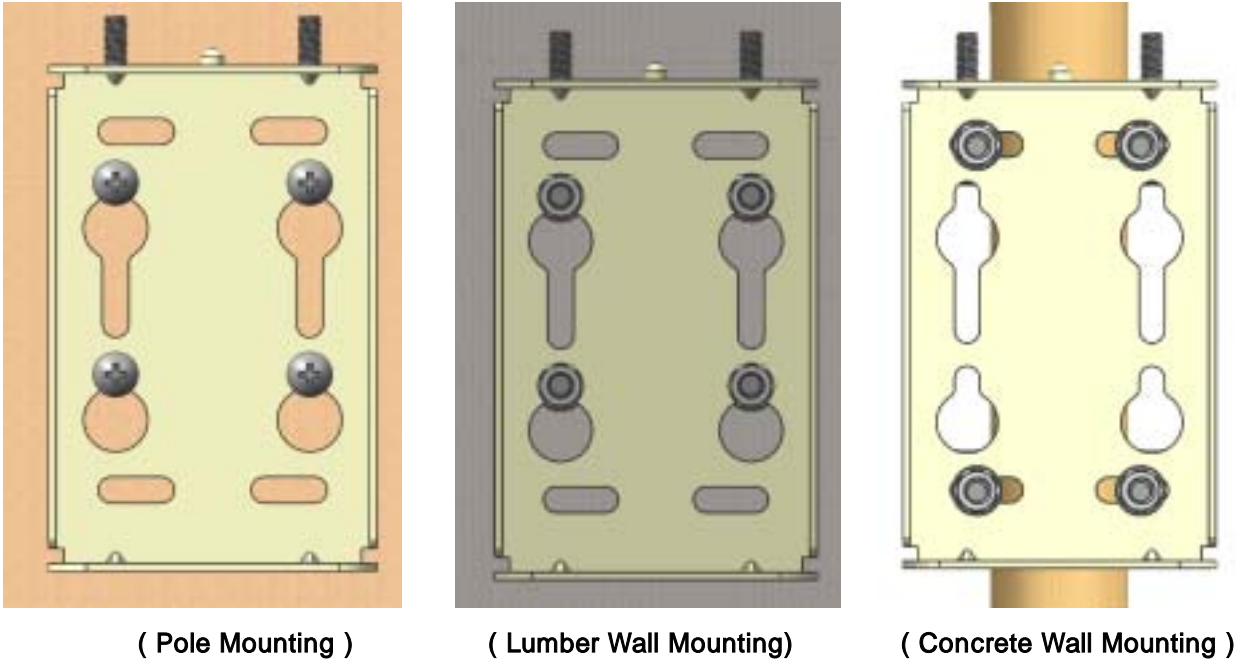


Fig. 7 MTG Bracket Image

5.1.2. BRACKET-DU Connection Image to Installation(WALL or POLE)



(Pole Mounting)

(Lumber Wall Mounting)

(Concrete Wall Mounting)

Fig. 8 MTG BRACKET Mounting (Pole, Lumber Wall, Concrete Wall) Connection Image

5.2 BRACKET Connection to DU

- 1) 1) APPLY NUT, SPRING WASHER, PLATE WASHER.
(Do not Connect Completely)
[NUT, SPRING WASHER, PLATE WASHER each 4ea]
- 2) Apply BRACKET/MTG to DU. APPLY NUT COMPLETELY USING PROVIDED TOOL.
[BRACKER/MTG 1ea]

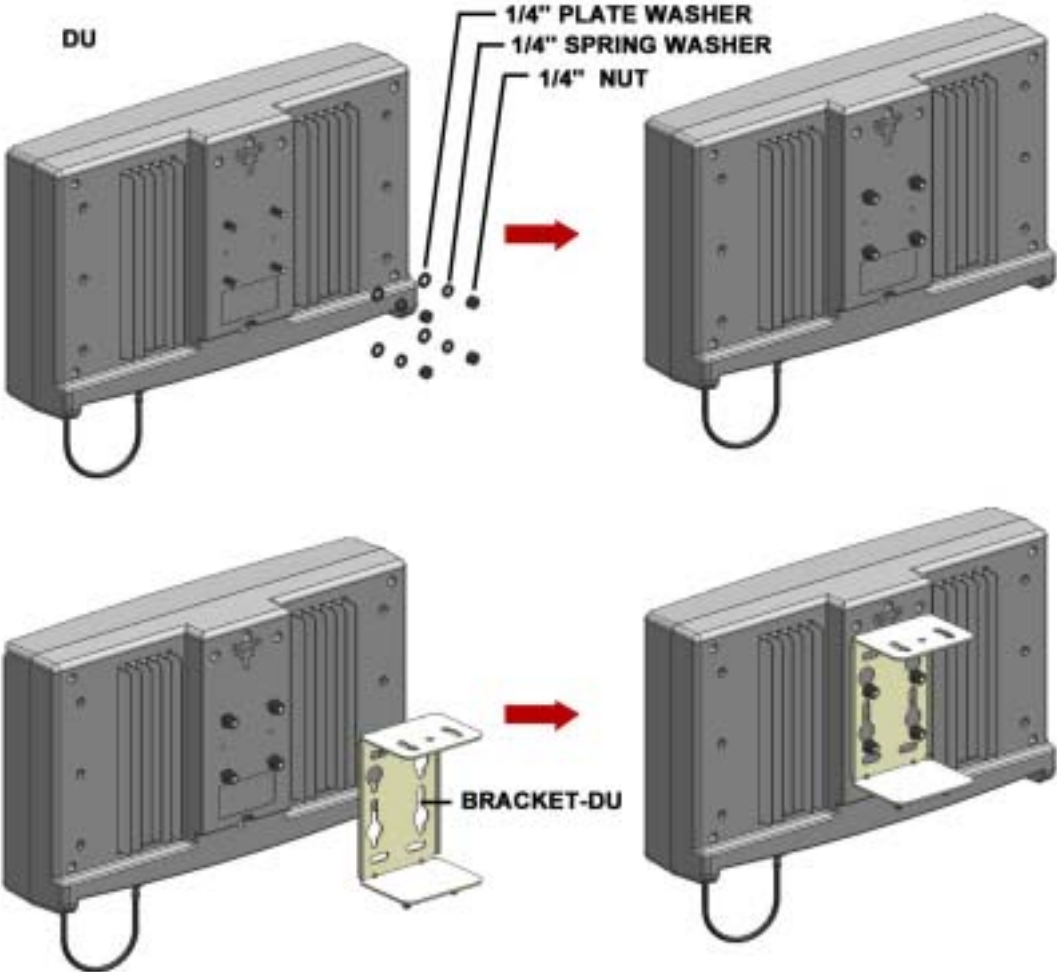


Fig. 9 DU Bracket Connection Diagram

5.3 BRACKET Connection depending on Installation Place

5.3.1. BRACKET/MTG POLE MOUNTING

- 1) Secure DU to the pole using U-BOLT.
- 2) Insert U-BOLT to between BRACKET-POLE and BRACKET-DU
- 3) Apply the pole to the BRACKET-DU: use the nuts and u-bolts provided to fixate the bracket into the Pole.

[BRACKET-DU 1ea, BRACKET-POLE 2ea, U-Bolt 2ea, NUT, SPRING WASHER, PLATE WASHER each 4ea]

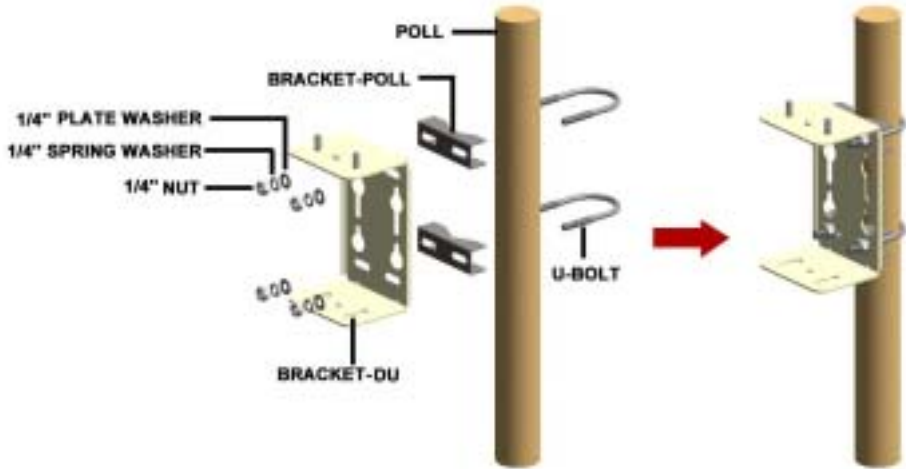


Fig. 10 POLE MOUNTING MTG BRACKET-DU Connection Sequence

5.3.2. BRACKET/MTG LUMBER WALL Mounting

- 1) Secure BRACKET-DU to the wooden wall. Using cross driver connect SCREW to wooden wall through BRACKET-DU.

