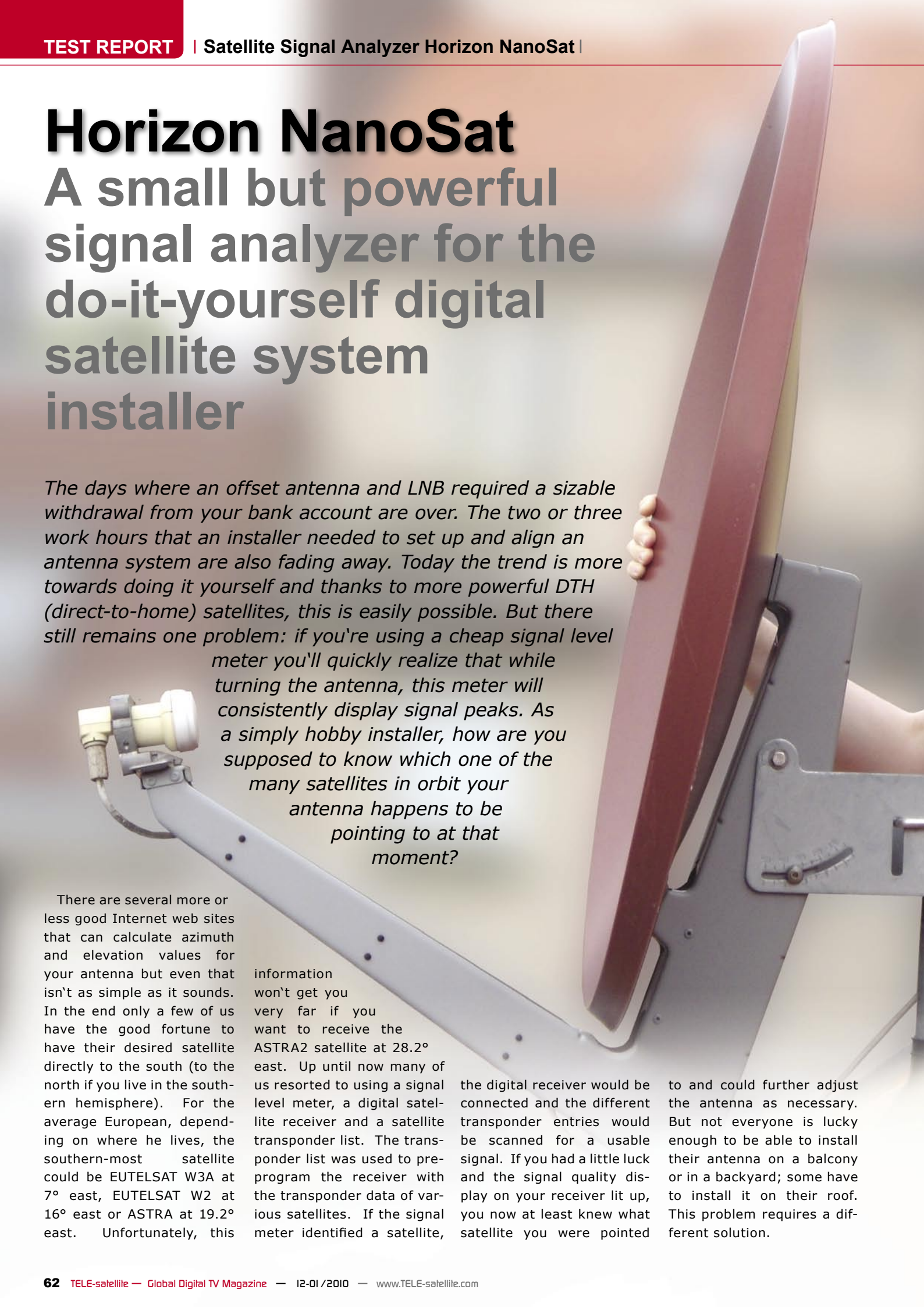
Horizon NanoSat

A small but powerful signal analyzer for the do-it-yourself digital satellite system installer

The days where an offset antenna and LNB required a sizable withdrawal from your bank account are over. The two or three work hours that an installer needed to set up and align an antenna system are also fading away. Today the trend is more towards doing it yourself and thanks to more powerful DTH (direct-to-home) satellites, this is easily possible. But there still remains one problem: if you're using a cheap signal level meter you'll quickly realize that while turning the antenna, this meter will consistently display signal peaks. As a simply hobby installer, how are you supposed to know which one of the many satellites in orbit your antenna happens to be pointing to at that moment?



