



# **Sentry 4G-900 Pico Base Station**

## **Installation and Setup Guide**

**PN: 001-9290-001**

**Revision 0**

**June 2010**

---

# Preface Material

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CALAMP REPRESENTATIVE FOR A COPY.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CALAMP AND ITS SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CALAMP OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CALAMP OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

COPYRIGHT ©2010 CALAMP. ALL RIGHTS RESERVED.

CALAMP AND SENTRY 4G-900™ ARE REGISTERED TRADEMARKS OF CALAMP AND/OR ITS AFFILIATES IN THE U.S. AND CERTAIN OTHER COUNTRIES.

# Safety Information

## General

Read this User Manual and follow all operating and safety instructions.

The base station and antennas must be installed by a professional installer.

The power requirements are indicated on the product-marking label. Do not exceed the described limits.

## Equipment Installation

The equipment should be installed in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part 1, CSA C22.1; and when applicable, the National Electrical Safety Code IEEE C2. And unless marked or otherwise identified, the Standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

## RF Exposure

Sentry 4G-900 Pico Base Station is compliant with the requirements set forth in CFR 47 section 1.1307, addressing RF Exposure from radio frequency devices as defined in OET Bulletin 65. The outdoor base station should be positioned more than 0.6 feet (20 cm) from humans. Lightning Protection



When Sentry 4G-900 Pico Base Station unit is installed in an outdoor location, all indoor components (Ethernet, power supply) should be connected through a lightning protector.

The purpose of the lightning protection is to protect people and equipment located indoors from lightning that might strike the Sentry 4G-900 Pico Base Station unit or its outdoor cables. Therefore, the lightning protector device should be installed indoors, as close as possible to the point where the cables enter the building. The lightning protector can also be installed outdoors, as long as the cables that go from it indoors are well protected from lightning between the box and the building entrance.

## Power Cord Protection

The Sentry 4G-900 Pico Base Station should always be connected to the supplied data adapter for both power supply and data transfer purposes.

Any other type of connection/application of the Sentry 4G-900 Pico Base Station and/or supplied data adapter is not allowed.

Route all power supply cords so that people cannot walk on them, or place objects on or against them. This can pinch or damage the cords.

## Servicing

Do not open the cover of this product and attempt service unless instructed by a CalAmp certified technician. Refer all repairs to qualified service personnel. Removing the covers or modifying any part of this device voids its warranty.



Keep away from electric power lines!

Carefully read and follow all instructions in this manual. By nature of the installation, you may be exposed to hazardous environments and high voltage. Use caution when installing the outdoor system.

## Antenna Grounding Requirements

Verify that the antenna or cable system is grounded (earthed).

The antenna installation must be as per Article 810 of the NEC. Of particular note is the requirement that the grounding conductor not be less than 10 AWG (Cu). The scheme should be either in accordance with UL 96 and 96A. Lightning Protection Components and Installation Requirements for Lightning Protection Systems, or tested in accordance with UL 50 and UL 497.

## Outdoor Grounding System



Verify that the base station is grounded.

The system must be properly grounded to protect against power surges and accumulated static electricity. It is the installer responsibility to install this device in accordance with the local electrical codes.

## Safety Hazards



### Warning!

- Installing Sentry 4G-900 Pico Base Station can pose a serious hazard. Be sure to take precautions to avoid the following:
- Exposure to high voltage lines during installation
- Falling when working at heights or with ladders
- Injuries from dropping tools
- Contact with AC wiring (power system connection)



### Warning!

To reduce the risk of fire, only use a No. 24AWG or larger telecommunication line cord between the indoor and outdoor units.

**Important Note:**

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 undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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 the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# About This Guide

This user guide provides essential product functionality with all the information necessary to professionally install and configure the Sentry 4G-900 Pico Base Station.

This guide is intended for experienced technicians and operators. It is assumed that the customers installing, operating and maintaining this product are familiar with WiMAX technologies and procedures.

While some safety precautions are reviewed here, this manual assumes that installers have been trained in safe installation practices. Users, who are new to WiMAX technologies and service procedures, should not rely on this manual for comprehensive guidance.

## List of Acronyms

ASN	Access Service Network
CPE	Customer Premise Equipment
FTP	File Transfer Protocol
GW	Gateway
HTTP	Hypertext Transport Protocol
IDU	Indoor Units
IEEE	Institute of Electronic and Eclectic Engineers
IP	Internet Protocol
LAN	Local Area Network
LOS	Line-of-sight
NMS	Network Management System
ODU	Outdoor Units
QoS	Quality of Service
RF	Radio Frequency
SLA	Service Level Agreements
SNMP	Simple Network Management Protocol
TCP	Transmission Control Protocol
WiMAX	Worldwide Interoperability for Microwave Access

