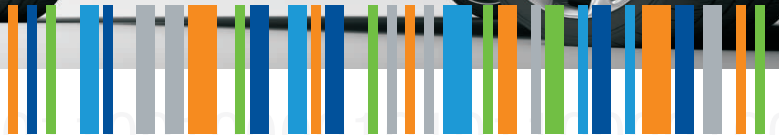


## Leading Software Solutions for Wire Harness Production



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# 4Wire PLS - Production and Logistics Suite

A Flexible Solution for Customer Specific Wire Harness Production (KSK)

## 4Wire PLS

Made to support customer specific wire harness production

Production processes are complex and different in every company contrary to commercial functions, especially in wire harness production with quantity one. Therefore, PLS functionality depends on the project at hand. There are no unnecessary, missing or convoluted functions in 4Wire PLS.

## 4Wire PLS

Experience over 25 years

Since 1990, DiIT develops software modules, that are part of a standard package. The modules have been proven and tested hundreds of times and can be used in any combination. Customization and new objects can be implemented reliably in very short time and with little effort.

Customer specific data structures are generated automatically with no extra effort. This software technology was funded by the European Commission and has been awarded with the highest award category „excellent“. The customer acquires a custom-made standard solution at a reasonable price.

## 4Wire PLS as MES is not in conflict with ERP

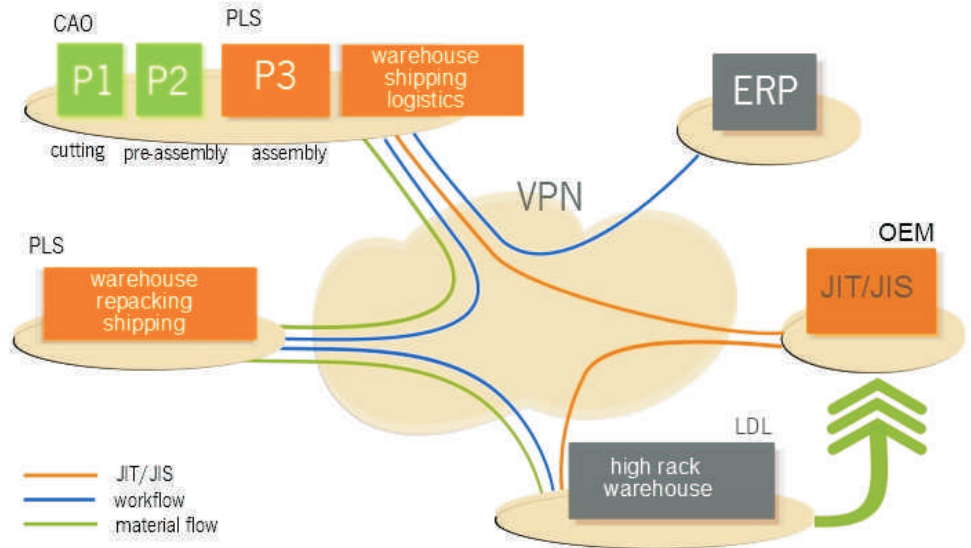
ERP systems quickly reach their limits when faced with the special project requirements in production. ERP customizations are costly and have to be carried through every release change. The PLS system, used complementary to ERP, is a way out of this predicament.

The required master and transaction data will be sent online from ERP and processed in PLS. In return, PLS will provide required confirmation and feedback online to the ERP system. Complex production functionality, like optimization, machine and control interfaces are realized elegantly, reliably and cost-efficiently in 4Wire PLS.

## 4Wire PLS and SAP

4Wire PLS is frequently employed as an extension to SAP-R/3. Data is either transferred by IDocs from R/3 to PLS or PLS uses standard SAP BAPIs to access data directly. Confirmation is provided in the same way.

This stable and secure communication can always be used within the SAP standard.



4Wire PLS supply chain network

## Rough and detailed planning - also in addition to SAP R/3

4Wire PLS rough planning is a gross-against net requirements planning inclusive order distribution to sub-contractors.

