GasAlarm

Engineering aspects and capabilities *(Regulation & Standards)*

- **Mechanical Ventilation Standards - enclosed areas AS1668.2**
- **Refrigeration Safety Standards – AS1677.2**
- **CO2/IAQ DCV / Energy saving (ASHRAE/USA 62.1-2016)**
- **Smart traffic, parking, navigation for smart cities**

Gas Alarm Systems - Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au
Web: www.gasalarm.com.au

Gas Alarm Systems - Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au
Web: www.gasalarm.com.au

ALVI Automation (India) Pvt Ltd
Tel: +91 141 2508131
Email: info@alviautomation.com
Web: www.alviautomaion.com

- CO/NO2 car park monitoring / ventilation fan control (AS 1668.2 Mechanical Ventilation)
- CO gas radicals detection for enhanced Very Early Fire Detection (**VEFSA**)

AS 1668.2 Mechanical Ventilation	***Building Code Aus. Section J***	***Energy Saving***
Greenhouse Gas Saving	***Very Early Fire Detection***	***Building, Plant & Human Safety***

Stand-alone Gas Controller:

- Hardware and software according to SIL2 compliant development process
- Three analog inputs 4-20 mA (CO, NO2, etc)
- Three relays with change-over contact, potential-free max. 250 V AC, 5 A
- Ingress protection weather proof to IP65 (various dimensional housings)
- Two digital inputs status LED for alarm, fault, operation and service (option)
- LCD display (option)
- Warning buzzer (option)
- Reset button (option)
- Operating voltage 24 VDC/AC (optional:240VAC)

Gas Controller for Small Car Parks

Digital / Multi-Channel Gas Controllers (large car parks):

- For up to 128 gas transmitters, 96 of them PolyGard®2 digital and/or 32 of them analog (4 to 20 mA)
- Suitable for about 50 toxic, combustible and refrigerant gas sensors/transmitters
- Simple and comfortable commissioning by configuration with standard parameters
- Logical system menu
- Flexible configuration thanks to programmable parameters and set-points
- Four free adjustable alarm thresholds per sensor transmitter
- Six menu languages, easily selectable
- Several alarm relays configurable per alarm threshold
- Power supply 90-240 V AC 50/60 Hz
- 24 V DC - 20 % + 20 %
- Power consumption (incl. sensors) Min. 30 W, 0.15 A, max. 160 W, 0.7 A (depending on type and configuration)
- With hinged polycarbonate clear transparent lockable door IP 65 acc. IEC 606701-24 GP, PD

Digital Gas Controller

Analog Expandable Gas Controllers

Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508131
Email: info@alviautomation.com

Gas Sensors / Transmitters (CO + Early Fire Detection):

- Built in Micro-Computer chip at sensor cartridge (for sensor performance/life tracking)
- Digital measurement value processing incl. temperature compensation
- Low zero point drift, minimal false alarms
- Long sensor life time with regular maintenance
- Hardware & software according to SIL2 compliant development process
- 4 – 20 mA (or 2-10 V) analog output
- Reverse polarity protected, overload and short-circuit protected
- IP 65 polycarbonate glass fibre reinforced acc. EN 60529/DIN VDE 0470-1
- Impact resistant for tough industrial environments IK08 acc. DIN EN 5012/ VDE 0470
- Fire retardant 5VA nach UL 50/ UL 746C, V-2 acc. UL 94, 960° C acc. VDE 0471 / EN 60695

A Housing

D Housing

MC2 Sensor

Sensor/Transmitter

Available for Gas Types:

- Carbon Monoxide (CO) / Nitrogen Dioxide (NO2)
- Refrigerants like; R134a, R410a, R123, CO2, Ammonia, etc
- Explosive Gases like; Methane, Propane, LPG, Hydrogen, LNG & CNG etc.
- **Coal Seam Methane Gas, VEFSA** (Very Early Fire Detection and Smoke Alarm for smouldering fires
- IAQ (CO2 / VOC) for fresh air fan intake fan control