# Table of Contents

<b>Preface Material .....</b>	<b>II</b>
About This Guide .....	VI
List of Acronyms .....	VII
Table of Contents .....	VIII
 <b>1 Introduction .....</b>	 <b>10</b>
1.1 About Sentry 4G-900 Pico Base Station .....	10
1.1.1 Main Features and Capabilities .....	11
1.2 System Architecture .....	11
1.3 Interfaces.....	12
1.3.1 Bottom Panel.....	12
1.3.2 Top Panel .....	13
 <b>2 Site and Installation Requirements .....</b>	 <b>14</b>
2.1 Pico Base Station Installation Location .....	14
2.1.1 Criteria for Outdoor Locations .....	14
2.1.2 Criteria for Indoor Locations .....	14
2.1.3 Antenna Grounding Requirements .....	14
 <b>3 Installation Procedure .....</b>	 <b>15</b>
3.1 Pre-Installation Safety Instructions .....	15
3.2 Unpacking .....	15
3.3 Required Tools and Materials .....	16
3.4 Installing the Pico Base Station .....	16
3.4.1 Overview .....	16
3.4.2 Cover Console Port .....	17
3.4.3 Assemble PoE Connector .....	17
3.4.4 Assemble Mounting Bracket .....	18
3.4.5 Mount the Pico Base Station .....	19
3.4.5.1 Wall Mount.....	19
3.4.5.2 Pole Mount.....	20
3.4.6 Antenna Connections .....	21
3.4.6.1 RF Connections and Grounding .....	21



3.4.7 Connect the Pico Base Station Data Adapter.....	22
<b>4 Setup.....</b>	<b>24</b>
4.1 Connecting Pico Base Station to Web Interface.....	24
<b>5 Troubleshooting.....</b>	<b>26</b>
5.1 No IP connectivity.....	26
5.2 No Serial Connection.....	26
<b>Appendix A – Specifications.....</b>	<b>27</b>
<b>Appendix B – IDU to ODU Cable Specifications .....</b>	<b>28</b>
<b>Appendix C – Console Connector .....</b>	<b>29</b>
<b>Appendix D - Mechanical Drawing .....</b>	<b>30</b>

# 1 Introduction

## 1.1 About Sentry 4G-900 Pico Base Station

CalAmp Sentry 4G-900 Pico Base Station is a single sector station used to enhance outdoor and indoor WiMAX coverage and capacity. The unit is easily installable, powered by PoE and supports remote management.

The Sentry 4G-900 Pico Base Station provides full base station functionality necessary for serving a single sector and operating in the 902-928 MHz ISM band. It supports up to 512 subscriber units and its light weight and small footprint allow it to be easily mounted by one person on poles, street lamps or walls.

The Pico Base Station is a broadband wireless access system based on the 802.16e mobile WiMAX standard. Sentry 4G-900 systems are designed for robustness and simplicity, offering feature-rich services with low deployment and operation costs, for unmatched operator competitiveness and fast ROI.

The Pico Base Station provides all the functionality necessary to communicate with fixed and mobile subscriber units according to the service criteria and customer Service Level Agreements (SLA). The end-to-end Quality of Service (QoS) ensures the same high quality WiMAX experience is delivered to customers outside or inside his/her home or small office.



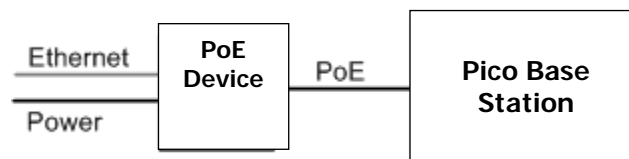
*Figure 1. Sentry 4G-900 Pico Base Station*

### 1.1.1 Main Features and Capabilities

- All outdoor, one-box Pico Base Station solution
- GPS synchronization
- MIMO (2x2) support
- NLOS
- Small footprint and light weight enables simple installation and deployment by a single person
- IEEE802.16e Wave2 Standard Compliance
- Backbone Ethernet connectivity via a 10/100 Base-T network interface
- Supports fixed and mobile CPEs
- Supports 3.5 MHz, 5MHz,7MHz and 10MHz channel bandwidth
- Traffic classification and connection establishment initiation
- Policy-based data switching
- Quality of Service (QoS) management
- Alarms management
- An SNMP agent incorporated into the unit enables extensive In-Band (IB) management of the Base Station and all its registered CPEs
- R6 interface to ASN GW profile C

## 1.2 System Architecture

The Pico Base Station unit receives power and data over PoE.



*Figure 2. Block Diagram*

## 1.3 Interfaces

The unit is installed vertically, where the integrated GPS antenna is located on the *top panel* (facing the sky). All other connections, including the optional GPS external antenna connections are located on the *bottom panel*.

### 1.3.1 Bottom Panel

The interface panel supports the antenna, power and Ethernet connections.



Figure 3. Pico Base Station Interface Panel

The following table provides a description of the Pico Base Station bottom panel connectors and ports.

