

Smart City Safe City
Video Knowledge Management

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CITY

Smart City Executive Summary

The Safe City / Smart City Project (hereinafter the «Project») is a combination of intellectual property, organizational and operational skills combined together in order to improve living standards of the population, propose a solution to the urban scale problems and enhance the information gathering and dissemination within a circumscribed metropolitan area through advanced technology and its practical application.

The Project is engineered to be at zero cost to the Public Administration, entirely financed by the Private Sector against the P.A. grant to the SPV to manage the offered services for a 8 years period, sharing part of the revenues (by law) and cashing the revenues generated by the implemented additional services and it is proposed to city Councils and to the Public Administration (P.A) through a SPV (Special Purpose Vehicle), Shareholders of which have wide experience and track record to perform the various aspects of the Project.

Executive Summary

There are various contexts where the Project performs its applications: Safety - Mobility - Governance - Environment - Health - Energy - Living – Communication – Tourism - Utilities.

Non exhaustively, main features of the Project may be summarized within the following areas: infrastructure (data center, marsh Wi-Fi), hardware (intelligent self sufficient poles, cameras, server, data room) and software solutions (Video Knowledge Management®, Data Knowledge Management, combining software).

The inter-connection of these three areas allows the Proponents to create a sound and hi-tech state of the art solution to most of any metropolitan area needs.

The Market

Globally, there are some 700 cities, each with population exceeding 500,000 and are growing faster than the average growth rate of cities. This opens up the market for industry players to grow their business in new and emerging smart cities. The infrastructure investment for these cities is forecasted to be \$30 trillion to \$40 trillion, cumulatively, over the next 20 years.

Deploying technologies such as smart grids, smart metering for energy management; traffic management with smart transportation and smart security are high growth areas within smart cities.

The overall smart cities market, valued at \$526.3 billion in 2011, is forecasted to grow double fold to \$1,023.4 billion by 2016, at a CAGR of 14.2% for the period 2011 to 2016.

The Market

Moreover, the next 40 years will see an unprecedented transformation in the global urban landscape. Between 2010 and 2050, the number of people living in cities will increase from 3.6 billion to 6.3 billion.

By 2025 there will be 37 megacities, each with a population greater than 10 million;

Trillions of dollars will be spent on urban infrastructure, presenting an **immense opportunity for new** transport management systems, smart grids, monitoring systems, and energy efficient buildings.

Information and communication technologies will be deeply embedded in the fabric of both old and new cities and will change the way we think of city operations and how we live and work in these environments.

Revenue Stream

Key elements of the project:

Main streets, 18 poles for Network Sensors, IP Digital Cameras, Point for Wireless Mesh Network, Data Center hosting, Service Delivery Platforms Video Knowledge Management®, Control Room, Patents and Decree of Approval EU unique, for direct interaction with P.A.

The project will generate revenues both to the Municipality and to the SPV

The SPV has different sources of revenues:

By Law: Road safety, Certified credit, Postal and Notification (fines, mailing, tax demands).

Services: Digital administration, additional services (safety-traffic management, wifi, communication).

Revenue Stream

BY LAW SUBDIVISION | CdS Art. 148

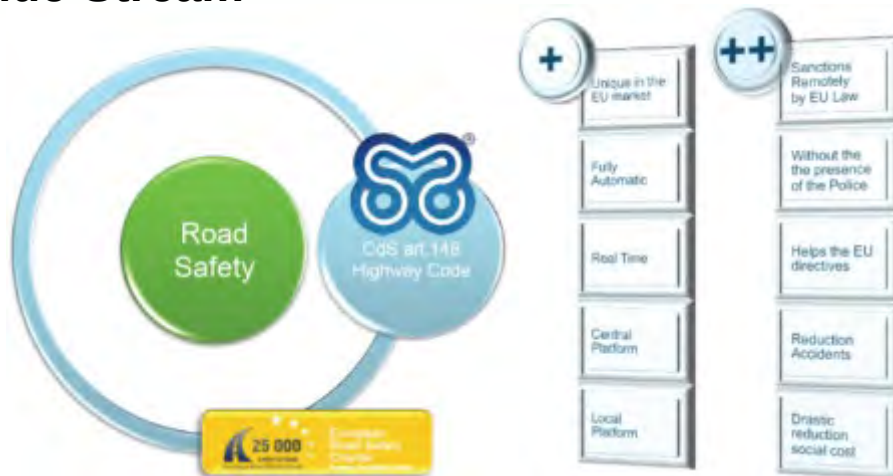
The contract with the Municipality for every, single penalty from Euro 84,00.

The basic price includes the rent of:

Wireless network infrastructure, Data center, Control room,
Rental of TMPSYS-VS23, Service Delivery Platforms Video Knowledge Management®,
Installation, Management,
Maintenance.

Not includes:

Energy, Mailing, Recourse.



Revenue Stream

The TMPSYS-VS23 is able to supply documentary information on the overtaking (and illegal drive on the emergency lane) forbidden by the Highway Code.

The TMPSYS-VS23 is the only product patent and homologate for Italy and the European market to behave as a virtual policeman and collect overtaking fines on the road 24x7.

TMPSYS-VS23 is a totally automatic, integrated and intelligent solution, analyzes the always increasing amount of heterogeneous information produced by the surveillance systems (surveillance camera networks) in order "to understand them" and to plan actions of prevention.

Enabling infrastructure



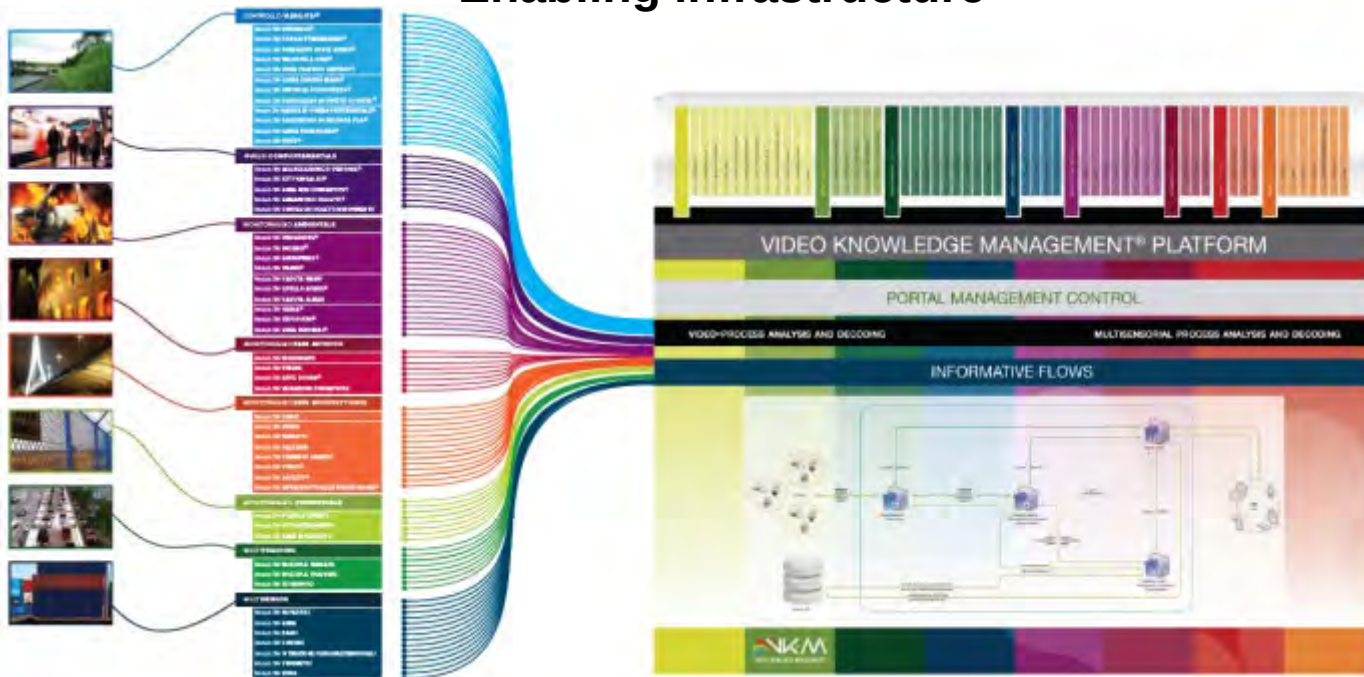
VIDEO FLOW ANALYSIS
AND CONTENT EXTRACTION OF
SEMANTICALLY RELEVANT EVENTS

INTELLIGENT KNOWLEDGE VIDEO
EXTRACTION – VIDEO DATA MINING

VIDEO EVENT ONTOLOGY: AUTOMATIC
MOVING OBJECTS

EVENT AUTOMATIC VIDEO EXTRACTION
VIDEO EVENT RECOGNITION

Enabling infrastructure



Enabling infrastructure



VKM Platform Enterprise

Video Knowledge Management

VKM Platform Enterprise extracts automatically and in real-time the meaning present in a video stream. VKM Platform Enterprise has been designed to extract the meaning of extremely complex situations, such as behavior.

It's a software Platform for Video Knowledge Management which has been conceived, designed and patented.

Each Video Knowledge Management Engine is designed to manage different levels of knowledge including:

- a descriptive level in which the event recognized / perceived object is returned to a theoretical abstract object;
- a methodological level, where reside the rules for its construction and / or simulation;
- a meta methodological level where reside the procedures for checking the reliability of operation between the theoretical object, simulated by the methodological level, and the actual event.