[BRACKET-DU 1ea, SCREW 4ea]

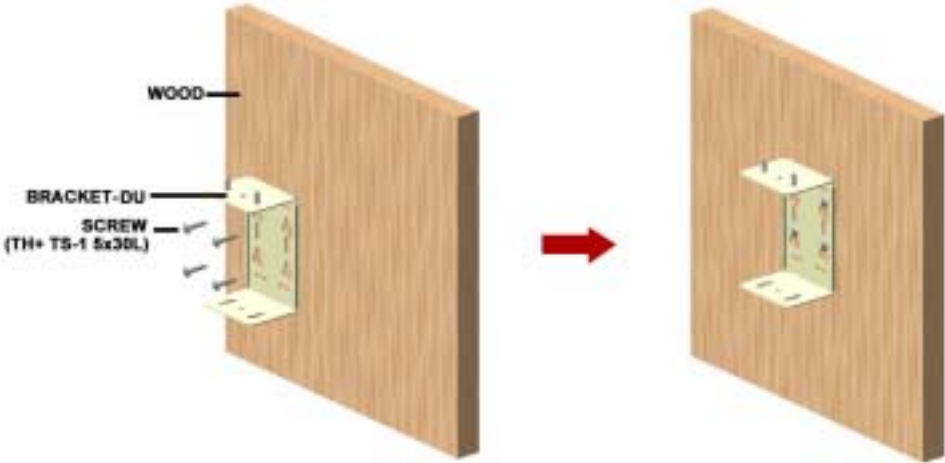


Fig. 11 LUMBER WALL MOUNTING MTG BRACKET-DU Connection Sequence

5.3.3. BRACKET/MTG CONCRETE WALL Mounting

- 1) Drill on the wall as the BRACKET-ANT distance. (for 10mm Hole depth to be 30 to 40 mm.)
- 2) INSERT SET-ANCHOR TO DRILLED HOLE.
- 3) Secure BRACKET-DU to the Wall and fix the nut.
[BRACKER-DU 1ea, SET-ANCHOR 4ea]

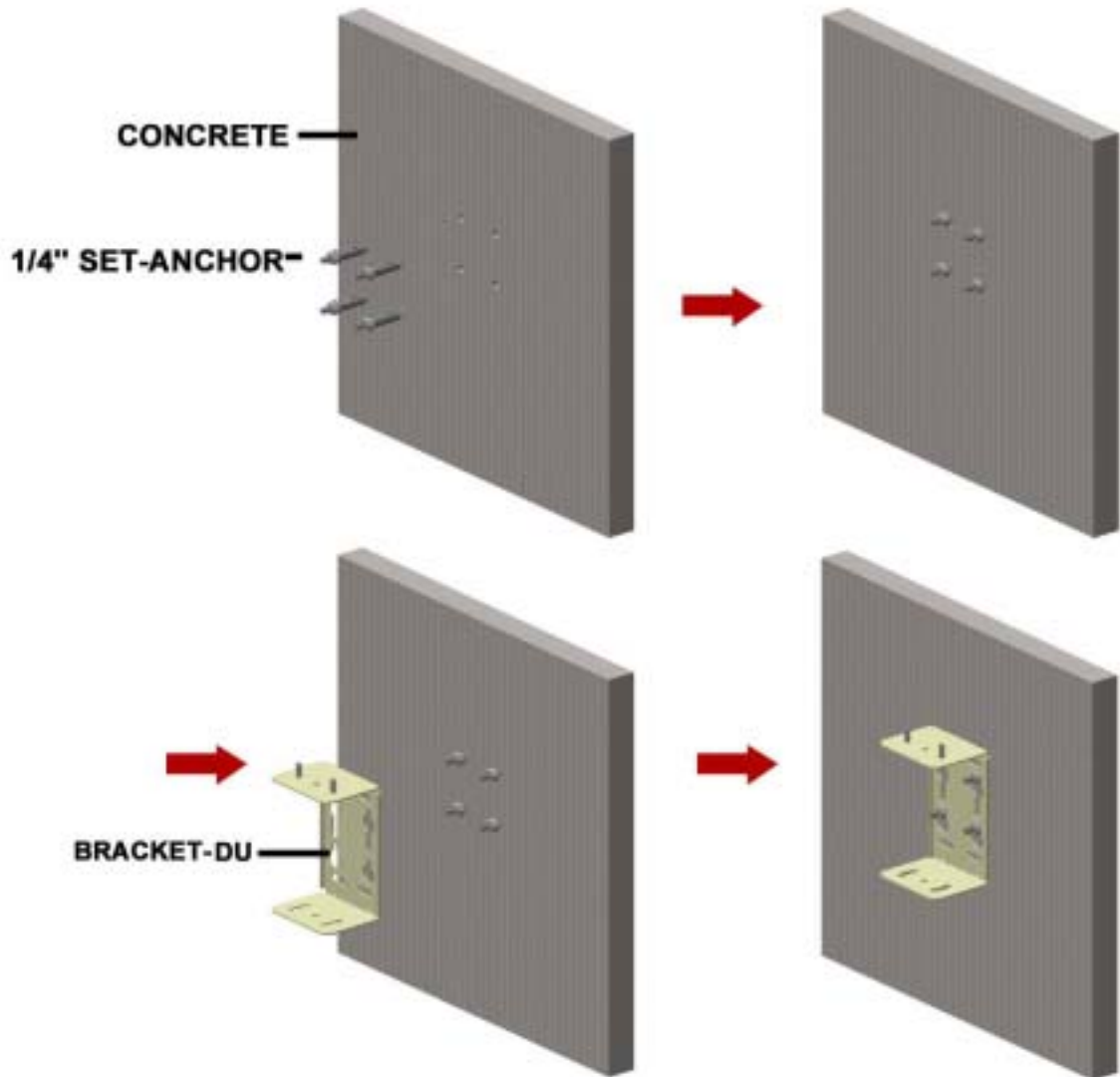


Fig. 12 CONCRETE WALL MOUNTING MTG BRACKET-DU Connection Sequence

5.4 DU Connection (same as 5.1) with BRACKET(same as 5.2)

- 1) APPLY DU to the BRACKET.
- 2) Apply the NUT to the upside of BRACKET like below sequence. – Do not apply the NUT

completely.

- 3) Set the receiving direction of the ANTENNA and apply the NUT completely using the provided tool.

[NUT, SPRING WASHER, PLATE WASHER each 4ea]