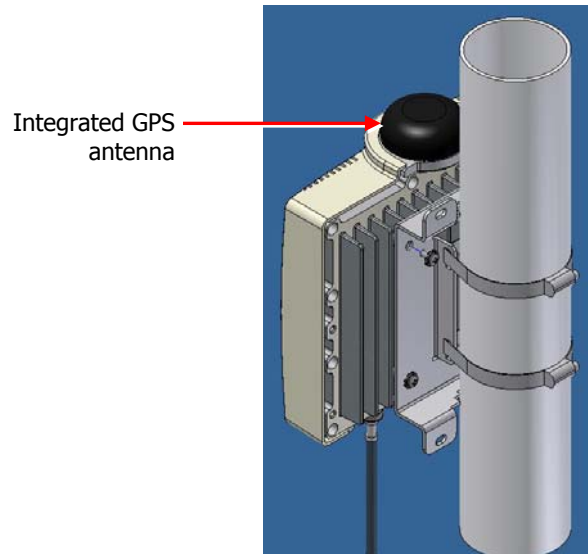
Table 1. Bottom Panel Connectors

No.	Connector Name	Connector Type	Cable Type	Description	Connected to
1	ANT1	N type Female	RG 214/U	RF antenna connection	external antenna or Screwed-on omni-directional antenna
2	Console	RJ45	Cat5 ETH	Low level CLI for CalAmp technical personnel. RS-232	Computer
3	DC + ETH	RJ45	Cat5 ETH	DC 1.5A + Ethernet Cat5	PoE data adapter
4	GND	1 screw ETSI	#10 AWG bare copper wire	Grounding lug. #10 AWG bare copper wire	Central earth ground, Tower or pole chassis
5	GPS (optional)	TNC Female	RG-59	Base Station Synchronization	Optional External GPS antenna
6	ANT2	N type Female	RG 214/U	RF antenna connection	external antenna or Screwed-on omni-directional antenna

### 1.3.2 Top Panel

The top panel supports the built-in GPS antenna. (An external GPS antenna can be connected to the bottom panel GPS connector). See section 2.1 for more information on GPS antennas and installation criteria.

The figure below shows the Pico Base Station mounted on a pole.



*Figure 4. Top panel GPS Antenna*

## 2 Site and Installation Requirements

### 2.1 Pico Base Station Installation Location

#### **WARNING!**

THE PICO BASE STATION UNIT MUST ALWAYS BE INSTALLED VERTICALLY AND TOP-DOWN –  
WITH THE CONNECTORS ON THE UNDERSIDE FOR PROTECTION.

This section describes the criteria that should be considered when selecting the Pico Base Station installation location.

#### 2.1.1 Criteria for Outdoor Locations

Take into account your site plan and local regulations that define distance from populated areas.

- The unit should be mounted in the highest possible point. Reception will increase according to the height of the antennas.
- There should be minimum obstacles between the antenna and the planned coverage area (zone) – minimum of 55% exposure to the sky.
- Take into account (according to your coverage site plan) distance from other antennas or devices that may cause interferences.
- Accessibility for maintenance (where possible).

#### 2.1.2 Criteria for Indoor Locations

- A minimum of 55% direct LOS exposure of the external GPS antenna to sky.
- Maximum distance between external GPS antenna to Pico Base Station = 22 meters.

#### 2.1.3 Antenna Grounding Requirements

The antenna installation must be as per Article 810 of the NEC. Of particular note is the requirement that the grounding conductor not be less than 10 AWG (Cu). The scheme should either correspond to UL 96 and 96A. Lightning Protection Components and Installation Requirements for Lightning Protection Systems, or tested in according to UL 50 and UL 497.

## 3 Installation Procedure

### 3.1 Pre-Installation Safety Instructions



#### **Warning!**

Before installing the Pico Base Station, review the following safety hazards:

- Installing Pico Base Station can pose a serious hazard. Be sure to take precautions to avoid the following:
- Exposure to high voltage lines during installation
- Falling when working at heights or with ladders
- Injuries from dropping tools
- Contact with AC wiring (power system connection)

### 3.2 Unpacking

Upon receiving the Pico Base Station unit, perform the following:

1. Examine the shipping container for damage before unpacking the unit.
2. Perform a visual inspection to reveal any physical damage to the equipment.

---

Note: In case of damage, contact the shipping company.

---

3. Verify that all of the equipment (listed below) is included. Otherwise contact CalAmp.
4. The Pico Base Station is shipped with the following equipment:

- Sentry 4G-900 Pico Base Station.
- Integral 2 x omni-directional antennas
- Data adapter including Power Supply.
- Internal GPS receiver and integrated GPS antenna
- Pico Base Station pole/wall mounting bracket.
- Cat5 Serial cable (2m) for the console connector of the Pico Base Station (cable connectors: DB9F, RJ45)

---

Note: The connection between the Pico Base Station to the data adapter is performed by a standard outdoor Cat5E shielded Ethernet cable. The Ethernet cable is not supplied.

---

- Metal bands x 2 for mounting on poles
- Screws, springs and washers x 4

## 3.3 Required Tools and Materials

In order to install the Pico Base Station, a standard professional toolbox is required.

## 3.4 Installing the Pico Base Station

---

Note: Should be installed at highest possible point!

---

### **Important!**

The equipment should be installed in compliance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part 1, CSA C22.1; and when applicable, the National Electrical Safety Code IEEE C2. Unless marked or otherwise identified, the Standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

There are two types of installations for the Pico Base Station:

- **Wall mount** - The Pico Base Station can be attached to any wall that can support the load of the unit.
- **Pole mount** - The unit can be attached to any pipe or pole with diameter 1.75" to 10".

