

Qualität bleibt nicht verborgen.
Sogar mit geschlossenen Augen!
Quality is not concealed.
Even blindfolded!



plasm^o

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More complex parts and installations plus shorter weld-to-weld times

—

The implications for process-monitoring systems

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EALA 2010

Wir erkennen Qualität.
Sogar mit geschlossenen Augen!

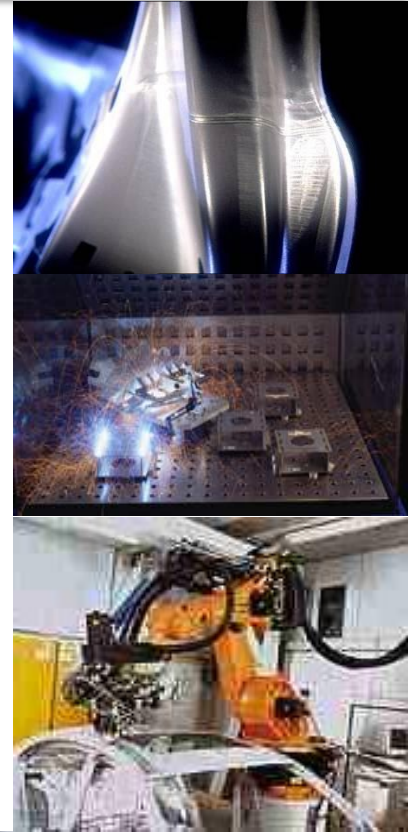
We recognize quality.
Even blindfolded!



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- Company
- Plasmo® processobserver
- Complexity of installations
- Tasks (examples of solutions)
 - Optical integration
 - Electrical integration
- Summary
- Contact



- Company

- International focused company headquartered in Vienna.

- Core competence

- Interdisciplinary competence in welding and laser cutting processes
- Sensor systems
- Machine vision
- HW & SW development
- Mathematical modeling and real time computing

- Market

- Segment of quality control & diagnosis system for **welding, laser brazing, cutting and drilling** f.i. in the metal working industry

- Main products

- **plasmo® processobserver**
 - ⊙ *Process monitoring system*
- **plasmo® profileobserver**
 - ⊙ *Quality inspection / 3D measurement*
 - ⊙ *Seam tracking*
 - ⊙ *Robot guidance and robot vision*
- **plasmo® 3D observer**
 - ⊙ *Robot guidance and robot vision for great workspaces*



INDUSTRIE
PREIS 2008



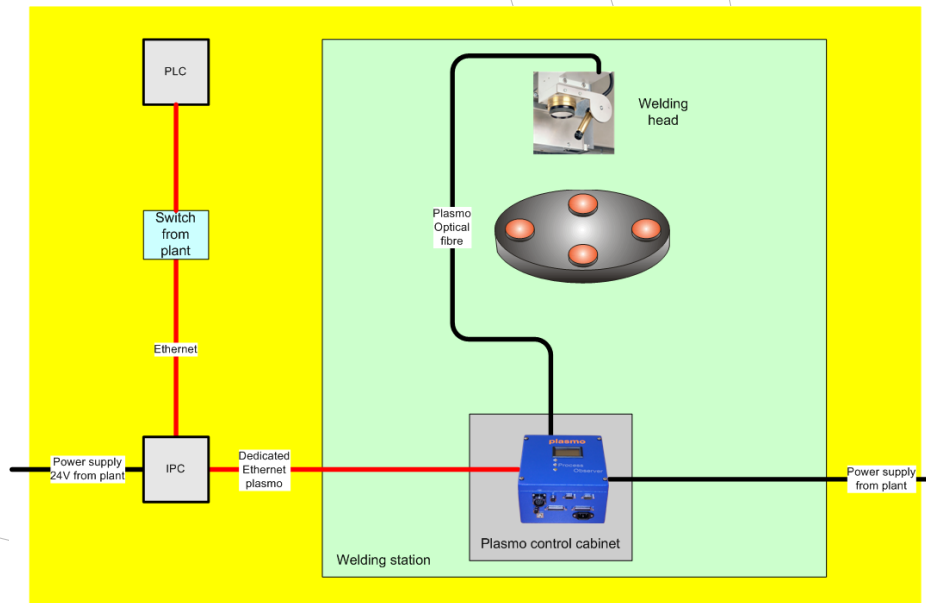
Reference list (excerpt)