Interfacing Accessories:

- Various ranges of sirens & strobes with different colour lenses.
- Health USB CO2 / VOC guard with different colour LED for low cost indoor air quality IAQ monitoring in office spaces and vehicles
- Flashing LED warning signs with Customized text like;
  - EVACUATE
  - GAS ALARM
  - SWITCH OFF IGNITION
  - DO NOT ENTER

Custom Made Signs

Sounders & Strobes (IAQ)

Health Guard USB CO2 /VOC

GSM Alarm Dialler 3G Compatible:

- 3G GSM dialler with 2,4 & 8 digital inputs, can send text to 10 different mobile numbers, easy to configure via software

Applications:

- Security & Safety Alarm System applications
- Pumping Stations, river Monitoring and Flood Control remote control
- Oil and gas pipelines remote control and data logging
- Valve controls;
- Energy saving, street lights control system;
- Tanks, levels, temperatures, water leakage applications
- Transformer stations;
- Unmanned machine rooms and Control room applications

Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508 131
Email: info@alviautomation.com

Atmospheric Contaminants Monitoring in Underground Car Parks CO/NO2

Australian standard AS 1668.2-2012 and Building Code Australia Section "J" indicates that the ventilation of the parking structures should be continuous, 24/7. However, by ventilating only when the sensors indicate a requirement, energy can be conserved both from reduced fan operation and also from any related heating or cooling costs and CO gas radicals detection for enhanced **Very Early Fire Detection**

Several factors must be taken into consideration when determining the correct system, few listed below (sample only):

Parameter	Council City	EXAMPLE
Site Name and Address		Building XYZ 505 George Street Sydney, 2000, NSW
Car Park Levels		5 levels of underground car park
Dimension		70m length & 35m wide All levels are same size
Gas Types of Sensors		CO, NO2, Natural Gas, Methane LPG[1a] *majority would be Carbon Monoxide and NO2 for Loading docks*
Number of sensors		4x sensors required in each level[1b]
Controller		24 Channel Controller or 1 Digital Controller with display.
Safe levels in Car parks		TWA of CO : 30 PPM, NO2: 3 PPM[2a] STEL of CO : 200 PPM, NO2: 5 PPM[2b]
Interface System		• Building Management System • Fan Details;- Single speed, Two Speeds, VSD Drive • Warning Signal/Alarms

Relevant Excerpts from AS 1668.2 (Mechanical Ventilation in Enclosed Car Park)

