

Title:

**TECHNICAL USER MANUAL
NP12, NP22, NG12
(NEO 2.0 SYSTEM MODELS)**

REVISIONS

REVISIONS

REV	DESCRIPTION	DATE	ENGINEER	REV	DESCRIPTION	DATE	APPROVED
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		ENG	
Used On		APPD	



Size:
US Letter

Important Information to our Users in North America

FCC Regulatory Compliance Statement

Checkpoint Systems, Inc., offers Electronic Article Surveillance (EAS) or Radio Frequency Identification Products that have been FCC certified or verified to 47 CFR Part 15 Subparts B/C. Appropriately, one of the following labels will apply to the approval:

NOTE: This equipment has been tested and found compliant within 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 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 own expense.

- OR -

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) including this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation, which may include intermittent decreases in detection and/or intermittent increases in alarm activity.

Industry Canada Regulatory Compliance Statement

This device complies with the Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le fonctionnement de l' appareil est soumis aux deux conditions suivantes:

- (1) Cet appareil ne doit pas perturber les communications radio, et
- (2) Cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Equipment Safety Compliance Statement

Checkpoint's Electronic Article Surveillance (EAS) products have been designed for safeness during normal use and, where applicable have been certified, listed, or recognized in accordance with one or more of the following safety standards; UL 62368-1, CSA C22.2 No. 62368-1-14. Additional approvals may be pending.

WARNING: Changes or modifications to Checkpoint's EAS equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner.

Equipment Compliance Statement

WARNING: Changes or modifications to Checkpoint's EAS equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner.

Important Information to our Users in Europe

CE Regulatory Compliance Statement

Where applicable, Checkpoint Systems, Inc. offers certain Electronic Article Surveillance (EAS) products that have CE Declarations of Conformity according to RED Directive 2014/53/EU, EMC Directive 2014/30/EU, and Low Voltage Directive 2014/35/EU.



System Electromagnetic Compatibility (EMC) has been tested and notified through Spectrum Management Authorities if necessary, using accredited laboratories, whereby, conformity is declared by voluntarily accepted European Norm or European Telecommunications Standards Institute (ETSI) standards EN 55032, EN 55035, EN 61000-3-2, EN 61000-3-3, EN 301489-3 and EN 302208 and/or EN 300330, as applicable.

NOTE: Certain Electronic Article Surveillance (EAS) equipment have been tested and found to conform to the CE emission and immunity requirement in Europe. 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. Under unusual circumstances, interference from external sources may degrade the system performance, which may include intermittent decreases in detection and/or intermittent increases in alarm activity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment experiences frequent interference from external sources or does cause harmful interference to radio communications reception, which can be determined by turning the equipment off and on, please contact a Checkpoint Systems representative for further assistance.

RoHS Compliance Statement

The RoHS Directive stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment." A RoHS compliant product means that electrical and electronic equipment cannot contain more than maximum permitted levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE). Checkpoint is in compliance with the RoHS directive.

WEEE Compliance Statement

The Waste Electrical and Electronic Equipment Directive (WEEE) applies to companies that manufacture, sell, distribute, or treat electrical and electronic equipment in the European Union. There are a number of obligations imposed on Checkpoint as a supplier of electrical and electronic equipment. Checkpoint's compliance approach for each of these obligations is provided below.

WEEE Marking

All products that are subject to the WEEE Directive supplied by Checkpoint are compliant with the WEEE marking requirements. Such products are marked with the "crossed out wheelee bin" WEEE symbol shown below in accordance with European Standard EN 50419.

Information for Users

According to the requirements of European Union member state WEEE legislation, the following user information is provided in English for all Checkpoint supplied products subject to the WEEE directive.



This symbol on the product or on its packaging indicates that the product must not be disposed of with normal waste. Instead, it is your responsibility to dispose of your waste equipment by arranging to return it to a designated collection point for the recycling of waste electrical and electronic equipment. By separating and recycling your waste equipment at the time of disposal you will help to conserve natural resources and ensure that the equipment is recycled in a manner that protects human health and the environment. For information about how to recycle your Checkpoint supplied waste equipment, please contact the Checkpoint Systems, Inc. Field Service office in your region. Customers can obtain this information from their system User's Guide.

REACH Compliance Statement

The European REACH Regulation 1907/2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH), Annex XVII entered into force in June 2009, and affects all companies producing, importing, using, or placing products on the European market. The aim of the REACH regulation is to ensure a high level of protection of human health and the environment from chemical substances.

Checkpoint Systems' substances management system follows and complies with the current revision of the REACH Regulation on the substances as identified by ECHA (European Chemical Agency).

