PERFECT 2020

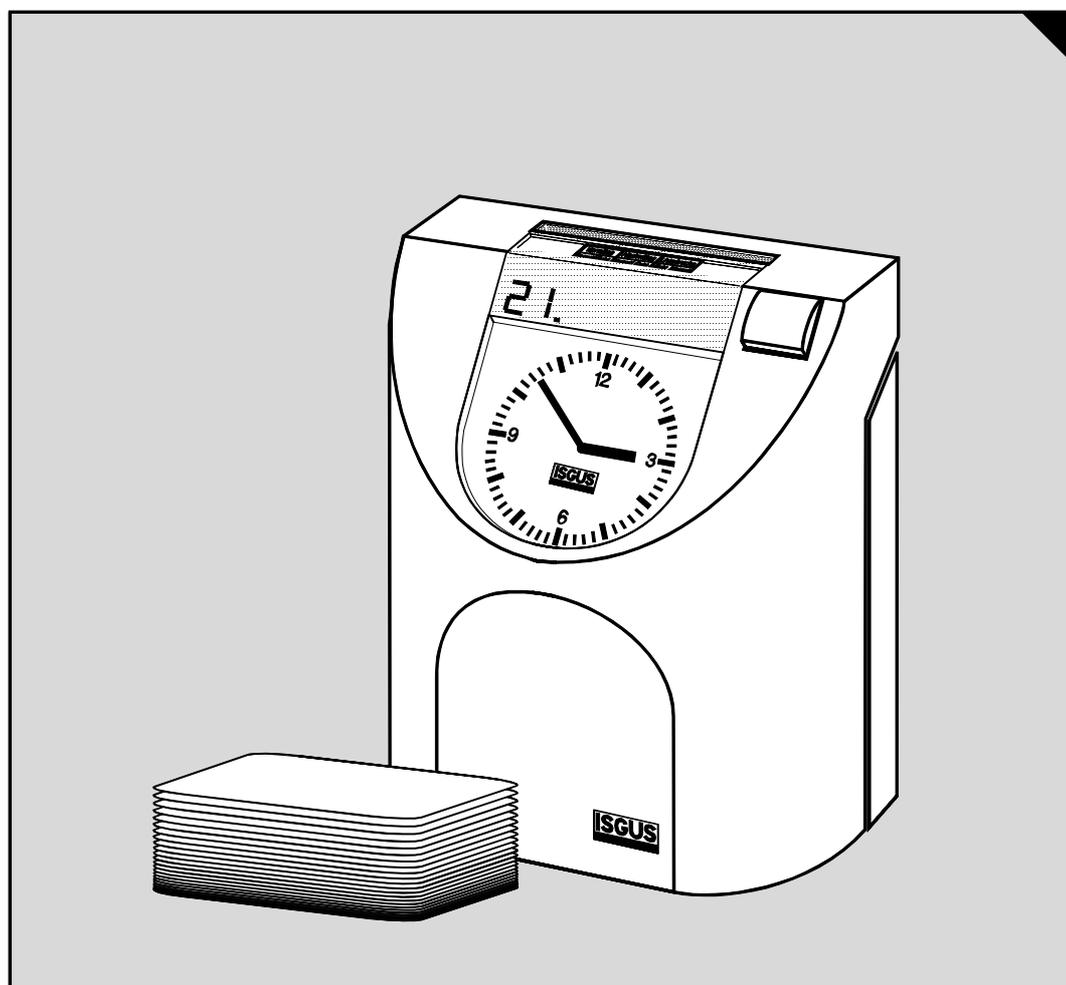**Product Manual**

PERFECT 2020
Time recorder

Manual for the operation, installation, commissioning, maintenance and troubleshooting of the time recorder.

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WARNING

This Equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
Only peripherals certified to comply with the Class B limits may be attached to this equipment.

However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

Safety instructions

Designated use

- The PERFECT 2020 time recorder is exclusively designed for the printing of time and date information on manufacturer approved time cards, which is the only designated use of this machine, as described in this manual.

- Using the time recorder for purposes other than that described above is considered contrary to its designated use. The manufacturer cannot be held liable for any damage resulting from such use. The risk of misuse of the time recorder lies entirely with the user.

- The time recorder has no explosive environment protection. The use of the recorder in an explosive hazardous area is contrary to its designated use. The manufacturer and/or dealer cannot be held liable for any damage resulting from installation and use of the time recorder in such areas.

- Operating the time recorder within the limits of its designated use requires that you follow the instructions set out in the operating manual.

- All service work on the time recorder must be done by trained technicians who are familiar with the time recorder and have been instructed in safety precautions.

- All applicable local and national safety regulations must be observed in the installation, use, and maintenance of the time recorder.

- Modifications to the time recorder made without the authorization of the manufacturer will negate the manufacturer's responsibility and liability.

Hints for the user

- Before installing and programming the time recorder, the operator must read the operating instructions and safety notes.

- The time recorder should only be opened by competent and trained personnel.

- The external power supply must be unplugged during maintenance and repair. The person performing the service must also ensure that all wiring entering or leaving the time recorder is electrical current-free before beginning work.

- Improper changing of the lithium battery may result in explosion. Do not use batteries other than those specified by the manufacturer. Send the replaced batteries to the recycling process available in your area.

- Any additional changes or service to the electrical components of the unit must be carried out by a qualified electrical technician.

- In addition to reading the operating instructions, the user should be instructed in all other generally applicable legal and other mandatory regulations relevant to accident prevention and environment protection.

Hints for the recorder's safety

- The time recorder has been built to the highest standards and conforms to recognized safety rules. Nevertheless, its use may constitute a risk to the user or third parties, or cause damage to the unit and to other property.

- Operate the time recorder only with the power supply being part of the time recorder package.

- The time recorder must only be used in a suitable environment, in accordance with its designated use and the instructions set out in this operating manual. Any equipment or functional problems, especially those affecting the safety of the unit and users of the unit, should be repaired immediately.

- Replacement parts must comply with the technical requirements specified by the manufacturer. This is guaranteed only when you use the manufacturer's original replacement parts. Use of non-conforming parts voids your warranty.

- Unplug and switch the unit off immediately if a problem occurs in the electrical system.

- Installation and mounting of the unit must be done by trained personnel.

- Plug the time recorder power supply into a sufficiently grounded electrical outlet.

- Ensure that all consumables and replaced parts are disposed of safely and with minimum environmental impact.

Warning!
This symbol focuses the user's attention to special procedures and in the handling of the time recorder that could cause serious injuries if the instructions are not followed carefully.

Attention
This symbol indicates that there may be danger to the time recorder if the text is not read or the procedure is not followed. Data may be lost or the recorder may be damaged.
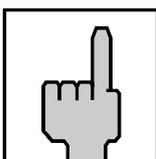
Hint
This symbol indicates useful information and recommendations for the handling of the time recorder.

Chapter 0

Contents

Chapter 1

Introduction

Product Overview

All the models of this series are micro-processor controlled recorders for electro-mechanical time recording. By programming parameters they are adaptable to the most different time organizations. This series can be supplied in various variants and power stages.

If desired the parameters for your company can be programmed ex factory. So the recorders are ready for operation immediately after power supply has been plugged in.
If you set the parameters by your own, we recommend to write down all parameters and settings on a sheet of paper.
Before the recorder is programmed, please note your time organization together with your individual time patterns and models.

This manual gives you step by step instructions on the operation of the **PERFECT 2020** time recorder. It documents all important functions which are available to users.
We recommend that you carefully read this manual, before the commissioning and use of the time recorder. To save time, please keep it in a handy location for future reference.

All recorders are of utmost reliability and have passed thorough quality assurance tests. Nevertheless, if there should be any problems which are not covered by this manual, please contact your local dealer or e-mail us at:

www.service@isgustime.com

How to Use This Manual

This manual will help you become familiar with the time recorder, and how to use the designated application possibilities with its many features.
Before using the time recorder, please read and study this manual. Pay particular attention to the pages with safety instructions.

The manual provides you with all of the important information required for the safe and efficient use of the time recorder. Following the instructions in this manual will help you to avoid danger and maximize the benefits from the use of the time recorder.

Chapter 1 "Introduction", contains general information about this recorder and about the structure of this manual.

Chapter 2 "Features", describes the functions of the PERFECT 2020 time recorder with illustrations and easy to understand explanations.

Chapter 3 "Installation", discusses how to assemble and connect the time recorder. Before installing the time recorder please pay close attention to the required installation conditions.

Chapter 4 "Getting Started", teaches you how to prepare and program the time recorder for your application. This chapter takes you through a step by step instruction guide on the programming panel, setting of the date and time, various menu items and options, and how the programming routine works.
The programming via PC and other programming possibilities are described in a further paragraph.

Chapter 5 "Operation", explains how to use the time recorder and provides a description of how the recorder functions in standby operation.

Chapter 6 "Trouble Shooting", provides an explanation of the internal diagnostics built into the PERFECT 2020 and the corresponding messages. The chapter documents most service problems and lists possible solutions.

Chapter 7 "Maintenance", provides instruction on the periodic servicing of the time recorder that is required to guarantee top performance. Due to environmental conditions where the time recorder may be installed, the user is encouraged to occasionally clean the machine and change the ink ribbon.

Further useful information are printed in the Appendix:

If the card formats do not meet your requirements you can note how to define your own time card according to your requirements in **Appendix A "Define your own card format"**.

If you want a summary or to go in the programming and using of the recorder fast you can look in **Appendix B, "Code-table"** and **Appendix C, "Keyboard commands"**.

Appendix D "Technical specifications" contains a summary of all technical data.

Symbols and Abbreviations

To make the reading of this manual easier, symbols and pictures are used.
These symbols and pictures may be placed at the edge of a page or they may be inserted into text or table areas of the manual.

Warning!
This symbol focuses the user's attention to special procedures in the handling of the time recorder that could cause serious personal injury if the instructions are not followed carefully .

Attention
This symbol indicates that there may be danger to the time recorder if the text is not read or the procedure is not followed. Data may be lost or the recorder may be damaged.
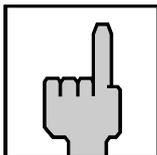
Hint
This symbol indicates useful information and recommendations for the handling of the time recorder.

D1   D2   D3
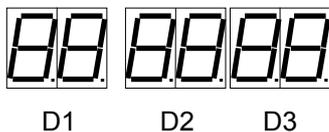
Digital display. Mainly used in chapter 4 "Getting Started". The values printed in the manual are only examples and may differ from the values for your time organisation.

D1   D2   D3
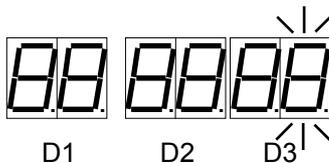
→ one single digit flashes.

D1   D2   D3
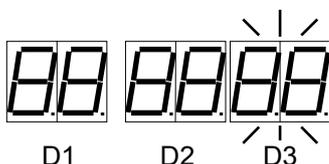
→ one field (two digits) flashes.

D1   D2   D3

→ complete display flashes.

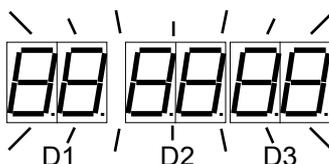**Chapter 2**

Features

PERFECT 2020

The PERFECT 2020 is an electronic time recorder used for the printing of employee time and attendance records. The time recorder can be programmed by the user to suit many different work schedules.

The PERFECT 2020 prints the time and day automatically when the employee inserts a time card into the card funnel. The horizontal day-of-the-week line position is done automatically by the time recorder.

A number of standard card formats are available and can be selected from the programming routine. If these formats do not last an adaptation to individual card formats can be achieved by programming another print position. Any card format within the dimensions given by the recorder can be used (width: 68 mm - 106 mm ; 2.67 - 4.17 inch). The print release on the time card is executed electro-mechanical.

The current column is marked by a column pointer in the pointer field.
The pointer field shows the current illustration with the column separation of the card used. This pointer field may be replaced by other funnel shields. The printer head is positioned in the corresponding column either automatically by the programmed change time or manually by position key depending on the type of recorder and programming.

Compared with the basic models, the model 2020 offers an extended number of efficient functions.

Technical features	Model 2020
Real time clock, quartz controlled with floating battery	●
Power reserve	●
Display with date	●
Summer-/Normal time change-over	●
Automatic month correction, including leap year	●
Manual column selection (position key)	●
Automatic column selection	●
Pre-programmed card formats	●

Freely defined card formats	●
Graphical cards	●
Variable card width	●
Variable payroll period	●
Two colour imprint programmable	●
Select character order and print format out of default values	●
Select character order and print format freely	●
National identification for weekday	●
Variable card lift	●
Imprint with machine reference number	●
Programming via PC	●
Signal circuit	●
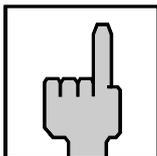
Hint
To program the recorder via PC, you need program "P2020".
This program can be bought from your sales partner.

Options

Option	Model 2020
Slave clock function, POLA	●
DCF-connection	●
Standby operation	●
Check of individuals	●
Master clock function	●

Hint
A recorder can only be provided with one of the following functions: Slave clock function or DCF-connection. The functions signal circuit and check of individuals exclude each other. Only one of these two functions can be active.

