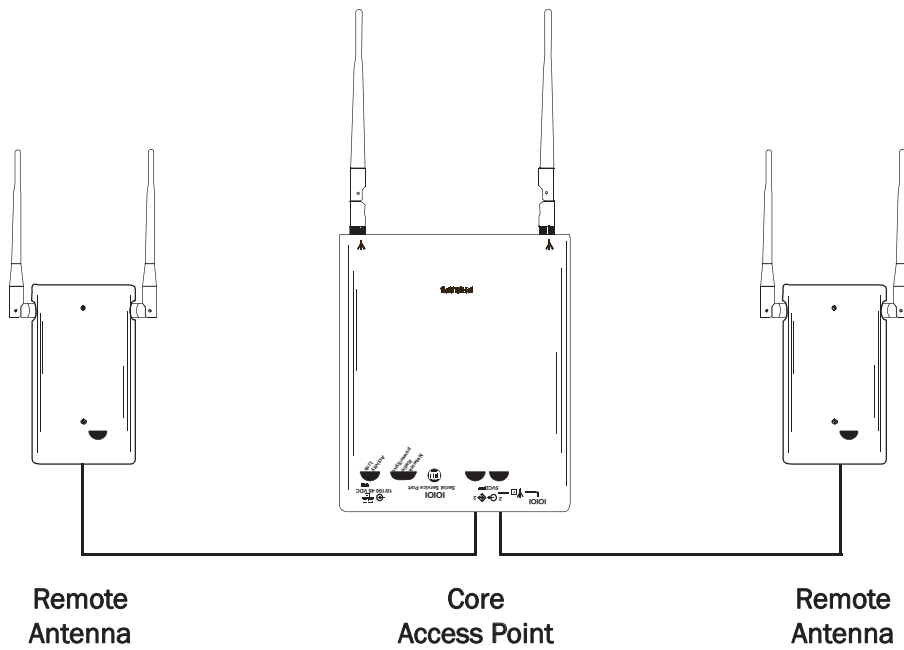


DRAFT-3

IntelliVue Telemetry System

1.4 GHz Core Access Point/Remote Antenna

Installation Guide



PHILIPS

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First Edition



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About This Guide

This *IntelliVue Telemetry System 1.4 GHz Core Access Point/Remote Antenna Installation Guide* provides complete instructions and procedures for installing the Philips IntelliVue Telemetry System ITS4843B 1.4 GHz Core Access Point and ITS4846A Remote Antennas. This section describes the document and includes:

- Audience
- Document Organization
- Notational Conventions
- Related Documentation
- Terminology

Audience

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The *IntelliVue Telemetry System 1.4 GHz Core Access Point/Remote Antenna Installation Guide* is written for trained service personnel who will install the IntelliVue Telemetry System 1.4 GHz Core Access Point as part of an overall IntelliVue Telemetry System deployment.

Document Organization

The information in this guide is organized and presented as follows:

- *Chapter 1, Overview*, describes the Model ITS4843B IntelliVue Telemetry System 1.4 GHz Core Access Point and how it is used to provide a bi-directional data flow between the IntelliVue Information Center and patient-worn transceivers and wireless bedside monitors.
- *Chapter 2, Installing the ITS 1.4 GHz Access Point*, provides procedures to physically install the Philips IntelliVue Telemetry System 1.4 GHz Core Access Point and includes instructions for mounting the Core AP and Remote Antennas to a wall, above a ceiling tile, and below a ceiling tile.
- *Chapter 3, Maintaining the ITS 1.4 GHz Core Access Point*, provides procedures to maintain and troubleshoot operation of the Philips IntelliVue Telemetry System 1.4 GHz Core Access Point.

Notational Conventions

This guide uses the following notational conventions to convey information:

Note	Notes call attention to important information.
-------------	--

Caution	Cautionary statements call attention to a condition that could result in loss of data or damage to equipment.
----------------	---

Warning	Warnings call attention to a condition that could result in physical injury.
----------------	--

Related Documentation**DRAFT-3**

Please refer to these other documents for additional installation service information about the IntelliVue Telemetry System:

- *ITS Access Point Controller Installation Guide (453564238151)* - provides procedures to physically install and power the ITS Access Point Controller at the clinical site.
- *ITS 2.4 GHz Access Point Installation Guide (453564238161)* - gives procedures to install the model ITS4852A 2.4 GHz AP at the clinical site to a wall, or above or below a ceiling tile.
- *ITS Infrastructure Installation and Service Guide (453564238181)* - provides complete information and procedures to install, configure, inter-connect, and deploy the ITS infrastructure at the clinical site. This document includes site planning guidelines, procedures for use of the APC command line and graphical user interfaces, AP configuration procedures, and APC and AP firmware deployment procedures.
- *ITS Sync Unit Installation Guide (453564238191)* - lists procedures to install the model M4844A Sync Unit at the clinical site.
- *Upgrading ITS Access Point Controllers and Access Points (453564238141)* - gives procedures to use the Philips ITS APC and AP Upgrade Wizard tool to install and synchronize the firmware version on ITS APCs and APs.

Terminology

Please note the following terms, acronyms, and abbreviations used throughout this document:

- **IntelliVue Clinical Network (ICN)** - This term refers to the entire Philips network. In a routed topology, the ICN includes the routers and all inter-connected Database Domain(s) and the IntelliVue Telemetry System wireless subnet.
- **Database Domain (DBSD)** - This term is used to describe the “network” that contains the Standalone IntelliVue Information Center, or the IntelliVue Database Server and its connected Information Centers, Clients, bedsides, and infrastructure. This term applies to both routed and non-routed topologies.

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- **IntelliVue Telemetry System (ITS)** - Cellular wireless architecture that provides two-way communications between patient-worn transceivers, wireless bedside patient monitors, and the IntelliVue Information Center.
 - **IntelliVue Wireless Subnet** - This term is used to describe the IntelliVue Telemetry System (ITS) “network” that contains the infrastructure used in a routed topology to connect the IntelliVue Telemetry System devices.
 - **Access Point (AP)** - A network device that provides bi-directional wireless access to the monitoring network for patient-worn transceivers and wireless bedside monitors.
 - **Access Point Controller (APC)** - A network device used to manage the operation of the Access Points. One APC is elected the Master APC. The Master APC supports the web interface to the system and manages the master configuration.
 - **Access Point Group/AP Group** - A logical grouping of APs. AP members of the same AP Group will inherit common configuration settings (defaults). AP groups will often map logically to the clinical units in which the ITS is being installed.
 - **Partnered APC** - Configurable element within an AP Group used to determine which APC will manage the operation of the AP members of a particular AP Group.
 - **RF Access Code** - Configurable element in the Smart-hopping AP defaults shared among APs and patient-worn transceivers to control wireless access to the monitoring network. Portable devices will only connect to access points with which they share access codes. The RF Access Code allows a specific wireless client that is programmed with a matching Access Point RF Access Code to connect to that Access Point.
 - **Synchronization Unit** - The Philips Sync Unit provides a necessary common clock signal to synchronize all the IntelliVue Access Points in the system. As patients ambulate around the hospital coverage area their transmitted data are handed over from one AP to another seamlessly without interruption or data loss.
 - **System ID** - Configurable element in the APC Configuration to logically associate Access Points and Access Point Controllers operating within the same ITS.

1



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Overview

This chapter provides a high-level overview of the Philips IntelliVue Telemetry System ITS4843B 1.4 GHz Core Access Point and includes:

- Introduction
- A General Description of the ITS Core Access Point
- Connectors and Status Indicators
- Specifications
- Ordering Information

Introduction

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The Philips IntelliVue Telemetry System (ITS) uses a cellular wireless architecture to provide two-way communications between patient-worn transceivers/monitors and wireless bedside patient monitors, and the IntelliVue Information Center.

Using the “Smart-hopping” wireless protocol, the ITS provides monitoring capabilities for ambulatory patients within a wide coverage area. The ITS transceivers (portable patient-worn devices), patient-worn monitors, wireless bedside monitors, and infrastructure operate on the 1.4 GHz US Wireless Medical Telemetry Service (WMTS) band or on the 2.4 GHz Industrial, Scientific and Medical (ISM) band.

The pocket-size patient-worn transceiver or monitor sends patient data, and sends and receives control and device information to and from the IntelliVue Information Center (bi-directional communication) for subsequent monitoring, display, analysis, alarm detection, operator alerts, data storage and permanent recording. Displays, settings, recordings, and alarms are controlled from the IntelliVue Information Center. Recordings can also be initiated from the patient worn-transceivers/monitors.

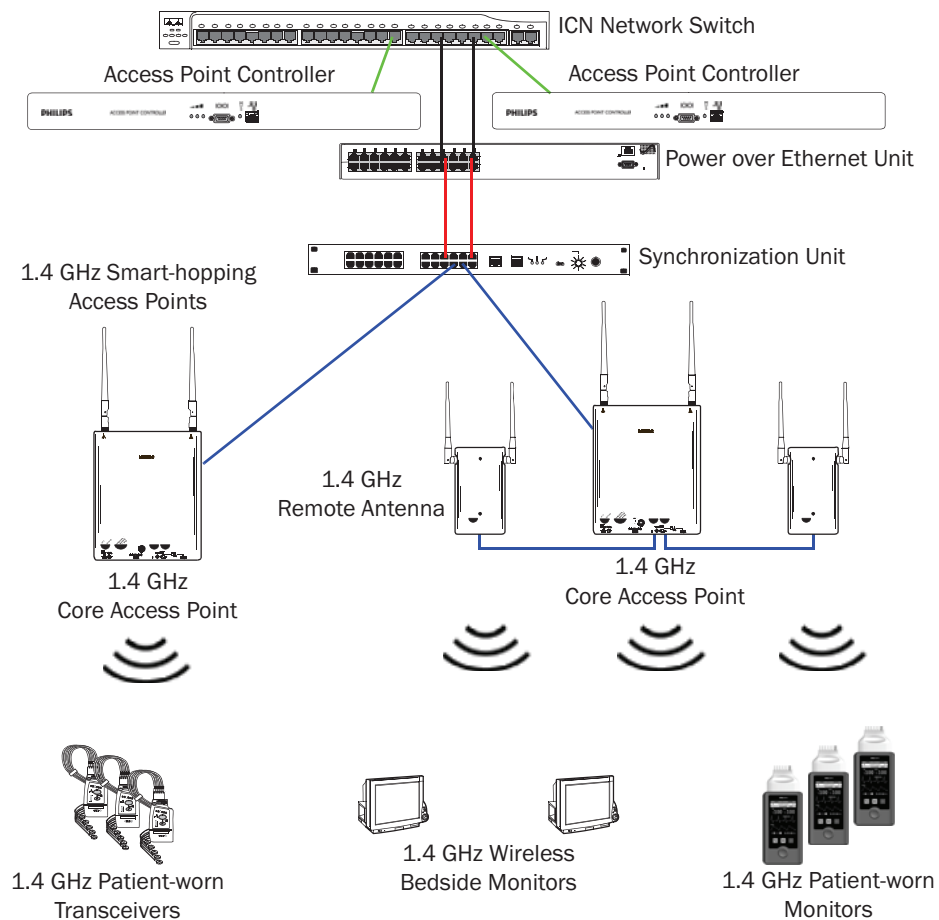


Figure 1-1: 1.4 GHz IntelliVue Telemetry System

You can configure the Access Point Controller to communicate with IntelliVue 1.4 or 2.4 GHz Smart-hopping Access Points (APs). IntelliVue 1.4 GHz APs can only communicate with 1.4 GHz transceivers and monitors. Likewise, 2.4 GHz APs can only communicate with 2.4 GHz transceivers and monitors. You cannot mix 1.4 GHz and 2.4 GHz transceivers or monitors at a given ITS installation site.

Philips Smart-hopping technology utilizes a cognitive radio that senses the RF environment and adapts to it. Dynamic wireless channel allocation ensures best use of available wireless spectrum. When configured to operate in the 2.4 GHz spectrum, the ITS is designed to co-exist with other 802.11 wireless deployments.

A General Description of the ITS Core Access Point

The IntelliVue Telemetry System Core Smart-hopping Access Point (AP), Model ITS4843B (Figure 1-2), provides an air-link to transmit and receive data between ITS wireless clients and the Philips IntelliVue Information Center via the ITS infrastructure.

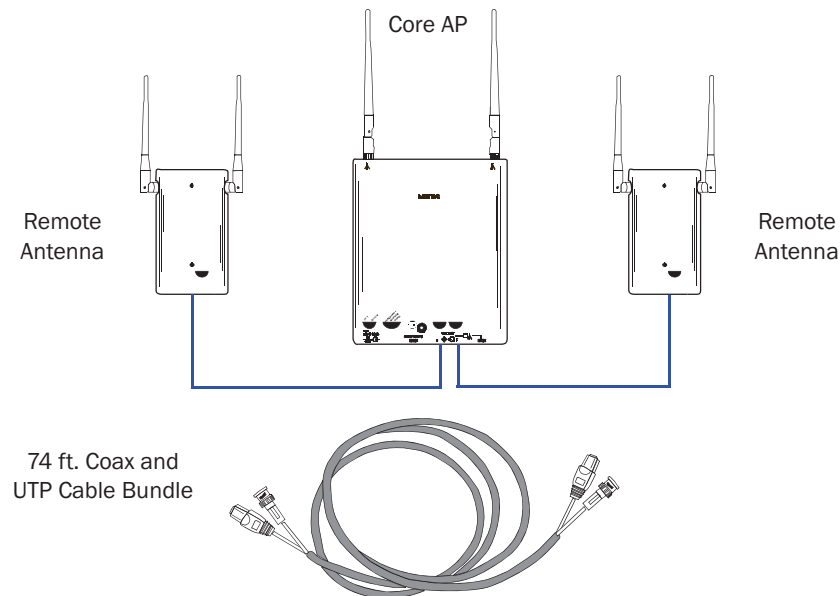


Figure 1-2: IntelliVue Telemetry System Core Access Point

The Core AP is a modular antenna infrastructure consisting of a Core AP (CAP) with up to two connected **Model ITS4846A Remote Antennas (RAs)**. A 74-foot (22.6 m) coaxial and unshielded twisted pair (UTP) cable bundle is used to connect a Remote Antenna to a Core AP. Core APs are only available for the 1.4 GHz ITS.

The effective range of the Core AP and of each Remote Antenna is typically 32 feet. The Core AP always supports a maximum of 18 wireless clients (i.e., patient-worn transceivers or bedside monitors) regardless of its component configuration. A Core AP alone supports 18 wireless clients. When used with a single RA, the Core AP supports nine wireless clients and its connected RA supports nine wireless clients (9+9=18). When used with two RAs, the Core AP supports six wireless clients and its connected RAs each support six wireless clients (6+6+6=18).

When monitored patients are ambulatory, data roaming is handled seamlessly between the other IntelliVue Access Points in the system. The Core AP and each RA are always used with their two supplied antennas installed. The Core AP and its attached Remote Antennas can be mounted out of the way on corridor walls, or above or below ceiling tiles.

Philips provides Model ITS4843B ITS Core Access Points for the 1.4 GHz US Wireless Medical Telemetry Service (WMTS) band (P/N 989803171211) that can be used with one or two Model ITS4846A Remote Antennas (P/N 865052).

Core AP Mounting Options

Wall-mounting hardware is standard. An optional above/below ceiling tile mount kit (P/N 862415 Option K05 (453564052201)) is available that can be used with both the Core AP and its Remote Antennas.

Power Source

The ITS 1.4 GHz Core Access Point receives its 48 VDC operating power source via its Ethernet LAN cabling from the ITS Power over Ethernet Unit via the ITS Sync Unit. The AP is not equipped with a power socket. The AP consumes less than 13.8W, and internally generates a variety of voltages used for its internal components.

The CAT-5 UTP cable within the 74 ft.-cable bundle carries 5.5 VDC power, Transmit and Receive control signals, and Antenna Diversity signals from the Core AP to a connected Remote Antenna.

The 75 Ohm coaxial cable within the 74 ft.-cable bundle carries RF and DC sense signals from the Core AP to a connected Remote Antenna.

Synchronization Signal

The ITS 1.4 GHz Core Access Point receives a synchronization signal from a network of Sync Units that enables a patient-worn transceiver to hand over data seamlessly between APs within the coverage area when a patient is ambulatory and to transfer data to the IntelliVue Information Center without interruption. Each Sync Unit provides synchronization for up to 12 APs. The Sync Unit also distributes the common reference clock signal needed by the IntelliVue Telemetry System as a whole.

Transceiver Mobility

The Philips IntelliVue Telemetry System supports full mobility of patient-worn transceivers within the area of coverage. This roaming is accomplished via communications between the transceivers and the Access Points (AP) as follows.

As a patient-worn transceiver is moved around a building, it automatically monitors the quality of the wireless link to its current AP (and it also detects the presence of other APs). When the quality starts to deteriorate, the transceiver automatically establishes a new connection to another AP.

The patient-worn transceiver remains connected to two APs for a finite time, and thus the same data is received by these APs. During this time, information for header compression and other data for the connection is routed to the new AP.

One of the two APs subsequently releases the radio connection. If a packet is in progress when a handover occurs, then the packet is reassembled co-operatively between the two APs.

The central station or other ICN central equipment sees an unbroken flow of complete IP packets.

Technical Alarms

Each AP is configured to signal alarm conditions that are viewed at the IIC in the wireless status log.

