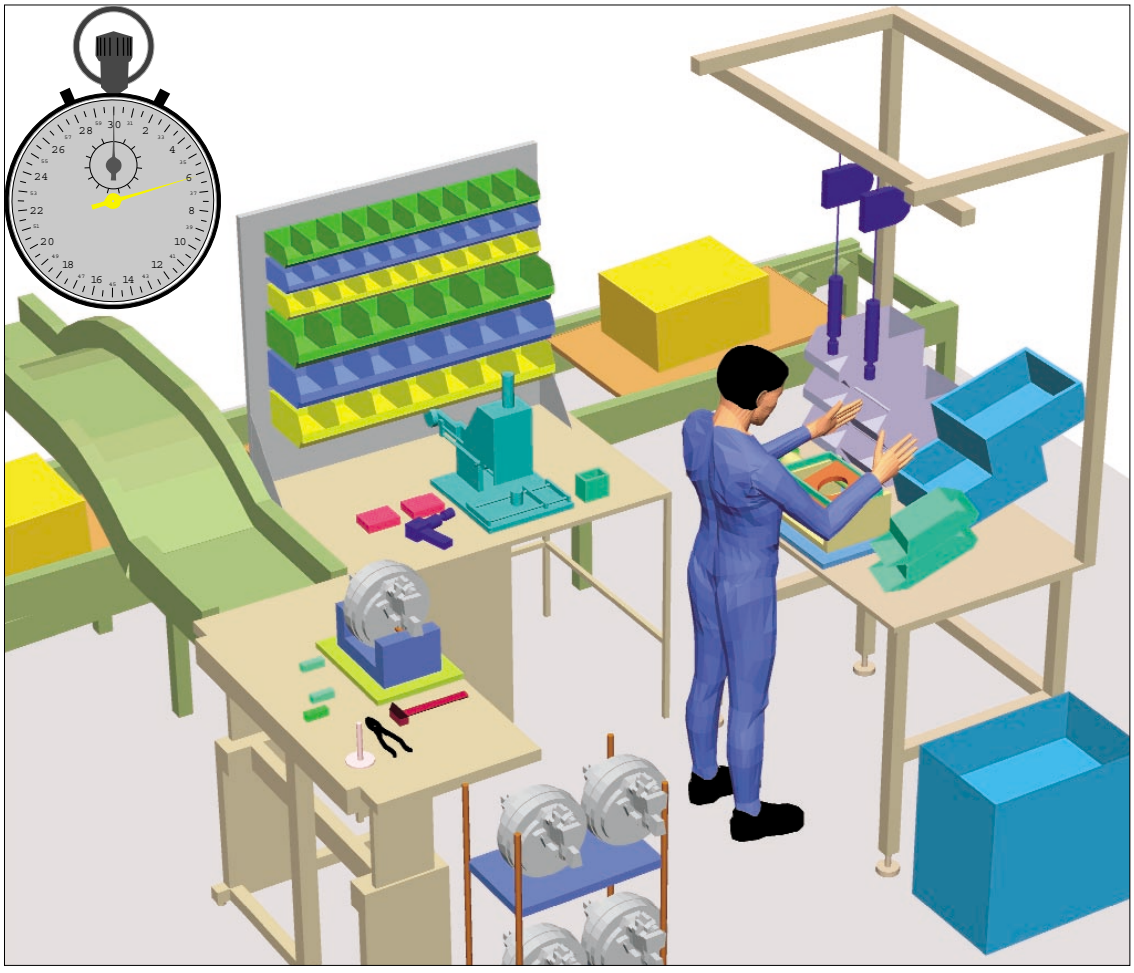
DELMIA

DELMIA Industrial Engineer

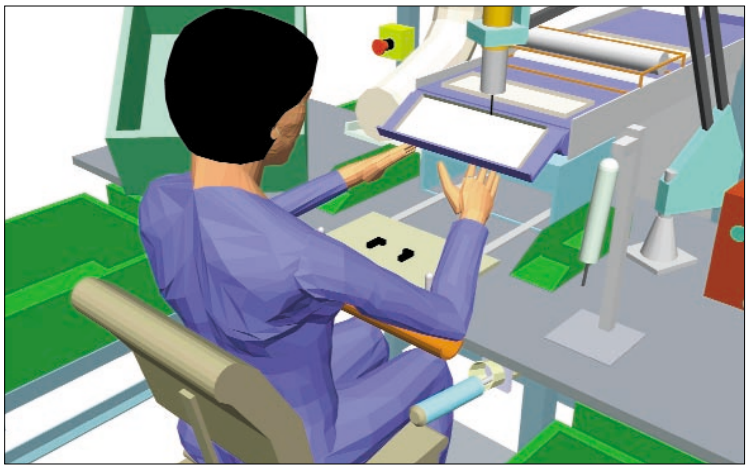
Standard Time Measurement



PROCESS PLANNING

DELMIA Industrial Engineer Professional Standard Time Measurement Workplace Design (Optional)

