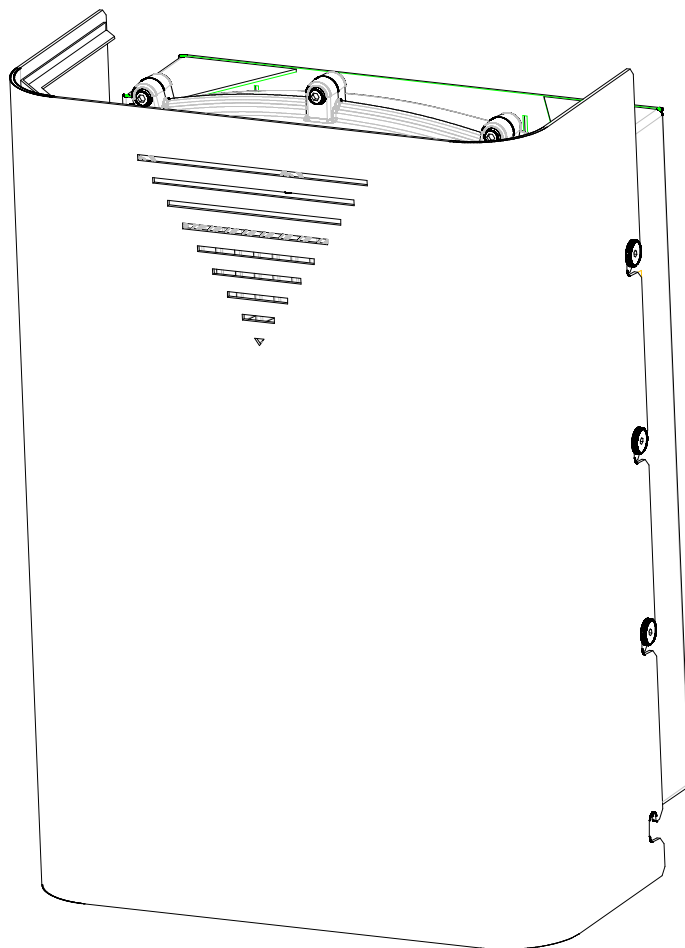


Node B V2 Installation Guide





Information in this document and the products described are subject to change without notice.

© 2000-2003 IPWireless, Inc. All rights reserved.

Reproduction, alteration, or distribution in any manner whatsoever without the written permission of IPWireless Inc, is strictly forbidden.

Trademarks used in this text: the IPWireless logo, icon and IPWireless Broadband Modem are trademarks of IPWireless, Inc.; Microsoft, Windows, and Windows NT are registered trademarks of Microsoft Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products, IPWireless, Inc., disclaims any proprietary interest in trademarks and trade names other than its own.

February 2003

Part No. IPW-0463



Table of Contents

1. Release Version	5
2. Safety Precautions	6
3. General Warnings	6
4. Overview	7
5. General Specifications.....	8
6. Installation	10
Step 1- Pre-Installation	10
Step 2 – Parts Shipped & Tools Required.....	11
Step 3 Site Preparations for Node B Installation	13
Step 4 Mounting Bracket Installations	15
Step 5 Conduit Installation & Cabling	Error! Bookmark not defined.
Step 6 Node B Installation onto Mounting Bracket	Error! Bookmark not defined.
Step 7 Ground Installation	Error! Bookmark not defined.
Step 8 Service Cover Access.....	Error! Bookmark not defined.
Step 9 DC Power Connection.....	Error! Bookmark not defined.
Step 10 Backhaul Connections (Iub) to INC.....	Error! Bookmark not defined.
Step 12 Antenna Cabling - Installation.....	Error! Bookmark not defined.
Step 13 Alarm Connections	Error! Bookmark not defined.
Step 14 GPS Installation & Operation	Error! Bookmark not defined.
Step 15 Solar Shield Installation.....	Error! Bookmark not defined.
7. APPENDIX.....	Error! Bookmark not defined.
Appendix A - Installation Check Card	Error! Bookmark not defined.
Appendix B - Glossary	Error! Bookmark not defined.