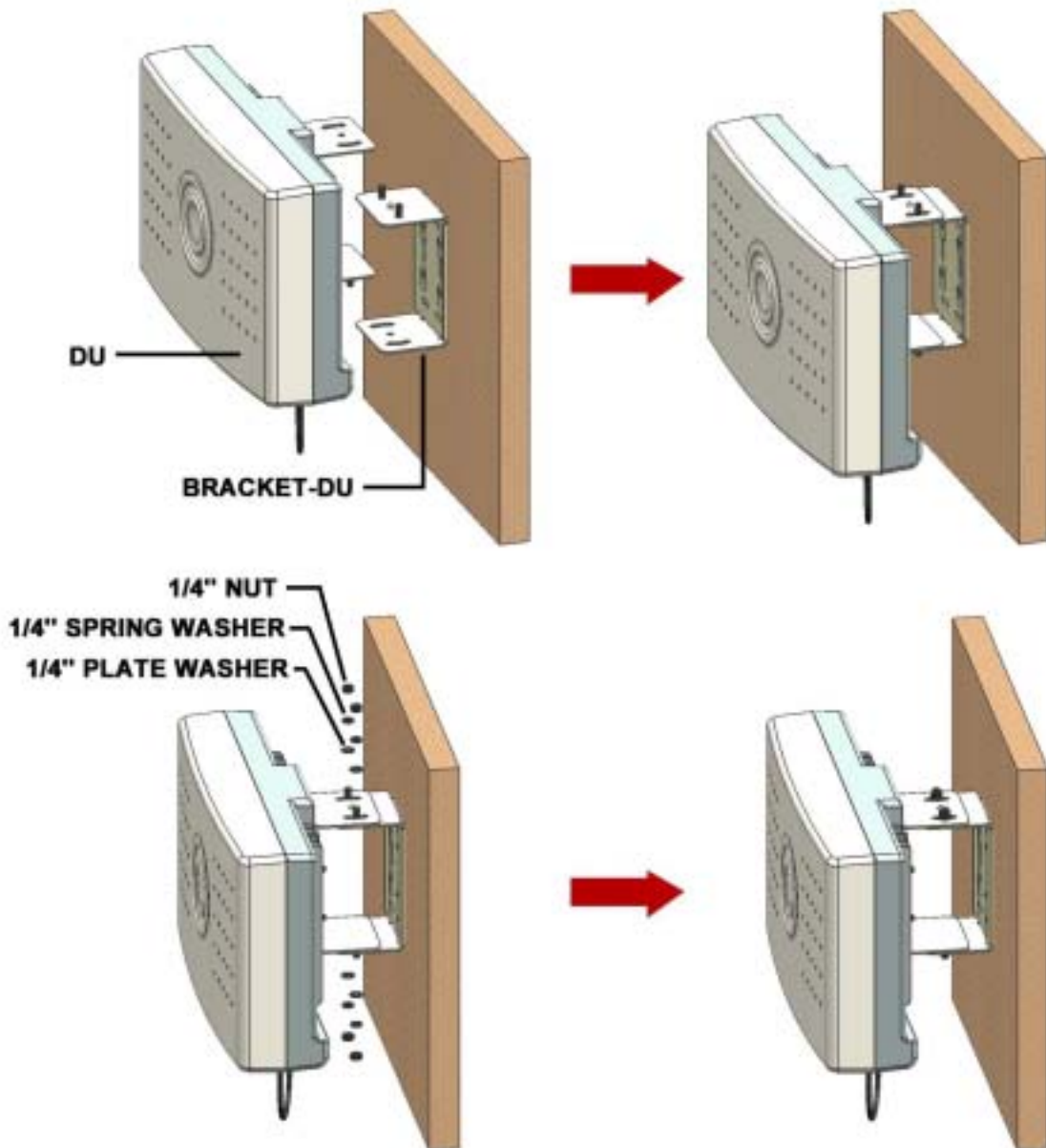


Fig. 13 DU Unit Wall Mounting

5.5 Installation Completion.



Fig. 14 DU Unit POLE Mounting Installation Completion Diagram

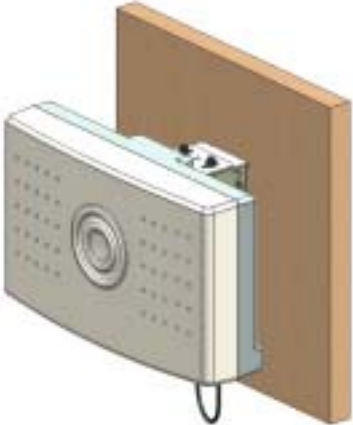


Fig. 15 DU Unit LUMBER WALL Mounting Installation Completion Diagram

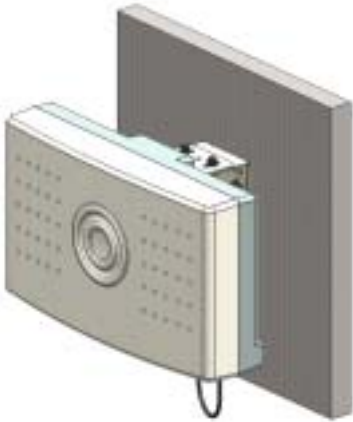


Fig. 16 DU Unit CONCRETE WALL Mounting Installation Completion Diagram

6. CU Wall & Ceil Mount Installation

6.1. MTG Bracket Image

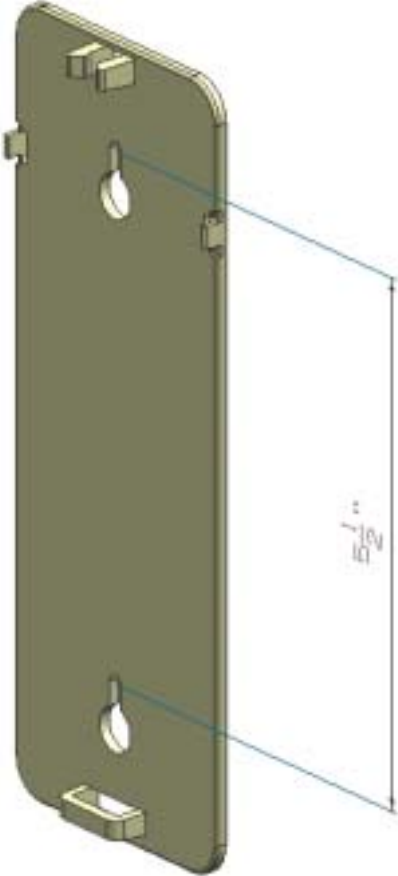


Fig. 17 CU MTG Bracket Image & Hole Distance

6.2 GYPSUM BOARD WALL MOUNTING

- 1) Secure DRYWALL anchor to the GYPSUM BOARD WALL using cross driver by keeping BRACKET Hole distance 5.5inch(140mm).
- 2) Secure DRYWALL anchor screw(TS_1 TH+ 4x16L) to BRACKET/install.

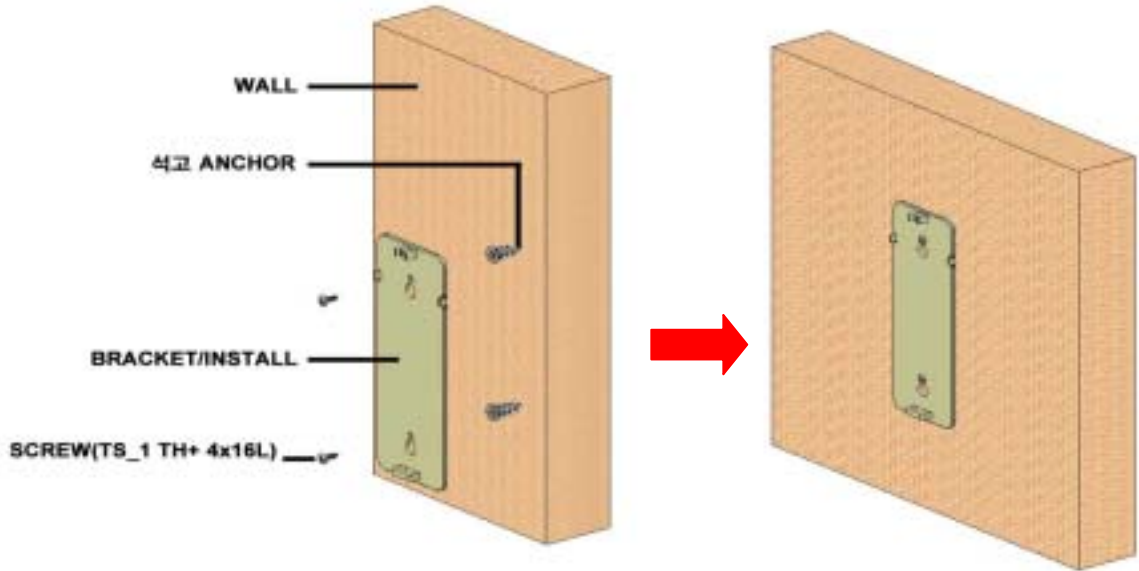


Fig. 18 CU Bracket Gypsum Wall Mounting

6.3 CONCRETE WALL MOUNTING

- 1) Secure PLASTIC ANCHOR TO WALL.
: INSERT PLASTIC ANCHOR after drill 6mm Hole in the wall by 30~40mm depth by keeping BRACKET Hole distance 5.5inch(140mm).