Today's enterprises are forced to continually increase their efficiency and productivity in order to ensure their competitiveness and survival. This requires shorter delivery times, reduced operating costs, efficient use of resources and optimized material and information flows. Today, companies require analysis and planning tools that support the quick, economical and safe design of manual and partially automated workstations. This requires a methodology to efficiently and reliably determine the time required to perform a specific job sequence based on commonly used time measurement methods or company-proprietary time standards. DELMIA Industrial Engineer's intuitive user interface – compatible with the Microsoft Office standard – allows multiple users to work efficiently after a brief familiarization period.



DELMIA Industrial Engineer Supports the Design and Evaluation of Lean and Flexible Work Stations

Advantages of DELMIA Industrial Engineer:

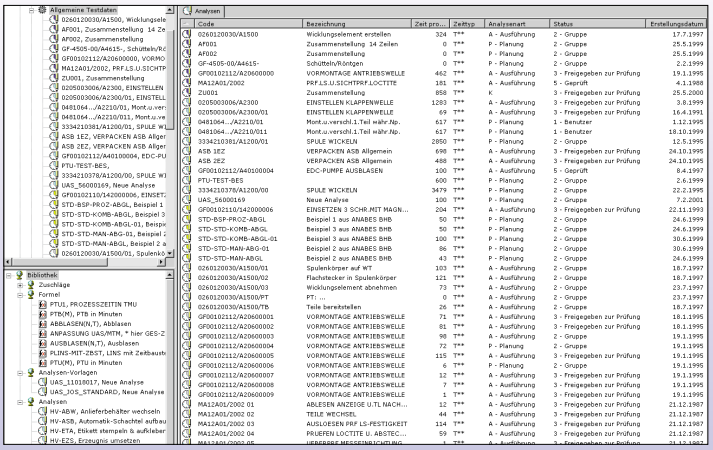
- Quick and efficient generation of time analyses with all common analysis procedures (MTM and WF)
- Capture and management of estimated and recorded time values
- Creation of user-defined data cards
- Creation of user-defined formulas for determining process times
- Design of user-defined print forms
- Checking of rules for accuracy and totality (MTM-1, UAS, MEK, MTM standard data, WF)
- High productivity through the creation and usage of time macros (library elements) and of analysis templates
- Data compression capability over any number of data levels
- Structured data management into work processes/work stations
- Flexible search mechanisms using key words and search patterns
- Time analysis directly associated with workstation layout
- Automatic updating of time values
- Extensive user configuration options

DELMIA Industrial Engineer
Efficient Data Organization and Easy-to-Use GUI

Structured Management of Time Analyses in Work Processes and Stations

DELMIA Industrial Engineer manages time analyses and time elements using the same concept as the DELMIA Layout Planner (an optional add-on to Industrial Engineer and a module within DELMIA Process Engineer), enabling the user to access identical production structures in both systems. The workstation layouts defined in DELMIA Layout Planner can be used in DELMIA Industrial Engineer to support time analyses.

STRUCTURED FILING OF TIME ANALYSES



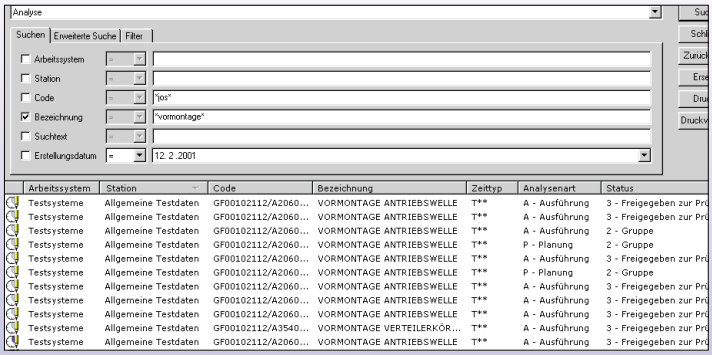
The Library as a Central Repository for General-Purpose Data

With DELMIA Industrial Engineer libraries, users can perform time analyses efficiently, quickly and with consistent accuracy. The library data can be "referenced" in any work process and station. Changes made to the data "referenced" in a library are automatically reflected in all work processes and stations. Thus, an up-to-date time analysis database is available to the user at all times.

Browser Technology for Easy Navigation within Data Areas

The familiar Windows look and feel facilitates navigation in DELMIA Industrial Engineer. The time required to learn the program is minimal, so users can be immediately productive. User-defined screen layouts are easily configured. DELMIA Industrial Engineer supports familiar Windows techniques, such as drag and drop.