Table of Tables

Table 2-1 : Safety Symbols.....	6
Table 5-1 : Specifications.....	8
Table 5-2 : Node B Model Types	9
Table 6-1 : Packing List.....	11
Table 6-2 : Tools Required.....	12
Table 6-3 : Materials Required.....	12
Table 6-4 : Site Preparation Checklist	13
Table 6-5 : T1/E1 Pin-outs	Error! Bookmark not defined.

Table of Figures

Figure 5-1 : Node B Physical Dimensions	8
Figure 5-2 : General Description.....	9
Figure 6-1 : Unpacking Sequence	11
Figure 6-2 : Node B - Positioning Clearance	14
Figure 6-3 : Mounting Bracket.....	15
Figure 6-4: Drill template	Error! Bookmark not defined.
Figure 6-5 : Bracket Fixing to Wall - Wall.....	Error! Bookmark not defined.
Figure 6-6: Node B Securing to Uneven Wall	Error! Bookmark not defined.
Figure 6-7 : Pole Mounting using Unistrut systems	Error! Bookmark not defined.
Figure 6-8 : Node B - Rack Mounted	Error! Bookmark not defined.
Figure 6-9: Flexible Conduit.....	Error! Bookmark not defined.
Figure 6-10: Node B onto Mounting Bracket.....	Error! Bookmark not defined.
Figure 6-11 : Earth Connection	Error! Bookmark not defined.
Figure 6-12 : Service Access	Error! Bookmark not defined.
Figure 6-13 : Service Area Description	Error! Bookmark not defined.
Figure 6-14 : Power Connections	Error! Bookmark not defined.
Figure 6-15 : Backhaul Connections	Error! Bookmark not defined.
Figure 6-16 : Ethernet Pin-outs using RJ45.....	Error! Bookmark not defined.
Figure 6-17 : Ethernet Pin-outs using RJ45.....	Error! Bookmark not defined.
Figure 6-18 : Antenna Connections	Error! Bookmark not defined.
Figure 6-19 : Alarm Outputs & Inputs	Error! Bookmark not defined.
Figure 6-20 : GPS Antenna.....	Error! Bookmark not defined.
Figure 6-21 : Solar Shield Fitting	Error! Bookmark not defined.
Figure 6-22 : Solar Shield Securing	Error! Bookmark not defined.
Figure 6-23 : Solar Shield Hooked on Node B.....	Error! Bookmark not defined.



Node B Installation Guide

1. Release Version

Date	Version	Author	Reason For Change Issue
8 th April 2003	5.0.0	L.Mujegu	Initial Version

2. Safety Precautions

Table 2-1 : Safety Symbols

GENERAL WARNING	ELECTRICAL HAZARD	BURN/HEAT HAZARD	CORROSIVE MATERIALS	GROUND
				
GENERAL SAFETY PRECAUTION	VOLTAGE: Direct contact with these areas could result in severe physical harm and property damage	HEAT: Direct contact with this surface will result in severe burns	CORROSIVE: Direct contact with this surface will result in chemical burns. NOT USED	GROUND: Site for grounding equipment

These cautionary signs are used on the physical equipment and throughout this manual. For safety of personnel and protection of equipment observe these precautions when installing, operating or servicing the equipment and surrounding areas.

3. General Warnings

Electrical

Power Supply – cord fitted for AC or DC. DO NOT adapt to a different configuration. Power supply circuits carry high voltages. Remove rings, watches, and other jewellery before working with this type of equipment.

Batteries – Certain installation of this equipment require working with lead acid batteries, batteries present chemical, electric and gaseous hazards. Batteries are not supplied by IPWireless for the Node B equipment although UPS systems may be coupled with the device in order to provide back up power in case of power outages.

Physical

Weight – Each Node B weighs 25kgs (55 pounds). Precautions should be taken, depending on the installation site conditions, in lifting and hoisting the device.

Environmental

There are different precautions to take within each environment. Specific precautions are listed in the installation section for that environment.

Site Location

The NodeB basestation is designed to be installed in restricted access locations only. The site locations are accessible by suitably trained service/installation personnel only.

