

PG - 3000



The Plating Line Control System

Software :

- **Documentation**
- **Data Base Functions**
- **Visual Process Control**
- **Parameter Setup**
- **Remote Control Services**

Hardware :

- **Industrial PLC + PC**
- **Rugged Industrial Performance**
- **Modular Construction**
- **Field Bus - Systems**

Main Advantages:

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1. Software :

- Programming with or without Time-Way-Diagram
- Optimisation with or without priority
- Data Base System
- Operation and equipment data record
- Trouble message record
- Data security through password protection
- Test fuctions via PC
- PC-Software not copy protected
- Remote Control and maintenance services via standard modem

2. Hardware :

- Standard–PC without special components or cards
- Standard–PLC without special components or cards
- Flexibility through modular construction
- Field Bus performance (CAN-Bus , Profibus und Ethernet)
- High availability through rugged industrial electronic components
- Different functionality for PLC and PC
- All control functions on PLC side
- Flexible interface concept for hardware connection
- Spare parts service guaranteed for min. 10 years

The Plating Line control system PG – 3000 is developed from the practice of the plating technology. The concept, experierced since years, has been developed continuously together with the development of the electronic industry

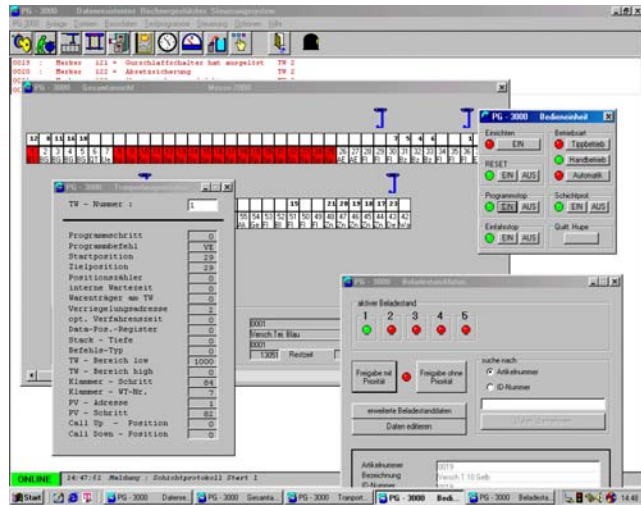
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A modern Real-Time Multitask Operation System guarantees high availability and a secured operation of the control while using extensive applications.

A special service is the remote support and maintenance service via standard modem. This service guarantees short reaction time for maintenance or support as well as it helps to safe money.

The Plating Line Control System PG – 3000 contains the following main functions:

- Visual Process Control,
- Parameter Setup and Editor for equipment data
- Parameter Setup and Editor for process data. Parameters and process steps are changeable also for flightbars during the process cycle,
- Data Base System for article data (PCB) and process data,
- Data input at loading station via external terminal or PC,
- Protocol record:
 - Process protocol
 - Charge protocol
 - Shift protocol
 - Malfunction protocol
 - Dosing pump protocol
 - LOG-Book for data and parameter changes
- Hoist processing in easy clear text programming
- Extensive test functions
- Password protection with access authorisation