Accessories

Accessories	Model 2020
Program "P2020" with connection cable for programming via PC"	●

Recorder Construction
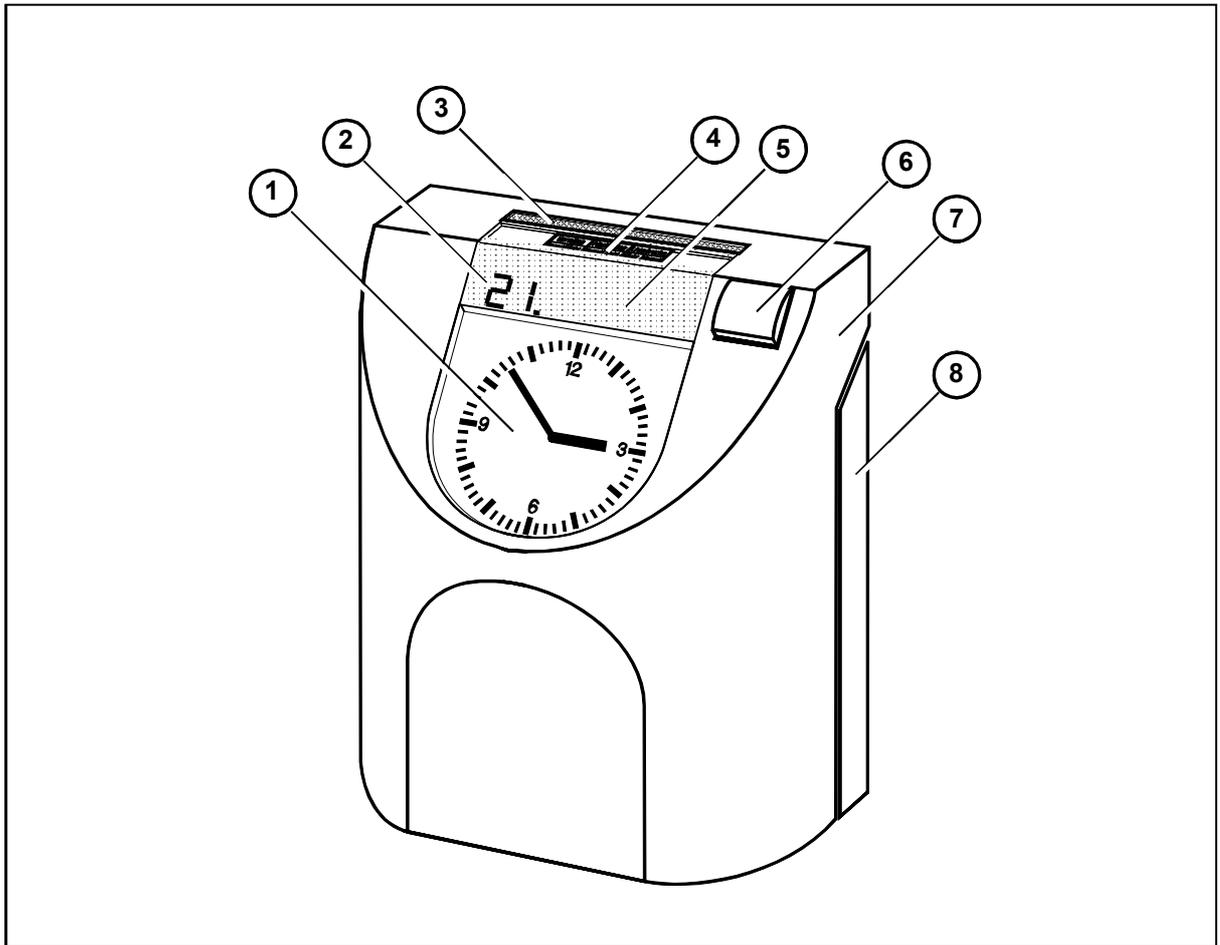
Fig. 1: Total view

(1) Analogue clock

(2) Digital display for date

(3) Card funnel

(4) Pointer field with funnel shield and column pointer

(5) Programming Panel, concealed by the front cover
    $\rightarrow$ see chapter 4 "Getting Started"

(6) Position key

(7) Front case cover

(8) Rear case cover

Time Recorder Identification

- Electrical rating plate
- Program data

The name-plate is fixed on the bottom side of the cover.

The serial number is attached to the inside bottom of the unit.

Electrical data ⟶

800	V
50 / 60	Hz
800	mA Typ

ISGUS CE c(UL)us LISTED I.T.E. 1DD8

PERFECT 2020 ⟶ Type of recorder
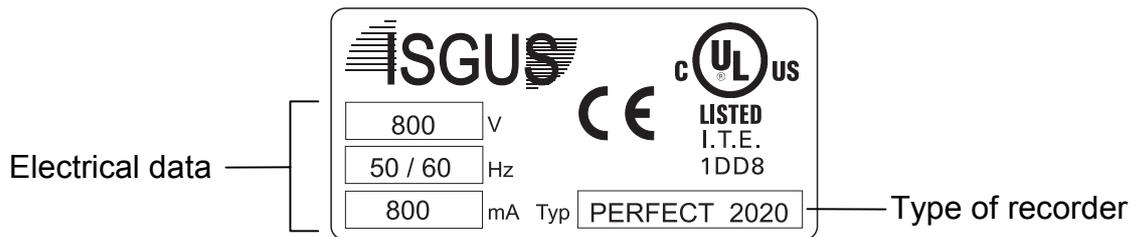
The label with the program data (1) can be found on the operating system PROM of the CPU.

Example:

| **P 2020** ⟶ | Type of recorder |
| **V 2.19** ⟶ | Program release |

Fig. 2: PC-board

Chapter 3

Installation

Contents

The following illustration shows the time recorder box contents without options.
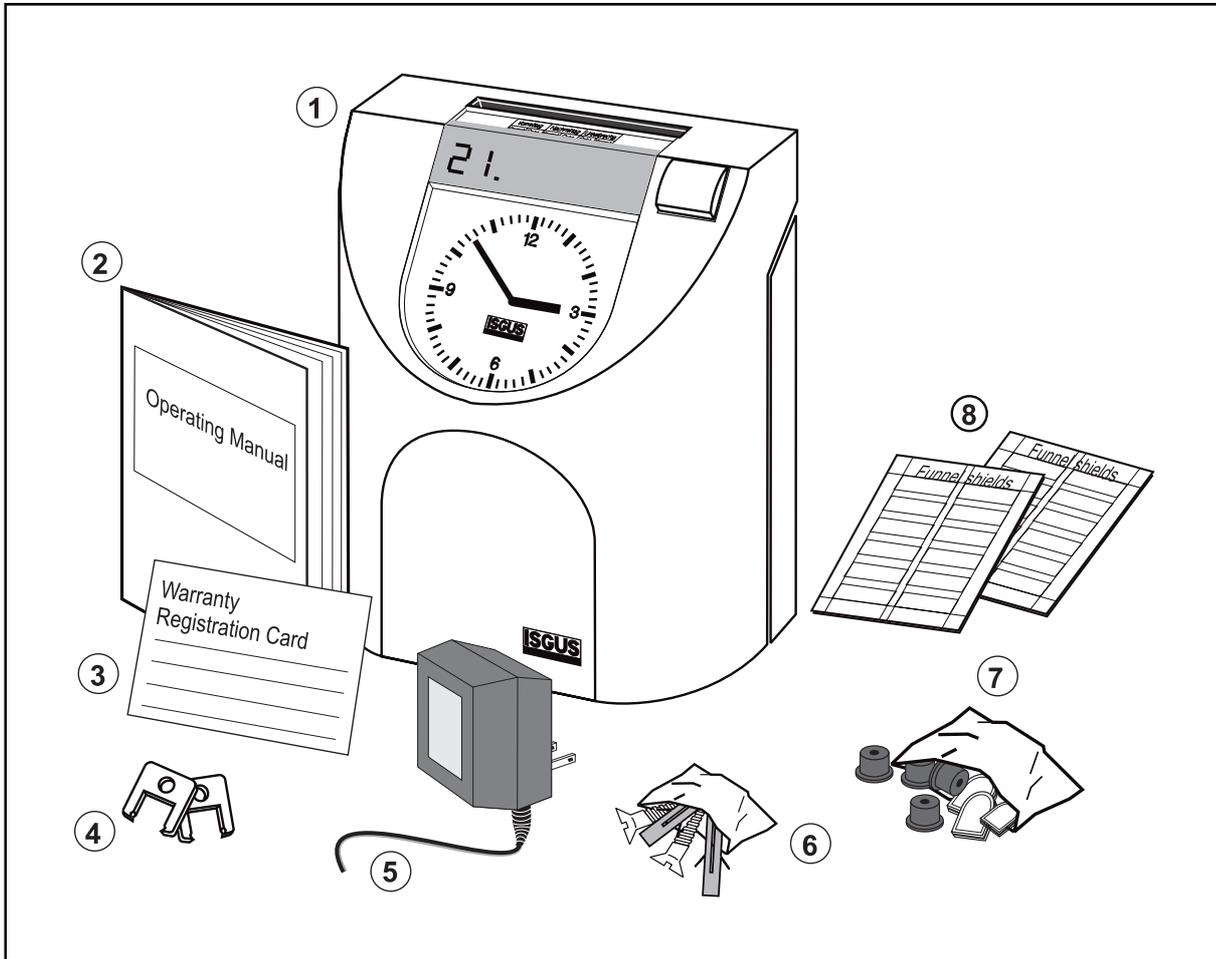
Fig. 3: Supply

(1) Time recorder PERFECT 2020
(2) Operating manual
(3) Warranty Registration Card
(4) 2 keys
(5) Power supply unit
(6) Fixing elements for wall mounting (2 screws, 2 plugs)
(7) Set of accessories for table operation (4 rubber feet, 3 cover caps)
(8) Set of funnel shields
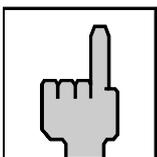
Hint
Time cards are not included with your time recorder and must be ordered separately. Please contact your local dealer or e-mail us at:

www.sales@isgustime.com

Selecting a Location

	Warning! Proper installation of the time recorder is the responsibility of the owner. All work must only be carried out by qualified personnel. The installation must comply with the requirements of the authorities having jurisdiction and all applicable safety codes and regulations that govern the installation of electrical appliances.

General Conditions

The installation location should have the following characteristics:

→   the time recorder is not exposed to electrical frequency transmissions

→   the time recorder is not exposed to direct sunlight.

→   the location's environment is within the temperature and humidity limits published in this manual.

→   the location is free of airborne particles such as dust, dirt and fine powders and there is no possibility of the time recorder being exposed to direct contact with any kind of liquid or steam.

→   there are no dirty manufacturing processes that could contaminate the location .

→   the location is isolated from electromagnetic noise sources such as motors, electromagnets, and series reactors.

Specific Conditions for the Time Recorder

→   The time recorder is designed for continuous operation.

→   The time recorder is designed for indoor mounting only. Outdoor mounting is not supported. Avoid direct sunlight and high humidity (refer to "Technical Specifications, Appendix A".

→   Connection only to the mains voltage specified on the name-plate.

→   Cable connections must not be permanently installed.

→   Only use the recorder with the supplied power supply unit, both in table and wall mount installations.

→   In the power supply installation in the building a separator, e.g. fuse, switch, etc. must be integrated to allow a contact opening of at least 3 mm per pole.

→   Installation inside a building shall comply with Standard VDE 0100 or the applicable local regulations (as an example DIN, ISO and EN).

Time Recorder Installation

Basically the PERFECT recorder is designed for table operation. No further settings are required for this type of application. Please see the instructions in the following section "Installation for table operation". If you have to connect additional functions such as signal operation, or master and slave clock operation, refer to the end of section "Wall mounting".

For wall mounting refer to the corresponding section "Wall mounting". When used as wall-mounted recorder you have to carry out a number of installation steps described in this chapter.

The connection of additional options and the programming of the time recorder are carried out with the time recorder's case open. Below the time display panel you will find a power switch and other electrical terminals and components. Please refer to the section "Programming panel".

⚠	**Warning!** All work must only be carried out by qualified and authorized personal.

Installation for Table Operation

When using the time recorder as a table model, the installation effort is reduced to a minimum. Simply connect the power supply to the recorder and then plug it in to the closest receptacle. Switch on the black power switch located on the PC board. For instructions on how to switch the recorder on and how to program it for your individual requirements see chapter "Getting Started".
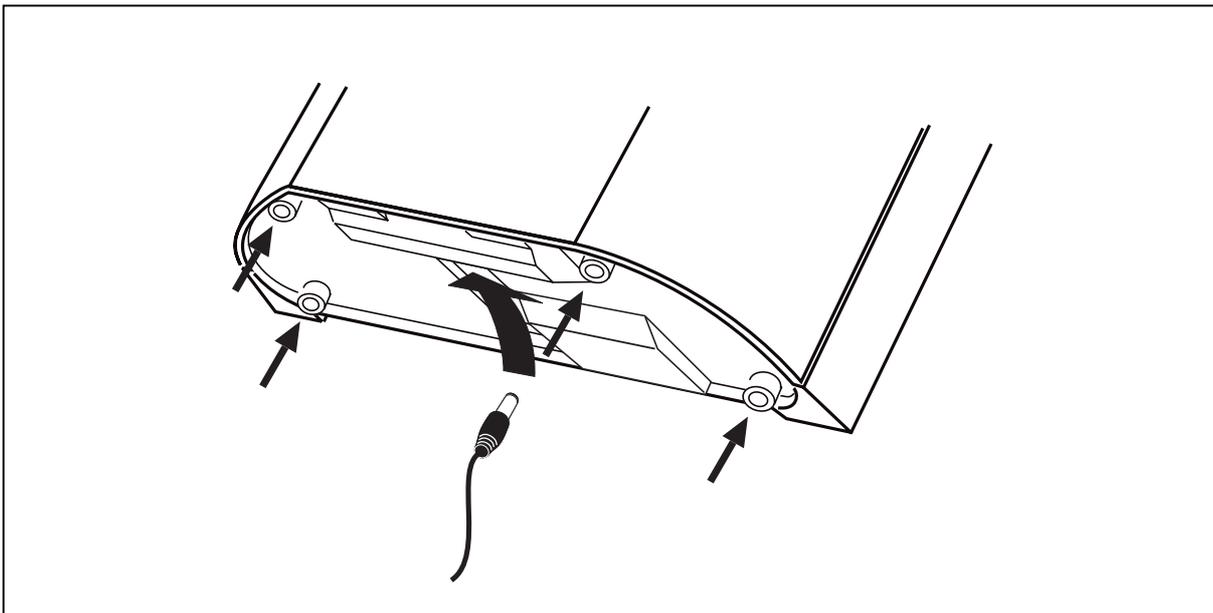

Fig. 4: Bottom side of the recorder with rubber feet and mains cable socket

Select an easily accessible and vibration-free place of installation. The recorder may only be placed on a stable, slip-resistant surface.

