

Plena PLN-1LA10 Loop Amplifier

Inductive Loop Presentation



Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

 **BOSCH**


1

Plena PLN-1LA10 Loop Amplifier

Agenda

- Objectives
- Introduction?
 - How it works
 - Where to think of
- Plena PLN-1LA10 Loop Amplifier
 - Features
 - Configuration Example
 - A complete solution
 - Applications

Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

 **BOSCH**

2

Plena PLN-1LA10 Loop Amplifier

Objectives

- Further completion of the Plena product range
- Provide solution to meet legislation towards equal opportunities for disabled people in both public address and voice alarm applications.
- Make audio available for people that are hard of hearing
- Growing liability in different countries.
 - To now about:
 - Due to liability Australia became the biggest market, followed by Germany and the Netherlands.
 - About 3-5% of the population have hearing problems.

3

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.


BOSCH

Plena PLN-1LA10 Loop Amplifier

Introduction

Hearing aid users have difficulty in understanding in situations where:

- The background noise level is high
 - Normal hearing need around 6 dB signal to noise ratio
 - Impaired hearing need **15 to 20 dB** signal to noise ratio
- Reverberation time is long
- The sound has a large dynamic range
- Turning up the volume of the hearing aid is not a solution
- Assistive listening systems are very helpful

4

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.


BOSCH

Plena PLN-1LA10 Loop Amplifier

Introduction

- Assistive listening technologies available in the market:
 - Inductive loop system (E.g. Plena PLN-1LA10)
 - Infra-Red distribution system (E.g. Integrus)
 - FM carrier system

NOTE:

- More and more countries introduce legislation to ensure equal rights for disabled people
 - DDA Disability Discrimination Act (UK)

5

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

Loop amplifier or Infra-Red?

Loop Amplifier

- No special accessories needed, such as infra-red receiver
- Suitable for Voice Alarm applications (if supervised)
- Proceedings in 1 language only
- Multi room applications
 - only supported using low spill over schemes

6

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

Loop amplifier or Infra-Red?

Infra-Red

- Suitable for confidential meetings
- Multi language proceedings
- Multi room applications easily supported

- Can call unwelcome attention to the disability
- Need to be collected at the end of the hearing session

7

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

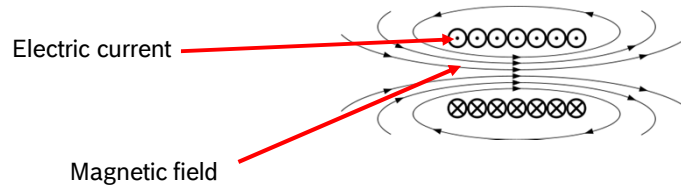

BOSCH

Plena PLN-1LA10 Loop Amplifier

How it works?

Loop = Simple Antenna

A changing electric current through a loop (antenna)
generates a changing magnetic field
(like a dynamo on your bike)



8

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.


BOSCH

Plena PLN-1LA10 Loop Amplifier

How it works?

→ Hearing aid in T mode picks up magnetic field from inductive loop

9

Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

How it works?

- The Loop driven by the loop amplifier generates an magnetic field.
- Magnetic **field strength varies** with audio supplied to loop amplifier.
- Hearing aid works on the vertical component of the magnetic field.

10

Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

How it works?

Voltage driven loops

→ Features:

- Not suitable for large areas / loops
- Loss of high frequencies
- Low efficiency

11

Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

How it works?

Current driven loops

→ Features:

- Best solution
- Good frequency response
- Suitable for both small and large areas

12

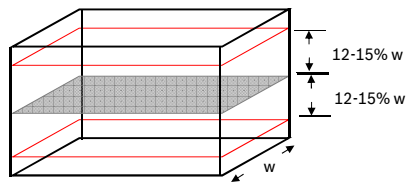
Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

How it works?

Loop design

- Create loop around listening area
- Max 12 meter wide (w)
- Mounted on the floor or ceiling
 - Optimal distance from ear level $\pm 12-15\%$ of width (w)



13

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

How it works?

Loop design

- Compliance with IEC60118-4
- Flat frequency response $\pm 3\text{dB}$ within 100 – 5000 Hz range
(Relative to 1kHz)
- Average field strength 100 mA/m $\pm 3\text{dB}$
(70-140 mA/m)
- Maximum field strength 400 mA/m
- Dynamic range $< 12\text{dB}$

14

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

How it works?

Loop design single loop


Loop Amp

Loop Amp

Max 12 meter wide (w)

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



BOSCH

15

Plena PLN-1LA10 Loop Amplifier


How it works?

Loop design multi loops

Loop Amp

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



BOSCH

16

Plena PLN-1LA10 Loop Amplifier

Where to think of

Before installing a loop take care of the following:

- Magnetic interference from other electronic devices
- Metal in floor or walls
 - causes loss of high frequencies
- Position of (dynamic) microphones

Always do a site survey!

