Siemens Automation Concepts for Paint Shop

Siemens Industry Competence Center Automotive

V1.2
Siemens offers an integrated solution portfolio for paint shops

Automotive process
Core challenges in paint shop
Technological answers
Automation concept
References

Press Shop | Body Shop | Paint Shop | Powertrain | Assembly
---|---|---|---|---
Logistics

Highest requirements on availability and energy efficiency

Key challenges:
- Non-stop production (6x24h)
- Slow and time-intensive processing
- Harsh production environment (heat, fouling etc.)
- High energy consumption
## Process steps and core challenges

<table>
<thead>
<tr>
<th>Pretreatment</th>
<th>E-coating</th>
<th>Underbody Protection and Sealing</th>
<th>Primer</th>
<th>Base &amp; Clear Coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-stage degreasing and rinsing</td>
<td>E-coating</td>
<td>Underbody protection</td>
<td>Quality check</td>
<td>Sanding</td>
</tr>
<tr>
<td>Zinc phosphating, multiple rinsing with VE water</td>
<td>Heating &amp; Cooling</td>
<td>Seam sealing</td>
<td>Sanding</td>
<td>Cleaning</td>
</tr>
<tr>
<td>Repassivation process</td>
<td>Quality check</td>
<td>Material supply (PVC)</td>
<td>Cleaning (by washing machine, robot, EMU system)</td>
<td>Base coat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quality check</td>
<td>Coat Provision</td>
<td>Clear coat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Primer</td>
<td>Heating &amp; Cooling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Quality check</td>
</tr>
</tbody>
</table>

### Core challenges in paint shop

- Multi-stage degreasing and rinsing
- Zinc phosphating, multiple rinsing with VE water
- Repassivation process
- E-coating
- Heating & Cooling
- Quality check
- Underbody protection
- Seam sealing
- Material supply (PVC)
- Quality check
- Sanding
- Cleaning (by washing machine, robot, EMU system)
- Cleaning (by washing machine, robot, EMU system)
- Base coat
- Clear coat
- Heating & Cooling
- Quality check

### Special transportation process of the car body:
Rotations by painting and underbody protection application

### Special requirements on Machine Safety:
Fast movements of robots in operation

### Innovative visualization concept:
Need for higher flexibility and cost reductions in HMI installation

### Clear identification of the car body:
Process control depends from car body /skid type

### Energy efficient components:
High Energy consumption at drying and cooling processes
### Process steps and core challenges

#### Pretreatment
- Multi-stage degreasing and rinsing
- Zinc phosphating, multiple rinsing with VE water
- Repassivation process

#### E-coating
- E-coating
- Heating & Cooling
- Quality check

#### Underbody Protection and Sealing
- Underbody protection
- Seam sealing
- Material supply (PVC)
- Quality check

#### Primer
- Quality check
- Sanding
- Cleaning (by washing machine, robot, EMU system)
- Coat Provision
- Primer
- Heating & Cooling

#### Base & Clear Coat
- Sanding
- Cleaning
- Base coat
- Clear coat
- Heating & Cooling
- Quality check

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**Special transportation process of the car body:**
Rotations by painting and underbody protection application
Optimized communication at E-Coating with wireless technology

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- Rotating car body carrier in dirty environment
- Abrasion of the sliding contact surface soils the coat
- Chemical vapors cause chemical reactions at the sliding surfaces

→ Use of contact-free and environment independent wireless technology for data und energy (up to 1,5kW)
### Wired vs. wireless communication solution in paint shop (E-coating, 200m, 20 skids)

<table>
<thead>
<tr>
<th></th>
<th>Wired</th>
<th>Wireless</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Investment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client (23 pieces) and communication infrastructure (Access points, power supply, switches etc.)</td>
<td></td>
<td>24.600 €</td>
</tr>
<tr>
<td>RCOAX infrastructure (RCOAX cable, connectors, antenna cable, …)</td>
<td></td>
<td>3.200 €</td>
</tr>
<tr>
<td>Power rail booster (24 pieces)</td>
<td>17.800 €</td>
<td></td>
</tr>
<tr>
<td>Slip ring (200m) and communication infrastructure</td>
<td>4.000 €</td>
<td></td>
</tr>
<tr>
<td>Installation and commissioning</td>
<td>12.000 €</td>
<td>12.000 €</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>33.800 €</td>
<td>39.800 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Wired</th>
<th>Wireless</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lifecycle cost</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material (power rail booster, …)</td>
<td>1.500 €/year</td>
<td></td>
</tr>
<tr>
<td>Maintenance (2 FTEs for 1 day/month)</td>
<td>15.000 €/year</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16.500 €/year</td>
<td></td>
</tr>
</tbody>
</table>
ROI of wireless solution after 1,5 years