UNIQUE features

- Intelligent Extrapolation of Information from a Video Stream
- Automatic Extraction of Meaning Present in the Video Stream
- Video Sources
- Heritage of Knowledge
- Primary Sources of Information
- VKM Cloud Platform
- VKM Augmented Reality
- VKM Engines
- VKM Behavioral
- VKM Facial Expression Tracking, Face Recognition
- VKM People Counting, Moving People, Height People Measuring
- VKM Blood Pressure, Heartbeat, Fever
- VKM Body Marks, Tattoo
- VKM Smoke Detection, Fire Monitoring, Water Level
- VKM Access Control, Guest Access Control
- VKM Perimeters Control, Cycle Paths, Foot Paths
- VKM Residential Areas, Perimeters Control, Interiors, Risk Areas
- VKM Forbidden Parking, Garages Monitoring, OVCR
- VKM Crossing, Climb Over, Fall, Run
- VKM Object Abandonment, Object Removing
- VKM House Control, Static, Cracks
- VKM Chromatic Variations, Cromie Analysis

Tech Specs

- Multi Platform
- Independent Operating System, Multi Database
- Multi Server, Multi Cpu, Multi Gpu
- Number of devices managed unlimited video recording
- 10 Mil of video streams managed
- 10 Mil of video streams analyzed
- 100 Engines VKM for video analysis
- Average processing time for a frame by engine VKM 40 msec
- Subdivision of the single stream into sub-streams multiple analyzed separately
- 256 VKM Motors for every single video stream
- Events, produced automatically by the analysis in real time by VKM engines
- Analysis, retrieval, management and archiving of video streams
- Web portal, in several languages, encrypted authentication
- Research on stored video streams and events, using multiple search terms
- Report of the activities of the users and the information and statistics of the events
- Automatic access to external databases in real time
- 256bit encryption with symmetric keys and asymmetric 16Kbit
- Viewing Events in Real-time administrator and remote users are enabled
- Real-time analysis of video streams produced by other devices
- Integration of content, in real time taken from external databases
- Archiving and indexing of events depending on the contents
- Archiving and indexing of video streams depending on the contents



Video Streams

Camera and
video devices



TLC



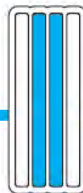
DOME



360°



180°



Firewall

VKM® PLATFORM ENTERPRISE



Storage Video

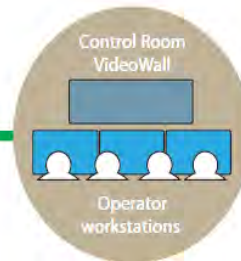


Video Server

CAD area



Firewall



Control Room
VideoWall

Operator
workstations

Internet



Web User



Web User



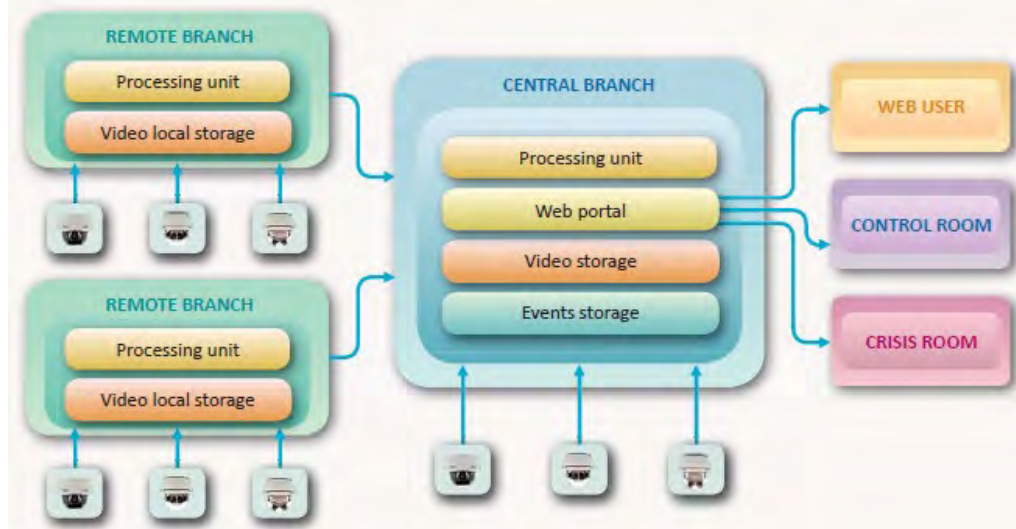
Web User

Intelligent Public Lighting Control



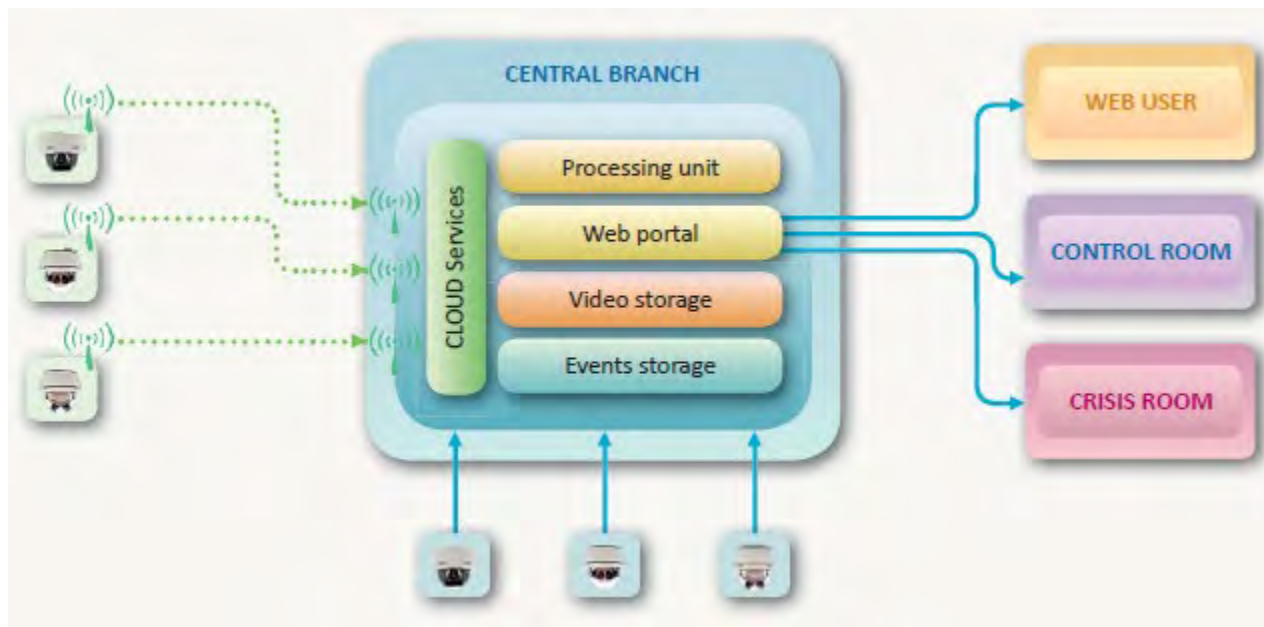
Central / Remote Solution Description

The Central / Remote solution is a modular and scalable system, designed and built to meet companies needs to manage the security of geographically dispersed offices or plants in the area through one central point of control, and monitoring as well as storing information of interest. TMPYSYS-VKMS Systems placed in the remote seats, through the use of specific TMPYSYS-VKMS engines aimed to the detection of events of interest, perform the automatic and real-time analysis of video streams acquired by the local recovery devices.



Cloud Solution Description

CLOUD solution is a modular and scalable system, designed and built to meet companies needs to manage the security of geographically dispersed offices or plants in the area and who want to use a cloud service to process, store and see all data and information of interest, without having to purchase, install, configure and manage hardware and software components at the remote branches and the central branche.



REFERENCE SCENARIOS

The aim of this solution consists to optimize and reduce waste derived from a bad management of public lighting through the realization of intelligent lighting circuits able to ensure consumption savings.

The system, through automatically and in real time intelligent analysis, processes and interprets the video stream from each device mounted on lampposts or other public structures designed to generate public lighting.

These devices, detect, through specific TMPSYS-VKMS engines, the presence and the transit of people and / or vehicles within the monitored area, enabling the same structure to provide a specific light intensity depending on the following situations:

- transit detection of people in the monitoring area – the system will deliver to 100% of the luminous flux produced by a full operating structure;
- transit detection of just vehicles in the monitored area – the system will supply 70% of the luminous flux produced by a full operating structure;
- no transit of persons or detected vehicles in the monitored area - the system will supply 30% of the luminous flux produced by a full operating structure;



Architecture Solution

Installation IP Camera 180° and DOME Camera on lamp post fixed

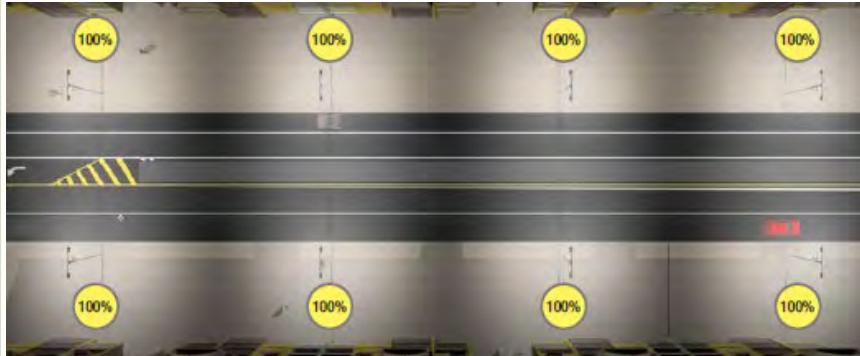
View of the street lamp equipped with IP Camera 180°
and DOME Camera fixed to the structure



View of the urban monitored environment



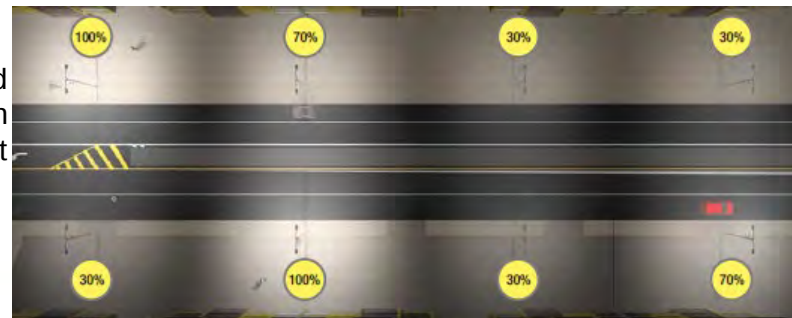
Top view of the urban environment with lighting generated without recognition of objects recognition in the scene with an indication of the light intensity emitted by each element of the network.



Panoramic view of the urban environment with light generated by the recognition of moving objects recognition in the scene



Top view of the urban environment with light generated by the recognition of moving objects in the scene with an indication of the light intensity emitted by each element of the network



CityTouch – Lighting management platform



TMPSYS-Smart-City is a connected public lighting solution for cities. It is transforming the way public lighting is controlled, managed and maintained. TMPSYS-Smart-City is a dynamic, intelligent and flexible way to bring your city to life.

The concept is incredibly simple. This unique solution combines three differentiating elements:

- **CityTouch** – Lighting management platform that can link all the public lighting assets in your city so you can easily manage and control them from your desk.
- **Intelligent luminaires** – CityTouch Ready plug-and-play LED luminaires that are designed for automated connectivity and no-hassle commissioning – all controlled remotely by CityTouch via the public mobile network.
- **Services** – Available separately or combined in a tailor-made, turnkey package. Our dedicated services mean you can outsource several tasks, reduce your investment risk, and be guaranteed a completely coordinated end-to-end solution.



