



PowerSeries Neo Alarm Controller

Models:

(HS2016/HS2032/HS2064/ HS2064 E/HS2128/HS2128 E)



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Wireless Host Architecture and Engineering Specification



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Wireless Host Introduction and Overview

Introduction

The purpose of this document is to discuss the wireless transceiver component of the PowerSeries Neo Alarm Controller and to provide detailed information about its specifications and features. The following items are covered in this document:

- Wireless transceiver current draw
- Battery life for wireless devices
- Transmit power of wireless devices
- Communication security
- Network topography
- Wireless host features
- Local and remote link quality
- Remote programming of devices

Important: For detailed information about regulatory requirements, model features, system performance, mechanical, electrical and environmental specifications, refer to the document: *PowerSeries Neo Architecture and Engineering Specification*.

System Overview

PowerSeries Neo is a feature-rich, scalable alarm system designed for residential and commercial use. The alarm panel supports both hardwired and wireless devices.

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Wireless Host Specifications and Features

This chapter describes the specifications and features of the PowerSeries Neo wireless host transceiver. It includes information on voltage, current draw, battery life, transmit power, security, and topography.

Model Current Draw Values

The following table lists the current draw values, based on a voltage rating of: 7VDC to 14VDC of each wireless transceiver model.

Table 1 Current Draw Values

Model/Item	Current (mA)
HS2LCDRF	60
HS2ICNRF	60
HS2ICNRFP	60
HSM2HOSTx	35

Battery Life of Wireless Devices

The following table lists the battery life values of PowerSeries Neo wireless devices.

Table 2 Wireless Device Battery Life

Device Type	Model	Bat. Type	Qty	Exp. Life	Low Bat. Threshold
Smoke detector	PGx926	CR123	1	5 years	2.5V
Smoke detector	PGx916	CR123	1	5 years	2.5V
Carbon monoxide	PGx913	9V	1	1 year	7.8V
Siren	PGx901	3.6V 14.5A/H	1	8 years	2 V +300 mV negative slope or 1.2V
Siren	PGx911	3.6V 14.5A/H	1	8 years	2V +300 mV negative slope or 1.2V
Wireless key	PGx939	CR2032	1	8 years	2.2V
Wireless key	PGx929	CR2032	1	5 years	2.1V
Wireless key	PGx938	CR2032	1	5 years	2.1V
Wireless key	PGx949	CR2032	1	5 years	2.1V
Repeater	PGx920	4.8V 1300mAh NiMH rechargeable	1	N/A	4.8V
Glassbreak	PGx912	CR123	1	4 years	2.7V
Glassbreak	PGx922	CR123A	3	5 years	2.6V
Motion	PGx924	CR123	1	7 years	2.45V
Motion	PGx934 /PGx93 4P	CR123	2	4 years	4.5V

Device Type	Model	Bat. Type	Qty	Exp. Life	Low Bat. Threshold
Motion	PGx904	CR123	1	6 years	2.5V
Motion	PGx994	CR123	2	3 years	4V
Motion	PGx974	CR123	1	7 years	2.45V
Motion	PGx984	CR123	1	5 years	2.5V
Temp.	PGx905	CR123	1	7 years	2.2V
Natural gas	PGx923	CR123	1	5 years	2.7V
Flood sensor	PGx985	CR123	1	8 years	2.2V
Shock	PGx935	CR123	1	5 years	2.5V
Door/win	PGx975	CR2032	1	5 years	2.1V
Door/win	PGx945	CR123	1	8 years	2.2V

Transmit Power of Wireless Devices

The following table lists the PowerSeries Radiated Power (ERP) values of PowerSeries Neo wireless devices.

Table 3 Transmit Power of Wireless Devices

Device Type	915MHz	Power Variable	Transmission Power [dBm]	
			Max	Min
			ERP (dBm)	ERP (dBm)
Smoke Detector	PG9926	Yes	14	-26
Smoke and Heat Detector	PG9916	Yes	14	-26
Carbon Monoxide Detector	PG9913	Yes	16.8	-23.2
PIR Motion Detector	PG9904P	Yes	11.7	-28.3
PIR Motion Detector with Integrated	PG9934P	Yes	17.32	-22.68

Device Type	915MHz	Power Variable	Transmission Power [dBm]	
			Max	Min
			ERP (dBm)	ERP (dBm)
Camera				
Curtain Motion Detector	PG9924	Yes	19.62	-20.38
Dual Technology (PIR & MW) Motion Detector	PG9984P	Yes	5.6	-34.4
Mirror Motion Detector	PG9974P	Yes	11.92	-28.08
Outdoor Motion Detector	PG9994	Yes	11.7	-28.3
Glass Break Detector	PG9912	Yes	18.63	-21.37
Glass Break Detector	PG9922	Yes	15.97	-14.53
Shock Detector	PG9935	Yes	22.09	-17.91
Flood Detector	PG9985	Yes	14	-26
Temperature Detector	PG9905	Yes	14	-26
4-Button Key	PG9939	No	-5.28	Same as Max.
4-Button Key	PG9929	No	12.93	Same as Max.
Indoor Siren	PG9901	Yes	12	-28
Outdoor Siren	PG9911	Yes	14.03	-25.97
Repeater	PG9920	Yes	11.24	-28.76
Wireless PowerG Door/Window Contact	PG9975	Yes	14	-26
Door/Window Contact with Auxiliary Output	PG9945	Yes	14.95	-25.05
Panic Key	PG9938	No	4.59	Same as Max.
2-Button Key	PG9949	No	4.59	Same as Max.
Proximity Tag	MPT	--	--	--