The IntelliVue Access Point is configured to raise alarms on error conditions. The alarms are sent over the ITS/ICN Ethernet LAN infrastructure to a monitoring station or Database Sever. The Access Point raises an alarm if:

- it is approaching its maximum load capacity
- if data loss exceeds the configured threshold
- it loses its synchronization signal

For small systems having only one AP and no Sync Unit, the AP can be configured to suppress the loss of synchronization signal alarm.

Note that the ITS APC provides System Alarms such as loss of synchronization, high data loss, AP hardware failure, and over capacity. Additionally, when redundant APCs are installed, the APC will provide a System Alarm for APC hardware or software failure.

Firmware Updates

You can update the firmware on the ITS 1.4 GHz Core Access Point from the Access Point Controller by using the Philips Animation Upgrade Wizard. Refer to the service document entitled *IntelliVue Telemetry System Infrastructure Installation and Service Guide* (M3185-91934) for details. The AP firmware image is provided on the *Philips Network Infrastructure Tools* CD-ROM.

Management Interfaces

The Access Point supports the full range of management interfaces via the Philips Access Point Controller (APC). These interfaces also enable you to view the status of the Access Point including the following information:

- System configuration such as firmware version
- Connection information such as numbers of packets received and transmitted, and number of errors
- Wave data information such as total number of seconds of data sent and lost

The AP statistics can be read by remote devices (e.g., an ICN Database Server), using the Scaleable Node Address Protocol (SNAP).

The following status items can be displayed using the APC's web-accessed graphical user interface:

- AP Name
- Physical Address
- Partnered AP Controller

- IP Address
- Subnet Mask
- Default Gateway
- AP Type

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Connectors and Status Indicators

Figure 1-3 shows the controls and connectors on the 1.4 GHz ITS Core AP and Remote Antenna.

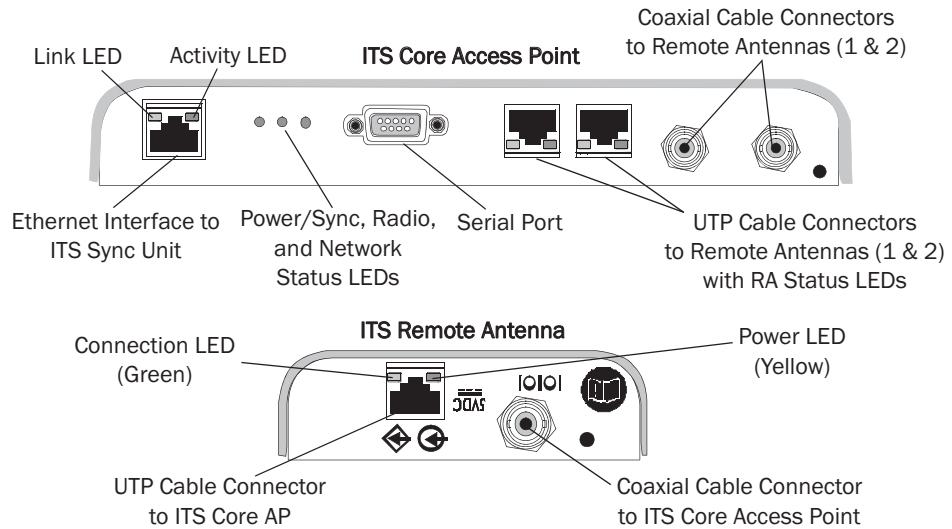


Figure 1-3: 1.4 GHz ITS Core AP and Remote Antenna Controls and Connectors

ITS Core AP Connectors

Note the following connectors on the ITS Core AP:

- **Ethernet Interface** - The AP provides a 100 Base-T Ethernet interface with an RJ-45 connector to connect the Core AP to the ITS Sync Unit.

The AP Ethernet interface provides data communications to and from the IntelliVue Information Center over the ITS LAN infrastructure. It also presents the 48Vdc power and synchronization signals required by the Core AP. The synchronization signal is superimposed on the power supply voltage. You should attach a ferrite block to the CAT 5 cabling (from the Sync Unit) no more than 20 inches (50 cm) from the RJ-45 connector to reduce electromagnetic (radiation) interference. Table 1-1 lists the pin signals for the AP Ethernet interface.

Table 1-1: AP Ethernet Interface Pin Signals

Pin	Signal Description
1	Transmit Pair TX + Conductor
2	Transmit Pair TX - Conductor
3	Receive Pair RX + Conductor

Table 1-1: AP Ethernet Interface Pin Signals

Pin	Signal Description
4	+ 48Vdc Power and Synchronization
5	+ 48Vdc Power and Synchronization
6	Receive Pair RX - Conductor
7	0V Power Return
8	0V Power Return

- **Serial Port** - The serial port is used only for manufacturing purposes.
- **UTP Cable Connectors to Remote Antennas** - Two standard RJ-45 connectors are provided for the UTP cables that connect the Core AP to its Remote Antennas. Each UTP cable carries 5.5 VDC power, Transmit, Receive and Antenna Diversity Control signals to the Remote Antenna.
- **Coaxial Cable Connectors to Remote Antennas** - Two standard 75 Ohm connectors are provided for the coaxial cables that connect the Core AP to its Remote Antennas. Each coaxial cable carries RF and DC sense signals from the Remote Antenna.

Remote AP Connectors

Note the following connectors on the Remote Antenna:

- **UTP Cable Connector to Core AP** - A standard RJ-45 connector is provided for the UTP cable that connect the Remote Antenna to its Core AP. The UTP cable carries 5.5 VDC power, Transmit, Receive and Antenna Diversity Control signals to the Remote Antenna.
- **Coaxial Cable Connector to Core AP** - A standard 75 Ohm connector is provided for the coaxial cable that connects the Remote Antenna to its Core AP. The coaxial cable carries RF and DC sense signals from the Core AP.

Note If an installed, powered Remote Antenna becomes disconnected from its Core AP via its Coax/UTP cable bundle, you must reconnect the Coax/UTP cable bundle to the RA and Core AP, and then cycle power to the connected Core AP before the RA will re-establish communications with the Core AP.

ITS Core AP Status LEDs **DRAFT-3**

The ITS Core AP provides the following status LEDs.

- **Wired/Ethernet Activity** - The Core AP provides two LEDs to indicate wired/Ethernet activity to the ITS infrastructure. During normal operation, these LEDs indicate the following information:
 - **Link LED** - Link present/Ethernet connection. Lights GREEN (ON) when a pass-through link is present - OFF when not present.
 - **Act LED** - Wired network activity. Flashes YELLOW (ON) when there is activity is over the wired network.
- **Wireless/RF Activity** - The Core AP provides three LEDs to indicate wireless/RF activity. During normal operation, these LEDs indicate the following information:
 - **Power/Sync LED** - GREEN (ON) when power and synchronization signal is present.
 - **Radio LED** - Normally OFF (not lit) - flashes green to indicate wireless network activity.
 - **Network LED** - Normally OFF (not lit) - flashes green to indicate wired network activity.

At initial power on the AP runs a Power On Self-Test (POST). During the POST, the above LEDs indicators flicker and then all three will illuminate continuously (AMBER) to indicate correct startup operation. Then, the Power ON LED will illuminate (GREEN) continuously to indicate that the 48Vdc power and sync signal are being supplied, and the other two (AMBER) LEDs turn off (not lit).

- **Remote Antenna** - The Core AP provides two LEDs on each RJ-45 UTP cable connector that provides status on a connected Remote Antenna:
 - **RA Connection** - Lights GREEN to indicate a RA is connected to the Core AP.
 - **RA Power** - Lights YELLOW to indicate connected RA is receiving power from the Core AP.

Remote Antenna Status LEDs

The Remote Antenna provides the following status LEDs.

- **Remote Antenna Status LEDs** - The green and yellow LEDs above the RJ-45 UTP cable connector to the Core AP provide status on the Remote Antenna as summarized below.

Table 1-2: Remote Antenna Status LEDs

Green/Yellow LEDs	Remote Antenna Status
Off/Off	No connection to or power from Core AP/Self-test Failed.
Flash Green/Yellow	Remote Antenna is running self-test/Power on.
Solid Green/Yellow	Connection to Core AP is Successful/Power On. This is the expected normal operational status.

Specifications

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Table 1-3: Model ITS4843B 1.4 GHz Core Access Point Specifications

Specification	Value
Physical:	
Chassis (only) Dimensions (H x W x L)	30 mm x 204 mm x 243 mm (1.2 in x 8.0 in x 9.6 in)
Local Antenna (only) Dimensions	160 mm (6.3 inches L) Sleeve Dipole
Weight with Antenna	<.79g (1.8 lb)
Mounting	Above Ceiling, Below Ceiling, or Wall Mount
Environmental:	
Operating Temperature	0 to +55° C (32 to 131oF)
Storage Temperature	-40 to +60° C (-4 to 140oF)
Humidity Range (Operating)	< 95% RH @ 40° C non-condensing
Humidity Range (Storage)	< 90% RH @ 60° C
Altitude	Operating and Storage up to 3048 m (10,000 ft)
Electrical:	
Power	48 VDC nominal (44 - 52 VDC), from PoE Unit via Sync Unit) ≤ 13.8Watts, 287 mA
Power Sensing	Auto sensing POE, compliant with 802.3af
RF Diversity	Uses Dual Antenna, selects antenna with best signal.
Frequency Diversity	Dynamic, selects RF channels for best signals.
Antenna Type	Sleeve Dipole > 10dB over 1395MHz to 1432MHz in 50 Ohms.
LED Indicators	Two LEDs for LAN activity, part of LAN RJ-45 connector. Three LEDs for Radio Activity, Sync, Network status. Two LEDs on Remote Antenna Ports provide Power and Fault status (part of RA RJ-45 connector).
Electrical Installation:	
Fire Safety	Model ITS4843B 1.4 GHz Core Access Points are Listed for use within "Other Spaces Used for Environmental Air (Plenum)" per NFPA70: 2011, Article 300.22. Note: The term "plenum" as used in Article 300.22 Section C correlates with the use of the term "plenum" in NFPA 90A-2009, Standard for the Installation of Air-Conditioning and Ventilating Systems, and other mechanical codes where the plenum is used for return air purposes, as well as some other air-handling spaces. The area above dropped ceilings is an example of plenum space.
Interface Connections:	
LAN Input (Data): 1 Port; Ethernet 100 Base-T (only 100 Mbps Full Duplex)	RJ-45 Female Socket.
LAN Cable to Network Switch	CAT-5 or better, up to 100m (328 ft.).

Table 1-3: Model ITS4843B 1.4 GHz Core Access Point Specifications

Specification	Value
Remote Antenna UTP Cable Connectors	Two RJ-45 Female Socket Connectors are provided to connect the UTP cables on which 5.5 VDC power, Transmit and Receive control signals, and Antenna Diversity signals to the remote Antennas are carried. Connectors are protected against damage from unexpected connection to LAN with PoE
Remote Antenna 75 Ohm Coaxial Cable Connectors	Two standard 75 Ohm connectors are provided for the coaxial cables on which RF and DC sense signals are carried to the Remote Antenna.
Local Antenna Connections (two)	Two SMA-style connectors.

Table 1-4: Model ITS4846A 1.4 GHz Remote Antenna Specifications

Specification	Value
Physical:	
Chassis (only) Dimensions (H x W x L)	30 mm x 100 mm x 174 mm (1.2 in x 4.0 in x 6.9 in)
Local Antenna (only) Dimensions	160 mm (6.3 inches L) Sleeve Dipole
Weight with Antenna	<.32kg (0.7 lb)
Mounting	Above Ceiling, Below Ceiling, or Wall Mount
Environmental:	
Operating Temperature	0 to +55° C (32 to 131oF)
Storage Temperature	-40 to +60° C (-4 to 140oF)
Humidity Range (Operating)	< 95% RH @ 40° C non-condensing
Humidity Range (Storage)	< 90% RH @ 60° C
Altitude	Operating and Storage up to 3048 m (10,000 ft)
Electrical:	
Power	5.0 VDC nominal input via Core AP RJ-45 Cable Connector
Power Sensing	802.3af-compliant
RF Diversity	Uses Dual Antenna, selects antenna with best signal.
Antenna Type	Sleeve Dipole > 10dB over 1395MHz to 1432MHz in 50 Ohms.
LED Indicators	Power and Connection LED notification on RJ-45 connector.

Table 1-4: Model ITS4846A 1.4 GHz Remote Antenna Specifications

Specification	Value
Electrical Installation:	
Fire Safety	Model ITS4846A 1.4 GHz Remote Antennas are Listed for use within "Other Spaces Used for Environmental Air (Plenum)" per NFPA70: 2011, Article 300.22. Note: The term "plenum" as used in Article 300.22 Section C correlates with the use of the term "plenum" in NFPA 90A-2009, Standard for the Installation of Air-Conditioning and Ventilating Systems, and other mechanical codes where the plenum is used for return air purposes, as well as some other air-handling spaces. The area above dropped ceilings is an example of plenum space.
Interface Connections:	
Control Signals	RJ-45 Female Socket.
Core AP 75 Ohm Coaxial Cable Connector	One standard 75 Ohm connector is provided for the coaxial cable on which RF and DC sense signals are carried to the Remote Antenna.
Local Antenna Connections (two)	Two SMA-style connectors.

Ordering Information

Table 1-5: IntelliVue Telemetry System 1.4 GHz Access Point Part Numbers

Device/Option	Part Number/Option Number
IntelliVue ITS4843B 1.4 GHz Enhanced Smart-Hopping Access Point	989803171211
IntelliVue ITS4846A Remote Antenna	865052
IntelliVue Telemetry System Mounting Options <ul style="list-style-type: none"> Above & Below Ceiling Tile-mount Option for 989803171211 or 865052 	453564052201 or 862415/K05

DRAFT-3



Installing the ITS 1.4 GHz Core Access Point

This chapter provides procedures to physically install the Philips IntelliVue Telemetry System 1.4 GHz Core Access Point and includes:

- Access Point Placement Guidelines
- General Installation Procedure
- Mounting the ITS Core AP to a Wall (Fixed Mount)
- Mounting the ITS Core AP to a Wall (CA Earthquake Rated)
- Mounting the ITS Core AP Above a Ceiling Tile
- Mounting the ITS Core AP Below a Ceiling Tile (Fixed Mount)
- Mounting the ITS Core AP Below a Ceiling Tile (Quick Release)
- Mounting the ITS Remote Antenna to a Wall (Fixed Mount)
- Mounting the ITS Remote Antenna to a Wall (CA Earthquake Rated)
- Mounting the ITS Remote Antenna Above a Ceiling Tile (Mounting Rails)
- Mounting the ITS Remote Antenna Above a Ceiling Tile (Tether Mount)
- Mounting the ITS Remote Antenna Below a Ceiling Tile (Fixed Mount)
- Mounting the ITS RA Below a Ceiling Tile (Quick Release)
- AP Configuration Information
- Access Point Startup Sequence

Access Point Placement Guidelines

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Note the following important guidelines when locating ITS Access Points:

- AP antennas must be more than four inches (10 cm) away from metal structures. If the antennas are too close to the structure, antenna performance can be degraded.
- A Core AP alone supports 18 wireless clients. When used with a single RA, the Core AP supports nine wireless clients and its connected RA supports nine wireless clients (9+9=18). When used with two RAs, the Core AP supports six wireless clients and its connected RAs each support six wireless clients (6+6+6=18).
- If there is a need to support more than 18 wireless clients within a single Radius-of-Coverage cell, Access Points/Remote Antennas can be moved closer together until the desired density is achieved.
- APs or Remote Antennas shall not be placed closer than three feet (1 m) from other APs or RAs to prevent signal overload conditions.
- Each ITS Access Point requires a 100Mbps/Full Duplex switch port connection.
- Try to avoid placing APs close to other electrical devices (exit lights, light fixtures, speakers, etc.). Devices like florescent light ballasts can create a significant amount of interference that can impact system performance.
- Orient the antennas on ITS APs so that they are perpendicular to the floor.

General Installation Procedure **DRAFT-3**

To install the IntelliVue Telemetry System 1.4 GHz Core Access Point:

1. Mount the ITS 1.4 GHz Core Access Point and Remote Antennas within the clinic where they can communicate with 1.4 GHz patient-worn transceivers and wireless bedside monitors. Note these guidelines when installing the ITS Core Access Point and Remote Antennas:
 - You may mount each ITS Core Access Point as follows:
 - to a wall (fixed mount) as described on page 2-6
 - to a wall (CA earthquake rated) as described on page 2-7
 - above a ceiling as described on page 2-9
 - below a ceiling (fixed mount) as described on page 2-12
 - below a ceiling (quick release) as described on page 2-16
 - You may mount each ITS Remote Antenna as follows:
 - to a wall (fixed mount) as described on page 2-21
 - to a wall (ca earthquake rated) as described on page 2-22
 - above a ceiling as described on page 2-23
 - above a ceiling (tether mount) as described on page 2-26
 - below a ceiling (fixed mount) as described on page 2-28
 - below a ceiling (quick release) as described on page 2-32
 - Use category 5 (or better) Unshielded Twisted Pair cable to connect each ITS Core Access Point to the ITS infrastructure.
 - The total length of UTP cable from the ITS access point-to the ITS Synchronization Unit-to the ITS Power over Ethernet Unit-to ICN Network Switch cannot exceed 328 ft. (100 m).
 - Use only the supplied, unmodified 74 ft. (22.6m) Coax and UTP cable bundle when connecting Remote Antennas to the Core AP.
2. Attach each supplied local antenna to the Core AP chassis by inserting the antenna into the socket connector. Orient the antenna (either straight for wall mounting or rotate downward for ceiling tile mounting) and then screw on its collar until the antenna is secure to the chassis.
3. Attach each supplied antenna to the Remote Antenna chassis by inserting the antenna into the socket connector. Orient the antenna (either straight for wall mounting or rotate downward for ceiling tile mounting) and then screw on its collar until the antenna is secure to the chassis.
4. If you have installed Remote Antennas, connect each ITS Core Access Point to its installed Remote Antenna(s) using the supplied, unmodified 74 ft. (22.6m) Coax and UTP cable bundle(s).