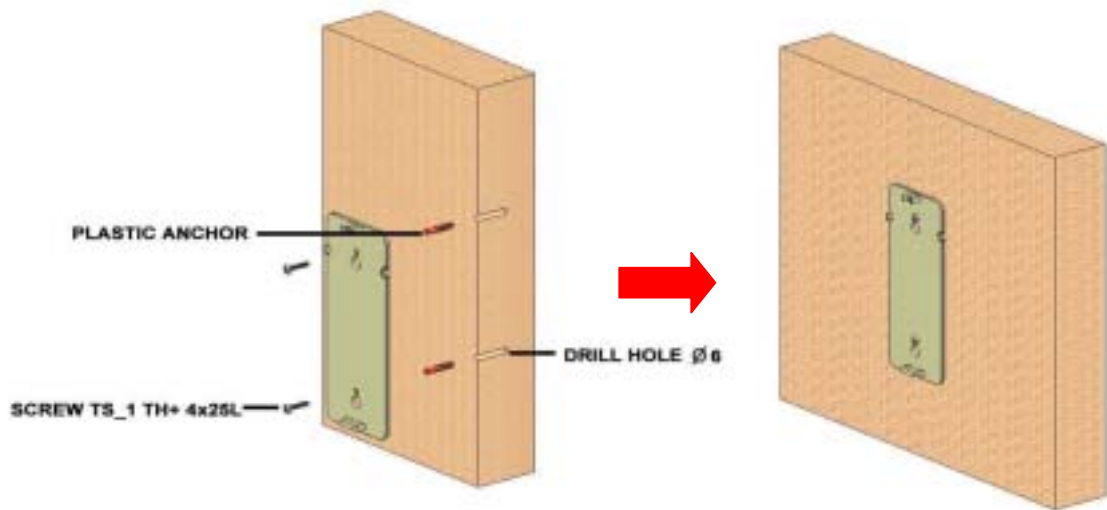


Fig. 19 CU Bracket Concrete Wall Mounting

6.4 LUMBER WALL MOUNTING

- 1) Secure BRACKET-INSTALL to the wooden wall. Using cross driver, connect completely SCREW(TS_1 TH+ 4x25L) to wooden wall through BRACKET-INSTALL by keeping BRACKET Hole distance 5.5inch(140mm).

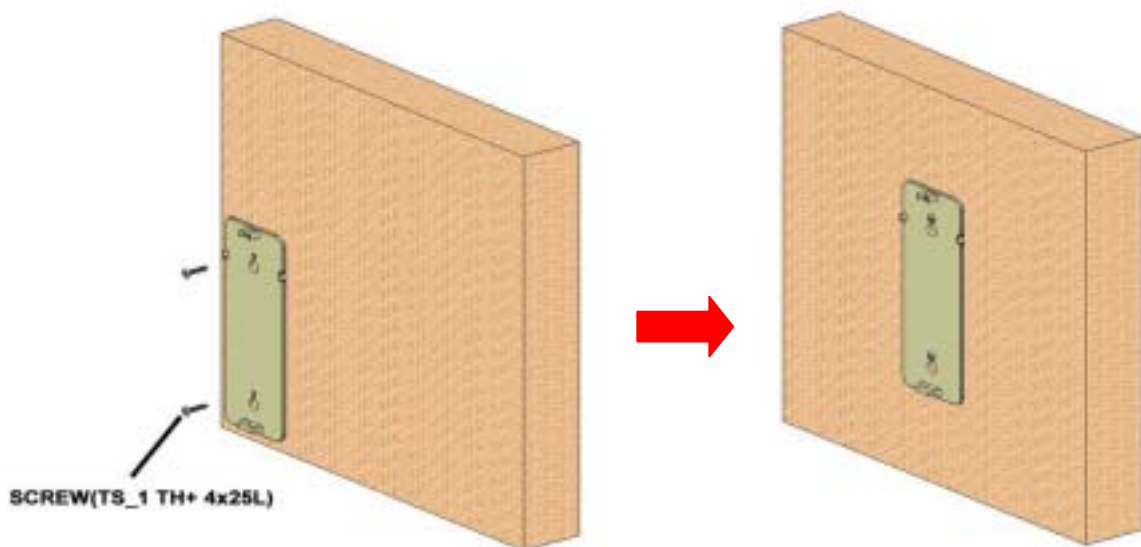


Fig. 20 CU Bracket Lumber Wall Mounting

6.5 Install Bracket Connection with CU

- 1) APPLY CU to BRACKET-CU MTG.
- 2) After connecting RF+POWER CABLE, connect ANT to right TNC connector.

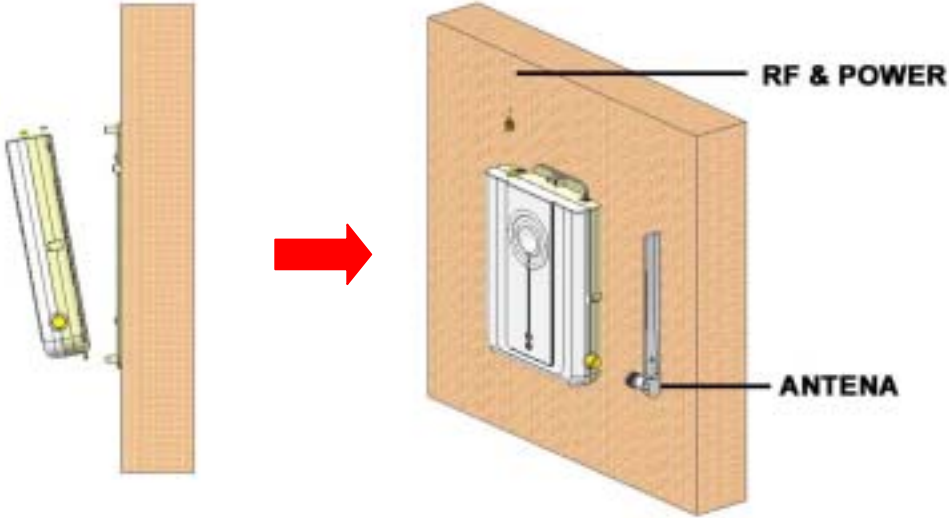


Fig. 21 CU MTG Bracket – CU SET Connection Image

6.6 CU SET Installation Completion

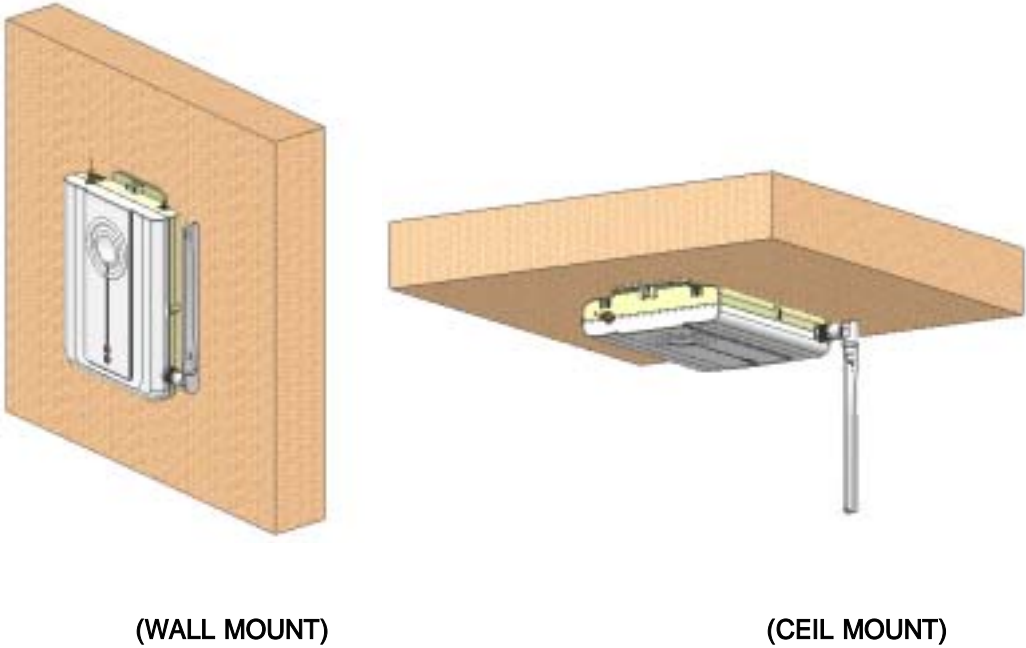


Fig. 22 CU Installation Sequence

7. Power Connection and Optimization SETTING

1) Once the RF Cable is connected between the Donor Unit and Bias T and the second RF Cable is connected between the Bias T and the Coverage Unit, the Power Adaptor should be connected to the Bias T. If the Power Adaptor is connected to Bias T before the RF cable is connected to either the Donor or Coverage Unit, possible damage could occur to the equipment. Therefore the installer should be sure to connect the Power Adaptor to the Bias T after the RF cables are connected to the Donor and Coverage Units.

