

SOLUTIONS

FACTORY
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MHP-Leitstand[®]
LIGHT

Version 1.0

Product-Description

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1. Preface

The AHP-Leitstand[®] is a one of the most successful fine-planning tools on the software-market. Specially for small und medium-sized enterprises (SME) we developed the AHP-Leitstand[®] *light*. A high value program for production planning. We want to invite you to learn more about AHP-Leitstand[®] *light*.

Who need AHP-Leitstand[®] *light*?

With AHP-Leitstand[®] *light* from Factory Solutions small und medium-sized enterprises have a practice proofed tool for the production planning. AHP-Leitstand[®] *light* can be used without connection to ERP and/or Booking-System (routing plan / order generation and booking mask are integrated in the standard AHP-Leitstand[®] *light* package). If needed AHP-Leitstand[®] *light* could be integrated to an existing ERP or Booking System (Interfaces, if available for your system, also included in standard package). Have already ask any of following questions:

- Have I transparency over all of my production orders?
- Can I give my customer anytime the actual order status?
- Can I meet the promised deadlines?
- Can I give realistic delivery dates for new orders?

With AHP-Leitstand[®] *light* you could answer all these questions with a “yes”.

What use has AHP-Leitstand[®] *light*?

The AHP-Leitstand[®] *light* completes your factory in the area of production planning. But even by using the AHP-Leitstand[®] *light* it is possible to plan in detail to improve the results of the plan. Production processes get more flexible, faster and efficient:

- obvious improved adherence to schedules
- contraction of lead times
- stock reduction
- reliable delivery dates
- high tranperency

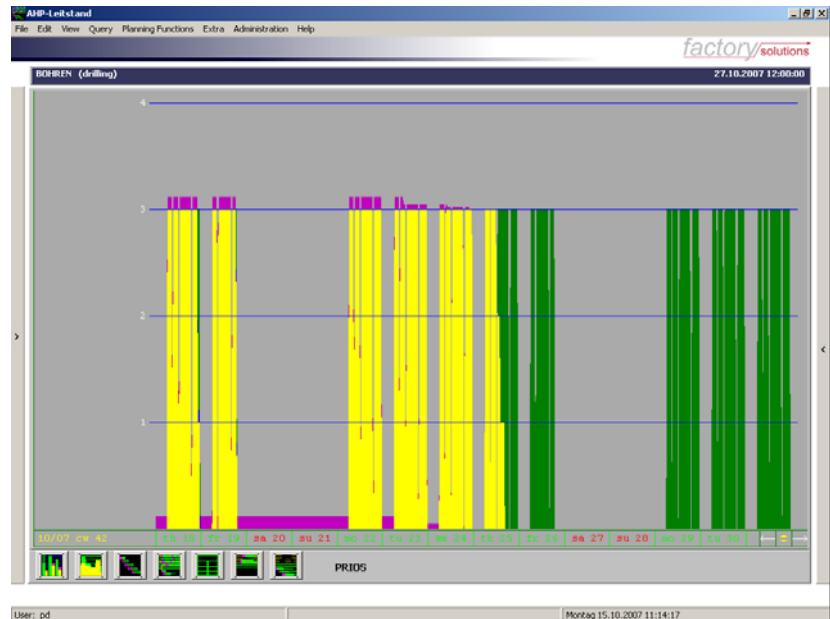
2. Basic Functions

The AHP-Leitstand[®] *light* is conceived as a dual screen application. On one screen the user works on the planning board (planning screen), the second screen provides additional information about the selected operation (information screen). The AHP-Leitstand[®] *light* can also be operated with one screen on which both windows are accessible.

2.1.3. Capacity Graph for a Resource Group

Along a horizontal time axis the loading of a group is represented in colour from three aspects, the capacity scheduled, the capacity available and the capacity required.