Caution Do not kink the RA Coax-and-UTP-cable-bundle during installation. You must **maintain a minimum 2.5-inch (64-mm) bend radius** for the RA Coax-and-UTP-cable-bundle throughout the installation.

- DRAFT-3**
- a) Connect the first Remote Antenna to the Core AP using the UTP and Coaxial cable connectors labeled **RA 1** in Figure 2-1.
 - b) Connect the second Remote Antenna to the Core AP using the UTP and Coaxial cable connectors labeled **RA 2** in Figure 2-1.
 - c) Be sure to label the UTP cable bundles and the Remote Antennas themselves as **RA 1** and **RA 2** corresponding to the cable connections you made in steps a and b.

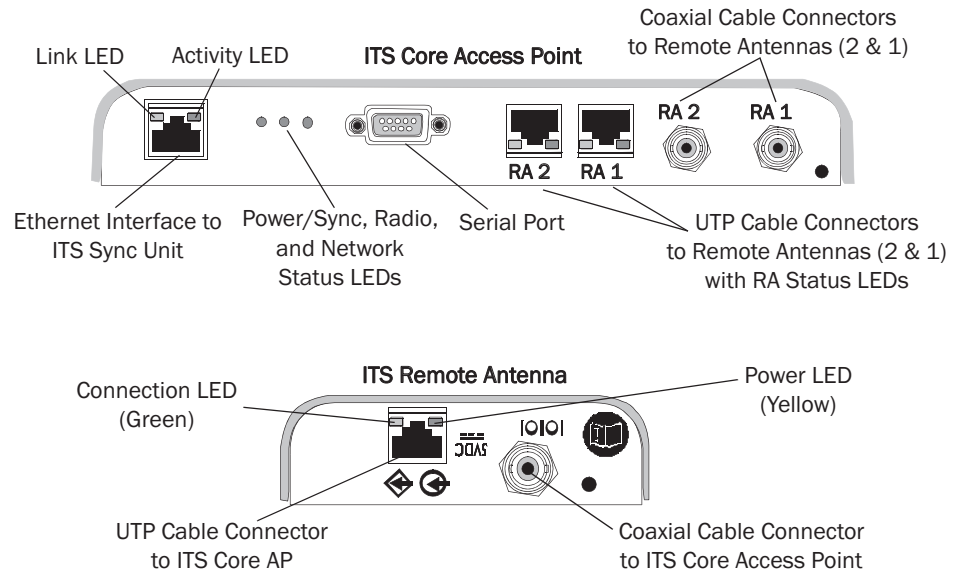


Figure 2-1: 1.4 GHz ITS Core AP and Remote Antenna Controls and Connectors

5. Route a Category 5 UTP cable between each ITS Core Access Point and the equipment closet in which the ITS infrastructure devices are installed.
6. Install a ferrite block on the UTP cable within 20 inches (50 cm) of the RJ-45 connector that connects to the Core Access Point as shown in Figure 2-2.

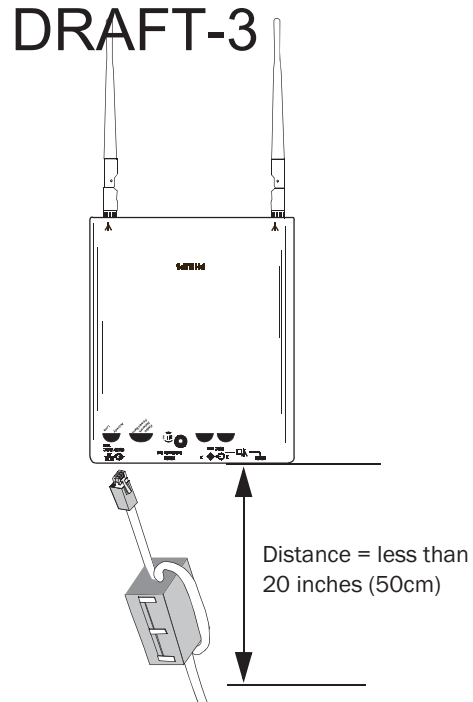


Figure 2-2: Installing a Ferrite Block on the UTP Cable to the ITS Infrastructure

7. Connect the Access Point to the ITS Sync Unit only when appropriate as part of the overall ITS installation.
 - a) After initially connecting and powering the Core AP, verify that the two status LEDs on each of its connected Remote Antennas are lit. You can verify this by viewing the AP's Status page presented in the APC web interface.

Note If after connecting and powering the Core AP, its LEDs are lit red and the Remote Antenna LEDs do not light at all, open the APC web interface, click **System** in the **View Device tree**, click **Configure** and then select the **Advanced** tab. Verify that the **Allow new APs to be added automatically** option is set to **True**. This option must be set to **True** for the Core AP and Remote Antenna LEDs to light properly.

- b) Reboot the Core AP.

The Core AP and its connected Remote Antennas should now be listed in the APC web interface. Press **F5** to refresh the web interface display if the Core AP and RAs are not listed.

General AP configuration information is given on page 2-35. See page 2-35 for the AP startup sequence.

Mounting the ITS Core AP to a Wall (Fixed Mount)

DRAFT-3

You can mount the IntelliVue Telemetry System Core Access Point to a wall using the mounting screws and screw anchors supplied with the AP. We recommend that you mount the Core AP high on the wall as close to the ceiling as possible.

To mount the 1.4 GHz ITS Core AP to a wall:

1. Using a 3/16-inch drill bit, drill a pilot hole .188 inches (5 mm) in diameter at the locations shown in Figure 2-3.
2. Tap a supplied plastic screw anchor into each pilot hole until it is flush with the wall surface.

This step is not necessary if mounting the ITS Core AP on a wood surface.

3. Screw a supplied #6 x 1 1/4 inch self-tapping screw into each screw anchor (or pilot hole) as shown in Figure 2-3.

Tighten each screw until a 1/16-inch (2 mm) gap remains between the screw head and the mounting surface.

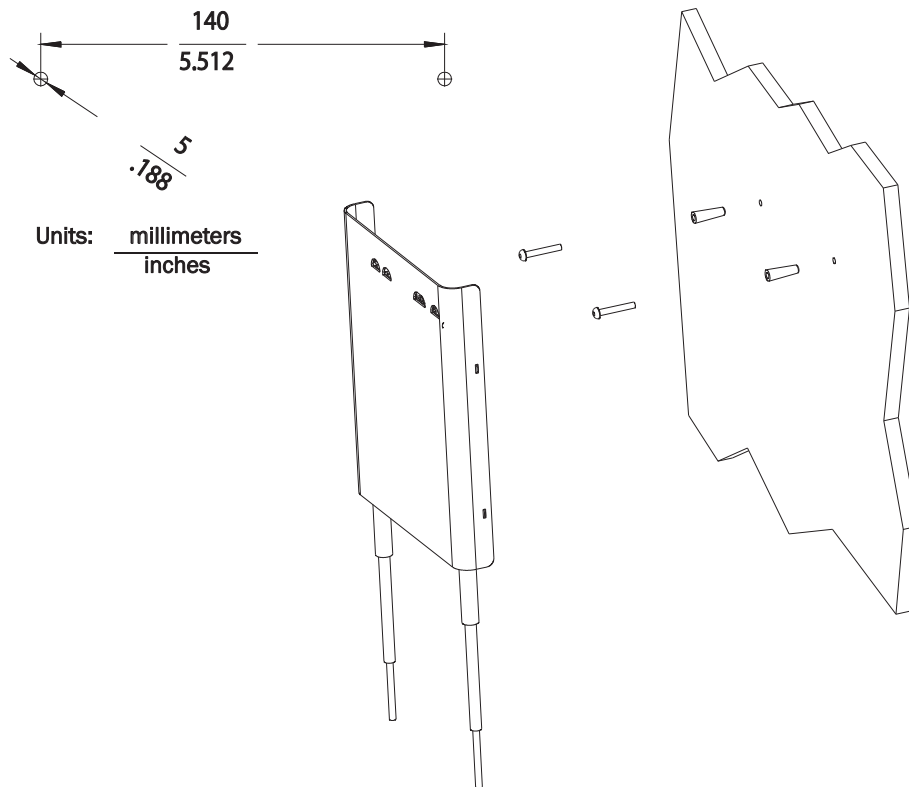


Figure 2-3: Mounting the ITS 1.4 GHz Core AP to a Wall (Fixed Mount)

4. While holding the AP chassis with its antennas pointing down as shown in Figure 2-3, fit the holes in the back of the AP chassis over the screw heads that protrude from the wall. Slide the AP chassis down so that the screw heads are securely in the grooves in the back of the AP chassis.

Mounting the ITS Core AP to a Wall (CA Earthquake Rated)

You can mount the IntelliVue Telemetry System Core Access Point onto walls using an optional California (CA) earthquake-rated wall plate. We recommend that you mount the Core AP high on the wall as close to the ceiling as possible.

To mount the 1.4 GHz ITS Core AP to a wall:

1. Using a 3/16-inch drill bit, drill two pilot holes .188 inches (5 mm) in diameter at the locations shown in Figure 2-4.

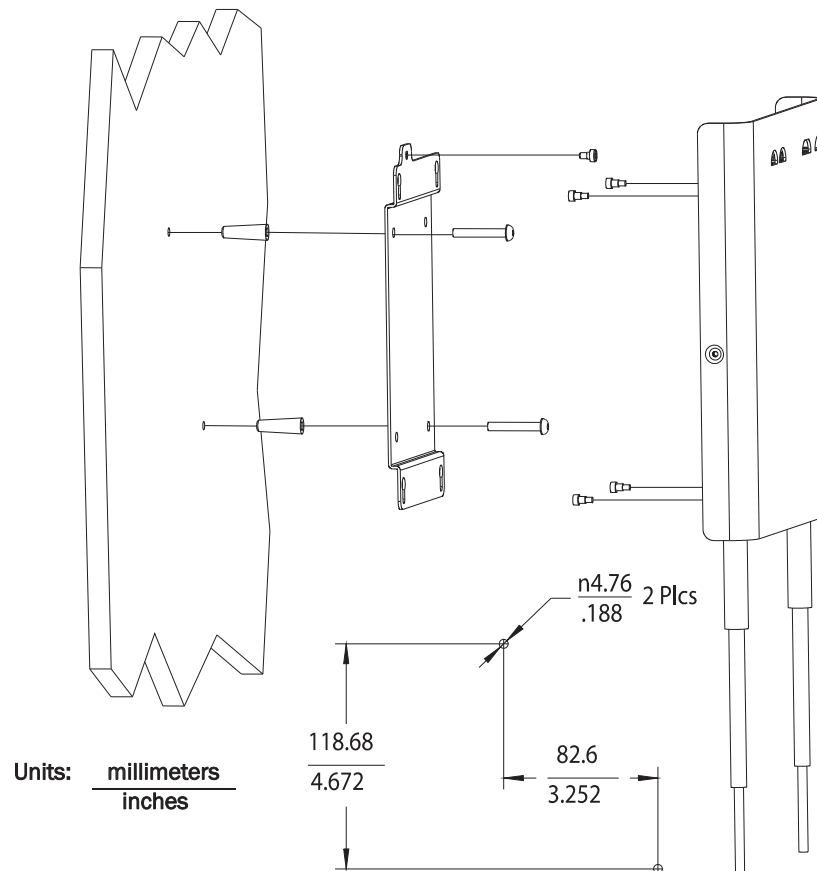


Figure 2-4: Mounting the ITS 1.4 GHz Core AP to a Wall (CA Earthquake Rated)

2. Tap a supplied plastic screw anchor into each pilot hole until flush with the wall surface.

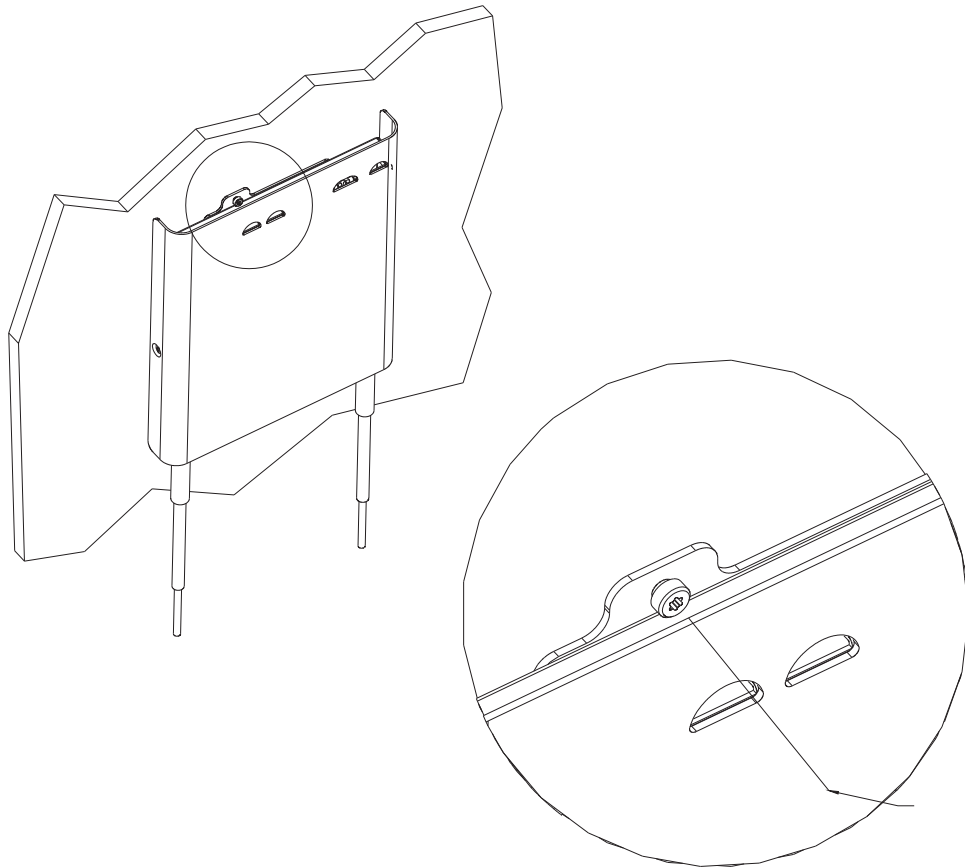
This step is not necessary if mounting the ITS Core AP on a wood surface.

3. Secure the quick release wall plate to the wall by screwing a supplied #6 x 1 1/4 inch self-tapping screw through the wall plate into each screw anchor (or pilot hole) as shown in Figure 2-4.

Tighten each screw until the wall plate is fixed securely in place.

4. Using a 5/64-inch (2 mm) Allen (i.e., hexagonal) wrench, secure the four supplied M3 X 0.5 hex-head shoulder screws to the back of the Core AP as shown in Figure 2-4. Torque-tighten each shoulder screw to 8-inch lbs.

- DRAFT-3
5. Mount the Core AP to the wall plate by inserting the head of each shoulder screw into the four mounting holes provided in the wall plate and then sliding the Core AP down so that the shoulder screw heads are securely in the grooves of the wall plate.
 6. Using a Torx T10 screw driver, secure the Core AP to the wall plate by screwing the supplied M3.5 X 0.6 T-10 Torx Head security screw into the PEM nut in the wall plate as shown in Figure 2-5. Torque-tighten the screw to 10-inch lbs. Note that this safety screw is used to prevent the Core AP from sliding out of the wall plate.



Insert M3.5 Security Screw through this View Port and Tighten Using a Torx T10 Screwdriver.

Figure 2-5: Securing the Core AP to its Quick Release Wall Plate

Mounting the ITS Core AP Above a Ceiling Tile

DRAFT-3

You can mount the IntelliVue Telemetry System Core Access Point above a ceiling tile by using the mounting rails provided in the Above & Below Ceiling Tile Mount Kit (862415-K05) for the Core AP and Remote Antennas.

Caution When installing the IntelliVue Access Point onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Core Access Point, 0.79 kg (1.8 lbs), and any extra cabling.

To mount the 1.4 GHz ITS Core AP above a ceiling tile:

1. Determine which ceiling tile the Core AP is be mounted onto, and the approximate Core AP placement and orientation of the antennas on the tile. Also, check for adequate clearance above the Core AP.
2. Remove the ceiling tile to which the Core AP will be mounted (and also an adjacent tile to facilitate installation).
3. Orient the antenna(s) on the Core AP chassis so they bend downward at right angles to the chassis. Unscrew the collar and rotate the antenna into position and then retighten the collar to secure the antenna in place.
4. Determine where the two holes for the antennas are going to be located on the tile and mark the centers of the holes.

The Core AP chassis can be rotated 90 degrees to the mounting rails. Choose the best placement of the Core AP to facilitate where the antennas will go through the ceiling tile. Note that there are additional holes in the mounting rails to allow for tethering to other permanent structures where local building codes require this type of installation. Refer to Figure 2-6 or Figure 2-7 for the dimensions used to locate the antenna holes in the tile.