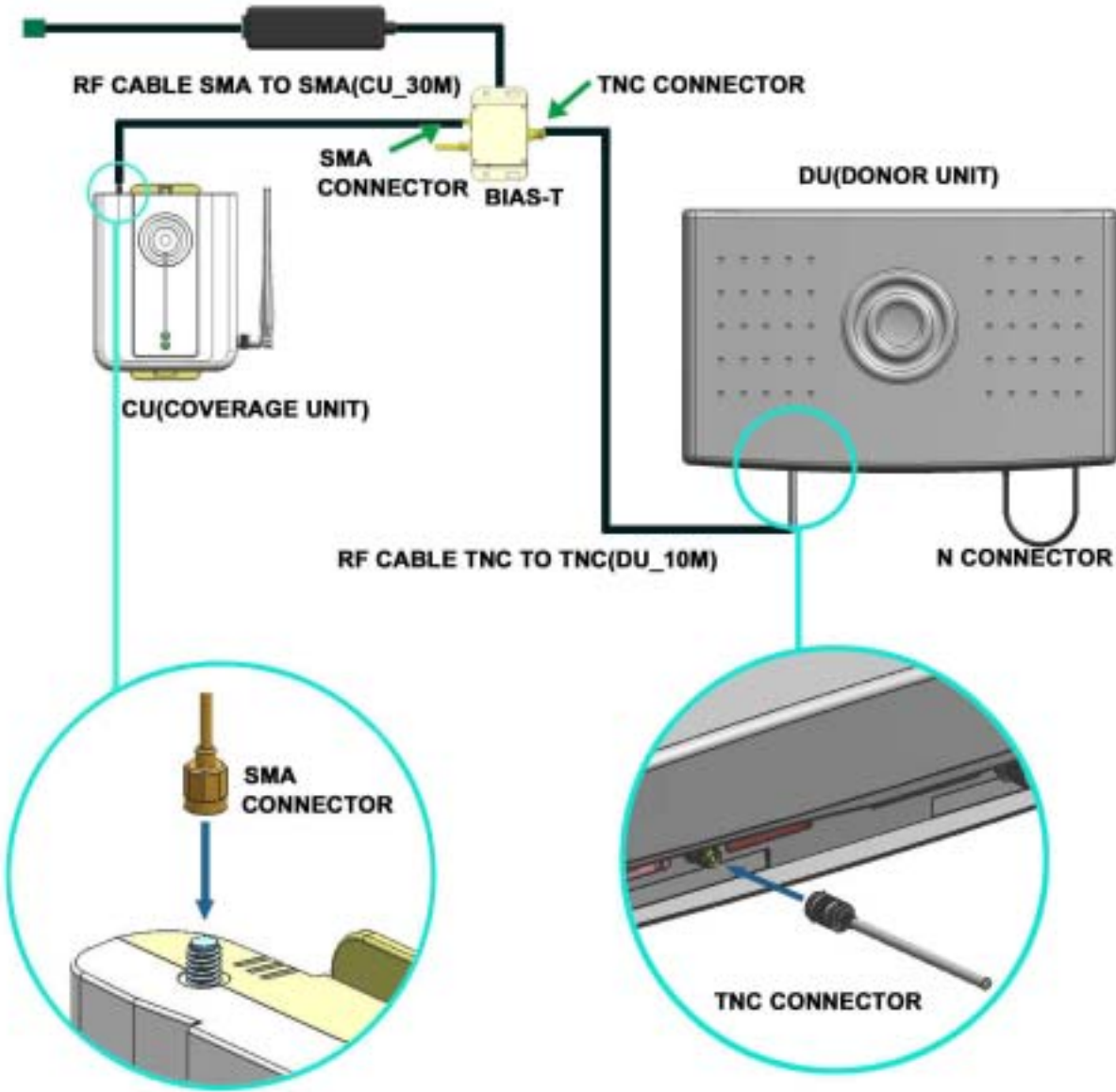


Fig. 23 Power PORT Connection

1-1) BIAS-T Installation Guide

. The figure below shows a detailed connection of the Power Adaptor and the Bias T. The Ground cable at the Bias T must be connected before AC power is supplied to the Power Adaptor.

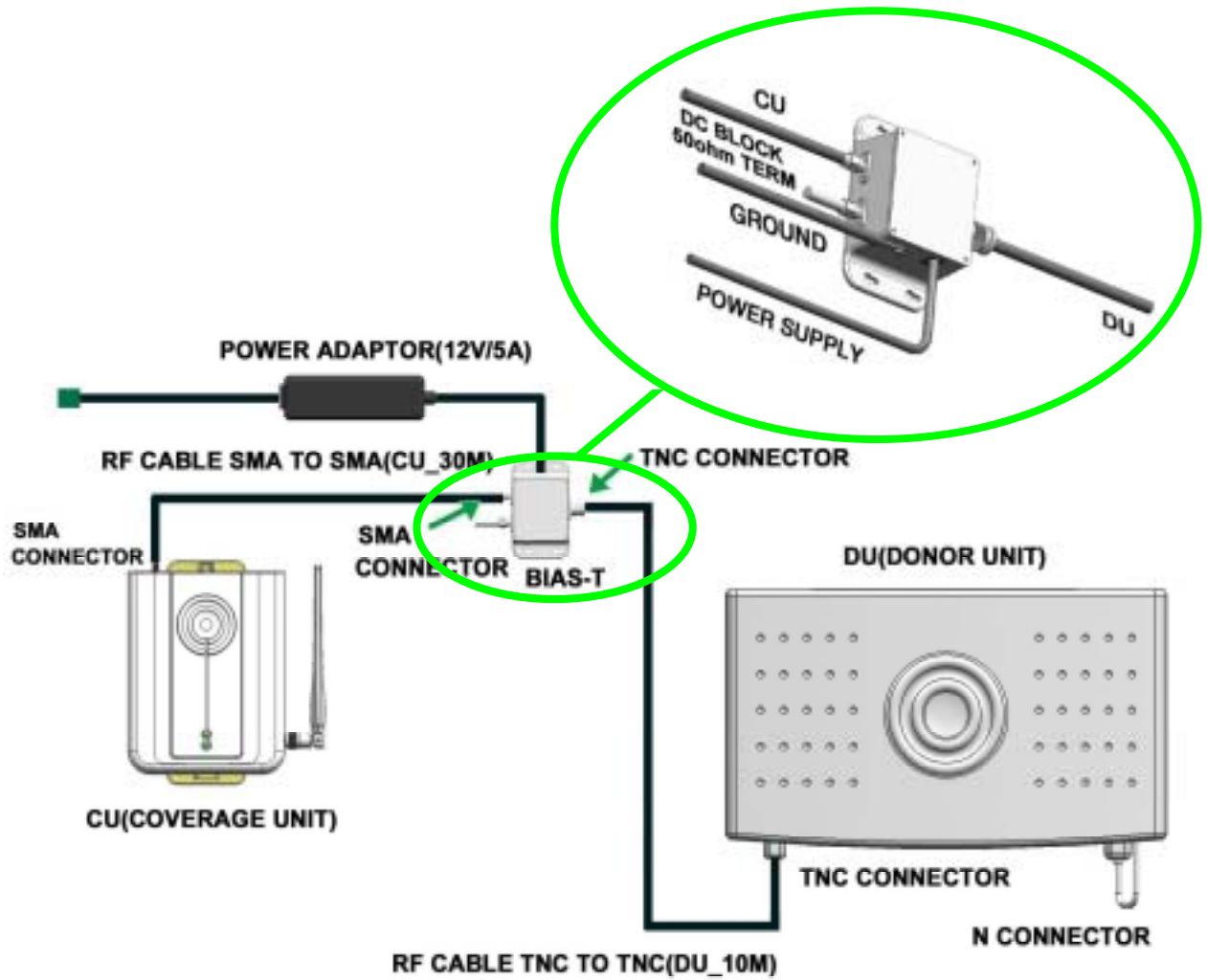
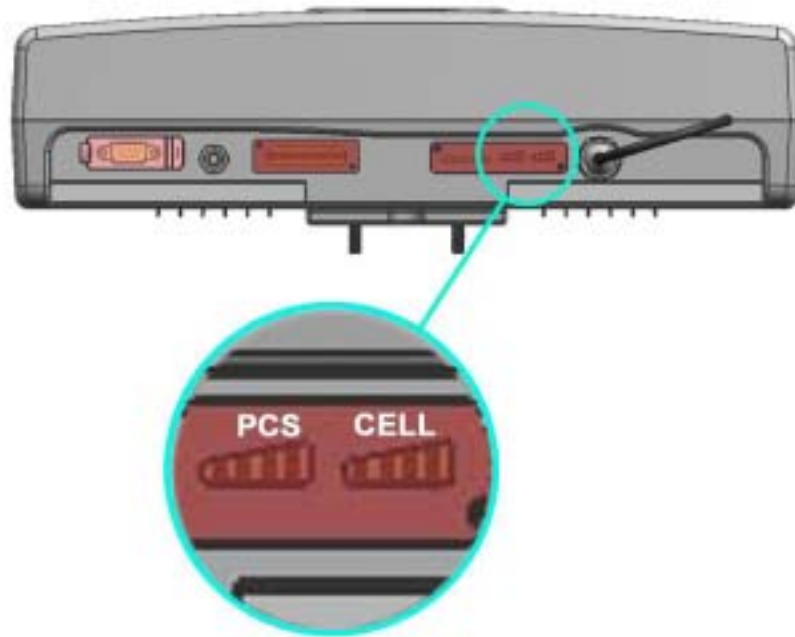


Fig. 24 POWER INJECTOR Installation Diagram

2). Once power connection has been successfully made (this can be verified by checking the Alarm LED on the Donor Unit and LED indications on the Coverage Unit, the Donor Unit azimuth should be positioned so that maximum signal level is being received from the BTS. This can be monitored via the LEDs which indicate the signal strength reading (RSSI).