Smart-City is for people

Lighting can transform the city into a vibrant, exciting space that people want to spend time in after dark. But it must also respect the needs of its residents. Artificial lighting is responsible for 19% of all the energy consumed worldwide. It can also result in a night sky that is 500 times brighter than is natural.

IntelligentCity achieves the perfect balance between a beautiful city ambience and preserving the darkness that makes our cities more livable. TMPSYS-Smart-City improves the livability of your city.

It increases traffic and social safety, improves well-being, leads to the beautification of cities, and is an important factor in crime reduction.

Sustainability

- Green city
- Saving energy
- Reducing carbon footprint
- Minimizing light pollution
- Ensuring sustainable public lighting

Livability

- Flexible light at the right levels
- Providing comfortable high-quality lighting
- Making cities more attractive to people

Urbanization

- More light needed
- Light that adapts and changes to city needs
- Light that is scalable and future-proof to cope with rapid growth



Smart-City is for lighting operators and service providers

Over the last three years, public lighting has gone through a massive revolution in the transition from conventional lighting to LED technology to digital lighting. The combination of LED with new digital technologies opens up new opportunities. Now it is so much easier to optimize the business of installing, controlling and maintaining your city public lighting installations. Meanwhile the digital revolution is opening up huge opportunities for new business models too.

Take decisions confidently

Improve maintenance effectiveness

Save energy more easily

Create new business models



Smart-City is for municipalities

Over the last few years outdoor lighting has gone through a massive revolution from conventional lighting to LED. The combination of LED with new digital connectivity technologies opens up endless opportunities for making cities more smarter, safer and livable.

A green and sustainable city

A safe and attractive city

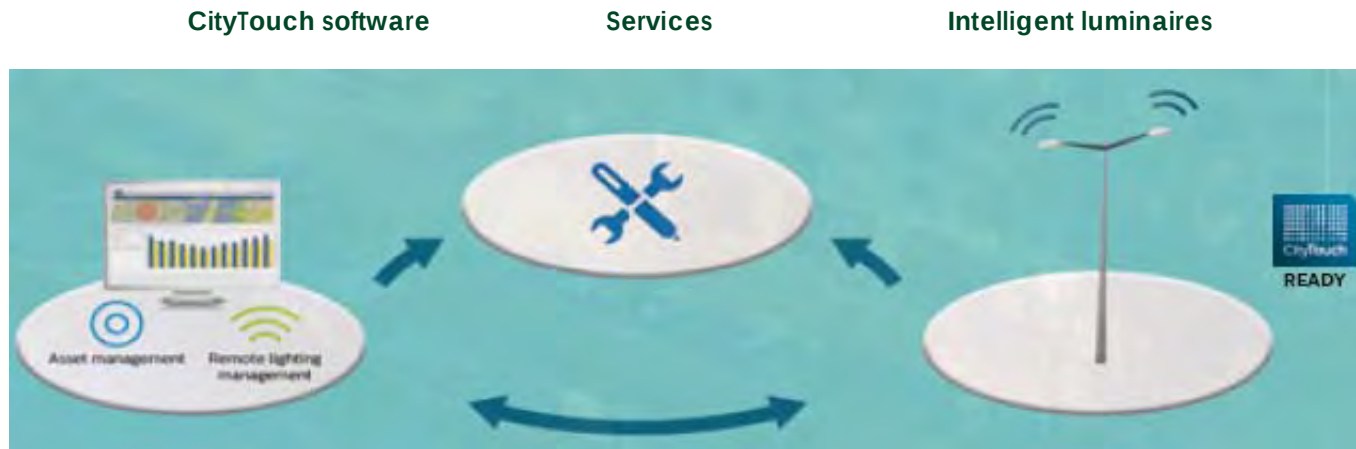
A popular and welcoming city

An innovative and future-proof city



Smart-City - How it works

Smart-City is a connected public lighting solution that combines CityTouch software with intelligent luminaires and dedicated services.



CityTouch

CityTouch is a web-based lighting management platform that links all the lighting assets in your city with CityTouch software that you can use to manage and control lighting from your desk at one touch. It is a platform that puts you in charge today with plug-and-play commissioning and open standards.

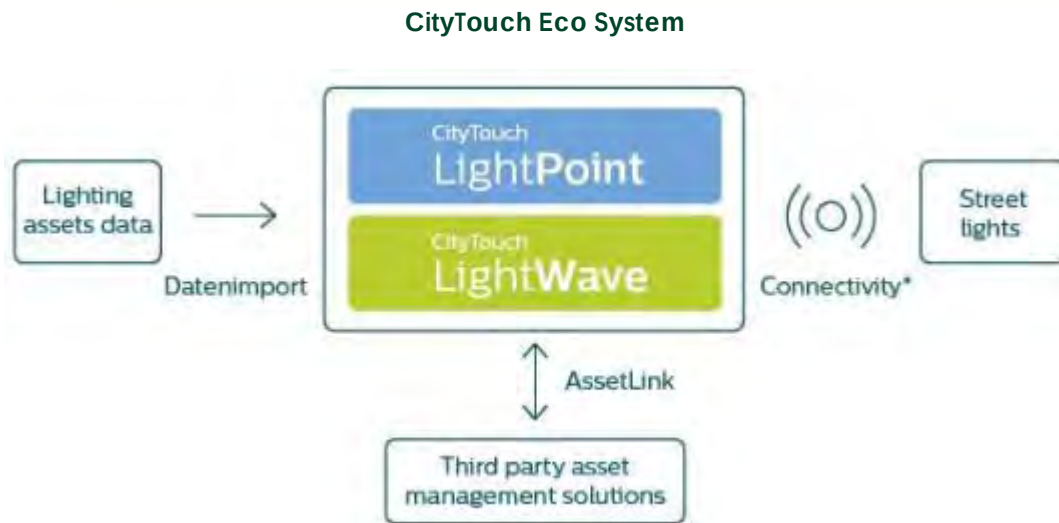
Advanced architecture management

CityTouch puts into practice the most advanced lighting management available. It consists of two key application programs:

CityTouch LightPoint

Asset lighting management system. A sophisticated tool for data and maintenance management. It brings transparency over your assets and workflows.





CityTouch LightPoint

Bring light into your lighting operations

Putting your data to work

CityTouch LightPoint, the asset management software solution, makes planning, analyzing and managing your lighting infrastructure very simple.

With its intuitive user interface, mapbased visualizations, and simple charts and diagrams, CityTouch LightPoint gives you visibility for every single asset in your lighting infrastructure. This level of transparency leads to important insights that can improve your decision making. It also facilitates workflowbased maintenance, allowing you to conveniently and efficiently manage light failures.



CityTouch LightWave

Stay in touch with your streetlights

Putting you in control

CityTouch LightWave gives you the power to make the lighting in your city dynamic, intelligent and totally flexible. It is a web-based remote lighting management software that connects your streetlights with the CityTouch platform.

With just a few simple mouse clicks, you can adjust the lighting in your city, monitor it, and control it. You are automatically informed when a failure occurs, enabling you to immediately initiate the repair work process.

The intuitive user interface allows you to easily adjust lighting levels to respond to changing requirements. You can boost lighting levels to improve safety and visibility, or dim them to save energy and prevent light pollution.



Intelligent Luminaires

Seamless connectivity
Easy plug-and-play installation
Automated asset management
No commissioning
CityTouch Ready

Intelligent luminaires are designed for seamless connectivity and automated asset management.

No hassle in commissioning – just plug-and-play installation of the luminaire and you are ready to go.



Connectivity benefits

- Intelligent luminaires designed for seamless connectivity
- Full control and efficient monitoring of your entire street lighting infrastructure
- Ready for connectivity at installation
- Energy saving due to dimming schedule optimization for every luminaire
- Energy metering to accurately measure and track the energy consumption of the luminaire
- Flexibility to adapt the light to the different requirements in the city
- Improved safety by increasing the light levels where needed

Installation, operation and maintenance benefits

- All intelligence is integrated into the luminaire
- High efficiency ensuring fast payback and low Total Cost of Ownership
- No own maintenance effort on network
- Plug-and-play installation
- Automated commissioning for quick, flexible and cost efficient roll-out
- Automated locating, so no GPRS location needed
- Automated connection, so no complex local networks required
- Automated upload of all lighting related asset data in your lighting management system
- Reduced spare part control



“STRADE & LED”

System for Telecontrol, Radio Access and Distribution of ETHERNET signal & LED

STRADE & Led: the Vision

- Save Energy through low consumption LED technology (SSL)
- Respect Environment while saving money
- Utilize the existing Public Lighting Infrastructure (PLI)
- Create a Low-Cost & Widespread Broadband Wireless Public Access Network
- Multiple Solutions Strategy: "You choose only what You want "

STRADE & LED “BASIC”

First Option: ONLY SAVE MONEY

The First Option includes:

- Replacing existing street lamps with low consumption LED lamps
- Supply of remote control systems for local on and off switching and, at the same time, for increasing/decreasing the LED brightness
- Remote check for functionality of the LED lamps (for each sector of the network)
- Alert in case of local malfunction (i.e.: an entire street or a sector)

STRADE & LED “COMBINED”

Second Option: Save Money & Produce New Revenues

The Second Option includes:

- The First Option Basic Features
- WiFi Access Point (also in “mesh” version) in order to create a “ring” of WiFi spots along the Public Lighting Infrastructure, every 6-8 poles
- On and off switching and Brightness electronic control
- Remote monitoring of each LED lamp through the same wireless network
- The immediate deployment of New Services (Broadband wireless public access, Video surveillance, Traffic congestion monitoring, Fire alarm, etc.)