For the stability of the time recorder use the rubber feet included in the set of accessories. For this purpose clip them on by following the arrow-head indications.

Also use the 3 cover caps for the metal back plate in order to seal the cable leadings.

The power outlet has to be close to the recorder and easily accessible. Lay the power cable so that access is not obstructed and persons are not endangered.

> **Warning!**
> Only use the time recorder with the enclosed power supply both in case of table operation and of wall mounting. Do not use extension cords.

For the connection of additional functions such as slave clocks and/or signal devices, refer to section "Wall mounting":

Wall Mounting

The PERFECT time recorder is designed for table mounting. However, 120 VAC power connection and signal control terminals have been provided to meet the requirements of eventual wall mounting applications.

Installation steps:

1. **Open the time recorder**
2. **Remove the metal rear panel**
3. **Mount the time recorder on the wall**
4. **Connect the power supply**
5. **Connect any additional functions (if required)**
6. **Getting Started**

The location of the mounting holes can be traced from the metal back plate of the time recorder. The metal back plate can be plugged in with the plastic housing.

The installation dimensions shown in the figure on the right are recommendations which can be adjusted to the local conditions. The dimensions apply both for table operation and for wall mounting.
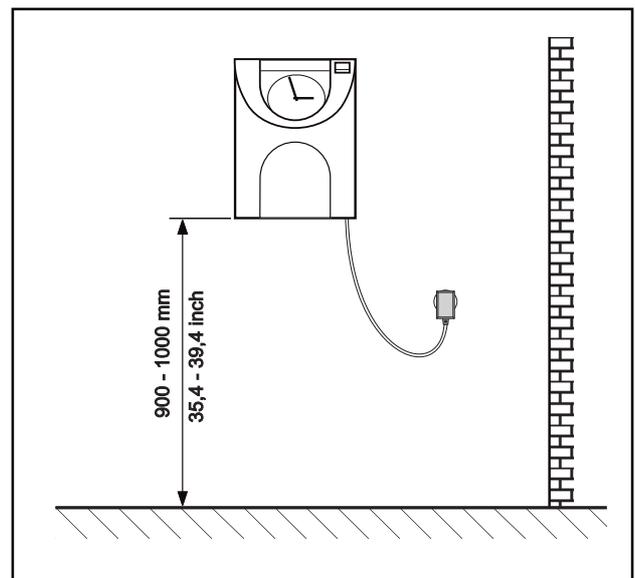
Fig. 5: Installation dimensions

Open the Recorder

1. Insert the key into the slot on the under side of the time recorder. Press the key into the slot until the locking latch releases the front case cover.
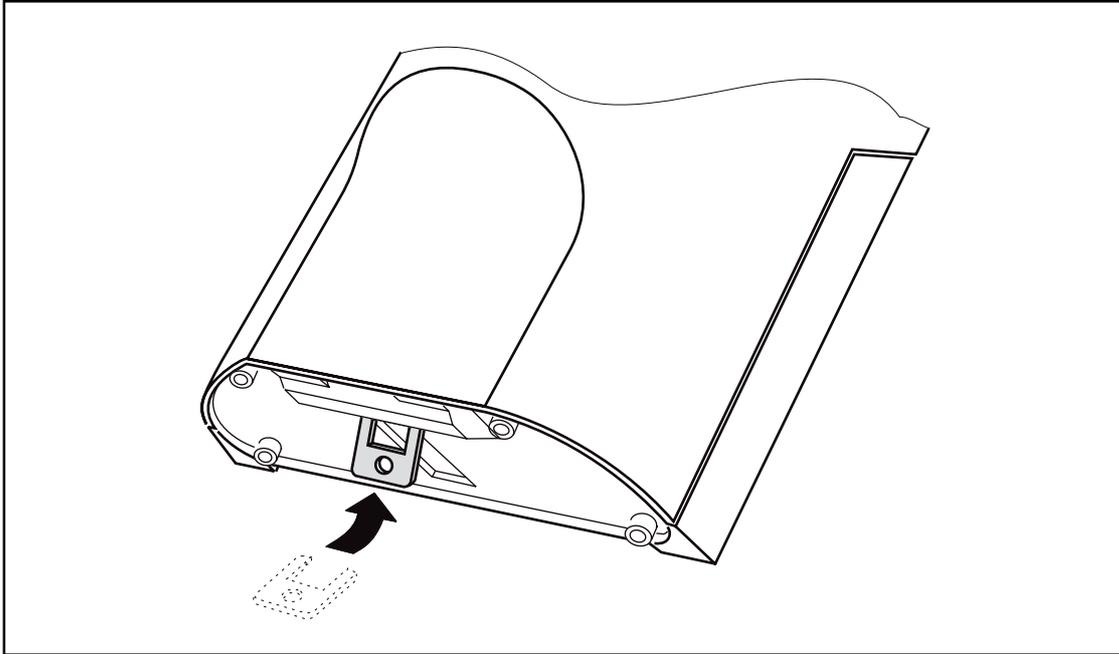
Fig. 6: Unlock the recorder

2. Swing out the front case cover with the time recorder tilted away from you (step 1) until it can be lifted up and off the time recorder (step 2).
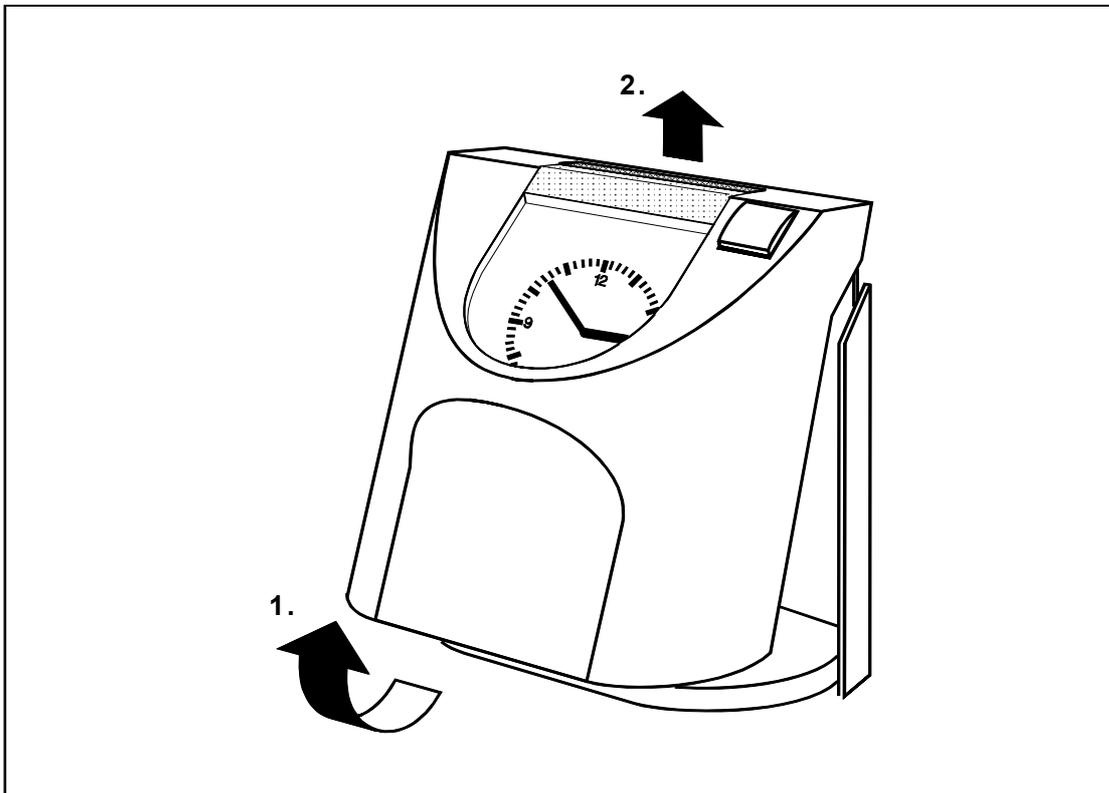
Fig. 7: Open the recorder

Close the Recorder

1. Align and insert on an angle the two tabs at the top of the rear case cover into the corresponding two slots at the top of the front case cover.

2. Swing the front case cover downwards until it meets the bottom of the rear case cover. Push the bottom of the front case cover until it engages the locking latch on the bottom of the rear case cover.
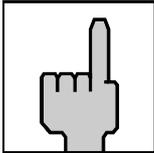
Hint
Do not close the time recorder until you have made all electrical connections and completed all time recorder programming.

Remove the Metal Back Plate

1. To begin removing the metal back plate, press the two locking tabs located on the top left and right hand sides of the rear case cover (step 1).

2. Keep the locking tabs pressed in and push the metal back plate back about ½ of an inch (step 2).

3. Pull the metal back plate away from the unit (step 3).
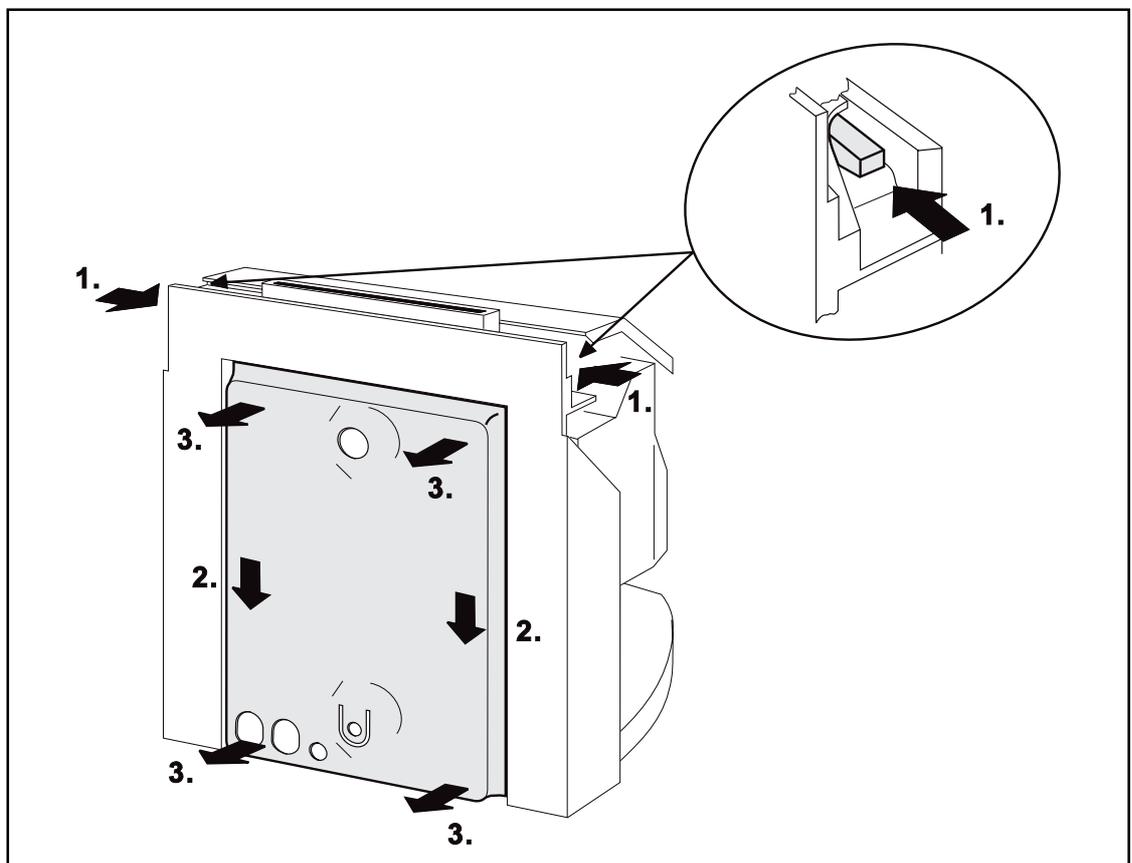
Fig. 8: Rear view of the recorder with metal back plate

Wall Mounting

The location of the mounting holes can be traced from the metal back plate of the time recorder. The metal back plate can be plugged in with the plastic housing. See previous section. The installation dimensions mentioned in this manual are recommendations which have to be adjusted for local conditions.

1.   Position the metal back plate in the desired wall location. Make sure the back plate is level by using a carpenter's level

2.   Using a pencil, trace the upper and lower mounting holes of the metal back plate on the wall. Drill corresponding holes with a 5/16" drillbit . Insert the wall plugs.