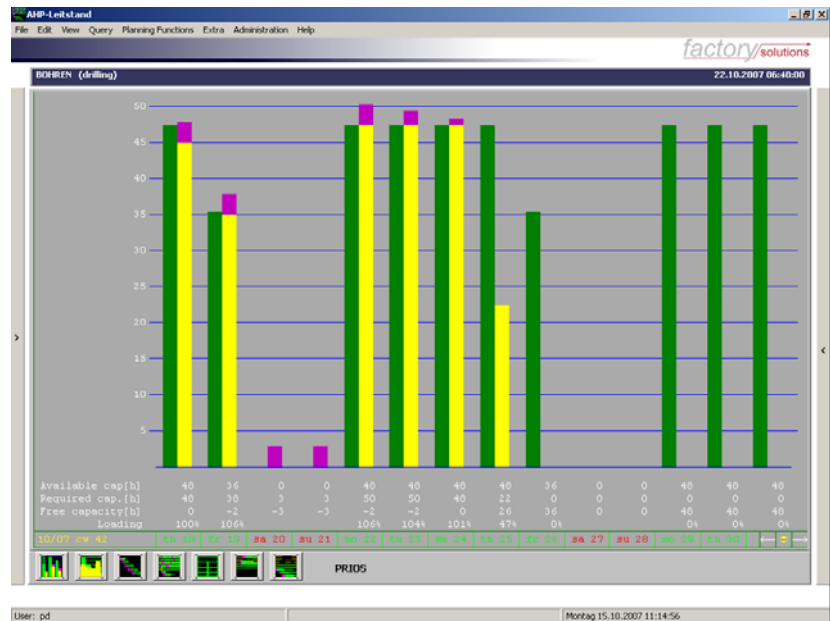
This display provides timely information of future over or under capacity.



2.1.4. Capacity Columns for a Resource Group

In this diagram, planned capacity, available capacity and required capacity are represented by coloured columns (bars).

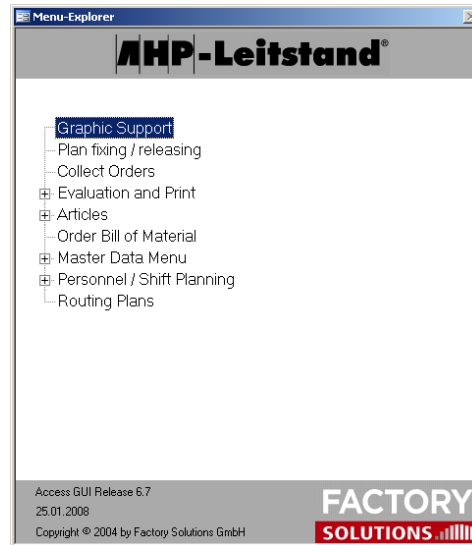
Under- or overloading respectively can be ascertained for a selected period.



2.2. Functions of Information Screen

The Information Screen is developed under Microsoft Access to have an easy tool to create, change and insert new forms or reports. The database for the order data is not the Access-MDB, we use only the Forms and VBA-Code.

The information screen has been realised as a graphic user interface and offers i.a. a graphic support form that is synchronized with the planning board. All necessary operation and order information are shown in these forms.



2.2.1. Graphic Support

An elementary function of the dialog screen is supporting of the graphic screen. This mask is synchronised with mouse operations on the planning board and shows additional information to the selected operation. This application normally is in parallel use while scheduling on the planning.

	plan	Actual	hrs.
Setup	0.50	0.00	
process	4.50	0.00	
Setdown	0.00	0.00	
Quantity	450.00	0.00	

	Planned	Actual	Start
	0.50	0.00	17.10.2007 06:00:00
	4.50	0.00	17.10.2007 06:30:00
	0.00	0.00	17.10.2007 11:20:00
	450.00	0.00	

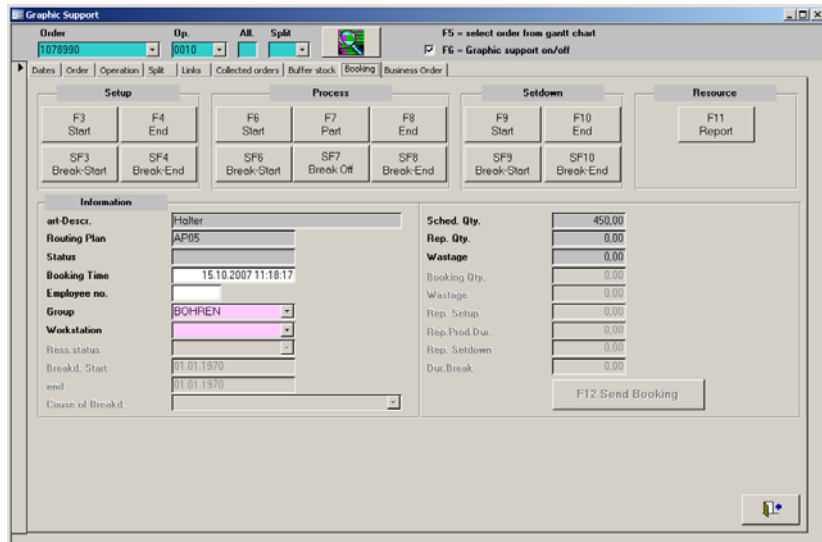
2.2.2. Production Bookings

Bookings can be received directly from a SFDC terminal, from an external system (communication software for all standard hard- and software products is available), or entered manually at the AHP-Leitstand[®] light.

