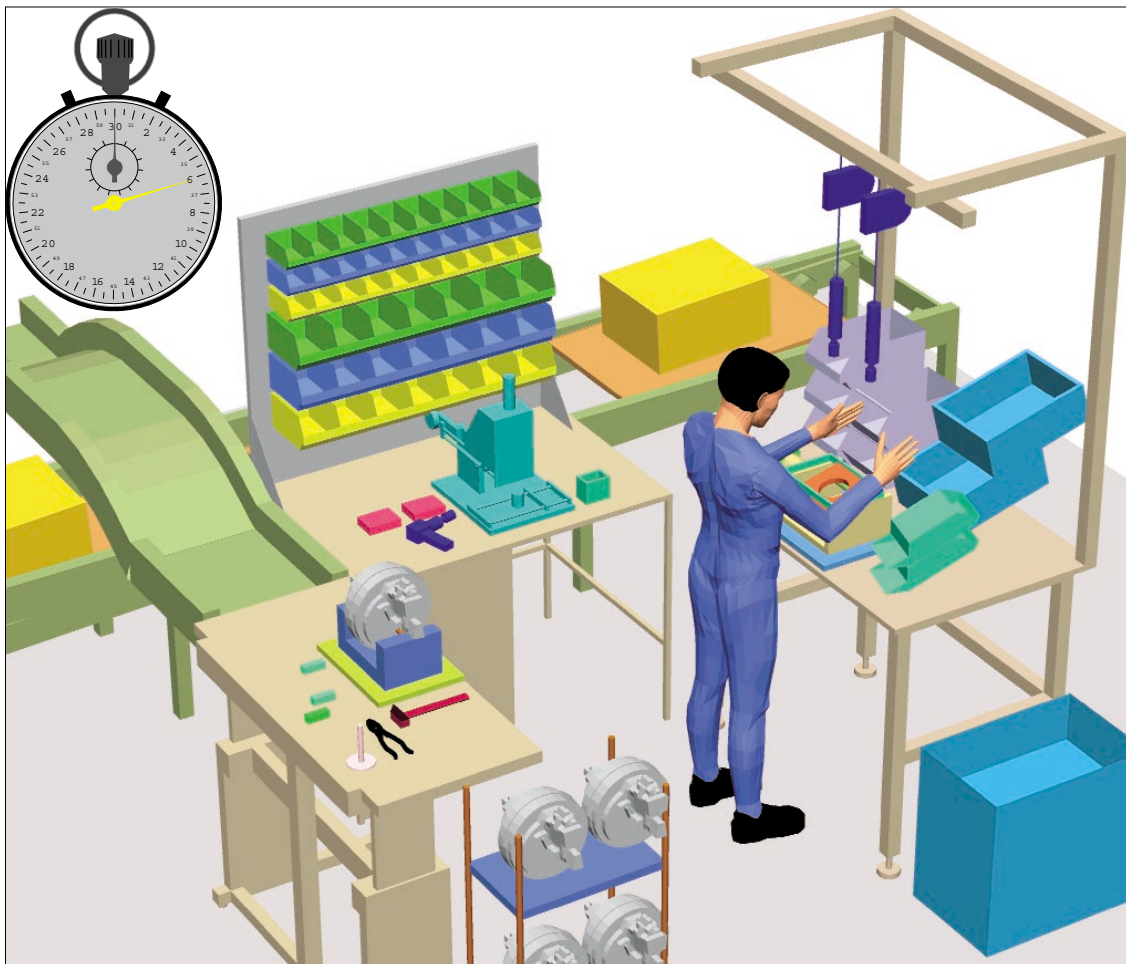




DELMI A Industrial Engineer

Standard Time Measurement



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.