### 3.4.1 Overview

The Pico Base Station installation procedure consists of the following steps:

1. Covering the Console port (only used for maintenance purposes by authorized personnel) – see 3.4.2.
2. Assembling the PoE connector – see 3.4.3.
3. Assembling the Pico Base Station mounting bracket – see 3.4.4.
4. Mounting the Pico Base Station (wall/pole mount) – See 3.4.5.
5. Antenna connections and grounding – see 3.4.6.
6. Connecting the Pico Base Station Data Adapter – see 3.4.7.
7. See chapter 4 for the initial Setup procedure.



### 3.4.2 Cover Console Port

The **Console** port is only used for maintenance operations performed by authorized service personnel and should be closed in normal conditions.

Secure the **Console** port with both of the (supplied) screws to the port panel. See figure below.



---

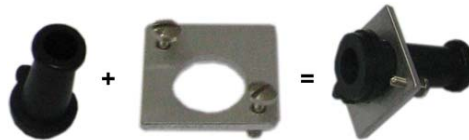
Note: See Appendix C – Console C for Console cable pin out.

---

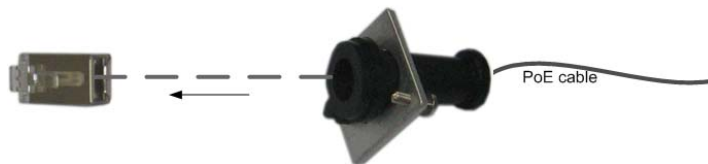
### 3.4.3 Assemble PoE Connector

The DC/Ethernet connector that provides the PoE connection must be assembled as follows:

1. Insert the cap in to the DC/Ethernet port cover, with the as shown below.



2. Insert the PoE cable (not supplied) through the cap and connect it to the supplied J45 connector.



3. Snap the J45 connector into the **DC/Ethernet** opening.

4. Align the cap ridge with slot in port and insert both screws into the cover screw holes and insert in to corresponding screw holes located at the top-left and bottom-right of the **DC/Ethernet** port.

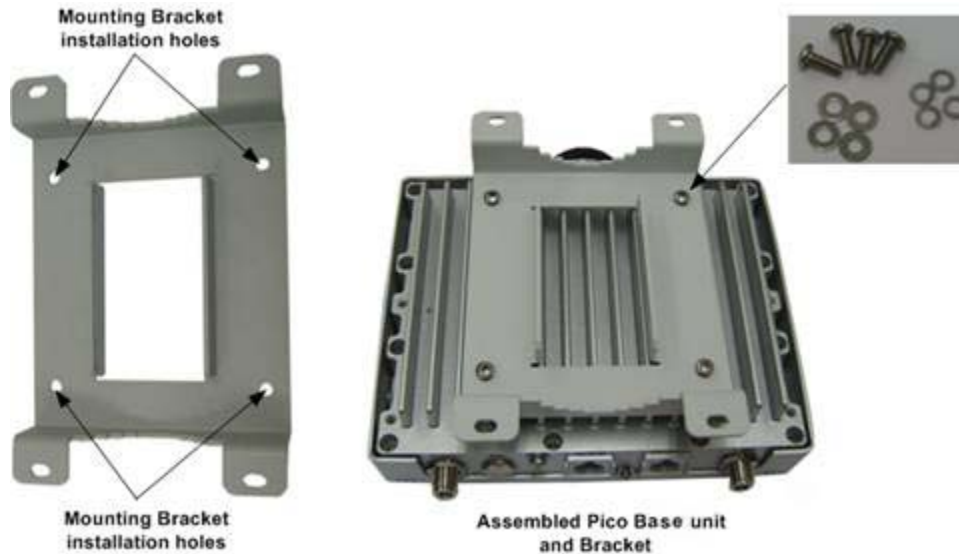


5. Tighten the screws and secure cover to port.

### 3.4.4 Assemble Mounting Bracket

#### To assemble the mounting bracket on the Pico Base Station unit

1. Align the mounting brackets' four inner holes with the Pico Base Station installation holes, located on the under-side of the unit (rib-side). See figure below.
2. Using a Phillips screwdriver, secure the bracket to the Pico Base Station unit with the four screws and washers (supplied).



### 3.4.5 Mount the Pico Base Station

#### 3.4.5.1 Wall Mount

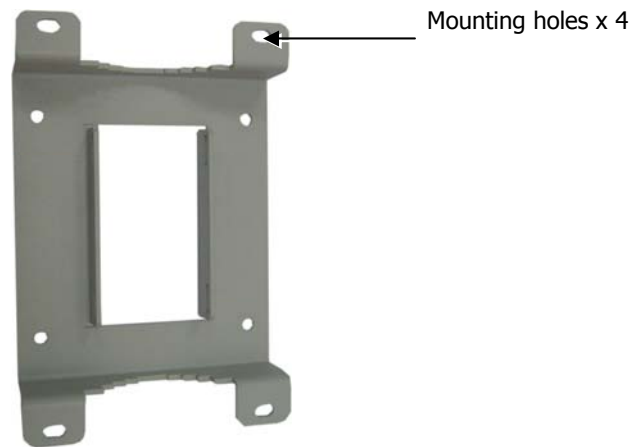
---

Note: The Pico Base Station can be attached to any wall that can support the load of the unit.