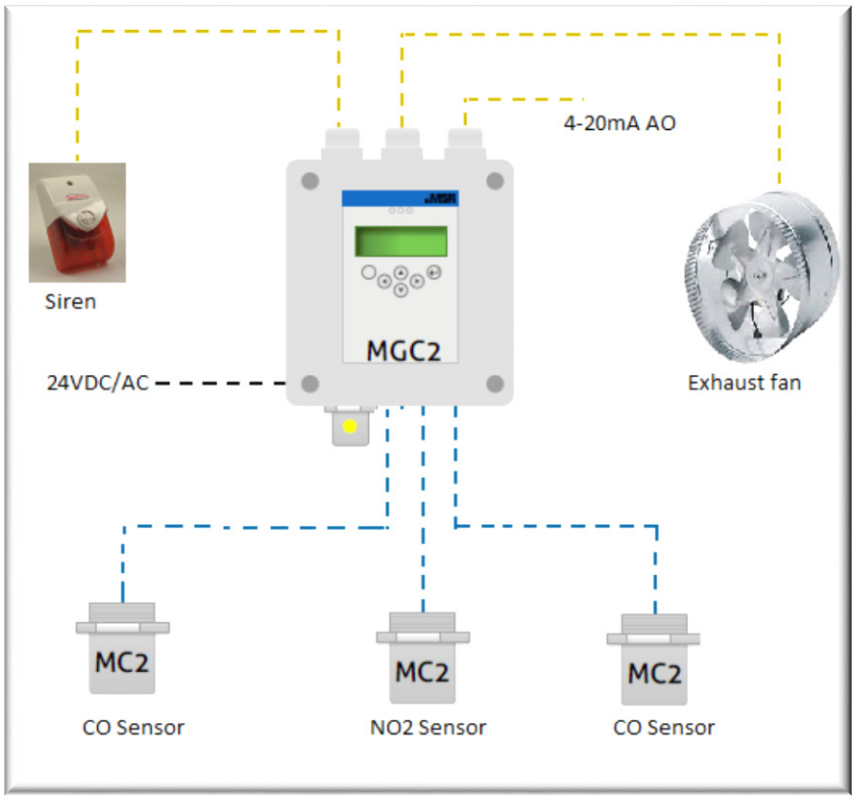
1. **4.12 Monitoring Of Atmospheric Contaminants**
   a. ***C4.12.1*** *Advice from health authorities indicates that monitoring of CO is optimum for contaminant monitoring system for enclosures used by vehicles with combustion engines. Although NO2 is produced by some combustion engines, monitoring results have indicative the CO levels exceed the exposure standard (ES) before NO2 level.*
   b. ***4.12.5.1 Location and Number***
   Sampling points shall be located
      - *Not greater than 25 m away from a sampling point*
   c. ***4.12.2 System Requirement***
      - *display current reading, Operate 24 hr, In fault condition; activate alarm*
      - *Clearly marked servicing and calibration requirements*

2. **Adopted National Exposure Standards for Atmospheric Contaminants in the Occupation Environment [NOHSC: 1003] CO [630-08-0], NO2 [10102-44-0]**
   a. ***TWA*** *exposure standard- time weighted average, according to section 5.1 concentration over eight-hour working day*
   b. ***STEL*** *Short Term Exposure Limit according to section 6.6 is expressed as airborne concentrations of substances, averaged over a period of 15 minutes.*

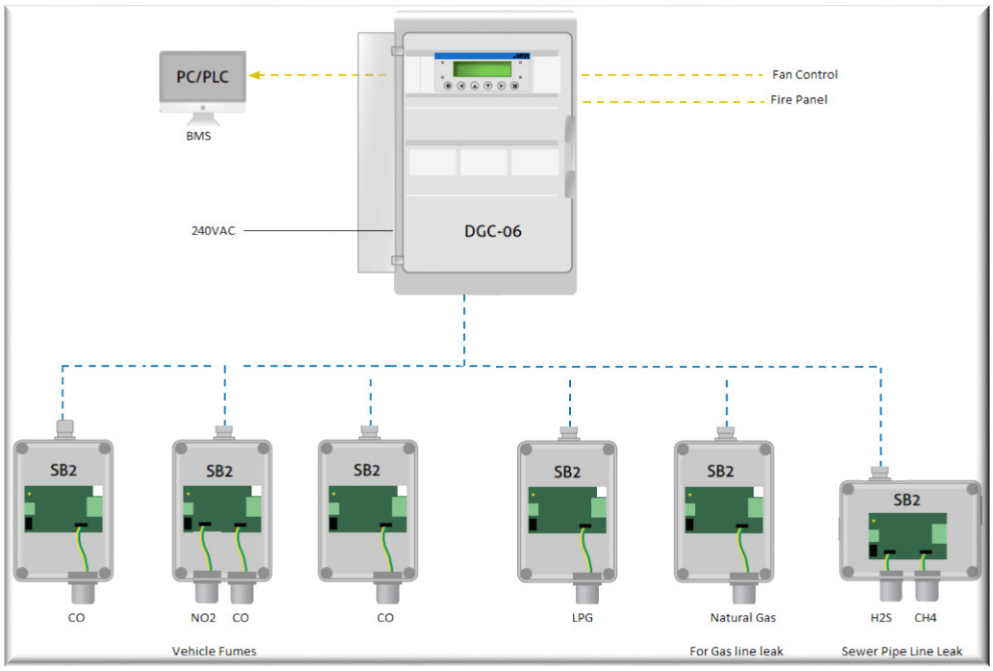
Typical Engineering Schematic

CO/NO_2 Car Park of Ventilation Fan Control System (AS 1668.2, BCA Section J)

