### Technical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>+/- 0.1 mm (i.o.s.)</td>
</tr>
<tr>
<td><strong>Spatial resolution</strong></td>
<td>Range: 0.5 m Cross Range: 4.4 mrad (0.5 m by 4.4 m @1 km; 0.5 m by 8.8 m @2 km)</td>
</tr>
<tr>
<td><strong>Operating range</strong></td>
<td>10 m to 4000 m</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-20°C to +55°C</td>
</tr>
<tr>
<td><strong>Scan time</strong></td>
<td>&lt;3 min</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>&lt;100 W</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>IP66</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>FCC, CE, IC</td>
</tr>
</tbody>
</table>

### IBIS-FM Optional Items

The IBIS-FM basic configuration, including linear scanner, radar sensor and power supply module, can be provided with the optional tools listed below:

- **Genset**: Diesel generator controlled by IBIS Controller
- **Digital Camera**: High Resolution Digital Camera with dedicated software
- **Radio link**: Wi-fi point-to-point link for data transfer
- **Radio link repeater**: Radio link repeater for data transfer
- **Weather station**: Weather station controlled by IBIS Controller

### Software Specifications

<table>
<thead>
<tr>
<th>Software</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IBIS Controller</strong></td>
<td>Acquisition parameter setting, Power supply control, Status Information, Preliminary data processing, Transfer data tools</td>
</tr>
<tr>
<td><strong>IBIS Guardian</strong></td>
<td>Automatic Atmospheric Correction, Alarm generation with user-defined levels, Multiple alarm criteria based on area definition, 3D interactive data handling, Output exportation to mine planning packages, External DTM importation</td>
</tr>
</tbody>
</table>
**APPLICATIONS**

- Continuously measure (24x7) mine wall movements with sub-millimetric accuracy at long distance (up to 4 Km)
- Provide reliable early warning for progressive slope movements that potentially lead to failures of mine walls
- Map the long term evolution of slow moving slopes

**BENEFITS**

- Safety improvements for both personnel and equipment
- Reduced production delays due to slope instability
- A better knowledge of the rock mass strength through long term monitoring
- Limited use of personnel needed to operate the radar thanks to the long working range
- The large area coverage provides a broad picture of the pit walls
- Simultaneous tracking of fast and slow movements through long term acquisitions
- Fast alarm generation time thanks to high spatial resolution and fast scan time
- Low false alarm rate thanks to the innovative radar technology
- Full suite of support packages: professional training, installation services, customer support plans

**COMPOSITION**

- Digital Camera
- Solar Panels
- Wi-Fi Link
- Diesel Generator
- Weather Station
- Power Supply Module
- Radar Unit

**OPTIONAL INTEGRATED CONTAINER**

The Integrated Container for the IBIS-FM system offers a unique all-in-one solution, as well as extra protection against unexpected weather events and theft attempts

- Fully integrated and self-powered
- Rugged solution for harsh environments
- Easy to relocate (forklift, bottom skids, truck)
- Thermal insulation
- Optional processing workstation for on-site radar data availability

**SOFTWARE FEATURES**

- Real time processing with automatic atmospheric corrections
- Alarm generation with user-defined levels and multiple alarm criteria
- Processing of discontinuous datasets (through re-positioning of the system)
- Fully georeferenced outputs
- 3D interactive data handling
- User defined zones for alarm generation
- Exportability of outputs to mine planning software

**FEATURES**

IDS has furnished IBIS-FM with a suite of advanced technologies able to overcome the weak points of the previous generation of slope radar systems and it now offers the following leading edge features:

- Highest spatial resolution (0.5 x 4.4 m resolution cell @1 km), resulting in a smaller detectable area of failure.
- Longest operating range: from 10 m to 4000 m.
- Extremely broad coverage of pit walls (e.g. an area of around 5 km² @2 km)
- Acquisition time: just a few minutes for a full resolution scan at long range (3 minutes @2 km)
- Long term monitoring through either permanent installations away from blasting restricted areas or precise re-positioning of the system
- Fully self powered operation by using a combination of solar panels and batteries, resorting to a diesel generator only as a back-up
- High in-service availability: limited number of moving parts and low maintenance requirements mean minimum down time
- Fully remote operation through a wire-less radio link.
- Advanced atmospheric estimation
- Fully tested in harsh mining environments

**IBIS Guardian software highlighting areas of slope movement**