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

STRUCTURED FILING OF TIME ANALYSES

Arbeitsystem	Station	Code	Bezeichnung	Zeitgr.	Zeittr.	Analysenart	Status	Erstellungsdatum
0206120030/A1500	Wicklungselle	0206120030/A1500	Wicklungselement erstellen	324	T**	A - Ausführung	2 - Gruppe	17.7.1997
GF-4505-00/AA415	Schultheber	GF-4505-00/AA415	Zusammenstellung 14 Zielen	0	T**	P - Planung	2 - Gruppe	25.5.1999
GF-4505-00/AA415	Schultheber	GF-4505-00/AA415	Schultheber/Verfahren	0	T**	P - Planung	2 - Gruppe	2.2.1999
GF-4505-00/AA415	Schultheber	GF-4505-00/AA415	VORMONTAGE ANTRIEBSWELLE	442	T**	A - Ausführung	3 - Freigegeben zur Prüfung	18.1.1998
MA12A01/2002	REF.LS U. SICHTSTR. LOCITTE	MA12A01/2002	Zusammenstellung	105	T**	A - Ausführung	5 - Geprüft	4.1.1988
02050000/A2300/01	ERSTELLEN	02050000/A2300	ERSTELLEN KLAPPENWELLE	1205	T**	A - Ausführung	3 - Freigegeben zur Prüfung	25.5.2000
0481044 - /A2210/01	Mont-u-verv.H.1 Teil	03050100/A2210/01	ERSTELLEN KLAPPENWELLE	69	T**	A - Ausführung	3 - Freigegeben zur Prüfung	16.4.1991
0481044 - /A2210/01	Mont-u-verv.H.1 Teil	03050100/A2210/01	Mont-u-verv.H.1 Teil	617	T**	P - Planung	1 - Benutzer	1.12.1998
0481044 - /A2210/01	Mont-u-verv.H.1 Teil	03050100/A2210/01	Mont-u-verv.H.1 Teil	617	T**	P - Planung	1 - Benutzer	18.10.1999
ASB_ZEZ_VERPACKEN ASB ASBP	ASB_ZEZ	333421078/A1200/00	SPULE WICKELN	2950	T**	P - Planung	2 - Gruppe	12.5.1999
EDC-PUMPE AUSLAGEN	EDC-PUMPE AUSLAGEN	333421078/A1200/00	SPULE WICKELN	698	T**	A - Ausführung	3 - Freigegeben zur Prüfung	24.10.1998
VERPACKEN ASB Allgemein	VERPACKEN ASB Allgemein	333421078/A1200/00	SPULE WICKELN	488	T**	A - Ausführung	3 - Freigegeben zur Prüfung	24.10.1998
UAC_KURZANF. Neue Analyse	UAC_KURZANF. Neue Analyse	333421078/A1200/00	SPULE WICKELN	100	T**	A - Ausführung	5 - Geprüft	8.4.1997
PTU-TEST-REIS	PTU-TEST-REIS	333421078/A1200/00	SPULE WICKELN	600	T**	P - Planung	2 - Gruppe	2.6.1999
STD-BSP-PR02-ABGL	Beispiel 1 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	3478	T**	P - Planung	2 - Gruppe	22.2.1997
STD-STD-KOMB-ABGL	Beispiel 2 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	200	T**	P - Planung	2 - Gruppe	7.2.2001
STD-STD-KOMB-ABGL	Beispiel 3 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	304	T**	A - Ausführung	3 - Freigegeben zur Prüfung	22.11.1999
STD-STD-KOMB-ABGL	Beispiel 4 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	50	T**	P - Planung	2 - Gruppe	26.4.1999
STD-STD-KOMB-ABGL	Beispiel 5 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	100	T**	P - Planung	2 - Gruppe	26.4.1999
STD-STD-KOMB-ABGL	Beispiel 6 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	100	T**	P - Planung	2 - Gruppe	30.8.1999
STD-STD-KOMB-ABGL	Beispiel 7 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	90	T**	P - Planung	2 - Gruppe	30.8.1999
STD-STD-KOMB-ABGL	Beispiel 8 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	43	T**	P - Planung	2 - Gruppe	26.4.1999
STD-STD-KOMB-ABGL	Beispiel 9 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	100	T**	A - Ausführung	2 - Gruppe	18.7.1997
STD-STD-KOMB-ABGL	Beispiel 10 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	100	T**	A - Ausführung	2 - Gruppe	18.7.1997
STD-STD-KOMB-ABGL	Beispiel 11 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	73	T**	A - Ausführung	2 - Gruppe	23.7.1997
STD-STD-KOMB-ABGL	Beispiel 12 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	0	T**	A - Ausführung	2 - Gruppe	23.7.1997
STD-STD-KOMB-ABGL	Beispiel 13 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	26	T**	A - Ausführung	2 - Gruppe	18.7.1997
STD-STD-KOMB-ABGL	Beispiel 14 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	71	T**	A - Ausführung	3 - Freigegeben zur Prüfung	18.1.1998
STD-STD-KOMB-ABGL	Beispiel 15 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	82	T**	A - Ausführung	3 - Freigegeben zur Prüfung	18.1.1998
STD-STD-KOMB-ABGL	Beispiel 16 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	90	T**	A - Ausführung	2 - Gruppe	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 17 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	72	T**	P - Planung	2 - Gruppe	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 18 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	115	T**	A - Ausführung	3 - Freigegeben zur Prüfung	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 19 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	6	T**	P - Planung	2 - Gruppe	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 20 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	1	T**	A - Ausführung	3 - Freigegeben zur Prüfung	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 21 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	7	T**	A - Ausführung	3 - Freigegeben zur Prüfung	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 22 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	1	T**	A - Ausführung	3 - Freigegeben zur Prüfung	19.1.1998
STD-STD-KOMB-ABGL	Beispiel 23 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	44	T**	A - Ausführung	3 - Freigegeben zur Prüfung	21.12.1987
STD-STD-KOMB-ABGL	Beispiel 24 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	244	T**	A - Ausführung	3 - Freigegeben zur Prüfung	21.12.1987
STD-STD-KOMB-ABGL	Beispiel 25 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	59	T**	A - Ausführung	3 - Freigegeben zur Prüfung	21.12.1987
STD-STD-KOMB-ABGL	Beispiel 26 aus AMABES BMB	333421078/A1200/00	SPULE WICKELN	4	T**	A - Ausführung	3 - Freigegeben zur Prüfung	21.12.1987