ANALYSIS FINDER



The Finder for Special Search Operations

- Search for various object types, such as complete analysis, single operations, workstations, lines or resources.
- Flexible configuration of filter criteria. Up to 20 filter criteria can be activated in the standard version. Other criteria may be added as needed by configuring DELMIA Industrial Engineer accordingly.
- Expanded search with any combination of OR and AND with the use of all filter criteria available.
- Direct processing of time analyses displayed in the list box with the search results.

DELMIA Industrial Engineer
Standard Time Methods and Data Cards

Available Standard Time Methods

- MTM:
  - MTM-I
  - MTM-II
  - Standard data
  - UAS
  - MEK
  - Office tasks
  - Visual inspection

Standard time method extensions ar also supported.

- Work Factor:
  - Block method
  - Quick method
- SAM
- General time element or time analysis:

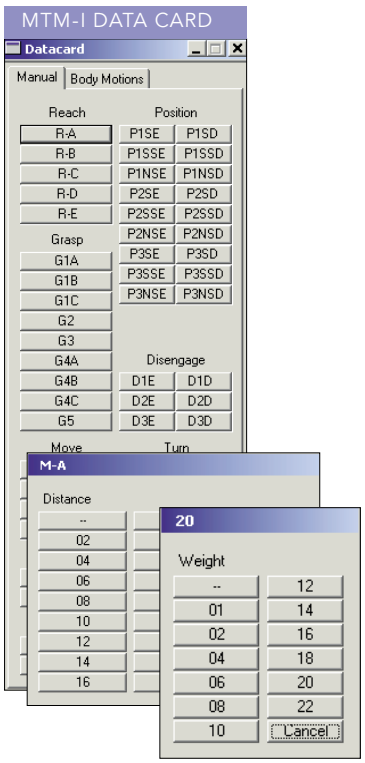
Modules of any quality obtained from any source (estimated times, process times, planning time elements) can be acquired and managed in this category. The time element codes needed for the standard time methods are included in DELMIA Industrial Engineer.

The "Summary" Function

DELMIA Industrial Engineer offers "summary" as a specific data type within a standard time method. This data type is used to combine a number of related small elements that must be performed together as a "block." An example is an inspection process that includes selecting the part, inspecting it, documenting the inspection results and either returning the part or placing the part in a reject bin. This "summary" data type can be used to generate the work instructions for the worker – directly at the workstation.

Structure of Time Analyses

DELMIA Industrial Engineer gives the user complete freedom in creating and structuring time analyses. Time analyses can be compressed over any number of data levels; i.e., the system allows any time structure, from basic procedures (standard and repeat activities) through partial operations and operations to sub-assemblies, assemblies and products.

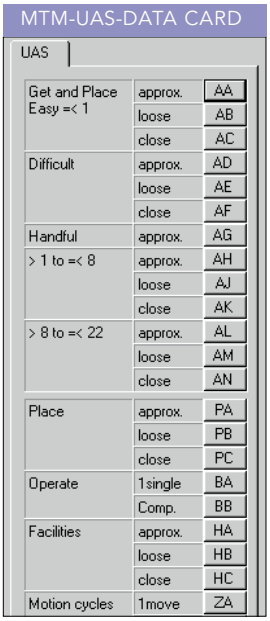


Interfaces to Other Time Measurement Systems

Data import from ORTIM (time recording and planned time) and MTM (ANA/ZEBA-DATA) is available. Data import from company-specific systems can be developed by the user or DELMIA.

Data Cards

DELMIA Industrial Engineer offers data cards tailored to the different standard time methods and their time element code. Each data card displays the time values in logically arranged lists for maximum analysis efficiency. DELMIA Industrial Engineer enables the user to create custom data cards for quick and easy integration of company-specific data.



DELMIA Industrial Engineer Time Analysis

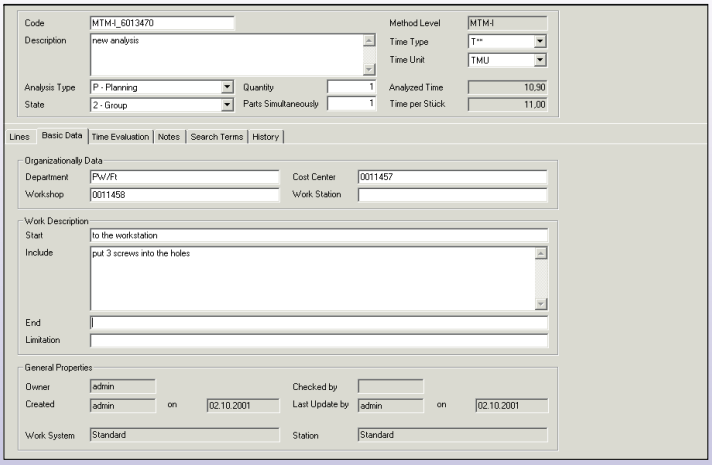
The easily understood structure of the time elements in DELMIA Industrial Engineer allows the user to analyze manual and partially automated activities very quickly and efficiently. The master data is visible to the user at any time during the analysis process. The fundamental data values and results of the analysis are shown in this section of the screen.