5. Drill out two 3/4-inch (19 mm) diameter holes in the ceiling tile for the antennas. Lightly coat both plastic grommets with silicone adhesive and insert them into both holes in the tile (Insert grommets from the outside of the tile).
6. Secure the mounting rails to the AP. Insert the four (4) M3 x 0.5 (8 mm LG) screws into the Core AP mounting rail holes, and into the mating holes in the back of the Core AP as shown in Figure 2-6 or Figure 2-7. Torque-tighten each shoulder screw to 8-inch lbs.
7. Place the Core AP with mounting rails across the top of the tile.
8. Replace the tile back onto the ceiling frame structure with the Core AP antennas hanging down through the ceiling. Wiring connections to the Core AP can be accessed via the open adjacent tile.
9. Replace other adjacent ceiling tiles if necessary.

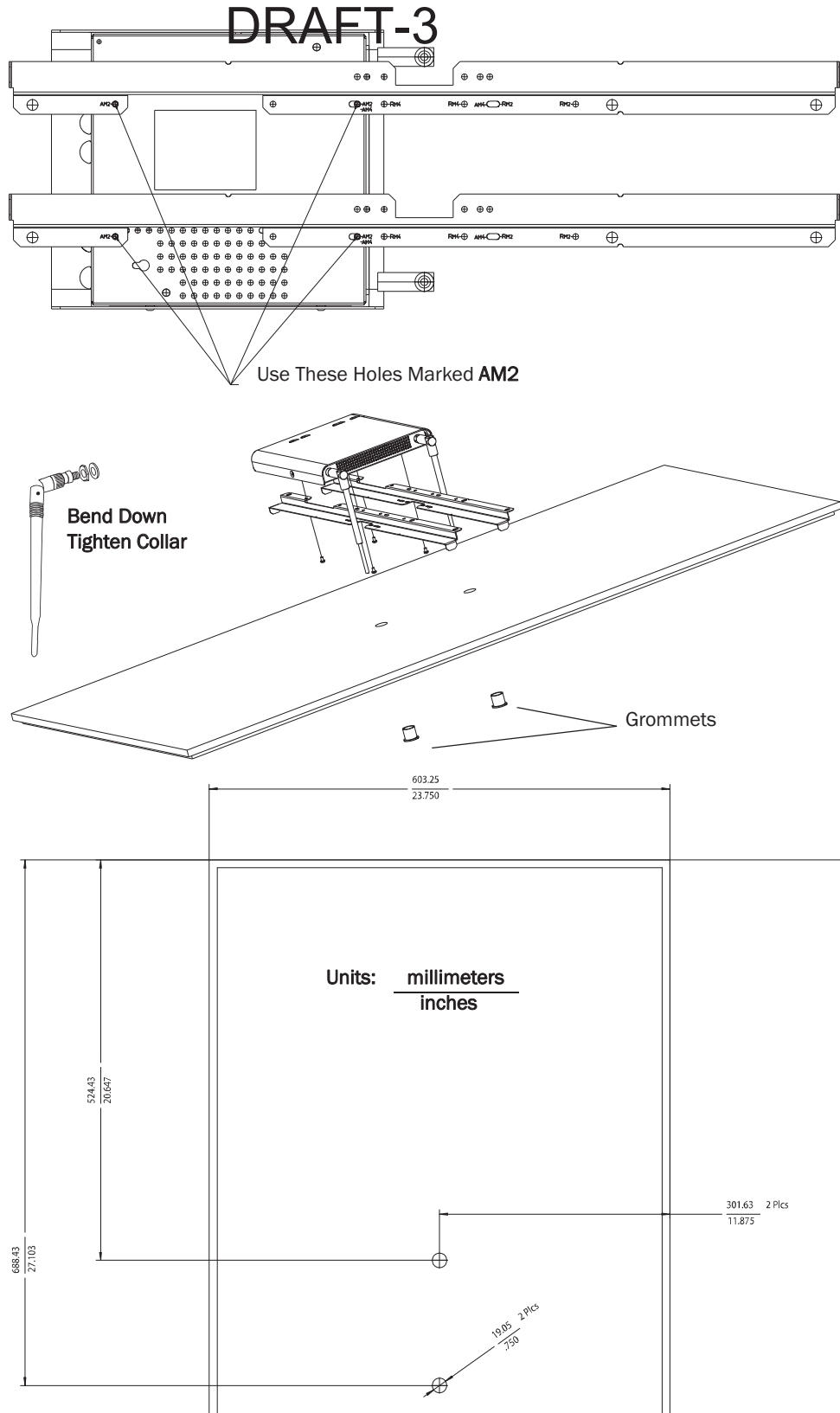


Figure 2-6: Possible Above the Ceiling Core AP Mounting Position

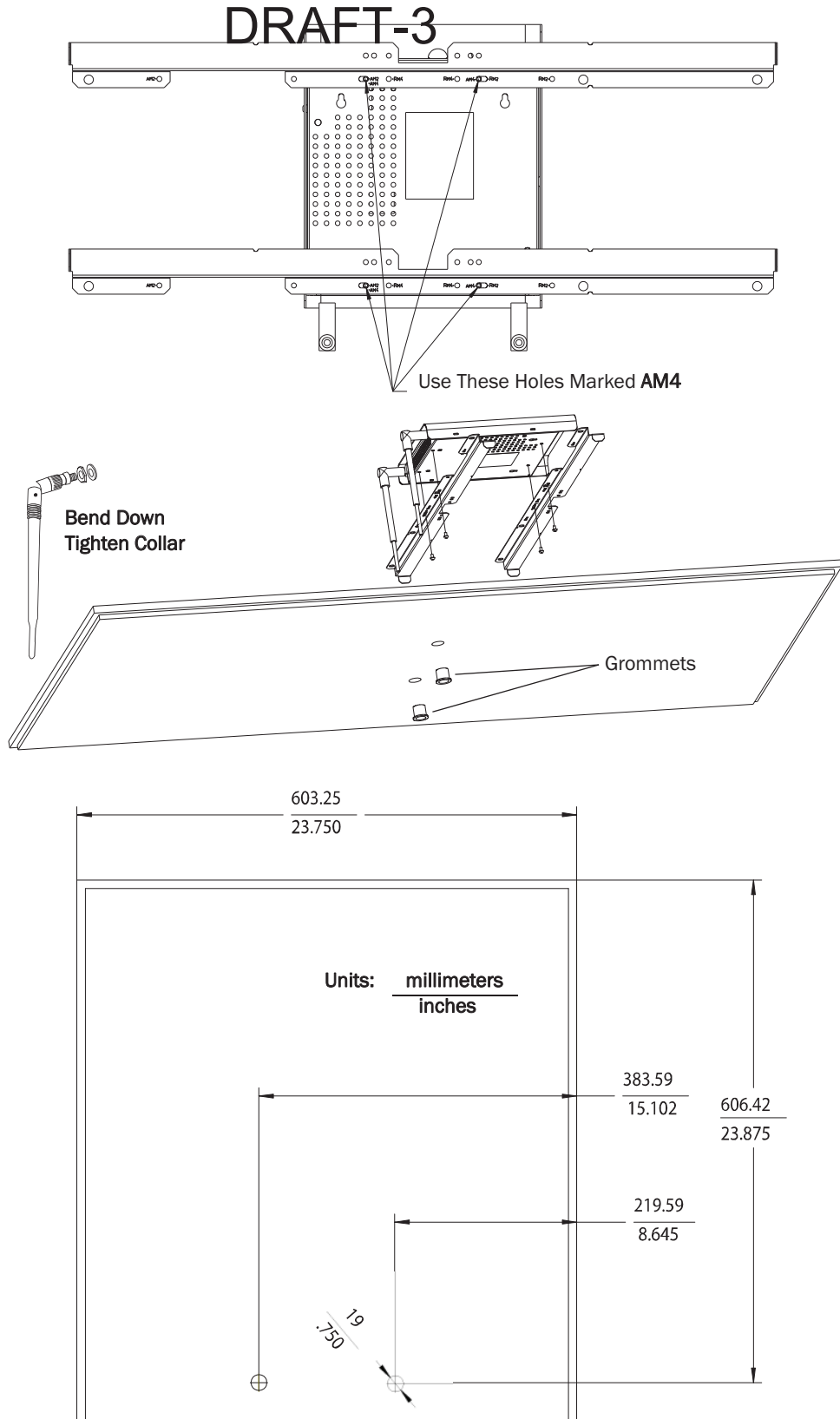


Figure 2-7: Alternative Above the Ceiling Core AP Mounting Position

Mounting the ITS Core AP Below a Ceiling Tile (Fixed Mount)

DRAFT-3

You can mount the IntelliVue Telemetry System Access Point below a ceiling tile by using the mounting rails provided in the Above & Below Ceiling Tile Mount Kit (862415-K05) for the Core AP and Remote Antennas.

Caution When installing the IntelliVue Access Point onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Access Point, 0.7kg (1.5 lbs), and any extra cabling.

To mount the 1.4 GHz ITS Core AP below a ceiling tile:

1. Determine which ceiling tile the Core AP is to be mounted onto, and the approximate placement of the Core AP and orientation of the antennas hanging down from the ceiling tile.
2. Remove the ceiling tile the Core AP will be mounted to (and also the adjacent tile to facilitate installation).
3. Refer to Figure 2-8 for all dimensions and hole locations. Place the mounting rails across the tile (underside of tile). For ceiling tiles that are smaller than standard 2' x 4' size ceiling tile, the mounting rails can be cut down in length at the u-shaped cutouts.
4. Mark the location of the **AB** screw holes in the mounting rails on the ceiling tile where the holes will be drilled through the tile as shown in Figure 2-9. Drill four .375-inch (10 mm) diameter holes in the ceiling tile.
5. Determine where the two holes for the Remote Antenna cables are going to be located on the tile and mark the centers of the hole.

Note that one of these holes will also be used to route the CAT 5 cable that connects the Core AP to the Sync Unit on the ITS.

6. Drill or cut out two .813-inch (21 mm) diameter holes for the Remote Antenna cables to be connected to the Core AP. Lightly coat a plastic grommet with silicone adhesive and insert it into each hole in the tile (insert grommet from the outside of the tile).
7. Insert the four (4) M3-.5 X 30 lobe screws into the Core AP mounting rail holes, through the provided plastic spacers, through the tile, and into the mating holes in the back of the Core AP as shown in Figure 2-10. Torque-tighten each screw to 8-inch lbs.

Note that the Core AP mounting rails and spacers allow for sufficient airflow between the Core AP and the ceiling tile.

8. Orient the antenna(s) on the Core AP chassis so they bend upward at right angles to the chassis. Unscrew the collar and rotate into position and then retighten the collar to secure the antenna in place.
9. Replace the tile back onto the ceiling frame structure with the Core AP antennas hanging down from the ceiling. Cabling connections to the Core AP can be accessed via the open holes in the tile.

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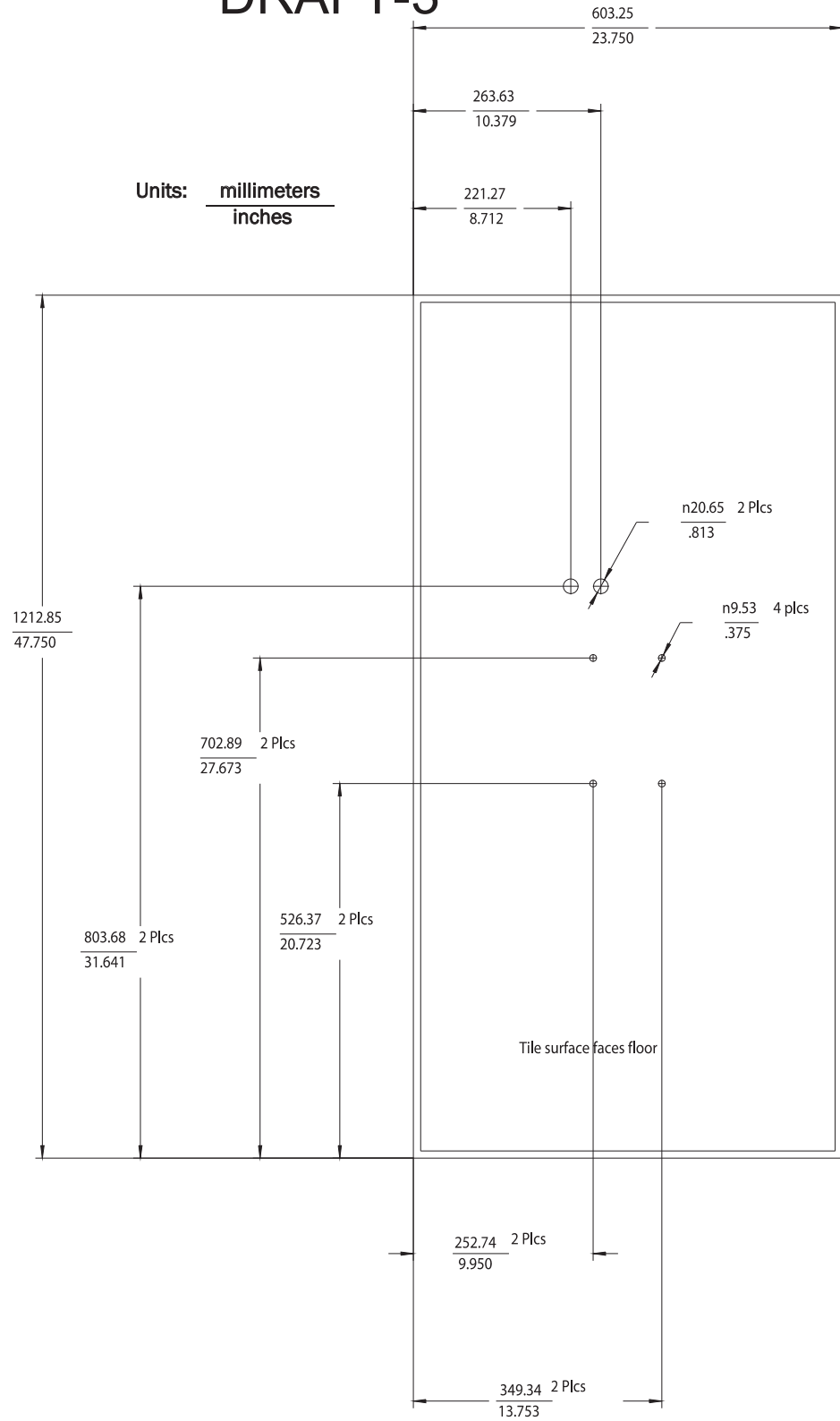