**ROI calculation of wired vs. wireless communication solution**

- Break even
- Cumulated cost savings of wireless vs. wired solution

Discount rate: 20%
Optimized communication at underbody protection with wireless technology

- Floor conveying technology incl. rotation of the car body simplifies the drop-free application of underbody protection
- Floor conveying technology easier to implement than overhead monorail conveyor

➔ Wireless technology creates user-friendly work environments
Wireless network configuration with Siemens SCALANCE W

Wireless communication between all kinds of automation components in different applications
Increased flexibility with Siemens wireless technology

**Reliable and stable wireless communication**
- Deterministic data exchange in real-time
- Redundant wireless networks
- Rapid roaming for fast handover of mobile devices

**Robust Hardware**
- Metal enclosure with high degree of protection IP65
- Protection against vibration and shock
- Extended temperature range (-40°C to +70°C)

**Secure access and data transfer**
- Access control (authentication)
- Data encryption

**Fast commissioning and reduced maintenance cost**
- Radio field Planning, Simulation, Engineering, Commissioning, Maintenance & Service
- Integrated PROFINET IO diagnostics
- Support of PROFIsafe applications
- Substitution of dragging leaders and dragging cables
- Maintenance free data communication
Process steps and core challenges

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Special transportation process of the car body:
Rotations by painting and underbody protection application

Special requirements on Machine Safety:
Fast movements of robots in operation
Safety technology in paint shops

- Personnel protection in area of moving robots during painting → Safety Technology integrated into the automation technology
- Securing access to robots for maintenance and cleaning → Safety Technology for definition of secure areas in paint cells

→ One system for standard and safety results into cost savings
Siemens offers a comprehensive SAFETY portfolio

Safety relays in separate cabinet
- Approx. 20 control relays
- Approx. 15 safety relays
- Approx. 50 multi-conductor cables, connectors and plugs
- Inter panel wiring
- Big cabinets

Reduction of:
- Wired logics
- Cabinet size
- Time & costs for wiring

Use of Safety PLC and Safety Network
- No safety relays and complex circuits
- Less hard wired devices
- No inter-panel wiring
- Smaller cabinets

- additional network
- additional PLC+Software+Engineering
- additional Periphery
Initial Investment Reduction up to 20% by implementing Distributed Safety from Siemens

Use of Safety PLC and Safety Network

- Approx. 20 control relays
- Approx. 15 safety relays
- Approx. 50 multi-conductor cables, connectors and plugs
- Inter panel wiring
- Big cabinets

Reduction of:
- Hardware
- Space
- Engineering effort
- Components variety
- Programming Tools

Standard and SAFETY in one System

- Elimination of one cabinet incl. modules
- Standard & safety data on one cable
- Standard & safety data in one station
- Standard & safety program in one PLC
- Engineering with one software tool

Less investment → average 20%
### Investment savings by using PROFinet in a typical paint shop robot cell (3 robots) : ~ 20%

<table>
<thead>
<tr>
<th>Initial Investment</th>
<th>Investment w/o PROFIsafe</th>
<th>Investment w/ PROFIsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of cabinets through elimination of hardware (cabinet space + control &amp; safety relays)</td>
<td>14.000 €</td>
<td>10.000 €</td>
</tr>
<tr>
<td>Additional safety modules in distributed operator panel</td>
<td>1.800 €</td>
<td>3.500 €</td>
</tr>
<tr>
<td>Reduction of wiring material (cables, connectors, plugs)</td>
<td>3.700 €</td>
<td>2.700 €</td>
</tr>
<tr>
<td>Reduction of installation and commissioning costs</td>
<td>12.000 € (15 days)</td>
<td>9.600 € (12 days)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31.500 €</strong></td>
<td><strong>25.800 €</strong></td>
</tr>
</tbody>
</table>