Network Connections

The NodeB basestation is not suitable for direct connection to Public Switched Networks. This means that the Node B is not suitable for direct connection to TNV circuits



4. Overview

Node B is the European Technical Standards Institute's (ETSI) name for the radio base station. The basic function of the Node B is to convert 100 Base T packet data into the UTRAN TD-CDMA air interface used between the Node B and the 3G Modem. The Node B can be configured to operate in configurations ranging from a single sector or omni mode, up to a 6 sector arrangement. One Node B is required for each sector of coverage, in the case of an omni configuration one Node B will be required. The Node B is controlled by an INC (Integrated network Controller) Generally co located at the site in a separate cabinet.

The Node B supports both 768 mega chips (10MHz) and 385 mega chips (5MHz) without any hardware modification.

Scope

This document covers the physical installation and mountint of the NodeB using bracketry supplied. It does not detail custom or specialised installations or applications.

Additionally, antenna rigging/mounting, lightning protection, tower work, feeder installation / termination are all considered to be outside the scope of this document.

If in any doubt about the suitability of this document to successfully install at the proposed location, then please consult IPWireless technical support for assistance.

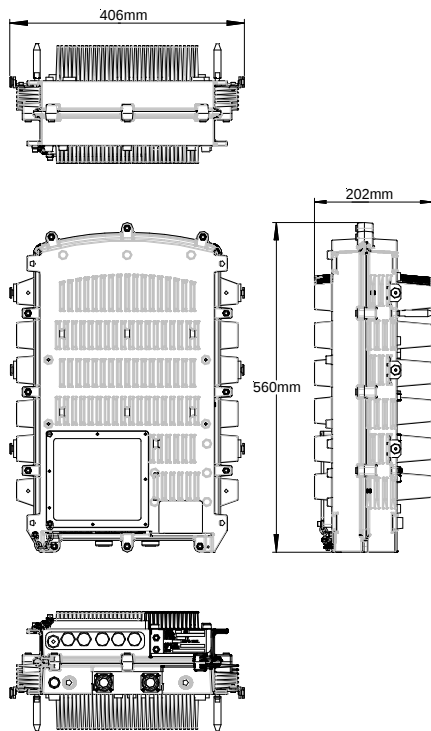
5. General Specifications

Table 5-1 : Specifications

Unit	Specification
Measurements	566 H x 380 W x 202 D mm 22.5 H x 15 W x 8 D inch
Measurements with Solar Shield attached	566 H x 380 W x 294 D mm 22.5 H x 15 W x 11.5 D inch
Node B Weight	25Kgs / 55 lbs
Node B Weight with solar shield and mounting Bracket	30Kgs / 66 lbs
Power Consumption	200 Watts max
Input Power	-48 V DC
Input Range	-36V to -72V DC
Ambient Operational Temp Range	-40°C to +55°C
Cooling	Passive
Operating Frequencies	
MMDS	2500 MHz – 2700 MHz
UMTS	1900MHz – 2100MHz

