WAPS Beacon NOC User Manual

Version 1.0

History

Version	Date	Author	Notes
0.1	Initial Draft Version	Jeff Reese	1
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Notes:

1. Initial Version
2. Released version

3.

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1 Introduction

1.1 Purpose and Scope

This document includes the information of the NextNav WAPS Beacon system A4P-100-0004-05 that is required for the network deployment and Network Operations Center (NOC) operator.

2 Product specification

The WAPS beacon system is intended to be used in restricted access locations (RAL) in indoor and outdoor environments under all weather conditions. The WAPS beacon is a battery backed system, and is provided with two 12 volt batteries approved for use in telecommunications equipment.

WAPS Operating Temperature: -40 Deg C to +50 Deg C operating
Storage temperature: -55 Deg C to +80 Deg C
Humidity: 90% non-condensing.
WAPS weight: 200 lbs with batteries installed, 150 lbs prior to battery installation.
Power rating: 120VAC, 60Hz, 5 AMP

3 Equipment List:

- NextNav WAPS Beacon
- Antenna
  - Transmit Omni
  - GPS : L1 GPS (BL1R-A-XTB-1-FKM)
- Cables
  - TX antenna cable: As per chart below:

Main Feed Length	Cable Type	Jumper Top	Jumper Bottom
<50’	LDF4 (1/2”)	None	None
51’-130’	LDF5 (7/8”)	None	None
131’ -250’	LDF 7 (15/8”)	½” X10’	½” X 6 ft

  - GPS antenna Cable: (not to exceed 100 feet)
    GPS cables are pre-fabbed and available in three lengths: 25’, 50’ and 100‘. The cable is an LMR 240 or equivalent (1/4”) and is pre-terminated with mating ends N male for connection to the beacon and TNC Male for the antenna end.

4 Antenna Mounting

4.1 TX Antenna

Omni antenna to be installed on tower or roof top construction as defined in site specific construction drawing. As a general rule on any monopole installations the TX antenna shall be attached to a 6 foot side arm mount , minimum distance away from the monopole unless the antenna extends above the monopole in its entirety. Likewise the antenna shall be kept a minimum distance of 6 feet from any other vertical structures on other types of towers. For roof tip installations, the TX antenna must extend above all parapet walls and penthouses on the roof top.

This radio transmitter (FCC ID: A4P-100-0004-05) has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

This radio transmitter may only operate using a vertically polarized antenna with maximum gain of +8 dBi. To reduce potential radio interference to other users, the antenna gain should be so chosen that the equivalent effective radiated power (ERP) does not exceed 30 Watts.

Antenna Type: Monopole
Polarization: Vertical
Maximum Gain: +8 dBi (maximum gain of antenna + cable loss is 3dBd)

A CSV file (configuration file) per transmitter are created by the NOC engineer based on the installation parameters such as line lengths, antenna type etc.

The TX output power level setting is contained in the CSV file.

The output power is adjusted by the 'attenuation' setting This value in the CSV file is calculated by a formula to set the output power (not to exceed 30W EIRP). The variables used in the calculation include PA Gain (G_{pa}), TX Antenna Gain (G_{ant}), TX filter insertion loss (IL_{flt}), internal cable loss (IL_{int}), external cable loss (IL_{ext}), and transceiver output power (P_{TCVR}).

$$EIRP\ (W) = 10\text{^}((P_{TCVR} - IL_{int} + G_{pa} - IL_{flt} - IL_{ext} + G_{ant}) / 10) / 1000$$

4.2 GPS Receive Antenna

GPS antenna should be installed such that it has clear view of sky. Ideally, you would keep the antenna close to the ground away from obstruction

- Keep any horizontal blockage smaller than 10 degrees
- Obstruction Clearance guideline
  - If it is 1 ft wide it should be at least 6 ft away
  - If it is 10 ft wide, it should be at least 60 ft. away.
  - If it is significantly less than 1 ft wide (like a guy wire, or a post) it should not cause any measurable effect.

4.3 Product information

Modifications made to the product, unless expressly approved by NextNav, LLC 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 A digital device , pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.