10035527

Title:

USER'S MANUAL

NS40 EAS SYSTEM:

USING NS40 PEDESTAL &
NEO CONTROLLER

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REVISIONS

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00	CR2688R	08/13/20	S. SINGH

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

		DOC SPEC	DATES
		DWN	
		CHK	
		ENG	
Used On		APPD	

Checkpoint®

Size US Letter	10035527
Scale: N/A	© Checkpoint Systems, Inc. 2020

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.

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.

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 60950-1, CSA C22.2 No. 60950-1-07. 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.

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 R&TTE Directive 99/5/EC, EMC Directive 2004/108/EC, and Low Voltage Directive 2006/95/EC.

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 Telecommunications Standards Institute (ETSI) standards 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.

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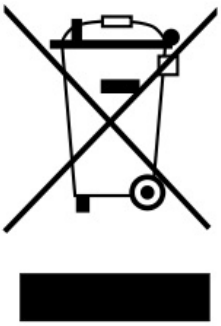
The Waste Electrical and Electronic Equipment Directive (WEEE) applies to companies that manufacture, sell, distribute, or treat electrical and electronic equipment in the European Union. There are a number of obligations imposed on Checkpoint as a supplier of electrical and electronic equipment. Checkpoint's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

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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 no obligation to register substances.

Packaging Compliance Statement

No CFCs (chlorofluorocarbons), HCFCs (hydrofluorocarbons) or other ozone depleting sub-stances 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/E.

TABLE OF CONTENTS

1.0 INTRODUCTION 7
1.1 System Identification 7
1.2 System Level Checkpoint Part Numbers (SKUs) 7
1.3 Using this Guide 8
1.3.1 Reference Documents (See Also): 8
2.0 GENERAL DESCRIPTION 9
2.1 EAS Features 9
2.1.1 Radio Frequency Band 9
2.1.2 Electronic Mode of Operation 9
2.1.3 Configurable alarm sound/light color 9
3.0 System Hardware 10
3.1 System Controller 10
3.1.1 USB Ports on the System Controller 10
3.1.2 Spare Part Information 10
3.2 All Hardware found in Upper Bay 10
3.2.1 Light and Speaker Board 10
3.2.2 LED Board 11
3.2.3 Speaker 11
3.2.4 USB Devices 11
3.3 EAS Sensor (TR4300 board) 11
3.3.1 Spare Part information 11
3.4 Remaining Hardware 12
3.4.1 Matching Board 12
3.4.2 GPIO Module 12
3.4.3 Power Supply 12
4.0 SPECIFICATIONS 13
4.1 Overall Size 13
4.2 EAS Sensor 13
4.3 System Controller 13
4.4 Light and Speaker Board 14
4.5 IO Board (GPIO Module) 15
4.6 Audio Speaker 15
4.7 LED Board 16
4.8 Environmental 16
5.0 USING DMS TO APPLY SOFTWARE SETTINGS 17
6.0 POWER SUPPLY REQUIREMENTS 18
6.1 General Details 18
6.1.1 Approved PSU Model 18
6.1.2 Plenum PSU Installation 19
6.2 PSU 1:1 Rule 19
6.3 Other Safety Considerations 19
6.4 Ferrite Core Installation 19
6.4.1 Optional Ferrite on DC Cord near PSU AC/DC Adapter 19
7.0 DEVICE LABELING 21
7.1 External Label 21

LIST OF FIGURES

FIGURE 1: NS40 7
FIGURE 2: 50W POWER SUPPLY 18
FIGURE 3: IEC CORD (NOT INCLUDED) 18
FIGURE 4: COMMON FERRITES 20
FIGURE 5: OPTIONAL FERRITE CORE PLACEMENT, NEAR PSU ADAPTER 20

LIST OF TABLES

TABLE 1-1: NS40, CONTROLLER AND PSU PART NUMBERS 7
TABLE 4-1: UPPER BAY SPARES 10
TABLE 4-2: CONTROLLER PCB "CAGE" SPARES 11

1.0 INTRODUCTION

The NS40 is an EAS Pedestal which has some unique aspects to it, both visually and in terms of the way it works. NS40 can be considered part of the NEO "Range" or Product Family. It relies upon the same radio transceiver found in the popular NP10, NP20 and NG10 Antennas but the difference between NS40 and these Antennas (Pedestals) is the NS40 is a remote-driven antenna.