There are several more or less good Internet web sites that can calculate azimuth and elevation values for your antenna but even that isn't as simple as it sounds. In the end only a few of us have the good fortune to have their desired satellite directly to the south (to the north if you live in the southern hemisphere). For the average European, depending on where he lives, the southern-most satellite could be EUTELSAT W3A at 7° east, EUTELSAT W2 at 16° east or ASTRA at 19.2° east. Unfortunately, this information won't get you very far if you want to receive the ASTRA2 satellite at 28.2° east. Up until now many of us resorted to using a signal level meter, a digital satellite receiver and a satellite transponder list. The transponder list was used to pre-program the receiver with the transponder data of various satellites. If the signal meter identified a satellite, the digital receiver would be connected and the different transponder entries would be scanned for a usable signal. If you had a little luck and the signal quality display on your receiver lit up, you now at least knew what satellite you were pointed to and could further adjust the antenna as necessary. But not everyone is lucky enough to be able to install their antenna on a balcony or in a backyard; some have to install it on their roof. This problem requires a different solution.

HORIZON

For a reliable solution!

TELE satellite AWARD 12-01/2010

HORIZON NANOSAT
Ideal for the speedy alignment of satellite antennas

TELE-satellite Test Editor Thomas Haring adjusting a 90cm offset dish using the NanoSat

Naturally, there are an assortment of professional signal analyzers on the market such as those we have here in our test facility, but would a normal end-user who needs to do a one-time antenna alignment spend the money on such an analyzer that could cost as much as a small used car? That's doubtful, and if he did, then he could also afford to have a professional installer do the work for him. Even an enthusiastic RV'er would balk at such a large investment; he would find other means to

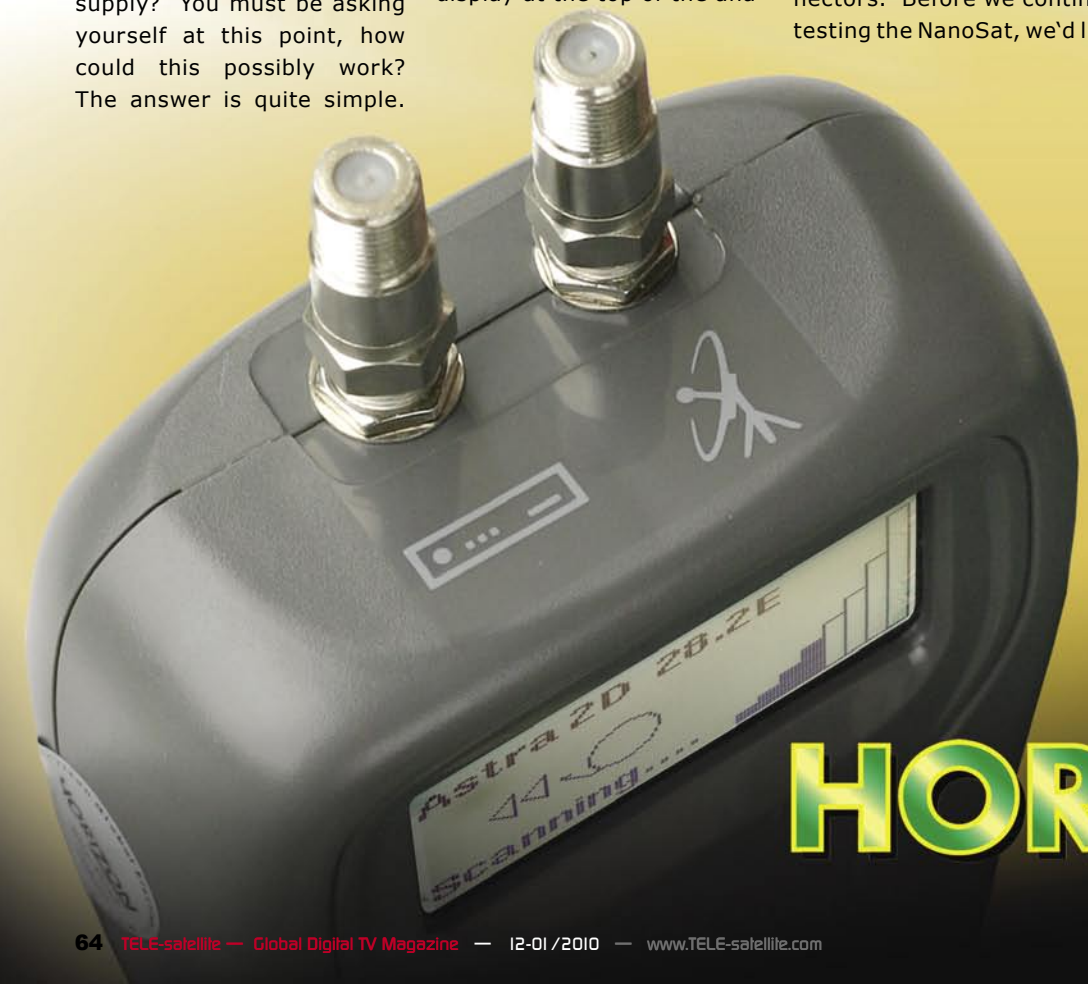
align his RV satellite antenna to his desired satellite. If you look at a professional signal analyzer a little closer, you'd quickly notice that it operates through dozens of functions that are more geared for the professional user but are otherwise not really needed when aligning to a DTH satellite. The British company Horizon, familiar to our readers for its innovative line of signal analyzer products, recognized this problem and designed a completely new signal analyzer. Its basic requirements were simple: it must be extremely easy to use, it must support the end-user as best as possible while installing an antenna and it has to be affordable. The end result was the NanoSat.