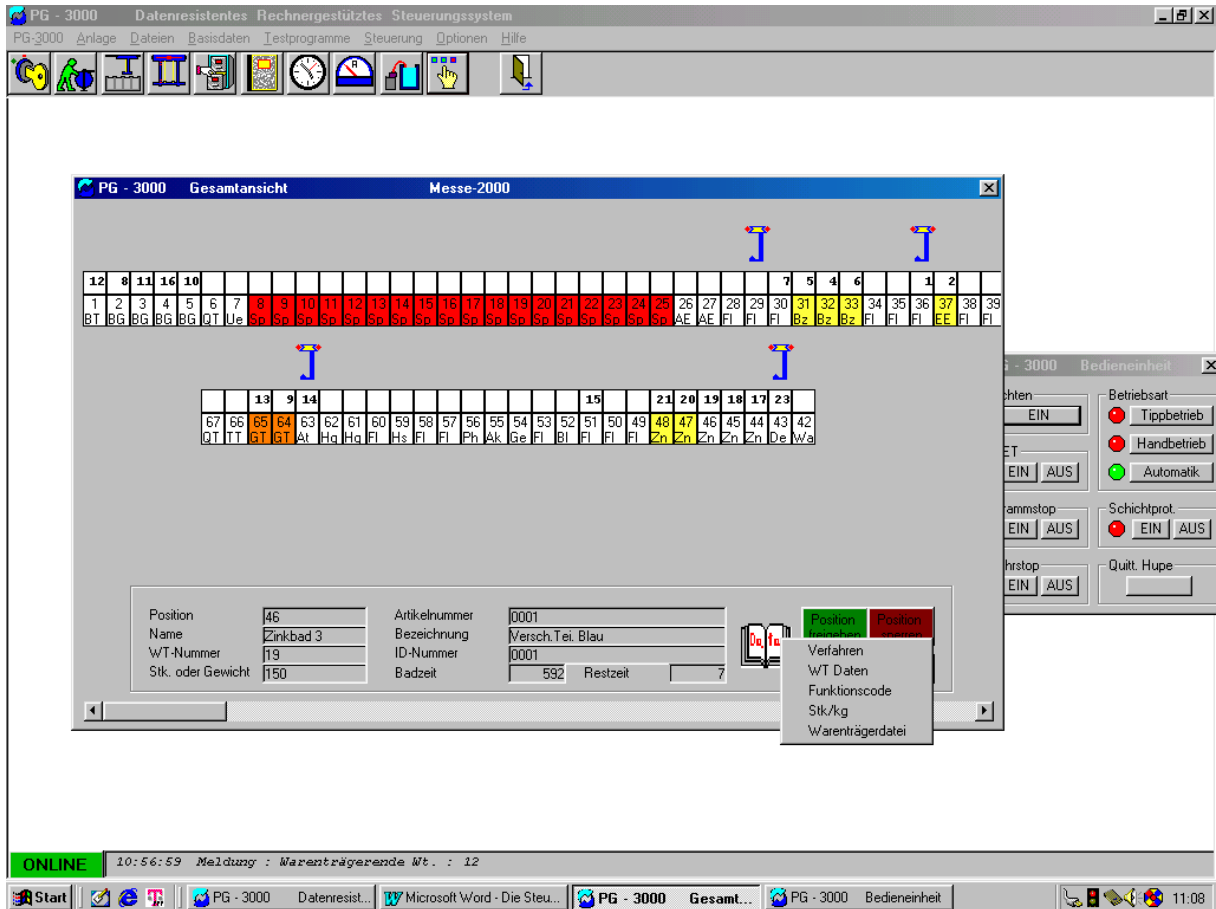
Software Functions:

1) Visual Process Control:

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- General line view with flightbar location
- Flightbar view complete with article and process data (changeable during process)
- Hoist status view
- Flightbar data files view with recorded process protocol