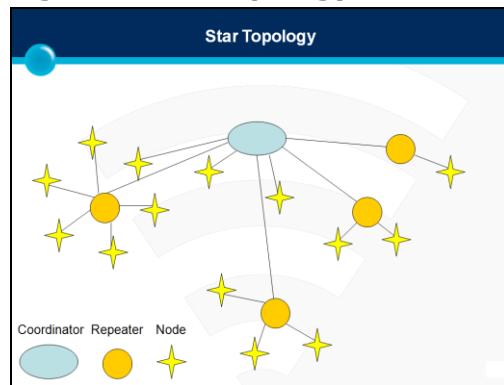
Communication Security

For encrypted traffic line security applications, Advanced Encryption Standard (AES) 128 bit authentication is used.

Network Topography

The topography of the network is a Star topology, as displayed in the following figure.

Figure 1 Star Topology



Wireless Host Features

The following identifies important wireless host features.

- Frequency-hopping Spread Spectrum (FHSS), provides high immunity to interference and good neighbor network co-existence
- Unicast, multicast and "multi-unicast" addressing modes
- Transmit power is dynamically adjusted to the minimum required for reliable communication (Transmit Power Control)
- Automatic route recovery and on-going route optimization
- Device dynamically selects the best local antenna and best parent antenna to work with (Smart Antenna Diversity)
- Detailed, on-going, generation, collection and analysis of diagnostic data
- Enrollment: separated system registration and network association procedures, provides pre-enrollment (local and remote) capabilities

Local Link Quality Indication

Typically after power-up and tamper closure, the end-device provides information, using LEDs, to indicate the quality of the local link. The end-device sends messages to the control panel, and when it receives acknowledgment from the control panel, it interrogates its devices for the quality of the link.

Table 4 LED Color Indication Codes

Code Color	Meaning
Green	Strong
Orange	Good
Red	Poor
No Color	Did not receive an acknowledgment

Remote Link Quality Measurement

The control panel provides statistical information on the quality of the link to devices, which is calculated using data gathered over the previous 24 hours.

Remote Programming of Devices

The following table lists the wireless devices that can be programmed remotely.

Table 5 Programmable Wireless Devices

Wireless Devices	
Wireless PG smoke detector	PGx926 ^{UL}
Wireless PG smoke and heat detector	PGx916 ^{UL}
Wireless PG CO detector	PGx913
Wireless PG PIR motion detector	PGx904(P) ^{UL}
Wireless PG PIR + camera motion detector	PGx934(P) ^{UL}
Wireless PG curtain motion detector	PGx924 ^{UL}

Wireless Devices	
Wireless PG dual tech motion detector	PGx984(P)
Wireless PG mirror motion detector	PGx974(P) ^{UL}
Wireless PG outdoor motion detector	PGx994 ^{UL}
Wireless PG glass break detector	PGx912, PGx922
Wireless PG shock detector	PGx935 ^{UL}
Wireless PG flood detector	PGx985 ^{UL}
Wireless PG temperature detector (indoor use)	PGx905 ^{UL}
Outdoor temperature probe (requires PGx905)	PGTEMP-PROBE
Wireless PG key	PGx939 ^{UL}
Wireless PG key	PGx929 ^{UL}
Wireless PG panic key	PGx938 ^{UL}
Wireless PG 2-button key	PGx949 ^{UL}
Wireless PG indoor siren	PGx901 ^{UL}
Wireless PG outdoor siren	PGx911 ^{UL}
Wireless PG repeater	PGx920 ^{UL}
Wireless PG door/window contact	PGx975 ^{UL}
Wireless PG door/window contact w/ AUX	PGx945 ^{UL}

Frequency Hopping Spread Spectrum (FHSS)

The system uses FHSS technology to change the frequency of a transmission at intervals faster than an intruder can retune a jamming device. With FHSS, the bandwidth is divided into multiple frequency channels. Once a wireless connection is established and time-synchronization is gained, the receiver and transmitter agree on one of practically an infinite number of frequency hopping sequences.

These sequences are both encrypted and time-dependent. Based on the current time and a mathematical calculation, both the receiver and transmitter hop to the next frequency channel in the sequence at the same time. Unless the system time, the system encryption key, and the proper calculation are all known, the communication cannot be tracked. As a result, unauthorized interception of a communication is virtually impossible.

Table 6 FHSS Specifications

Frequency Bands (Mhz)	Hopping Frequencies
433 - 434	8
868 - 869	4
912 - 919 (North America)	50

Wireless Keys

Wireless keys do not take up zones once they are configured. In addition, once a wireless key is configured, the control panel can then communicate with it to determine its communication status and to display the status to the user, by means of LEDs on the wireless key itself.

This completes the Wireless Hosting Architecture and Engineering specification for the PowerSeries Neo Alarm Controller.

Again, for detailed information about regulatory requirements, model features, system performance, mechanical, electrical and environmental specifications, refer to the document: *PowerSeries Neo Architecture and Engineering Specification*.



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