Maintenance cost to be neglected

**Investment savings with PROFinet: ~ 20 %**
Levers for Reduction of Life cycle costs by implementing Distributed Safety from Siemens

**Shorter planning and implementation phase**
- Standardized cabinet design by applying software instead of hard-wired relays
- Use of one common engineering and programming tool for standard & safety program

**Cost saving by material and warehousing**
- Less component variety leads to less spare parts inventory

**Increased flexibility in production line**
- Thanks to program alterations and system add-ons (hard- and software)

**Reduced service and maintenance**
- Fully integrated and system diagnosis
- Continuous and consistent operation
Conventional Safety vs. Safety Integrated

**Implementation steps**

**Conventional Safety**
1. Modification of the safety logic within the electrical layout
2. Installation of standard input modules for feedback signals
3. Wiring of the safety relays and feedback signals
4. Modification of the standard PLC program
5. Commissioning

**Safety Integrated**
1. Installation of safety I/O modules
2. Modification of the standard and safety PLC program
3. Commissioning

**Time saving through less implementation steps**

→ Faster from design to operation with integrated safety technology
Conventional Safety Relays vs. Safety Integrated with PROFIsafe

Before: with safety relays

After: with Safety Integrated
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Special transportation process of the car body:
Rotations by painting and underbody protection application

Special requirements on Machine Safety:
Fast movements of robots in operation

Innovative visualization concept:
Need for higher flexibility and cost reductions in HMI installation
Cost reduction and more flexibility through wireless mobile HMI panel in interim storages

Visualization with conventional mounted HMI panels

Visualization with wireless mobile HMI panels
Mobile Panel 277 wireless with integrated Safety

**Features:**
- IP65 housing, max. drop height of 1,2m
- 7,5” TFT Touch screen, 640 x 480, 64K colours
- 18 membrane keys with LED
- Emergency stop
- Key-operated switch
- 2 x illuminated push buttons
- Handweel
- Externally accessible USB connection
- Configuration with WINCC Flexible 2007

**Failsafe Operating and monitoring**
- TÜV / BGIA certified according to SIL 3
- HMI authorization for individual operators or places / spots
- Identification and distance measurement by transponder technology
- Safety function (acknowledge button, emergency-stop) via PROFISAFE
- Safety-related operating elements (acknowledge button, emergency-stop)

**Increased availability**
- Flexible changing of batteries for continuous operation without interruption
- Support of Sm@rt Access und Sm@rt service for flexible plant concepts
- SD-/Multi Media Card Combi Slot for fast data transmission
## Investment savings by using wireless mobile HMI panel: ~ 54%

### Initial Investment

<table>
<thead>
<tr>
<th>Description</th>
<th>Wireless mobile HMI panel</th>
<th>Mounted HMI panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x PC 477 incl. housing</td>
<td>-</td>
<td>3,000 €</td>
</tr>
<tr>
<td>3 x Thin Client incl. housing</td>
<td>-</td>
<td>6,000 €</td>
</tr>
<tr>
<td>Cabling (250 m)</td>
<td>-</td>
<td>375 €</td>
</tr>
<tr>
<td>1x Switch X108 (8 port)</td>
<td>-</td>
<td>340 €</td>
</tr>
<tr>
<td>1x wireless mobile HMI 277 IWLAN</td>
<td>3,300 €</td>
<td>-</td>
</tr>
<tr>
<td>1 x access points W788/1Pro</td>
<td>950 €</td>
<td>-</td>
</tr>
<tr>
<td>Cabling for access point (50 m)</td>
<td>75 €</td>
<td>-</td>
</tr>
<tr>
<td>1 Switch X005 (5 port)</td>
<td>150 €</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,475 €</strong></td>
<td><strong>9,715 €</strong></td>
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Process steps:

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Special transportation process of the car body:
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Special requirements on Machine Safety:
Fast movements by robots in operation

Innovative visualization concept:
Need for higher flexibility and cost reductions in HMI installation

Clear identification of the car body:
Process control depends from car body /skid type
Optimized communication at E-Coating