Bookings are processed continuously as they are received at the AHP-Leitstand[®] light so that the current status of each operation is instantly reflected on the graphical planning board.

Bookings are usually passed on to an external system (e.g. MRP, SAP), however this is optional

Most requirements for processing bookings by the AHP-Leitstand[®] light can be configured so that customization is seldom necessary.

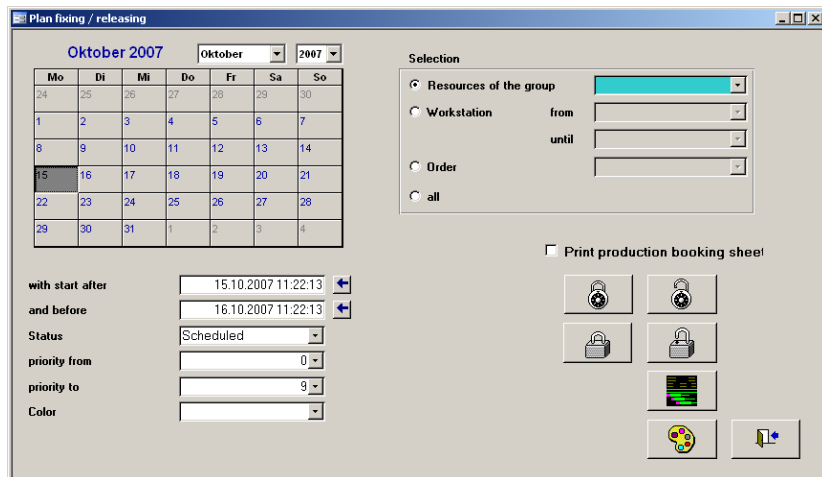


2.2.3. Plan fixing / releasing (Plan-OK)

Scheduled operations within a defined period can be fixed (or released) using the Plan-OK dialogue. Fixed operations cannot be rescheduled. Upon fixing a message are usually transmitted to external systems (ERP, Inventory Management, Material Disposition, DNC, ...) using standard AHP-Leitstand[®] light communication modules.

A dialogue with an external system is possible, e.g. requests for materials or tools.

The response from an external system to such a request could result in an operation being highlighted with a colour change, blocked, rescheduled etc.



2.2.4. Operation Splitting / Rejoining

To reduce throughput time, operations can be split and scheduled on multiple resources.

An operation can be split by quantity or duration. Alternatively, a given number of equal splits can be created.

The inverse function (rejoin splits) is also available.

The screenshot shows the 'Graphic Support' window for order 1076155, operation 0020. The interface includes several sections:

- Information:** Group: DREHEN, Workstation: [empty], Priority: 5, needed start: 24.10.2007 03:20:00, Reported: 01.01.1970, Status: Descheduled, fixed, possible start: 19.01.2038 03:14:07, Reported Date: 01.01.1970.
- Quantity and Dates:** A table comparing plan, Planned, and Actual values for various stages.
- Split or Join:** Radio buttons for 'Split into', 'Split off one part of', 'Split off one part of', and 'Re-join with Split'. The 'Split into' option is selected with 'equal parts'.

	plan	Planned	Actual
Setup		1,50	0,00
process	9,00	9,00	0,00
Setdown		0,00	0,00
Breakdown		0,00	0,00
Quantity		450,00	0,00
Rejects			0,00

	Planned	Actual
Start Setup	01.01.1970	01.01.1970
Production Start	17.10.2007 21:08:26	01.01.1970
Production End	18.10.2007 11:18:26	01.01.1970
End	18.10.2007 11:18:26	
Breakd. Start		01.01.1970

2.2.5. AHP-Leitstand[®] light Lists and Reports

2.2.5.1. Work Distribution List

The machine loading resulting from scheduling can be displayed on the screen or printed using this dialogue.

All operations scheduled within a selected period and for a selected resource and group will be displayed and/or printed.