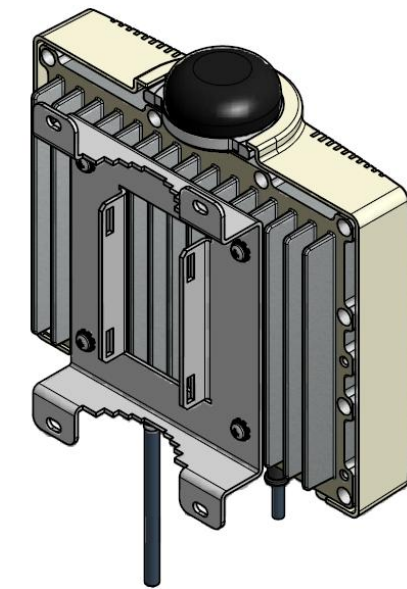
---

##### To mount the unit on the wall

1. Determine the location of the Pico Base Station mounting bracket and mark the drilling holes on the wall surface based on the brackets' four (outer) mounting holes (two at the top and two at the bottom).



**PLAN THE INSTALLATION SO THE INTERFACES FACE DOWN- PROVIDING MORE PROTECTION AGAINST THE ELEMENTS.**



2. Drill the four holes in the wall and align the bracket installation holes with the holes in the wall. Secure with the appropriate screws and washers (not supplied).

### 3.4.5.2 Pole Mount

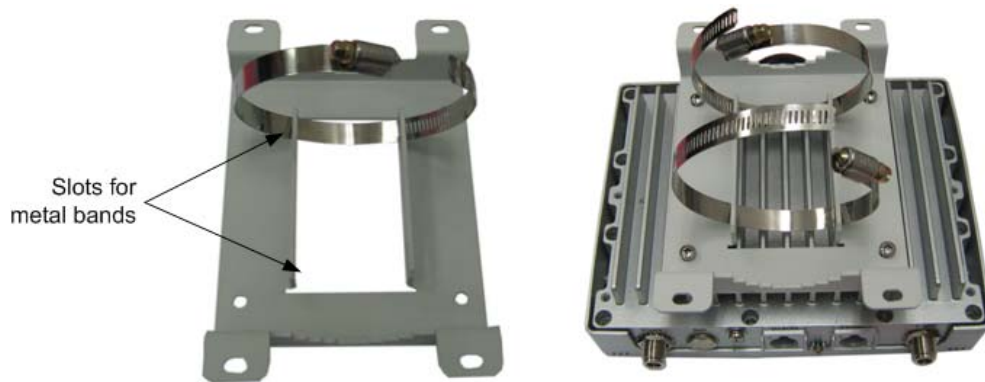
---

Note: The unit can be attached to any pipe or pole with a 1.75" to 10" diameter.

---

#### To mount the Pico Base Station on a pole

1. Assemble the wall-mounting bracket to the rear side of the unit (rib-side) – see 3.4.2.
2. Insert the metal bands in the bracket slots, as shown below.



3. Mount the unit on the pole, using the metal bands and close the bands tightly around the pole.
4. Secure the metal bands with their screws. See following figure.

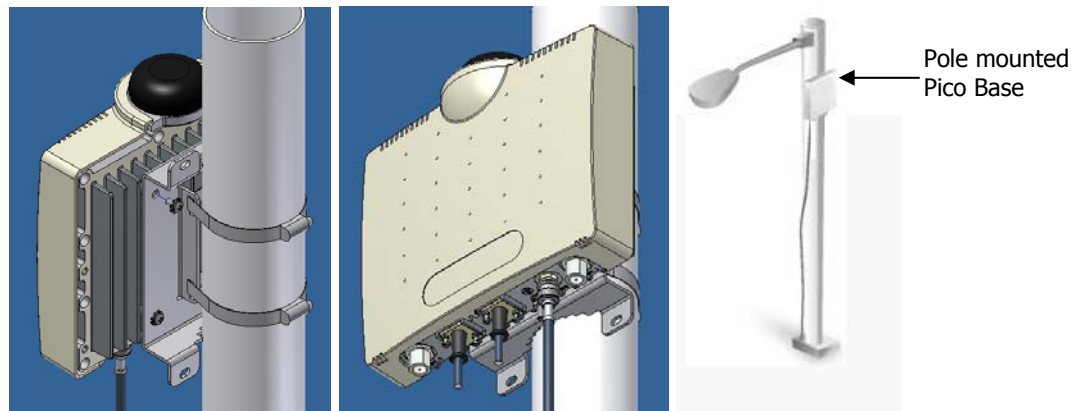


Figure 5. Pole Mount

### 3.4.6 Antenna Connections

**IMPORTANT!**

THE PART OF THE ANTENNA THAT IS CONNECTED TO THE CENTRAL PIN OF THE ANTENNA CONNECTOR SHOULD BE COVERED BY ISOLATION MATERIAL WHICH IS SUFFICIENTLY RESISTANT TO DEGRADATION BY ULTRA-VIOLET (UV) RADIATION.