Figure 2-8: Core AP Below Ceiling Tile Hole Locations and Dimensions

DRAFT-3

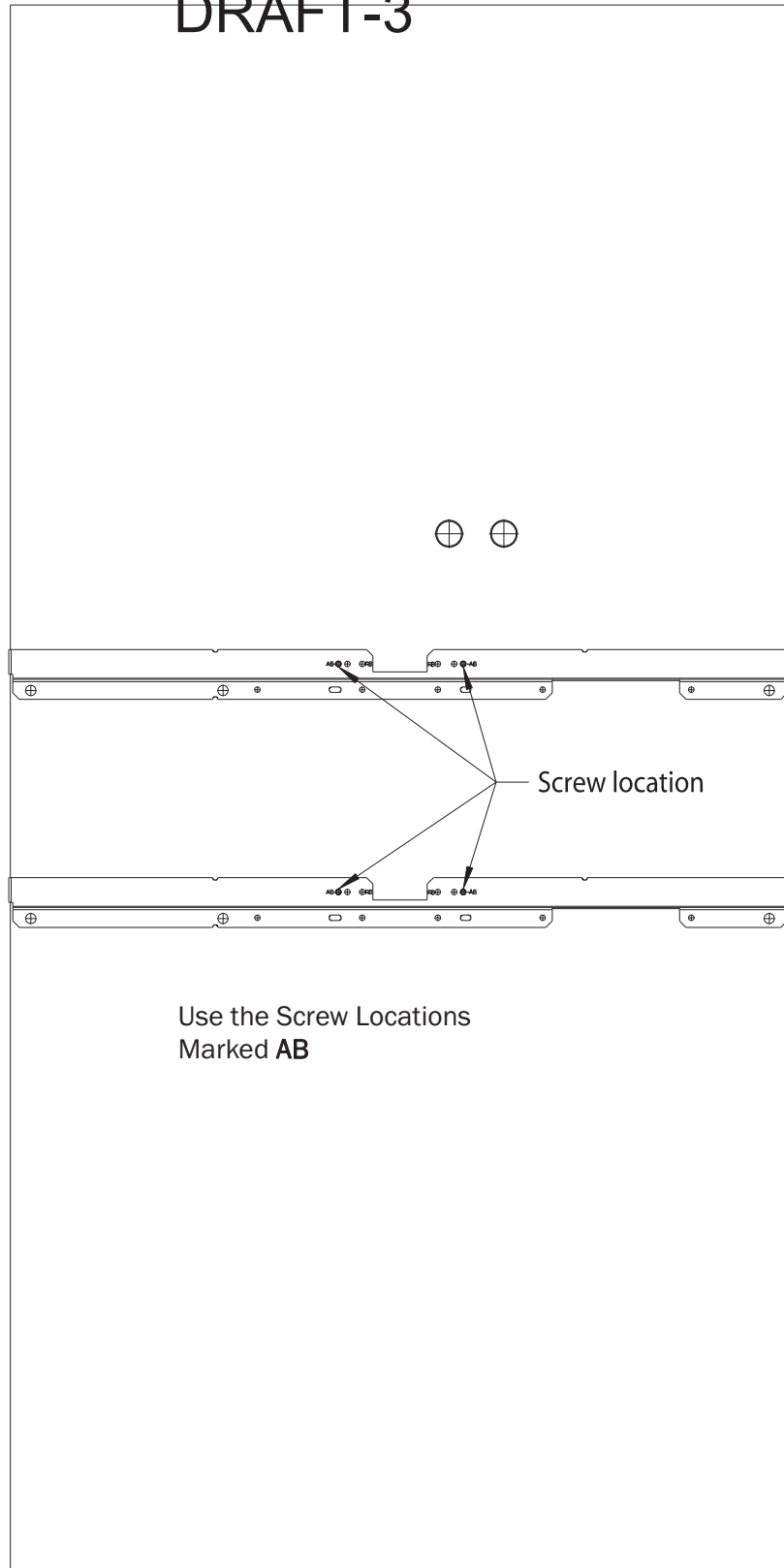


Figure 2-9: Core AP Below Ceiling Tile Mounting Rail Screw Locations

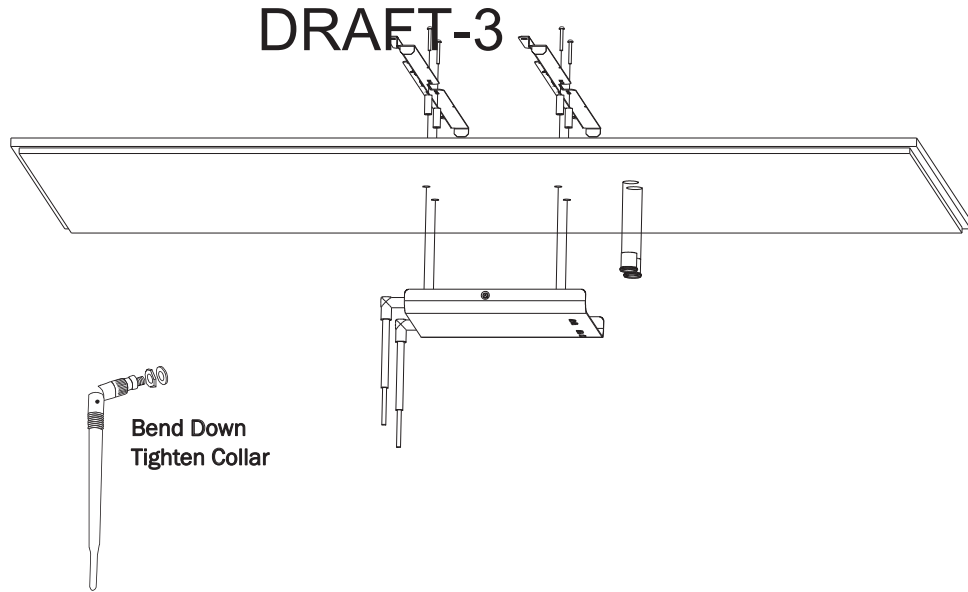


Figure 2-10: Mounting the Core AP Below a Ceiling Tile (Fixed Mount)

Note that there are additional holes in the mounting rails to allow for tethering to other permanent structures where local building codes require this type of installation.

10. Replace other adjacent ceiling tiles if necessary.

Mounting the ITS Core AP Below a Ceiling Tile (Quick Release)

You can mount the IntelliVue Telemetry System Access Point below a ceiling tile by using an optional quick release wall plate along with the mounting rails provided in the Above & Below Ceiling Tile Mount Kit for the Core AP and Remote Antennas (862415-K05). Use of this wall plate enables you to relocate 1.4 GHz ITS Core APs within your facility quickly and easily.

Caution When installing the IntelliVue Access Point onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Access Point, 0.7kg (1.5 lbs), and any extra cabling.

To mount the 1.4 GHz ITS Core AP below a ceiling tile:

1. Determine which ceiling tile the Core AP is to be mounted onto, and the approximate placement of the Core AP and orientation of the antennas hanging down from the ceiling tile.
2. Remove the ceiling tile the Core AP will be mounted to (and also the adjacent tile to facilitate installation).
3. Refer to Figure 2-11 for all dimensions and hole locations. Place the mounting rails across the tile (underside of tile). For ceiling tiles that are smaller than standard 2' x 4' size ceiling tile, the mounting rails can be cut down in length at the u-shaped cutouts.
4. Mark the location of the **AB** screw holes in the mounting rails on the ceiling tile where the holes will be drilled through the tile as shown in Figure 2-12. Drill four .375-inch (10 mm) diameter holes in the ceiling tile.
5. Determine where the two holes for the Remote Antenna cabling are going to be located on the tile and mark the centers of the hole.

Note that one of these holes will also be used to route the CAT 5 cable that connects the Core AP to the Sync Unit on the ITS.

6. Drill or cut out two .813-inch (21 mm) diameter holes for the Remote Antenna cables to be connected to the Core AP. Lightly coat a plastic grommet with silicone adhesive and insert it into each hole in the tile (insert grommet from the outside of the tile).
7. Place the AP wall plate over the four holes drilled on the bottom of the tile. Note: The top direction is as when the tile is in its installed position.
8. Insert the four (4) M3 .5 x 0.6 x 30mm screws into the AP wall plate, through the tile, and into the mating holes in the mounting rails on top of the tile. Hand tighten the four locking hex nuts onto the screws, and then torque-tighten each nut to 10-inch lbs (#1 Pozidrive).
9. Using a 5/64-inch (2 mm) Allen (i.e., hexagonal) wrench, secure the four supplied M3 X 0.5 hex-head shoulder screws to the back of the Core AP as shown in Figure 2-13. Torque-tighten each shoulder screw to 8-inch lbs.
10. Mount the Core AP to the wall plate by inserting the head of each shoulder screw into the four mounting holes provided in the wall plate and then sliding the Core AP so that the shoulder screw heads are securely in the grooves of the wall plate.

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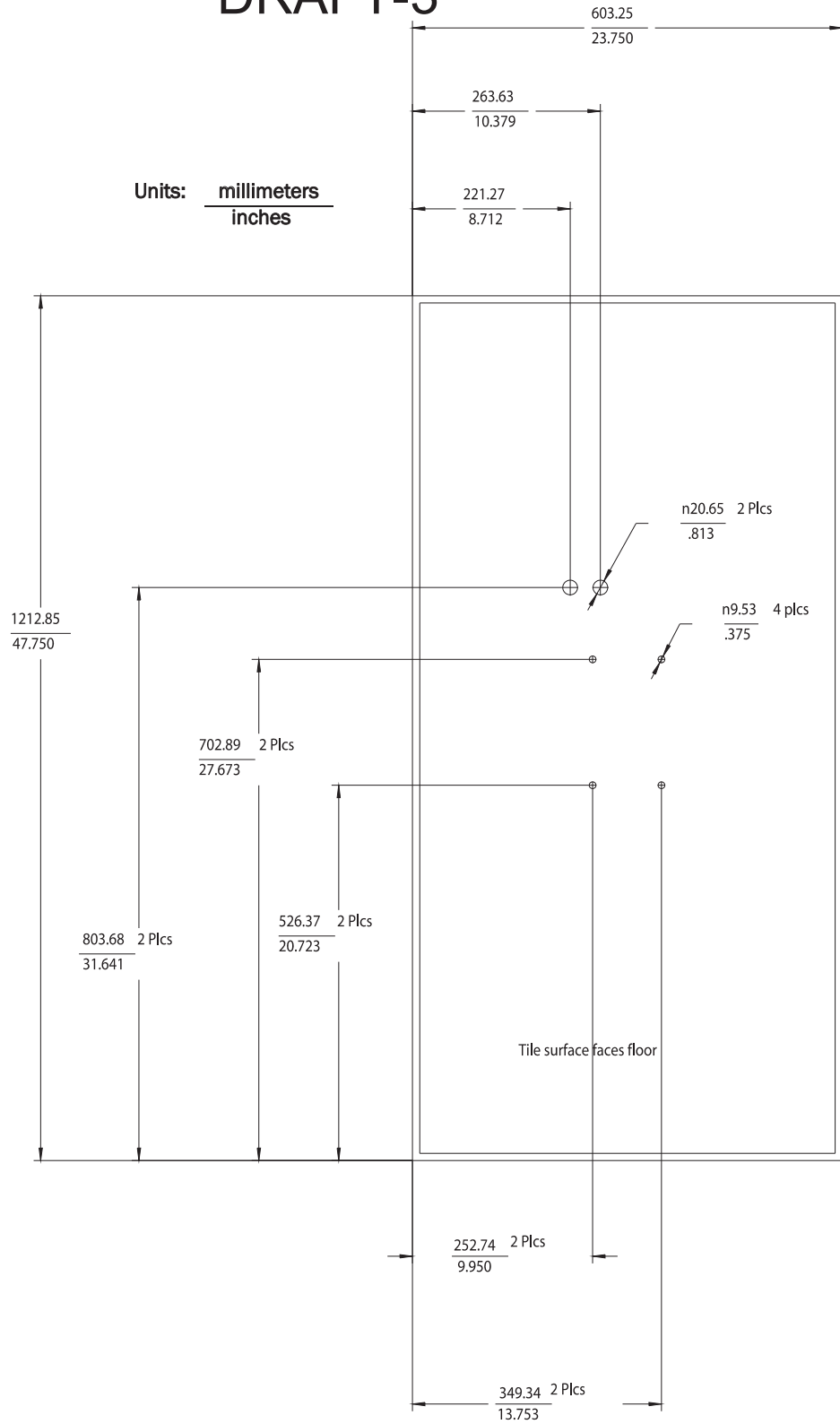


Figure 2-11: Core AP Below Ceiling Tile Hole Locations and Dimensions

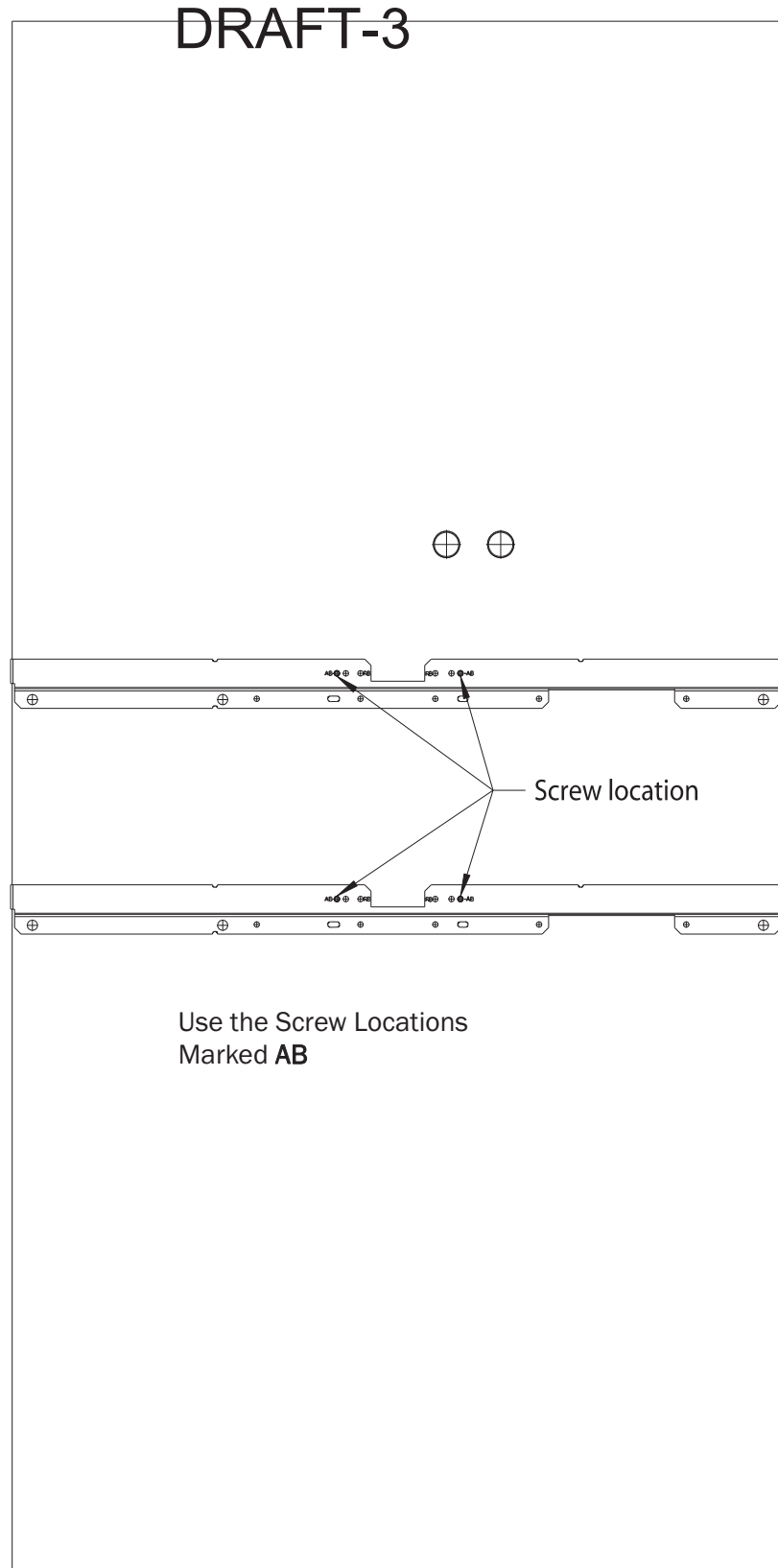


Figure 2-12: Core AP Below Ceiling Tile Mounting Rail Screw Locations

DRAFT-3

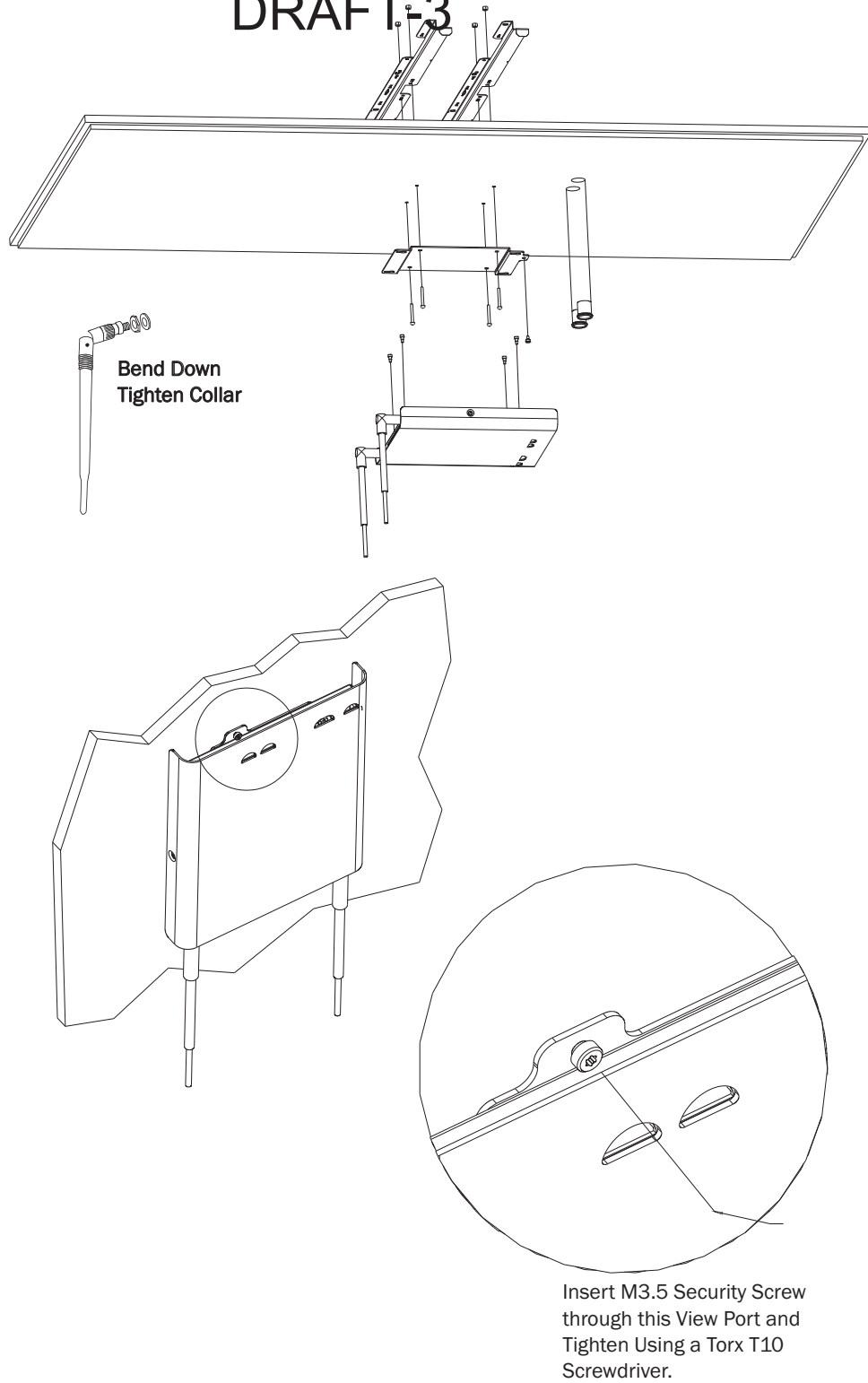


Figure 2-13: Mounting the Core AP Below a Ceiling Tile (Quick Release)

- DRAFT-3
11. Using a Torx T10 screw driver, secure the Core AP to the wall plate by screwing the supplied M3 .5 X 0.6 T-10 Torx Head security screw into the PEM nut in the wall plate as shown in Figure 2-13. Torque-tighten the screw to 10-inch lbs. Note that this safety screw is used to prevent the Core AP from sliding out of the wall plate.
 12. Orient the antenna(s) on the Core AP chassis so they bend upward at right angles to the chassis. Unscrew the collar, rotate the antenna into position, and then retighten the collar to secure the antenna in place.
 13. Replace the tile back onto the ceiling frame structure with the Core AP antennas hanging down from the ceiling. Wiring connections to the Core AP can be accessed via the open hole in the tile.
 14. Replace other adjacent ceiling tiles if necessary.