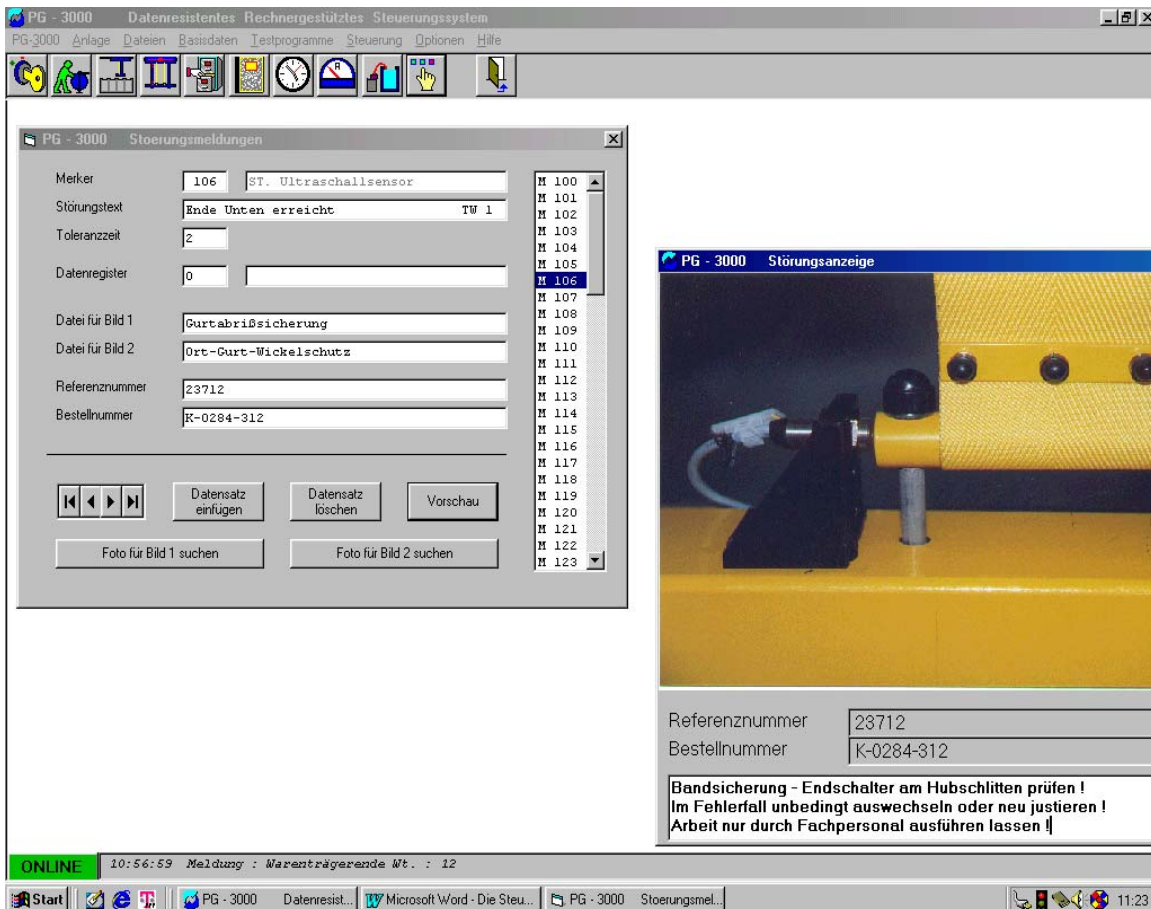


2) Line Parameter Setup:

- Position parameter setup (tank load/unload etc.)

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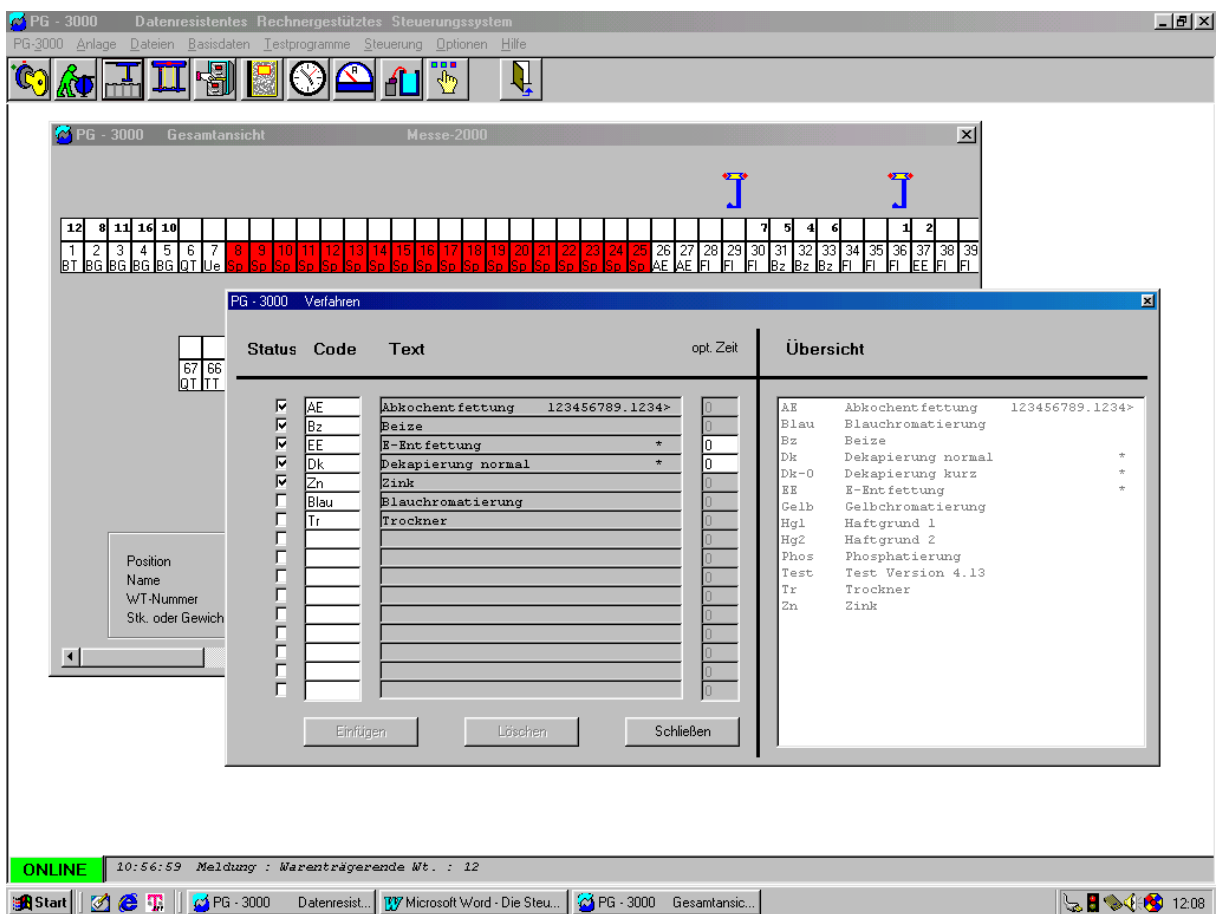
- Spray rinse parameter setup (spray times etc)
- Rectifier parameter setup (max value, current density, hysteresis etc.)
- Dosing pump parameter setup (set points, dosing times, description)
- Malfunction setup (priority, message, description and visual view)