Checkpoint Systems' products are considered articles as defined in REACH Article 3 (3).

These products/articles under normal and reasonable conditions of use do not have intended release of substances. Therefore, the requirement in REACH Article 7 (1) (b) for registration of substances contained in these products/articles does not apply.

Checkpoint Systems' products/articles do not contain Substances of Very High Concern or if there are SVHC in the product/article, the content is less than the 0.1% (wt/wt) as defined by REACH Article 57, Annex XIV, Directive 67/548/EEC. Therefore, the requirement in REACH Article 7 (2) to notify ECHA if a product/article contains more than 0.1% wt/wt of an SVHC and tonnage exceeding 1 tonne per importer per year is not applicable.

Checkpoint Systems' European operations do not manufacture or import chemicals. Therefore, Checkpoint Systems has no obligation to register substances.

Packaging Compliance Statement

No CFCs (chlorofluorocarbons), HCFCs (hydrofluorocarbons) or other ozone depleting substances are used in packaging material. Chromium, lead, mercury, or cadmium are not intentionally added to packaging materials and are not present in a cumulative concentration greater than 100 ppm as incidental impurities. No halogenated plastics or polymers are used for packaging material. Checkpoint complies with the EU Directive 94/62/EC.

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1.0 INTRODUCTION

The NP12, NP22 and NG12 NEO 2.0 System Antenna models are covered in this manual. System top-level part numbers and available hardware options are provided in the following.

1.1 System Identification



Figure 1: NP12

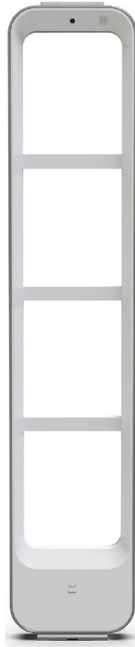


Figure 2: NP22



Figure 3: NG12

1.2 System Part Numbers (SKUS)

The following Checkpoint Part Numbers (CKP P/Ns) are NEO 2.0 Finished Good part numbers (SKUs). The part numbers are available in SAP. Check SAP to determine which NEO 2.0 Antennas, Accessories and Kits are currently stocked in the local warehouse.

Lower Base (NP12/NP22) models listed below require appropriate matching Antenna Frame models for a complete Pedestal system.



Figure 4: Lower Base



Figure 5: Antenna Frame

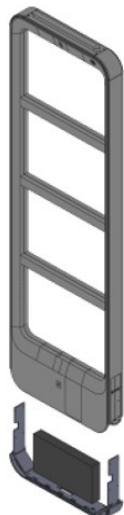


Figure 6: Antenna Frame / Lower Base

Lower Base Models

Model Name	Part Number (SKU)	Description / SAP Material Name
NP12 Lower Base	10037227	NP12 PRI/PAB LOWER BASE
	10037229	NP12 SAB LOWER BASE
NP22 Lower Base	10037234	NP22 PRI/PAB LOWER BASE
	10037235	NP22 SAB LOWER BASE

Table 1: Lower Base Models

RF Antenna Frame Models

Model Name	Part Number (SKU)	Description / SAP Material Name
NP12 RF Antenna Frame	10037230	NP12 PRI/PAB/SAB RF ANT FRAME WHT
	10037231	NP12 PRI/PAB/SAB RF ANT FRAME GRY
NP22 RF Antenna Frame	10037236	NP22 PRI/PAB/SAB RF ANT FRAME WHT
	10037237	NP22 PRI/PAB/SAB RF ANT FRAME GRY

Table 2: RF Antenna Frame Models

Pedestal Models

Model Name	Part Number (SKU)	Description / SAP Material Name
NG12 Pedestal	10037240	NG12 PRI/PAB RF PED WHT
	10037241	NG12 SAB RF PED WHT
	10037243	NG12 PRI/PAB RF PED GRY
	10037244	NG12 SAB RF PED GRY

Table 3: Pedestal Models

1.3 Accessories and Kits

Kits

Model Name	Part Number (SKU)	Description / SAP Material Name
NP12/NP22/NG12 Speaker Upgrade Kit	10037251	KIT, SPEAKER UPG NP12/NP22/NG12
NP12/NP22/NG12 Disable Key Card	10037252	KIT, PED EN/DIS RDR NP12/NP22/NG12
Hyperguard Upgrade Kit (NP12 or NP22)	10037260	KIT, UPG HYPERGUARD NP12/NP22
Metalguard Upgrade Kit (NP12 or NP22)	10037261	KIT, UPG METALGUARD NP12/NP22
Kit, NP12 Quick Base	10037538	KIT, NP12 QUICK BASE
Kit, NP22 Quick Base	10037539	KIT, NP22 QUICK BASE