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.

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.

ANALYSIS FINDER

Analyse

Suchen | Erweiterte Suche | Filter

Arbeitsystem:
 Station:
 Code:
 Bezeichnung:
 Suchtext:
 Erstellungsdatum:

Suchtext:
 Erstellungsdatum:

Arbeitsystem	Station	Code	Bezeichnung	Zeittr.	Analysenart	Status
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	2 - Gruppe
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	P - Planung	2 - Gruppe
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	P - Planung	2 - Gruppe
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A3540...	VORMONTAGE VERTEILERKÖR...	T**	A - Ausführung	3 - Freigegeben zur Prüfung
Testsysteme	Allgemeine Testdaten	GF00102112/A2060...	VORMONTAGE ANTRIEBSWELLE	T**	A - Ausführung	3 - Freigegeben zur Prüfung

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 are 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/ZEBADA-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.

Reach	Position	
R-A	P1SE	P1SD
R-B	P1SSE	P1SSD
R-C	P1NSE	P1NSD
R-D	P2SE	P2SD
R-E	P2SSE	P2SSD
	P2NSE	P2NSD
Grasp	P3SE	P3SD
G1A	P3SSE	P3SSD
G1B	P3NSE	P3NSD
G1C		
G2		
G3		
G4A	Disengage	
G4B	D1E	D1D
G4C	D2E	D2D
G4D	D3E	D3D
G5		

M-A

Distance

-
- 02
- 04
- 06
- 08
- 10
- 12
- 14
- 16

Weight

-
- 01
- 02
- 04
- 06
- 08
- 10

20

Cancel

UAS		
Get and Place Easy <= 1	approx.	AA
	loose	AB
	close	AC
Difficult	approx.	AD
	loose	AE
	close	AF
Handful > 1 to <= 8	approx.	AG
	loose	AH
	close	AJ
	loose	AK
	close	AL
> 8 to <= 22	approx.	AM
	loose	AN
	close	AO
Place	approx.	PA
	loose	PB
	close	PC
Operate	1single	BA
	Comp.	BB
Facilities	approx.	HA
	loose	HB
	close	HC
Motion cycles	1move	ZA

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.

ANALYSIS HEADER

Code: MTM_1_6013470 Method Level: MTM1
 Description: new analysis Time Type: T**
 Time Unit: TMU
 Analysis Type: P-Planning Quantity: 1 Analyzed Time: 10.90
 State: 2-Group Parts Simultaneously: 1 Time per Stück: 11.00

Lines: Basic Data | Time Evaluation | Notes | Search Terms | History

Organizationally Data
 Department: Pw/R Cost Center: 0011457
 Workshop: 0011458 Work Station:

Work Description
 Start: to the workstation
 Include: put 3 screws into the holes
 End:
 Limitation:

General Properties
 Owner: admin Checked by:
 Created: admin on 02.10.2001 Last Update by: admin on 02.10.2001
 Work System: Standard Station: Standard

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.