Mounting the ITS Remote Antenna to a Wall (Fixed Mount)

DRAFT-3

You can mount the IntelliVue Telemetry System Remote Antenna (RA) to a wall using the mounting screws and screw anchors supplied with the RA. We recommend that you mount the RA high on the wall as close to the ceiling as possible.

To mount the 1.4 GHz ITS RA to a wall:

1. Using a 3/16-inch drill bit, drill two pilot holes .188 inches (5 mm) in diameter at the locations shown in Figure 2-14.
2. Tap a supplied plastic screw anchor into each pilot hole until it is flush with the wall surface.

This step is not necessary if mounting the ITS RA on a wood surface.

3. Screw a supplied #6 x 1 1/4 inch self-tapping screw into each screw anchor (or pilot hole) as shown in Figure 2-14.

Tighten each screw until a 1/16-inch (2 mm) gap remains between the screw head and the mounting surface.

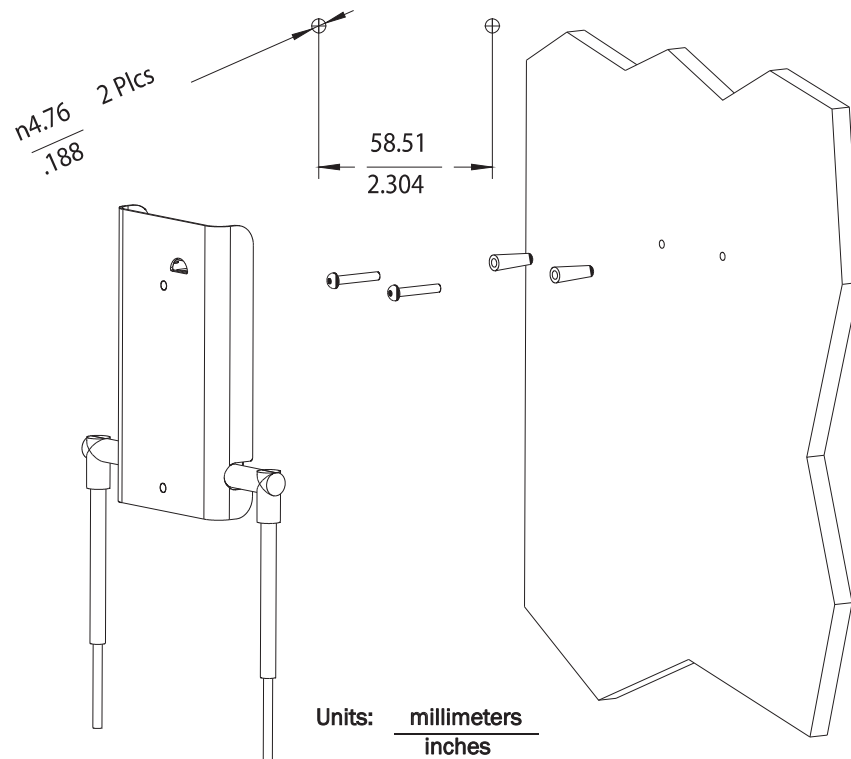


Figure 2-14: Mounting the ITS 1.4 GHz Remote Antenna to a Wall

4. While holding the RA chassis with its antennas pointing down as shown in Figure 2-14, fit the holes in the back of the RA chassis over the screw heads that protrude from the wall. Slide the RA chassis down so that the screw heads are securely in the grooves in the back of the RA chassis.

Mounting the ITS Remote Antenna to a Wall (CA Earthquake Rated)

You can mount the IntelliVue Telemetry System Remote Antenna onto walls using an optional California (CA) earthquake-rated wall plate. Use of this quick release wall plate enables you to relocate 1.4 GHz ITS RAs within your facility quickly and easily.

To mount the 1.4 GHz ITS RA to a wall:

1. Using a 3/16-inch drill bit, drill two pilot holes .188 inches (5 mm) in diameter at the locations shown in Figure 2-15.

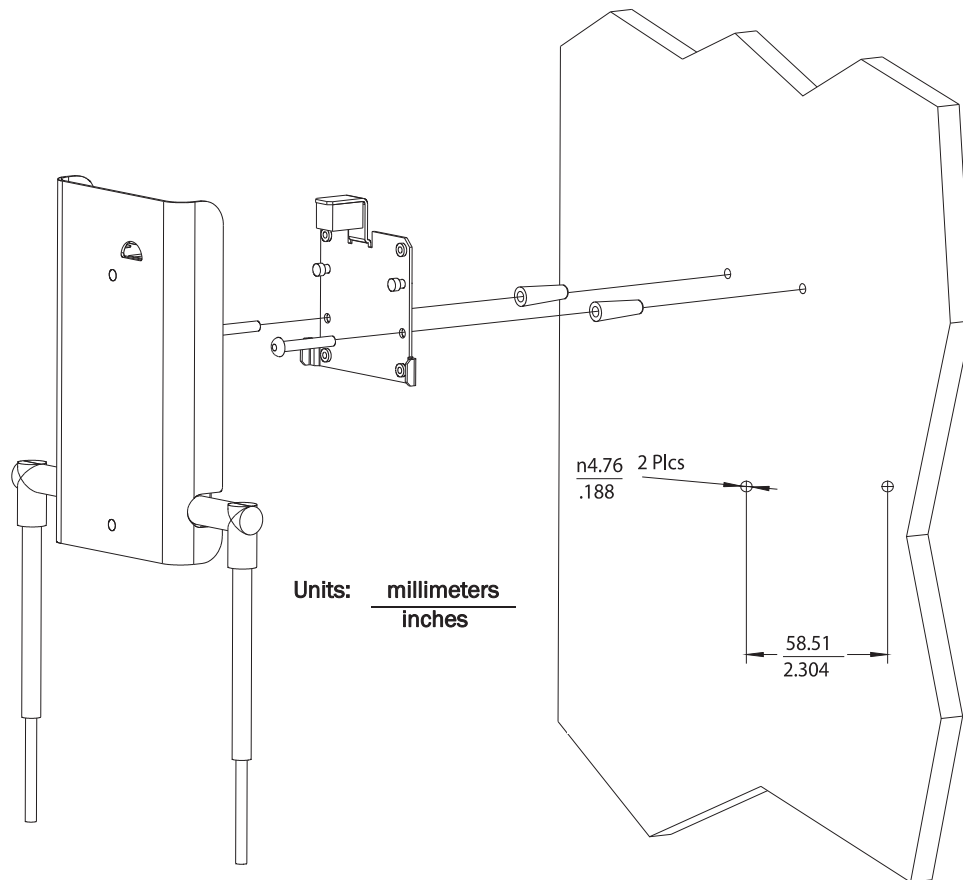


Figure 2-15: Mounting the ITS 1.4 GHz RA to a Wall (CA Earthquake Rated)

2. Tap a supplied plastic screw anchor into each pilot hole until flush with the wall surface.

This step is not necessary if mounting the ITS RA on a wood surface.

3. Secure the quick release wall plate to the wall by screwing a supplied #6 x 1 1/4 inch self-tapping screw through the wall plate into each screw anchor (or pilot hole) as shown in Figure 2-15.

Tighten each screw until the wall plate is fixed securely in place.

4. While holding the RA chassis with its antennas pointing down as shown in Figure 2-15, fit the openings in the back of the RA chassis over the two mounting studs that protrude from the wall plate, and then slide the RA chassis down so that the mounting studs are securely in the grooves in the back of the RA chassis.

Mounting the ITS Remote Antenna Above a Ceiling Tile (Mounting Rails)

DRAFT-3

You can mount the IntelliVue Telemetry System Remote Antenna (RA) above a ceiling tile by using the mounting rails provided in the Above & Below Ceiling Tile Mount Kit (862415-K05) for the Core AP and Remote Antennas.

Caution When installing the ITS Remote Antenna onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Remote Antenna, 0.32 kg (.7 lbs), and any extra cabling.

To mount the 1.4 GHz ITS RA above a ceiling tile:

1. Determine which ceiling tile the RA is be mounted onto, and the approximate RA placement and orientation of the antennas on the tile. Also, check for adequate clearance above the RA.
2. Remove the ceiling tile to which the RA will be mounted (and also an adjacent tile to facilitate installation).
3. Orient the antenna(s) on the RA chassis so they bend downward at right angles to the chassis. Unscrew the collar and rotate the antenna into position and then retighten the collar to secure the antenna in place.
4. Determine where the two holes for the antennas are going to be located on the tile and mark the centers of the holes.

The RA chassis can be rotated 90 degrees to the mounting rails. Choose the best placement of the RA to facilitate where the antennas will go through the ceiling tile. Note that there are two holes in the RA chassis to allow for tethering to other permanent structures where local building codes require this type of installation. Refer to Figure 2-16 or Figure 2-17 for the dimensions to locate the antenna holes in the ceiling tile.

5. Drill out two 3/4-inch (19 mm) diameter holes in the ceiling tile for the antennas. Lightly coat both plastic grommets with silicone adhesive and insert them into both holes in the tile (insert grommets from the outside of the tile).
6. Secure the mounting rails to the RA. Insert the four (4) M3 X 0.5 (8 mm LG) screws into the RA mounting rail holes, and into the mating holes in the back of the RA chassis as shown in Figure 2-17 or Figure 2-18. Torque-tighten each screw to 8-inch lbs.
7. Place the RA with mounting rails across the top of the tile.
8. Replace the tile back onto the ceiling frame structure with the RA antennas hanging down through the ceiling. Wiring connections to the RA can be accessed via the open adjacent tile.
9. Replace other adjacent ceiling tiles if necessary.

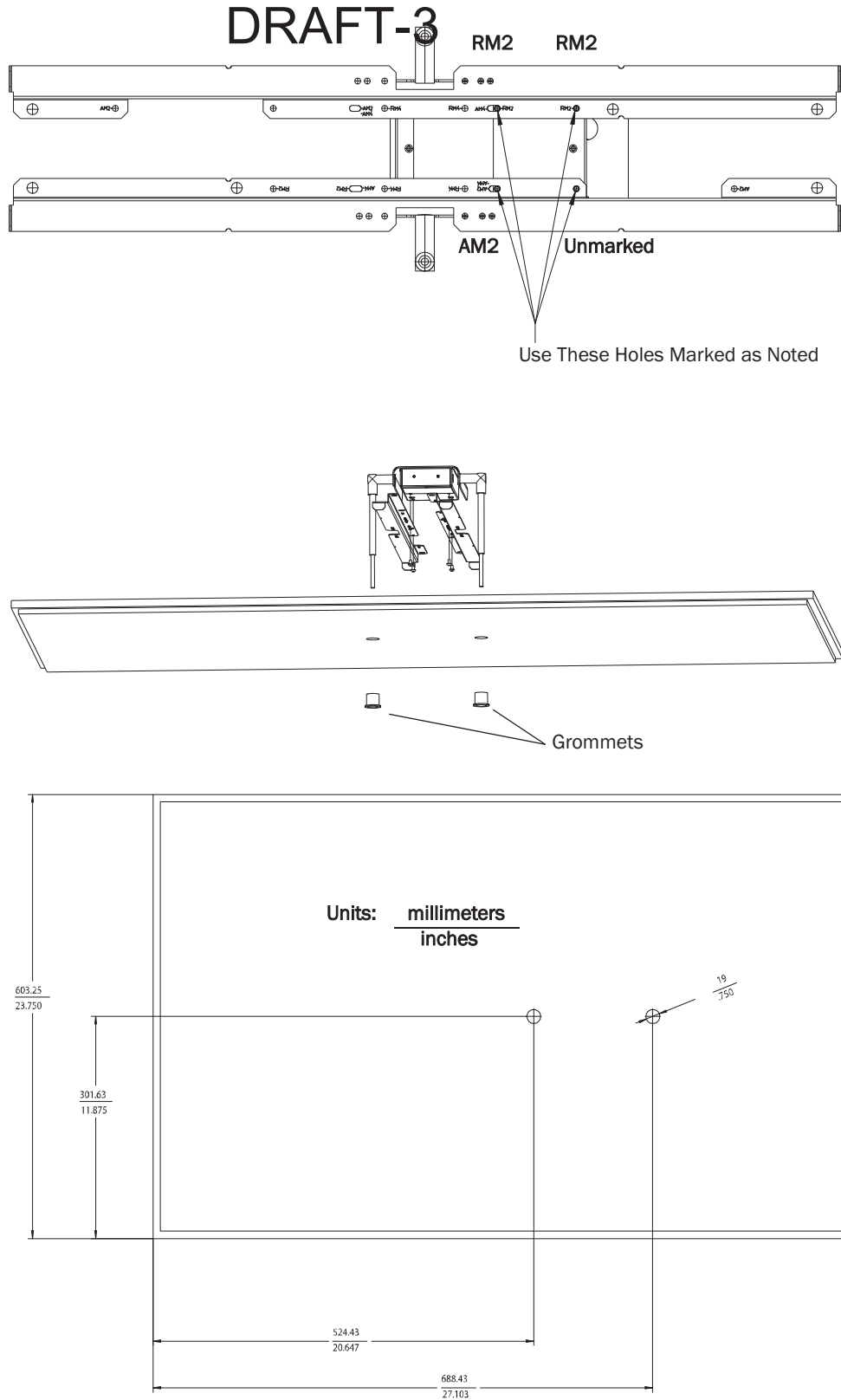


Figure 2-16: Possible Above the Ceiling Remote Antenna Mounting Position

Mounting the ITS Remote Antenna Above a Ceiling Tile (Mounting Rails)

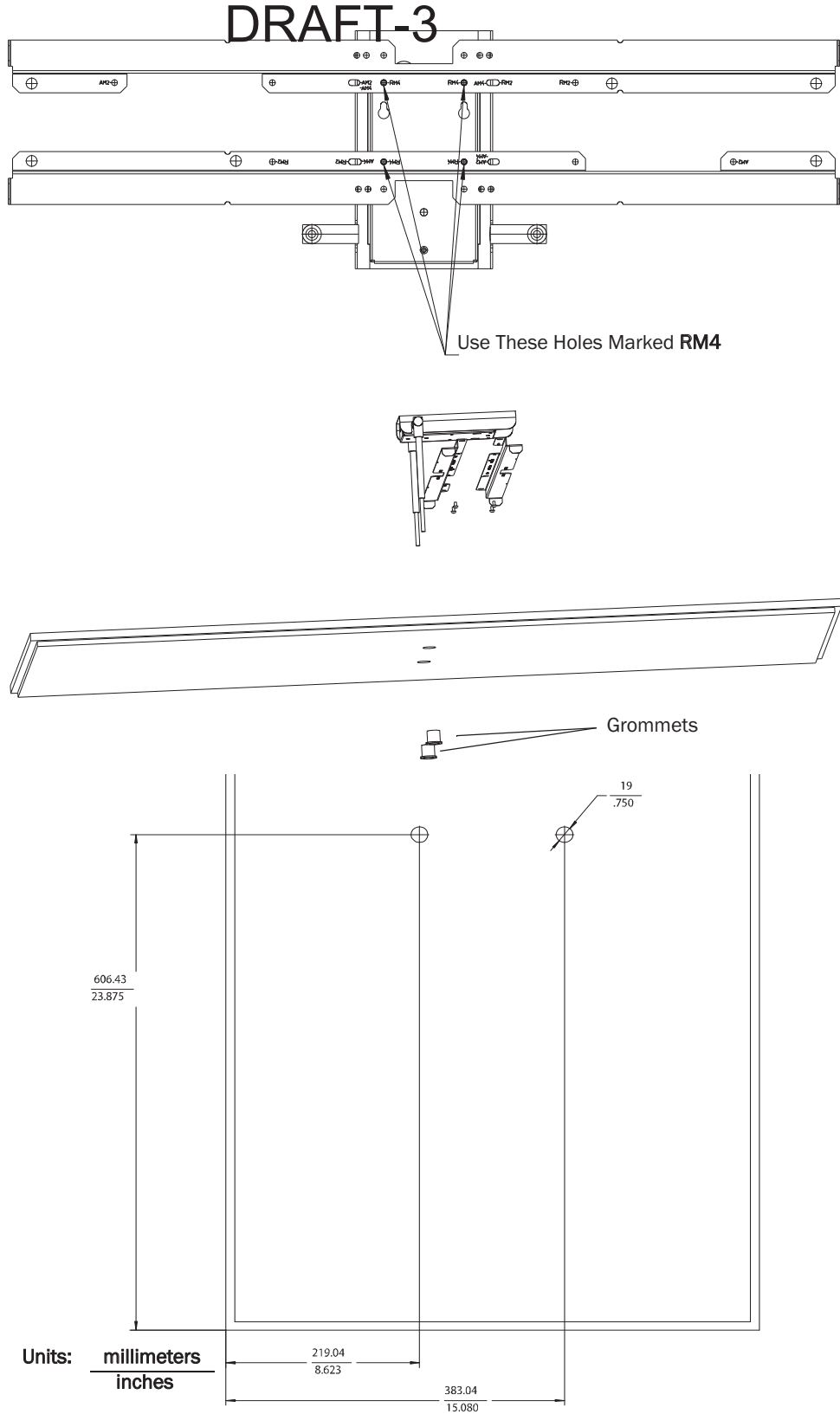


Figure 2-17: Alternative Above the Ceiling Remote Antenna Mounting Position

Mounting the ITS Remote Antenna Above a Ceiling Tile (Tether Mount)

DRAFT-3

You can mount the IntelliVue Telemetry System Remote Antenna (RA) above a ceiling tile without the use of mounting rails if the following conditions are met:

- The ceiling tile can support the weight of the RA, 0.32 kg (.7 lbs), and any extra cabling.
- The RA is tethered securely to a permanent structure within the ceiling.
- A minimum of 12-gauge galvanized soft annealed mild steel wire conforming to ASTM A 641 is used to tether the RA chassis to a permanent structure within the ceiling.