3.   Mount the metal back plate starting first with the lower screw and then the top screw. Make sure you do not fully tighten.

4.   Using a carpenters level, align the time recorder once more and then tighten both screws.

5.   Hang the time recorder mechanism on the wall mounted metal back plate. The four metal tabs (one on each corner of the metal back plate) must be aligned and inserted into the corresponding slots of the rear case cover. When the cover has been inserted correctly on the metal tabs, pull time recorder slightly downwards until the locking mechanism engages.

Check your installation for good fits.

Connect the Power Supply

1.   Make sure that the recorder has been switched off.
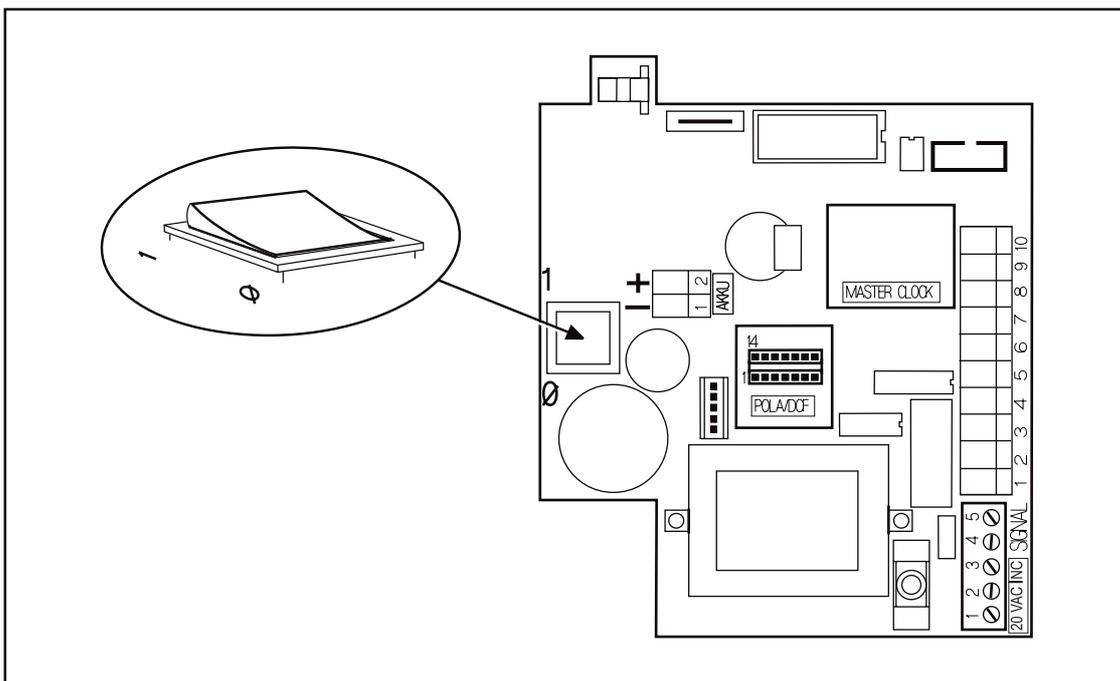
Fig. 9: PC-board with power switch

2. Check the connection of the power cord to the screw-type terminal strip of the CPU.

black

black
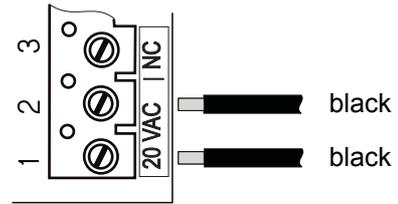
Attention
The power cord must be connected to the PC board terminals that are electrically compatible with the supply voltage of the electrical outlet that the power cord is plugged into. Incorrect connections can cause the destruction of the time recorder!

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3. Connect the power cable of the power supply unit to the bottom side of your PERFECT.
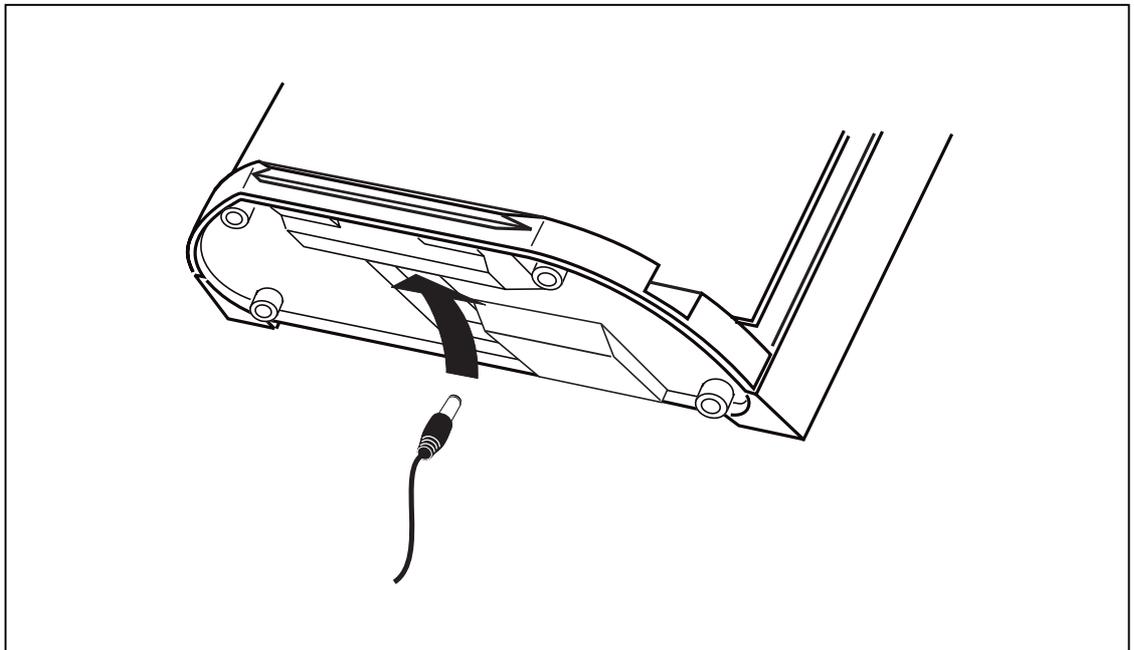
Fig. 10: Bottom side of the recorder with power cable socket

4. Insert the plug-in power supply unit into the provided socket.

Warning!
The power outlet must be close to the recorder and easily accessible. Make sure, that a loose power cable does not cause obstruction or risk to people.

Connect Optional Features

Only connect optional features when they are required.

Optional features:
 – Signal operation / Check of individuals
 – Master clock operation
 – Standby operation
 – Slave clock operation

All optional features can be used for both types of installation, i.e. table or wall mounted version.

When used as a table unit, the knockouts at the bottom of the metal rear back plate have to be used for cable entry.
For wall mounted units the plastic knockouts on the bottom of the rear cover have to be detached.
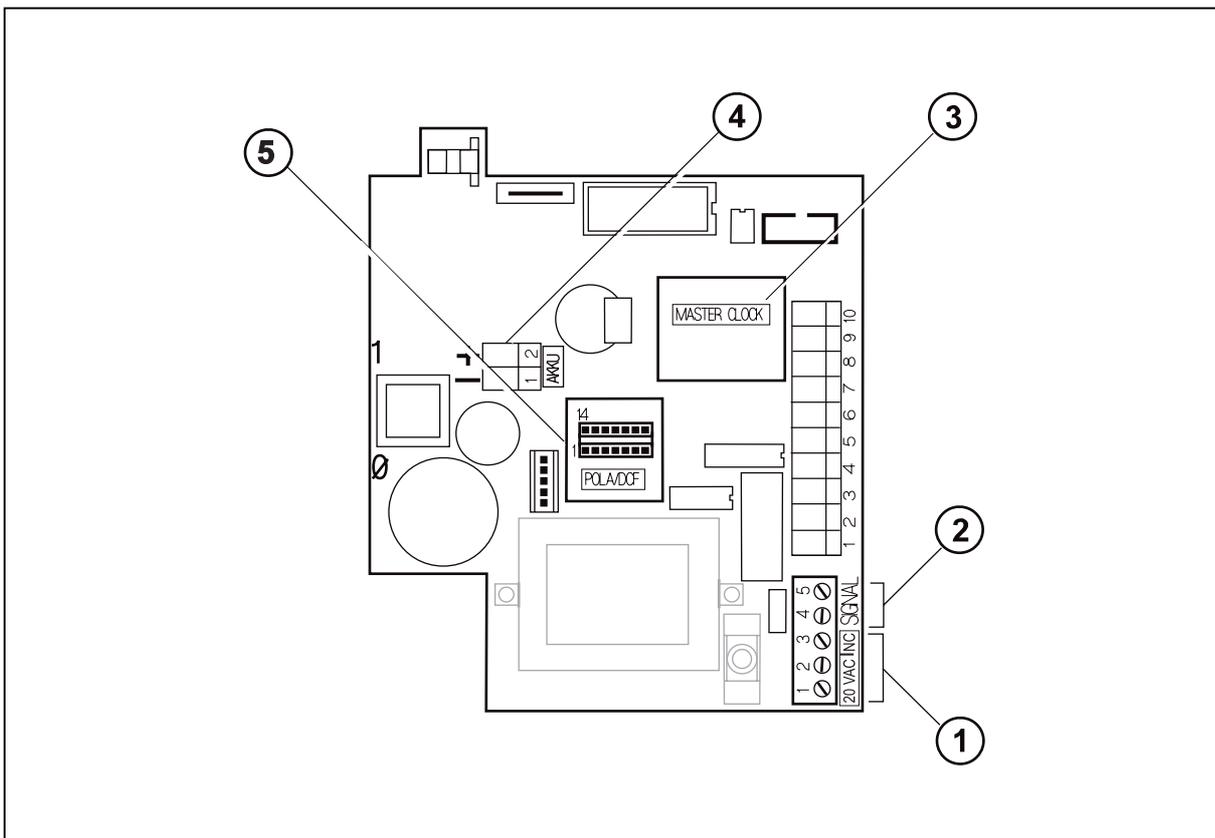
Fig. 11: PC-board with connection options

(1) Power connection terminals   (4) Battery standby connector

(2) Signal circuit connection terminals   (5) Slave clock connector

(3) Synchronized clock connector

Connect wiring for audible signal circuit control
(Signal circuit / Check of individuals
→ only if required.
→ low power signal output: 15 V DC, 50mA
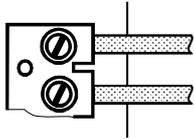
This connection is not polarity sensitive.

Connect wiring for synchronized clock option
→ only if the recorder is equipped with the option module "MASTER CLOCK".
→ fused output rated at 12 V, max. 50 mA,
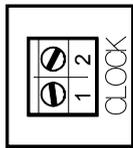
This connection is not polarity sensitive.

Connect an optional battery pack for printer operation during a power failure.
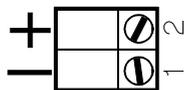
Attention
This connection is polarity sensitive!

Connect impulse lines for slave clocks connection.
→ only if recorder is equipped with option module slave clock function"
→ unipolar and bipolar impulses, 12 V - 60 V, 2 - 10 mA.
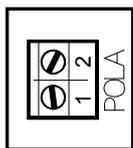
This connection is not polarity sensitive.

The Installation is now finished.
To program the time recorder see chapter 4 "Getting Started".
If the recorder is to be programmed at a later date, insert the front cover and close
the recorder.

Chapter 4

Getting Started

. continued

Preparations

All settings have to be executed with the recorder opened. Under the front cover you will find further symbols and another display, see chapter 4 "Programming Panel".

Follow the instructions in this chapter and keep in the order the topics are presented.

Switch on Recorder

The recorder is provided with a separate power switch.
This power switch is placed in the recorder on the left side of the PC-board.
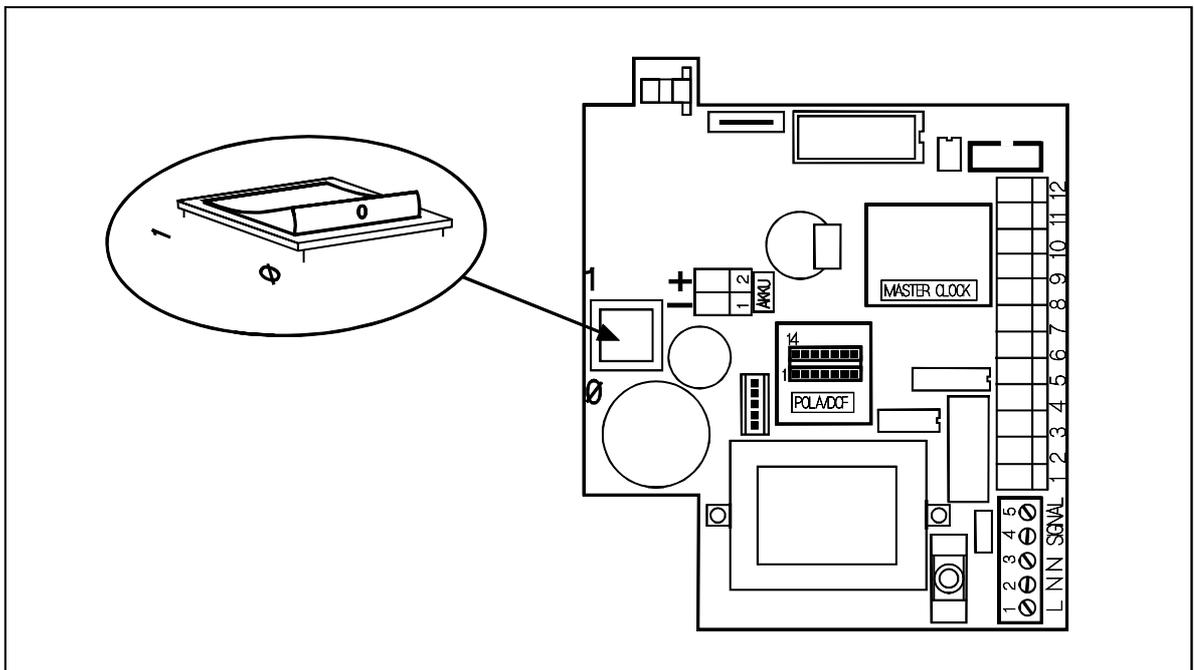
Fig. 12: PC-board with power switch

If the recorder is switched on the first time an internal reset is executed. This reset has been executed in the factory. A pre-programmed card organisation was loaded into the recorder.
The time of the analogue clock is synchronised automatically with the time of the internal quartz clock. Now the columns can be selected manually by the position key. After the first switch-on of the recorder, it is now fitted with all parameters required for test operation.
Insert an empty time card and execute a sample punching to check that recorder is ready for programming.
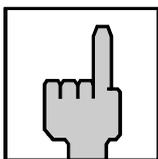
	Hint If the recorder has been programmed in the factory, all programmed parameters will resist when recorder is switched on. The explanations given above are only valid for recorders which have not been pre-programmed.