(The recommended LED RSSI reading is 3 bars)



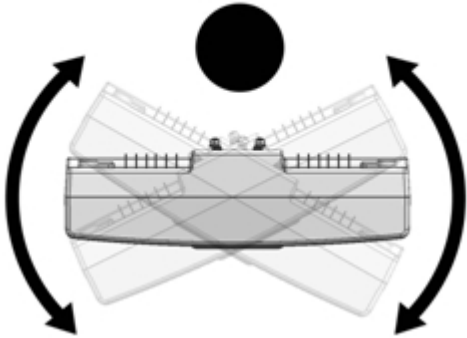
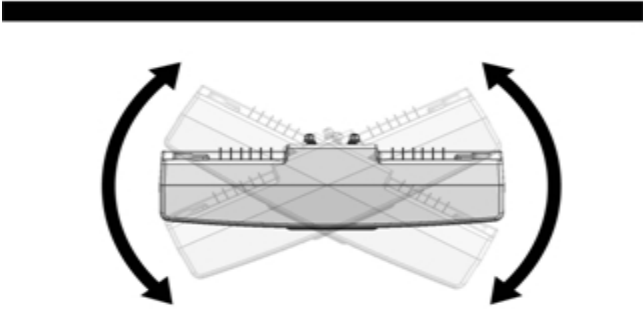
| Outdoor DU on a Roof (Pole mount) | Outdoor DU (Wall mount) |
|---|---|
| <p style="text-align: center;">Pole</p>  <p>Once the Donor Unit is mounted onto the pole, it is capable of being rotated 20° in either direction. The Donor Unit can also be mounted anywhere around the pole.</p> | <p style="text-align: center;">Exterior Wall</p>  <p>Can be rotated 20° in either direction</p> |

Fig. 25 DU ANT Tilt Diagram

3) The type of mounting method used will determine how much flexibility the Donor Unit has to adjust the azimuth.

The diagram below shows how the installer can maneuver the Donor Unit to obtain the highest

signal strength while monitoring the LED indications.

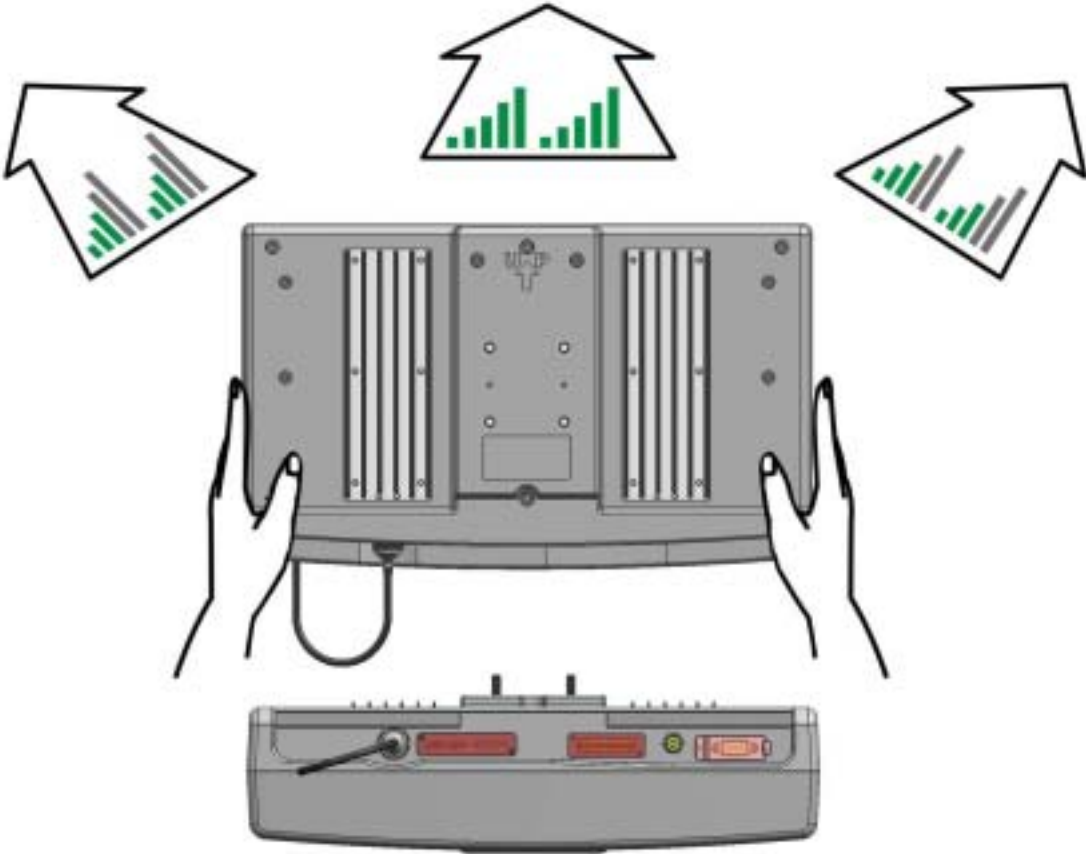


Fig. 26 Verifying Reception Status Diagram

4) Once the positioning and direction of the Donor Unit has been finalized, use the DIP Switch to activate the UL path.



Fig. 27 DIP Switch (Uplink Path Activation)

8. Status Check

8.1 DU FAULT LED

A red LED will turn on if the Repeater is not functioning properly. Each of the LEDs pertains to the status of a specific section of the system as shown below.

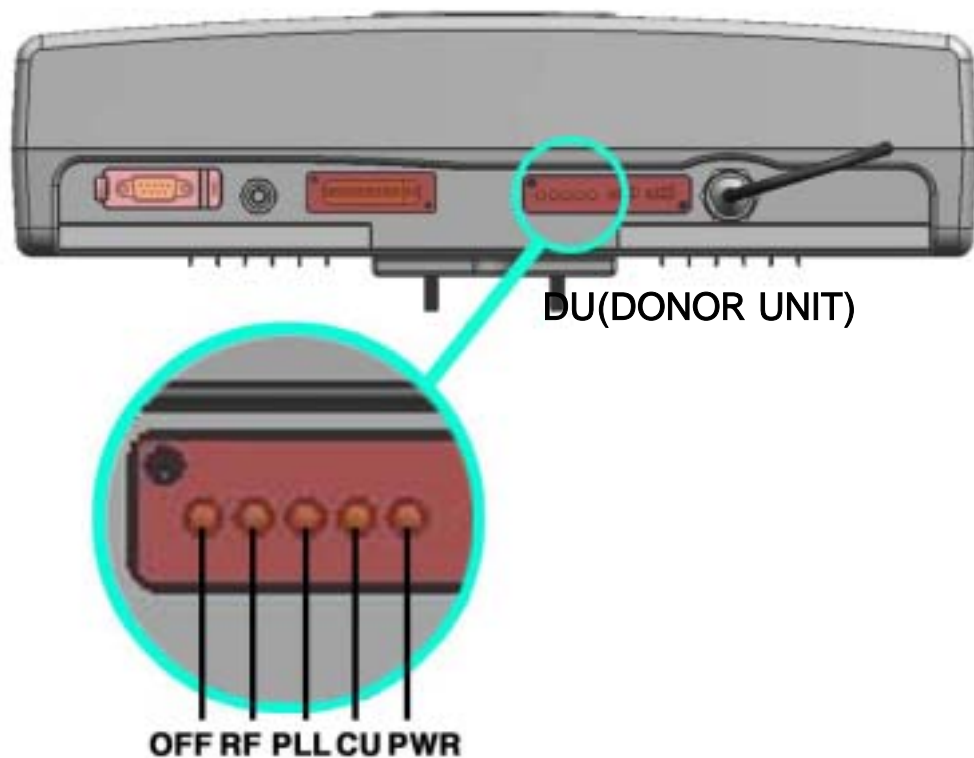


Fig. 28 DU LED

MANUAL OFF – If the installer decides to turn off the system, this LED will indicate red.