#### 3.4.6.1 RF Connections and Grounding

---

Note: See 2.1.3 for antenna grounding requirements.

---

Connect the omni-antennas to the N-Type **ANT1** and **ANT2** connectors and connect the grounding lug to the common ground.

---

**Caution:** This device has been designed to operate with the antenna described below, and having a maximum gain of 7.15dBi. Other antennas or having an antenna with a gain greater than 7.15dBi are strictly prohibited for use with this device. The required antenna impedance is 50Ω.

---

Antenna Information: MAXRAD model MFB 9155

The installation of this equipment and the antenna must be performed by a professional.

### 3.4.7 Connect the Pico Base Station Data Adapter

The Data Adapter is a combined data and power adapter that interfaces to the customer's Outdoor Unit wireless device and is used to power the Pico Base Station and to distribute data.

The Data Adapter unit includes a single output RJ-45 connector (for connection to an IEEE802.3 compatible device) that provides bi-directional 10/100 Base-T data and power to the outdoor equipment over a Cat5e cable.

The unit receives power from 100V to 240V AC using an IEC-320-C14 industry standard connector.

---

**Note:** The AC power supply cord should be 3 wires, 18 AWG minimum, with length less than 4.5 m, safety certified according to national rules.

---

#### To connect the Pico Base Station Data Adapter

1. Interconnect the Pico Base Station **DC/Ethernet** port and the Data Adapter **ODU IF** port, using a Cat5E shielded cable (not supplied).

---

**Note:** The indoor to outdoor CAT5 cable max length should not exceed 100m.

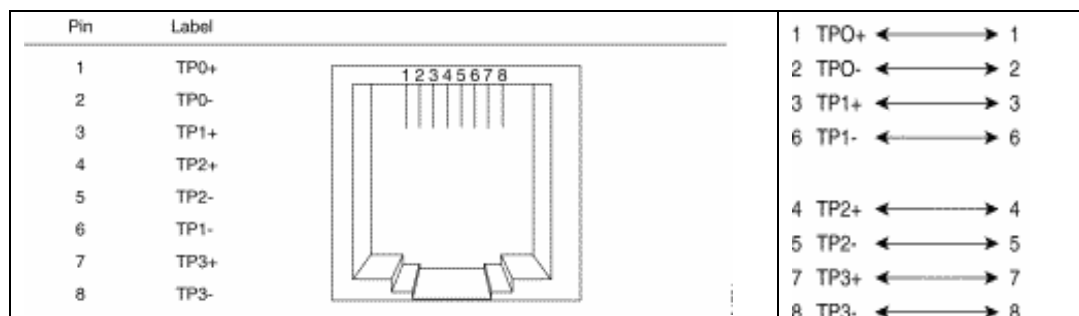
---

Refer to the following table for the ODU I/F connector pin out.

Table 2. ODU I/F port pin-out

Pin No.	Description
1	ETH Data
2	ETH Data
3	ETH Data
4	+55V
5	+55V
6	ETH Data
7	RTN (-)
8	RTN (-)

Refer to the following figure for the Ethernet cable pin out.



---

**Note:** The Cat5e Ethernet cable is not included. Please refer to Appendix B – IDU to ODU Cable Specifications for detailed technical specifications.

---

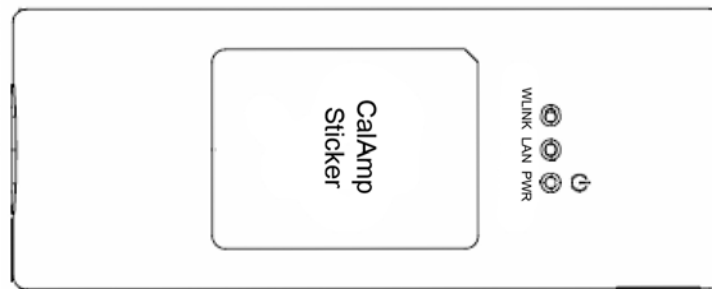
2. Connect the Data Adapter to a Switch/Router by interconnecting the Data Adapters' **Ethernet** port and the Switch/Router **10/100 Base T-port** using a Cat5e cable.
3. Connect the Data Adapter to the 110V/220V AC mains using the supplied cable.

**IMPORTANT!**

BEFORE CONNECTING THE DATA ADAPTER TO THE MAIN OUTLET VERIFY THAT ALL SYSTEM COMPONENTS ARE PROPERLY INSTALLED. MAKE SURE THAT ALL CABLE CONNECTORS ARE SECURELY POSITIONED IN THE APPROPRIATE PORTS.

4. Verify that the Data Adapter LEDs, located on the front panel, are *Green* indicating an OK status.

### Data Adapter LED Indicators



*Figure 6: Data Adapter Front Panel*

The table below provides a description of the Data Adapter LED indicators.