Operations are described and defined by up to 10 data items that can be switched on or off through configuration. The key entities for a time analysis are:

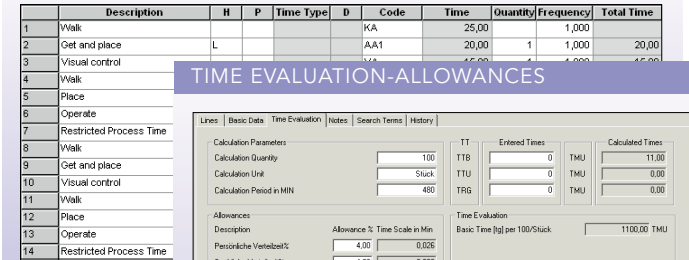
Header Data

This screen is used to describe activities according to MTM rules. Moreover, organizational data is entered here and general status information about the analysis is displayed.

ANALYIS HEADER

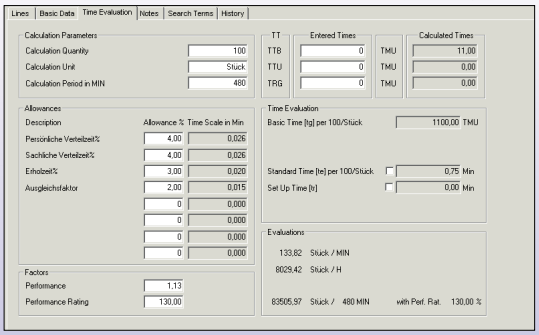


MTM-UAS ANALYSIS SHEET



	Description	H	P	Time Type	D	Code	Time	Quantity	Frequency	Total Time
1	Walk					KA	25,00		1,000	
2	Get and place	L				AA1	20,00	1	1,000	20,00
3	Visual control									
4	Walk									
5	Place									
6	Operate									
7	Restricted Process Time									
8	Walk									
9	Get and place									
10	Visual control									
11	Walk									
12	Place									
13	Operate									
14	Restricted Process Time									

TIME EVALUATION-ALLOWANCES



Lines

Lines constitute the key elements defining the operations within an analysis. Time codes are entered and quantity/frequency evaluations are made here. During the calculation of a time analysis, the times are checked against the MTM rules, and errors are displayed immediately.

Time Structuring

The time structuring function evaluates the basic results of the analysis (basic times) using defined allowances and calculates the "time per unit." Furthermore, capacity and expected output per time are calculated and displayed here. DELMIA Industrial Engineer manages any number of allowances, which are combined in allowance sets. The names, values and computing rules of allowances are user-definable.

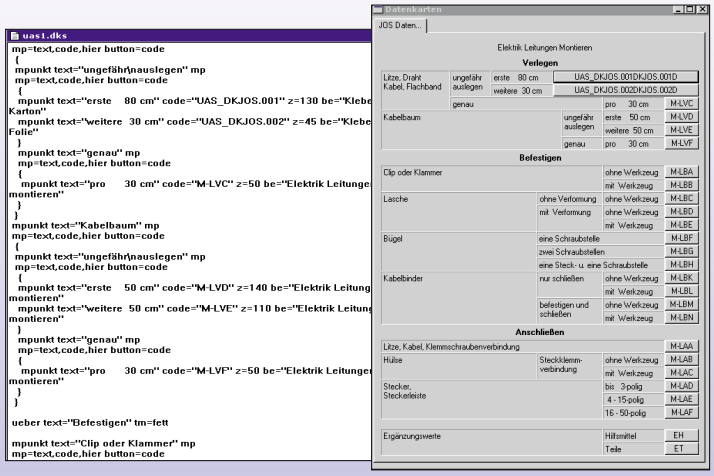
DELMIA Industrial Engineer Analysis with Data Cards

Graphical data cards facilitate quick and efficient creation of work sequence descriptions for manual and partially automated workstations. The desired activity is selected by clicking on it within the data card. DELMIA Industrial Engineer then prompts for the associated time element parameters, such as length of movement. From the data card element chosen, a complete line with code, standard description, quantity, frequency and time is generated. The data is entered at the current cursor position. In the case of analysis forms with left and right hand activities, the data generated can be moved to the appropriate code column. User-defined time elements can be inserted in the sequence of operations described, wherever needed.
All data cards available in the time measurement method are displayed using the handy index tab format.