STRADE & LED: How it works

Example of a Combined Option in case of lamp-post installation

The wireless network STRADE utilizes last generation technologies in order to allow:

- WiFi access from anywhere
- Full interconnection with all other existing communication infrastructures

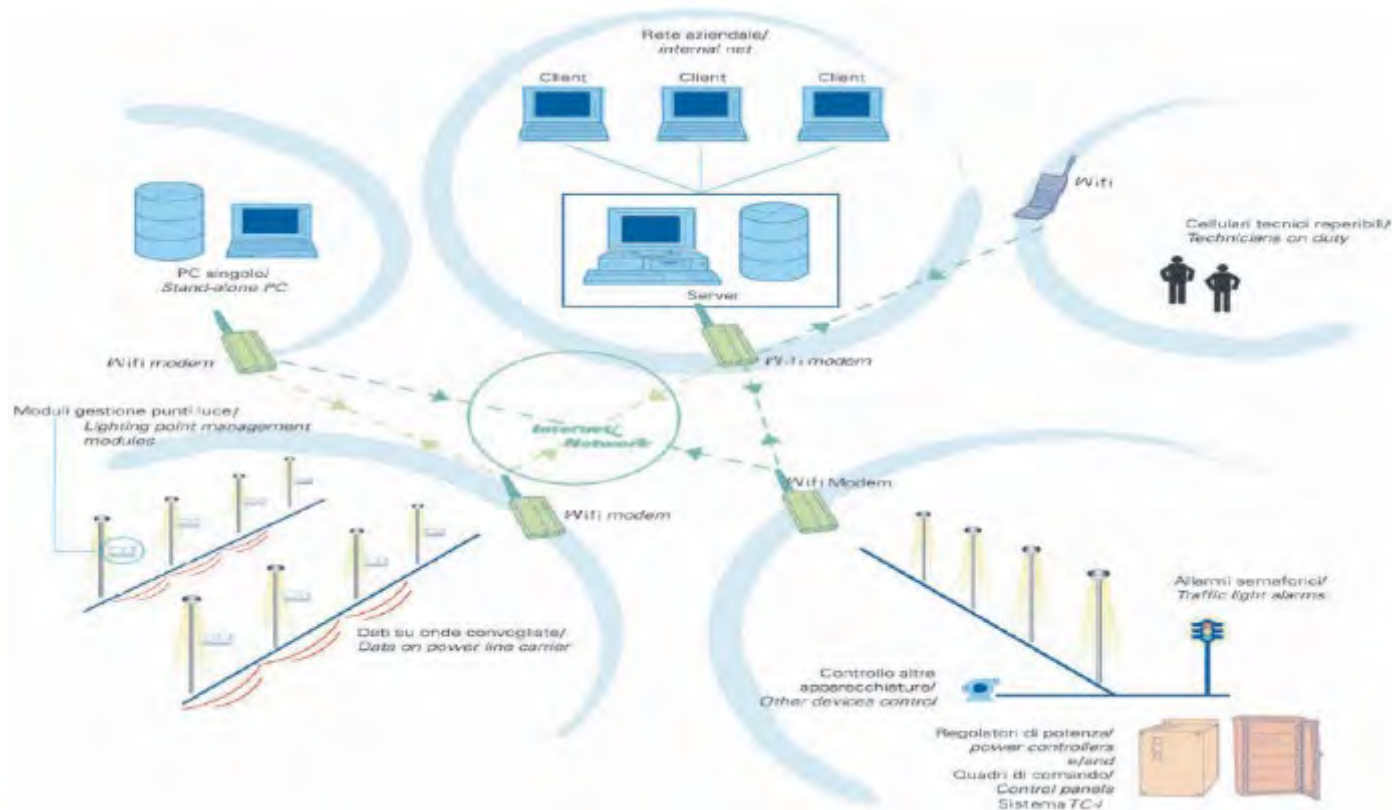


STRADE & LED

The present-days technologies allow the availability of advanced tools to effectively manage, and not simply supervise, the plants. It is therefore advisable that the structure of the system is designed to serve the specific needs of the plant and of whom shall ensure its efficiently. In particular the most suitable communications system among those available should be selected:

- **GSM • GPRS:** at present is the most used system as it allows low installation and operation costs and is also extremely flexible.
- **ETHERNET NETWORK:** advisable for the speed and the low communications costs, but with high installation costs. It is convenient for urban cabled networks or plants where the distance between the equipment and the control centers is short.
- **RADIO FREQUENCY:** most used in the past it has been almost everywhere replaced by GSM. It is still in operation where a GSM coverage does not exist or when the flow of data is so high that the time rates of a GSM system are not convenient.
- **SWITCHED TELEPHONIC NETWORK:** functionally complements a GSM system; the communication speed is good but it is often preferable to use a modern GSM system as the costs and timing of installation of the equipment are lower.
- **CONVEYED WAVES:** because of its features this system can only be used for the communication between the control panel and the electric light points. The data are transmitted by means of the supply cables.
- **The TC4 System** allows the supervision of the lighting network through the control of the existing cables, without the need to add any electronic component or circuit that can reduce the reliability of the LED lighting network.

STRADE & LED: Network Management



INTEGRATED SYSTEM FOR PUBLIC LIGHTING

Our proposal “STRADE LED” (TC4)



The Public lighting network

Outdoor lighting with LED lamps.

LEDs tend to produce a highly directional luminous beam and, consequently they would not be fitted for widespread lighting. The lamps used in our STRADE solution, by means of a tailored optics system and a specific lay-out of the LEDs, **allows to create a lighting system matching the purpose.**

LEDs have the advantage of a good chromatic yield: it allows to reach a chromatic yield index (CRI-Color Rendering Index) up to 90%.

Long-lasting life of the lamps.

A LED lamp has a life between 50 and 100 thousand hours versus the just 12 thousand hours of both high pressure sodium lamps (AP) and low pressure sodium lamps (BP).

In the first case **the lighting time is instantaneous, while are needed up to 5 minutes** to reach the utmost light intensity with the traditional technology.

STRADE & LED

Outdoor LED lighting:

no difference and full compliance with existing rules



LED ADVANTAGES

Best light quality	Low operational and maintenance costs	Highest stability and durability of performances	Relevant side advantages
Ideal light for human Eyes	Reduction of the consumption of energy between 50% and 75%	Other technologies have significant reductions already after 3.000 hours	Low voltage operation (without sparkles)
Outstanding chromatic yield (Ra>93%)	Lower initial investment for the electrical plant		Low environment impact: Absence of lead, mercury and other heavy Metals
	Long-lasting life cycle (more than 70.000 hours)		Infinitely dimmerable with proportional saving of energy
			Instantaneous lighting (nanoseconds)

STRADE & LED

The STRADE LED TC4 System and the Photovoltaic

The public lighting STRADE TC4 system can be backed up with a photovoltaic plant, in order to partially support the energy requirements to power the lighting network.

ADVANTAGES OF THE “COMBINED SYSTEM”

The “STRADE & LED COMBINED SYSTEM” will bring the following benefits to the Public Administration who will adopt the system :

- **relevant reduction of the electricity bill for the Public Lighting**
- **realization of an outdoor Widespread Broadband Wireless Public Access Network**
- **creation of additional job opportunities in the technical services for the LED and WiFi Networks**
- **possibility to deploy new Public Services such as video surveillance, traffic congestion monitoring, fire alarm, etc .**

The installation and setting up of the “Combined STRADE & LED” system will have no cost as it will be implemented through the savings generated from the reduction of energy consumption for the Public Lighting.

DIGITAL NETWORK “SMART CITY”



Info citizens



Remote control



Video Surveillance



Remote Assistance



Battery Recharge



Environmental data detection



Wi-Fi Broad Band



Traffic Control

STREAMLINE OF THE PUBLIC BUILDING'S ILLUMINATION

- 
- Proposal for the improvement and modernization of the public building's illumination system
 - Replacement of existing lamps with LED light sources which have the characteristics of low power consumption, high performance, long life and reduced environmental pollution
 - Particular attention to the phenomenon of light pollution by adopting the appropriate measures (eg., identification and adoption of appropriate lighting levels taking into account the shapes and dimensions of the different rooms and different areas of the buildings to be streamlined)
 - Costs free for the Public Administration: Each project will be implemented with the formula of "project financing" through the savings of the electricity energy bills
 - At the end of the amortization period the advantages of substantial savings achieved in the electricity bill will remain at the sole prerogative of the municipality.

“ENERGY AUDIT” SERVICES

Energy Audit Program:

- ❖ Analytical phase: checking the status of public lighting to identify critical issues and determine priorities for actions to be implemented for the efficiency of the Installations
- ❖ Project Phase: aimed at conforming the existing plants to the existing illumination rules and subsequently to streamline and technologically modernize the installations.
- ❖ Management stage: the key objective of this stage is to schedule appropriate solutions and to define appropriate operational and maintenance procedures in order to minimize the energy consumption while maintaining the illuminance in conformity with the requirements established by law.

Affordable Persistent Surveillance with Aerostats



TMPSYS-AirStar Tethered Aerostats with Vista Research Smart Sensor Radar Systems and an EO/IR sensor are a smart, cost-effective investment in technology to successfully accomplish national security missions.

Cost Effective: Feature the lowest procurement, operational, and lifecycle costs per flight hour—especially when accounting for costs associated with fuel, spare parts and manpower

Flexible Capabilities: Ability to carry a wide range of payloads to perform a broad spectrum of Communications, Intelligence, Surveillance and Reconnaissance (CISR) missions

- Force protection
- Border/port security
- Beyond Line of Sight (BLOS) communication relays
- Disaster recovery
- Incident awareness and assessment
- Critical Infrastructure



TMPSYS-AirStar Medium Aerostats

TMPSYS-AirStar Medium Tethered Aerostat System are the turn-key, value-price lighter-than-air platform solution sought by military, commercial and scientific customers.