Proceeding	

1.	Remove front cover
	If the recorder is not yet opened, remove the front cover as described in section "Open the recorder".
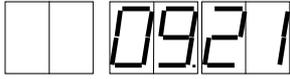
2.	`0921`	Switch power switch to position "**1**".
		→ Analogue clock is synchronised. Current time is displayed until clock synchronisation has finished.
	`28`	Current date is displayed.
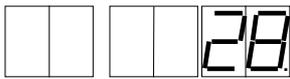
All time recorders have been programmed in the factory with current date and Eastern Standard Time (EST). However, if the recorder was previously switched on, or if your time zone is not Eastern Standard Time, you have to re-set the time and date displayed.

`0000`
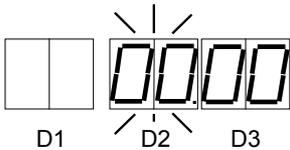
D1   D2   D3   D2 = Hours, D3 = Minutes

→ Enter current hour with "**R**".
→ Confirm with "**E**".
→ Repeat steps 1 and 2 for minutes.
→ Set hands of analogue clock.
→ After time has been entered, the current date is displayed.

For more details on setting date and time, see section "Setting the Time and Date".

3.	Close the unit and locking it.
	See section "Close the Recorder".
	The recorder is now ready for operation. The current time is shown on the analogue clock.
	In order to learn how to handle the recorder, you should do some sample punches with blank time cards. See also section "Punching at the Recorder".

Card Funnel

The pointer field in front of the card funnel is designed for changeable funnel shields.

The funnel shield can be inserted and can be compared with a table: it shows all column headlines. The column headlines correspond with the clocking columns on the time card.
In clocking operation, the column pointer marks the current clocking column in which the IN - and OUT-times are printed when inserting the card. Structure and form of representation of the funnel shield, therefore, should correspond to the time card. The selection of the funnel shield depends on the time card used for your time organisation.
The recorder is delivered with funnel shields for all standard card formats which are available in the unit.

If you take a standard card format, you can select the corresponding funnel shield out of the two plastic templates. Separate the corresponding shield with a cutting knife. For a clean cutting edge, we recommend to use a guide strip. The cutting lines are marked on the plastic bows.

In the upper left edge of the funnel shield, language and field separation, number of columns x column width, are printed. So you can find the desired funnel shield easier.

Example of a funnel shield:
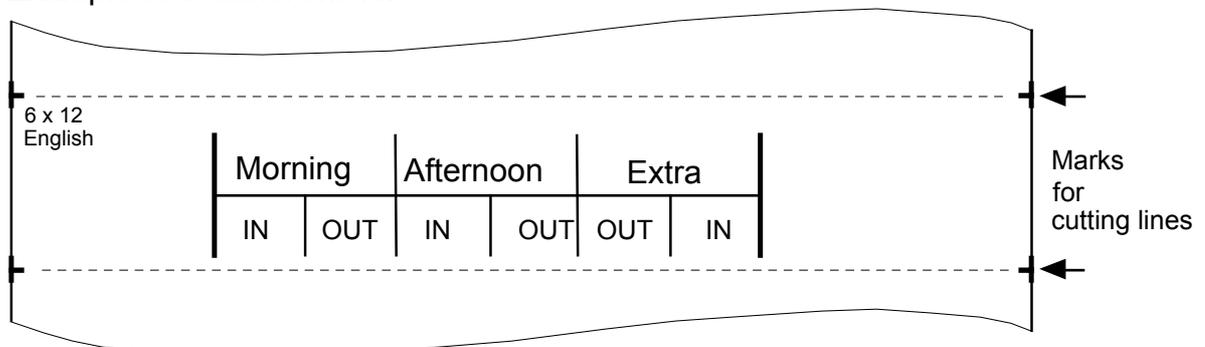
If no funnel shield is available for the desired time card you can define/create your own funnel shield.
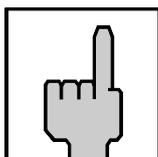
Recommendation
If you need another funnel shield than delivered, we recommend to cut the part with the column headlines from your time card and to use it as a funnel shield.
Dimensions of the funnel shield:
23 x 135 mm (HxW), 0,4 mm thick

Insert the Funnel Shield

The funnel shield can be placed at any time (before or after commissioning). We recommend, if the recorder is not pre-programmed, to adjust and fix the funnel shield after all the programming and test work, e.g. with an adhesive point.

1.   Remove front cover.

2.   Insert funnel shield into pointer field.
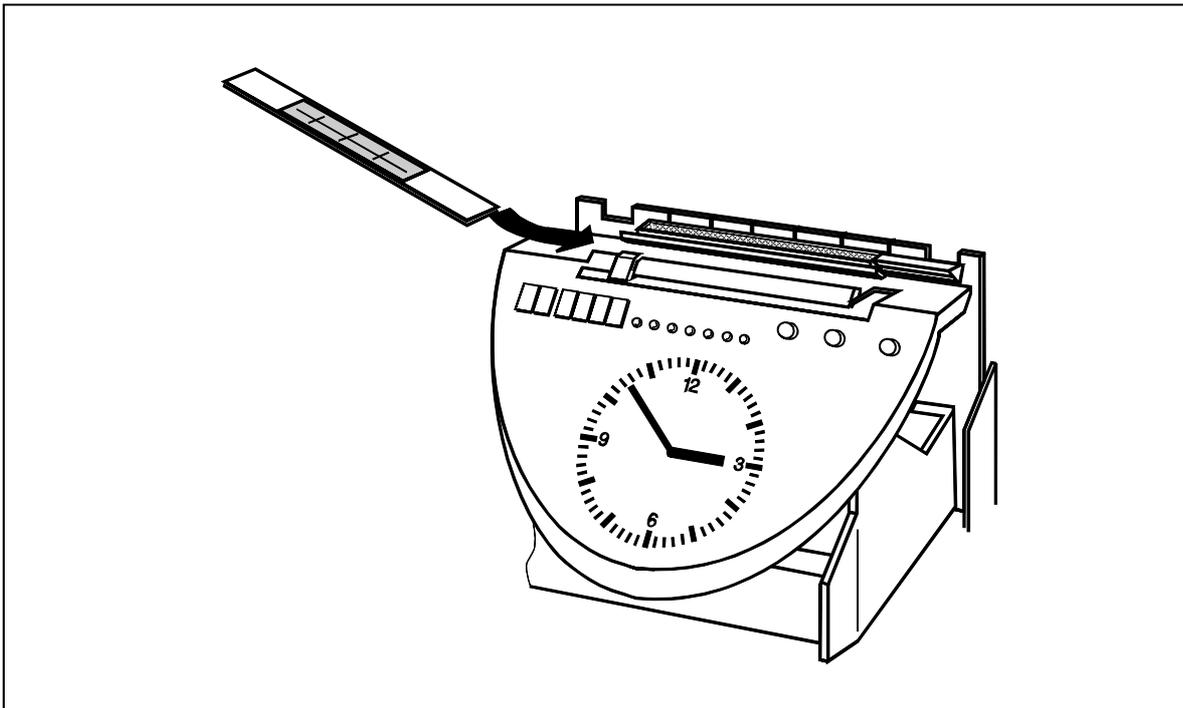
Fig. 13: Insert funnel shield

3.   Check that the column pointer marks the right clocking column. Execute a sample clocking and adjust the funnel shield centred to the clocking printed on the time card and the column pointer.

The big right-angled opening left of the pointer field must not be covered!

Fix the funnel shield e.g. with an adhesive point.

4.   Set front cover again and close recorder.

Card Funnel Adjustment

This recorder can be adjusted infinitely variable to all different card widths and thicknesses. If your recorder has been programmed ex factory, these measures have already been taken.
A subsequent adjustment of the card funnel may be necessary due to manufacture tolerances of time cards resp. due to a change of the card thickness at the place of work.

Adjustment of the correct funnel width

The card funnel is adapted by means of an adjustable card guide rail on the rear panel of the recorder and a guide wedge of the card funnel on the top side of the recorder.
We recommend to adjust the card funnel (if necessary) together with the recorder installation.
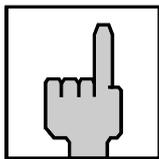
Hint
Minimum width of card funnel: 68 mm
Maximum width of card funnel: 106 mm
If the minimum card width of 68 mm is not reached a correct card guide cannot be guaranteed.

Proceeding

1.   Open recorder.
→ Remove front cover.

2.   Connect power supply (via separate mains cable). Recorder is switched off.
→ Power switch in position "0".

3.   Remove rear panel of recorder.
→ See chapter 3 "Installation", fig. 4.

4.   Switch recorder on.
→ Power switch in position "1".

5.   Press the keys **R** and **E** simultaneously. Keep these keys pressed until the column pointer is positioned far right, in front of the opening right of the pointer field.

6.   The programming panel can be tipped forward. Press the locking straps in the left and right side of the card funnel slightly towards the recorder and swing the programming panel out.

The guide wedge of the card funnel is fixed with a small screw below the wedge. This screw is only accessible if the programming panel is tipped forward.

7. Open the screw of the guide wedge until the complete guiding element can be moved. Insert a card with a certain card width, e.g. a time card, into the card funnel and adjust the card wedge. Do not adjust the card funnel too tight.

Tighten screw of the guide wedge.
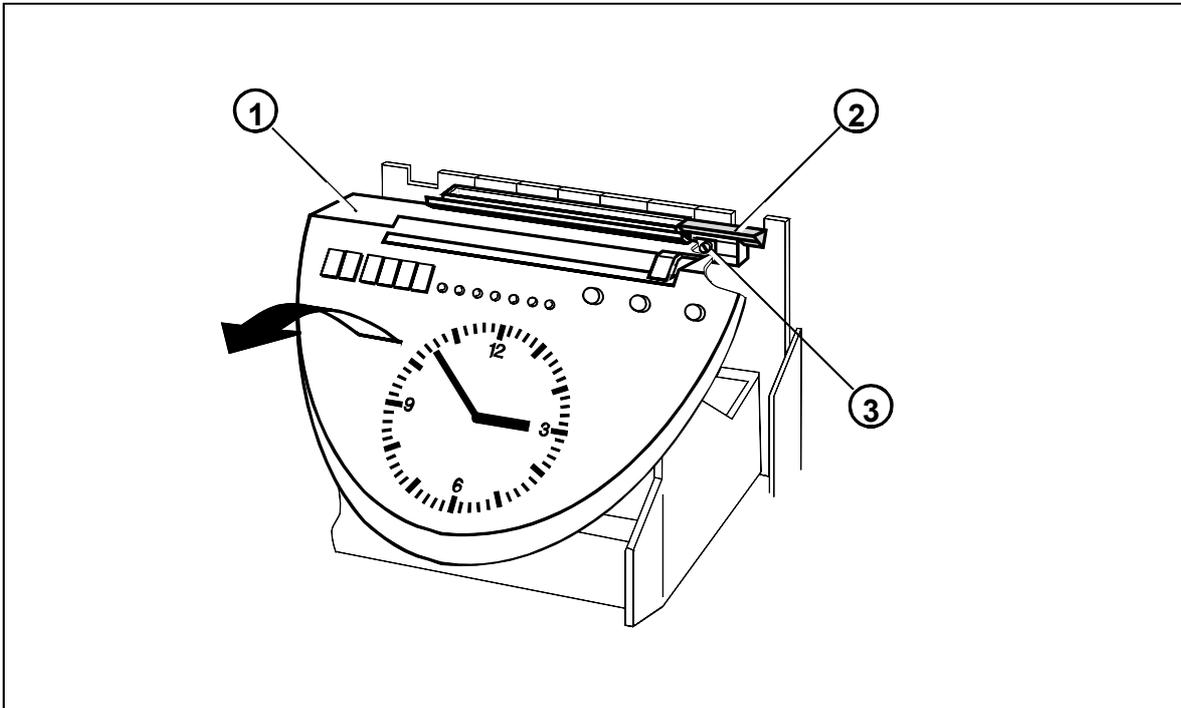
Fig. 14: Card funnel adjustment

(1)   Programming panel
(2)   Guide wedge for card funnel
(3)   Screw for guide wedge adjustment

8. Adjust card guide.
→ See fig. on the next page.
Open **left** guide rail with the two screws. Insert card completely into card funnel. If necessary move controller for card lift adjustment downwards by turning the transport spindle, until the card can be inserted far enough into the card funnel.
Adjust guide rail to the card, so that a safe card guide is possible. The left guide rail have to be adjusted parallel to the right one.
Check a smooth sliding fit by moving the card upwards and downwards.