3) Flightbar Parameter Setup:

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- General view for each flightbar in the line complete with its process data. Process parameters as there are i.e. current setpoints, treatment setpoints can be modified during the treatment cycle
- Process steps (treatment steps) can be modified during the treatment cycle. Finished process steps will be marked as finished
- All flightbar data modifications will be recorded in the charge protocol



4) Article Data Setup :

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- Possible entries per article:
 - max. 4 lines with 32 digits each for customers address
 - max. 24 digits for the part (article) no.
 - max. 16 digits for the description
 - max. 8 digits for the identify no.
 - the process (treatment) steps,
 - No. of pieces or weight per flightbar,
 - more specific article informations i.e. temperatures for drying lines etc.
 - The article setup date will be recorded automatically
- A packing list no., if available, will be recorded together with packing list date in the charge protocol. A research with packing list no. is possible.
- Article (part) no. can be sorted, printed, copied or deleted with the help of a research screen mask

The screenshot displays the PG-3000 software interface. The main window, titled 'PG - 3000 Artikeldatenliste', shows a table of article data. A secondary window, 'PG - 3000 Basisdaten', is open over the table, showing the details for article 0012.

Artikelnummer	Bezeichnung	ID-Nummer	AT-Datum	Stk/kg	Lieferschein	LS-Datum
0006	Vers.Tei.schwarz	0006	20.04.97	80	*	00:00:00
0007	Sputnik Blau	0007	28.09.00	15	*	00:00:00
0008	Sputnik Gelb	0008	14.09.00	15	*	00:00:00
0009	Sputnik Schwarz	0009	25.09.00	15	*	00:00:00
0010	Sputn.6 Schwarz	0010	04.09.00	15	*	00:00:00
0011	Sputn 8 Schwarz	0011	11.06.99	15	*	00:00:00
0012	Hebel+Bolzen	0012	09.07.99	80		
0013	Anverzinken 1-3	0013	21.08.00	100		
0014	Fertigverz Gelb	0014	27.09.00	100		
0015	Fertigverz Blau	0015	25.07.00	100		
0016	Fertigverz 8Gelb	0016	15.09.00	100		
0017	Fertigverz 8Blau	0017	22.09.00	100		
0019	Versch T.10 Gelb	0019	24.07.00	80		
0020	Versch T.10 Blau	0020	14.06.00	80		
0023	Sputnik 6 Blau	0023	06.09.00	15		
0025	Sputnik 4 Blau	0025	19.09.00	15		
0026	Sputnik 4 Gelb	0026	07.08.00	15		
0027	Sputnik 6 Gelb	0027	29.09.00	15		
0028	Versch T 8 Gelb	0028	23.08.00	80		
0029	Sputnik 8 Blau	0029	06.09.00	15		
0030	Sputnik 8 Gelb	0030	22.09.00	15		
0031	Bolz.16*175 10 C	0031	20.04.97	150		
0032	Sputnik.10-12 B	0032	07.09.00	20		
0033	Sputnik.10-12 C	0033	13.09.00	20		
0034	Sputn C.+TNT	0034	11.06.99	15		

