PANDA SYSTEM OVERVIEW

A low cost, wireless solution for enhancing pedestrian and driver safety

The PANDA (Pedestrian And Driver Alert) System is an Australian developed 'driver active advance warning' system that uses wirelessly controlled flashing lights to deliver more effective warnings in locations where pedestrians and road vehicles interact. By coupling road-side flashing lights with optional in-road lights, this system has been shown to deliver more effective warnings - up to 80% more effective than alternate systems - to help reduce the risk of accidents and near misses.

Designed for locations such as pedestrian crossings, carpark exits and other 'black spots', PANDA's modular architecture is simple to apply, because all the warning lights are wirelessly controlled and either solar or battery powered. This means PANDA lights can be installed almost anywhere - and for considerably less than hard-wired (externally controlled and powered) warning systems.

The warning lights at the heart of a PANDA System come in two forms:

- **‘Road-Side’** light modules that:
  - comprise a modular enclosure with 2 flashing lights, a wireless repeater, a 3G modem, a storage battery and a solar charging system; and
  - are pole-mountable so that they can be placed behind, or adjacent to, a passive warning sign;
  - suit a range of sign types, including diamond, circular and square/rectangular.

- **‘In-Road’** light modules that:
  - comprise a sealed enclosure with 14 ultra-bright flashing LEDs, a wireless repeater and a long-life Lithium Ion storage battery pack;
  - are installed into the road surface, facing on-coming vehicular or foot traffic;
  - are placed where they’re most easily seen, either down road lane markers and/or are across a road or pavement.

PANDA’s wireless architecture makes the system highly modular and able to be configured to address a very wide variety of applications where more effective advance warnings are needed to improve driver and pedestrian safety. A range of activation options, combined with local engineering and support, make PANDA not only the most flexible ‘advance visual warning’ solution in Australia, but also the best value-for-money solution.

### Features vs. Benefits

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<th>Benefits</th>
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<tr>
<td>Modular architecture</td>
<td>Can be adapted to suit most applications</td>
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<td>Wirelessly networked components</td>
<td>No inter-connecting cables means lower costs of installation and lower cost of ownership</td>
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<td>Solar and battery powered</td>
<td>Road-side and In-Road lights can be installed anywhere, even in locations without 240V power</td>
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<td>Retrofittable Road-Side Light modules</td>
<td>Can be easily fitted to existing pole-mounted ‘passive’ warning or hazard signs</td>
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<td>No radio license required</td>
<td>Simplifies installation and commissioning</td>
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<td>Warning Lights provide enhanced advance warnings to drivers and pedestrians</td>
<td>Deliver the improved response times required to avoid danger</td>
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## System Building Blocks

### Activation
- **Pedestrian Pressure Pad**
  Used in applications where foot traffic in a defined area is required as the trigger for the warning system. Bonded to the paving surface, these mats are connected to an adjacent ADC (see below), that in turn wirelessly activates the warning lights.

- **Pedestrian Infra-Red Detector**
  An alternate option for applications where pedestrians approaching a hazard zone is required to trigger the warning system. These pole mounted sensors are connected to an adjacent ADC, that in turn wirelessly activates the warning lights.

- **Vehicle Detection Radar**
  Used in applications where vehicles approaching a hazard zone is required as the trigger for the warning system. These pole mounted sensors are connected to an adjacent ADC, that in turn wirelessly activates the warning lights.

- **Pedestrian Push-button**
  Used where it is required that pedestrians activate the warning system manually. These pole-mounted push-buttons are connected to an adjacent ADC, that in turn wirelessly activates the warning lights.

### Timer
- In applications where the warning system is desired to operate for set periods, e.g. at a school crossing during school zone hours, the road-side flashing warning lights can be pre-programmed. These can in turn activate optional in-road lights. In timed applications, an ADC is not required.

### Attendant
- **Handheld (Portable) Wireless Remote Control**
  For applications where an attendant on duty (e.g. a school crossing ‘lollipop person’), is the preferred mechanism for activating the warning system. Simply press a button to activate, and another to deactivate. Remotes are security coded to the PANDA System they are supplied with.

- **Building Mounted (Fixed) Wireless Remote Control Panel**
  For applications where a remote attendant (e.g. in the administration office of a local school that a crossing services) wishes to activate the warning system.