1.1 System Identification

Figure 1: NS40

1.2 System Level Checkpoint Part Numbers (SKUs)

Checkpoint Part Number (CKP P/N) can be considered the SKU of the Finished Good. In SAP you will find these "System SKU" part numbers listed as the Material Item #. Check SAP to determine which NEO Antennas are currently stocked in your local warehouse:

Table 1-1: NS40, Controller and PSU part numbers

Model Name	System SKU	Omnify Description
NS40	10035441	*NS40 PEDESTAL
NEO Controller	10034765	*NEO REMOTE ELECTRONICS CONTROLLER
50W GlobTek	7116509	PWR SPLY,SW 90-264 VAC 24 VDC 2.1A EPS1

1.3 Using this Guide

You can review NS40 features and learn about the hardware which provides functionality in this document. For Product Specifications, please see Section 4.0.

This document does not provide any instructions for installation or site planning.

Please refer to the NS40 Quick Start Guide for site planning and installation support.

1.3.1 Reference Documents (See Also):

For NS40 "Quick Start" help, refer to CKP P/N 10035521 Rev 00 or later.

2.0 GENERAL DESCRIPTION

2.1 EAS Features

2.1.1 Radio Frequency Band

Detection Limited to 8.2 MHz

- No “Application Based Detection Mode” (7.6, 9.0 detection).
- NS40 is tuned to achieve detection of HF targets at 8.2MHz ±5% radio frequency.
- Tags tuned to other frequencies may or may not produce the alarm; expect a noticeable drop in performance for any non 8.2 tag.
- By product management and design team choice, working from voice of customer, the feature was removed intentionally. Now the only supported band is 8.2 - different from Evolve/Liberty Systems. Currently for NEO Antennas, please consider alterative tuning & dual frequency no longer supported.

2.1.2 Electronic Mode of Operation

The NS40 requires the NEO Controller with the EAS Sensor (TR4300 TX/RX PCB).

The controller ships in the default configuration of Detector mode, and there should be no need to reconfigure this setting.

Each controller drives 1 NS40.

At the time of this publication, NS40 does not support PAB/SAB or the "2 SSB" Remote Installation layout.

2.1.3 Configurable alarm sound/light color

Using DMS (see section 5.0), the Field Service Technician is able to choose from a set of pre-loaded Sound Files (.mp3 format) or otherwise import a file, a replacement sound requested by the customer, then assign it as the default EAS Alarm sound. The color is also selectable from a range of visual colors and patterns.

3.0 SYSTEM HARDWARE

3.1 System Controller

The NS40 itself includes one (1) coupler board (A1200 matching board), RF 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 it.

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). The USB Ports and Ethernet port are described in more detail below.

The system controller receives 5.0V / 3A regulated DC power from the Light and Speaker board covered in section 3.2.1 below.

3.1.1 USB Ports on the System Controller

There are three (3) connection ports are USB Ports and one (1) is an Ethernet port (RJ-45) on one side of the System Controller. Each **USB Port** has a **designated function** (e.g. the port for Bluetooth; the port for the Data cable). When you need to swap (or install) an accessory module, be sure you are installing your device in the correct port. The Ethernet port is a wired "Service Interface," used only by MFG and/or field service.

3.1.2 Spare Part Information

The spare part for the SOM used in NS40 is described below.

See Table 4-1:

Table 4-1: Upper Bay Spares

Model Name	SAP Material code	Description
Spare "SOM" for NS40	10035460	^SOM,NS40

The same SOM unit (CKP P/N 10034668) is used in both NS40 and NG10. The thermal pad used is the only difference. Also, for NS40 the thermal pad is pre-applied in the correct place. The NS40 Quick Start Guide will describe SOM replacement.

3.2 All Hardware found in Upper Bay

3.2.1 Light and Speaker Board

The Lights and Speaker board (CKP P/N 10077571) mates directly with the system controller. +24V DC power arrives from the lower bay. The PCB features power regulators, a real-time clock with temperature compensation and battery backup, a watchdog, an Audio amplifier, and a RGB Light driver.

3.2.2 LED Board

The LED Board has 10 LEDs which are each comprised of 3 RGB LEDs, 3 sub-LEDs per every 1 Multi-color LED. The LED Board also has a small momentary switch, which is a push button; only Field Service is expected to use this interface.

3.2.3 Speaker

NS40 features an audio speaker, which is distinctly different from a piezo type "buzzer". Read more about the Speaker in section 4.6.

3.2.4 USB Devices

One (1) USB Bluetooth module (dongle) comes standard. However, NS40 does not come with WiFi dongle pre-installed. So if WiFi is plannd, it's necessary to upgrade the planned master.