*Table 3. Data Adapter LED Description*

LED	Color	Description
PWR	Green	Input power is connected
LAN	Green	LAN link/activity display
Ready	Green	System ready display

## 4 Setup

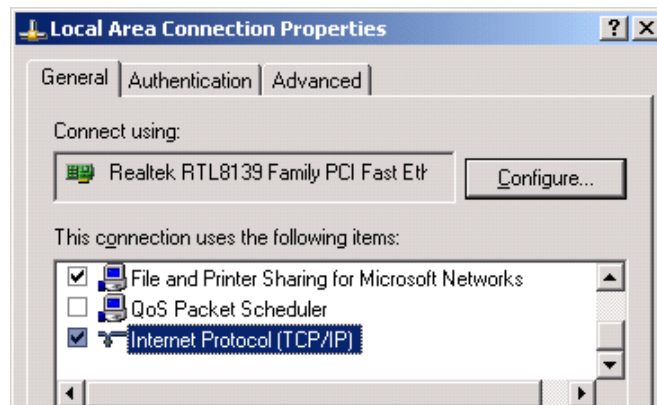
The initial setup procedure consists of:

- Configuring the computers' network parameters and connecting the Pico Base Station to the Web interface
- Verifying IP connectivity

### 4.1 Connecting Pico Base Station to Web Interface

**To configure computer network parameters and connect the Pico Base Station unit to the Web Interface**

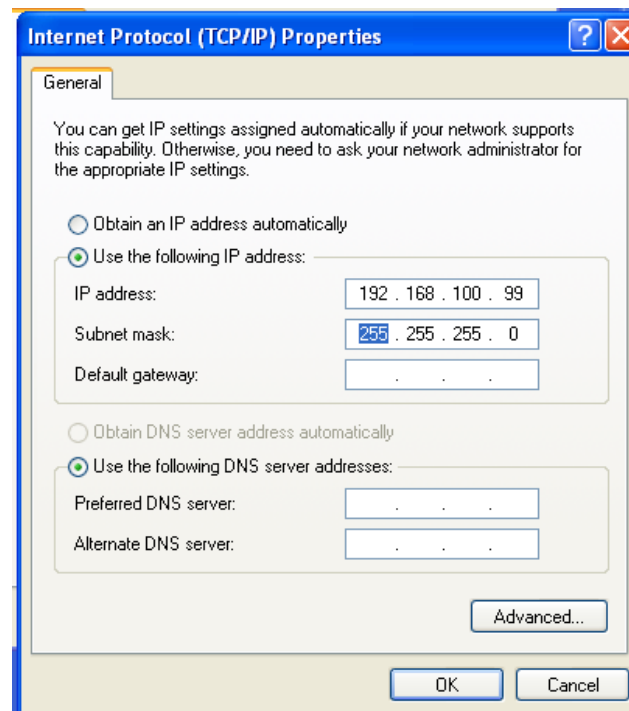
1. Interconnect the unit and the computer Ethernet ports using the Ethernet cable.
2. Configure the computers' network parameters
  - Click the **Start** menu and choose **Control Panel**.
  - In the Control Panel, click Network and Internet Connections.
  - Click Network Connections and then double-click Local Area Connection. The Local Area Connections Properties dialog appears with the General tab displayed by default.



- In the Items list, select "**Internet Protocol (TCP\*IP)**" and click the **Properties** button. The "Internet Protocol (TCP/IP) Properties" dialog appears.



- Assign your computer the following IP address and subnet. In the IP address area:
  - Enter the IP address **192.168.100.99**
  - Enter the subnet **255.255.255.0**



3. Open your WEB browser and enter **192.168.100.100**. The following Login window appears.



# 5 Troubleshooting

## 5.1 No IP connectivity

If there is no IP connectivity between the Pico Base Station unit and your computer, perform the following steps:

1. Interconnect computer and Pico Base Station **Console** connector (serial connection), located on the units' bottom panel.
2. In the terminal type the command: **showIPAddr**. The Pico Base Station IP address will be displayed.
3. Try to ping the Pico Base Station unit address.
4. If connectivity is still not established, contact CalAmp customer support

## 5.2 No Serial Connection

If there is no serial connection when using the serial cable perform the following:

- Verify IP connectivity using ping to the Pico Base Station unit IP address (see 5.1).
- If there is no IP connectivity - verify the power connections.
- If the power connections are OK, however there is still no serial connection or IP connectivity, contact CalAmp customer support.