- Identification of body type, color etc. for optimized planning and dispatching of orders
- Rough environmental conditions (high temperatures, acid, fouling etc.) requires special product features

→ Data storage on mobile data carriers
→ Heat resistant and dirt resistant data carrier, mounted on car body or on skid
Siemens offers a comprehensive RFID portfolio for paint shops

Comprehensive portfolio for individual applications and environments:
- Heat resistance up to 220°C
- Data storage up to 32 Kbyte
- Extended write/read distance
  - up to 0.2m for skid identification
  - up to 3m for body identification
- For hazardous location use (ATEX)
- Protection up to IP68

Highest reliability
- Fast and high reliable identification (100%)

Reduction of engineering and maintenance costs
- Fully integrated in SIMATIC portfolio
- Standard programming interface

Highest flexibility and scalability
- Combination of RFID with I/O modules in distributed periphery systems
  - e.g. ET200pro with up to 6 RFID modules
- Easy connectable to PROFBUS and PROFINET

High temperature Transponder

Reader/Communication Interfaces
- Moby MDS D139
- Moby MDS U589 RF 380T
- Moby MDS SLG D 12 S

18.02.2010
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Clear identification of the car body:
Process control depends from car body /skid type

Energy efficient components:
High Energy consumption at drying and cooling processes
Paint shop with highest energy consumption in automotive production process

Due to highest energy consumption in the paint shop energy efficient components are needed
Example paint shop:
Drives for ventilation/exhaust cause high energy consumption

High energy consumption due to:
- High need of ventilation and exhaust air in primer and top coat sub-processes
- Slow and time intensive processing require constant production and energy supply
Example paint shop:
Reduced energy consumption through innovative drives

Energy-efficient motors from Siemens

- with high efficiency (EFF1 class) due to compact design with up to 40% less power loss compared to standard motors

SINAMICS frequency converters

- Frequency converters capable of energy recovery with innovative infeed technology where the braking energy is fed back into the line supply

![Energy-efficient motors from Siemens](image)

![SINAMICS frequency converters](image)
Example paint shop:
Reduced energy consumption through innovative drives

### Assumptions

<table>
<thead>
<tr>
<th>Plant capacity</th>
<th>max 300.000 cars/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant uptime</td>
<td>6 x 24 h / 310 days per year</td>
</tr>
<tr>
<td>Plant life cycle</td>
<td>10 years</td>
</tr>
<tr>
<td>Motor utilization</td>
<td>100 %</td>
</tr>
<tr>
<td>Energy costs</td>
<td>0,09 €/kwh</td>
</tr>
</tbody>
</table>

### Motors used for ventilation and exhaust air

<table>
<thead>
<tr>
<th>Motor type (in KW)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>18.5</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>30 (4-pole)</td>
<td>2</td>
</tr>
<tr>
<td>30 (6-pole)</td>
<td>7</td>
</tr>
<tr>
<td>37</td>
<td>3</td>
</tr>
<tr>
<td>45 (4-pole)</td>
<td>3</td>
</tr>
<tr>
<td>45 (6-pole)</td>
<td>1</td>
</tr>
<tr>
<td>55</td>
<td>22</td>
</tr>
<tr>
<td>75</td>
<td>1</td>
</tr>
<tr>
<td>90</td>
<td>4</td>
</tr>
<tr>
<td>110</td>
<td>8</td>
</tr>
<tr>
<td>132 (4-pole)</td>
<td>4</td>
</tr>
<tr>
<td>132 (6-pole)</td>
<td>15</td>
</tr>
<tr>
<td>160</td>
<td>7</td>
</tr>
</tbody>
</table>
Example paint shop:
Application of energy efficient motors reduces energy costs

Calculation for a typical paint shop (300,000 cars/year)

<table>
<thead>
<tr>
<th>Initial Investment</th>
<th>Energy efficient drives (EFF1*)</th>
<th>Standard drives (EFF2*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approx. 100 motors (15 kW - 160 kW) for ventilation and exhaust air supply</td>
<td>340,000 €</td>
<td>320,000 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy cost</th>
<th>Energy efficient drives (EFF1*)</th>
<th>Standard drives (EFF2*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price per kWh: 0.09 €</td>
<td>5,000 Mio €/year</td>
<td>5,110 Mio €/year</td>
</tr>
</tbody>
</table>

