

Parking Guidance Systems – Cost issues

1. General

Parking Guidance Systems are wonderful! Everybody loves them!

- The parking lot users love them as they reduce the frustration experienced looking for parking in a busy facility.
- The parking managers love them as they provide a valuable management tool.
- The tenants love them as their customers can spend less time looking for parking, and more time shopping.
- The landlords want to have them as they upgrade the parking facility to new heights.



If Parking Guidance Systems are so appreciated, why is their penetration so slow?

The main answer lies with their price! Their price makes their economical substantiation difficult.

Parking Guidance Systems are not complicated and they do not represent any technological challenge. However, Parking Guidance Systems may have many hardware components (In the thousands), require complex communication and they spread across the entire area of the parking lot. All these factors contribute to their high cost.

When looking at the cost distribution of those systems between the various components that make the total cost, it was obvious that the main cost does not solely lay with the components (sensors, indicators numeric displays etc). For example, sensors, which make the bulk of the component cost are generally priced at +/-USD30, a relatively small portion of the cost per installed bay. It was clear that:

The main cost of Parking Guidance Systems lay with the mechanical installation, electrical wiring and commissioning.

It was clear to us at Joint Ventures Electronic Services, that if we want to make a dent in this market we will have to think differently, “out-of-the box” and come up with new concepts.

We then designed our Diamond Parking Guidance System “backwards” as follows:

- We defined the simplest and easiest mechanical installation.
- We defined the simplest and easiest wiring scheme.
- We defined the simplest and easiest commissioning process.
- We defined the ControlRoom application so that we use the same application in all our sites, with only the graphic interface changing.

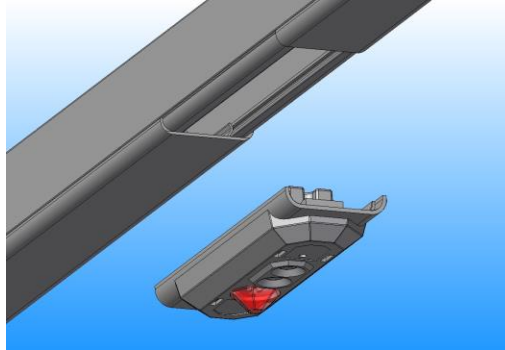
We then implemented those definitions to, what we believe, is most innovative, neat and most cost effective Parking Guidance System available to date.



2. Mechanical installation made easy

The Diamond Parking Guidance System comes with full installation gear.

- The System is installed and housed in our specially designed, complete solution trunking system. The solution includes end caps, side entries, joiners, cable rings and more.
- Units, sensors, space indicators and even data buffers are simply clicked in.



- The trunking system is easy to mount suspended from the ceiling using special brackets.



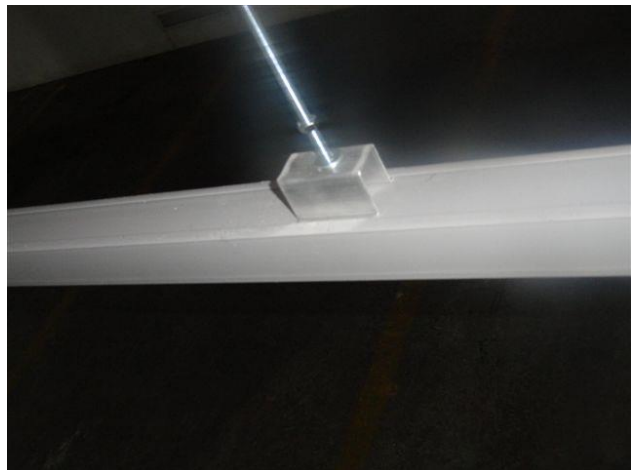
The suspension rods and the brackets can be attached to the ceiling and the trunking can be clipped in once a full line is ready. Further, the system allows for drilling errors due to the structure of the bracket.



Suspension rods with brackets ready



Suspension rod is attached to the ceiling

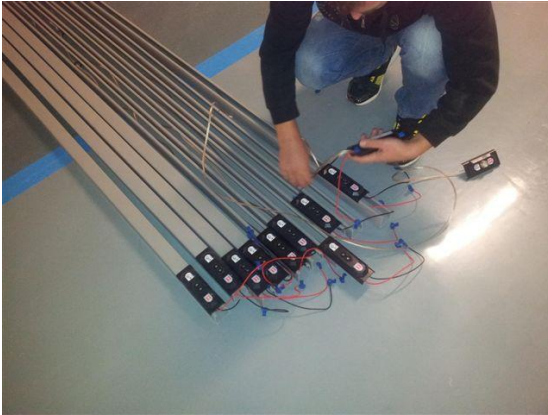


The trunking is clipped to the suspended bracket



Trunking is ready for units and wiring

- Many parts of the installation can be prepared at the factory. Reducing site time to minimum. In the following pictures you can see the outreach arms containing the sensors and indicators, which are prepared and wired before they are installed.



Outreach arms are prepared



Outreach arms are ready to be installed

Conclusion

The full installation gear of the Diamond Parking Guidance System makes mechanical installation quick and easy

Also, since there is one installation system that caters for all applications, the process is repetitive across various sites with different heights and geometries.

3. Wiring made easy

No special connectors or tools are required for the electrical installation. All is needed are screwdriver and cutter.

The wiring of Parking Guidance Systems can be divided to two:

- Power wiring.
- Communication wiring

3.1 Power wiring

Delivering power to thousands of units is not trivial. It was clear that the power consumption must be minimized in order to reduce the power supplies size and number. In turn, this will reduce the complexity and cost of the wiring.

The Diamond PGS is by far the lowest power consumption sensor available to date:

Less than 300mW per sensor!

This was achieved by using the latest micro controller and LED technology with careful design.

