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## 2. Document History

<table>
<thead>
<tr>
<th>Date</th>
<th>Author</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>23.12.2005</td>
<td>PRa</td>
<td>V1.0 First version</td>
</tr>
<tr>
<td>04.05.2006</td>
<td>PRa</td>
<td>V1.1 Changes for the project (CP342-5 card)</td>
</tr>
<tr>
<td>07.09.2007</td>
<td>PRa</td>
<td>V1.2 Minor changes here and there</td>
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3. General

TFS 500 control system is based on:

- PC user interface (PC or HMI=Human Machine Interface), which is implemented using InTouch-software. Operator can control and monitor operation of TFS 500 by using PC.
- Siemens S7-300 PLC (PLC), which takes care of measuring encoders (temperature etc. process values) and controlling actuators (valves etc.).

Communication takes place via Profibus. There is Woodhead Direct Link DRL-MPI-PCU card (DRL-card) in the PC, which takes care of communication in the PC side. Profibus cable is connected from the PC to the PLC. There is a CP342-5 card in the PLC, which takes care of communication in the PLC side.

If there are troubles with the TFS 500 control system, normally shutting down and starting up the system will help. Do it in Idle-state, if possible.

4. Woodhead Direct Link DRL-MPI-PCU card

There are two leds beside Profibus connector of the card: Communication Status (ST) and Bus Fault (BF)–led.

**Communication Status –led**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Communication not initialised</td>
</tr>
<tr>
<td>Green</td>
<td>Communication ready</td>
</tr>
<tr>
<td>Red</td>
<td>Error on exchange of data with device</td>
</tr>
</tbody>
</table>

**Bus Fault –led**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Card not initialised</td>
</tr>
<tr>
<td>Green</td>
<td>Network ready</td>
</tr>
<tr>
<td>Red</td>
<td>Physical problem accessing the bus</td>
</tr>
</tbody>
</table>

There should be two green leds, when everything is ok. Further information can be found from CD-manuals delivered with the card. Just put the CD into a DVD-drive and it will startup automatically (autorun feature).
5. Siemens CP342-5 card

There are three leds in the front panel of CP342-5 card: System Fault (SF)-, RUN- and STOP-leds.

SF –led
Off - Card ok.
Red - System fault

BUSF –led
Off - Bus ok.
Red - Bus fault

RUN –led
Off - Card not running.
Green - Card ok and running.

STOP –led
Off - Card not stopped.
Yellow - Card stopped.

There should be one green led, when everything is ok. Further information can be found from Siemens manuals.

6. Siemens CPU315-2DP

There are six leds in the front panel of CPU315-2DP: System Fault (SF)-, Bus Fault (BF)-, (Voltage) DC5V-, Force (FRCE)-, RUN- and STOP-leds.

SF –led
Off - Card ok.
Red - System fault

BF –led
Off - Bus ok.
Red - Bus fault

DC5V –led
Off - No voltage.
Green - Voltage ok.

FRCE –led
Off - No forces in the CPU.
Yellow - Forces in the CPU.
RUN –led
Off    - CPU not running.
Green  - CPU running.

STOP –led
Off    - CPU not stopped.
Yellow - CPU stopped.

There should be two green leds, when everything is ok.

Programs are saved into Micro Memory Card (MMC), which is in the slot in the front panel of the CPU. It can be pulled out, when there is no power in the CPU. Small button below MMC has to be pushed gently to get it out.

Programs can be returned back from MMC to CPU in the following way:
1. Turn RUN-STOP-MRES-switch in the front panel of the CPU in the MRES-position and keep it there for a couple of seconds until STOP-led has blinked twice in slow speed.
2. Release the switch, then it returns back to STOP-position.
3. Turn RUN-STOP-MRES-switch back to MRES-position and release it immediately. After that STOP-led blinks rapidly for few seconds. After STOP-led is steady, then programs have been returned from MMC to the CPU.
4. Turn the switch back to RUN-position to change the CPU to Run-mode.

Further information can be found from Siemens manuals.
7. PC backup/restore

There is Norton Ghost program installed in the PC for taking image backups of the hard disk to the DVD and returning them back to the hard disk.

Creating PC image backup

PC image backup can be done in the following way:
1. Stop all programs running in the PC.
2. Start up Norton Ghost by selecting Start – All Programs – Norton Ghost. It can be run by double clicking icon in the tray beside the clock (icon looks like a ghost), too.
3. Then follow instructions in the Norton Ghost online help; Creating backup image file / To backup hard disk or partition.

Restoring PC image backup

PC restore can be done in the following way:
1. Put image backup DVD (first disk) to the DVD-drive.
2. Shutdown the PC.
3. Turn power on the PC.
4. Then follow instructions in the Norton Ghost online help; Restoring your computer from an image file / To restore a disk or partition.

Note! DVD-drive has to be selected to be bootable (and booting before hard disk) in the BIOS-settings.