MTM-UAS ANALYSIS SHEET

	Description	H	P	Time Type	D	Code	Time	Quantity	Frequency	Total Time
1	Walk						25,00		1,000	
2	Get and place	L				AA1	20,00	1	1,000	20,00
3	Visual control						15,00		1,000	15,00
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: Basic Data | Time Evaluation | Notes | Search Terms | History

Calculation Parameters
 Calculation Quantity: 100
 Calculation Unit: Stück
 Calculation Period in MIN: 480

Entered Times
 TT: 0 TMU
 TTU: 0 TMU
 TRG: 0 TMU

Calculated Times
 TT: 11,00
 TTU: 0,00
 TRG: 0,00

Time Evaluation
 Basic Time [h] per 100/Stück: 1100,00 TMU

Standard Time [h] per 100/Stück: 0,75 Min
 Set Up Time [h]: 0,00 Min

Evaluations
 133,82 Stück / MIN
 8029,42 Stück / H
 85005,97 Stück / 480 MIN with Perf. Rat. 130,00 %

Factors
 Performance: 1,13
 Performance Rating: 130,00

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

The screenshot displays the 'DATA CARD GENERATOR' interface. On the left, a code editor shows a sequence of operations in German, such as 'mpunkt text="erste 80 cm" code="UAS_DKJOS.001" z=130 be="Klebe...' and 'mpunkt text="weite 30 cm" code="UAS_DKJOS.002" z=45 be="Klebe...'. On the right, a preview window titled 'Datenkarten' shows a table of activities under three main sections: 'Verlegen', 'Befestigen', and 'Anschließen'. Each section contains a table with columns for activity description, quantity, and code. For example, under 'Verlegen', there are entries for 'Liese, Draht Kabel, Flachband' and 'Kabelbaum' with various codes like 'UAS_DKJOS.001DKJOS.001D' and 'UAS_DKJOS.002DKJOS.002D'.

ANALYZING WITH DATA CARDS

The screenshot shows the 'ANALYZING WITH DATA CARDS' interface. The main window displays a table of activities with columns for Description, Frequency, Quantity, Code L.M., Time, and Code R.M. The table includes activities like 'reach to drive shaft in container', 'take drive shaft out of container', and 'insert drive shaft into fixture'. A 'Time-0' dialog box is open, showing a grid for time analysis with columns for 'Distance' and 'Weight' and rows for 'Release', 'RL1', 'RL2', 'Process', 'PTU', and 'PTB'. The dialog box has 'Cancel' and 'Lancel' buttons.

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

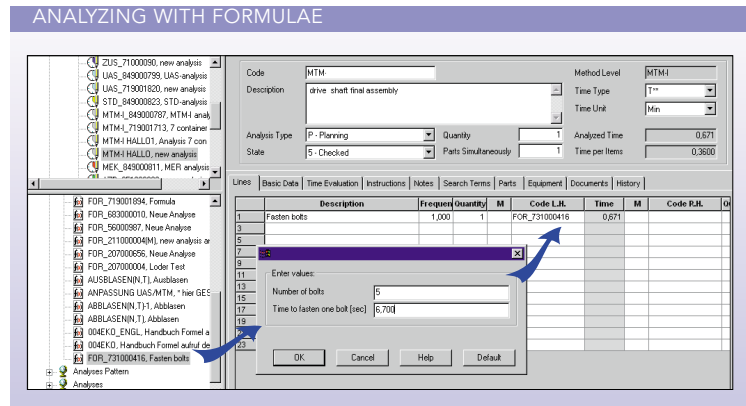
DELMIA Industrial Engineer offers the following procedures and functions:

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
l 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 [seconds]";
{
time value=65+(N*T)*27.8 + (N-1)*20;
description="Drop-off place="+N+"Duration="+T;
return(time value);
}
```



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

MTM-UAS DATA CARD

UAS	Electrics	Clamp, Loo...	
Get and Place Easy =< 1	approx.	AA	
	loose	AB	
	close	AC	
Difficult	approx.	AD	
	loose	AE	
	close	AF	
Handful	approx.	AG	
	> 1 to =< 8	approx.	AH
		loose	AJ
		close	AK
> 8 to =< 22	approx.	AL	

DISTANCE DETERMINATION MACRO

Code	Maximum of distance	Hand	OK
AB1	800,0000		Cancel
Assembly components/ Bill of minimum distances		Z [mm]	Distance [mm] Walking
<input checked="" type="checkbox"/> Nr. 1	swivel bearing	3329,74	260,83
	grid box	3624,14	-613,78
			-52,69
			1015,37
			KA1

MTM ANALYSIS SHEET

Analysis Lines	Basic Data	Time Evaluation	Evaluation VA	Instruction		
	Description	H	P	D	Code	Time
1	Fasten or loosen	B			ZD	20,00
2	Place	L			PC1	30,00
3	Visual control				VA	15,00
4	Get and place	R			AB2	45,00

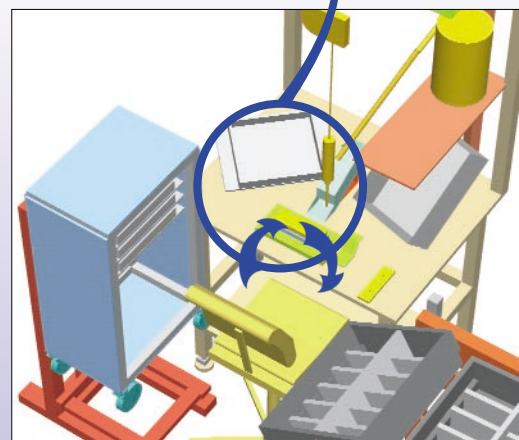
When existing 3D workstation layouts developed in Layout Planning are used - rather than working exclusively with data cards - DELMIA Industrial Engineer can perform quick and reliable analyses. As virtual workstations, these 3D workstation graphics completely represent the subsequent real workstation 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

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

3D WORKSTATION LAYOUT



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

No	Description	Time	Unit
1	left hand	33.70	Pc./hr
2	right hand	33.60	Pc./hr
3	task overall	67.30	Pc./hr
4	work to task	67.30	Pc./hr
5	select component	34.20	Pc./hr
6	get and place cover	33.10	Pc./hr
7	task overall	67.30	Pc./hr

ANALYSIS SUMMARY

No	Description	Time	Unit
1	task overall	67.30	Pc./hr
2	select component	34.20	Pc./hr
3	get and place cover	33.10	Pc./hr
4	place cover to bench	0.00	Pc./hr
5	pick up tool & place on cover	0.00	Pc./hr
6	inspect cover	0.00	Pc./hr
7	generate time points	0.00	Pc./hr
8	calculate overall task time	67.30	Pc./hr

FORM GENERATION/STANDARD FORMS

DELMIA		Tset System		Code: UAS_46015911			
Standard		Standard	Standard	Analysis Type: P	STEP: 2	Method Used: UAS	
Standard		Standard	Standard	Quantity: 1	Items z/Unit: 1	Time/Item by TMU: 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

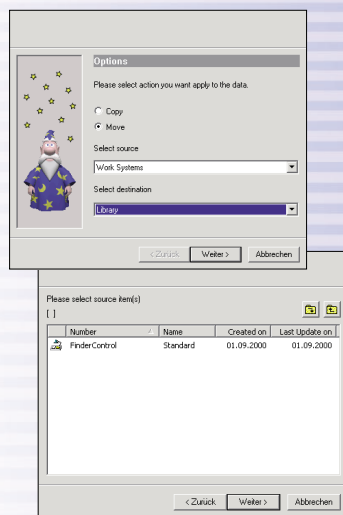
Assistants

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.

Copy assistant

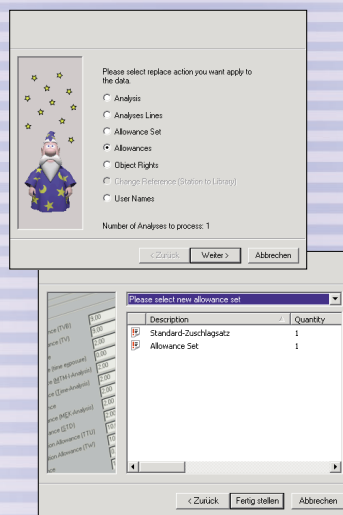


Replace

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.

Replacement assistant

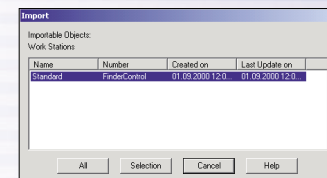


Import/Export

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.



DELMIA Industrial Engineer Options, Evaluations and System Requirements

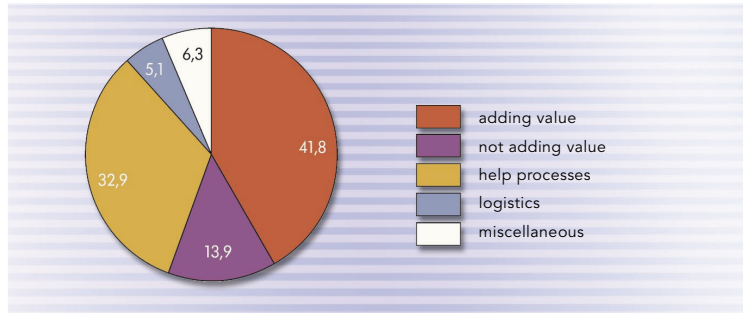
Added Value

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 sub-groups. 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.

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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 bezel 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

PROCESS PLANNING