



SMART CITY Case History

GDS brings innovative E-paper signage to Berlin

Global Display Solution (GDS) is proud to announce the installation of a fully solar powered sign based on a 13inch e-Tela display in Berlin.

As part of its *Grüne Haltestelle* 'future green stations' initiative, Berliner Verkehrsbetriebe (BVG), Germany's largest local public transport company, plans to provide real-time passenger information on self-sustainable displays across its transit network.

Several companies have been invited to participate in the initiative with different technologies: e-paper, LCD and LED displays.

GDS team applied all its display competence to install a fully outdoor and solar powered e-paper sign capable of withstanding every weather condition.

Moreover, the sign becomes an important piece of the smart city network. In fact, thanks to the connection to the web server, it is possible to control the display from any location and in real time.

The application

According to a research study conducted in Atlanta, more than 60% of riders feel more relaxed and perceive a decrease in wait time when they have access to real time information at a bus stop.

Currently, all the technologies available that show real time information (LCD or LED displays) require an electrical installation from an outside source, making both the installation and the cost of operation more expensive.

Thanks to the minimal power consumption of e-tela screens it is now possible to provide instant information.

No outside electrical hookup is necessary.

A small solar panel provides all the power needed.

Bus operators will be able to show real-time info on everything from bus arrivals, to bus routes, as well as regularly maintained schedules.

The sign can also display important notices about any changing service conditions. This leads to a much more efficient public bus transport system.

GDS E-Tela: the most effective choice based on the E Ink technology

GDS e-Tela is based on E Ink technology which is **bi-stable**.

This means that the display retains the image even when no electrical power is being used.

In fact, electrical power is only needed when the content is changed.

The display is also reflective, which means that backlight is not needed as long as there is adequate ambient light.

Unless it is properly installed, however, the e-paper module alone is not practical for the outdoor environment.

Here the GDS experience in outdoor traditional displays is very important.

When coupled with GDS' proprietary technologies and processes dedicated to E-ink, the module can be used as a perfect display solution for all those conditions in which power, readability and liability are concerns.

Moreover, e-Tela is friendly to battery and solar power generation.

The challenge of making outdoor reliable displays

Can anyone install one of these panels?

No, this is the tricky part. It requires a company with proven experience to assure that the panel will be able to handle extreme weather conditions and avoid vandalism.

Improperly installed equipment (or signage not specifically manufactured for outdoor use) might work for a few days or even weeks.

But it will eventually fail, just as a commercial TV would fail if placed outdoors for any length of time. Global Display Solutions (GDS) understands the requirements that must be met to make outdoor displays work well thanks to the thousands of screens installed and properly working all over the world.

For over thirty years we have been developing and manufacturing leading edge technologies based on LCD, TFT, LED and now E-Paper for outdoor signage, thanks to the unique Joint Development Agreement between GDS and E Ink.

Berlin, 13" e-Tela Schuetzallee bus stop installation



Berlin, GDS' bus stop solution system: e-Tela product with solar panel



The GDS' 13" e-Tela product is reliable in all weather conditions



GDS G+Bond: the ultimate solution for the best readability

One of the most important requirements of a public digital sign is its readability. In fact, the screen needs to be visible in all sunlight conditions with a wide viewing angle of 180°. GDS is able to achieve this goal thanks to GDS G+Bond™ technology. The GDS G+Bond™ is a proven and unique technology that GDS uses also in the outdoor LCDs. A special transparent material fills the air gap between the E ink panel and front glass leading to many advantages, such as removing internal reflections (improving contrast), increasing viewing angle, improving thermal management and protecting the display from dust and condensation accumulation. The G+Bond™ is a professional solution and temperature resistant, which has been developed by GDS specifically for outdoor displays. G+Bond™ has been successfully tested in the field for many years.

The difference between a GDS E-Tela display with GDS G+Bond™ and any other competitor solution is clearly evident as soon as a person observes the signs from a side: GDS solution looks exactly like a piece of paper with absolutely no reflections, while the competitor solutions are almost impossible to read under direct sunlight due to the high degree of reflection from the front glass.

The importance of choosing the right display expert

Thanks to the minimal power consumption and the paper like appearance E-paper has proven to be the right technology for real time passenger information at bus stops.