The 'Basisdaten' form for article 0012 contains the following fields:

- Artikelnummer: 0012
- Bezeichnung: Hebel+Bolzen
- ID-Nummer: 0012
- AT-Datum: 09.07.99
- Name 1: *
- Name 2: *
- Straße: *
- Ort: *
- Stk/kg: 80
- Lieferschein: *
- LS-Datum: 00:00:00

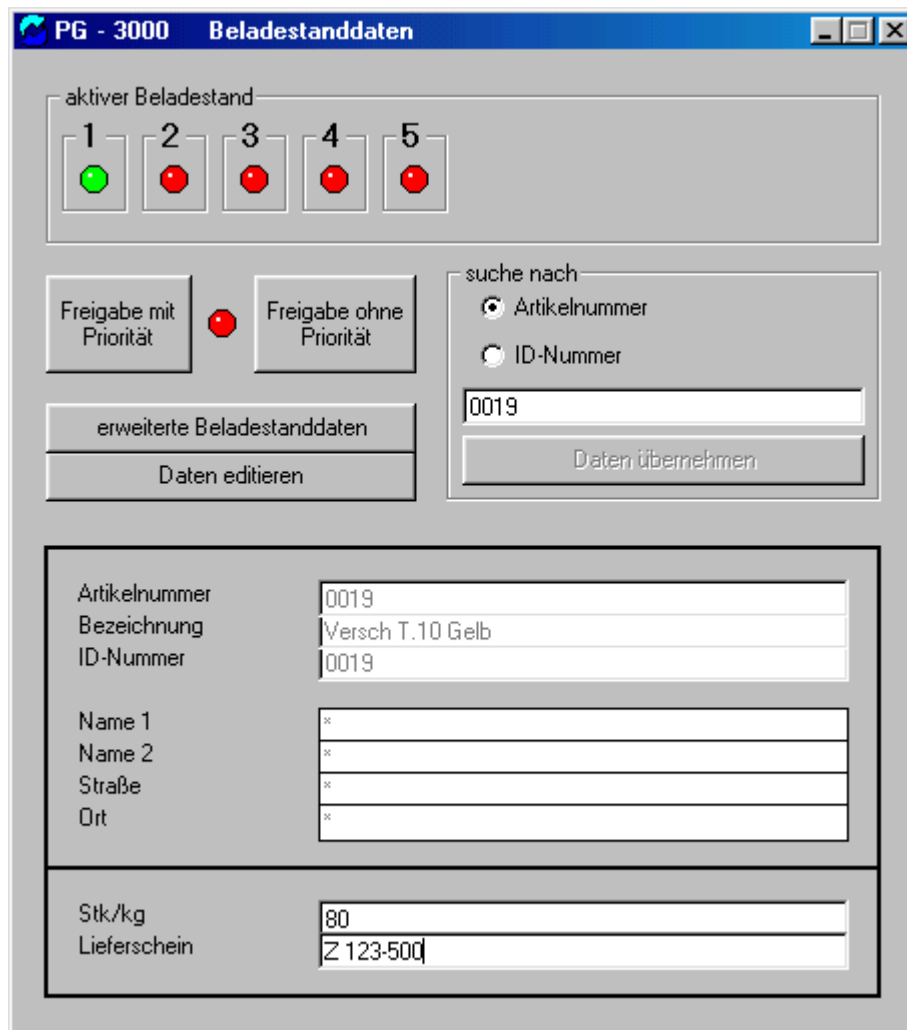
Buttons at the bottom of the form: Verfahren editieren, Daten editieren, Funktionscode editieren, and Schließen.

5) Screen Mask for Loading Station Data:

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The screen mask for loading station data shows the article and identify no. as well as no. of pieces or weight for each loading station in the line. Furthermore, the following information can be inserted for each loading station:

- Up to 3 more packing list no. together with no. of pieces or weight and article no.
- Up to 4 text lines with additional information i.e. reason for re-work etc..