4Wire PLS detailed planning calculates as a dynamic and continual process the optimum sequencing and routing of production work steps in the face of shop floor disruptions, so that deadlines are being met in the end.

## Reliable and secure

DiIT prefers LINUX as operating system for object-oriented and relational databases. Each project has two servers that are mirrored online by a DiIT application.

In case of problems with the primary server, the backup server can take over immediately, either by an automatic procedure (hot-stand-by cluster solution) or by a simple instruction (warm stand-by).

DiIT supplies complete IT systems for production, inclusive software, hardware, service, hotline and maintenance 24h/7 days.

## 4Wire PLS EXAMPLE PROJECTS

- Audi A1
- Audi A4
- Audi A7
- Audi A6
- Audi A8
- Audi Q7
- Audi TT
- BMW 5-series
- BMW 7-series
- Daimler G-model
- Daimler trucks (Actros, Atego, Axor)
- Skoda Octavia
- Skoda Superb
- Skoda Kodiaq
- VW EOS
- VW Golf
- VW Lupo
- VW Passat
- VW Polo
- VW Scirocco

## 4Wire PLS - Features

- JIT - call module with automatic module structure comparison and email information
- JIT - sequence monitor (JIS) with automatic check for missing and duplicate JIT calls
- JIT - receipt module with automatic time monitoring per each JIT type
- 3 Level - hierarchical order structure for customer specific order (KSK) with different ZSB groups, each with 1 up to n ZSB, and different parallel production and logistic flows
- Bills of Material (BOM) for ZSB with integration of customer modules from OEM
- Warehouse and buffer administration
- Gross-net requirements calculation for KSK in picking area
- Dynamic work plans, individual per working place at the form board next to and at the transfer lines
- Form board management
- Transfer line management with own client application at the transfer line
- Working place order coordination with own client for working places beside transfer lines
- Optimization algorithms for transfer lines
- Personal management, shift calendar
- Warehouse beside transfer lines
- Goods issue with package management with VDA 4913 support
- Expedition with JIS sequencing, truck support, and Audi special delivery process (pearl necklace)
- OEM and special internal label support (VDA, Audi, VW...)
- Order archive for traceability
- Twin computer and cluster systems
- Graphical user interface (GUI) and internet applications
- ERP interface
- Standard interface for subsystems like TSK, Schunk, Optosoft and others

## 4Wire PLS - Benefits

### EDI-/JIT-/JIS module

4Wire PLS has its own very powerful EDI module, that can handle all VDA-, ODETTE Synchro and other procedures. More than 100.000 JIT calls per day can be received and processed. Production synchronous calls-for-supply are compared with preceding ones and trigger production.

Special features of the DiIT EDI module are among others, that identical JIT/JIS calls in one transmission and mix-ups in the logical sequence will be tolerated, deviations in structure will be highlighted.

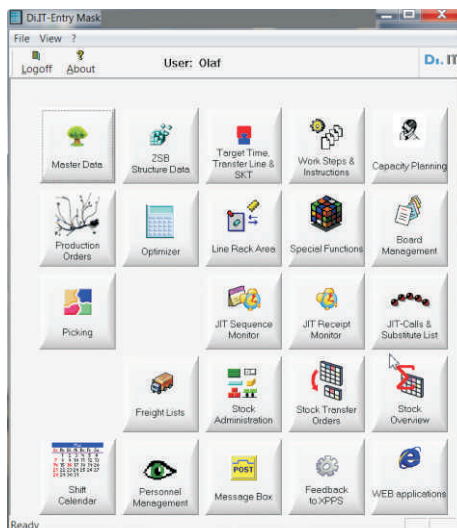
### Picking, warehouse and dispatch

4Wire PLS can control and administer all stores: raw material store, production store, dispatch store. Storage location management in combination with DiIT radio frequency software offer new opportunities to the customer.

4Wire PLS will support the worker with information and instructions: what has to be built, picked, moved or shipped next. These have been derived from complex computations for picking control of the modules from order with quantity one, right up to the rearrangement of outbound shipments due to JIT.