Up to 250 Sensor units can be connected to a single 100W power supply. The bus is made of two 1.5mm standard cable. To avoid voltage drop, the cable is continuous from the power supply to the last unit. Standard splices are used to branch from the main cable to the units.

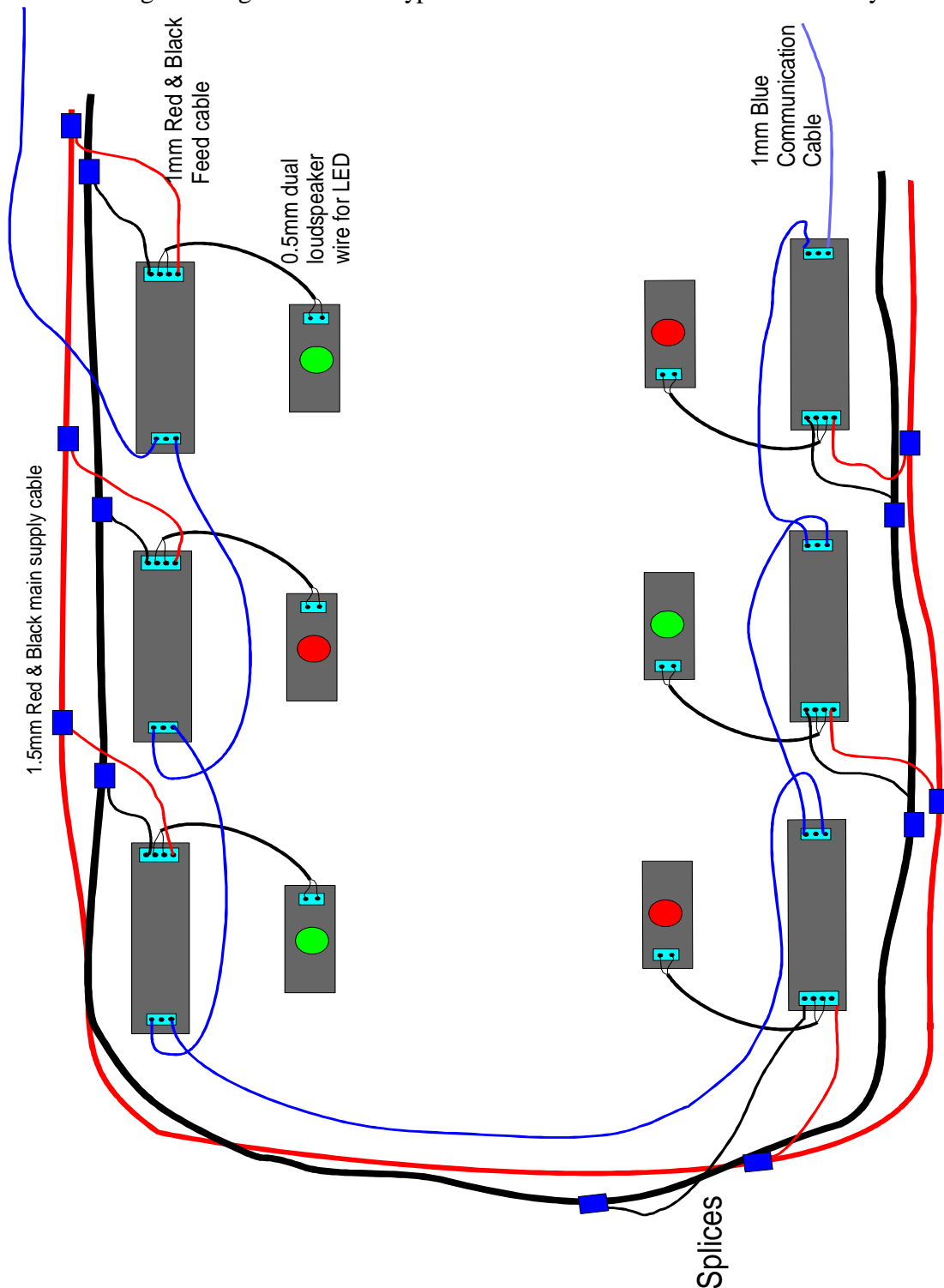
Further, all units are supplied with wire tail and splices already attached, making the connection to the power a 10 seconds effort.



3.2 Communication wiring

The communication is of a daisy chain architecture that uses standard RS232 communication. The communication line between two units is never longer than a few meters enabling the use of a low cost standard single core screened wire.

The following drawing illustrates a typical connection of a few sensors to the system



Conclusion

The Diamond Parking Guidance System is very easy to wire. No special connectors, wire or tools are required.

4. Commissioning made easy

Commissioning is a significant cost for all the traditional systems. It is a massive effort to mark, address and document the position and address of thousands of sensors and then map it into the system. Once the thousands of sensors are mapped one still need to allocate parking areas to specific numeric displays.

The communication architecture of the Diamond Parking Guidance System together with an automatic mapping application is an integral part of the system brings commissioning effort to practically **nil**.

In other words:

You can build a system of 2400 sensors, 48 numeric displays, and 12 Power supplies with division to various geographical sections and allocations.

Switch the power to the system ON, perform Auto-Mapping procedure and all relevant information will be relayed to all relevant displays without you needing to put any effort.

Conclusion

The Commissioning effort required by the Diamond Parking Guidance System is very low, practically nil.

5. ControlRoom Application made easy

The ControlRoom application is standard and runs all sites. All you need to do is create the graphical view of the site; the application then imports it and runs.

In other words:

You can have a 5000 bays site, on 10 levels. The ControlRoom will run, indicate, log, and produce graphs and reports without **you needing to write a single line of code!!**

Conclusion

The Diamond Parking Guidance System ControlRoom Application is easy to construct using a graphical front end.