simple and easy to use cross line laser which projects horizontal (level) and vertical (plumb) lines together, or separately." Applications for the laser include surface and wall layout, such as floor and wall tiles, drop ceiling instrument, wall framing and aligning wall fixtures.

Improvements over the LS100 include a wider laser line, a low battery indicator and a pendulum lock function to protect the laser during transport. The laser has two output windows, one for the laser cross and the other for the 90° plumb line reference.

Trimble's new Spectra Precision Laser HV201 model, meanwhile, is a portable, horizontal and vertical laser targeted at a wide range of general construction and interior applications. Described by Trimble as an "entry-level laser", the HV201 has been built for construction site use – it will survive being dropped 1 m onto concrete – and is designed to be "highly intuitive" to use and is fully automatic, with self-levelling set up in both horizontal and vertical planes.

The HV201 is available in two configurations: the general construction package is for levelling, establishing vertical alignments and squaring/ maintaining layout requirements on residential and small commercial construction projects, and the interior package, for installing ceiling grids, locating finished floor levels and laying out interior walls.

It doesn't have an integral digital camera, and neither will it tell you where you are in the world (to the nearest centimetre), but it will tell you if you've installed the window frames correctly. ce

GPS answer for Greek railways

GREEK SURVEYING FIRM METRON CONSULTING ENGINEERS has used a combination of GPS surveying techniques and total station instruments to create a three-dimensional survey of a 240 km length of railway between Thessaloniki and the Turkish border.

Working for O.S.E. Railway, which is upgrading the line, Metron had to survey a 60 m wide corridor along the entire length, using the track as the centre line. The company decided early on that using total stations for the entire job would have been time consuming and costly, and instead opted for a GPS-based survey using five Thales Z-Max GPS receivers and four Thales Z-Xtreme GPS receivers.

The seven-person survey team – led by Metron directors Vasilios Paslis and Epaminondas Valtinos – used static survey methods for the triangulation network and Real Time Kinematic (RTK) methods for control and detailed survey points. The triangulation network comprised 140 points, which were all identified, measured and permanently marked within 15 days.

The surveyors also established around 2000 control points using RTK methods, with detailed points collected in RTK mode using one Z-Xtreme system as a base station along with eight rover receivers. Receivers were placed in a straight line about 20 paces apart, at right angles to the track, with one surveyor sketching the arrangement as the rovers collected the points.

At train stations, where greater survey details were required, or in areas where there was dense foliage, the team reverted to conventional total station surveying methods, with the RTK control points in the area used to set up total station in a short time. All the data, whether collected by total stations or the RTK receivers, was then imported into Thales' FAST Survey software package.

Thales says the contract was completed "in a very short time with accurate and precise results" and that Metron is now using its GPS technology on a number of major projects, including a 4,5 million m² land survey as part of a national highway project from Athens to Thessaloniki, a real estate registration project for 60 km of railway in the Messologgi province, and a 20 km forest road project.

enquiries 126 see page 56

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