### Orders, bill of materials and dynamic work plans

4Wire PLS maps structures in a way familiar to the customer. Orders, bills of materials (BOM) and work plans can have hierarchical structures. For KSK-production, 4Wire PLS has a built-in work plan generator specific for transfer lines and associated work places that depends on the modules in the customer-specific BoMs.



4Wire PLS entry mask example

### Form board and transfer line support

4Wire PLS has integrated a form board and transfer line management with own properties and status management, special for wire harness management and working places.

### Optimization algorithms

Employing complex order optimization algorithms, the PLS system is capable to account for the features of transfer lines and orders properties.

### Integration of radio terminals, RFID, industrial terminals and machine control

Over the past years, DiIT has integrated more than 500 machine controllers in 4Wire PLS. The radio terminals operate with their own specific programs under Windows CE or Telnet.

In 1994, DiIT delivered its first RFID system in the wire harness PLS of the BMW 7-series.

### Open interface to SAP and other systems

4Wire PLS receives master data and orders from ERP and reports finished parts (good parts and waste) and all material movements to ERP. Subsystems like TSK, Schunk, Optosoft and others are integrated over a standard interface for feedback of the production progress and packing validation.

### 4Wire PLS EXAMPLE DATA

- 400 trucks
- 2250 wire harnesses
- 80.000 modules
- 1 module per second
- 3.000.000 components
- 75.000 work steps
- 6.000 EDI records
- 8.000 production orders



## Complementary Systems

### 4Wire CAO Cutting and Assembly Optimization

The software solution 4Wire CAO is the leading manufacturing execution system for the cutting area and assembly. It is the only system, that is used worldwide and supports all languages.

The system has interfaces to machines from Schleuniger, Artos, Komax, ShinMaywa, Schäfer, Yazaki and others, that are continuously updated in close cooperation with the machine manufacturers. That is why 4Wire CAO has the latest and the largest scope of functions that can be regarded as a de facto standard.

The software solution 4Wire CAO is flexible, scalable and efficient and already successfully installed by many successful companies. Due to its modularity, 4Wire CAO is also beneficial for small and medium-size companies.

4Wire CAO controls any cutting area between 2 to 200 machines and assembly. Its extension functions adapt flexible to the needs of companies. Optimization, machine and control interfaces are realized elegantly, reliably and cost-efficiently in 4Wire CAO.

### 4Wire PPG Production Plan Generation

4Wire PPG is a comprehensive software solution for wire harness engineering to automatically create production data and documents.

Based on the engineering drawing, 4Wire PPG generates production modules rule based with bill of materials, work plans and operating instructions.

4Wire PPG supports your complete manufacturing chain, from the cutting machine to the final assembly, for batch size wire harnesses and customer specific wire harnesses with JIT/JIS process for cars and utility vehicles.

A powerful set of rules manages the generation of production modules. The existing basic rule set can be adapted flexible to your production method. Therefore, 4Wire PPG generates optimized production modules for your production.

## Locations

### Head Office Krailling/Munich

Justus-von-Liebig-Ring 11a  
D-82152 Krailling near Munich  
Phone +49 (0)89 - 89 32 50 - 0  
Fax +49 (0)89 - 89 32 50 - 50  
info@diit.de  
www.diit.de

### Branch Office Berlin

Am Borsigturm 33  
D-13507 Berlin  
Phone +49 (0)30 - 64 0996 - 37  
Fax +49 (0)30 - 64 0996 - 36  
berlin@diit.de

### Branch Office Romania

Strada Mihai Eminescu Nr.35  
RO-310085 Arad  
Phone +40 357 411 500  
info@diit.ro

### Branch Office Mexico/USA

1370-B Pullman Drive, Suite A  
TX-79936 El Paso  
Phone +1 915 856 8868  
Fax +1 915 856 7825

### Branch Office China

108, BH Center  
7755 Zhongchun Rd  
Shanghai 201101  
Phone +86 (21) 6252 6677  
Fax +86 (21) 6240 8655