- Visual observation of targets of interest both in the air and on the ground
- Beyond-line-of-sight communications
- Tracking of air and ground based targets of interest

The family of medium sized aerostats includes:

- T-17K
- T-25K
- T-40K
- T-56K
- T-75K

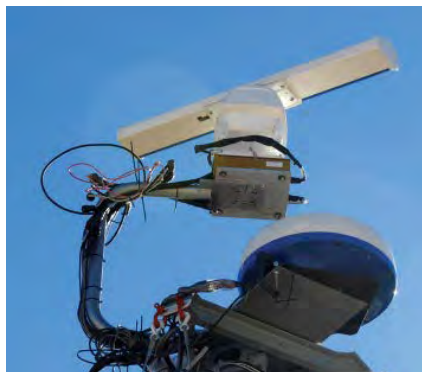
Aerostats can be manufactured in standard or TMPSYS-AirStar's proprietary High Strength Laminated Aerostat Material (HSLAM). HSLAM gives additional user payload lift capacity for the same size of aerostat



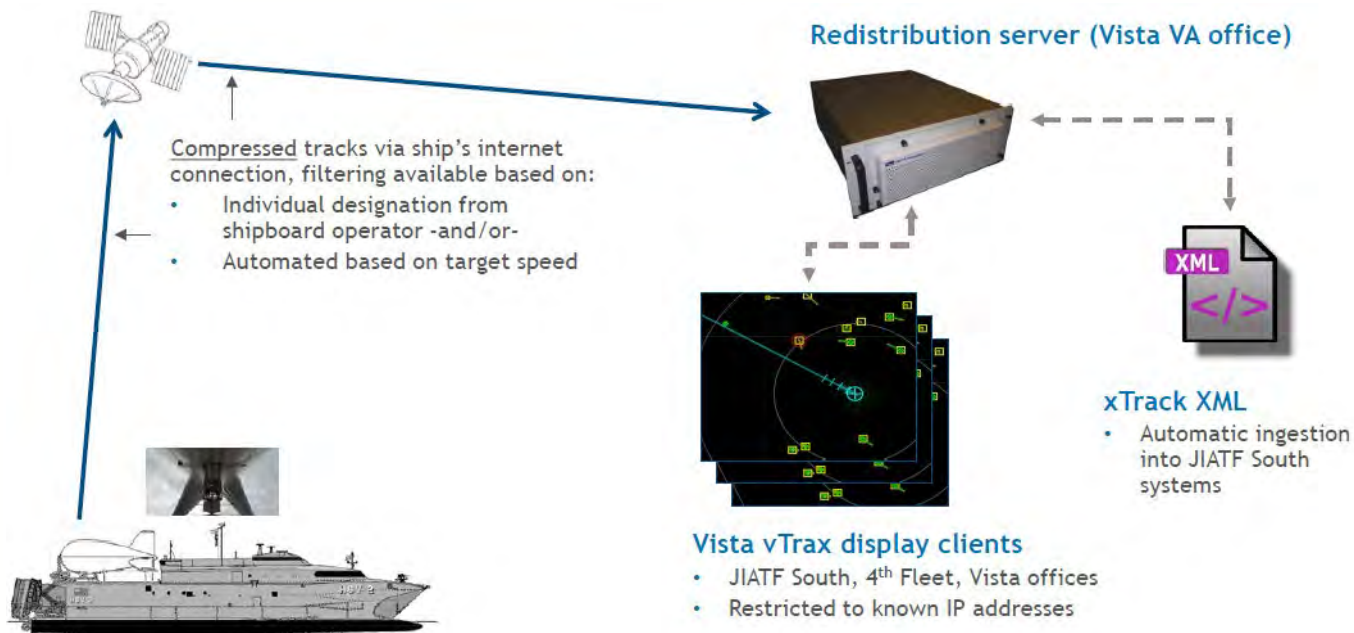
Smart Sensor Radar Systems (SSRS)

A family of Smart Sensor Radar Systems (SSRS) providing wide area surveillance over land or water.

- Land Radar Processor (LRP) used on aerostats and towers
- Maritime Radar Processor (MRP) used over water on ships or aerostats SSRS-F4 or F-10: small tactical light-weight
 - SSRS-F25: land, medium class, flown on tactical Aerostats
 - SSRS-F50: marine, large class, flown on masts, all sizes of aerostats
- 360° automated wide-area tracking
- Extremely low false alarm rates



Data Distribution



Border Demonstration

Eagle Pass, TX

- Operated for 10 days on the Dob Cunningham ranch, 1.25 miles of border on the Rio Grande, about 725 acres
- With the aerostat aloft, mobile tower system and roving sensors, illicit trafficking was disrupted driving it approximately 16 miles in either direction

Nogales, AZ

- Moved the aerostat from TX to AZ, up and operational in less than 72 hrs from end of operations
- A new payload set was integrated and operational in less than 4 hrs from arrival on site

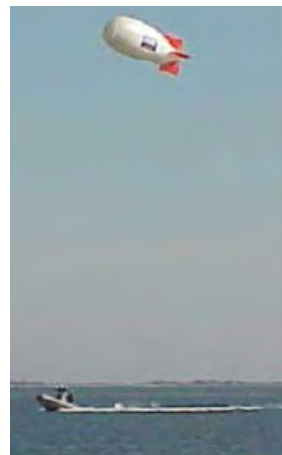


Aerostats Over Water

All TMPSYS-AirStar Tethered Aerostat systems, small to large, are capable of being operated from barges or ship-decks with appropriate clearances.

- The Mobile Mooring Platform must have enough room to rotate 360° without the platform or tail fins encountering an obstruction
- No masts or vertical obstructions which could entangle the tether
- When being towed, the aerostat may face a different direction than the direction of travel due to the prevailing upper wind direction
- The vessel should have appropriate room to store helium tanks

The deck area should provide room to safely work around the platform on the aerostat



Site Security/Protection Scenario

Operational Problem

Need a persistent visual surveillance capability for day and night monitoring of activity in an area of interest. Solution must be affordable and capable of vehicles and dismounts, and provide visual identification of activities.

Technology Solution

- TMPSYS-AirStar T-25K aerostat
- Vista F25 Land Radar and SSRP
- EO/IR camera

Concept of Operations

- GMTI radar tracking to provide 360 degree coverage
- EO/IR cameras for detailed surveillance
- Archiving and analysis to detect patterns
- Manning by contractors or host nation personnel

Delivery

- Approximately 2-6 months after receipt of order
- Must also allow time for an Export License (if required)



Maritime Surveillance Scenario

Operational Problem

Need a persistent wide-area surveillance capability along coastal illicit trafficking areas. Solution must be affordable and capable of tracking small boats, periscopes and small aircraft.

Technology Solution

- TMPSYS-AirStar T-25K or T-40K aerostat
- Vista F50 Maritime Radar and SSRP
- Lightweight EO/IO camera

Concept of Operations

- Radar tracking of suspect targets early enough to allow interdiction
- Archiving and analysis to detect patterns
- Manning by contractors or host nation personnel

Delivery

- Approximately 6-9 months after receipt of order
- Must also allow time for an Export License (if required)



Common Ground Control Shelters (CGCS)

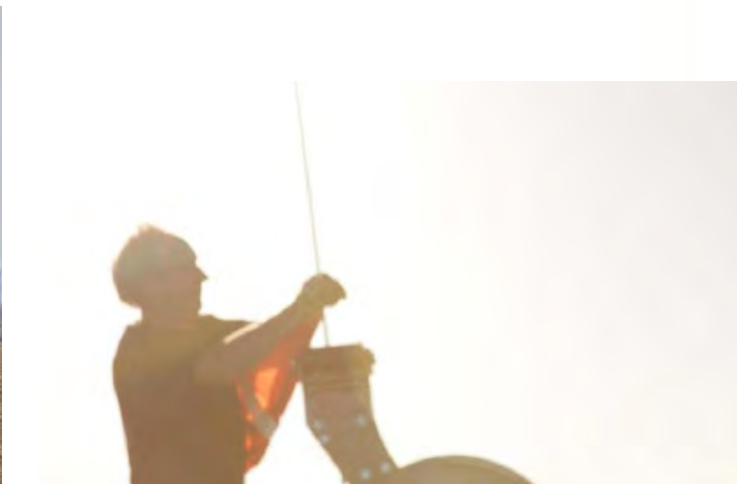
A Ground Control Shelter can be any type of shelter from a vehicle to a tent to a ISO container to a permanent building.



Training & Field Support

We can provide training in specific training facilities located in Sioux Falls, South Dakota

- FAA waiver to operate up to 1000' AGL
- Training customers on operations and maintenance of the small and medium class of aerostat systems
- Year round operations

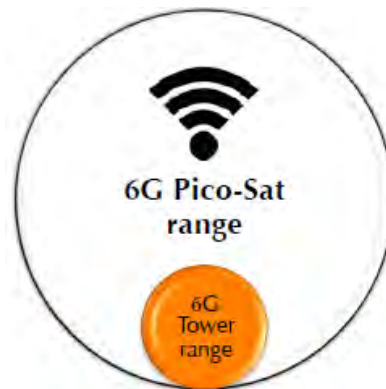


6G PICO-SAT!

Introducing the 6G Pico-Sat

- Pico-Sat is the Patent Technology which provides a perfect **combination of Satellite Technology and 6G mobile network service**
- A combination of two standard and consolidated technologies which generates **a cost-effective and efficient solution for areas without 6G coverage**
- The 6G Pico-Sat provides **full IP, voice, web access and TV services at up to 47Mbit/sec with** substantial cost savings to comparable Infrastructures
- The 6G Pico-Sat **covers more than 60x the area** covered by the standard telecom tower in which the mobile device can connect to the Base Transceiver Station (BTS)
- The 6G Pico-Sat can reach 800m altitude compared to 30m of the towered 6G BTS