Small Car Park (up to 10 car Spaces) CO / NO_2 (Analogue System)



For Large and Multi-level car parks, Gas Detection System (Digital System)



Digital System saves 60-80% on installation cost

Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508 131
Email: info@alviautomation.com

GasAlarm

GAS ALARM SYSTEMS

www.gasalarm.com.au

Refrigerant (Freon) Leak Alarm (HFC & HCFC)

AS 1667.2 Refrigerant Standards	*GWP Ozone Regulation / Act*	*Get 2x Credit Points (EMI 3) acc. GBCA*

Stand-alone Gas Controller:

- Hardware and software according to SIL2 compliant development process
- Three analog inputs 4-20 mA (R134a, R41a, etc)
- Three relays with change-over contact, potential-free max. 250 V AC, 5 A
- Ingress protection weather proof to IP65 (Various dimensional housings)
- UPS (option)
- Two digital inputs status LED for alarm, fault, operation and service (option)
- LCD display (option)
- Warning buzzer (option)
- Reset button (option)
- Operating voltage 24 VDC/AC (optional 240VAC)

3 channel Gas Controller for Chiller Plants

(Multi-Channel Gas Controller also available)

Gas Sensors / Transmitters:

- Built in Micro-Computer chip at sensor cartridge (for sensor performance/life tracking) Semi-Conductor Technology
- Long sensor life time with regular maintenance, no false alarm
- Hardware & software according to SIL2 compliant development process
- 4 – 20 mA (or 2-10 V) analog output
- Reverse polarity protected, overload and short-circuit protected
- IP 65 polycarbonate glass fibre reinforced acc. EN 60529/DIN VDE 0470-1
- Impact resistant for tough industrial environments IK08 acc. DIN EN 5012/ VDE 0470
- Fire retardant 5VA nach UL 50/ UL 746C, V-2 acc. UL 94, 960° C acc. VDE 0471 / EN 60695

A Housing **D Housing** **MC2 Sensor**

Gas Sensor/Transmitters

Available for Gas Types:

- Refrigerants like; R134a, R410a, R123, CO2, Ammonia, etc.
- NDIR (infra-red) technology for **VRV/VRF** and most refrigerants

Interfacing Accessories:

- Various ranges of Sirens & Strobes with different colour lenses.
- Flashing LED warning signs with Customised text like;
  - **EVACUATE, GAS ALARM**
  - **DO NOT ENTER**
- Alarm Dialler (3G GSM) with 2,4 & 8 digital inputs, can send text to 10 different mobile numbers, easy to configure via software
  - Refrigerant Leak Alarm
  - Vapour Recovery System Activated

Custom Made Signs

Sounders & Strobes

Alarm Dialler (GSM 3G)

Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508 131
Email: info@alviautomation.com

Overview / Technicalities

Refrigerant Leak Detection System

Refrigerant leak Detection, Monitoring & Control System is required in large machinery plant rooms as it is mandated by AS1677.2:1998 Section 4.8.

Application of heavier than air (HFC or HCFC) refrigerant gases and its benefits to the end user

• ***Worker protection*** Toxic gases such as R134A and R410A, two commonly used refrigerants in the Australian industry can result in serious health and safety consequences. (TWA 1000ppm)	• ***Industry Regulation Compliance***: AS 1677.2:1998 Section 4.8.2 States machinery/plant rooms are required to be monitored for refrigerant leaks as per specifications supplied.
• ***Cost savings*** The loss of gas through leaks which can be eliminated by a leak monitoring system therefore minimising leakage of expensive refrigerant gases by activating a vapour recovery system. ***This includes the disposal of expensive gases*** according to the Ozone Protection and Synthetic Greenhouse Gas Management Regulations Act 1995	