Figure 5-1 : Node B Physical Dimensions

**Node B without
Solar shield or Bracket**



**Node B with
Solar shield & Bracket**

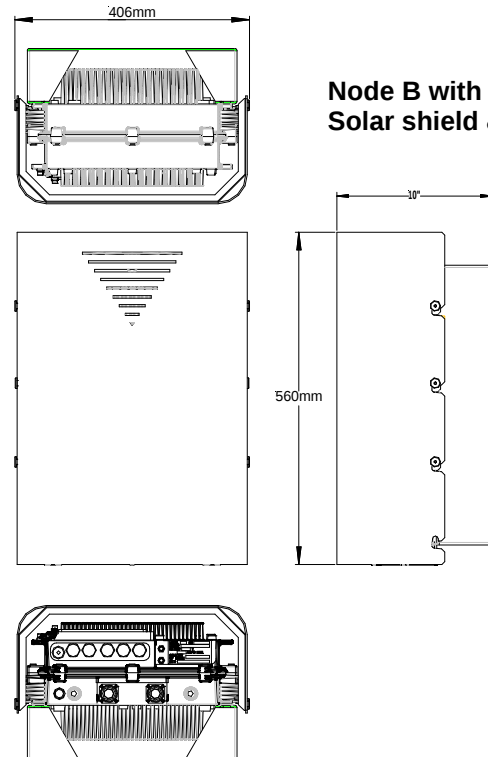
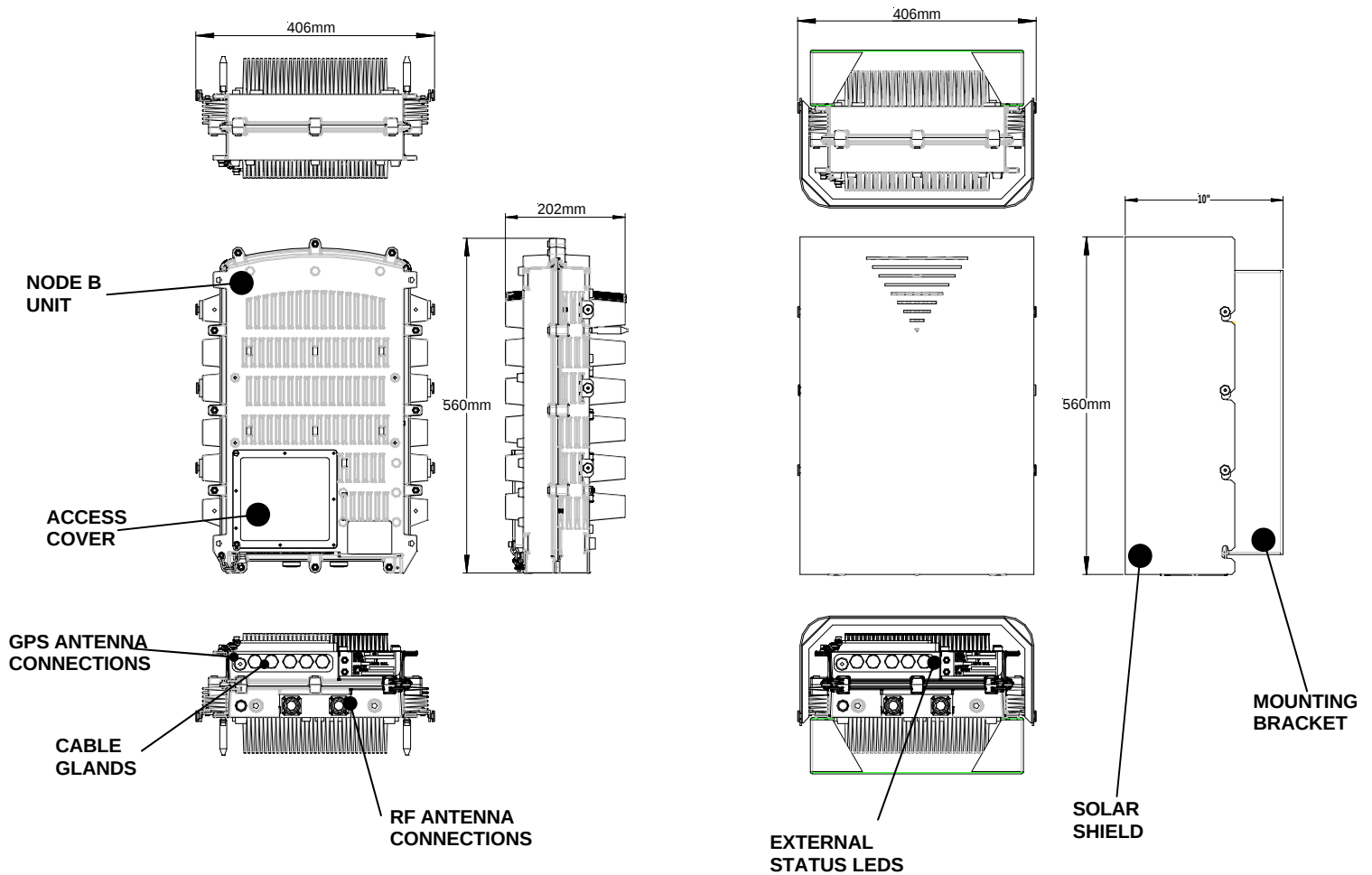