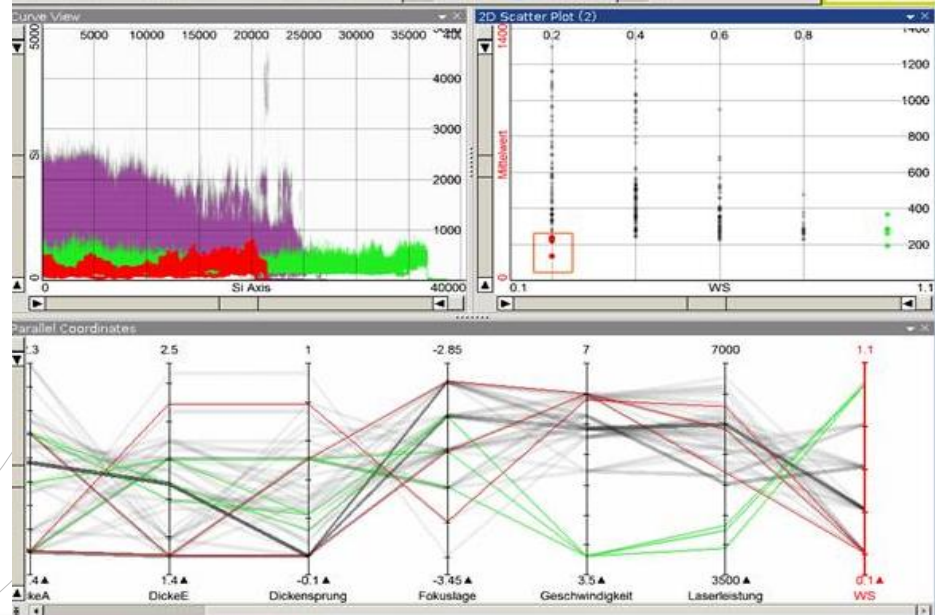
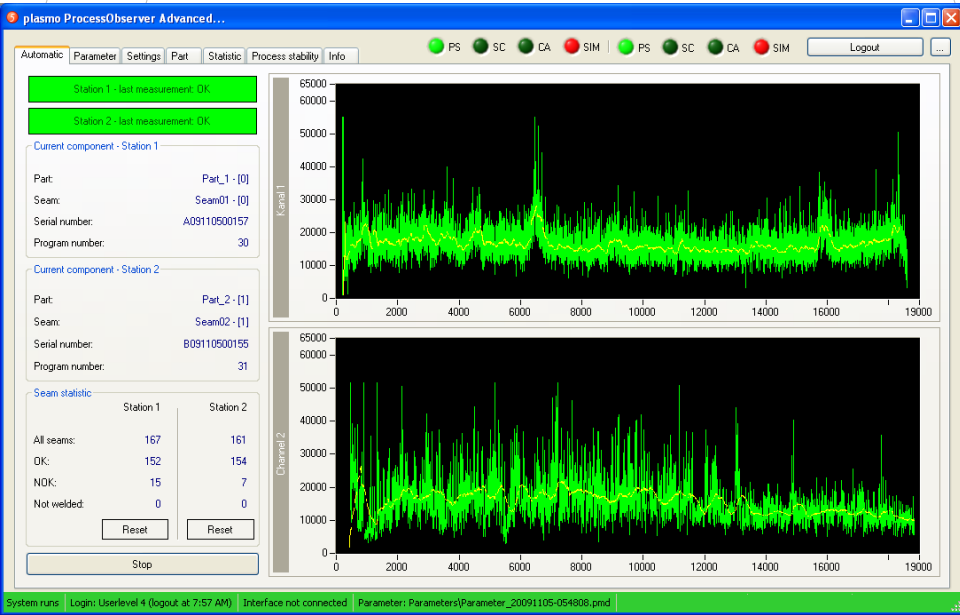
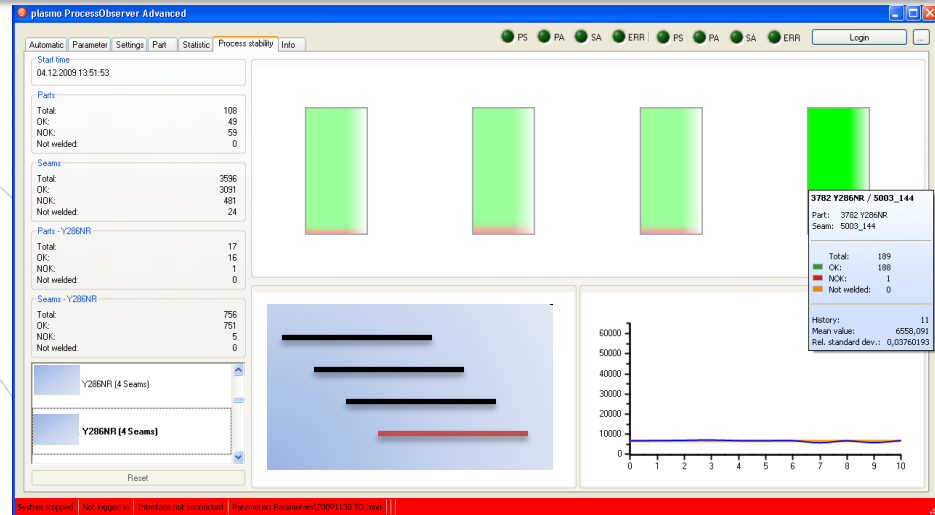
- Measurement principle

- A photodiode sensitive in two wavelength ranges measures the radiation emitted by the laser process
- These signals are digitised and transferred to a fast evaluation unit
- The results are presented to the operator using a standard IPC