PG - 3000 Beladestanddaten

aktiver Beladestand

1 2 3 4 5

Freigabe mit Priorität Freigabe ohne Priorität

suche nach

Artikelnummer
 ID-Nummer

0019

erweiterte Beladestanddaten

Daten editieren

Daten übernehmen

Artikelnummer 0019
Bezeichnung Versch T.10 Gelb
ID-Nummer 0019

Name 1 *
Name 2 *
Straße *
Ort *

Stk/kg 80
Lieferschein Z 123-500

6) Protocol Files :

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Process Protocol :

The process protocol shows main information for each charge, i.e. start time, finish time etc. Entry view and printout is possible via a research screen mask.

A research via part-no., identify-no. date, packing-list-no. is possible.

The screenshot shows the 'PG - 3000 Betriebsdaten' window. It contains a list of data fields with their corresponding values:

Datensatz	81
Start-Uhrzeit	10:42:17
Start-Datum	26.04.01
Artikelnummer	0001
Bezeichnung	Versch. Teil. Blau
ID-Nummer	0001
AT-Datum	29.09.00
Lieferschein	*
Stk/kg	150
Chargennummer	11
Warenträger	12
WT - Info	---
Fertig-Uhrzeit	10:56:59
Fertig-Datum	26.04.01
Zeitüberschr.	

At the bottom, there are two buttons: 'Chargendatei anzeigen' and 'Artikelliste anzeigen'.

Charge Protocol :

For each charge all important information i.e. actual treatment times, amp-hours in plating tanks, temperatures (option) will be recorded in a charge protocol. Modified data will be recorded also in the charge protocol.

The screenshot shows the 'PG - 3000 Chargendaten' window. It displays a detailed charge protocol with the following data:

-01- Beladestand Nr.	2
-02- Start-Uhrzeit	10:42:17
-03- Start-Datum	26.04.2001
-04- Artikelnummer	0001
-05- Bezeichnung	Versch. Teil. Blau
-06- ID-Nummer	0001
-07- AT-Datum	29.09.00
-08- Lieferschein	*
-09- Stk/kg	150
-10- Name 1	*
-11- Name 2	*
-12- Straße	*
-13- Ort	*
-14- Chargennummer	11
-15- Warenträger	12
-16- WT - Info	---
-17- Fertig-Uhrzeit	10:56:59
-18- Fertig-Datum	26.04.2001

Below the main data, there are three lines of additional information:

- * 10:42:17 Data 0 = Funktionscode : 0
- * 10:42:17 Data 1 = zus. Abtropfzeit : 0
- * 10:42:17 Data 2 = Oberflaeche pro Stueck : 0.00

A 'Datei drucken' button is located at the bottom of the window.

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Shift Protocol :

If the shift protocol is switched on, information i.e. time, date, article-no., identify-no., no of pieces or weight will be recorded in the shift protocol for each flightbar. This guarantees a exact report about the productivity per shift.

lfd.Nr.	Datum	Uhrzeit	Artikelnummer	Identnr	Info	Charge
1	14.03.96	06:23:30	91029		30	1146
2	14.03.96	06:35:52	19359.2		45	1147
3	14.03.96	06:48:06	19359.2		45	1148
4	14.03.96	06:59:22	19359.2		45	1149
5	14.03.96	07:10:32	19350.2		45	1150
6	14.03.96	07:21:29	19350.2		45	1151
7	14.03.96	07:39:46	19350.2		45	1152
8	14.03.96	07:52:38	92825.32.2		40	1153
9	14.03.96	08:34:04	92825.32.2		40	1154
10	14.03.96	08:45:32	71026		24	1155
11	14.03.96	08:56:02	71026		24	1156
12	14.03.96	09:26:06	92825.32.2		40	1157
13	14.03.96	09:37:11	92825.32.2		36	1158
14	14.03.96	10:06:44	92825.30.2		33	1159
15	14.03.96	10:19:46	92825.30.2		33	1160
16	14.03.96	10:35:03	19950		35	1161
17	14.03.96	10:52:50	19950.2		34	1162
18	14.03.96	11:04:42	19950.2		34	1163
19	14.03.96	11:42:20	71026		23	1164

Malfunction Protocol:

All malfunctions in the line will be recorded with start and finish time in the malfunction protocol. Malfunction messages will be selected and printed via a research screen mask.

Active malfunctions can be screened via mouse click. Malfunctions will be shown priority sorted together with malfunction-no. and message.