Coverage area proportion

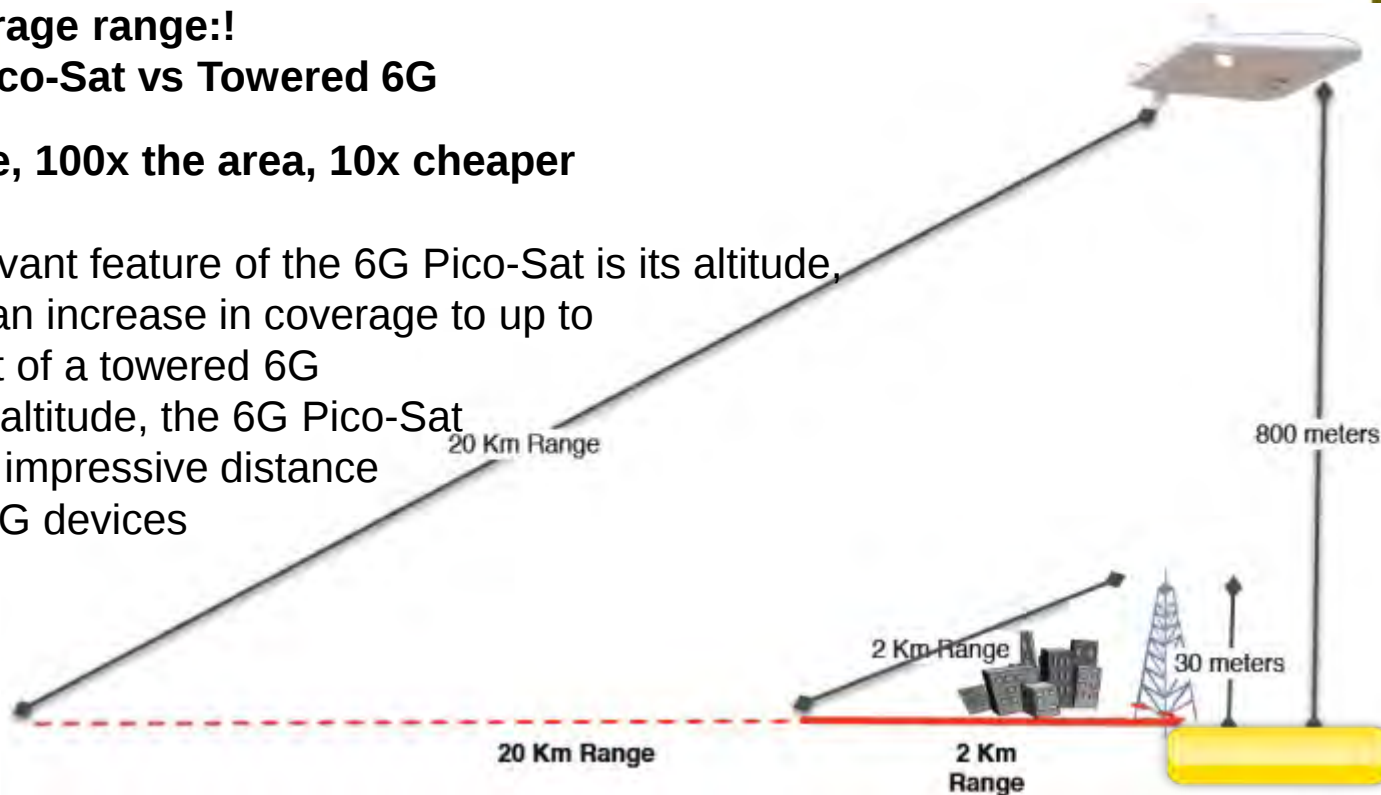


Coverage range:! 6G Pico-Sat vs Towered 6G

10x the range, 100x the area, 10x cheaper

The most relevant feature of the 6G Pico-Sat is its altitude, which allows an increase in coverage to up to 100 times that of a towered 6G

With 800m of altitude, the 6G Pico-Sat can cover the impressive distance of 20 km for 6G devices connection



Performance

- **Frequency Operation at 800MHz, 1,800MHz and 2,600MHz**
- **Configuration supported with 3, 6 or 12 sectors per Pico Sat**
 - 288 Mbit/sec per sectors
 - 220 simultaneous calls per sectors
- **Every Pico-Sat distributes from 800Mbit/sec up to the amazing performance of 3,300 Mbit/sec IP services**
- **Every Pico-Sat supports from 660 to 2,640 simultaneous voice calls**

Configuration & performance

Frequency in MHz	900-1,800-2,500	900-1,800-2,500	900-1,800-2,500
Sector	3	6	12
Max direct connection in Km	20	20	20
Number of simultaneous voice call	660	1,320	2,640
6G Pico-Sat Mbit/sec bandwidth	800	1,600	3,300
Picosat-to-Picosat link bandwidth, in Mbit/sec	2,000	2,000	2,000
Satellite backhauling & management	included	included	included
6G network management	included	included	included
Content delivery network	included	included	included
Multicast TV	supported	supported	supported

Specifications

Altitude	meters	200	800
Payload	Kg	70	250
Max Wind for operation	Knot	70	100
Pico-Sat to Picosat backhauling bandwidth	Gigabit/sec	2	4
Pico-Sat to Picosat backhauling distance	Km	40	80
6G max distance	Km	12	20
6G area coverage	Km2	450	1,250
6G max distance with local amplifiers 6G max area with local amplifiers	Km Km2	18 1,000	30 2,800
Power consumption	KWatt	2	5
Dimensions	meters	14 x 16 x 4,70	16 x 19 x 5

Security, signalling & protection

- Day & Night light and radio signalling for flight safety
- Lightning protection
- Automatic landing and recovery for wind over 100 knots
- Perimeter alarm
- Camera remote surveillance
- 48 hours UPS & automatic power generator
- Direct Satellite Backup Backhauling

Ground station & launch

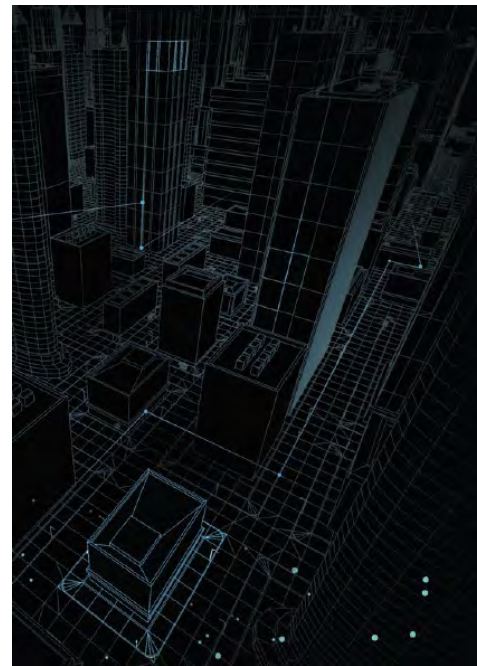


E-Link – Strategic Extraction of Wi-Fi Identities

E-Link solution enables the operator to extract and collect Wi-Fi identities operating within an urban environment by deploying passive sensors. Empowering Law Enforcement Agencies to perform analysis and locating of all Wi-Fi networks and devices within range.

Technology

- E-Link scans over 2.4GHz and 5GHz band and maps the WiFi environment to discover, profile and locate any WiFi enable device including:
- Each E-Link sensor transmits the collected data through an encrypted (6G) connection.
- The Control Centre organizes the data in a format for analysis and action in real time.
- The E-Link sensors can effectively Integrates with a city's existing Wi-Fi infrastructure.
- The E-Link sensors can be used as a standalone sensor deployed anywhere.



Control Center

The Control Center is used as a monitoring station for numerous sensors deployed in various locations. These sensors give out indications such as:

- Active Wi-Fi identities in range.
- WiFi Network's locations and connected devices.
- Geo-fencing, entering or exiting the sensors range.
- Tracked devices behaviour patterns.
- Expose hidden networks.
- Distinguishing between Randomized Mac addresses and real ones.

Power Management & IP Rating

- E-Link sensor can be deployed with a direct AC Power in fixed locations or with an integrated backup battery for field operations.
- The sensor can be turned on and off remotely on demand.
- The sensor is enclosed with an IP65 case making it weatherproof and resilient.

Specifications

Scan Range	150 Meters (Line of Sight)
Power	Direct AC
Backup Battery	11.1V 21Ah Lithium Ion
Battery Run Time	20 Hours Directional Rubber Antenna
Charger	3S Li-ion Smart Backup Battery Charger
Antenna	1 sectorial 90° Antennas 1 Omni directional Antenna 360°

Wi-Fi Detecting Protocols b/g/n/ac

Wi-Fi Adapters	802.11 b/g/n/a Dual Band 2T2R USB Wi-Fi
Amplifier	Dual Band 2 Watt Wi-Fi Booster
Bands	2.4 GHz & 5 GHz
Data Transmission	4G/3G Modem
Operation Temperature	-10°C~40°C
Operation Humidity	<90%
IP Code	65
Dimensions	156x100x60 mm
Weight	4.5 KG



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GREEN

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Waste to Energy

Next Generation Bio-Solution Technology

Solutions for cleaner more sustainable communities

An efficient, sustainable solution to convert organic waste and biosolids into beneficial use materials

Tunnels designed to rapidly convert organic waste, then dried into various materials, such as compost for agricultural or landfill cover, or further dried into a biofuel for energy generation

All organic waste is efficiently processed:
Biosolids & sludge from sewage
Food, wood, paper, cloths of natural fibers
Agricultural, Industrial, Marine, Medical
Tissue, sinew, bones, plant stocks

Environmentally safe, non-odorous, carbon-neutral continuous processing without using any auxiliary fossil fuels

If used as a biofuel, it is as combustible as coal for use in power plants to generate reliable continuous electric power with no noxious fumes



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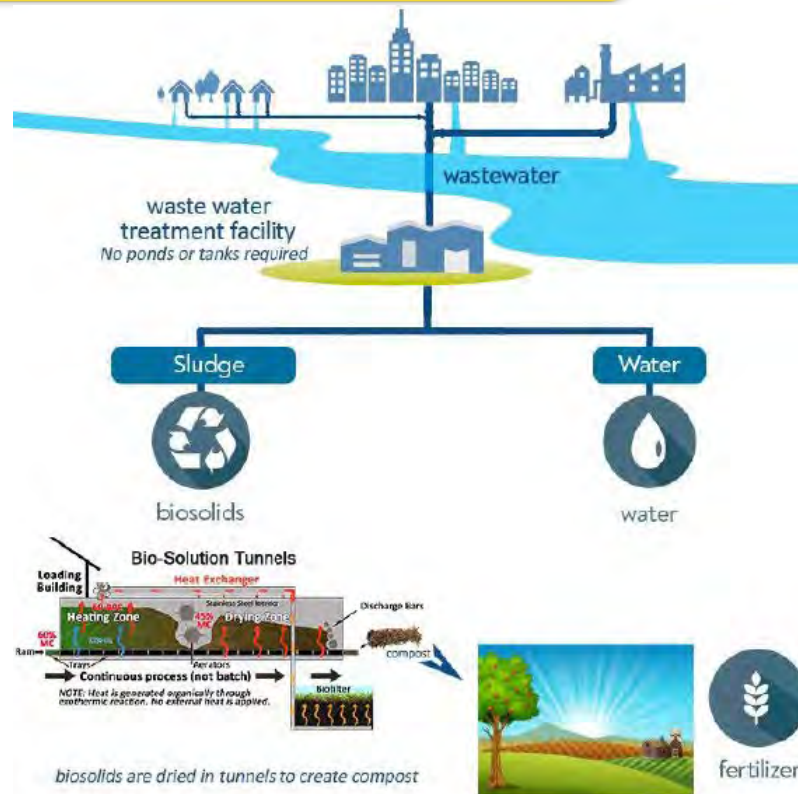
The Bio-Solution Nutrient-Rich Compost Option

A State-of-the-Art ultra environmentally friendly municipal system with 100% diversion of biosolids waste would begin with a wastewater treatment facility to separate the water. No external ponds or tanks will be required.

Sludge is passed through a Belt Press to reduce moisture content.

Remaining biosolids are fed into the Bio-Solution tunnels where they are converted and dried to produce a nutrient-rich compost/fertilizer.

The output produced can be used on farms, sold at retail or applied as soil building land cover.