NS40 does NOT support Cell Modem (due to the large size of the Cell Modem, there is no space for the device to fit).

3.3 EAS Sensor (TR4300 board)

The TR4300 (CKP P/N 10053101) is a TX/RX transceiver we call "EAS Sensor" or "TR4300 board."

The EAS Sensor gives rise to the EAS Detection System. To successfully detect real alarm events and not trigger due to "phantoms," the EAS Sensor has electronic tuning and digital signal processing. RF tuning is outside the scope of this document.

There are no jumpers on the TR4300. Like earlier "Evolve" main boards, the TR4300 has an FPGA (field programmable gate array) with processor and memory functions. Metal Shields are equipped (separate shields for Rx and Tx circuit sections). Manufacturing ensures tightness. With the NEO Controller, there are no pre-installed connectors. Field Service is responsible for installing the cable assemblies in the correct ports.

The TR4300 board is mounted in a subassembly referred to as the "Cage" or sometimes "Board Carrier" (also "PCBA" for PCB Assembly). The entire cage is the spare. See Table 4-2 for the spare or upgrade part numbers (SAP Material code).

3.3.1 Spare Part information

To order a spare:

Table 4-2: Controller PCB "Cage" Spares

Model Name	SAP Material code	Description
Complete Cage for the NEO Controller	10058664	^LOWER BAY,ELEC NEO RF ONLY

Complete replacement, rather than replacing a single failed PCB, speeds up service times.

3.4 Remaining Hardware

3.4.1 Matching Board

An important part of the antenna in the RF Circuit is the antenna impedance matching board or "coupler board" for short. The FS Technician should never have to inspect/repair a coupler board, because they are Factory-Installed and Ready "As Manufactured." On the NS40 coupler board, there is no hardware tuning (no PCB Jumpers, which is different from Evolve).

3.4.2 GPIO Module

The NEO Controller also features a simple I/O board has input, outputs, and a Serial data (RS-232) port. The NEO Quick Start guide offers complete pin-out tables and basic software setup instructions.

The available interfaces are defined below.

GPO J6

This RJ-45 port is for triggering external devices.

There are Relay NO/NC contact pairs, which must be enabled using DMS.

2 unique relays are present (2 available in hardware/software).

GPI J8

This RJ-45 port is for accepting input signals.

There are 4 inputs which can be "mapped" to various events (advanced setup required).

CPiD-RF J5

There is also a CPiD-RF Serial Data interface available (opening the system is required); the ferrite core in the installation kit shall be used on the Cat 5e / Cat 6 or better cable, if installed, to the J5 serial port.

The NEO Installation Manual describes the hard-wired connection which is used to integrate CPiD-RF Deactivator (or deactivator chain using the CPiD Communications Module or "CAM").

3.4.3 Power Supply

The Power Supply is part of the system. See section 6.0 for all Power Supply Requirements.

4.0 SPECIFICATIONS

4.1 Overall Size

NS40:

Height: 164.7cm [64.84in]

Width (at top): 8.3cm [3.27in]

Width (at base): 5.4cm [2.13in]

4.2 EAS Sensor

Mechanical Specs:
PCB Layers: 8
PCB Materials: FR4
Dimensions: L X W: 116mm X 170mm [4.567in X 6.693in]

Electrical Specs:
DC Input / Output: +24V (other voltages are available using GPIO and connectors)
Clock Speed: 100 MHz
Clock Speed: 12.000 MHz

Connector function (Number): Connector type
Power Input / Output (2): 3-Pin 3.5mm connector, keyed
Power Output to Upper Bay (1): 3-Pin 3.5mm connector, keyed
Power Output for expansion module (1): 3-Pin 3.5mm connector, keyed
RF Antenna outputs (2): 2-Pin 3.5mm connector, keyed
USB Serial port (1): USB Type B connector, shielded
IO Board (GPIO module) B2B connector (1): 2 x 12 Header PCB-mount, Right Angle
Expansion (e.g. Hub board) B2B connector (1): 2 x 12 Header PCB-mount, Right Angle

