Hardware and software upgrade of the motor test unit in HAMK Valkeakoski

Initial situation

- HAMK Valkeakoski, Finland
- Didactical motor testing unit
- Outdated (made in 1999)
  - Windows 95 computer
  - 3 Parallel interface
  - Old ABB ACS600 drive
  - Doesn’t function anymore
- Needs upgrade:
  - Software (Windows 7)
  - Hardware (new communication, new drive)

New hardware

- New Windows 7 PC
- Replaced custom I/O panels by Beckhoff CX9020 PLC
  - Dedicated PLC → SAFER
  - Communication through Ethernet (TwinCAT ADS)
- Replaced ACS600 drive by new ACS355 drive
  - Overdimension (student proof)
  - Communication through PROFINET
- Improved emergency stop system

New software

<table>
<thead>
<tr>
<th>PLC</th>
<th>PC</th>
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<tbody>
<tr>
<td>Beckhoff TwinCAT 3</td>
<td>Shows starting current, speed and acceleration of:</td>
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<tr>
<td>Intelligence</td>
<td>- Direct start</td>
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<tr>
<td>- Independent</td>
<td>- Star-delta start</td>
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<tr>
<td>- Takes load from PC program</td>
<td>- Softstarter start</td>
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<td>Improved emergency stop system</td>
<td>- Drive start</td>
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<tr>
<td>Connection monitoring</td>
<td>- Torque-speed characteristic measurement</td>
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<td>Datalogging</td>
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</tbody>
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Conclusion

- Ready to use solution
- Improved simplicity by using Ethernet and PROFINET connection
- Student proof
- Modern communication
  - Ethernet
  - PROFINET
- Easy to use
- Highly improved safety