Table 5-2 : Node B Model Types

Node B Frequency	Model Number
1900-1905 MHz	Model GM
1905-1910 MHz	Model GN
1910-1915 MHz	Model GP
1915-1920 MHz	Model GQ
2053-2082 MHz	Model HV
2010-2015 MHz	Model JG
2500-2686 MHz	Model HZ

Figure 5-2 : General Description





Node B Installation Guide

6. Installation

This section describes the steps to be followed to physically install the Node B.

Step 1- Pre-Installation

This section describes the initial checks that should be carried out to ensure that preparation for the installation is complete.

For Installation Check Card please see Appendix A at the back of this manual.

1. Review site construction drawings to determine if site was constructed according to the drawings.
2. Review drawings and actual installation to determine location of Node B installation.
3. Check availability of electrical, grounding and antenna connections.
4. Complete site survey.
5. Check structural strength of wall, pole or mounting frame to support Node B weight of 25Kgs (55lbs).

Node B Installation Guide

Step 2 – Parts Shipped & Tools Required

This section reviews the parts, ancillary materials and tools required to install the Node B.

Use this checklist to check quantity and quality of parts as they are unpacked: -

The Node B unit is packaged with the following items, the packing list on the inside top of the packing shall list these items.

The carton is packed to facilitate the intended sequence of installation. The figure below shows the sequence of removal from the packing.

Table 6-1 : Packing List

#	Description	Qty
1	Node B Unit	1
2	Node B Mounting Bracket	1
3	Solar Shield Assembly	1
4	Unit Mounting Bracket Fixings Kit <u>contains:</u> 4 x M8 bolts	1
5	GPS Antenna Kit incl Mounting <u>contains:</u> 1 x gps antenna 1 x gps antenna mounting	1
6	Alarm Connector Kit <u>contains:</u> 2 x 2 alarm connectors 1 x 12 way alarm connector 3 strain relief cable ties	1
7	Cable Gland Kit <u>contains:</u> 5 off cable glands plain-single Ø7-4mm 5 off emc cable glands- Ø8-4mm 2 x dual inserts 5mm diam cable 2 x dual inserts 6mm diam cable	1
8	Service Access Cover – Tool	1