Tighten both screws of the guide rail.

9. Push programming panel backwards until locking straps engage.
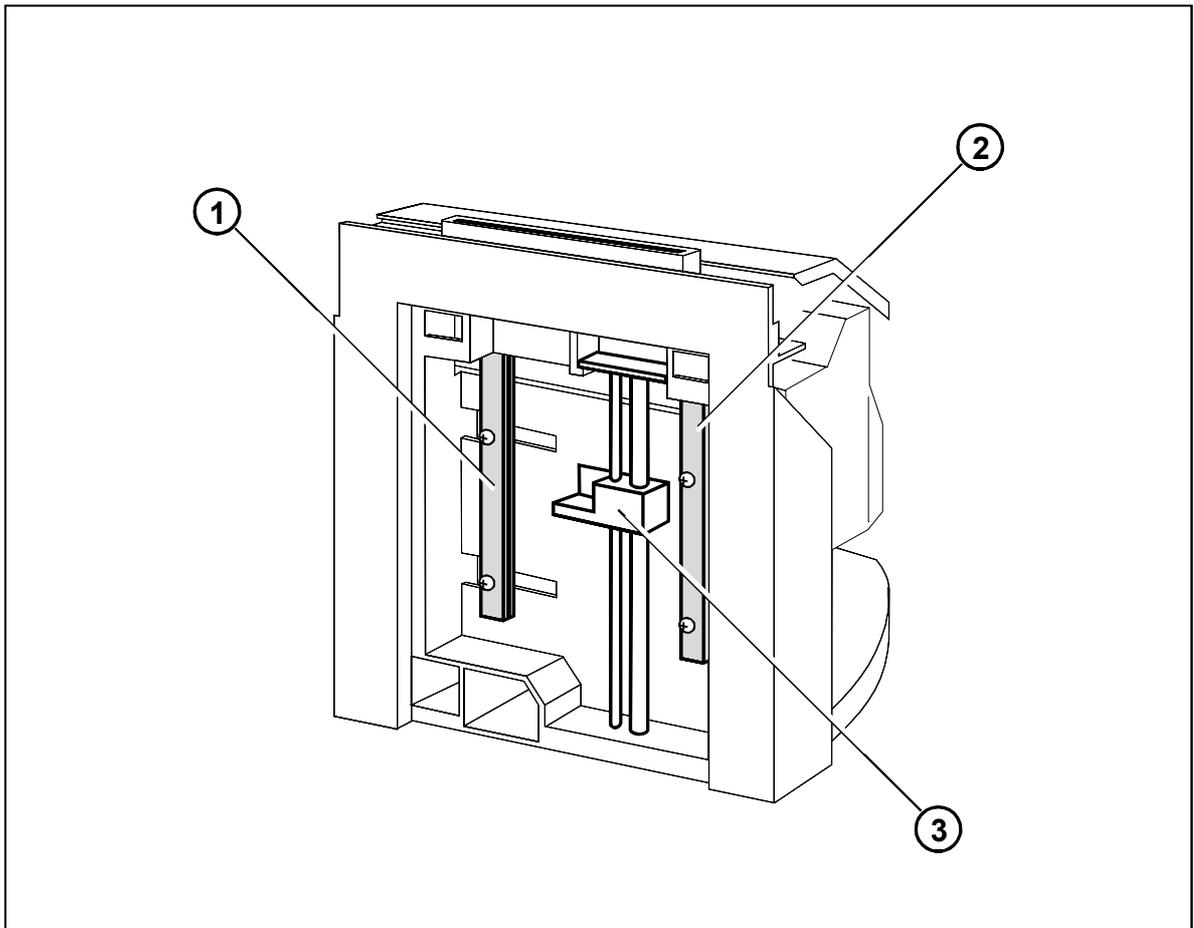
Fig. 15: Adjust card guide

(1)   Variable card guide rail
(2)   Fixed card guide rail
(3)   Controller for card lift adjustment with transport spindle and guide

10.   Press **"E"** and **"R"** again. Keep both keys pressed until column pointer switches back to the first menu symbol (time).

11.   Switch the recorder off and on .
Card lift adjustment is carried out and the controller for the card contact is set to the initial position.

12.   Set again metal rear panel of recorder.
Make a sample clocking before rear panel is set.

13.   Close recorder.
    → Put and engage front cover.

    Adjustment is finished.

Adjustment of Card Thickness / Intensity of Print

There are two red eccentric screws on the left and right side of the card funnel which serve for the adjustment of the card funnel to the correct card thickness. Both screws are accessible from above when the recorder is open. By turning the two eccentric screws the distance between printing beam and needle matrix head will be changed. Adjustment is necessary if the print on the time card is irregular or too weak.

	Hint
	If the recorder is adjusted to another card thickness, the eccentric screws must be positioned exactly parallel to achieve a regular print upon the whole card width.
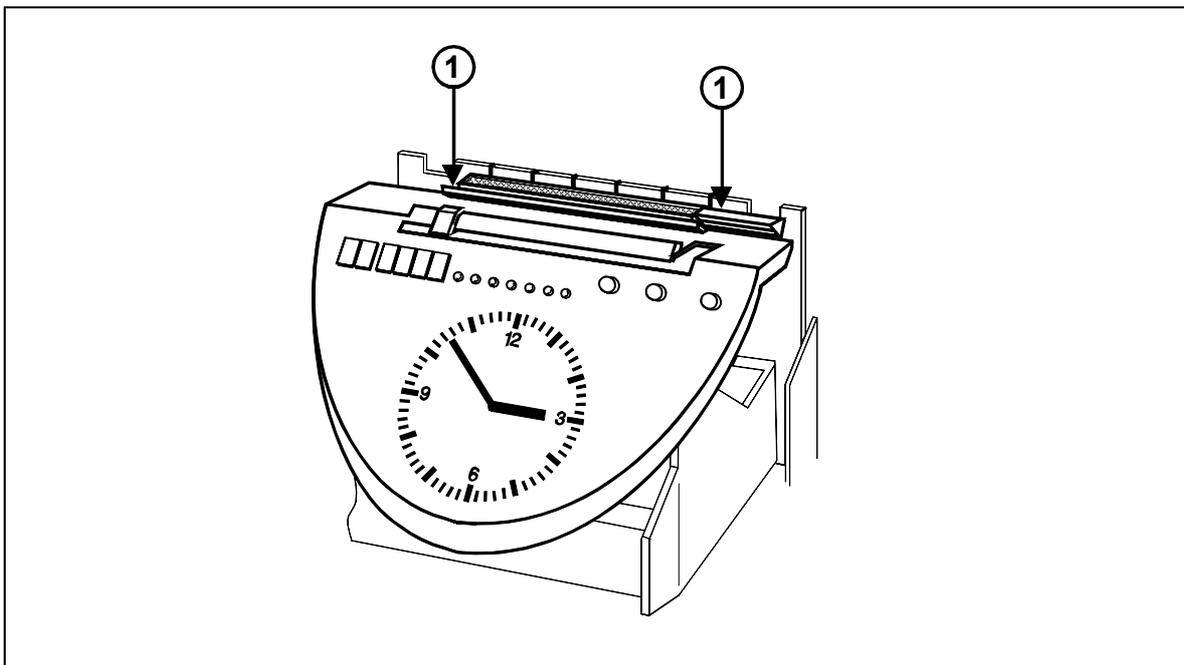
Fig. 16: Adjust card thickness

(1)   Left and right eccentric screw, red
        → The eccentric can be adjusted in steps by 5/100 mm

Proceeding

1.   Switch off recorder

2.   Insert time card.

3.   Turn both eccentric screws until the card slightly jams between printing beam and needle matrix head.
        Release eccentric by one or two steps.

        It must be possible to lead the card smoothly past the printer head.

4.   Execute a sample clocking and check the regular print.

Programming Panel

When the recorder is closed, most of the control and display elements are not visible.
All settings of commissioning and in case of subsequent changes have to be executed with the recorder opened. The programming panel contains function elements which are only necessary to set the parameters and for service purposes.
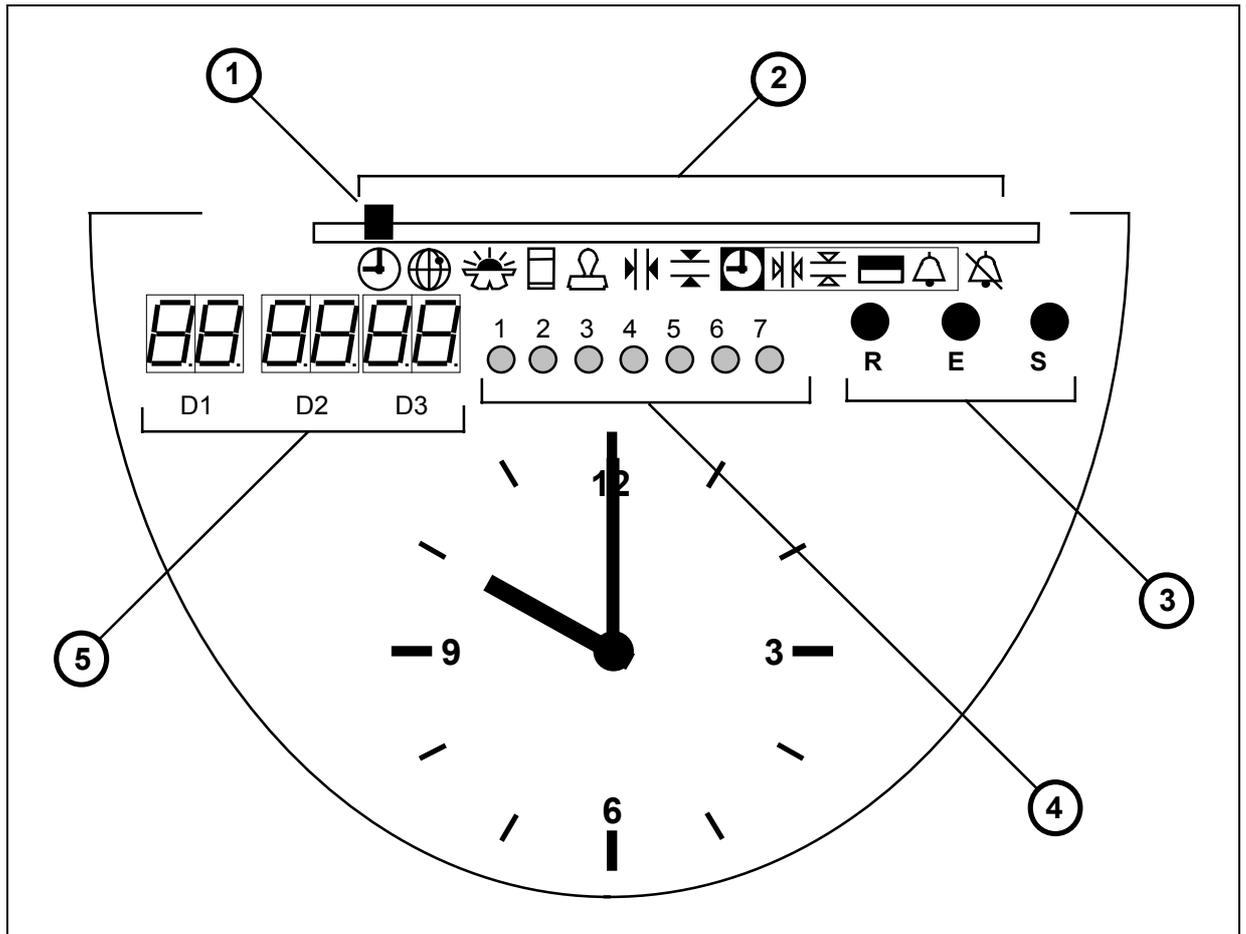
Fig. 17: Programming panel

(1)   Column pointer

(2)   Symbols for programming

(3)   Programming keys R, E and S

(4)   Programming LEDs 1 - 7

(5)   6-digits display

Column pointer	→	Mechanic pointer
	→	marks the current programming symbol and step in programming mode.
	→	In booking mode the column pointer marks the current column where the time punches will be placed on a time card.
Symbols for programming	→	Chronological order of the programming steps. Each symbol stands for one menu.
	→	During programming the current symbol is marked by the column pointer.
	→	**Set date and time** This symbol is not part of the programming routine. It can be selected with "E".
	→	See section "Set date and time".
	→	**Language identification** Controls specific language of weekday.
	→	See section "Programming - Language identification"
	→	**Daylight saving time change** Several models are available
	→	See section "Programming - Daylight saving time change".
	→	**Time card parameters** Selection of a certain card organisation, type of recorder, period duration, current week and number of lines and columns.
	→	In this menu a new card can be defined.
	→	See section "Programming - Time card parameters".
	→	**Print formats** Selection of different programmed print formats.
	→	Define a new card format.
	→	See section "Programming - Print formats".
	→	**Column change** Shows values if card format is stored in recorder.
	→	Only together with a new defined card format.