Additional to each malfunction message two pictures/graphics and a malfunction description text can be added. This saves time during the research for the malfunction reason.

0019 : Merker 121 = Gurtschlaffschalter hat ausgelöst TW 2
 0020 : Merker 122 = Absettsicherung TW 2
 0021 : Merker 123 = Absettsicherung defekt TW 2
 0022 : Merker 124 = Absettsicherung schaltet nicht TW 2

PG-3000 Störungsanzeige

Gurtschlaff-Schalter

Gurtschlaffschalter an Transportwagen 2 überprüfen. Schalter ist defekt oder nicht richtig justiert. Reparatur nur durch Fachpersonal ausführen lassen!

Dosing Pump Protocol :

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PG - 3000 Dosierpumpendaten

Datei Datensatz Suchen

Datensatz: 261
 Dosierpumpennummer: 1
 Dosierpumpenbez.: Kupfer
 Dosierdatum: 11.08.94
 Dosieruhrzeit: 15:08:39
 Summenwert: 35537.11
 Dosierwert: 100
 Anzahl der Impulse: 37532
 Dosierzeit: 40

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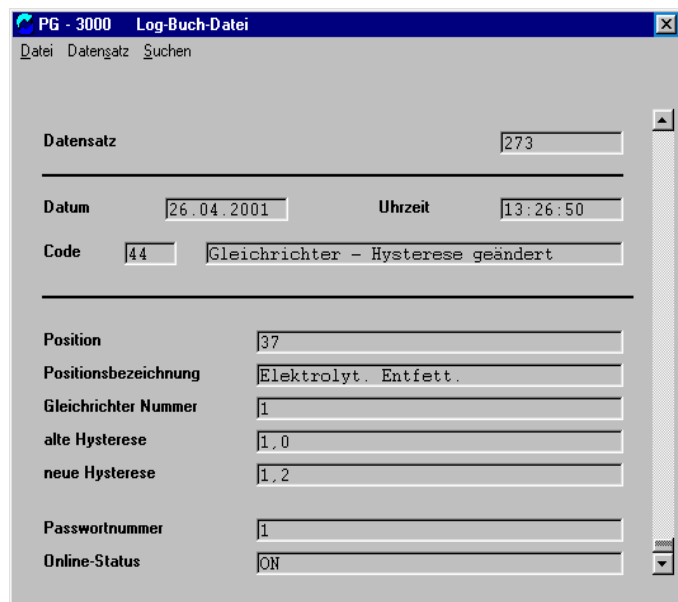
Each dosing pulse will be recorded with date, time, sum-value and dosing time.

All entries will be selected and printed via a research screen mask.

LOG-Book :

All data modifications will be recorded the LOG-Book.

All data can be selected and printed via a research screen mask.