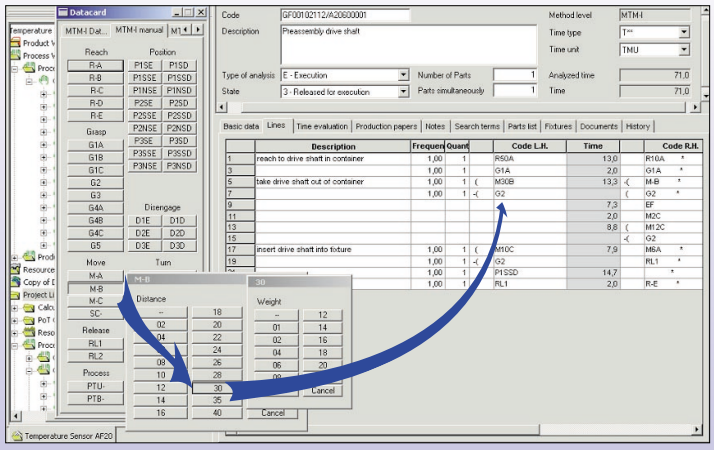
A convenient data card generator is available to create company-specific data cards.

Data cards are defined and the layout is created using this creation and editing environment in which the data cards can be tested and immediately viewed. The user can easily master the description language to create data cards. The data card generator fully supports the multilingual features available in DELMIA Industrial Engineer.

DATA CARD GENERATOR



ANALYZING WITH DATA CARDS



DELMIA Industrial Engineer
Analysis with Formulas

All process-oriented sequences can be computed with the formula system available in DELMIA Industrial Engineer. Formulas are created quickly and effortlessly using a simple but comprehensive definition language. Once a formula has been defined as a library element, it is available for use by any user whenever needed.

Even complex formula constructs can be created and structured in DELMIA Industrial Engineer.

This is implemented by means of structuring elements such as:

- Formula within a formula
- Subroutines
- "If … then … else …" control structures
- "From … to … step …" loops

DELMIA Industrial Engineer offers the following procedures and functions:

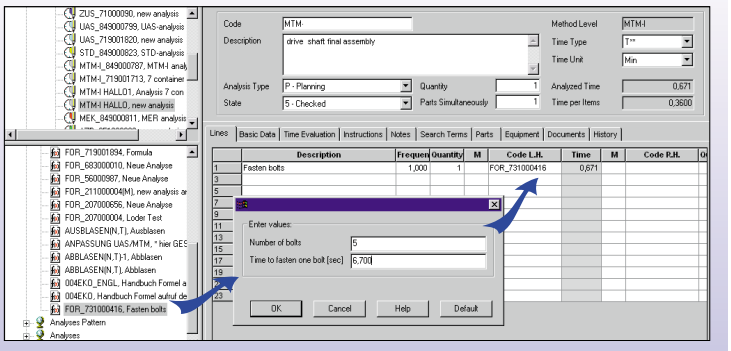
Mathematical Functions
root
sin
cos
tan
cot
arcsin
arccos
arctan
sec
cosec
arccot
sinh
cosh
tanh
coth
arsinh
arcosh
artanh
arcoth
sech
cosech
Exponential and Logarithms
exp
ln
ln10
log

Various conversions in G-number types
ceil
floor
round
G number
Special Functions
min
max
sig
Bool
Boolx
Hole
abs
Codezeit
Text Functions
Txtlen
Txt_left
txt_right
Txt_middle
Txt_small
Txt_large
User stack
task
I notice

Nesting and control structures enable the user to create highly dynamic formulas. It is possible to calculate and plan a great number of variants using only a few formulas. This simplifies data maintenance and increases the quality of the time data. Moreover, smart structuring of formulas helps to greatly reduce the data entry effort; i.e. the number of variables entered. By simply copying a formula into the analytical line, either by drag and drop or manual insertion, all necessary formula parameters are immediately queried and the result is automatically entered in the respective line.
DELMIA Industrial Engineer supports mapping and calculation of various time types (process times, manual activities, setting times) defined by formulas. Time elements can also be directly inserted in formulas.

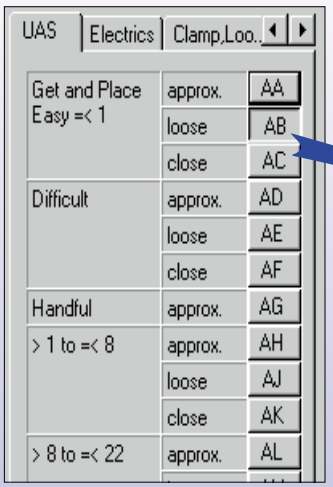
```
main program(N,I ): time
title="Drop off";
N=0.0;
N.text="Number of dropped-off places
[pieces]:";
T=0.0;
T.text="Duration of drop-off sequence  [sec-
onds]:";
{
time value=65+(N*T)*27.8 + (N-1)*20;
description="Drop-off
place="+N+"Duration="+T;
return(time value);
}
```