- Typical layout of an installation



- **Area of operation**
 - Process monitoring and visualisation
 - Process control cards
 - Process optimisation

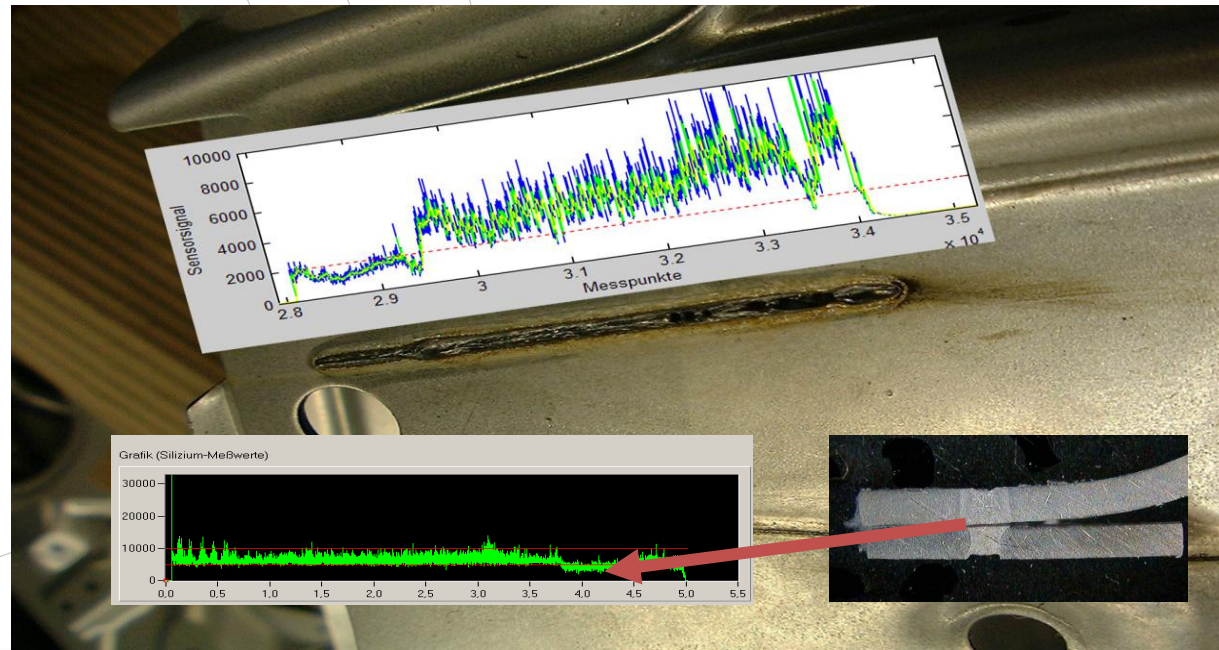


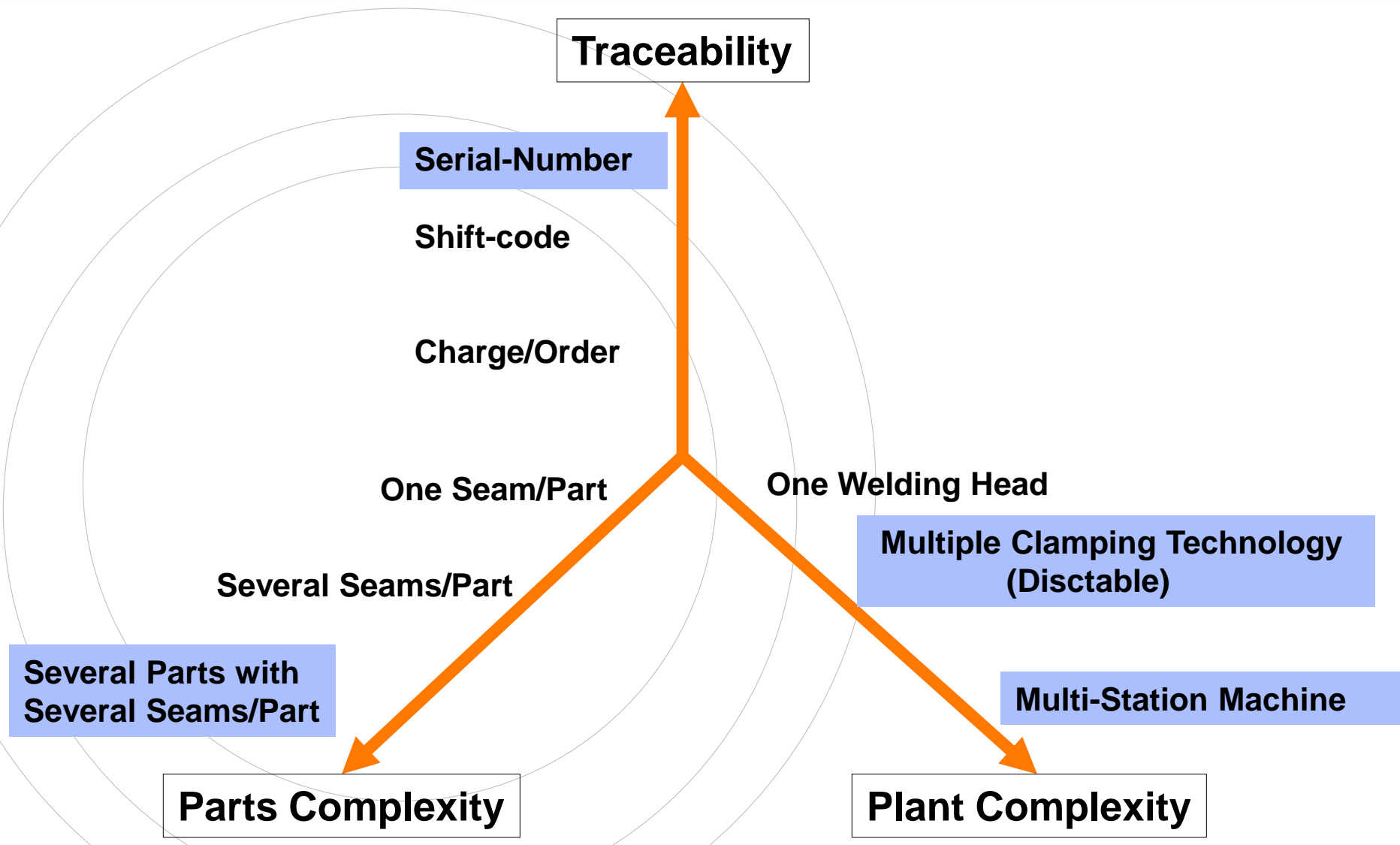
- Area of operation

- Quality inspection / traceability / documentation
- Weld defects express themselves in changes of process light intensity.

Recognizable defects are f.i.:

- ⊙ *Pore / seam narrowing*
- ⊙ *Holes / ejection*
- ⊙ *Lack of fusion*