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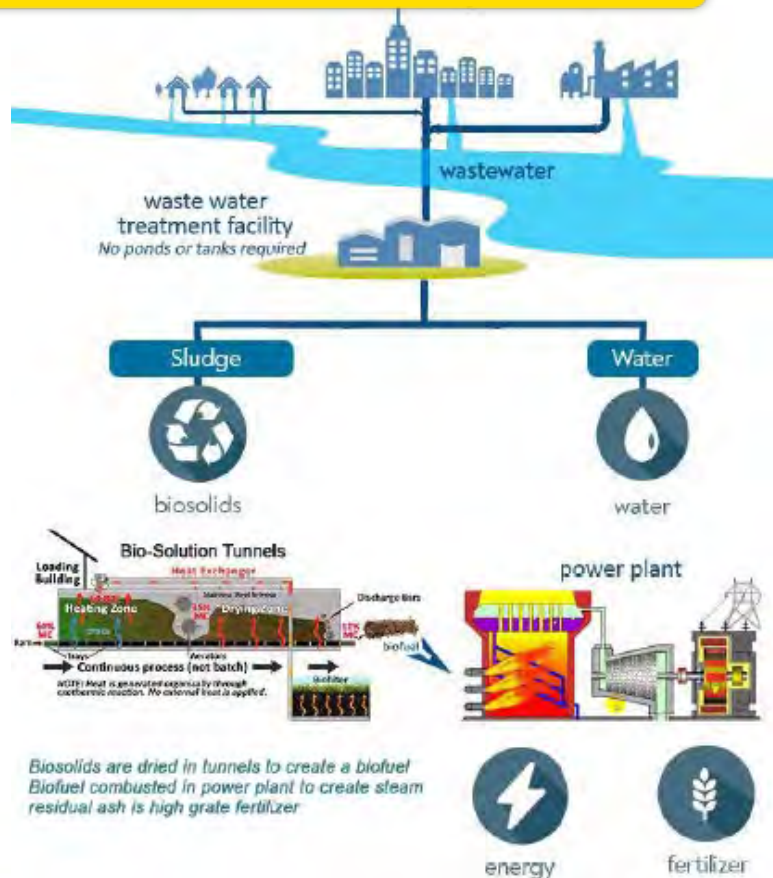
The Biofuel Option

A State-of-the-Art carbon neutral and net zero municipal system would begin with a wastewater treatment facility to separate the water. No external ponds or tanks will be required.

Sludge is passed through a Belt Press to reduce moisture content.

Remaining biosolids and organic waste are fed into the Bio-Solution tunnels where they are converted and dried to produce a Biofuel.

The Biofuel is then combusted in a specialized boiler to create steam, which is then utilized to drive turbines to create electrical power.

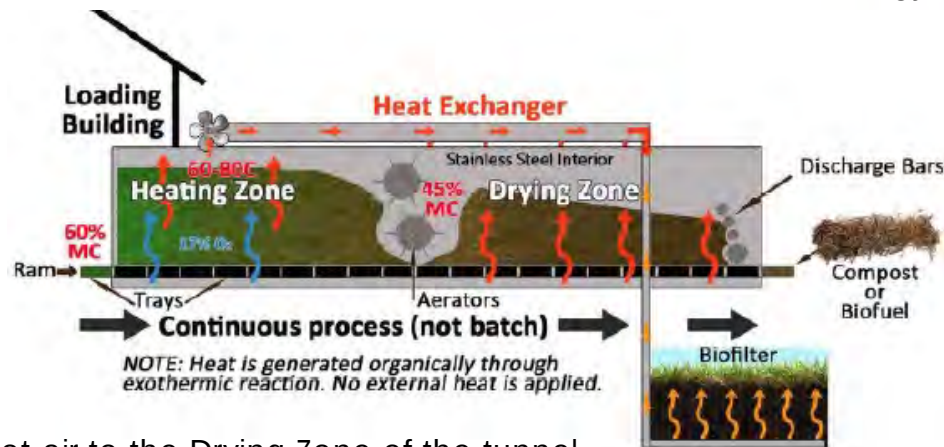


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The Bio-Solution Process

100 tons of daily biosolids and organic waste produces 65 tons of compost and 35 tons of clean water over a 7-day period or 50 tons of Biofuel and 50 tons of clean water when dried for energy generation applications.

- External fans draw in air to optimize the activity of inherent microbes
- Microbes breakdown organic cellular walls to release trapped water, which causes an exothermic reaction producing a large amount of heat
- The heat evaporates the water and is recaptured as a clean condensate
- A heat exchanger extracts and blows hot air to the Drying Zone of the tunnel
- Aerators (spinners) mix the material that is moved along on trays each day
- The material is dried to either produce compost or highly calorific Biofuel
- Exhaust air is fed through a biofilter to remove any odours



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Practical Uses

Crossing the entire spectrum of human life and our industriousness

Residential & Commercial Development or Infrastructure Renewal

- Fast track development of residential and commercial properties with an environmentally friendly carbon neutral waste solution.
- Accelerate municipal sewage solutions. No odours or leaching. No residual waste or toxic fumes.
- Less expensive than traditional waste and sewage solutions. Scalable to any size of development.
- Compost material can be used as landfill cover or dried to create a Biofuel for power generation.

Industrial & Construction

- Disposal of wood, cardboard, paper and other organic fibrous materials
- As a Biofuel can be used in Co-firing for cement plants and power plants

Agricultural

- Disposal of plant stalks, animal fecal waste and rendering waste
- Environmentally safe compost for land application and/or fertilizer ash, CO2 and clean water for irrigation as by-products of the Biofuel process

Airports, Cruise Ship Docks, Hospitals and Disposal of Virus Contaminations

- Each requiring on-site disposal of potentially hazardous organic waste
- Bio-Solution effectively handles all organic materials and natural fibres, including clothing & masks

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Fresh Water - Industry-Specific Contaminants and Corresponding Water Treatment Technologies

Depending on the type of wastewater to be treated, potential byproducts that can be captured and sold are:

- Hydrogen
- Chlorine-based disinfectant
- NaOH sodium hydroxide
- Carbon credits
- Purified water for use in boilers and nuclear powerplants
- Water for irrigation
- Potable water

The net result is not only are we treating the wastewater for recovery purposes, which is your primary objective, we are also creating various revenue streams that will keep the cost of wastewater treatment well below alternative technologies.



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Desalination + Oil & Gas

Desalination

Our partners are able to propose both short-term emergency solutions, such as nano-filtration, as well as long-term desalination plants that are cost-effective, at a fraction of older systems. The plants can be scaled to suit communities as small as 10,000 people and as large as required for major urban centers.

Oil & Gas Industry

This industry uses significant volumes of water for drilling, fracking, etc. The resulting wastewater is heavily contaminated. Our partners are able to extract totally dissolved solids to provide clean water and marketable byproducts. These newer technologies are able to achieve this at costs far below disposal costs for the industry, while providing water that can be reused on site or treated for alternative uses such as for irrigation or drinking water.

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Green and Renewable sources: Hydrogen and Solar Energy

WHY?



Reduce dependence on oil & gas and secure **long-term energy resilience**



Build a stable, decentralized, and **future-proof power system**



Free fossil resources for export, attract foreign investment, create **new green industries**



Position of the Country as a **hub for innovation** in solar, hydrogen, and sustainability

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Solar Energy

❖ Exceptional Solar Resource

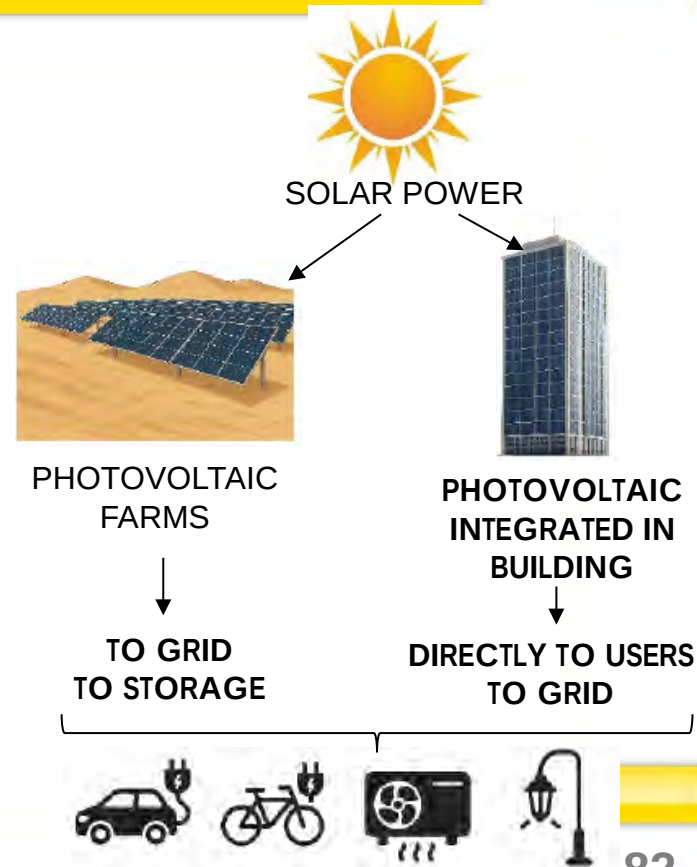
Desert regions have some of the highest solar irradiance on Earth (often $>2,000 \text{ kWh/m}^2/\text{year}$), providing a reliable and predictable source of renewable power.

❖ Vast, Available Land

Large areas of flat, uninhabited desert make it easier and cheaper to install utility-scale photovoltaic (PV) farms and concentrated solar power (CSP) plants with minimal land-use conflict.

❖ Urban Integration

Rooftops and skyscraper facades integrated with PV support decentralized and local energy generation, enabling smart cities and reducing grid stress.



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Hydrogen

H₂ Direct Use in Mobility

Hydrogen can power fuel-cell vehicles, trucks, and buses, providing zero-emission transportation and longer ranges compared to batteries.

H₂ Electricity Generation & Storage

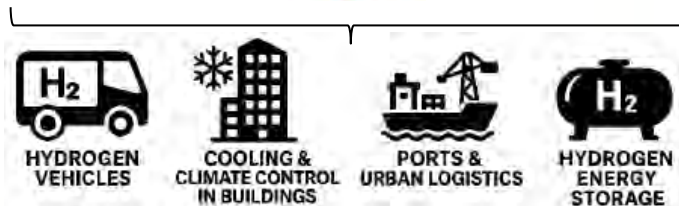
Acts as a long-term energy storage solution: hydrogen can be converted back into electricity through fuel cells or turbines, balancing grid fluctuations and providing night-time or seasonal power.

