Scope of supply

<table>
<thead>
<tr>
<th>Standard equipment</th>
</tr>
</thead>
</table>
| **USTER® SENTINEL workstation** | - Industrial computer  
- 3 hard drives for data security and system redundancy  
- Pre-installed software packages  
- 1 dongle key for the USTER® SENTINEL server  
- Supports up to 150 machine stations and 100,000 spindles |
| **Machine stations** | - Supports up to 2,048 spindles for each ring spinning machine  
- 1 machine station for each ring spinning machine |
| **Spindle monitoring** | - Single spindle monitoring sensor |
| **Main shaft sensor** | - 1 main shaft sensor for each ring spinning machine |
| **Front roller sensor** | - 1 front roller sensor for each ring spinning machine |
| **Doff sensor** | - 1 doff sensor for each ring spinning machine |
| **Indicators** | - 4 alarm lamps for each ring spinning machine  
- 1 LED for every spindle with end break, slip spindle, off-quality indication  
- 1 section indicator every 96 spindles, visible from large distance |
| **Energy sensor** | - 1 energy sensor for each ring spinning machine |
| **Optional equipment** | 
| **Temperature and humidity sensor** | - 1 temperature and humidity sensor for each ring spinning machine |
| **In-mill dashboard** | - 1 connection box for connection to a monitor inside the ring frame area. The cabling and monitor are organized by the customer. |
USTER® SENTINEL can be expanded by adding additional equipment. Uster Technologies does not supply the additional equipment. The following table shows the minimum requirements for the additional equipment.

**SENTINEL client PC**
- CPU: Intel® CoreTM2 Duo (>2.6 GHZ) or similar
- RAM: 2 GB
- Hard disk: 160 GB SATA Type
- Drives: 2 USB 2.0 port, 1 DVD Drive
- Network: Gigabit Ethernet Connection
- Display: 19" TFT monitor (resolution: 1920 x 1200)
- Graphic card: Support for WUXGA (1920 x 1200) and DirectX 9.0
- Internet connection: Broadband connection with minimum 2 Mbps speed (for remote support)
- Operating system, Windows 7 (32 bit and 64 bit supported)
- Other 1: Internet Explorer 7 or higher
- Other 2: Acrobat reader 6.0 or higher
- Other 3: Uninterruptable power supply

**Printer**
- No specific requirement. Note that the colors in reports may not be easily distinguished in the black and white print.
## Installation and storage conditions

<table>
<thead>
<tr>
<th><strong>Temperature and humidity</strong></th>
<th><strong>The ambient conditions must be maintained in order to avoid any influences on the operating and storage of the USTER® SENTINEL according to ISO 139 (2005).</strong></th>
</tr>
</thead>
</table>
| **Operating**               | **Temperature:** 0 – 50°C  
Relative humidity: 35 – 95%                                                                                                         |
| **Storage**                 | **Temperature:** -10 – 50°C  
Relative humidity: 35 – 95%                                                                                                         |
| **General ambient conditions** | **Water and dust resistance**  
IP class 60                                                                                                                               |
| **Installation**            | **Mains voltage range**  
100 – 240 VAC                                                                                                                             |
| **Mains frequency**         | **50/60 Hz**                                                                                                                             |
| **Power consumption**       | **USTER® SENTINEL workstation**  
240 W  
**Machine station**  
600 W                                                                                                                                     |
| **Connection type**         | By Ethernet Port via LAN cable. The installation and maintenance of the LAN is entirely in the responsibility of the customer. The network is an important prerequisite for correct and continuous operation of the USTER® SENTINEL system. |
| **Gross weights**           | **USTER® SENTINEL workstation**  
15.4 kg  
**Machine station**  
9 kg                                                                                                                                         |
Scope of application

**Application range**
- Yarn type: For spun yarns consisting of natural fibers, blended fibers, synthetic fibers, Siro and fancy yarns.
- Yarn color: For all yarn colors
- Count range: Tested application range from Ne 6 to Ne 150 / 10.2 Nm to 254 Nm / 98.4 tex to 3.94 tex
- Ring types: For all flange rings
- Traveler type and color: For all traveler types & colors
- Machine speed: Successfully operating up to 25,000 rpm
- Machine gauge: 70 mm and 75 mm supported currently

**Availability of ring frames**
Uster Technologies provides machine-specific variants of USTER® SENTINEL installation. A ring-spinning machine from a particular manufacturer can therefore only be equipped and operated with an USTER® SENTINEL variant that has been developed and adapted specifically for that machine type. USTER® SENTINEL is available for the following ring frame models:

<table>
<thead>
<tr>
<th>Company</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota</td>
<td>RX300, RX240 and similar</td>
</tr>
<tr>
<td>Jingwei</td>
<td>JWF1526, JWF1562, JWF1566 and similar</td>
</tr>
<tr>
<td>Lakshmi</td>
<td>LR-6 and similar</td>
</tr>
<tr>
<td>Rieter</td>
<td>G32, G35, K44, K45 and similar</td>
</tr>
<tr>
<td>Zinser</td>
<td>RM350, RM351 and similar</td>
</tr>
</tbody>
</table>

Additional ring frame models can be retrofitted upon request. A separate questionnaire is provided for new retrofit options.
Features

Key advantages
- Ergonomically designed single spindle sensors that support effortless piecing from machine operators
- Lightweight system with minimum stress on the ring rail lifting mechanism
- Monitoring of local temperature and humidity conditions for each ring frame
- Continuous monitoring of power consumption for each ring frame
- Machine maintenance history and monitoring of ageing of machine parts
- Team and personnel efficiency monitoring
- Class leading software provides real time analysis and seamless navigation from mill view down to the single spindle

Software key actions and features

Real time communication and control
- Live view of the machine state

Settings management
- Central article management
- Modify, store and download article settings

Advanced analysis
- Run/stop diagram for machines
- Bobbin build-up report

Intuitive reporting
- Exceptions handling and reporting
- Set of predefined role oriented reports
- Production, personnel performance
- End breaks, slip spindles, off-quality spindles, stops, maintenance
- Alarms for chain breaks and high end breaks
- Report editor
- Machines monitoring
- Team and personnel performance

Automated data management
- Automatic export of data
- Shift calendar
- Uploading articles data
- Data storage in a database
- User management – authorization

Fast connectivity and support
- Remote support and control tools
- Service logs

Database safety
- Automated data maintenance
- Automated backup
Languages and units

**Dialog languages**
German, English, Chinese, Turkish, Italian, Spanish, Vietnamese, French, Portuguese, Japanese

<table>
<thead>
<tr>
<th>Units</th>
<th>Productivity</th>
<th>Length</th>
<th>Weight</th>
<th>End breaks counter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m/min</td>
<td>m</td>
<td>g</td>
<td>EB/1000sh</td>
</tr>
<tr>
<td></td>
<td>yd/min</td>
<td>km</td>
<td>kg</td>
<td>absolute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>yd</td>
<td>lbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ky</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yarn count</th>
<th>Time</th>
<th>Power / Energy</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nec</td>
<td>minutes</td>
<td>kWh</td>
<td>Celsius</td>
</tr>
<tr>
<td>Nm</td>
<td>hours</td>
<td>kWh/kg</td>
<td></td>
</tr>
<tr>
<td>tex</td>
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<tr>
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</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>year</td>
<td></td>
<td></td>
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</tbody>
</table>