- ⊙ *Impurities*

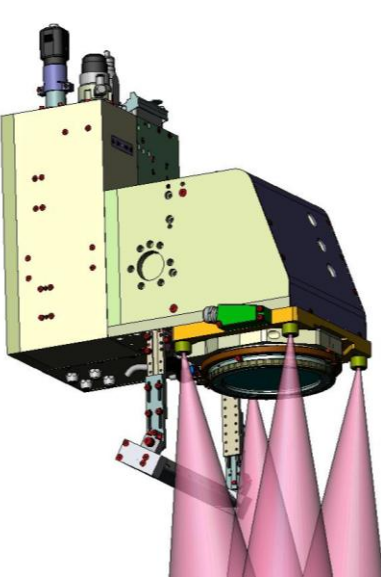




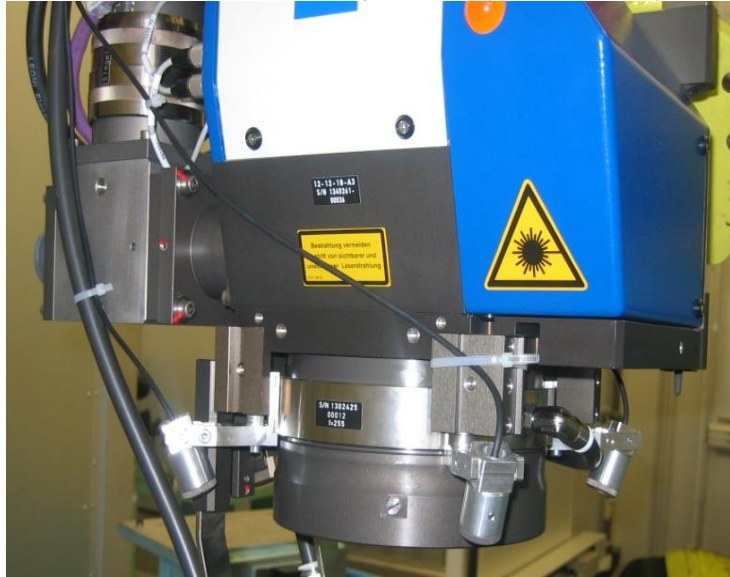
- **Optical integration**
 - Bright spectrum of optical integrations available
 - No dependency on complexity of installation

- **Electrical integration**
 - Layout of the plant
 - Time sharing / energy sharing
 - Short weld to weld times (signal classification active)
 - Laser redundancy concepts
 - Traceability
 - Reworking concepts
 - Integration into quality assurance systems