**ROI calculation EFF 1 motors vs. EFF 2 motors**

- **Break even**: -20,000 €
- **Life cycle**:
  - Discount rate: 20%
  - Energy efficiency class 1, energy efficiency class 2

→ **ROI of solution with energy efficient drives after 1.5 years**
→ **Total cumulated energy cost savings after 10 years**: 0’4 €
E-coating with rectifiers in paint shops

- Car bodies to be ionized for proper coating of corrosion protection
- Coating quality depends on consistency and availability of the ionization process
- High direct current (DC) for ionization process generated by large rectifiers

→ Due to the high energy consumption of the rectifiers, alternative solutions for the ionization process are needed
New rectifier concept with modular anode control for optimized paint processing

Traditional concept with static anode control

- Static electrical field results into inhomogeneous coating thickness
- Limited availability due to central architecture (→ Back-up solution necessary)

New concept with modular anode control

- Body specific dynamic field control guarantees homogenous coating thickness
- Highest availability due to modular architecture via fieldbus and PLC control
Rectifier solution with SIMOREG DC master improves coating quality and generates energy cost savings

**Improved coating quality**
- Improvement in the coating quality through < 1% ripple
- More uniform coating thickness through partial coating of selected areas

**Cost savings in coating material and energy**
- Lower material usage through targeted coating
- Energy cost saving: ~ 20 % because of reduction of reactive power
- Shorter coating times: ~ 10% because of the homogenous coating process

**Efficient network topology**
- High performance loop control for voltage and current
- No back up solution necessary
Feedback from GM regarding the Siemens rectifier solution

- Traditional Concept: typically used in the automotive industry
  - 2 Zone Control only with large rectifiers
  - Custom built
  - Limited process controllability
  - Only voltage control
  - Expensive backup solution

- New ELPO Power Supply Concept
  - New Concept: Modular Anode Control for future installations:
    - Multiple zones for selective coating
    - Off the shelf
    - 2 Anodes are controlled with 1 DC Unit
    - Constant current and constant voltage control
    - Modular built, Scalable
    - Flexible, inexpensive backup solution

- New ELPO/MAC Concept
  - DC Source 200 A each
  - PLC Control with Device-net

D:/GM/Rainer_Gerharz / New_ELpo Concept_9-10-2007
Automation Concepts for Paint shop
Paint Shop
Typical Automation Concept for a paint cell

Main control panel
- Scalance X208
- CPU 319F-3PN/DP
- PC 677 WinCC flexible

Distributed panel
- ET 200S with failsafe motor starters and emergency stop
- SIMATIC FS400 light curtain
- Paint robots

- ET 200S with failsafe motor starters and emergency stop
- ET 200S with failsafe motor starters and emergency stop
- ET 200S with failsafe motor starters and emergency stop

- PROFINET
- Distributed I/O with ET200 in IP20 & IP65
- Integrated Safety with PROFIsafe
- Plant Visualization with HMI panels and WinCC Flexible
- Plant control with SIMATIC PLCs
- Wired Communication with Profinet & Profibus
Paint Shop
Typical Automation Concept for a conveyor system in paint shops

Main control panel
- Scalance X208
- ET 200S
- CPU 319F-3PN/DP
- PC 677 WinCC flexible

Distributed panel
- ET 200S failsafe
- IWAN AP 786-2RR

Rail or chain conveyor
- ET200pro with motor starter and geared motor

Monorail overhead conveyor and Lift application
- Access Point
- Wireless LAN
- RCoax Antenna
- Drives
- Client

Automation concept
References
Paint Shop
Typical Automation Concept for process engineering in paint shops

Control panel
- PC 677 WinCC flexible
- Scalance X208
- CPU 317F-3PN/DP
- ET 200S with failsafe motor starters and emergency stop

Booth and oven
- ET 200S
- Sinamics G130
- Ventilator
- Motor

Control panel
- PC 677 WinCC flexible
- Scalance X208
- CPU 317F-3PN/DP
- ET 200S with failsafe motor starters and emergency stop