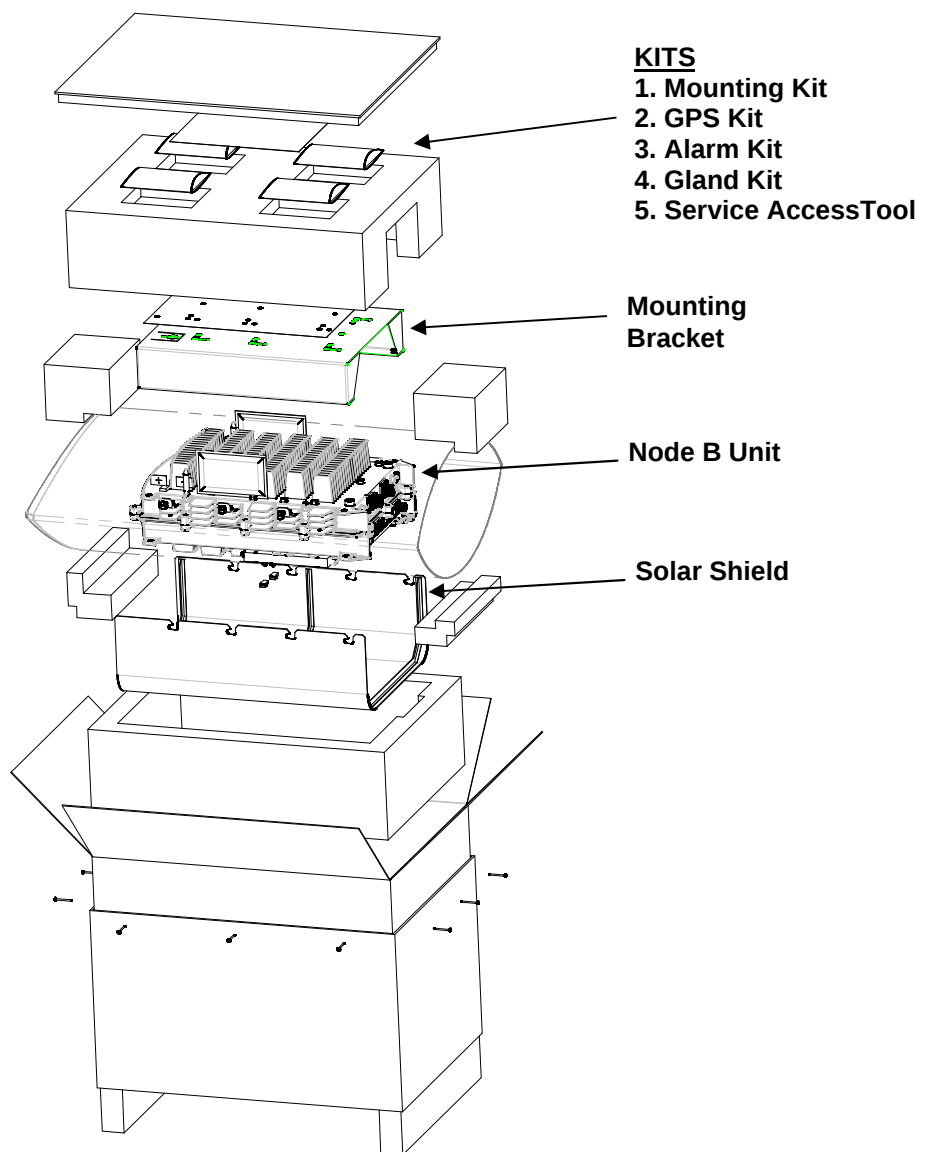


Figure 6-1 : Unpacking Sequence



Node B Installation Guide

In addition to standard construction equipment, the following tools and materials should be available prior to installation:

Table 6-2 : Tools Required

Tools	Description
Access Tool	Tool for Node B service area access
Drill and Drill Bits	M6 or No8 Masonry Drill Bit
Voltmeter	Fluke meter
Alarm Cable Insertion Tool	1mm flat blade Screwdriver
Basic telecommunications tool kit	Includes screwdriver, socket wrenches, etc.
Cable Stripper & Crimper	RJ 45 crimper connector
Ethernet cable test set	Test for all Ethernet cables
Compass or Handheld GPS with signal indicator	Test for GPS signal at site location

Table 6-3 : Materials Required

Material	Description
Armoured conduit- UL-1211 Ducting UL rated 12x18mm Diameter	Cable conduit attached to cable glands
CAT5 - 4 pair, double screened cable, recommended Alcatel LANmark-5 F ² TP or equivalent	IUB / LMT / T1 / E1 Cable
RJ45 Connectors	IUB / LMT / T1 / E1 Connections
CSA 7mm ² or Ø3mm or 9AWG (Max) for each 2 core power cable	DC Power Cable 2 core
CAT5 - 4 pair, double screened cable, recommended Alcatel LANmark-5 F ² TP or equivalent	Alarm distribution cable
10 mm ² maximum Ground cable	Grounding termination
M10 ring terminal	Grounding termination
BNC Right Angle Connectors	Connectors for E3/T3 Connections
RG59 B/U-LSF and UV stabilised or equivalent	Cable for E3/T3 Connections

Step 3 Site Preparations for Node B Installation

The section specifies the facilities that need to be available at the site prior to installation. The table below is a site checklist that should be completed prior to installation.

It is assumed that the site has already been selected from RF network planning and that site acquisition or permission has been granted.