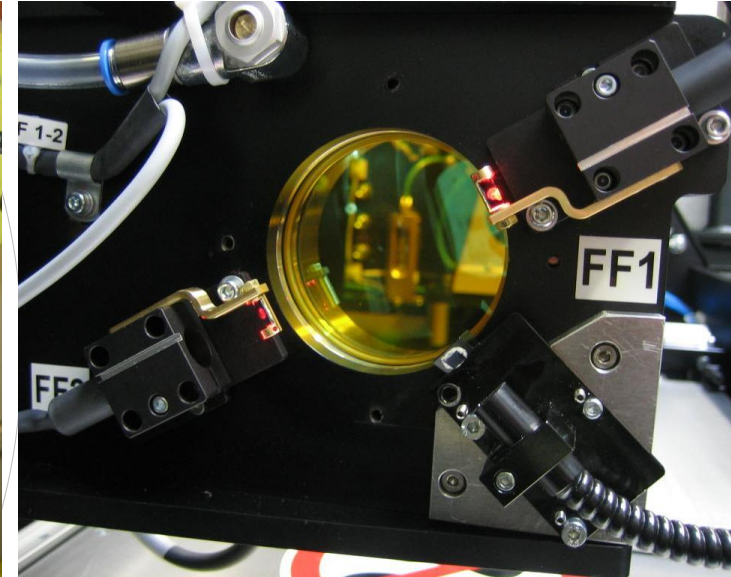
- **Examples scanner applications**



RLSK

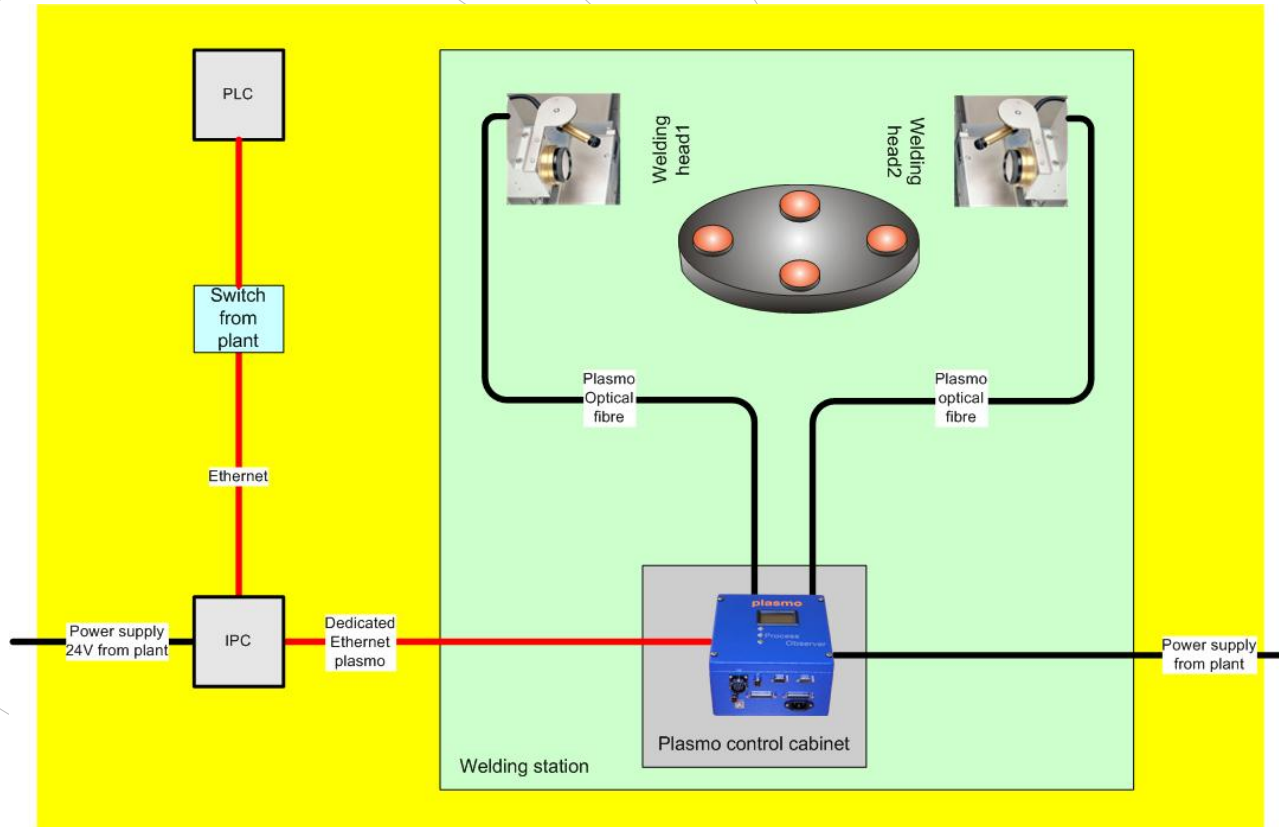


PFO

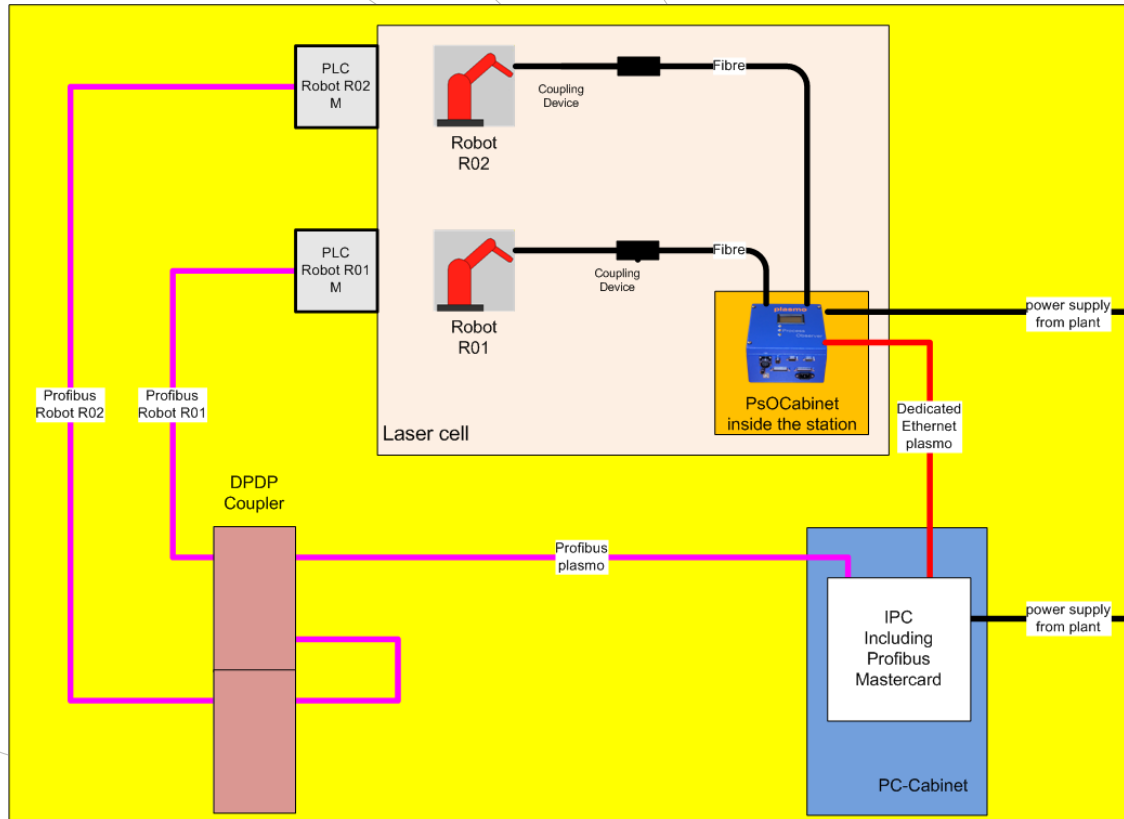


CO₂ Scanner

- **Energy sharing**
 - Approved plasmo multichannel processobserver hardware



- **1 Station 2 Robots 2 Laser**
 - Approved plasmo multichannel processobserver hardware