⤓	→	**Card lift**
		Shows values if card format is stored in recorder.
	→	Only together with a new defined card format.
🕐	→	This symbol contains no menu item.
		Together with the following symbols it indicates the programming of time specific events.
🕐▶◀	→	**Column change timing**
		Determines the times for the column change per weekday.
	→	Column change timing for graphical cards
	→	See section "Programming - Column change timing".
🕐⤓	→	**Card lift / line change timing**
		Determines the times for the card lift / line change per weekday entered.
	→	Card lift timing for graphical cards
	→	See section "Programming - Card lift / line change timing".
🕐▬	→	**Ribbon color change**
		The print color can be red or black. The times for the ribbon color change can be defined for each weekday.
	→	See section "Programming - Ribbon color change".
🕐🔔	→	**Signal circuit / Check of individuals**
		For the control of signal circuit or check of individuals. external signal devices for example acoustic or optical signals can be driven via the low power signal output of the recorder.
	→	See section "Programming - Signal circuit" and "Set Options - Check of individuals".
🔕	→	**Signal out-programming**
		Programming of the times to switch on/off signal circuit / check of individuals.
	→	See section "Programming - Signal out programming".

Programming keys	

○
 R
	Key R
	 → Change the displayed value.
	     A value can be changed when flashing in the display.
	     If the key is pressed once, the value will be
	     increased by one.
	     If the key is pressed continuously the value increases
	     in fast mode.

○
 E
	Key E
	 → Confirm the values entered.
	     Use this key to switch to the next value or next digit in
	     the current menu item without changing any value.

○
 S
	Key S
	 → Skip to next parameter or menu item.
	     If not all required values are entered for a menu item,
	     the "S" key will not move you to the next.
	 → In normal operation column selection by position key.

Programming-LED's
 	
 1   2   3   4   5   6   7
 ◎ ◎ ◎ ◎ ◎ ◎ ◎
	→ The seven LEDs are for weekday programming.
	     Each flashing LED represents the day for which the
	     necessary change timing needs to be programmed.
	     LED 1 = Monday to LED 7 = Sunday.

Digital display
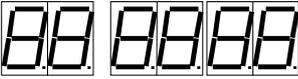 	
 🯸🯸 🯸🯸🯸🯸
 D1   D2   D3
	→ Separation into the fields D1, D2 and D3.
	 → When recorder is closed, only field D3 is visible.
	 → In normal operation current date is displayed.
	 → The decimal point flashes always. In case of DCF-
	     connection or slave clock function it goes off with no
	     reception.
	 → In programming mode the active digit is marked
	     by a flashing LED. A flashing LED indicates that the
	     displayed value can be changed.

Time / Date

The symbol (clock symbol) is indicated by the column pointer

The recorder is provided with a buffer battery controlled quartz clock with power reserve. The lithium battery stores the correct time for years in case of power failure. Setting of date and time usually is necessary only during commissioning of the recorder.

The analogue clock is permanently synchronised with the internal quartz clock. In case of power failure the analogue clock will be synchronised with the internal quartz clock as soon as power returns (power reserve).

The correct display of the current date is guaranteed by an eternal calendar.

If the recorder is used as master or slave clock or provided with DCF-connection → see in this chapter "Set Options".

In this menu the following functions are available:

- Setting the Time **and** Date
- Synchronizing the Analogue Clock
- Showing or Setting the Time of the Internal Quartz
- Setting the Date only
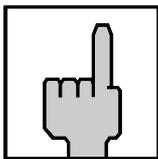
Hint
During the synchronisation of the analogue clock no clocking at the recorder is possible.

Setting the Time and Date

<table>
<tr><td>⚠</td><td>**Attention**
To set the analogue clock and/or the internal quartz clock always exactly observe the procedure described as follows. It is not sufficient to set only the hands of the analogue clock.</td></tr>
</table>

Set time first, enter date after.

<table>
<tr><td colspan="3">**Proceeding**</td></tr>
<tr><td>1.</td><td>🕐</td><td>Press "**E**" until column pointer marks the symbol for time.

Time is displayed.</td></tr>
<tr><td>2.</td><td>Example:

0928
D1   D2   D3</td><td>Enter current hour using "**R**" .

D2 = hour
Value range: 00 - 23
☞ If you do not want to change the value displayed, continue with step 3.</td></tr>
<tr><td>3.</td><td></td><td>Confirm the value using "**E**" .
Recorder switches to minutes.</td></tr>
<tr><td>4.</td><td>Example:

1028
D1   D2   D3</td><td>Enter minutes using "**R**".

D3 = minutes
Value range: 00 - 59
☞ The value entered should be set one minute before the desired reference time.</td></tr>
<tr><td>5.</td><td></td><td>Press "**E**" when reference time of an external clock corresponds to the time displayed on the recorder.

Now clock starts with 00 seconds.</td></tr>
</table>
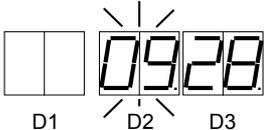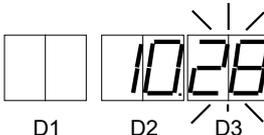
| | Example: | The recorder switches to "Synchronise analogue clock".

The current hour entered is still displayed. The field D3 indicates that the hands of the analogue clock have to be set. |
|---|---|---|
| **6.** | Set minute hand on 12h and hour hand on the full hour entered and displayed.

☞ In our example: 10 h
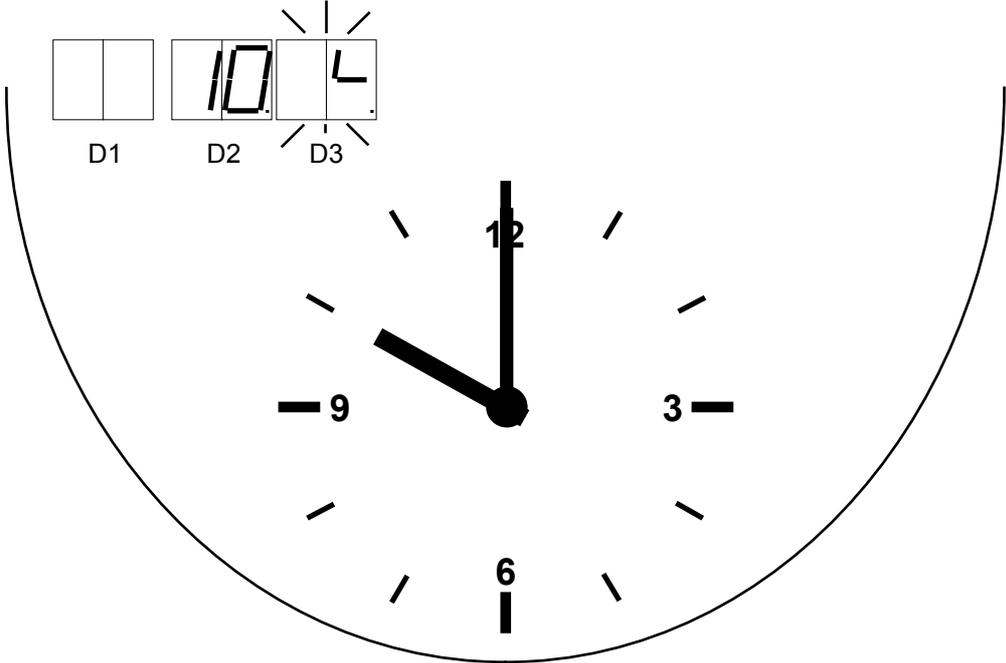
☞ Set **minute hand first** and then hour hand.
Both hands can be moved forwards and backwards.
If the minute hand is moved after the hour hand has been set, the hour hand will be moved as well. | |
| **7.** | | Confirm each setting with "**E**".

The synchronisation of the analogue clock will not start immediately. Only when the date has been set the automatic clock synchronisation routine will start.

Date format is: DD-MM-JJ |
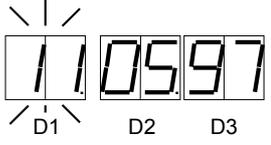
8.	`11.0597` D1 D2 D3	Enter current date using "**R**". D1 = day Value range: 01 to 31 ☞ If you keep the key "R" pressed, fast advancing in the value range is possible Example: 31. May 1997
9.		Confirm value using "**E**". Recorder switches to input of month.
10.	`31.0597` D1 D2 D3	Select current month using "**R**". D2 = month Value range: 01 to 12 If the value 31 has been entered in the field D1, only the months with 31 days are available (January, March, May, ...).
11.		Confirm selection using "**E**". The recorder switches to input of year.
12.	`31.0597` D1 D2 D3	D3 = year Value range: 00 - 99 Proceed as described in the previous steps.
13.		Confirm selection using "**E**".
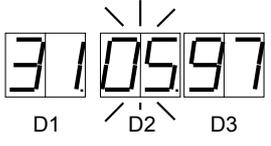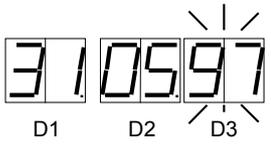
After the last date input has been confirmed with "**E**", the analogue clock is synchronised. If the synchronisation is finished the analogue clock works with the current time.

Recorder is now in normal operation. In field D3 the current date is displayed.
If the recorder is used as master clock, values for the slave clock have to be entered now.
See section "Set options".

Showing or Setting the Time of the Internal Quartz

If you want to check the time of the internal quartz clock, proceed as described on this page. The command "Indication only" to the internal quartz clock doesn't cause a manual setting of the hands.

1.   Select menu for time using "**E**".
        Keep "**E**" pressed until column pointer marks the symbol for the time.
        Current time is displayed, hour-display flashes.

2.   If the right time is displayed confirm setting using "**S**".
        → Current date is displayed.

3.   Skip the date display by confirming each field using "**E**".
        After the key has been pressed the 3rd time, the menu is left.
        → Recorder returns to current date.

If you want to set the time, you have to use the keys "**R**" and "**E**" instead of "**S**" in step 2.
Proceed as described under the topic "Set date and time".

A change of the internal quartz clock is always followed by a manual hand setting of the analogue clock and a synchronisation between quartz and analogue clock.

Synchronizing the Analogue clock

If the time printed on a time card differs from the time of the analogue clock, the analogue clock has to be synchronised with the internal quartz clock.

Proceed as described under "Set date and time" in this chapter. Confirm hours and minutes using "**E**" and set hands of the analogue clock when display shows "Synchronise analogue clock".
Confirm date using "**E**".

Now the synchronisation will be started and the time menu is left.
After synchronisation has been executed, current date is displayed.
Check analogue clock with a sample clocking.

Setting the Date only

Proceed as described under "Show/Set time of internal quartz clock" and under "Set date and time" in this chapter.
Date can be changed using "**R**".

Programming Customer Requirements

To program individual customer requirements two possibilities are available:

- Programming via programming panel at the recorder

- Programming via PC.
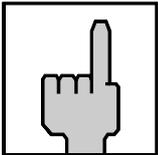
	Hint
	Please note that the PERFECT 2020 is designed for use around the world. In order to simplify the programming of your requirements, we have placed programming values applying to North American work places at the top of each paragraph. Besides we have highlighted those values in extra bold characters.

Programming with the Programming Panel

Customer requirement programming is done using menus and submenus.

Each menu item is represented by a symbol on the programming panel. Please note that the recorder must be open to access the programming panel.

When the programming routine is started, the column pointer switches to the second symbol .

Each menu items has to be selected, and programmed or confirmed, in chronological order. The column pointer indicates the currently active menu item.

Different parameters are entered with special code-numbers that are selected using "**R**".

It is possible to switch to the next menu item or parameter by pressing the key "**S**". If a parameter must be entered, the key "**S**" will not be valid until this value has been entered.

You can check the value of a menu item by pressing "**E**". Pressing "**E**" will display the value of the menu item, it will not change the value.

You can find a summary of all symbols and the use of the keys in this chapter under the section "Programming Panel".

	Attention
	Once programming has started, it must be completed; otherwise, all parameters could be lost when the time recorder is restarted. If this happens, all values have to be re-entered.

On the following pages you can find all information and details how to program the recorder and which parameters or code numbers are available.
A summary of all code numbers available is printed in Appendix B "Code-table".

If you have defined you own card format for your time recording and you want to program this format, please read Appendix B "Define your own card format". In this chapter you will find all details about the programming and the settings for your recorder.

But before you start with the programming of the recorder you should planed and defined your time organization.

Programming via PC

Programming the recorder via PC is the easiest and most time-saving way to adjust the recorder to your individual time organisation.
If you own a connection cable and the program "P2020", we recommend to program the recorder via PC.
The program "P2020" contains all parameters and programming functions like for the programming via the programming panel. Additionally a help text is available for each menu item to be called by key.
If your PC is linked to a printer, you may get, after having finished the programming, a clear print-out of all programmed parameters in order to check and file the values.

Further information and details about the use of the program "P2020" are given at the end of this chapter under the topic "Programming via PC".

☞   On the following pages programming via the programming panel is described.

Calling up the Programming Routine

From version V1.19 the input of parameters is secured by a code-number. Two different access levels are distinguished:

$\rightarrow$ Code-number to program all time values:

       - Daylight saying time change-over
       - Column change timing
       - Card lift / line change timing
       - Ribbon colour change
       - Signal circuit / Check of individuals (Option)

$\rightarrow$ Code-number to program all parameters:
       - Language identification
       - ...... to
       - Signal circuit / Check of individuals (Option)

Code-numbers::

4 7 1 1 $\rightarrow$ **Allows the user to program time specific values of the unit**
1 8 8 8 $\rightarrow$ **Complete programming of the recorder**

If a wrong code-number was entered, the programming mode is left automatically. Additionally to the entry of a wrong code number, the programming mode can be left by pressing "**S**".