Basic Requirements as per AS1677.2 of Refrigerant Detection in machinery plant rooms:

- 4.9.2.4
  - *(Excerpt)* Any refrigerant detection alarm system shall incorporate an independent power supply. E.g. battery.
    - Standards state that a detection alarm system must be powered by an independent power supply to the chillers; a UPS therefore is required and comes as standard option in the MGC2 / DGC-06 shown in the typical configurations on the next page.
- 4.8.2
  - *(Excerpt)* … Detectors shall be provided in machinery rooms to activate an alarm in addition to any other functions…
  - *(Excerpt)* … The detector, when sensing a refrigerant concentration exceeding its pre-set limit shall, in addition to its other functions, initiate an alarm in the machinery room and also elsewhere so that emergency action may be initiated…
    - Detectors must be installed in all machinery rooms with chiller plant machinery.
    - Refrigerant leak detection system must be able to activate audio visual alarms inside / outside the room, notify BMS and other functions such as a complete shutdown of the chiller plant, vapor recovery system or an exhaust fan (see GBCA technical manual explanation EMI-3)
- Appendix G
  - *(Excerpt)* It is recommended that detectors are cited above to or both sides of compressors or other non-static parts of the system or down wind of such equipment in the direction of continuously operating ventilation extracts….
  - *(Excerpt)* Detectors should be maintained in accordance with the manufacturer's recommendations.
    - Detectors are recommended to be sited above or on both sides of compressors in a chiller plant room.
    - Detectors should be calibrated as per manufacturer's recommendations.

(Excerpt) ***Green Star Public Building Technical Manual (EMI-3 Refrigerant leaks)***
To Encourage and recognise building systems design that minimises environmental damage from refrigerant leaks (Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995).
Up to two points are available where all refrigeration machinery is equipped with refrigerant leak detection system installed to cover high-risk parts of the plant in accordance with Section 4.8 and Appendix G of AS1677.2:1998;

- One point where all refrigeration machinery is equipped with a manually activated dedicated refrigerant recovery system capable of capturing, isolation and storing 95% (by weight) of the maximum refrigerant charge;

OR

- Two points where all refrigeration machinery is equipped with an automatically activated (by the leak detection system), dedicated refrigerant recovery system capable of capturing, Isolating and storing 95% (by weight) of the maximum refrigerant charge.

Explanation of GBCA Technical manual EMI-3:

- A builder may receive up-to a two-star rating, on their construction, should the building meet the above EMI-3 refrigerant leak detection standard.
    - *(One Point)* Requirement specifies that a refrigerant leak detection system is installed in a machinery plant room and adheres to above basic requirements of AS 1677.2 Refrigerant detection. The refrigeration machinery is required to be equipped with a dedicated manual vapour recovery system capable of capturing, isolating and storing 95% (by weight) of the maximum refrigerant charge.
    - *(Two Points)* Requirement specifies that a refrigerant leak detection system is installed in a machinery plant as per AS1677.2 outline above; in addition the refrigeration machinery vapour recovery system is to be activated via an output from the refrigerant leak detection system.

- **CO2 IAQ Monitoring / Fresh Air fan control (ASHRAE Standard 62.1-2016)**
- **Maintain 1000 ppm IAQ and run fresh air fan only when required (Save Energy)**

Maintain Indoor Air Quality (IAQ)	***Reduce Sick Building Syndromes***	***Energy Saving***
Greenhouse Gas Saving	***Monitor CO2 IAQ***	***Demand Control Ventilation***

CO2 / IAQ Sensor Transmitter:

- Measuring Range : 0-2,000 / 0-5,000 / 0-50,000 ppm
- Sensor Cell : NDIR (Dual Beam Infrared)
- Internal automatic self-diagnostics with auto adjustment
- Maintenance interval* > 5 years
- Analog Output 4-20 mA / 2-10 V
- Modbus option
- Operating Voltage : 24 VDC/AC
- Approved according to* EN 61010-1; ANSI/UL 61010 1; CAN/CSA-C22.2 No. 61010-1
  *Note: may vary depending on model