4.3 System Controller

Mechanical Specs:
Small PCB about the size of a credit card

Electrical Specs:
CPU: 64-Bit Processor
Memory: 1GB 1600MHz LPDDR3 memory; 16GB

Connector function (Number): Connector type
Data Interface to/ from LnS Board (1): Header 2 x 20 PCB mounted, Female socket
Power input: DC power supplied from the Light and Speaker board (thru 2 x 20 header pins)
USB serial interface: USB Type A ports (3). Typically at least 2 USB ports are in always in use. These two uses are (1) Data from Lower Bay and (2) Bluetooth USB Dongle. The third available USB port can be used for WiFi in NS40 (no physical space to accommodate Cell Modem in NS40).
Audio output: Stereo output, bare leads are soldered to the PCB terminals to reduce space
Ethernet connector: Not in use (except for field service and/or MFG needs)
HDMI port: *not in use

4.4 Light and Speaker Board

Mechanical Specs:
PCB Layers: 4
PCB Materials: FR4
Dimensions: L X W: 56mm X 100mm [2.2in X 3.94in]

Electrical Specs:
DC Power Input: 24V DC
Regulated Outputs: 5V DC

Connector function (Number): Connector type:
Power Input (1): 2-Pin Euro Plug F connector (CKP P/N 7100784) included as part of PWR cable assemblies (for lower to upper power NP10 uses 10045277; NP20 uses 10090050).
Data Interface to/ from controller (1): Header 2 x 20 pins, Male pins
Speaker 2-Pin mini jack (1): Hirose 2-Pin port, keyed
LED 7-Pin mini jack (1): Hirose 7-Pin port, keyed
System Controller Audio Input 3-Pin mini jack (1) Hirose 3-Pin port, keyed
USB Connector (1): USB Mini-C connector for interface to controller

4.5 IO Board (GPIO Module)

Mechanical Specs:

PCB Layers: 4

PCB Materials: FR4

Dimensions: 32.5mm X 76.5mm [1.28in X 3.01in]

Electrical Specs:

Inputs: 4. RJ-45 connector (2 pins per input).

Outputs: 2. The GPO RJ-45 connector has 4 relay contact pairs in total. 2 Normally Open (N.O.) and 2 Normally Closed (N.C.). Each output drives an open and closed contact pair.

RS-232 serial data interface (intended only for support of CPiD-RF): 1

Connectors: 3 RJ-45, and 2 x 12 header male, pre-installed B2B with EAS Sensor.

4.6 Audio Speaker

Mechanical Specs:

Dimensions: 2” diameter

Square frame: OD of frame is approximately

Electrical Specs:

Impedance: 4 Ohm

Frequency response: Full range speaker (150 Hz - 20 KHz)

Terminals: Soldered

Wire type: 26 AWG PVC, stranded wires (Red and Black color)

Connector, Lights and Sound Board side (speaker output terminal): Hirose DF13-2S-1.25C

Crimp Terminals: Hirose DF13-2630SCFA(04), Qty 2.

4.7 LED Board

Mechanical specs:

PCB Layers: 2

PCB Materials: FR4

Dimensions: LED board is a circular shape with a center cutout, approx. 3 inches in diameter

Features: 10 LEDs aligned in a circle.

Each LED can illuminate in various colors, relying on 3 individual LEDs (Red, Green, and Blue) inside each of the 10 PCB-mounted LEDs.

Electrical specs:

Connector port (1): 7-Pin Hirose connector

Switch on it SPST Simple Switch (depress button)

Required Cable (available as a FS spare): ^CABLE ASSY,LED NS40 (10035418)

Power input rating: 24V / 60mA

4.8 Environmental

All the internal electronics shall meet or surpass the listed environment specifications:

Operating Temperature: 0° to + 60° C
Non-Condensing Relative Humidity: 5% to 95%

5.0 USING DMS TO APPLY SOFTWARE SETTINGS

Checkpoint DMS is **by-license-only** software, which will be used by field service, engineering and manufacturing to set up NS40.

Tuning can be performed using DMS. Transmit Power and other critical settings are checked/set with the help of Analog View and similar software features. DMS is also used at the time System installation to pick the LED color, pattern and the sound file (.mp3) played when the EAS Alarm Event occurs.

6.0 POWER SUPPLY REQUIREMENTS

6.1 General Details

The Power Supply Unit (PSU) is sold separately from the NS40 and NEO Controller.

The NEO Controller requires +24 Volts DC supplied at J6 or J14 of the EAS Sensor.

PSU which is suitable shall be an external AC/DC converter power supply rated at 24VDC nominal, with LPS either 50W or 90W maximum. LPS stands for limited power source. Refer to Sourcing Spec (CKP P/N 10034493).