Table 4: Kits

Accessories

Model Name	Part Number (SKU)	Description / SAP Material Name
NP12 Ad Panel	10037245	NP12 AD PANEL 3/4 HEIGHT
NP22 Ad Panel	10037246	NP22 AD PANEL 3/4 HEIGHT
NP12 People Counter	10037247	NP12 VISIPLUS UPG WHT
	10037248	NP12 VISIPLUS UPG GRY
NP22 People Counter	10037249	NP22 VISIPLUS UPG WHT
	10037250	NP22 VISIPLUS UPG GRY
Key Card - Blank	10037253	NEO EN/DIS KEY CARD
Baseplate, NP10	10070215	BASEPLATE, WIREMOLD INSTL NP12
Baseplate, NP20	10037457	BASEPLATE, WIREMOLD INSTL NP22

Table 5: Accessories

1.4 Using This Guide

This document provides information on NEO 2.0 features, hardware functionality and product specifications.

2.0 GENERAL DESCRIPTION

2.1 EAS Features

2.1.1 Radio Frequency Band – Detection limited to 8.2MHz

NEO 2.0 is tuned to achieve detection of tags at 8.2MHz ±5% radio frequency.

Tags tuned to other frequencies may or may not produce an EAS alarm; expect a noticeable drop in performance with non-8.2 MHz tags.

2.1.2 Electronic Mode of Operation

Two Electronic Modes of Operation are available:

1. Detector Mode
2. PAB/SAB Mode

Both operation modes are considered “Pulse-Listen”, but mode selection will cause TX/RX differences.

Any PRI model antenna should run in "Detector" mode and a PAB/SAB pair should operate in "PAB/SAB" mode.

The NEO 2.0 System Controller and EAS Sensor require minimum Software, Firmware and FPGA version to support PAB/SAB. New supported FPGA version(s) will also support the alternate (“Detector”) mode.

NOTE: A PAB antenna can technically operate in "Detector" mode and a PRI model can run in “PAB/SAB” mode, but both are considered non-standard operation. A system running in a non-standard mode – as intentionally or unintentionally set by the FS Technician – does NOT cause a regulatory compliance issue but is expected to negatively impact system performance. Therefore, always install the recommended FPGA (Software/Firmware package) and set up pedestals (antennas) in the mode that supports the appropriate hardware use case.

2.1.3 Configurable Alarm Sound/Light Color

Using DMS, the Field Service Technician can select from a set of pre-loaded Sound (.mp3 format) files or otherwise import an mp3 file (requested by the customer), then set the selected/imported sound file as the default EAS Alarm sound. Alarm light can also be configured from a range of colors and patterns.

3.0 QUICK CONNECT CABLES AND QUICK BASE

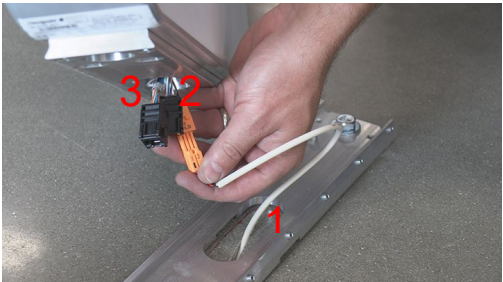

NEO 2.0 Family Antennas are equipped with:

1. Quick Connect cables.
2. "Quick Base" technology mounting/receptacle plates (NG12).

3.1 Quick Connect Cables


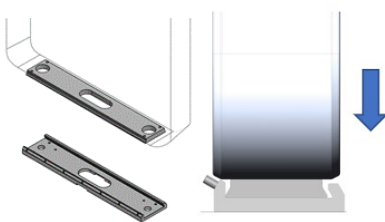


PAB and PRI Pedestals will have the following Quick Connect cables.

1. DC Power Input,
2. General Purpose Outputs (Relay contact pairs),
3. General Purpose Inputs (Digital inputs).
4. Network cable.

Minimum connections:	Maximum connections:
<ol style="list-style-type: none"> 1. +24V DC Power 2. GPO- J6 3. GPI- J8  <p style="text-align: center;">Figure 4: Quick Connect Cables</p>	<ol style="list-style-type: none"> 1. +24V DC Power 2. GPO- J6 3. GPI- J8 4. Network  <p style="text-align: center;">Figure 5: Maximum Cables</p>
<p>Network is available on the PAB and PRI models only. There is no way to repurpose the GPI or GPO cable to provide the Network feature - additional hardware is required.</p>	

3.2 Quick Base (NG12)

The NEO 2.0 Antenna’s no-tilt Quick Base technology Mounting/Receptacle Plates allow installation in tight spaces. Each pedestal’s factory installed Mounting Plate easily assembles to a floor anchored matching Receptacle Plate. After cable connections are made, Pedestal mounting can be completed. See critical details below.