Order	Op.	All	Split	Part-No.	art-Descr.	Sched. Qty.	Setup	Start	Workstation
Description				Cust. Order Id.	Cust. Description	Booked	Prod.	End	Status
DR00010132	0010			Y450023	Befestigung	2800,00	0,50	17.10.14.56	BOHRENT
Bohren						0,00	14,00	18.10.13.36	Scheduled
1079257	0010			313172606002	Sehtenteil Rechts	450,00	0,25	18.10.13.36	BOHRENT
Bohren				BA-588677	Anton Kleebach Gmbh	0,00	13,50	19.10.11.11	Scheduled
DR00010133	0010			Y450023	Befestigung	2700,00	0,50	19.10.11.11	BOHRENT
Bohren						0,00	13,50	22.10.13.41	Scheduled
1076154	0010			313199617102	U-Profil Rechts	450,00	0,50	17.10.14.56	BOHRENT
Bohren				BA-588677	Anton Kleebach Gmbh	0,00	4,50	17.10.20.36	Scheduled
DR00010129	0010			Y450023	Befestigung	2700,00	0,50	18.10.06.00	BOHRENT
Bohren						0,00	13,50	18.10.21.30	Scheduled
DR00010131	0010			Y450023	Befestigung	2900,00	0,50	19.10.06.00	BOHRENT
Bohren						0,00	14,50	22.10.09.30	Scheduled
1076155	0010			313199617101	U-Profil Links	450,00	0,50	17.10.14.57	BOHRENT
Bohren				BA-588677	Anton Kleebach Gmbh	0,00	4,50	17.10.20.37	Scheduled
DR00010126	0010			Y450023	Befestigung	2500,00	0,50	18.10.06.00	BOHRENT
Bohren						0,00	12,50	18.10.20.30	Scheduled
1079258	0010			313172606001	Sehtenteil Links	450,00	0,25	18.10.20.30	BOHRENT
Bohren				BA-588677	Anton Kleebach Gmbh	0,00	13,50	19.10.17.55	Scheduled
DR00010123	0010			Y450023	Befestigung	2000,00	0,50	19.10.17.55	BOHRENT
Bohren						0,00	10,00	22.10.16.25	Scheduled

2.2.5.2. List of delay

After scheduling, all operations which production end is later then the latest end, are marked with a red bar in the graphic screen. These operations are also shown in the "List of delay". In this list only the first operation of an order that is too late is shown.

Order	Op.	Split	Group	Earliest Start	Latest End	Start Setup	Production End	Delay
AGEN000206	0040		Pruefen	27.10.2007 00:43:36	02.11.2007 16:35:59	01.11.2007 11:10:06	05.11.2007 13:13:06	68,63
AGEN000206	0050		Elektr	27.10.2007 18:46:36	02.11.2007 23:59:59	05.11.2007 13:13:06	06.11.2007 08:14:06	80,26
AGEN000207	0050		Elektr	27.10.2007 14:51:51	02.11.2007 23:59:59	05.11.2007 06:00:00	05.11.2007 10:36:09	58,62
AGEN000209	0030		SCHLEIF	29.10.2007 07:00:13	01.11.2007 20:35:23	31.10.2007 21:50:24	01.11.2007 21:45:36	1,17
AGEN000209	0040		Pruefen	29.10.2007 22:37:25	02.11.2007 16:02:23	02.11.2007 15:21:00	06.11.2007 18:48:00	98,77
AGEN000209	0050		Elektr	30.10.2007 18:04:25	02.11.2007 23:59:59	07.11.2007 06:00:00	07.11.2007 10:27:48	106,47
DR00010123	0030		SCHLEIF	26.10.2007 10:10:00	01.11.2007 12:23:59	01.11.2007 21:45:36	05.11.2007 13:43:36	97,33
DR00010123	0040		Pruefen	27.10.2007 08:28:00	02.11.2007 13:41:54	05.11.2007 22:00:00	06.11.2007 23:18:00	153,62
DR00010123	0050		Elektr	28.10.2007 07:46:00	02.11.2007 23:59:59	09.11.2007 06:00:00	09.11.2007 11:48:00	155,82

2.2.5.3. Evaluation

This module calculates the parameters as numbers, hours and costs for all:

- setup procedures
- production steps
- operations which are finished before latest end
- delayed operations

The evaluations are stored and could be compared after each planning.

2.2.5.4. Operation Booking Forms

Operation booking forms can be printed using the Plan-OK function. The forms themselves can be defined for the form interpreter. The printing of bar codes to facilitate bookings from SFDC terminals is standard.

2.2.5.5. Lists and Reports using Standard Tools

Beyond this individual evaluations and reports can be produced with standard report or form generators. Data from the database are exported with the ODBC interface to an ODBC-Tool such as Excel or Access.