H₂ Industrial & Cooling Applications

Enables decarbonization of high-temperature industrial processes (steel, chemicals) and can be used in innovative hydrogen-based cooling systems in large facilities or data centers.



**GREEN
HYDROGEN**



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ENTERTAINMENT PARK

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The Great Thetered Balloon



*A spectacular, popular and
environment-friendly attraction*

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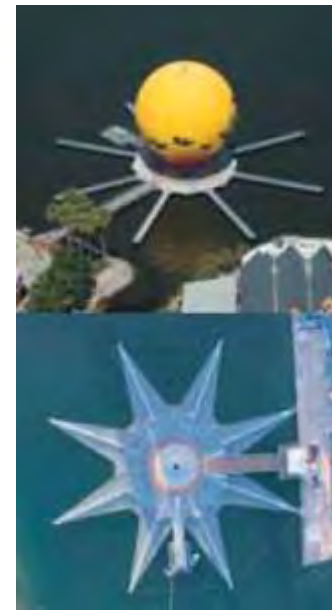
Balloon

Total height of system: 34 m (105 feet)
 Envelope's diameter: 22,46 m (72 feet)
 Envelope's volume: 5 950 m³ (210,000 cubic feet)
 Nominal lift: 4 800 kg (10,560 lbs)
 Helium loss: less than 70 m³ per month
 (2,470 cubic feet/month)
 Useful pressure in the envelope: up to 900 Pa

A tourist attraction...

An incredible 360° view in total silence.

An open-air gondola that allows up to 30 passengers to experience the sensation of riding on a flying balcony.



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... chosen by the world's biggest
amusement parks



WALT DISNEY WORLD in ORLANDO – USA
Opened in 2009 in the biggest amusement park
in the world



OCEAN PARK in HONG KONG – CHINA
Opened in 2007, up to 2,100 passengers per
day

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A real monument...

Since 1999, the balloon has flown more than 1/2 million people and has enjoyed three successive sponsors: Fortis, Eutelsat and Banque Populaire.

Thanks to its dimensions (22 meters in diameter, 34 meters high), the balloon is perfectly visible from 4 km in all directions. Thus, in PARIS, 400,000 people have the opportunity to see it every day.



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AIRBAR



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Technical Characteristics

Dimensions

- Overall height: 40 meters (130 feet)
- Total ground surface area: about 100 m² (1100 sq feet)
- Base surface area (diameter of the tower): 11 metres (36 feet)
- Balloon diameter: 7 meters (23 feet)
- Balloon high: 3 meters (10 feet)
- Gondola diameter: 3,5 meters (11,5 feet)

Weight

- Tower : 44 tons
- Balloon : 50 kg (110 pounds)
- Gondola & bar : 3000 kg (6600 pounds)

Performances

- Number of seats : 15
- Ascension height of passengers: 35 m above ground level
- Speed: approximately 0.5 m/sec
- Drive system power: 3 x 9 kW
- Maximum number of cycles per hour: 12
- Total ride time: about 5 minutes Maximum wind for payload lift: 70 km/hour (44 mph)



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The tower is a major element of the attraction owing to its size and function.

Its contemporary design and the project's architectural aspirations, which rely on staging the bar's ascensions, reveal a festive dimension which provides an attraction for the entire site.

This 11-metre-diameter (36 feet) circular base cylinder comprises twelve helices, six of which turn clockwise and six anticlockwise, the pitch of which increases according to height in proportion to variations in load. They are linked by three vertical masts which ensure the balloon's steering system.

The transparency of the tower's lower parts allows the balloon to be completely visible both from the inside and the outside, and helps to make the attraction secure.

Therefore, the tower ensures the safe steering of the balloon whilst also ensuring that the bar remains the main star of the show.



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A 2 meters (6 feet) in diameter bar is mounted on the three branches platform connected to the vertical rails of the tower. It is circular and has 15 seats; each seat is equipped with a seat belt.

The 15 passengers can enjoy the full panorama offered by a flight at 35 meters (115 feet) high.

Electric power supply :

The fan and lighting of the balloon is provided with on-board batteries that are recharged at night on the network.

Design:

The AirBar has been designed to lift the bar platform and its passengers in complete safety, accordance with standards for attractions. The elevation system is soundproofed and invisible to the public.



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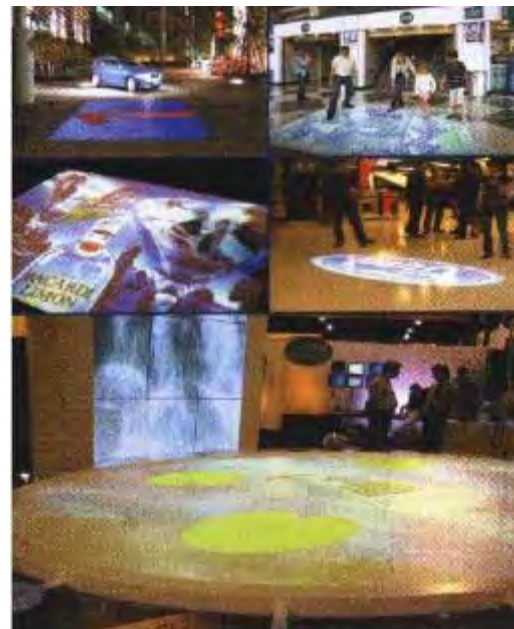
Entertainment Systems with Motion Gestures

Ground-Effect

This system revolutionizes public space entertainment and advertising by projecting dynamic, visual content onto surfaces, including floors, walls, and tables. Ground-Effect uses the patented motion gesture control system to create an interactive virtual world. Our state-of-the-art tracking system continuously detects body position, allowing for real-time interaction between users and the display.

Ground-Effect 's array of special effects can be customized in endless ways. Ripples form as you step on pools of water. Images flip or fly with the sweep of your arm. Fire, bubbles and beams of light emit as you enter the display area. Picture yourself cracking ice to reveal a school of fish that instantly scatters away. Play virtual soccer and other games or engage interactive display advertising that is both informative and entertaining.

Ground-Effect is effective in many types of venues, including retail outlets, sports arenas, and transportation terminals. It always draws crowds at trade shows and takes entertainment to new levels at night clubs and other location-based entertainment sites.

[Video demo](#)

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Ground-Effect includes several, easy-to-customize, interactive templates to get you up and running quickly. Our Creative Services team is also available to work with you to incorporate your design or campaign ideas with Ground-Effect, using 2-D and 3-D graphics, sound and video.

Our expert system integrators will assist in handling all facets of site inspection, installation, activation, and maintenance.

We also offer optional remote monitoring to keep display(s) running smoothly.

VirtualScreen

Responsive Media

VirtualScreen is a free-standing or wall-mounted interactive display that is controlled by a person's body movements. Display elements magically come alive and respond upon approach, instantly attracting the attention of passersby. VirtualScreen utilizes a patented camera-based technology that tracks the area in its vicinity and responds to movement in front of the display.



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VirtualScreen is an optimal solution in a wide range of environments, including malls, airports, retail locations, or trade shows. Easy to install, VirtualScreen displays range from 42- to 103 inch flat screens.



[Video demo 1](#)



[Video demo 2](#)



[Video demo 3](#)



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Projection Screens

Pro Diffusion screen (professional cast material) – a grey tint rear projection screen – providing unparalleled image quality and perfect colour reproduction. This unique screen technology recreates a high definition TV quality image, similar to that of Plasma Screen, making it the ideal solution for all video applications. One matt surface and one gloss surface (reversible) and the only diffusion screen technology providing true 180° visibility.

A hand cast screen technology offering superior image quality in relation to extruded or coated screens. Pro Diffusion offers high gain and high contrast making it ideal for all rear projection applications. A reversible material with a gloss surface for TV quality images or a matt surface to eliminate reflections from other light sources.



[Video demo](#)

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Indoor & Outdoor curve-shape LED Screen (Die-Casting Aluminum Alloy Cabinet)



[Video demo 1](#)

[Video demo 2](#)

[illegible]

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INSIDE VILLA

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Luxury Art Selection

The main purpose of our brand is to offer products and furnishings that evoke a sense of beauty and refinement in those who look at and use its interior design items just as if they were admiring a painting or a sculpture. Artisanry and art thus come together in every piece of this new collection whose versatility of ceramics and impressive beauty of marble play the lead role and are linked by the common thread of the most refined luxury. More than sixty years of experience in the processing of ceramics and bathroom furniture have resulted in a desire to charm those who seek uniqueness in every detail: every object is transformed into something to admire, something that enriches the environment and makes it exclusive.

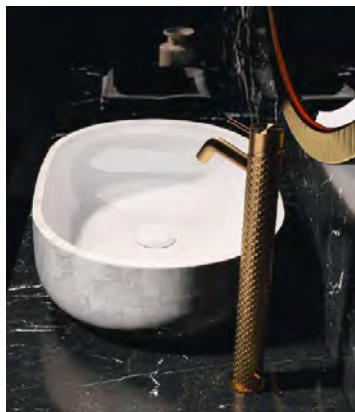


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We start with the choice of the finest materials, and we end up with the creation of objects capable of conveying a feeling, an emotion, a sensation. Precious stones are undoubtedly the raw material that best represents uniqueness and natural beauty. This is why we have chosen marble as the main attraction of the entire collection, using it to decorate ceramic fixtures and thus, creating precious mosaics to be admired in your own home every day.



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Vibroacoustic Audio and Alarm system with vibration detection

Your Hi-Fi system, your television and the playlists on your mobile device; a sound effect of complete immersion in the environment.

'An enveloping, homogeneous and complementary sound in the environment, without the evident presence of sound emission elements',



[Video demo](#)

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Tiny, Simple, Magical

A patented technology that creates environments for innovative sound experiences.

The miniaturized and completely concealable piezoelectric actuators will make the different flat surfaces "active", creating surprising sound experiences:

- Immersive and emotional sound
- Innovative and functional communication
- Complementary alarm system



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Our products, our services ... our ideas

Attentive to new technologies, we offer innovative, intelligent and sustainable solutions.

We research and propose technological solutions that produce advantages and benefits for those who use them, with a focus on economic optimization and sustainability.



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Professional communications and innovative conference rooms

Group conversations in conference rooms or simply quality communications in the different areas of your office or home.



'Hands-free' Voice and Telephone Communications

Answering phone calls and having a free conversation, even in the most difficult conditions.



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HOUSES

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Prefabricated Houses



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Luxury Container Houses



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Thank You!