ANALYZING WITH FORMULAE

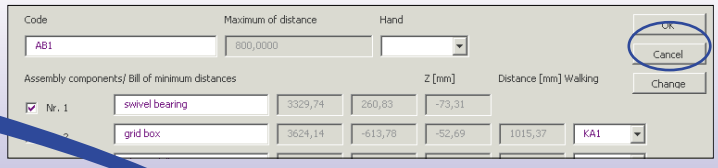


DELMIA Industrial Engineer
Analysis Based on 3D-Workstation Layouts (Optional with Layout Planning)

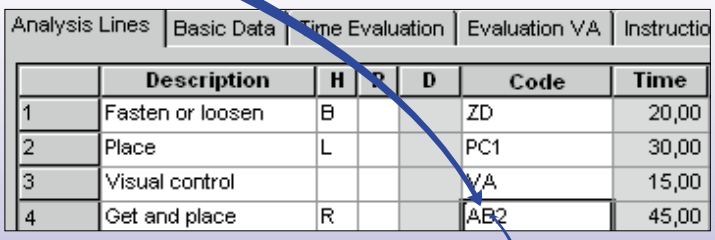
MTM-UAS DATA CARD



DISTANCE DETERMINATION MACRO



MTM ANALYSIS SHEET

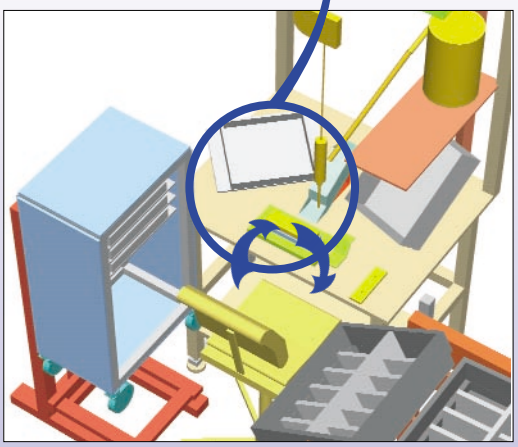


When existing 3D workstation layouts developed in Layout Planning are used - rather than working exclusively with data cards - DELMIA Industrial Engineer can perform quick and reliable analyses. As virtual workstations, these 3D workstation graphics completely represent the subsequent real workstation situation in production - including all essential features. This provides a clearly defined and unambiguous documentation of workstation conditions underlying the time analysis. The estimation of distances based on rough guesses regarding the arrangement of workstation elements, is completely eliminated.

The process of analysis based on 3D workstation layouts is simple:

- Select the time element code from the data card
- Define the starting and ending points of the action by mouse clicks on the 3D representation
- Confirm the sequence

3D WORKSTATION LAYOUT



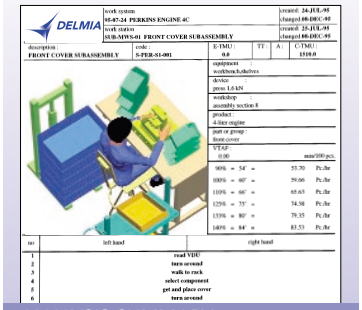
Active 3D layout/MTM code assignments enable the planner to immediately recognize what effect a change in the layout has on the time calculation.

DELMIA Industrial Engineer
Printing Time Study Results

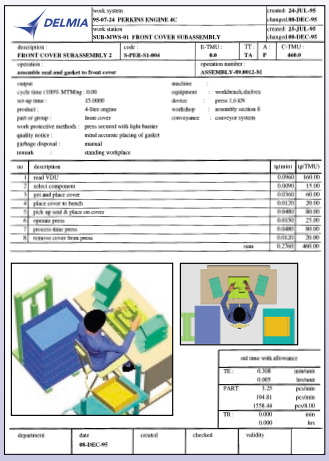
Print Variants

DELMIA Industrial Engineer allows the user to control the output of results in a flexible and individual manner. Variants to printed forms can be easily created. These variants are determined for a particular standard time method and provide highly differentiated and flexible arrangement of forms.

WORK INSTRUCTION SHEET



ANALYSIS SUMMARY



FORM GENERATION / STANDARD FORMS

DELMIA

Tset System

Standard
Standard

Code: UAS_46015911

Analysis Type:	State:	Method Level:
P	2	UAS
Quantity:	Items Limit:	Time/Item by TMU
1	1	435,00

No	Description	H	P	Code	Qu	Freq	TotTime in TMU
1	Get and place			AH3	1	1,000	55,00
2	Get and place			AH2	1	1,000	45,00
3	Visual control			VA	1	1,000	15,00
4	Get and place			AF2	1	1,000	65,00
5	Motion sequence			ZB1	1	1,000	10,00
6	Get and place			AD2	1	1,000	45,00
7	Restricted Process Time			PTU200	1	1,000	200,00

The following printed forms are defined in the standard configuration of DELMIA Industrial Engineer:

- Header data of time analysis with operating sequence descriptions
- Analytical lines for each standard time method configured
- Time structure with a detailed listing of all times and allowances
- P & T (production and test instruction)
- Optional analytical data, such as parts, resources, search keys, documents

Form Generation

Custom form design is available in DELMIA Industrial Engineer. It enables the user to quickly adapt the output of results to company-specific requirements, or to customize existing forms as needed.