2.2.6. Order Data

2.2.6.1. Orders and Operations

Work orders are maintained in a relational structure in form of order headings and associated operations.

All masks and functions necessary for management of order data are available. Order data can be entered manually, generated at the AHP-Leitstand[®] *light* from routing plans or downloaded from an external system. Changing and deleting of orders is likewise possible, manually or via updates from an external system. With an integrated HOST connection, data transfer occurs automatically; data can also be read in from an ASCII file in batch-mode. Respective decisions about interface strategy have to be discussed regarding the customer's work flow organization.

2.2.6.2. Operation Links

The relationship between operations in an order (the routing plan) is defined by operation link records. These records can be created and maintained by any of the methods described above.

Operations can be overlapped to reduce throughput time. This is only realistic where the production and consumption rates of two adjacent operations would facilitate such a schedule. The following transfer times are supported:

- Overlap time of two operations
- Transport time
- Pre-determined waiting time at the predecessor resource
- Pre-determined waiting time at the successor resource.

2.2.7. Master Data Management

2.2.7.1. Organization of Production Resources

Resources are combined into groups and classes according to organizational aspects (e.g. different resources needed to fabricate a product) or to functional aspects (similar resources in a resource group). Up to eight group levels are possible.

To depict individual organizational groups, multiple allocations of resources are supported.

2.2.7.2. Shifts and Working Hours

As many shifts as required may be defined. A shift describes the availability of a resource or of a resource group in elapsed time. Cyclical work patterns are supported by the AHP-Leitstand[®] light; this means that after a specified number of days the shift starts over again from the beginning.

Within a shift several work periods may be defined each of which can have differing production factors and capacities.

Non-working days (plant vacations, holidays) which apply to all resources can likewise be defined.

2.2.7.3. Assignment of Shifts to Resources and Resource Groups

There is no limit to the number of shifts which can be assigned to a resource or resource group. However, at any point in time only one shift can be active. The active shift determines the availability of the resource.

2.2.8. Routing Plan Maintenance

For the stand-alone release of the AHP-Leitstand[®] light and some special applications in an integrated environment use routing plans to generate work orders.

The routing plans maintained in this dialogue form the basis and reflect the structures of work orders to be generated (heading, operations, operation links, and if present, parallel resources).

Op.	All.	Description	Group	Prod.
0010		Komplettieren	Montage	5,00
0020		Prüfen Funktion	Prüfen	1,50
0030		Montage Rohr	Montage	0,50
0040		Montage Haller	Montage	0,50

3. Scheduling Operations

3.1. Scheduling Operations

The following scheduling methods are available:

- Mouse click or drag-and-drop into the group or resource planning boards
- All operations in an order (forward and backward, controlled by configuration)
- All operations in a resource group
- All unscheduled operations with user defined (PRIOS)

Normally when an operation is scheduled, its predecessor operation is automatically scheduled so that material availability will be assured. This function can be selectively switched off for the scheduling of bottleneck resources. Automatic scheduling of the successor can be configured.

If the last operation in an order is scheduled, the order will be automatically scheduled backward. In the same way forward scheduling will be carried out with the scheduling of the first operation in an order.

Restrictions (machine availability, efficiency level, current machine loading) are interactively checked by the AHP-Leitstand[®]*light*. If a due date cannot be met during scheduling, this is instantly indicated by a change of colour on the operation bar.

Optionally an 'Early Warning Signal' can be activated for anticipated production overruns.

3.2. Compute Throughput Schedule

With this module the buffer times per operation are computed for a selected order.

The throughput scheduling is computed in two phases: the first phase works back from the due date, taking account of the shift times, to calculate the latest completion of each operation. In the same way the second phase uses the earliest start of the first operation to calculate the earliest possible start for all the following operations.

The difference yields the buffer for the entire order.

3.3. Scheduling Variants

Using the module „Variant Management“ up to three scheduling variants can be stored. Each of these variants may be reinstated at a later time.

In so doing, operations in the past at the time the variant is reinstated, will be scheduled in accordance with the current AHP-Leitstand[®]*light* rules. The scheduling sequence will correspond as far as possible to that which obtained when the variant was stored.

4. Hard- and Software Requirements

Hardware

- Standard PC of actual generation
- Graphic card, Dual Head $\geq 1280 \times 1024$, we recommend MATROX G450
- 2 Monitors $\geq 19''$

Software

- Microsoft Windows XP, VISTA