However, it is a challenge to provide a digital sign that is reliable and perfectly readable in every sunlight condition.

GDS understands this challenge very well to our experience in serving the outdoor sign market for more than 30 years.

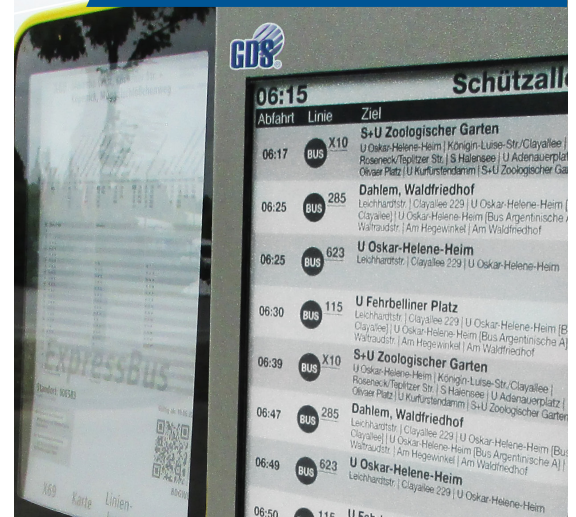
During this time, we have installed thousands of LCD displays all over the world. In fact, the first outdoor mass installation of e-paper screens was achieved through a partnership between GDS and E-ink that led to the creation of a price petrol sign based on e-paper for JET, the filling station brand of Philips 66 used in Germany.

Designed to succeed

Berliner Verkehrsbetriebe (BVG), Germany's largest local public transport company, gave to GDS the possibility to boost this 'future green stations' initiative, with the promise to Berlin citizens to provide a digital bus stop system with real time passenger information, based on Green and Low Power Network.

GDS with the long experience in the Outdoor market is pleased to be part of this innovative project, providing its knowledge in one complete solution: **GDS E-Tela 13"**.

Comparison between a competitor product and the 13" GDS' e-Tela product with G+Bond™ optical enhancement



GDS experience in outdoor displays: Live Demo Area under the snow



Berlin, GDS 13" e-Tela improves the passenger experience with real time information at the Schuetzallee Bus Stop



About GDS

After more than 40 years, GDS continues to be a technology leader and world leading manufacturer of display solutions. GDS's position as the chosen partner of some of the world's leading blue chip companies has been achieved and maintained by providing best-in-class solutions, products and services. Today, GDS continues this ethos by growing with clients as their needs and requirements change. It is this dedication to customers that drives GDS to remain at the forefront of its chosen technologies and markets.

11:24		Schützallee
Abfahrt	Linie	Ziel
11:24	285	Dahlem, Waldfriedhof Leichhardtstr. Clayallee 229 U Oskar-Helene-Heim Waldfriedhof Am Hegewinkel Dahlem, Waldfriedhof
11:25	623	U Oskar-Helene-Heim Leichhardtstr. Clayallee 229 U Oskar-Helene-Heim
11:31	115	U Fehrbelliner Platz Leichhardtstr. Clayallee 229 U Oskar-Helene-Heim Altes Postmuseum Bonaparte-Luisen-Str. Clayallee Ehrenplatz S Hohenschönhausen U Fehrbelliner Platz
11:32	X10	S+U Zoologischer Garten U Oskar-Helene-Heim Köpenicker Str. Clayallee Rosenthaler Platz S Hallesche Str. U Zehlendorf U Oskar-Platz U Köpenicker Str. S+U Zoologischer Garten
11:40	X10	S+U Zoologischer Garten U Oskar-Helene-Heim Köpenicker Str. Clayallee Rosenthaler Platz S Hallesche Str. U Zehlendorf U Oskar-Platz U Köpenicker Str. S+U Zoologischer Garten
11:44	285	Dahlem, Waldfriedhof Leichhardtstr. Clayallee 229 U Oskar-Helene-Heim Waldfriedhof Am Hegewinkel Dahlem, Waldfriedhof
11:44	623	U Oskar-Helene-Heim Leichhardtstr. Clayallee 229 U Oskar-Helene-Heim



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