DELMIA Industrial Engineer Tools for Data Management

Assistants

For rarely used functions, the user can resort to assistants that guide him/her through the function step-by-step, thereby ensuring that the desired function is carried out in the correct manner. All actions are logged. The log may be viewed at any time for verification.

Copy/Move

Experienced users can use drag and drop to quickly and efficiently copy and move elements in the expert mode. This is also logged and can be verified later on.

Replace

Entire data areas can be replaced in order to update time analyses with new data. This may become necessary when the company-specific environment changes; for example, due to changes in the number of employees, in allowances and/or the organizational structure (entire production areas are moved).

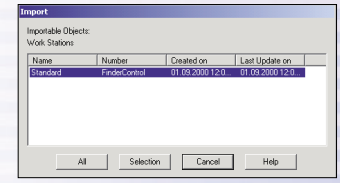
Replacement sequences can be executed and checked step-by-step by selection of individual data contents. Data integrity and the quality of the results are thus guaranteed.

Import/Export

DELMIA Industrial Engineer allows data to be transferred at any time from one working environment to another. For example, this can be used to export data from a central installation to a notebook. The results can then be retransferred to the central environment.

This import/export function is also used for data archiving.

Import/Export



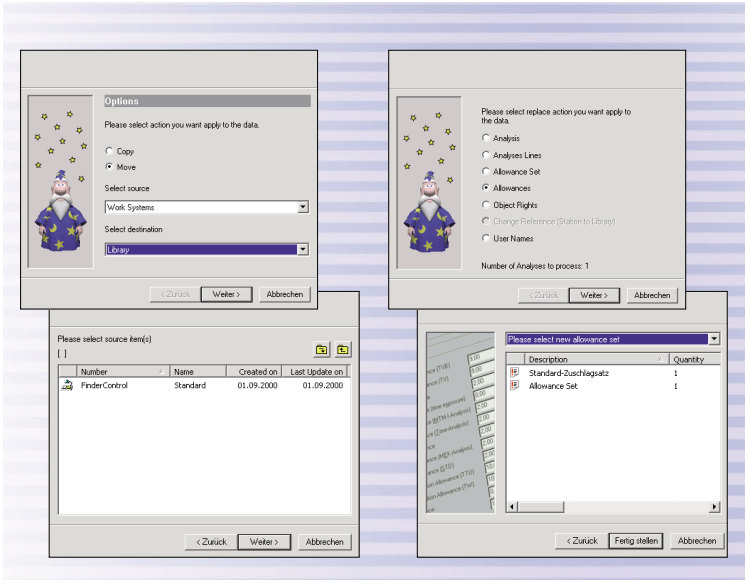
Updating Time

DELMIA Industrial Engineer is a powerful tool that allows the user to update specific time data at any time. In general, DELMIA Industrial Engineer updates time analyses immediately. Subsequent changes to time-relevant data, such as allowances and time codes, may make it necessary to recalculate the time data.

All changes are documented in a log and are therefore completely traceable.

Copy assistant

Replacement assistant



DELMIA Industrial Engineer Configuration and Authorization/Security

Configuration

DELMIA Industrial Engineer includes numerous configuration and setting options. These are divided into:

- User
- Local
- Global

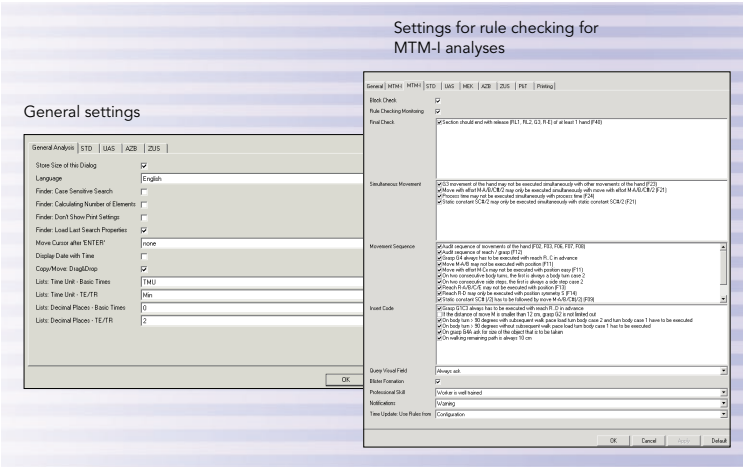
These options permit DELMIA Industrial Engineer to be optimally set and tailored to the needs of each company and each project.