Duct Mount Transmitter

CO2 Sensor Transmitters (IAQ)

Digital / Multi-Channel Gas Controllers (for large smart city buildings):

- For up to 128 gas transmitters, 96 of them PolyGard®2 digital and/or 32 of them analog (4 to 20 mA)
- Suitable for about 50 toxic, combustible and refrigerant gas sensors / transmitters
- Simple and comfortable commissioning by configuration with standard parameters
- Logical system menu
- Flexible configuration thanks to programmable parameters and set-points
- Four free adjustable alarm thresholds per sensor transmitter
- Six menu languages, easily selectable
- Several alarm relays configurable per alarm threshold
- Power supply 90-240 V AC 50/60 Hz
- 24 V DC - 20 % + 20 %
- Power consumption (incl. sensors) Min. 30 W, 0.15 A, max. 160 W, 0.7 A (depending on type and configuration)
- With hinged polycarbonate clear transparent lockable door IP65 acc. IEC 606701-24 GP, PD

Digital Gas Controllers

Analog Expandable Gas Controllers

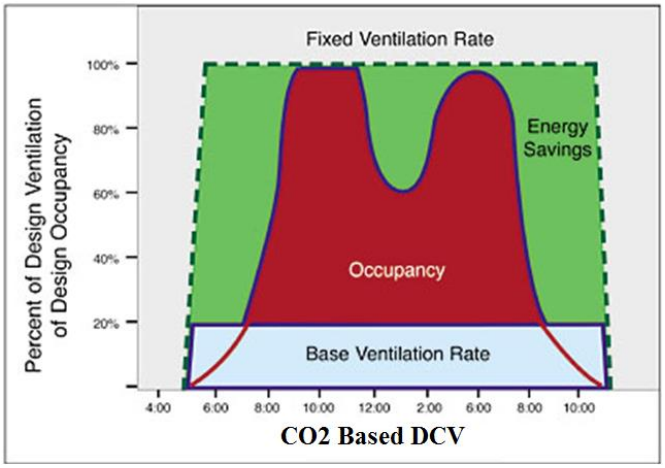
Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508 131
Email: info@alviautomation.com

Selection Criteria (DCV) :

- Ventilation depend on demand rather than supply (monitor space occupancy)
- Maintain indoor air quality – IAQ 1000 ppm
- Make better, healthier working environment including, energy efficient method
- Monitor CO2 IAQ and control fresh air ventilation fan.
- Fix rate of ventilation consumes huge amount of energy and leading to revenue wastage.
- Regulate ventilation requirements, fresh air supply and exhaust air with CO2 IAQ sensor and run fresh air fan only when required as per ASHRAE 62.1-2016
- Ventilation depend on demand rather than supply
- Meet LEED USA, ASHRAE, BCA standards



Interfacing Accessories:

- Differential Pressure Switch/Transmitter for fresh air filter saturations/clog alarm
- USB-IAQ Health guard for use in laptop for surveillance of indoor air quality in your building
- Duct mount CO2 IAQ gas sensor transmitter with 4-20 mA / 2-10 VDC analog output for fresh air fan intake area (to insure no toxic / explosive gases are getting sucked in)
- Terrorism gas threat sensors: range of CBRNE (Chemical Biological Radio Nuclides Explosive) gas sensor transmitters are available for monitoring the fresh air intake to prevent terrorism gases getting sucked in inside the building and there by posing threat to occupants.