6.1.1 Approved PSU Model

Use only the approved power supply. The approved PSU is GS-599ES(R) (CKP P/N 7116509). This PSU can be installed with or without the "hood kit." It is the Technician's responsibility to determine when the hood kit is required to meet national and/or local code. Plenum PSU Installation (see section 6.1.2 below) is not typical, but can be achieved as necessary to meet code.

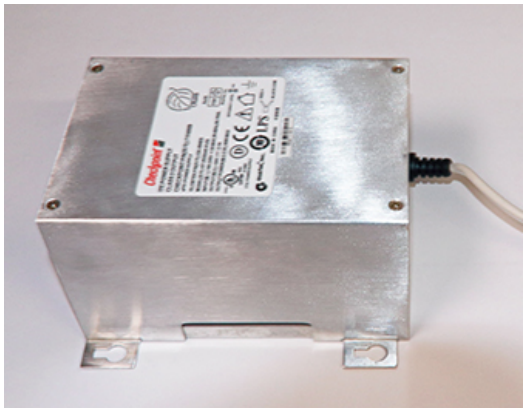

Figure 2: 50W Power Supply

The region-specific IEC Power Cord is not included. For example, North America uses the 3-prong AC cord type shown below. The "NA POWER CORD" is CKP P/N 7209892.

Note: You must purchase 1 region-specific AC Cord per 1 PSU.

Figure 3: IEC Cord (Not Included)

6.1.2 Plenum PSU Installation

In the US, if the power supply is to be installed in a plenum (HVAC ventilation) area, the GlobTek GS-599MC-KIT(R) (CKP P/N 7367100) must be installed. In the event of such an installation, the power supply must be hard wired to comply with section 300.22 (C) of the NEC.

The kit includes the standard power supply (see Figure 2 above) and plenum-rated conversion kit.

6.2 PSU 1:1 Rule

The "Power Supply One to One Rule" for NEO Controller is required.

PSU should be wired directly to a pedestal. Powering 2 primary pedestals from one PSU in daisy chain configuration is not allowed.

6.3 Other Safety Considerations

Always install using quality 18AWG, 2-Conductor cable routed directly to the TR4300 power input.

Only use 1 power connector as the DC Power input (i.e. do not connect 2 power supplies directly to 1 reader).

On the EAS Sensor, J6 and J14 are wired in parallel, allowing the means to supply power to an accessory device (rated for +24V DC), provided that the accessory device and the TR4300 combined do not draw more current than the PSU rating (e.g. 2.1 amps max current).

6.4 Ferrite Core Installation

The NS40 Install Kit contains the required ferrite cores, which are applied to the DC power cord and other I/O cables. Refer to the NS40 Quick Start Guide for ferrite core number of turns, type and placement on the system I/O cables.

Consistent with NEO NP10/20 Pedestals, applying an additional ferrite core at the PSU Adapter side is considered optional.

6.4.1 Optional Ferrite on DC Cord near PSU AC/DC Adapter

Although not required for FCC or ETSI compliance, the ferrite core shown below is considered "optional." When the DC cord seems to be causing "noise" then applying any of these types of ferrite cores may mitigate the noise conditions.

Figure 4: Common Ferrites

1 Ferrite Core is provided in the installation kit, however this ferrite is typically not needed (see section 3.4.2 describing its intended use).

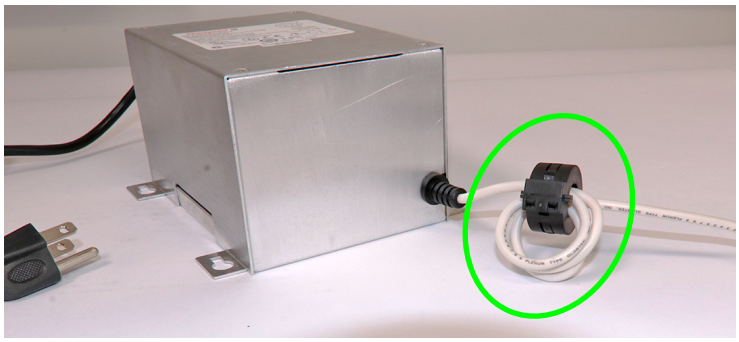

Figure 5: Optional Ferrite Core Placement, Near PSU Adapter

Shown above, the "Multi-Purpose Ferrite Core" (CKP P/N 7284760) is suitable to be used here. Figure 4 shows other types which can be used. You can apply this (or any) ferrite core with 4 turns near the DC output as shown.

7.0 DEVICE LABELING

7.1 External Label

NS40 has only the Serial Number/Agency Label which includes the regulatory information, as well as the Model Name and serial number of the unit manufactured.