Painting mix room
- ET 200S with Siwarex weighing module
- SIMATIC HMI - Operator Panel

Control panel
- PC 677 WinCC flexible
- Scalance X208
- CPU 317F-3PN/DP
- ET 200S with failsafe motor starters and emergency stop

E-Coating
- SIMOREG DC-Master
- Anodes 1,…,n

Typical Automation Concept for process engineering in paint shops
Increase your Productivity with Siemens

- RFID Technology
- Energy efficient components
- Industrial Wireless
- Safety Integrated
- Mobile HMI panels

Automotive process
Core challenges in paint shop
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Customer: Toyota, Canada, Cambridge
Solution: Future-oriented safety technology and a plant retrofit

Initial Situation
- Consistent rating in the top 10 by JD Power and Associates in spite of outdated technology
- Plant retrofit including a safety solution and a new plant for the Lexus RX 330 luxury SUV

Requirements
- Increase safety and production through better diagnostic
- Integration of the new safety solution with the existing controls platform
- Reduced downtime

Technical Solution
- Modernization of the factory through a retrofit
- Installation of top-notch, Control Reliable safety solution
**Customer:** Toyota, Canada, Cambridge  
**Solution:** Future-oriented safety technology and a plant retrofit

**Implementation:**
- Siemens safety solutions that meet EnN954-1 and IEC 61508 standards
- Upgrade of "antichip" and "black out" booths with new Control Reliable safety systems
- Using Siemens AS-Interface at Work and the Simatic S7-300F

**Benefits:**
- Higher availability and increased productivity
- Implementation with marginal downtime
- Reduces hardwiring to nearly zero
- Ease of installation
- Reduction of commissioning cost and site time required for retrofit
- Ensures enhanced operator safety

Up-to-date safety technology with AS-Interface and Simatic S7-300F
Customer: Toyota, Canada, Cambridge
Solution: Future-oriented safety technology and a plant retrofit
Initial Situation

- Production of around 250,000 VW Polos p.a.
- The plant in Navarra exists since 1984
- Renovation and development of the paint shop

Requirements

- Highest levels of environmental compatibility to be assured
- Reliable communication between central control unit and individual rotary carriers
- Maximum availability to be ensured

Technical Solution

- Rotational movements that implicate communication via Wireless LAN
- Identification of the bodyshell type by a tracing system
Customer: Volkswagen, Navarra, Spain
Solution: Optimized communication with Profinet

Implementation:
- Simatic S7-416F
- Simatic S7-315F onboard carrier control
- Sicalis central control system
- Communication via Industrial Ethernet Wireless LAN using leak wave conductors
- Scalance Access Points and a switch
- Scalance client and an IE/DP link
- tracking system Moby I

Benefits
- Attrition is avoided as there are no mechanical links
- No conflicts with other IWLAN networks, mobile telephony and Bluetooth
  =&gt; Higher availability
- Reduced radiation
Customer: Volkswagen, Navarra, Spain
Solution: Optimized communication with Profinet
Customer: Chrysler, St. Louis, USA
Solution: Conveyor technology for a paint shop with Simotion

Initial Situation
- Originally installed drives reached their life cycle and synchronization limits
- Stretched and stressed transport chains led to fractures and many downtimes

Requirements
- Precise synchronization and load sharing of the conveyor systems
- Detection of the stress points
- Long life-cycle
- Reduction of downtimes

Technical Solution
- Innovative drives solution controlling the speed of every individual drive → highest level of synchronization
Customer: Chrysler, St. Louis, USA
Solution: Conveyor technology for a paint shop with Simotion

Implementation
- Simotion C motion control system
- Operation in sync with the Simotion C230-2 in combination with Simovert Masterdrives converters, external encoders and control software
- Two communication networks over Profibus DP
- Touch screen panels Simatic TP270

Benefits
- High level of productivity
- Extended operation
- Control of the speed of every individual drive powering each of the conveyor systems
- Detection of slightest fluctuations in speed and chain torque
- Control of the positioning and speed of the individual drives
- Communication: Continuous data flow
- Real-time images of the entire paint prep conveyor system

Simotion increases productivity in the paint shop
Customer: Chrysler, St. Louis, USA
Solution: Conveyor technology for a paint shop with Simotion