Fresh Air Filter

CBRNE Terrorism Gas Threat Sensors

Filter Saturation Alarm

USB-IAQ Health-guard

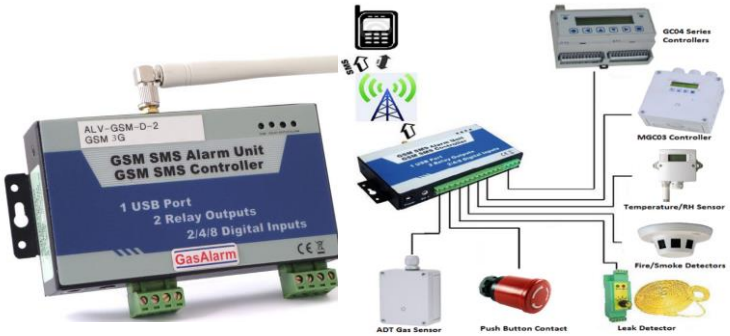
Differential Pressure Switch/Transmitter

Alarm GSM Alarm Dialler 3G Compatible:

- 3G GSM dialler with 2,4 & 8 digital inputs, can send text to 10 different mobile numbers, easy to configure via software

Applications:

- Security & Safety Alarm System applications
- Pumping Stations, river Monitoring and Flood Control remote control
- Oil and gas pipelines remote control and data logging
- Valve controls;
- Energy saving, street lights control system; Tanks, levels, temperatures, water leakage applications
- Transformer stations;
- Unmanned machine rooms and Control room applications



Alarm GSM Dialler 3G

Sydney
Tel: +61 2 9838 7220
Email: sales@gasalarm.com.au

Adelaide
Tel: +61 416 202 261
Email: salessa@gasalarm.com.au

Jaipur - India
Tel: +91 141 2508 131
Email: info@alviautomation.com

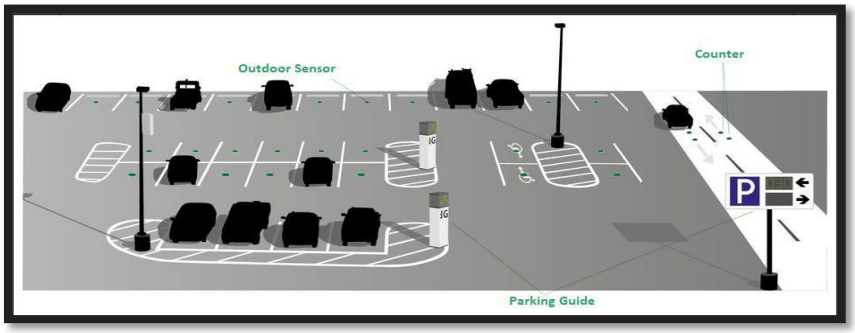
Smart Traffic Systems
PARKING | TRAFFIC | NAVIGATION
www.smarttrafficsystems.com.au

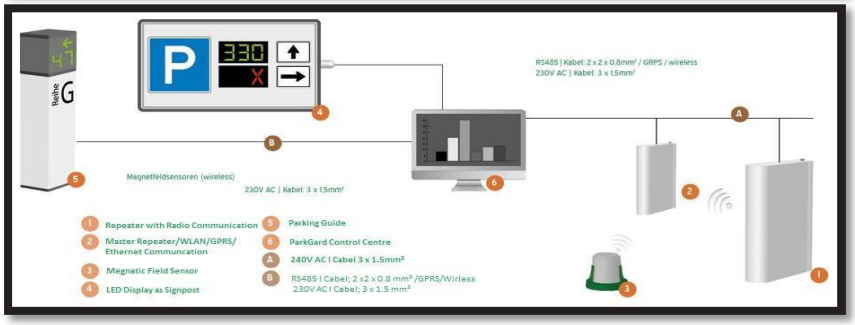
Parking/Navigation Solutions for Smart Cities

Intelligent Parking Guidance	***Innovative Sensor Technology***	***Reduction of Air/Noise Pollution***
Time Saving and Better Quality of Life	***Increase of Utilisation of Free Parking***	***IoT-enabled /Connectivity to Apps***

Outdoor Parking:

- Magnetic field sensors
- Robust sensors IP68 weather proof, regardless of the weather conditions
- Grouted flush with road surface giving protection against vandalism
- Integrated battery with a lifetime of 8 years (quick & easy replacement)
- Monitor zones where parking is prohibited. Likewise, parking spaces with special attention can be monitored, such as disabled parking spaces or unused charging stations





LED Displays:

- Long lifetime
- No additional maintenance costs
- Customer-specific configuration
- Modern design
- Weather-proof

Sydney – Australia
Tel: +61 2 9838 7220
Email: contact@smarttrafficsystems.com.au
Website : www.smarttrafficsystems.com.au

Adelaide– Australia
Tel: +61 416 202 261
Email: contact@smarttrafficsystems.com.au
Website : www.smarttrafficsystems.com.au

Jaipur – India
Tel: +91 141 2508 131
Email: info@alviautomation.com
Website : www.smarttrafficsystems.com.au

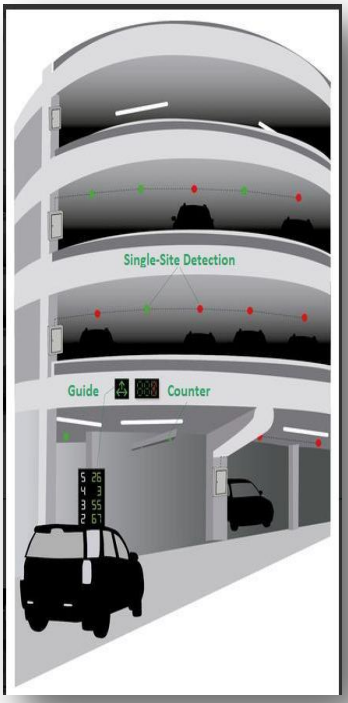
Smart Traffic Systems

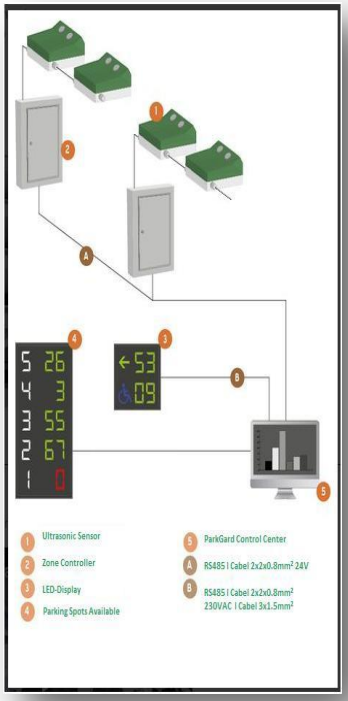
PARKING | TRAFFIC | NAVIGATION

www.smarttrafficsystems.com.au

Indoor Parking:

- Ultrasonic sensors with colored status LEDs
- Counting of free spot for certain zone, but also for individual levels
- The numbers, arrows and symbols can be individually configured
- Modbus Communication





Successful Projects:

- Intelligent parking at Sydney Markets, Australia
- Smart City Parking in Schwäbisch Hall, Germany
- Schilift-Zentrum-Gerlos GmbH, Austria
- Counting taxis at the Vienna International Airport, Austria
- KTM Museum in Mattighofen, Austria
- New Parking Guidance System for Lappersdorf, Germany
- Parking garage for supermarket SPAR in Vienna

SchwäbischHall

Markt Lappersdorf

SYDNEY MARKETS LIMITED

KTM

SPAR

VIE Vienna International Airport

BMW

Sydney – Australia
Tel: +61 2 9838 7220
Email: contact@smarttrafficsystems.com.au
Website : www.smarttrafficsystems.com.au

Adelaide– Australia
Tel: +61 416 202 261
Email: contact@smarttrafficsystems.com.au
Website : www.smarttrafficsystems.com.au

Jaipur – India
Tel: +91 141 2508 131
Email: info@alviautomation.com
Website : www.smarttrafficsystems.com.au