17

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

Plena PLN-1LA10 Loop Amplifier



18

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

Features

- Easy installation and configuration
- High power output
 - Coverage up to 600 m²
- Current driven
- Built-in support for quadrature systems
- IEC60849 compliant
- Excellent sound quality for both speech and music (*In top 3 (1.->.3 salesperson depended)*)
- Automatic Gain Control and Limiter
- Metal loss compensation
- 2 Audio inputs Line/Mic
- Access control via metal cover



Let's have a closer look

19

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

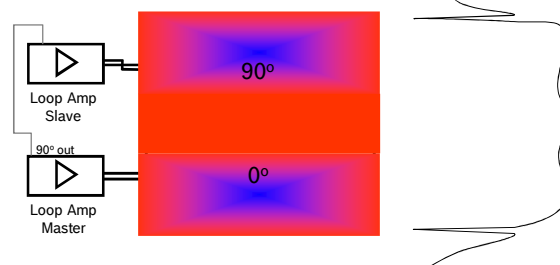

BOSCH

Plena PLN-1LA10 Loop Amplifier

Quadrature System

- Master / Slave configuration with 90° Phase shift
- Even coverage over very large areas (IEC60118-4)
- Support of low spill schemes
- Built-in, no extra components needed

Single turn loop



20

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.


BOSCH

Plena PLN-1LA10 Loop Amplifier

Quadrature System

Standard

Quadrature
Plena PLN-1LA10

21 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

Quadrature System

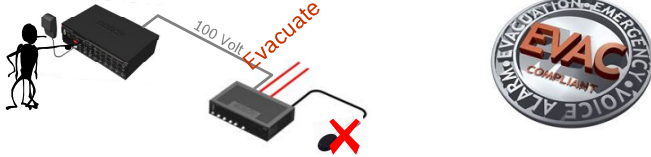
Multi loops

22 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.


Plena PLN-1LA10 Loop Amplifier

IEC 60849 compliant

- Fully supervised
 - internal power supply
 - integrity of the installed loop via pilot tone detection
 - priority input via pilot tone detection
- 100 Volt priority Input
- Visual fault indicator on the front panel
- Fault relay to connect to Voice Alarm System.
- Note: UPS power supply required to power Loop Amplifier



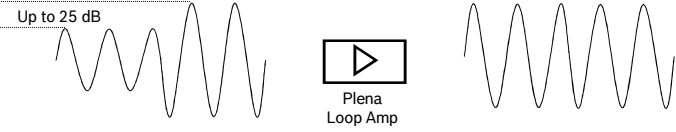
23 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.




Plena PLN-1LA10 Loop Amplifier

Automatic Gain control

- Constant output level
- No volume adjustment at hearing aid during hearing session
- Up to 25 dB adjustment range



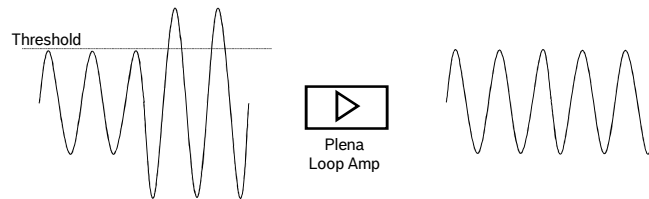
24 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



Plena PLN-1LA10 Loop Amplifier

Limiter

- Reduces level above threshold
- Acts immediately



25

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

What is more?

- Visual indicators
 - Important for hearing aid user to see correct functioning of the Loop Amplifier
 - Indicate power on and presence of input signal
 - Indicate presence of output signal on loop
 - Fault and loop integrity indicators
- Short circuit, overload and over temperature protection
- Part of the Plena family
 - Offering a complete solution for a wide range of applications
 - Appearance of the unit in line with current range of Plena products.

26

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

On/Off button, Input volume meter, LED controls, Tone controls, Master volume control, Current meter, Status indicators, Frequency compensation input/output, Priority Master/Slave input/output, Input 1 + Line output, Loop relay.

Security Systems
 27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

Configuration Example

Announcement set-up

Security Systems
 28/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

Plena PLN-1LA10 Loop Amplifier

A complete solution

Bosch Security Systems offers you a complete solution:

- The Plena Loop Amplifier
- The Plena Public Address range
- The XLA3200 series passive Line Arrays with excellent directivity and side lobe suppression
- The Intellivox series active Line Arrays with software controlled directivity of the sound beam
- A complete range of uni-directional microphones

29

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Plena PLN-1LA10 Loop Amplifier

Applications

Typical applications

- Medium sized to large areas
- Speech and/or Music reproduction
- Proceeding in 1 language
- Areas with high background noise and long reverberation times
- Multiple rooms using low spill over schemes

30

Security Systems

27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.

**BOSCH**

Header of section

Applications

Places of Worship



Theaters / Cinemas



City Councils / Meeting Rooms / Congress centers



31 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



Plena PLN-1LA10 Loop Amplifier

Marcom Materials

- Plena Poster
- Mailer
- Application Note
- A&E Specifications
- Advertisement
- Datasheet
- Press Release

Plena Public Address and Voice Alarm Systems

Ensure that hearing aid users...


Solution with Induction Loop System

Solution with Infrared System

Hearing aid assistance... in public buildings

Hearing aid assistance... in public buildings

32 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



Plena PLN-1LA10 Loop Amplifier



33 Security Systems
27/04/2006 | © Robert Bosch GmbH reserves all rights even in the event of industrial property rights. We reserve all rights of disposal such as copying and passing on to third parties.



BOSCH