The "User" settings represent the personal settings of an individual DELMIA Industrial Engineer user.

The "Global" settings define an important and central area of configuration. Global settings are those that have system-wide validity within a DELMIA Industrial Engineer installation and directly influence the results of time analyses.

The settings for "User" and "Local" are managed by the individual user.

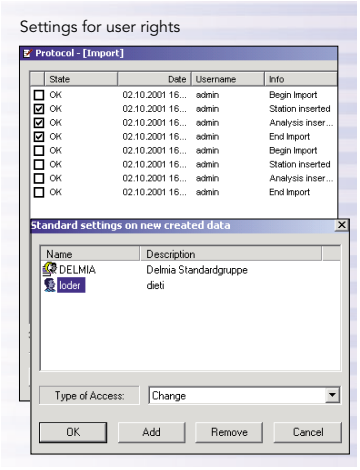
The "Global" settings are managed by the Process Engineering Solutions database administrator.



Authorization

DELMIA Industrial Engineer features a complete authorization/security system, guaranteeing maximum data security.
Essentially, there are three authorization levels:

- User
- Groups
- Administrator

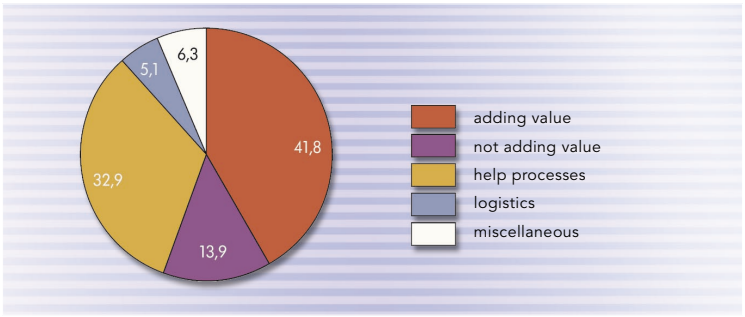


The access rights are "read," "write," "change," "complete access" and "locked." However, detailed user-specific settings are also supported. The rights assigned in DELMIA Industrial Engineer may be applied to a wide variety of objects.

DELMIA Industrial Engineer
Options, Evaluations and System Requirements

Added Value

The added value in work processes is an important supplementary criterion for time-based analyses.
In DELMIA Industrial Engineer, the value-added categories are configured by the user according to company-specific requirements.
Industrial Engineer supports a hierarchical structure of value-added categories that includes main groups (adding value, not adding value, auxiliary process, logistics, etc.) and subgroups. Examples of subgroups for the main group category "not adding value" are reading, walking distances, tool change, inspect. Multiple assignments based on percentages are also possible for evaluation of an activity according to value-added criteria; e.g., 50% adding value and 50 % not adding value.



DELMIA Industrial Engineer as an ActiveX Component in mySAP.COM

DELMIA Industrial Engineer can be integrated as an ActiveX component in the mySAP.COM environment and then becomes a professional time measurement system within the SAP environment.

Collaboration and Notification via XML

The standard version of DELMIA Industrial Engineer includes a notification system that notifies other DELMIA Process Engineering Solutions users about changes via e-mail. The relevant data can be transferred to the recipient along with the e-mail. This enables users who do not have DELMIA Industrial Engineer to view the analysis in an Internet browser and immediately take appropriate action.

System Requirements

DELMIA Industrial Engineer is designed as a client/server system but can also be used as a single-user system. Running under Windows NT4 and Windows 2000, it requires a workstation with a 17" screen and 128 MB of RAM. ORACLE is used as the database system. Please contact DELMIA for details on the installation environment.

Code	CARRIER_SUB	Description	Carrier subassembly
Analysis Type	E	Method	UAS
State	3	Time Type	T**
Created by	DELMIA	on	23.02.2001
Modified by	DELMIA	on	21.06.2001
Quantity	1	Time Unit	Sec
Parts Simultan.	1	Time/Item	20.88

No.	Description	Code	Time	Quantity	Frequency	Total Time
1	Get carrier from conveyor and place on table	AH3	1.98	1	1.000	1.980
2	Install (2) pushnuts in centre bexel area	AF2	2.34	2	1.000	4.680
3	Install two demister grills on carrier	AF2	2.34	2	1.000	4.680
4	Inspect carrier subassembly	VA	0.54	4	1.000	2.160
5	Place ID sticker on carrier	AF3	2.88	1	1.000	2.880
6	Get subassembled carrier and place in rack	AH1	0.90	1	1.000	0.900
7	Walk to rack	KA	0.90	2	1.000	1.800
8	Walk back to table to get next carrier	KA	0.90	2	1.000	1.800

Worldwide Collaboration and Rapid Data Exchange via the Internet

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