### Warning
- **Road-Side Warning Lights**
  These self-contained modules are comprised of amber flashing warning lights and wireless repeaters. They are fitted to pole-mounted signs on the approaches to pedestrian crossings or other hazardous locations. Modules are available in two styles: ‘Type A’ (with two lights at the top); and ‘Type B’ (with diagonally positioned lights). Module types are selected depending on the type of sign being used. These solar powered devices feature optional fail-to-safe capabilities if they lose network connection.

- **In-Road Warning Lights**
  These modules are self-contained amber flashing in-road lights. They are installed, as required, in the road on the approaches to pedestrian crossings or other potential hazardous zones, starting at the position of the Road-side Warning Light and ending at the crossing or the end of the hazard zone. These battery powered lights feature optional fail-to-safe capabilities.

### Control
- **System Control Unit**
  Also referred to as an ADC (or Alert Device Controller), this is the primary repeater that coordinates inputs from activation devices (e.g. such as Pedestrian Pressure Pads) and the warning lights (both road-side and in-road). In applications where road-side lights are activated by a timer, ADCs are not required.
**SYSTEM SOLUTIONS OPTIONS**

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<td>ATTENDANT ACTIVATION</td>
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- In-built into PANDA Road-Side Warning Light Module

| PEDESTRIAN/VEHICLE ACTIVATION         | 2 2 2 2 - - - 2 + 2 |

| TIMER ACTIVATION                     | - - - - * - - 2 + - |

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A typical PANDA System comprises a pair of wirelessly networked road-side warning lights that are installed behind pole-mounted warning signs. In a pedestrian crossing application, these would be placed 6-20 metres in advance of the crossing. Optional in-pavement beacons are then placed down the roadway, along the lane markers and/or centre line, typically every 4-10 metres.

Similar configurations are used on the approaches to concealed driveways, carpark exits, or other locations where drivers and/or pedestrians need better advance warnings of a hazard ahead. When activated, the lights flash to warn of the danger ahead.

The warning lights can be activated in a number of ways (see below), depending on the application and site-specific issues.

These activation devices communicate with a local PANDA Alert Device Controller (ADC) that signals all warning elements in that system to turn on (or off). The ADC also controls ‘fail to safe’ functions, as well as provides remote monitoring and management functions.

Network security (and separation from adjacent PANDA networks) is by means of an software ‘encryption key’ (set at time of delivery and installation). Adding lights is as simple as installing them and selecting the correct encryption key for that installed system.

**Activation Options**

A range of activation options are available, dependent on site-specific requirements. These devices communicate wirelessly with the PANDA warning lights, via an Alert Device Controller (ADC). This control device applies the over-arching network control and coordination, as well as applies ‘fail to safe’ logic. It also allows remote system monitoring via embedded 3G devices.

- **PEDESTRIAN/VEHICLE:**
  For applications where it is desired to have pedestrians or vehicles approaching the hazard zone to activate the warning lights automatically. Warning systems that are activated will flash for 30 seconds before turning off. Flash times can be changed, depending on site specific needs.

- **AUTO-TIMER:**
  In-built timers can be used to activate/deactivate the warning lights at set times (e.g. during school hours).

- **ATTENDANT:**
  For applications where an attendant (e.g. a ‘school crossing lollypop person’) is on duty at the crossing/hazard zone, or where a local controller (e.g., in the Administration Office of a local school) is supervising its operation. In these scenarios, activation is via either a handheld (portable) remote control, or a fixed wireless control panel (installed in a nearby building).

**Road-side Light Modules**

‘Type A’ & ‘Type B’ warning light modules are comprised of a weatherproof housing fitted with a pair of flashing LED lights, a wireless repeater, a storage battery and a 3G modem. A solar charging panel, antenna cabling and fitting accessories are also supplied.
ABOUT INVENTIS TECHNOLOGY

Inventis Technology is a Sydney based electronic control systems designer and manufacturer. We’ve been creating and delivering innovative control, management and safety solutions to electronics OEMs, emergency services, police, defence and many enterprise and government customers for more than 20 years.

Our brands include SafeZone (driver & pedestrian advance warning systems), PNE (electronic control systems for OEMs), Impart (motor vehicle control systems), EAS (emergency alert siren beacon systems) and Opentec (rugged portable computers and computer-based solutions).