Blighter B400 series radars scan and detect moving vehicles and persons (including ‘crawlers’) over a wide area and provide exceptional detection performance out to 32 km. Detected targets are reported via a standard Ethernet TCP/IP network connection, allowing target recognition and identification through the automatic slew-to-cue of optional cameras or thermal imagers. Accurate positional information is reported, including target lat/long co-ordinates, range and bearing. The data bandwidth required for target output and radar control is very low.

Electronic-scanning (E-Scan)
The B400 series is BSS’s latest generation of e-scan ground surveillance radars (GSR). Blighter e-scan radars have no moving parts to wear out, maintain or replace and offer dramatic improvements in reliability over mechanically scanned radars. Blighter radars are all-in-one fully integrated units comprising antennas, signal processing, plot extractor, GPS and compass. Angular coverage is provided in modular units of 90°. Blighter radars are proven to withstand harsh environmental conditions and provide many years of maintenance free operation. The radar operates in all weather conditions and includes a built-in precipitation filter that suppresses false detections from rain or snow. Day/night 24-hour operation is fully supported.

Low-power FMCW Doppler Technology
Blighter radars incorporate a unique combination of FMCW and Doppler processing technology, ensuring unsurpassed ground clutter cancellation with the ability to detect incredibly slow movement. Radio transmission power is very low, making the radar safe for human operation and difficult to intercept (i.e. electronically covert). Power consumption is low, allowing operation from battery, vehicle or mains.

Wide Elevation Beam
In order to maximise long range detection performance, radars are typically mounted high on a tower or on top of a hill. However, when mounted in this way, the narrow vertical elevation beam of traditional radars results in the problem of ‘dead ground’ close to the radar. Blighter radars benefit from having a very wide vertical elevation beam, allowing them to detect targets in the distance as well as close-up simultaneously. In complex mountainous regions, the Blighter radar’s wide elevation beam also ensures that hill tops and valleys can be scanned simultaneously, without the need to physically tilt the radar. Over flat land and calm water, the wide beam also provides rapid detection of low flying manned and unmanned aircraft including planes, helicopters, UAVs, microlights and hang gliders.

Blighter Surveillance Systems (BSS) addresses a broad range of security requirements in the defence, homeland security and civil/commercial markets. Blighter radars are part of a range of advanced BSS technologies that provide class-leading protection against both conventional and asymmetric/terrorist threats.
Architectural Overview
- Radar type: E-scan Frequency Modulated Continuous Wave (FMCW) Doppler Ground Surveillance Radar
- Frequency band: Ku band
- Spectrum occupancy:
  - Wide-band (WB): 15.7 to 17.2 GHz
  - Narrow-band (NB): 16.2 to 17.2 GHz
- Scan type: fully electronic scanning in azimuth (‘e-scan’) using a Passive Electronically Scanned Array (PESA)
- Transmitter power (nominal): 1 Watt (standard power transmitter version) or 4 Watt (high power transmitter version)
- Multi-radar operation: supported and unlimited
- Embedded software and firmware: field upgradeable via network connection

Target Detection Performance
- Maximum detection ranges:
  - Crawling person (RCS 0.1 m²): 4.6 km (2.9 mi.)
  - Walking person (RCS 1 m²): 11.0 km (6.8 mi.)
  - Moving RIB (RCS 5 m²): 16.0 km (9.9 mi.)
  - Moving vehicle (RCS 30 m²): 20.0 km (12.4 mi.)
  - Large moving vehicle (RCS 100 m²): 25.0 km (15.5 mi.)
  - Large moving vessel (RCS 1000 m²): 32.0 km (19.9 mi.)
- Minimum detectable target radial velocity: 0.37 km/h (0.23 mph)
- Vehicle supply input range: from 12 V to 24 V (DC)
- Power consumption (from 12 V regulated-PSU): 38 W (average)
- Endurance*: 10 to 12 hours continuous operation from dual 2590-type batteries

Coverage
- Instrumented maximum range: 2, 5, 8, 16 or 32 km (1.2, 3.1, 5.0, 9.9 or 19.9 mi.)
- Azimuth scan angle: 90° (B402), 180° (B422), 270° (B432) or 360° (B442) horizontal e-scan
- Elevation beam: 10° or 20° vertical beamwidth
- Fastest scan time (for 90°): 1 s

Target Output & Identification
- Data format: QZ (custom, open-standard data format)
- Target output port: available for cueing of pan/tilt-mounted cameras and thermal imagers
- Doppler audio modes: optional

Connectivity & Software
- Main I/O interface (for radar control and target data): 10/100 Ethernet network interface
- Auxiliary I/O interfaces: RS-232 and RS-422 control lines, opto-isolated control/status inputs and isolated switched contact outputs
- Software (SDK): API software library (Windows) and generic Interface Control Document (ICD) are both available to System Integrators

Electrical
- Battery/regulated-PSU input range: from 12 V to 28 V (DC)
- Vehicle supply input range: from 12 V to 24 V (DC)
- Power consumption (from 12 V regulated-PSU): 38 W (average)
- Endurance*: 10 to 12 hours continuous operation from dual 2590-type batteries

Physical, Environmental & Reliability
- External dimensions of radar unit(s) (W x H x D)*: 666 mm x 503 mm x 128 mm** (26.2 in. x 19.8 in. x 5.0 in.**)
- Weight of main radar unit (approx.)*:
  - Wide-band (WB): 25 kg (55 lb.)
  - Narrow-band (NB): 27 kg (60 lb.)
- Weight of auxiliary radar unit(s) (approx.)*:
  - Wide-band (WB): 21 kg (46 lb.)
  - Narrow-band (NB): 24 kg (53 lb.)
- Operating temperature: from -32° C to +60° C (from -25° F to +140° F)
- MTBF: > 65,000 h (zero maintenance)

* excluding antennas, mountings and solar shield
** depth of narrow-band radar units is 133 mm (5.2 in.)
* HP version fitted with M10S antennas