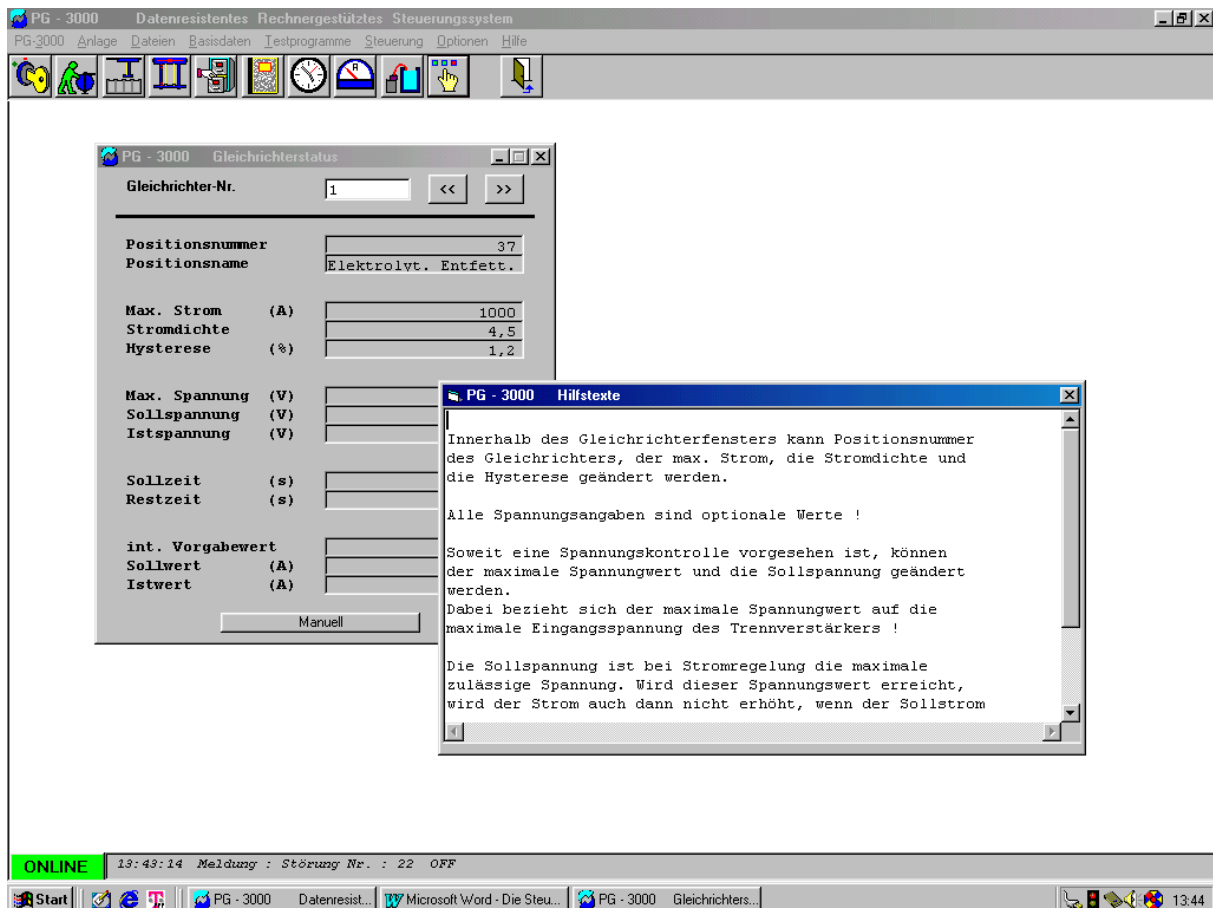
The screenshot shows a software window titled "PG - 3000 Log-Buch-Datei". The window contains a form with the following fields and values:

Datei		Datensatz		Suchen	
Datensatz		273			
Datum	26.04.2001	Uhrzeit	13:26:50		
Code	44	Gleichrichter - Hysterese geändert			
Position	37				
Positionsbezeichnung	Elektrolyt. Entfett.				
Gleichrichter Nummer	1				
alte Hysterese	1,0				
neue Hysterese	1,2				
Passwortnummer	1				
Online-Status	ON				

7) Help - Function :

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The software is equipped with an online help function which will be activated by switching the F1-key. The online help refers directly to the window from where it has been opened.



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8) Specific Functions (Option) :

Control functions for additional aggregates i.e. rectifiers, heaters, level controllers etc. can be selected by a mouse click on the tank position. (Option)

The screenshot displays the PG-3000 control software interface. The main window, titled 'PG - 3000 Gesamtansicht Messe-2000', shows a grid of 39 tanks. Tank 37 is highlighted in yellow. A detailed control panel for 'Position 37 Elektrolyt. Entfett.' is overlaid on the right. This panel includes:

- Temperatur 3:** Two digital displays showing 30.0 and 30.0, with corresponding bar graphs.
- Gleichrichter 1:** Two digital displays showing 4.5 and 45.1, with corresponding bar graphs and a 'Manuell' button.
- Niveau 2:** A level indicator with a blue liquid level and a 'Schließ' button.
- Control Buttons:** 'Erweite', 'Hilfe', 'Schließ', 'HAND', and 'AUTO' buttons.
- Temperature Gauge:** A vertical gauge with a red needle and a '450' display.

At the bottom of the control panel, there is a data table:

Position	37	Artikelnummer	0001
Name	Elektrolyt. Entfett.	Bezeichnung	Mersch.Tei. Blau
WT-Nummer	1	ID-Nummer	0001
Stk. oder Gewicht	150	Badzeit	41 Restzeit

The Windows taskbar at the bottom shows the system is 'ONLINE' at 15:05:49, with a message 'Warenträgerende Wt. : 17'. The taskbar includes icons for Start, PG-3000, Microsoft Word, and other applications.

Setpoints and actual values are shown with bar graph diagram and sliding controllers.

The software itself is available in German and/or English version.