To mount the 1.4 GHz ITS RA above a ceiling tile:

1. Determine which ceiling tile the RA is to be mounted onto, and the approximate RA placement and orientation of the antennas on the tile. Also, check for adequate clearance above the RA.
2. Remove the ceiling tile to which the RA will be mounted (and also an adjacent tile to facilitate installation).
3. Orient the antenna(s) on the RA chassis so they bend downward at right angles to the chassis. Unscrew the collar and rotate the antenna into position and then retighten the collar to secure the antenna in place.
4. Determine where the two holes for the antennas are going to be located on the tile and mark the centers of the holes.

Note that the RA antennas can be placed, and oriented in a variety of places to accommodate positioning the antennas through the tile (e.g., close to a side wall).

Also, the RA chassis can be rotated 90 degrees. Choose the best placement of the RA to facilitate where the antennas will go through the ceiling tile. Refer to Figure 2-16 or Figure 2-17 for the dimensions to locate the antenna holes in the ceiling tile.

5. Drill out two 3/4-inch (19 mm) diameter holes in the ceiling tile for the antennas. Lightly coat both plastic grommets with silicone adhesive and insert them into both holes in the tile (insert grommets from the outside of the tile).
6. Insert the tether wire through the two holes located at the corner of the RA chassis. The tether wire should have three tight turns of the wire within 1.5 inches of the end of the wire.
7. Connect the other end of the tether wire to a permanent structure within the ceiling. The tether wire may be attached to any of the following:
 - wood or metal stud framing
 - blocking attached to wood or metal framing
 - plywood adequately attached to wood or metal stud framing, reinforced concrete, or reinforced masonry
 - reinforced concrete
 - reinforced masonry
8. Place the RA across the top of the tile.

- DRAFT 3
9. Replace the tile back onto the ceiling frame structure with the RA antennas hanging down through the ceiling. Wiring connections to the RA can be accessed via the open adjacent tile.
 10. Replace other adjacent ceiling tiles if necessary.

Mounting the ITS Remote Antenna Below a Ceiling Tile (Fixed Mount)

DRAFT-3

You can mount the IntelliVue Telemetry System Remote Antenna (RA) below a ceiling tile by using the mounting rails provided in the Above & Below Ceiling Tile Mount Kit (862415-K05) for the Core AP and Remote Antennas.

Caution When installing the ITS Remote Antenna onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Remote Antenna, 0.32 kg (.7 lbs), and any extra cabling.

To mount the 1.4 GHz ITS RA below a ceiling tile:

1. Determine which ceiling tile the RA is to be mounted onto, and the approximate placement of the RA and orientation of the antennas hanging down from the ceiling tile.
2. Remove the ceiling tile the RA will be mounted to (and also the adjacent tile to facilitate installation).
3. Refer to Figure 2-18 for all dimensions and hole locations. Place the mounting rails across the tile (underside of tile). For ceiling tiles that are smaller than standard 2' x 4' size ceiling tile, the mounting rails can be cut down in length at the u-shaped cutouts.
4. Mark the location of the **RB** screw holes in the mounting rails on the ceiling tile where the holes will be drilled through the tile as shown in Figure 2-19. Drill four .25-inch (6 mm) diameter holes in the ceiling tile.
5. Determine where the hole for the Core AP cable is going to be located on the tile and mark the center of the hole.
6. Drill or cut out a .813-inch (21 mm) diameter hole for the Core AP cable to be connected to the RA. Lightly coat a plastic grommet with silicone adhesive and insert it into the hole in the tile (insert grommet from the outside of the tile).
7. Insert the four (4) M3-.5 x 30 lobe screws into the RA mounting rail holes, through the ceiling tile, through the provided plastic spacers, and into the mating holes in the back of the RA chassis as shown in Figure 2-20. Torque-tighten each screw to 8-inch lbs.

Note that the RA mounting rails and spacers allow for sufficient airflow between the RA and the ceiling tile.

8. Orient the antenna(s) on the RA chassis so they bend upward at right angles to the chassis. Unscrew the collar and rotate into position and then retighten the collar to secure the antenna in place.
9. Replace the tile back onto the ceiling frame structure with the RA antennas hanging down from the ceiling. Cabling connections to the RA can be accessed via the open holes in the tile.

Note that there are additional holes in the mounting rails to allow for tethering to other permanent structures where local building codes require this type of installation.

10. Replace other adjacent ceiling tiles if necessary.

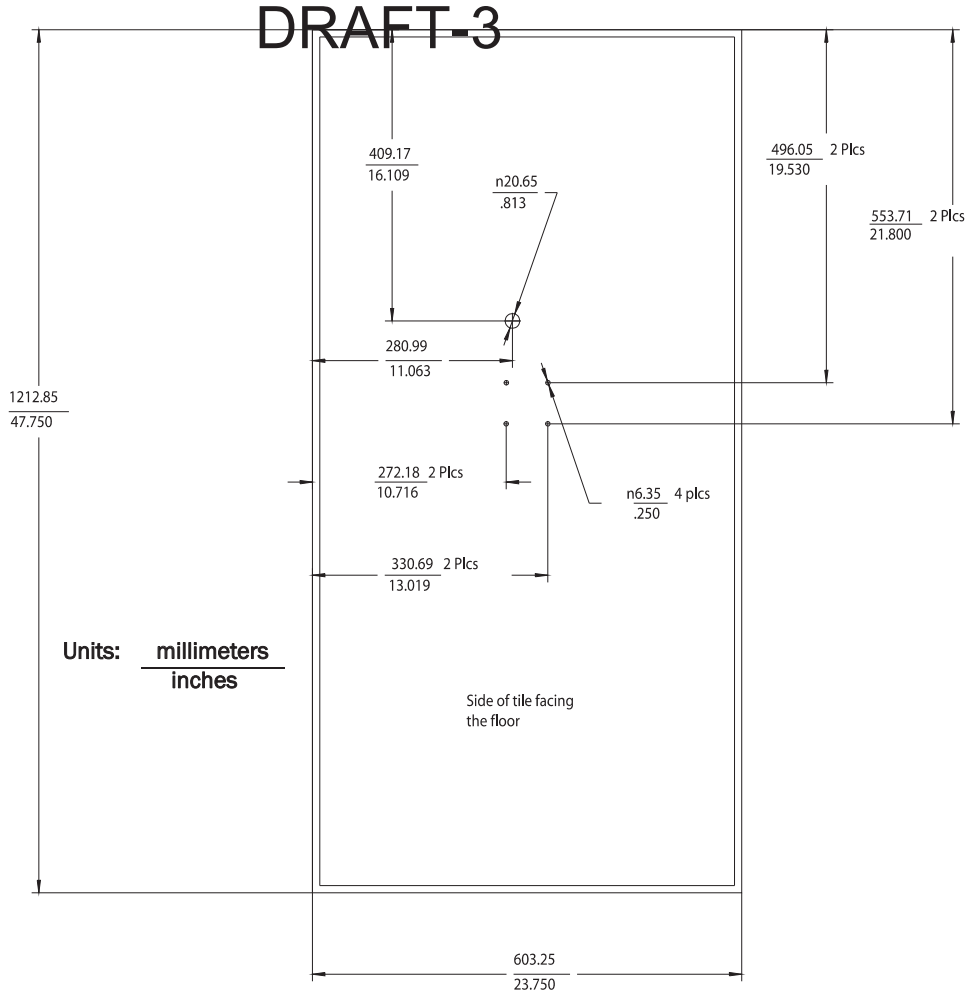


Figure 2-18: RA Below Ceiling Tile Hole Locations and Dimensions

DRAFT-3

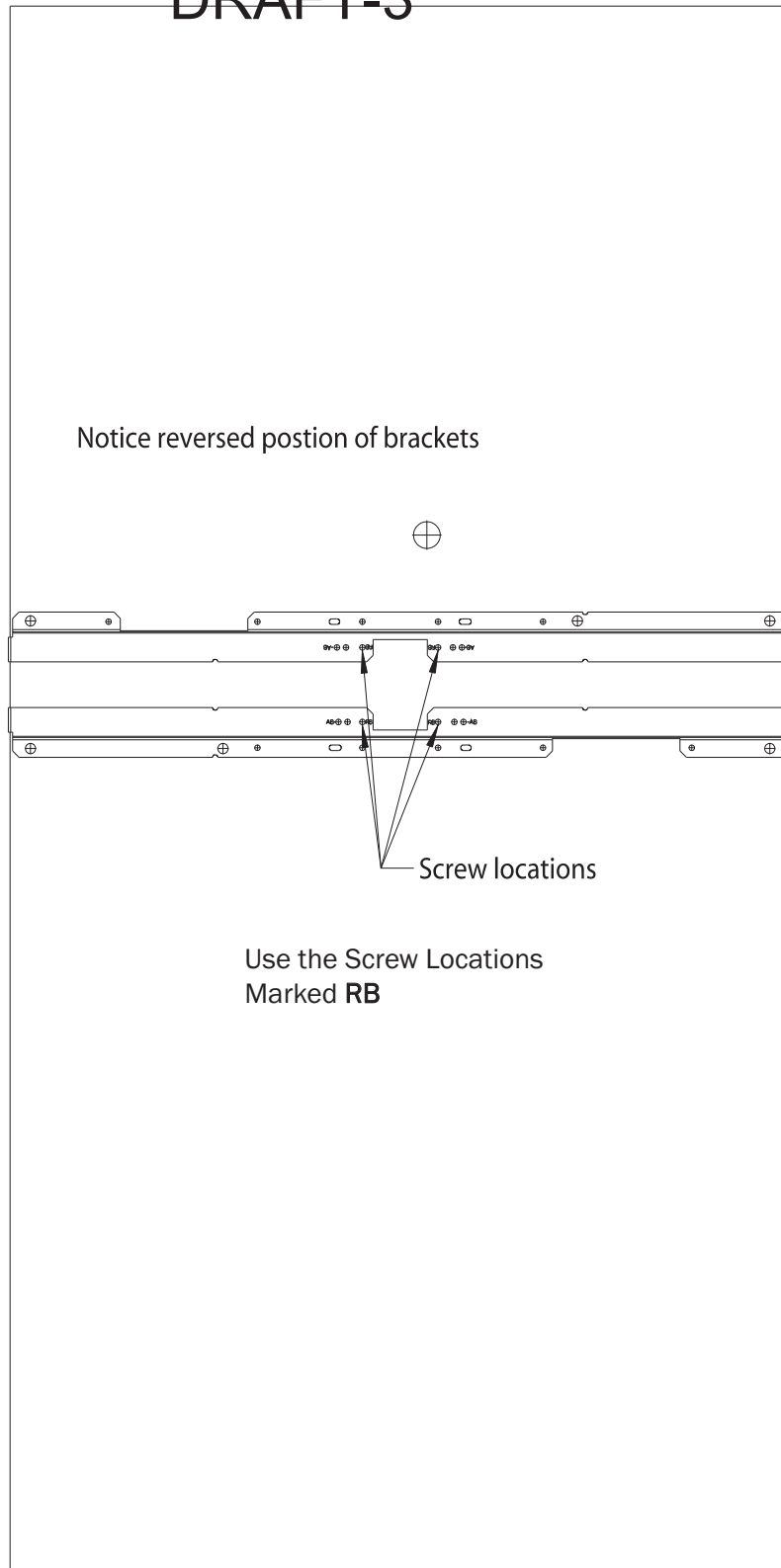


Figure 2-19: RA Below Ceiling Tile Mounting Rail Screw Locations

DRAFT-3

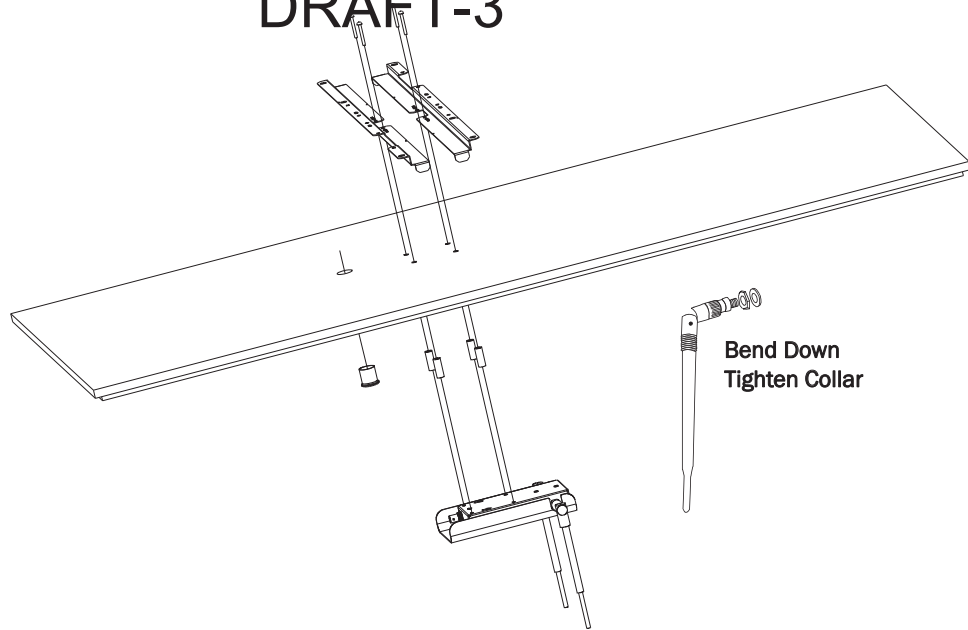


Figure 2-20: Mounting the RA Below a Ceiling Tile (Fixed Mount)

Mounting the ITS RA Below a Ceiling Tile (Quick Release)

You can mount the IntelliVue Telemetry System Remote Antenna below a ceiling tile by using an optional quick release wall plate along with the mounting rails provided in the Above & Below Ceiling Tile Mount Kit (862415-K05) for the Core AP and Remote Antennas. Use of this wall plate enables you to relocate 1.4 GHz ITS RAs within your facility quickly and easily.

Caution When installing the IntelliVue Access Point onto a suspended ceiling, make certain the ceiling grid is structurally rated to support the weight of the Access Point, 0.7kg (1.5 lbs), and any extra cabling.

To mount the 1.4 GHz ITS RA below a ceiling tile:

1. Determine which ceiling tile the RA is to be mounted onto, and the approximate placement of the RA and orientation of the antennas hanging down from the ceiling tile.
2. Remove the ceiling tile the RA will be mounted to (and also the adjacent tile to facilitate installation).
3. Refer to Figure 2-21 for all dimensions and hole locations. Place the mounting rails across the tile (underside of tile). For ceiling tiles that are smaller than standard 2' x 4' size ceiling tile, the mounting rails can be cut down in length at the u-shaped cutouts.
4. Mark the location of the "RB" screw holes in the mounting rails on the ceiling tile where the holes will be drilled through the tile as shown in Figure 2-22. Drill four .25-inch (6 mm) diameter holes in the ceiling tile.
5. Determine where the two holes for the Remote Antenna cabling are going to be located on the tile and mark the centers of the hole.
6. Drill or cut out a .813-inch (21 mm) diameter hole for the Core AP cable to be connected to the RA. Lightly coat a plastic grommet with silicone adhesive and insert it into each hole in the tile (insert grommet from the outside of the tile).
7. Place the wall plate over the four holes drilled on the bottom of the tile. Note: The top direction is as when the tile is in its installed position.
8. Insert the four (4) M3-.5 x 30 lobe screws into the RA mounting rail holes, through the ceiling tile, through the provided plastic spacers, and into the mating holes in the back of the wall plate.
9. Fit the openings in the back of the RA chassis over the two mounting studs that protrude from the wall plate and then slide the RA chassis so that the mounting studs are securely in the grooves in the back of the RA chassis.