Table 6-4 : Site Preparation Checklist

#	Facility	Complete Yes/No
1	Mains power supply –48Vdc	
2	Availability of suitable Ethernet, E1, T11, E3 or T3 Interfaces	
3	connections and trunking/conduits for interfaces	
4	Suitable earth	
5	Structure suitable to mount the NodeB	
6	Clearance around the NodeB for cable entry and cooling - see figure below	

Assumptions

It is assumed that prior to Node B installation all civil, electrical distribution, structured cabling termination work has been completed.

Additionally, all antenna rigging, feeder runs and terminations, associated lightning protection and earthing, has been done, with certification for safety / compliance issued as required by local regulations.

It is also strongly recommended that all VSWR plots of the feeder / antenna installations should be available for inspection.

Positioning the Node B

Depending on the flatness of the wall the bracket can either be mounting directly to the wall or can be mounted offset from the wall using 'Unistrut'.

Selection of a suitable position for the Node B shall be done by surveying possible sites with regard to the availability of facilities i.e. power, relative position to the INC and consulting the site plans.

The Node B should be sited not more than 100m from the INC using Shielded Category 5 Ethernet cable as specified. Care should be taken to position the Node B where it can be easily accessed via the front access cover.

The Node B will need to be connected near the feeder terminations and earthing points as provided on site.

Note: Where the Node B is installed using a microwave link ensure that the microwave link can support the Ethernet requirements for the IUB interface i.e. 10 or 100 Mbps / full / half duplex as the Node B and INC may need to be configured manually in order to support this configuration.

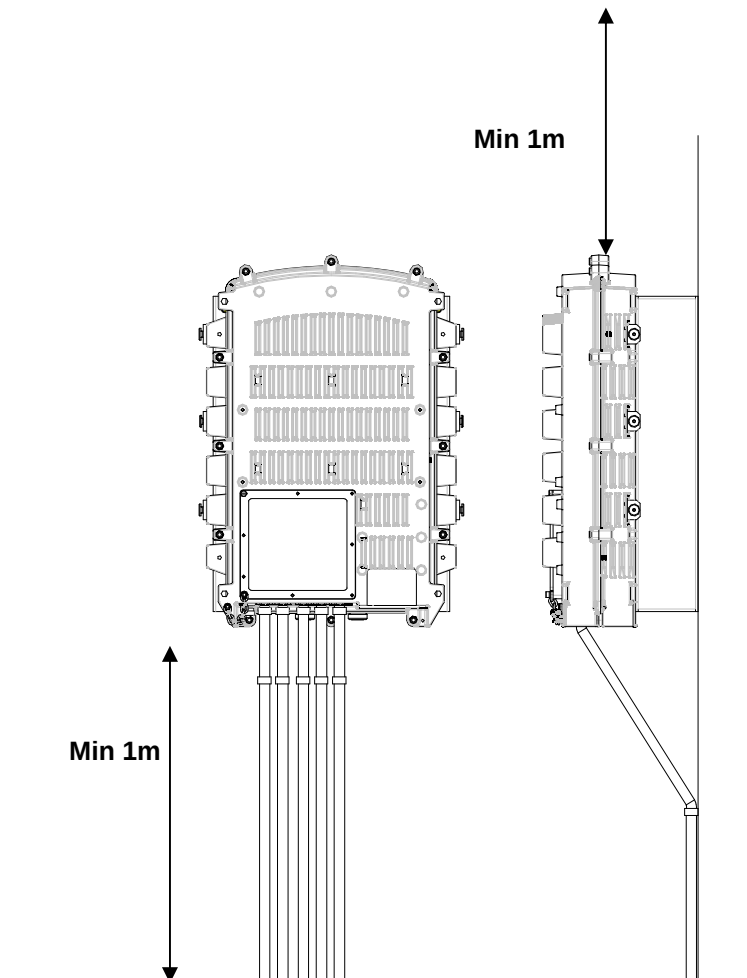
Node B Installation Guide

General Considerations

The following consideration and checks are applicable to all mounting types :-

- Consider the earthquake zone requirements for the given site being considered and ensure that the mounting arrangement and location complies.
- Review the GPS installation guidelines (Step 7) to ensure that the location will allow proper operation of the Node B GPS remote antenna. i.e. a Southern Exposure is required for outside installations (Northern Hemisphere), a GPS repeater may be necessary in areas where the active GPS antenna cannot reach.
- Depending on the installation it may be required to fit the cable conduit to the cable glands prior to mounting Node B to the bracket.
- There should be a minimum clearance of 1m above and below the Node B.
- Ensure that the wall or mounting surface is sufficiently strong to support the Node B and structure.
- The Node B should be upright to permit adequate heat dissipation.