RF – If the output power level exceeds the preset limit or if oscillation is present, the Repeater will automatically shut down and the RF LED will indicate RED.

PLL – Malfunction of the frequency setting circuitry will cause this LED to indicate RED.

CU – Malfunction of the Coverage Unit will cause this LED to indicate RED.

POWER – If the input RF level is not within the range set by the installer, or if the system identifies a problem during operation, this LED will indicate RED.

8.2 CU FAULT LED

A red LED will indicate that the equipment is not functioning properly. Each of the LEDs

represents a specific section of the system as shown below.

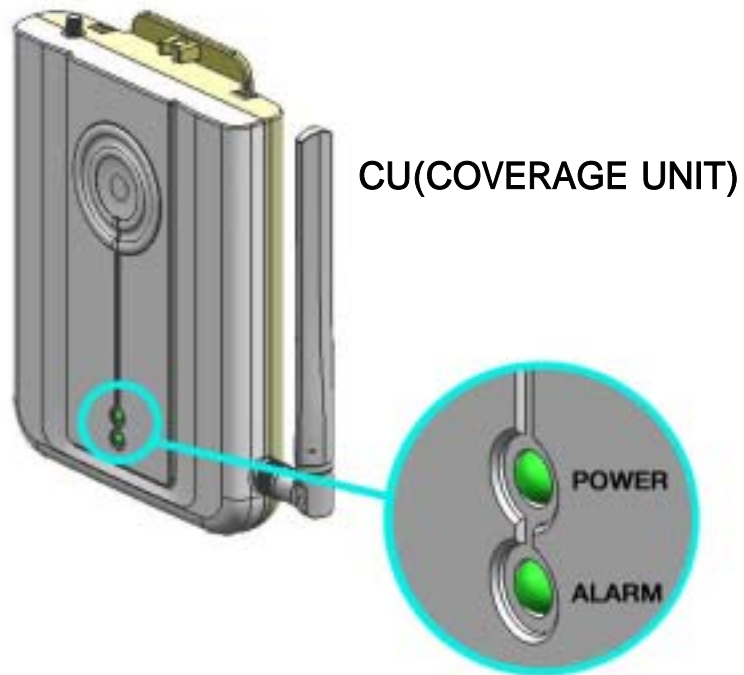


Fig. 29 CU LED

POWER – Will indicate GREEN if power is being supplied to the Unit

ALARM – If the RF input level is not within the range set by the installer, or if the system identifies a problem during operation, this LED will indicate RED.

Appendix A. Product Introduction

A.1 Overview

The Juni JR-20 MPE25K Repeater system is an RF repeater which provides coverage for indoor locations within a BTS coverage area. The repeater is intended to serve indoor locations where there is very little or no RF coverage. The system supports both US Cellular and US PCS bands. Verizon Wireless-authorized installation personnel are able to select frequency bands of operation via the internal band selection function. The Juni JR-20 MPE25K Repeater is intended to suit indoor environments of up to 25,000 sq.ft. The system configuration includes a Donor Unit which is typically located outside the building and a Coverage Unit which is positioned at the approximate center of the indoor space requiring better coverage. The role of the Donor Unit is to provide the link between the repeater system and the BTS. The Coverage Unit is intended to communicate with Mobiles located indoors. An optional second Coverage Unit may be added to the system to enhance indoor coverage.



Fig. 30 System Installation

The diagram below shows the basic system configuration. Once the two supplied RF Cables are connected from the Bias-T to the Donor Unit and Coverage Unit respectively and the Power Adaptor is connected to the Bias T with AC Power turned on, the Donor Units and Coverage Unit(s) will function properly.

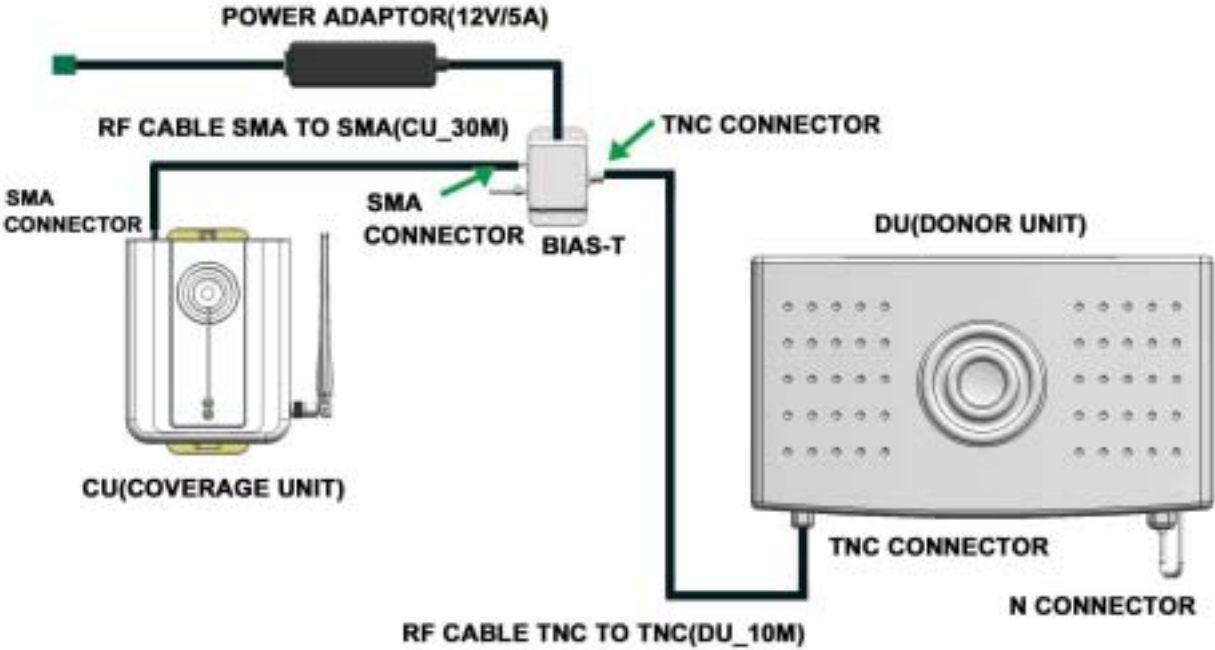


Fig. 31 System Diagram

A.2 Supported Frequency Range

Operator : Verizon Wireless

Frequency Band in Use : CELLULAR or PCS

→ CELLULAR Frequency Range

→ Cellular Band: (B1 and B2) or (A1 and A2) depending on Verizon Wireless' Cellular Band license for the area where the repeater is to be installed.

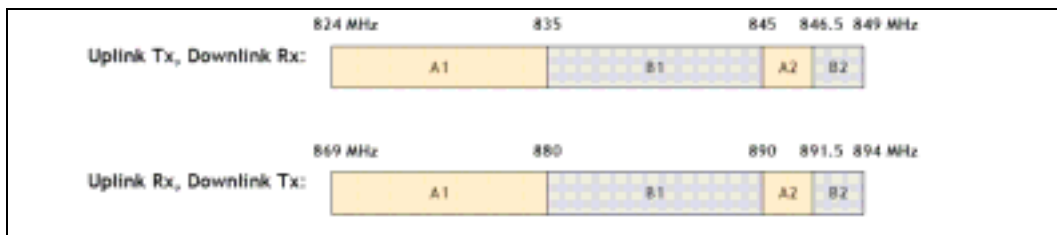


Table 2 Cellular Frequency

→ PCS Frequency Range (1850-1990 MHz): 1 tunable, non-contiguous PCS band of 5, 10 or 15 MHz selected depending on Verizon Wireless' PCS band license for the area where the repeater is to be installed.