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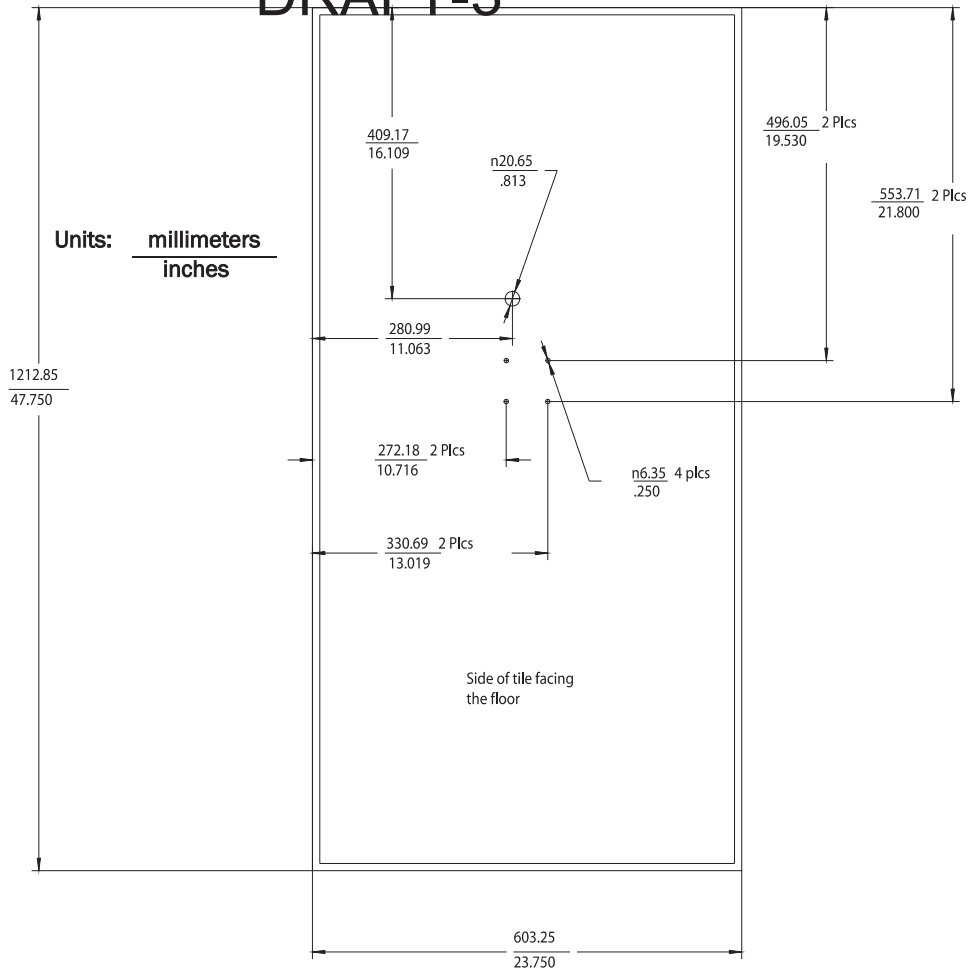


Figure 2-21: RA Below Ceiling Tile Hole Locations and Dimensions

DRAFT-3

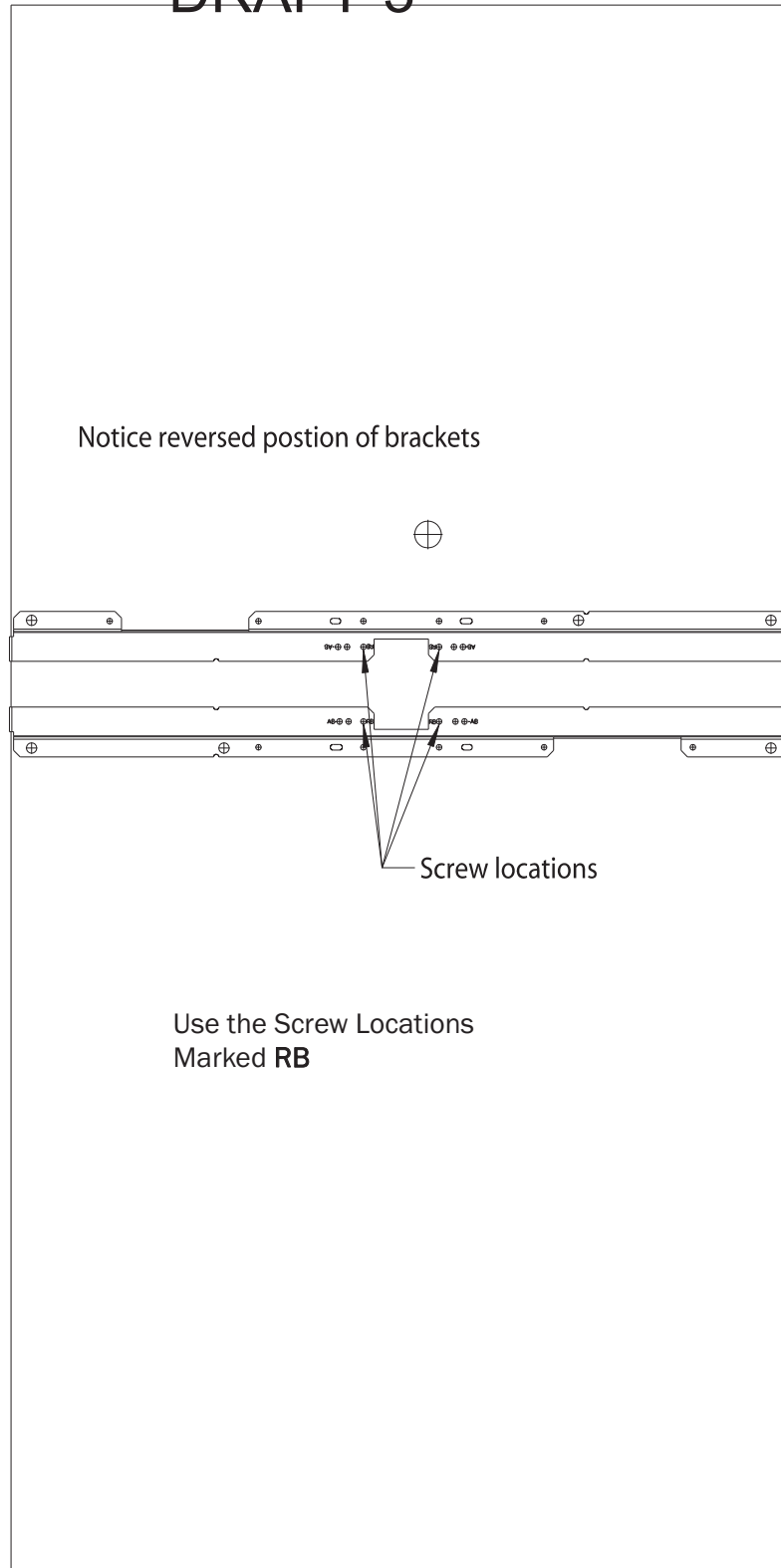


Figure 2-22: RA Below Ceiling Tile Mounting Rail Screw Locations

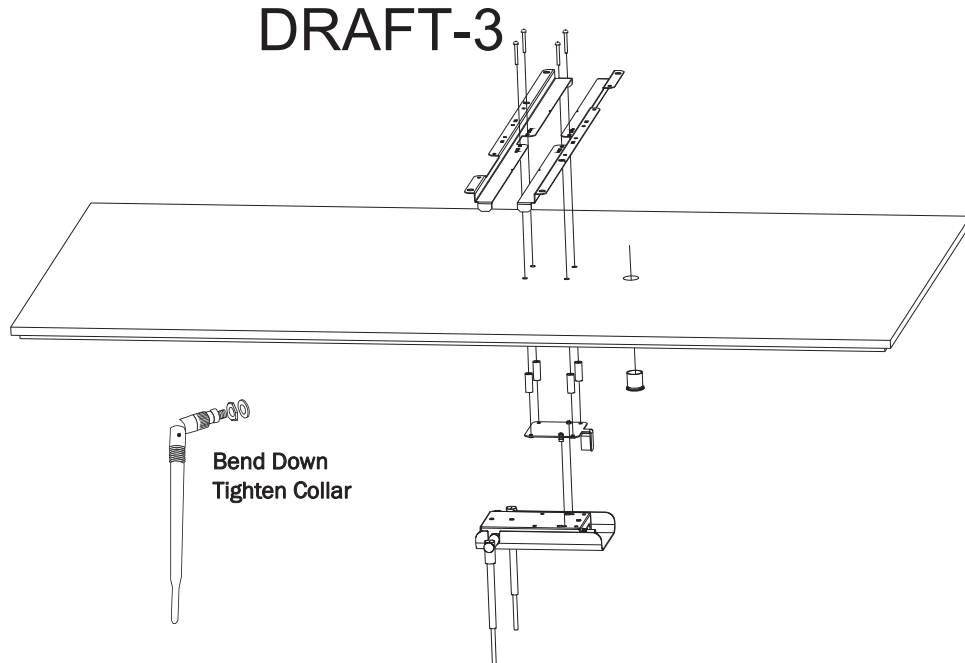


Figure 2-23: Mounting the RA Below a Ceiling Tile (Quick Release)

AP Configuration Information

Refer to the *IntelliVue Telemetry System Infrastructure Installation and Service Guide* (M3185-91934) for complete details about configuring the IntelliVue Telemetry System AP.

Access Point Startup Sequence

Upon power on/start up, the ITS Core Access Point will perform a Power-on-Self-Test (POST) to ensure that its basic components are fully functional.

This test detects critical system failures. As the test progresses the state of the system is displayed through a series of color combinations on the Power/Sync, Radio, and Network LEDs on the front of the AP. All three LEDs illuminate AMBER color, then the Power/Sync LED illuminates GREEN and the other two LEDs turn off (not illuminated) indicating correct startup. Should a test fail the LEDs are left in a state which indicates the point at which the test failed. When the system is transmitting data the radio and network LEDs on the AP will flicker on and off as data is transmitted.

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Maintaining the ITS 1.4 GHz Core Access Point

This chapter provides procedures and information for maintaining the Philips IntelliVue Telemetry System 1.4 GHz Core Access Point and includes:

- Maintenance Procedure
- Troubleshooting the Core AP Using its LEDs
- Replacing a Core AP or Remote Antenna
- Ordering Replacement Parts

Maintenance Procedure

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To ensure that IntelliVue Telemetry System 1.4 GHz Core Access Point (AP) and Remote Antenna (RA) continue to operate properly, you should perform the following maintenance tasks periodically:

- **Ventilation** - The IntelliVue Telemetry System 1.4 GHz Core Access Point and RA cases are vented to provide air circulation and cooling for the devices. Keep the immediate area around the AP and RA open to allow for natural air circulation around the devices. Periodically, dust the AP and RA cases to keep their ventilation holes open.
- **Antenna Orientation** - Under normal operation the AP or RA antennas may get bumped by cleaning crews and/or construction crews and causing the antennas to move from their original position set at installation.

Periodically check the antennas on all of the APs and RAs at the installation site for correct orientation, alignment, direction, and placement. If necessary, loosen the collar on the antenna and adjust the antenna for proper placement, orientation, and direction. Then, re-tighten the antenna collar to secure the antenna in place. Generally, you should orient the two local antennas on each Core AP and RA such that they are perpendicular to the floor.

Troubleshooting the Core AP Using its LEDs

Complete test and inspection procedures for the IntelliVue Telemetry System 1.4 GHz Core Access Point are given in Chapter 5 of the *IntelliVue Telemetry System Infrastructure Installation and Service Guide*. You must perform these procedures when the Philips IntelliVue Telemetry System is initially installed and after any service event.

Figure 3-1 shows the location of the ITS 1.4 GHz Core Access Point LEDs.

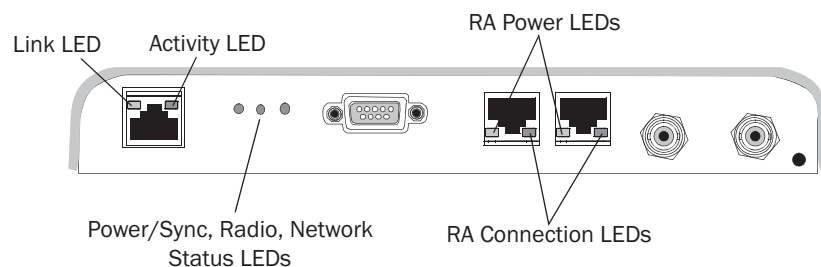


Figure 3-1: IntelliVue Telemetry System Core Access Point LEDs

A summary of the Core AP's system status LEDs is given below to help you troubleshoot any AP operational problems that may arise.

The ITS Core AP provides the following status LEDs.

- **Wired/Ethernet Activity** - The Core AP provides two LEDs to indicate wired/Ethernet activity to the ITS infrastructure. During normal operation, these LEDs indicate the following information:

- DRAFT 3
- **Link LED** - Link present/Ethernet connection. Lights GREEN (ON) when a pass-through link is present - OFF when not present.
 - **Act LED** - Wired network activity. Flashes GREEN (ON) when there is activity is over the wired network.
 - **Wireless/Rf Activity** - The AP provides three LEDs to indicate wireless/Rf activity. During normal operation, these LEDs indicate the following information:
 - **Power/Sync LED** - GREEN (ON) when power and synchronization signal is present.
 - **Radio LED** - Normally OFF (not lit) - flashes green to indicate wireless network activity.
 - **Network LED** - Normally OFF (not lit) - flashes green to indicate wired network activity.
 - **Remote Antenna** - The Core AP provides two LEDs on each RJ-45 UTP cable connector that provides status on a connected Remote Antenna:
 - **RA Connection** - Lights GREEN to indicate a RA is connected to the Core AP.
 - **RA Power** - Lights YELLOW to indicate connected RA is receiving power from the Core AP.

If the Status LED indicators are not functioning properly as indicated then perform the appropriate troubleshooting procedures. If you cannot resolve the problem with the LEDs, then make written note of the LED lighting and sequence of colors, replace the unit, and send the defective unit back to Philips with the explanation of LEDs sequence and colors displayed. Refer to Chapter 4 of the *IntelliVue Telemetry System Infrastructure Installation and Service Guide* for complete AP replacement procedures.

Troubleshooting the Remote Antenna Using its LEDs

Complete test and inspection procedures for the IntelliVue Telemetry System 1.4 GHz Remote Antenna are given in Chapter 4 of the *IntelliVue Telemetry System Infrastructure Installation and Service Guide*. You must perform these procedures when the Philips IntelliVue Telemetry System is initially installed and after any service event.

Figure 3-1 shows the location of the ITS 1.4 GHz Remote Antenna LEDs.

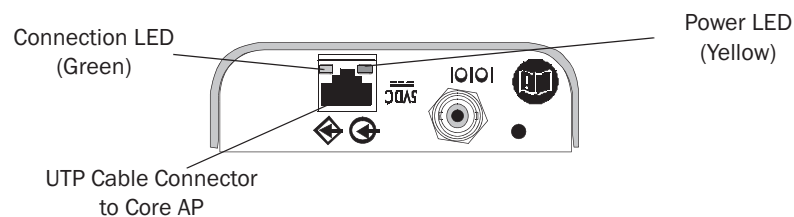


Figure 3-2: IntelliVue Telemetry System Remote Antenna LEDs

A summary of the Remote Antenna’s status LEDs is given below to help you troubleshoot any operational problems that may arise.

- DRAFT-3
- **Remote Antenna** - The Core AP provides two LEDs on each RJ-45 UTP cable connector that provides status on a connected Remote Antenna:
 - **RA Connection** - Lights GREEN to indicate a RA is connected to the Core AP.
 - **RA Power** - Lights YELLOW to indicate connected RA is receiving power from the Core AP.

If the Status LED indicators are not functioning properly as indicated, then refer to the sections that follow and Chapter 4 of the *IntelliVue Telemetry System Infrastructure Installation and Service Guide* for complete Remote Antenna replacement procedures.

Replacing a Core AP or Remote Antenna

The repair strategy for the ITS Core Access Point or Remote Antenna is unit replacement. No repairs are to be made to the Core AP or RA.

Individual AP or RA components, PC assemblies, or sub-assemblies are not available for purchase.

If an ITS Core AP or RA is determined to be defective/non-operational, call your local Philips Field Service Engineer/Customer Engineer or the Philips Customer Care Solutions Center for information on ordering a replacement unit and returning the defective unit.

Use the following toll-free number to contact the Philips Customer Care Solutions Center:

- Telephone: (+1) 800-722-9377

When replacing defective equipment on your ITS, be sure to follow the procedures given in Chapter 4 of the *IntelliVue Telemetry System Infrastructure Installation and Service Guide*.

Ordering Replacement Parts

This section contains information for ordering replaceable parts and assemblies for the Philips IntelliVue Telemetry System 1.4 GHz Core Access Point and Remote Antenna. The parts are listed in tables by major assemblies. Each table contains the orderable part number (New or Exchange) and a description of the part. Only the part numbers listed are orderable. Any unlisted part numbers and part descriptions are not orderable from Philips.

To order a replacement part, first identify the faulty component, part, subassembly or assembly, then look in the associated table for that major assembly and find (and record) the part description and replaceable part number. Order replaceable parts from your nearest Philips Sales/Service office or from the Philips Support Materials Organization. A complete listing of the Philips Sales/Service Offices addresses with phone numbers can be found at the end of this guide.

Table 3-1: Ordering Core Access Point Replacement Parts

New Part Number	Description
989803171211	IntelliVue Core Access Point, 1.4 GHz. Complete AP unit includes the following: AP Case (top cover and shell), Main PC Board, Radio Module PC Board, and Two External Antennas.
453564079561	1.4 GHz Antenna with SMA-style Connector
453564052201	Core AP/Remote Antenna Ceiling Mount Kit
453564090571	Ferrite Core Block

Table 3-2: Ordering Remote Antenna Replacement Parts

New Part Number	Description
453564036561	IntelliVue Remote Antenna, 1.4 GHz. Complete unit includes the following: RA Case (top cover and shell), Main PC Board, Radio Module PC Board, and Two External Antennas.
453564079561	1.4 GHz Antenna with SMA-style Connector
453564056081	Plenum, 74 ft. (22.6m), Coax & Data Cable Assembly
453564052201	Core AP/Remote Antenna Ceiling Mount Kit

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Mounting the ITS Remote Antenna

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