Figure 6-2 : Node B - Positioning Clearance



Step 4 Mounting Bracket Installations

There are three ways of installing the Node B:-

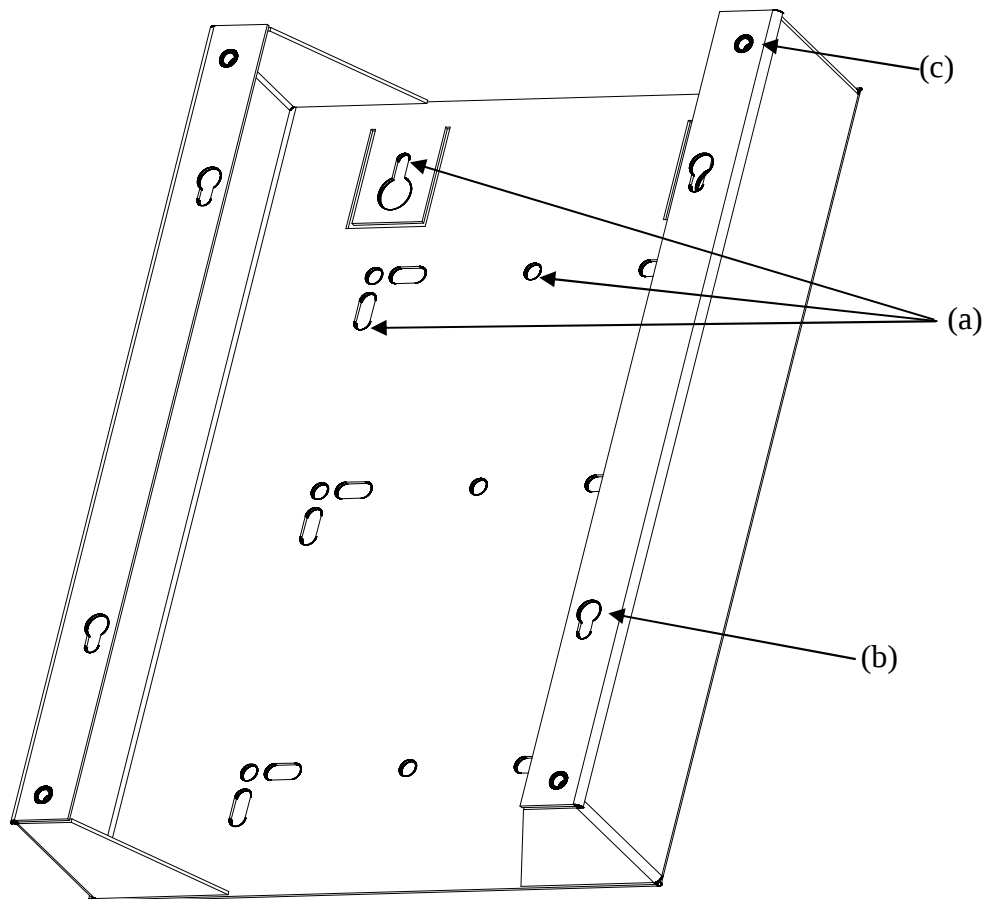
- Wall,
- Pole
- Rack Mounts.

This section explains how to mount the Node B bracket in all three instances. The securing of the Node B to the mounting bracket is the same for the three mounts and shall be described in step 10.

Mounting Bracket

The figure below illustrates the key features of the mounting bracket.

Figure 6-3 : Mounting Bracket



- a) wall mounting fixing holes & keyslots (various)
- b) unit mounting keyslots to mount nodeb to bracket (4off)
- c) fixing points – to secure Node B to bracket (4off-M8 Bolts)