<ul style="list-style-type: none"> One of these is required: <ul style="list-style-type: none"> ○ 2.5mm T-Wrench ○ 2.5mm Allen key  <ul style="list-style-type: none"> Each Extension Cable gets matched with/connected to the appropriate permanent-installation cable. Three (3) RJ-45 connectors (for building cables) are provided in the installation kit. Finally, the Field Service Technician / Installer will <ol style="list-style-type: none"> Lift and position the Pedestal’s Quick Base over the bolted down Receptacle Plate. Lower the quick base into the receptacle plate. Slide the quick base into the receptacle plate v-groove. Using the 2.5mm T-wrench/Allen key, tighten the receptacle setscrews to secure the pedestal. 		
		

4.0 SYSTEM HARDWARE

4.1 System Controller

Excluding SAB Antennas, each NEO 2.0 model includes one (1) EAS Sensor and antenna wiring, and one (1) System Controller and control cabling. The System Controller is one of the central devices. USB devices and the Light and Speaker board interface directly with the controller.

A 64-Bit Processor runs the embedded Software and Firmware, which work together to control all high-level and low-level operations. An example of a high-level (Software) operation is reporting to the cloud; an example of a low-level (Firmware) operation is controlling the hardware.

For wireless functionality, the System Controller relies on auxiliary devices (e.g., Bluetooth dongle). Auxiliary devices connect to the controller via USB ports (see [Connection Ports](#) below).

The system controller receives 5.0V / 3A regulated DC power from the Light and Sound Circuit of the TR4320 EAS Board (see [Light and Sound Circuit / SOM Board](#) below).

4.1.1 Connection Ports

There are three (3) USB ports and one (1) Ethernet (RJ45) port on the side of the System Controller. Each USB port has a designated function (e.g., Bluetooth port, Data cable port). When installing/swapping an accessory module,

ensure the module gets connected to the appropriate USB port. The Ethernet port is a wired "Service Interface" (for Field Service use).

4.1.2 Service Parts

There are different "Upper Bay Assemblies" for the NEO 2.0 models.

Model Name	SAP Material Code	Description
Upper Bay in NP12	10037286	^TOP PLATE,NP12
Upper Bay in NP22	10037278	^TOP PLATE,NP22

Table 6: Upper Bay Spares

4.2 Upper Bay Hardware

4.2.1 Light and Sound Circuit / SOM Board

The Light and Sound circuit is on the TR4320 EAS board. +24V DC power gets supplied to the EAS board in the lower bay. The Light and Sound Circuit of the EAS board features a real-time clock with battery backup, an Audio amplifier, LED drivers, serial EEPROM, Watchdog timer, and reset switch.

4.2.2 LED Board

The LED Board has 10 LEDs each comprised of 3 RGB LEDs and 3 sub-LEDs per every 1 Multi-color LED. The LED Board also has a small momentary switch (push button). The push button is for Field Service use only.

4.2.3 Speaker

NEO 2.0 offers a full-range (150 Hz - 20 KHz) speaker.

4.3 EAS Sensor (TR4320 Board)

The TR4320 "EAS Sensor" (CKP P/N 10036971) is a TX/RX transceiver. The EAS Sensor (TR4320 board) is a critical component in the EAS Detection System.

The EAS Sensor's electronic tuning and digital signal processing enable successful detection of real alarm events while ignoring alarm triggers due to "phantoms." The TR4320 has an FPGA (Field Programmable Gate Array) with processor and memory functions. It's equipped with Metal Shields - separate shields for RX and TX circuit sections.

The TR4320 board, assembled to the lower bay mounting bracket, makes up the Lower Bay subassembly also called "Board Carrier" or "PCBA" (PCB Assembly). The complete Lower Bay subassembly is serviceable. See the table below for service part numbers (SAP Material codes).

Check and note provided NEO 2.0 hardware revisions.

4.3.1 Service Parts

Model Name	SAP Material Code	Description
Lower Bay for PRI/PAB Model Antenna	10037310	^LOWER BAY, PRI/PAB NEO V2.0
Lower Bay for SAB Model Antenna	10037311	^LOWER BAY, SAB NEO V2.0

Table 7: Lower Bay Spares

Complete Lower Bay, rather than a single failed PCB, replacement speeds up service. See the installation manual for lower bay replacement/upgrade procedures.