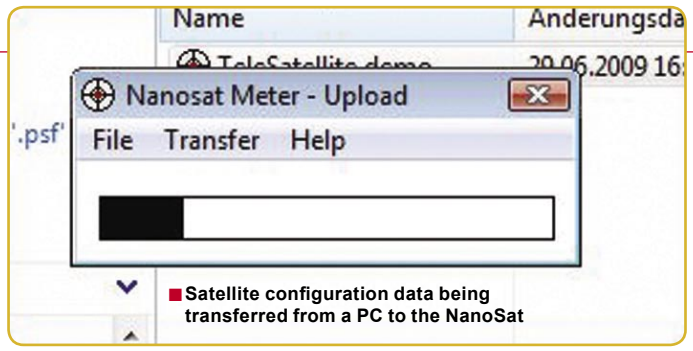
Everyday Use

The NanoSat is a lightweight device and at 14x9x4cm is not all that big. It's a featherweight at 230g thanks in large part to the absence of an integrated power supply. No power supply? You must be asking yourself at this point, how could this possibly work? The answer is quite simple. If you're installing a satellite antenna, you would also be running a cable from the receiver to the LNB.

Horizon was very clever here: the NanoSat is installed between the LNB and receiver inline with the coax cable. The cable from the receiver is connected to one of the F-connectors on the NanoSat while the coax cable included in the NanoSat package is connected to the second F-connector on the NanoSat and routed to the LNB. The receiver is then turned on, thus supplying power to the NanoSat via the coax cable. The selected channel doesn't matter; the NanoSat can work with either 13V or 18V.

You won't find an assortment of buttons providing access to a multitude of features or operational modes, and wouldn't you know it, you really don't need them! What you will find is an easy-to-read 128x64 pixel LCD display at the top of the analyzer and one single large button to select the desired satellite. The entire unit is protected in a very practical pouch that can be kept on the analyzer since there are cutouts for the display, the button and the connections. A detailed user manual is also included that clearly and precisely describes the functions of this new Horizon signal analyzer. And to make sure that the end-user wastes no time in getting to work, Horizon also included a satellite IF cable as well as a USB cable in the package. Also very practical are the two protection plugs to help prevent damage to the connectors. Before we continue testing the NanoSat, we'd like to first highlight some of its functional capabilities. The NanoSat comes with internal memory with the capacity to store transponder data from up to four satellites. The NanoSat came delivered to us with the data from ASTRA 19.2° east, HOTBIRD 13° east, ASTRA2A 28.2° east and ASTRA2D 28.2° east already pre-installed. The NanoSat consistently scans for active signals from one of these four satellites. If it recognizes one of these satellites, it first displays arrows to indicate the direction to the desired satellite, that is, whether the antenna needs to be turned to the east or to the west. The number of arrows shown indicates how far the antenna is from the desired satellite; four arrows represents the furthest distance, three arrows is closer, two arrows is very close and one arrow suggests the antenna is nearly on top of the desired satellite. Once the antenna is aligned with the proper satellite, an audio tone can be heard allowing the fine-tuning of the antenna. On the right side of the screen are signal bar graphs; the higher the bar graph, the better the received signal. If the signal strength is as high as it will go, that is, the





Satellite configuration data being transferred from a PC to the NanoSat

bar graph display can't go any higher, simply tighten the screws and your antenna is perfectly aligned.