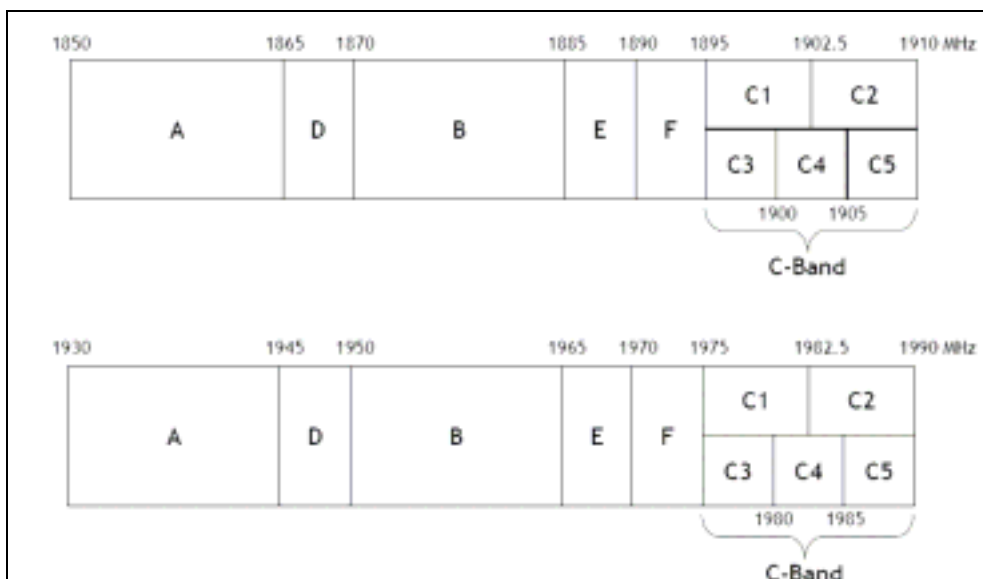


Table 3 PCS Frequency

Appendix B. System Specifications

| | |
|--|--|
| Frequency Bands | PCS Uplink : 1850 – 1910MHz Downlink : 1930 – 1990MHz CELL Uplink : 824 – 849MHz Downlink : 869-894 MHz |
| Sub - Bands | Cell : A+A', B+B' PCS : 5 , 10 , 15 MHz |
| Formats Supported | IS-95 / CDMA / 1X EVDO |
| Typical Coverage Area | 2,5000 sq. ft(230 m ²) |
| System Gain(Eirp) | CEL Up link : 79dB , CEL Down link : 82dB PCS Up link : 85dB , PCS Down link : 88dB |
| Downlink Operating Range | ~ -40dBm (Receive isotropic power) |
| Output Level(MAX Eirp) | CEL UPLINK : +20dBm, CEL DOWNLINK : +12dBm PCS UPLINK : +20dBm, PCS DOWNLINK : +18dBm |
| Third Order Intercept(Eirp) - typical | CEL DL : 36dBm , CEL UL : 43dBm PCS DL :38dBm , PCS UL : 38dBm |
| Power Consumption | < 60W |
| 가 | AGC FUCNTION, BRING DOWN, OVERDRIVE, OVERPOWER |

Table 4 RF Specifications

| | DONOR UNIT | COVERAGE UNIT |
|-----------------------|--------------------------------|---|
| OPERATING TEMPERATURE | -20 ~ 50 | 0 ~ 40 |
| SIZE | 389(W) X 236(H) X 107(D) | 144(W) X 190(H) X 38(D) |
| WEIGHT | 2.7Kg | 0.5Kg |
| RF CONNECTORS | LINK : N TYPE CU : TNC TYPE | DU ANT : SMA COVERAGE ANT : TNC TYPE |
| POWER SUPPLY | < 60W | |

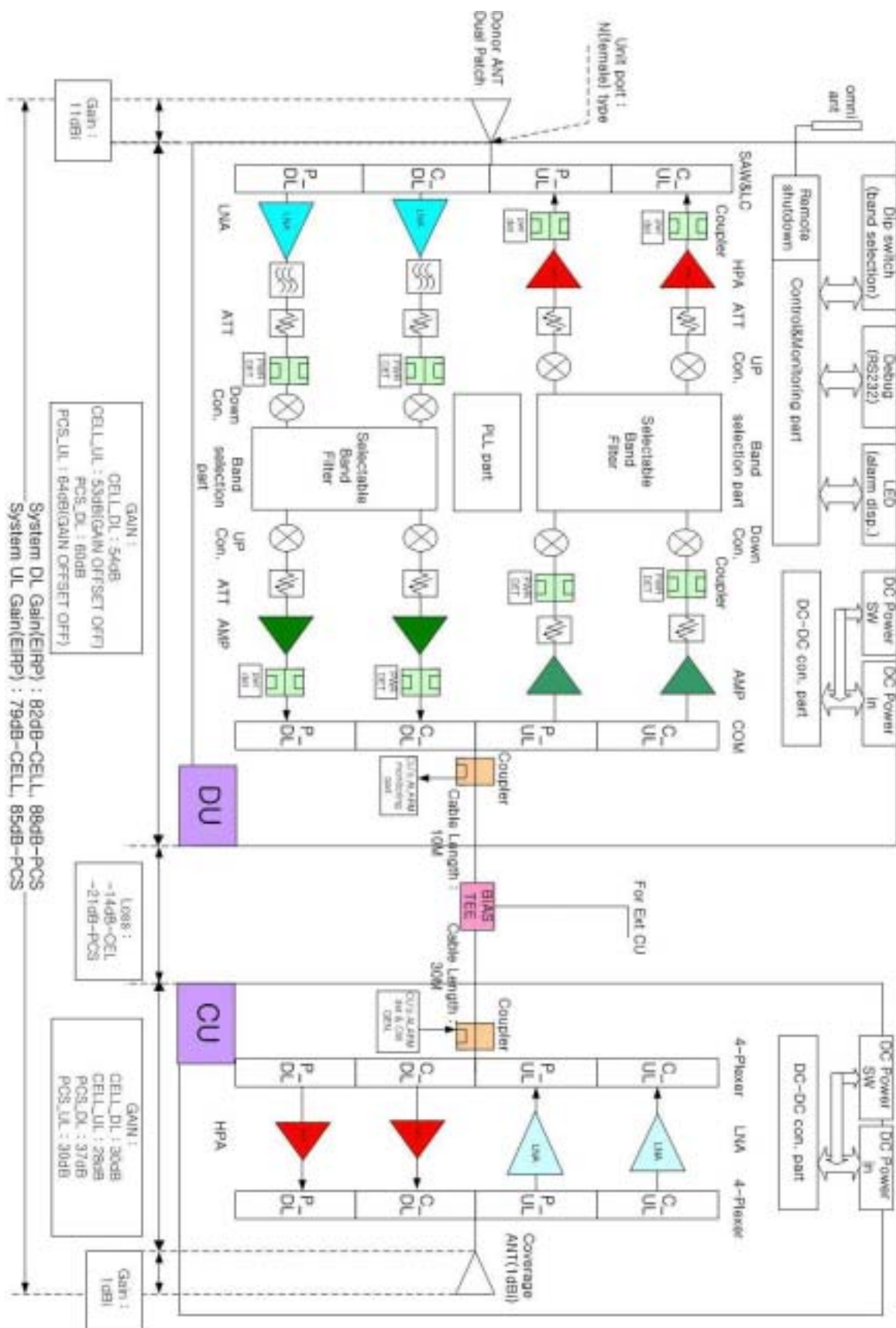
Table 5 Physical Specifications

| | CELL | | PCS | |
|-----------------------------------|----------|--------|--------|--------|
| | DU ANT | CU ANT | DU ANT | CU ANT |
| GAIN(dBi) | 10 | 0 | 10 | 0 |
| Elevation Beamwidth - typical(dg) | 65° | >90° | 50° | >90° |
| Azimuth Beamwidth - typical(dg) | 40° | NA | 30° | NA |
| Front - to - Back Ratio(dB) | > 15dB | NA | > 15dB | NA |
| Polarization | Vertical | | | |

Table 6 Antenna Specifications

Appendix C. System Block

MPE25K Repeater Block diagram



Appendix D. Troubleshooting for MPE25K

DU

| Alarm | LED Color | Possible Reason | Action Required | Action |
|---------------|-----------------|--|--|---|
| MANUAL OFF | Green -> Red | When service Provider force the System OFF | Check Alarm -> Call Juni Technical Support | Contact Juni Technical Support |
| RF | Green -> Red | Shutdown by Excessive RF Output Power or System Oscillation | - Excessive Output Power: Automatically Recovered. Call Juni Technical Support if repeated - Oscillation: Wrong Donor Unit direction or Donora Unit and Coverage Unit installed too close to one another Call Juni Technical Support if not improved | |
| PLL | Green -> Red | Repeater Failure | Check Alarm -> Power ON/OFF Call Juni Technical Support if not improved | |
| CU | Green -> Red | COVERAGE UNIT- Out of Service | Check Alarm -> Check the Input AC/DC Power Adaptor -> Call Juni Technical Support if not improved | |
| Power | Green -> Red | Input Power – Out of Range Operating Current – Out of Range | Check Alarm -> Check the Input AC/DC Power Adaptor -> Call Juni Technical Support if not improved | |

1. Coverage Unit

| Alarm | LED Color | Possible Reason | Action Required | Action |
|-------|-----------------|----------------------------------|---|-----------------------------------|
| CU | Green -> Red | COVERAGE UNIT- Out of Service | Check Alarm -> Check input AC/DC Power -> Call Juni Technical Support | Call Juni Technical Support |