4.4 A1240 PAB/SAB Splitter Board

Each EAS Sensor has two (2) RF transmit (TX)/receive (RX) circuits. When running in "PAB/SAB" mode, the two (2) TX/RX circuits operate in different modes and are physically connected to the "Splitter Board" PCB hardware (CKP P/N 10037179) which features a 1:2 RF split and LED signal routing.

With PAB/SAB, there is a "Primary" pedestal which contains the EAS Sensor (TR4320) and a Splitter Board (A1240), and a "Secondary" pedestal, which contains only the Splitter Board (A1240). From the EAS Sensor, 1 transmitter controls the primary side, and 1 transmitter controls the secondary side.

Each set of adjacent pedestals include one splitter board in the Primary and one in the Secondary. Inter-pedestal cables connect both devices. "PAB" and "SAB" apply because the splitter board can be used either as the "Primary Antenna Board" (or Primary Splitter Board) or, when installed at the secondary, as the "Secondary Antenna Board" (or Secondary Splitter Board). Jumper settings adjustment is not required for PAB or SAB operation but can be made for LED color selection.

NOTE: Both PAB and SAB systems contain a "Coupler board" (impedance matching board). The diagram below shows the 8.2 MHz RF signal path (other cabling and hardware features not depicted) illustrating how TX1 and TX2 are typically used.

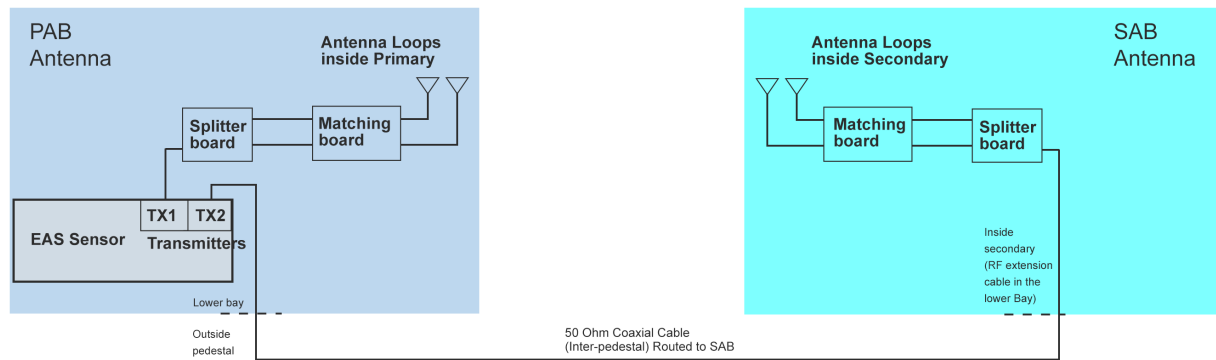


Figure 6: PAB (above left) and SAB (above right): Pedestal hardware and RF signal routing.

4.4 Other Hardware

4.5.1 Matching Coupler Board

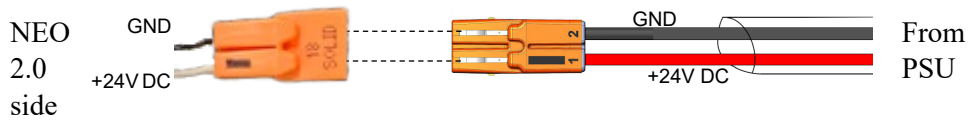
An important part of the antenna RF Circuit is the antenna impedance Matching Coupler Board. The FS Technician should not have to inspect/repair a coupler board since each is Factory-Installed and Ready "As Manufactured." There are no PCB Jumpers on the NEO 2.0 Coupler boards - tuning is not required.

4.5.3 Quick Connect Cables

As stated in section 3.1 above, each Antenna will have (based on configuration) up to four (4) Quick Connect cables. During installation, cable connections are made before pedestal mounting.

24V DC Power Input

NEO 2.0 Side: +24V DC = White Cable (Orange Connector pole with Black stripe)



The power connection is a "tool less" connector (only wire strippers/cutters are needed to prep the wire leads - no screwdriver required).

If the provided power connector fails during use, the FS Technician may install the DC power cable using a UL-approved wire connector junction such as 2-Position terminal block (CKP P/N 7155630) or equivalent. Insulated connectors with a locking lever are also common (approved for use so long as they meet local/national code for low voltage wiring and have UL-approval).