- **Short weld to weld times (signal classification active)**
 - Transfer using fieldbus not possible
 - Realised solutions

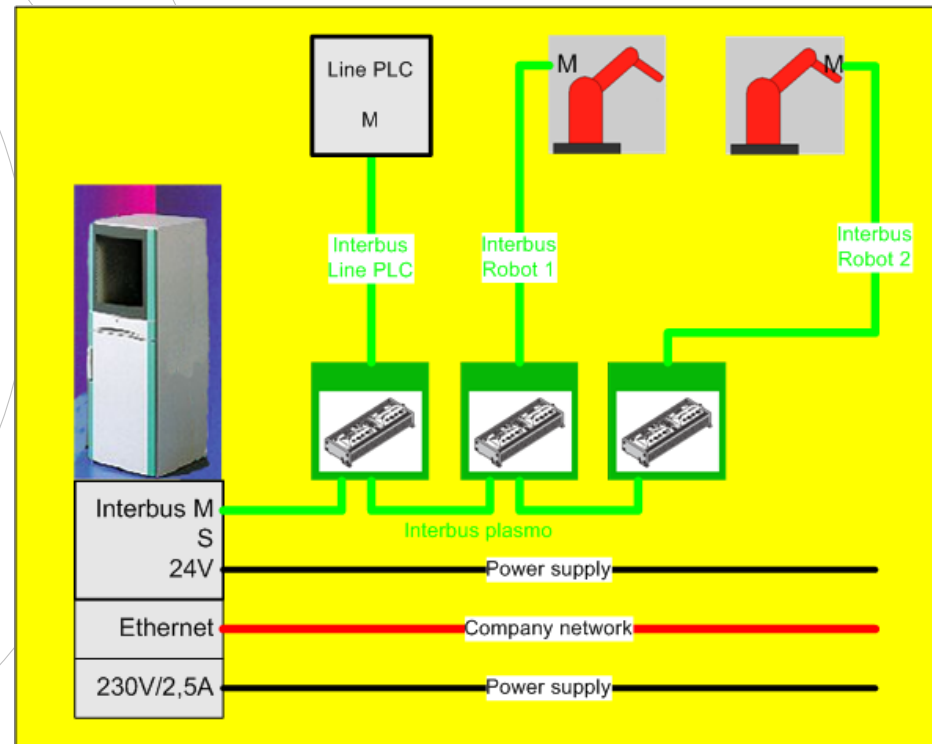
Used Input to plasmo	Solution
Fast dig. PLC output 24V	Directly connected to plasmo
Analog control input of laser power	Threshold switch to plasmo
Analog output laser power of laser	Threshold switch to plasmo
CAN Bus	Plasmo CANIO module