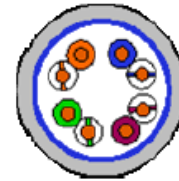
# Appendix A – Specifications

<b>Radio and Modem</b>	
Frequency	903.90-926.10 MHz for 3.5 MHz Channels 904.65-925.30 MHz for 5 MHz Channels 905.75-924.20 MHz for 7 MHz Channels 907.25-922.70 MHz for 10 MHz Channels
Radio Access Method	IEEE 802.16-2005 (S-OFDMA)
Operation Mode	TDD
Channel Bandwidth	3.5Mhz, 5 MHz, 7Mhz, 10 MHz
Frequency Resolution	0.25 MHz
Antennas	Integral Omni (default)
Number of Antennas	2
Default Antenna	Omni
Antennas Connectors	2x N-Type, 50 ohm, lightning protected
Diversity Support	2x2, STC/MIMO-SM
Output Power (average)	2x0.5W
FFT/Modulation	512/1024 FFT points; QPSK, 16QAM, 64QAM
FEC	Convolution Code and Turbo Code
TPC	10dB
Synchronization	GPS
<b>Configuration and Management</b>	
Management	SNMP, WEB GUI
SNMP Agent	SNMP v2c client: MIB II (RFC 1213), Private MIBs
Software Upgrade	FTP
Remote Configuration	FTP
<b>Power Interface</b>	
Input	Custom POE
Power Consumption	39Watt maximum
<b>Environmental</b>	
Operating Temperature	-30°C to +60°C
Operating Humidity	5%-95% non condensing, Weather protected
<b>Standards and Compliances</b>	
FCC/IC	FCC part 15.247, subpart C; IC RSS-210
<b>Mechanical</b>	
Dimensions [HxWxD]	24cm x 20cm x 4cm
Weight	<4Kg

# Appendix B – IDU to ODU Cable Specifications

## Special 4x2x24 AWG FTP Cat. 5e Outdoor Double Jacket Data Cable UL (1581 VW 1)

<b>Applications:</b>	Outdoor installations, Fixed or portable installations, Digital distribution frames in transmission stations, Outdoor installations in harsh environments
<b>General Construction:</b>	Custom made cable designed specially for wireless systems, meeting the requirements of Cat. 5e per ANSI/TIA/EIA-568-B.2 and IEC 61156-5. The cable contains 4 twisted pairs, cabled, foil-tape shielded and jacketed with two special black UV resistant, flame retardant PVC compounds for direct outdoor use in harsh electrical environments. The diameter of the inner core complies with RJ45 connecting hardware allowing direct connection to equipment without patch cords.
<b>Conductor Size:</b>	0.52 mm
<b>Outer Jacket Material:</b>	UV resistant FR-PVC
<b>Outer Diameter:</b>	7.9 mm nom.
<b>Weight:</b>	68.0 kg/km



### Design & Materials

<b>Conductor Material:</b>	Bare Copper
<b>Conductor Size:</b>	24 AWG
<b>Insulation Material:</b>	Solid PO
<b>Insulation O.D.:</b>	1.07 mm
<b>Color code:</b>	Per TIA/EIA 568-B
<b>Overall Foil Shield:</b>	Yes
<b>Overall Shield Material:</b>	Aluminum/Polyester Foil
<b>Overall Foil Design:</b>	100% Coverage
<b>Overall Drain-wire Material:</b>	Tinned Copper
<b>Overall Drain-wire size:</b>	24 AWG
<b>Overall Drain-wire Construction:</b>	Stranded
<b>Inner Jacket Material:</b>	UV resistant FR-PVC
<b>Inner Jacket Diameter:</b>	6.1 mm
<b>Total number of wires:</b>	8

### Standards

<b>Flamability Rating:</b>	IEC 60332, UL 1581 VW-1
<b>Standards:</b>	IEC 61156, TIA/EIA-568

### Performance

<b>Frequency Range:</b>	1 - 100 MHz
<b>Impedance:</b>	100 $\Omega$
<b>DC Resistance:</b>	93 $\Omega$ /km nom.
<b>Max. DC Resistance :</b>	95 $\Omega$ /km@20°C
<b>Capacitance Unbalance:</b>	1.6 pF/m max.
<b>Velocity of Propagation:</b>	68 % nom.
<b>Propagation Delay Skew:</b>	35 ns/100m max.
<b>Dielectric Strength:</b>	700 V/minute
<b>Dielectric Strength to Shield:</b>	700 V/minute
<b>Min. Bend Radius:</b>	70 mm
<b>Max. Operating Temperature:</b>	+70 °C
<b>Min. Operating Temperature:</b>	-40 °C

# Appendix C – Console Connector

**Important!** The Console connector should be closed in normal condition and is only intended for the use of an authorized technician.

The chassis has RJ-45 maintenance female connector, used by a technician to connect a "console".

The port is used (by maintenance personnel) to communicate with the processor when the normal management interfaces cannot be used. The console port is based on RS-232 serial standard and support a standard terminal connection.

The Console port enables the technician to configure and monitor the Pico DST unit through CLI (Command Language Interface) for low level debug.

The following table provides a description of the connector pin out.

*Table 4: Maintenance connector*

Pin Number	Type
1	TX
2	RX
5	GND

The serial cable used to connect the Pico Base Station *Console port* to the console is supplied by CalAmp:

- **Cable Type** – Cat5
- **Cable Connectors** – DB9F; RJ45
- **Cable Length** – 2m

# Appendix D - Mechanical Drawing

The following figure shows the Pico Base Station units' dimensions (and with the mounting bracket).