For our tests we used a Kathrein CAS90 90cm offset antenna. Not much effort was needed to connect the signal analyzer to the LNB and receiver. We loosened several mounting screws and started adjusting the antenna. It was quite clear that for us here in Vienna the southernmost satellite was Eutelsat W2 at 16° east and that we could very easily find the very popular ASTRA 19.2° east. But we wanted to approach this task as would a beginner and began to adjust the antenna arbitrarily.

We set up ASTRA 19.2° east on the signal analyzer as the desired satellite and then started to move the antenna. The user manual recommended adjusting the elevation setting to roughly 5-10° below what the actual antenna elevation angle should be. We then began moving the antenna from east to west or vice versa. After each movement from one side to the other, the elevation was slightly raised and the antenna movement repeated. To our surprise, the NanoSat meter using this method showed quite clearly that we had passed HOTBIRD 13° east and that we had to move the antenna to the east to find ASTRA 19.2°.

The displayed arrows were quite helpful and over just a short period of time fewer and fewer arrows were shown until the audio tone came on indicating we had found ASTRA 19.2° east. We quickly fine-tuned the antenna and discovered something very interesting: Even though ASTRA is a very strong satellite and we used an antenna with sufficient gain, we were not able to achieve a full-scale reading on the signal quality bar graph. There's a very good reason for this: Horizon has no idea what size antenna will be used with their NanoSat meter so if it gave a full-scale display above a certain MER, then with a larger antenna it would be nearly impossible to find the optimal antenna position. Instead, the NanoSat adjusts itself based on the measured MER and the signal level and reduces the signal quality display correspondingly. So the goal when tuning the antenna is not to get a full-scale reading on the meter but to get the highest possible reading and adjust the antenna accordingly.

The user manual also describes the fine adjustment of the antenna very clearly. As soon as the correct satellite is identified, the user is instructed to move the antenna just far enough to the east and west until the signal is lost. The point in between these east and west limits is the optimal azimuth setting. The same procedure is used for elevation and LNB skew.

After this first triumph, we wanted to make sure and try it again. This time we switched the NanoSat to the ASTRA2A 28.2° east position and managed to also find this satellite in no time at all. It became clear that even a professional signal analyzer used in this special application would not do much better for us. We adjusted the antenna in both cases with a professional signal meter and could not noticeably improve the signal.

Naturally, the next question that comes to mind is this: what if a user outside of Europe wants to use the NanoSat or what if someone wants to align their antenna to some other satellite? Horizon included a USB interface in the Nanosat exactly for this reason. With the help of the included USB cable, the NanoSat can be linked with a PC. Software containing configuration data from various regions can be downloaded from the manufacturer's website. By the time the NanoSat is introduced to the market, preprogrammed settings for the Americas, Asia, Australia, Africa, etc. will be available. Also being worked on is configuration data for other popular European satellites such as TURKSAT 42° east, THOR 1° west, SIRIUS 5° east or EUTELSAT W3A 7° east. Thanks to the USB interface, the NanoSat can be used anywhere in the world and can be reprogrammed by the user as often as needed.

We here at TELE-satellite were quite impressed with Horizon's NanoSat. It is small, handy and simplifies the alignment of a satellite antenna for beginners as well as for professionals. It is also perfect for use in aligning RV antennas. It was never this easy to quickly and precisely align a satellite antenna!

Expert Opinion

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Small, handy, completely reliable and easily expandable thanks to the USB interface. Measurements were correct and even with a professional signal meter there was no noticeable improvement in the signal. Its lightweight 230g made it especially easy to handle.

Thomas Haring
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None

TECHNICAL DATA

Manufacturer	Horizon Global Electronics Ltd., Unit 3, West Side Flex Meadow Harlow, Essex, CM19 5SR, United Kingdom
Tel	+44 (0) 1279 417005
Fax	+44 (0) 1279 417025
Web	www.horizonhge.com
Email	sales@horizonhge.com
Model	NanoSat
Function	Handheld Satellite Meter for fast and easy Dish Alignment
Frequency range	950~2150 MHz
Reception Mode	DVB-S
Items included	Carry case, USB cable, Sat-IF cable, 2 protective barrels, Satellite region packs download via Internet
Dimensions	140x90x40mm
Weight	0.23kg
Display	128x64 Pixel LCD