- **Short weld to weld time possible if using non scanner systems**
 - Time sharing of 1 laser and 2 welding heads
 - Time between weldings < 10ms

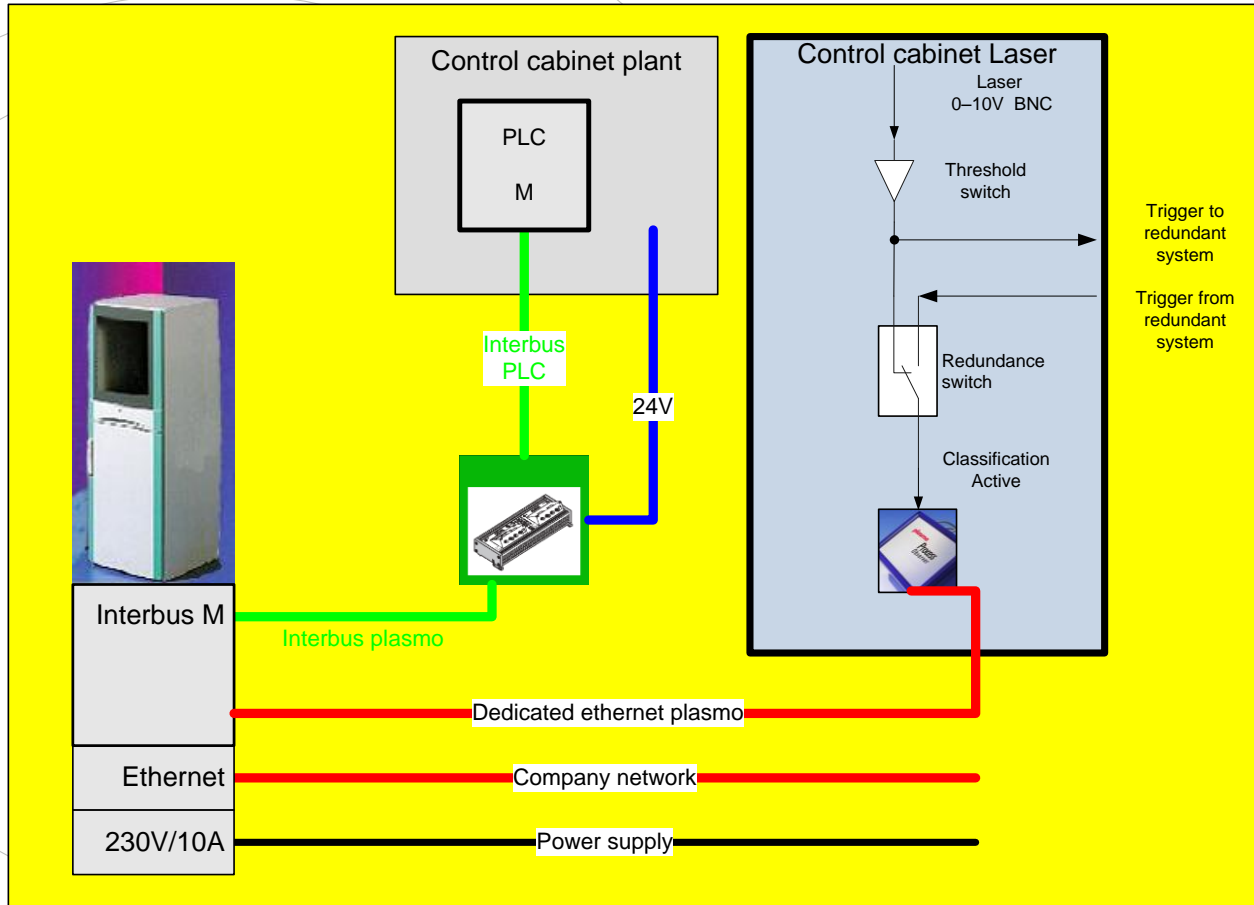


- Traceability

- Serial number available?
- Virtual serial number?
- Where is the information available?
 - ⊙ *Serial number line PLC*
 - ⊙ *Welding program number robot PLC*
 - ⊙ *OK NOK information to line PLC for discharging NOK parts?*

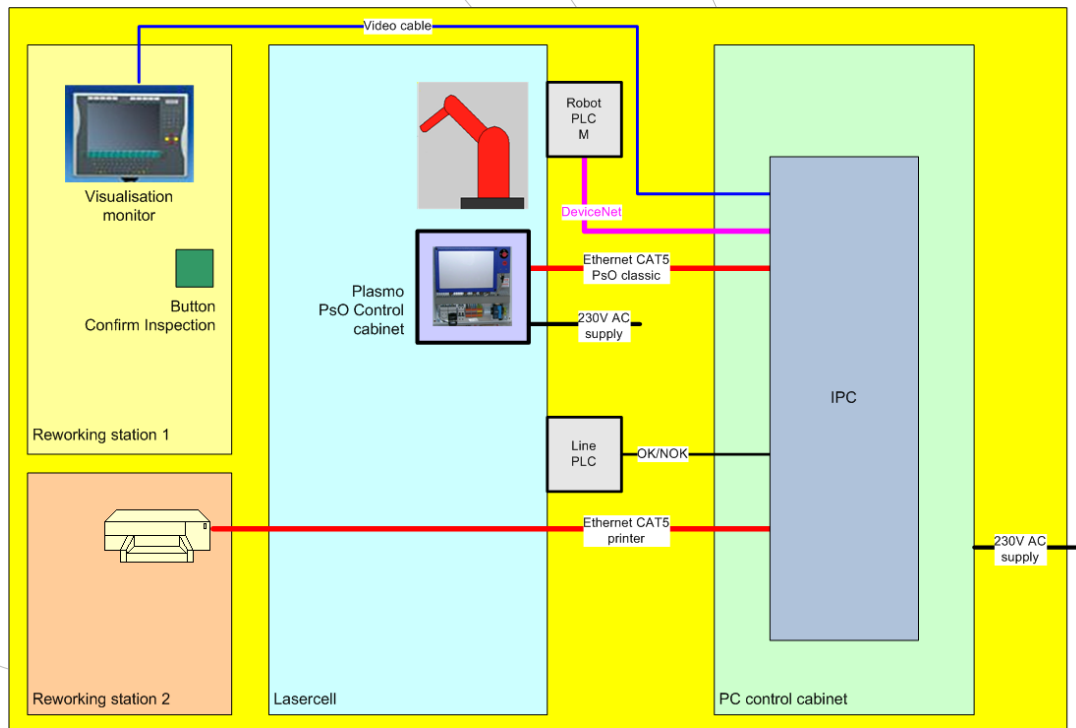


- Laser redundancy concept

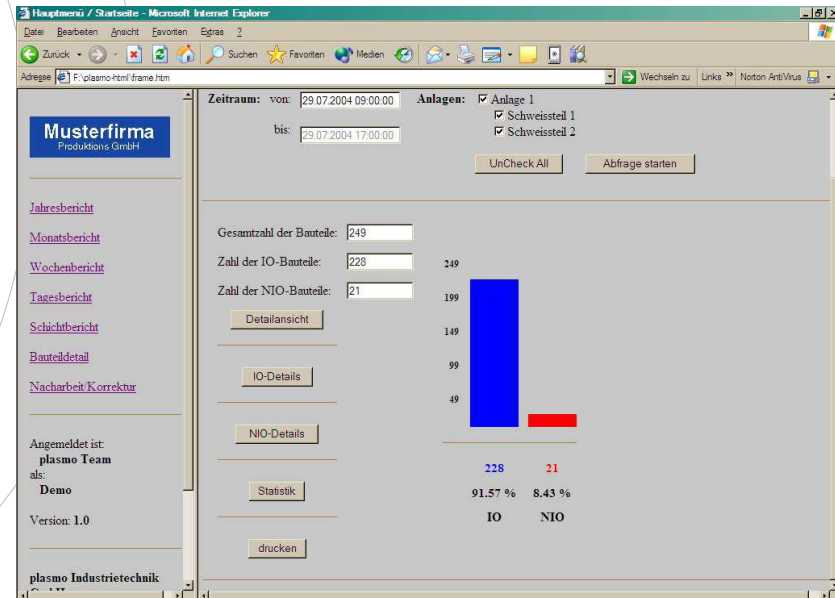


- Reworking concepts

- Additional visualisation using 2nd monitor or own visualisation PC
- Transfer to carrier using fieldbus
- Transfer to quality assurance system



- **Integration in quality assurance system**
 - OKNOK information using field bus
 - XML export of OKNOK information to network share
 - XML export of OKNOK information to message queing system
 - XML export of measurement data to network share
 - ODBC or similar interfaces to existing database
 - plasmo DataSupervisor (including measurement data and OKNOK information)



- **100% manual inspection of parts is often impossible (this holds especially for complex installations)**
- **Process monitoring systems like plasmo® processobserver can solve this task**
- **Benefits**
 - Visualisation of the process an control cards
 - 100% documentation of the quality of process and parts
 - ROI depends on the application, highlights:
 - ⊙ *30% reduction of NOK parts (keeping the process more constant)*
 - ⊙ *Reduction of process time for drilling up to 30%*

- Reducing costs

- Inspection of welding and cutting possible with one system
- Energy sharing and 2 welding heads with 2 lasers possible with one plasmo process**observer** advanced
- More flexible installations using Ethernet communication between IPC and plasmo process**observer**
- plasmo use standards and develop solutions for different customers requirements (standards needed, works fine for algorithms and visualisation of data and process control cards)

- But:

- Standards often not available
- Use of special components specified
- Planning the integration of quality inspection systems is sometimes done if the complete plant is already planned

Thank you for your attention

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...plasmo Know-how

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