To call up the programming routine, the front cover of the recorder must be removed. If the recorder is switched off, you must switch it on with the powers switch.
Read in this in section "Switch on recorder".

Proceeding		
1.		Press "**R**" (at least 2 seconds) until 4 digits are displayed. The displayed sequence is optional. The entry of the code-number begins with the left flashing digit.
2.	*1000*	Enter first digit using "**R**". The code-number "1888" shall be entered as an example.
3.	*1000*	Confirm first digit using "**E**". Recorder changes to next digit.
4.	*1800*	Enter second digit using "**R**" and confirm settings using "**E**" Repeat steps 2 and 3 for the other 2 digits.
5.		After the last digit has been confirmed using "**E**" the column pointer changes to the first menu symbol. With code-no. 1888 → ⊕ Language identification With code-no. 4711 → ☼ Daylight saving time Now the first value in the menu can be programmed. With code-number 4711, the column pointer changes to the next possible menu item.
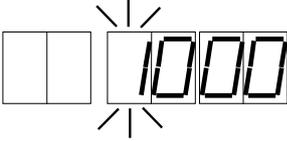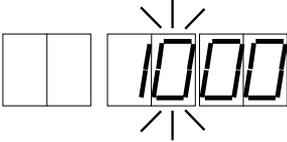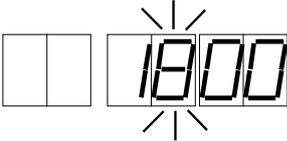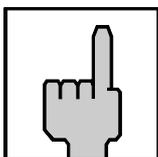
Hint
The values used on the next pages are only examples and may differ from your values.

Print out all Parameters Programmed

The recorder offers the possibility to print out all parameters values on an empty time card. Any empty card can be used.

Minimum dimension of the card: 210 x 86 mm (L x W)

We recommend a card length of 230 mm.

You can print out the parameters together with programming the recorder or afterwards. After the programming you have to insert an empty card and select the menus again. For this it is indispensable to once again call up the programming routine (1888).

Attention
We recommend to use a card with the same dimensions as the time card used normally.
If another card is taken it may happen that the printer overprints the card edge and directly prints upon the printing beam. This could damage the printer head.
The minimum card length has to be 210 mm. Don't fall below the indicated dimensions.

The parameter values will be printed out when a menu item is left. If you insert an empty card and press "S" all values programmed in the last menu will be printed out.

The print out begins with the menu item "Card specific parameters". The menu items "National identification" and "Summer- /normaltime" cannot be printed.
The card must be turned from the menu item "Ribbon colour change" on.

You can find a complete protocol print out at the end of this chapter
(page 4-60/4-61).

Proceeding

1.   Insert empty time card.

2.   Press time card slightly down after menu item has been finished (like at a normal clocking)

      and

3.   press "**S**".
      Column pointer changes to the next menu symbol (menu item) and the values of the last menu item are printed out.

4.   Repeat steps 2 and 3 with the card remaining in the recorder. Remove card after programming has been finished.

Language Identification

The symbol ⊕ is indicated by the column pointer.

In this menu the rules for the language of the weekday abbreviation is selected.

Proceeding		
1.	![display showing 01 with D1 D2 D3 labels]	Select language identification with "**R**". Value range: 01 - 16 ***Values for applications in North America*** ***02 = American 04 = French*** ***05 = Spanish 07 = Portuguese*** Definition: 01 = German 09 = Danish 02 = American 10 = Swedish 03 = English 11 = Norwegian 04 = French 12 = Finnish 05 = Spanish 13 = Polish 06 = Italian 14 = Russian 07 = Portuguese 15 = Turkish 08 = Dutch 16 = Greek **Units destined for North America are pre-programmed with language identification = 02.** ☞ If you do not want to change the value displayed, continue as described in step 2.
2.		Press "**S**" for next menu item "Daylight saving time".

Daylight Saving Time Change-over

The symbol ☀ is indicated by the column pointer.

Spring and fall daylight saving time changes can be automatically implemented by the time recorder. You can select an perpetual automatic change-over or you may disable this function using code 00.
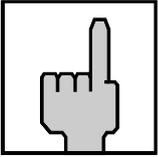
Hint

If the change-over is executed according to a freely defined program, all date and time values have to be entered every year resp. after each change-over.

Please note that the change timing can only be entered for the current year. Timing for the current year that are in the past, are automatically deleted by the unit. Entries for the next year are possible from 01.01., 00.00 on.
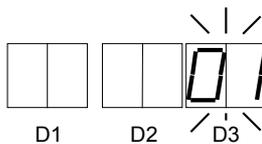
Proceeding	
1.	Select change-over mode using "**R**".

Value range: 00 - 07

Values for applications in North America

00 = no change-over

07 = change-over according to USA
   - 1st Sunday in April, 02:00 >> 03:00
   - last Sunday in October, 02:00 >> 01:00

Definition:

00 = no change-over

01 = change-over according to CET
   - last Sunday in March, 02:00 >> 03:00
   - last Sunday in October, 03:00 >> 02:00

02 = change over according to CET
   - last Sunday in March, 02:00 >> 03:00
   - 4th Sunday in October, 03:00 >> 02:00

03 = change-over according to GMT
   - last Sunday in March, 01:00 >> 02:00
   - last Sunday in October, 02:00 >> 01:00

04 = change-over according to GMT
   - last Sunday in March, 01:00 >> 02:00
   - 4th Sunday in October, 02:00 >> 01:00

05 = change-over according to EEZ
   - last Sunday in March, 03:00 >> 04:00
   - last Sunday in October, 04:00 >> 03:00

06 = change-over according to EEZ
   - last Sunday in March, 03:00 >> 04:00
   - 4th Sunday in October, 04:00 >> 03:00

07 = change-over according to USA
   - 1st Sunday in April, 02:00 >> 03:00
   - last Sunday in October, 03:00 >> 02:00

99 = change-over freely programmed

Units destined for North America are pre-programmed with daylight saving time change over = 07.

		☞ With selection of code "00" to "07", continue with step 4
		☞ With selection of code "99" continue with step 2.
2.	```01``` D1 D2 D3	Confirm selection using "**E**". ☞ With selection of code "99", enter further values (step 3) for: - Date for normal- → daylight saying time - Time for normal- → daylight saving time - Date for daylight saving- → normaltime - Time for daylight saving- → normaltime
3.	```01 30.04``` D1 D2 D3	**Only for freely programmed change-over** D1 = **01** = Change-over from normal- to daylight saving time > **Date** < D2 = day Select desired date using "**R**". Value range: 01 - 31
		Confirm selection using "**E**".
	```01 30.04``` D1 D2 D3	D3 = month Select desired month with "**R**". Value range: 01 - 12
		Confirm selection with "**E**".
	```02 02.00``` D1 D2 D3	D1 = **02** = Change-over from normal- to daylight saving time > **Time** < D2 = hour Select desired hour with "**R**". Value range: 00 - 23 ☞ If "--.--" is displayed, the change-over has already been executed but afterwards these values have been erased by an initial start of the recorder or manually. You can enter new time values.
		Confirm selection with "**E**".
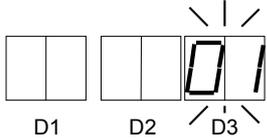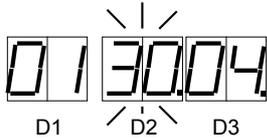
	`02 02.00` D1　　D2　　D3	D3 = minutes Enter minutes with "**R**". Value range:　　00 - 59
		Confirm minutes with "**E**".
	`03 30.00` D1　　D2　　D3	Repeat the adjustment for: D1 = **03** = Change-over from daylight saving 　　　　　　time - to normaltime > **Date** < D1 = **04** = Change-over from daylight saving 　　　　　　time - to normaltime > **Time** < Proceed as described before. Change the values displayed with key "**R**". D2 = day / hour D3 = month / minute
		Confirm each value with "**E**". ☞　In order to check all the introduced values with key "**E**" the whole menu item could be displayed step by step.
4.		Confirm menu with "**S**" to continue with next menu item "Time card parameters".

After having confirmed the menu with key "**S**" the recorder makes a card lift adjustment. This procedure lasts some seconds. It is indicated by the noise of the transport spindle for the controller for card lift adjustment.

After having finished this operation the pointer moves to the next symbol "Card specific parameters".

Time Card Parameters

The symbol ⊔ is indicated by the column pointer.

This menu contains the following submenus:

- Selection of a pre-programmed card format (see separate time card catalogue)
- Select type of recorder
- Definition of period duration
- Current week
- Enter number of columns
- Enter number of lines
- Definition of the start of the pay period

Some submenus are influenced by settings and parameter values of other menu items.
In these cases only the possible values are available and only these values are displayed.

If you want to define your own card format, you will find all details concerning the proceeding in Appendix A "Define your own card format".

Select Card Format

A high number of time card formats have already been programmed and stored in the recorder. If you use such a standard card format you have to indicate which card-No. and by this which card format should be activated for your application.
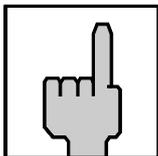
Hint
Only one card format can be defined/selected in the recorder!

All pre-programmed card formats are printed in a separate card catalogue. All card formats have a card-No. which has to be entered in the recorder.

Possible card formats

- All standard cards
- All graphical cards

If a new card format is used which slightly deviates from a standard card format shown in the separate card catalogue, for example a card format with different column width, you need not to program the complete card format.
You can copy a stored card format with the command "Copy" and then alter all the values which are different to the stored one.

For further information about the command "Copy", please read Appendix A "Define your own card format - Adjust a standard format".

⚠	**Attention** If the card format is changed, the following parameter values will be erased: - Time values for column change and card lift - Time values for ribbon colour change

Proceeding		

1.	
	D1 D2 D3
		Select card no. with "**R**".
		
		Value range: 00 - see card catalogue; Copy
		
		Definition:
		00 = Card format freely defined
		                → see Appendix A
		01 - xx = Standard card formats
		                → card-no. see sep. card catalogue
		Co -- = Copy standard card formats
		              = Erase values for card format.
		                → Copy-function see Appendix A
		
		Units destined for North America are pre-programmed with card format = 29

2.		Confirm selection with "**E**".

If you have already been using a standard format and you want to alter only some values of this format, we recommend to copy this standard format and alter the values in the copied format. All values of the standard format remain.
This proceeding is only possible with standard formats.
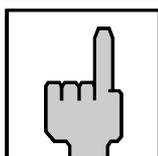
☝	**Hint** If you select a standard card format and do not alter any settings, the values for "period duration", "type of recorder", "current week" and "number of lines and columns" cannot be changed. All default values can be checked with "E". If you do not want to check the default values, press "S" for next menu item: "Print Format".

If you want to record the parameters of the programming on a time card you can start here. Insert the card until the stop before pressing key "S".

Type of Recorder
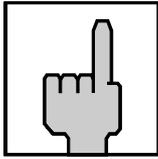
Two different types are available:

- Standard recorder
- Graphic recorder

Standard recorder

The imprint on the time card will be executed in lines according to the day. The time card is separated in an IN- and OUT-clocking columns. The days are arranged vertically.

See separate card catalogue.

If you have defined a new card format, you select whether one or two card lifts per day shall be executed.

Graphic recorder

The imprint on the time card is executed in columns according to the day. The card is not separated in lines. Each column corresponds to one day of the current period.

Graphical cards may be folded, so that all days of one booking period, e.g. one month, can be arranged on one card.

The recorder distinguishes in graphic mode between a "leaping imprint" and "creeping imprint". With "leaping imprint" all IN- and OUT-clockings are positioned in defined distances.
With "creeping imprint" the distances change according to the time, the clocking is executed. The advantage of a creeping imprint: an "early IN-" or "early OUT"-clocking can be seen on the time card.

With a graphic recorder with "creeping imprint" you can choose between an ascending and descending imprint.

Ascending imprint: → IN-clocking is printed on bottom of the card, all further clockings are printed ascending.

Descending imprint: → IN-clocking is printed on top of the card, all further clockings are printed descending.

Definitions:

```
  01     01
  D1  D2  D3
```
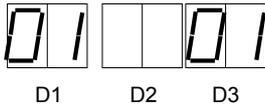
D1 = 01:   → indicates the 1st submenu "Select type of recorder".

D3 = 01:   → Standard recorder with one card lift/day.
    = 02:   → Standard recorder with two card lifts/day.
    = 03:   → Graphic recorder with "leaping imprint".
    = 04:   → Graphic recorder with "creeping imprint", ascending.
    = 05:   → Graphic recorder with "creeping imprint", descending.

**Units destined for North America are pre-programmed with
type of recorder = 05 (consequence of setting card format no. 29)**

☞   Continue with "**E**". Next submenu "Period duration".
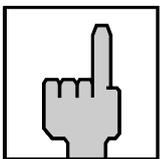
Period Duration

Hint
You can only change any values/setting if you have selected the value "00" or "Co" in the submenu "Card format".
See Appendix A "Define your own card format".

The period duration refers to the time period after which a payroll should be executed and the time card must be changed.
Several period durations can be selected in the recorder. For a monthly wage period additionally the division of the card may be varied. The period duration depends on the card format and type of recorder selected.

Definitions:
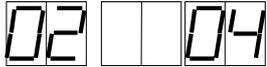
```
02    04
D1   D2   D3
```

D1 = 02:   → indicates the 2nd submenu "Period duration".
D3 = 01:   → 1 week
   = 02:   → 2 weeks
   = 03:   → 3 weeks
   = 04:   → 4 weeks
   = 05:   → 5 weeks with month correction
   = 06:   → monthly, start position 1. column or 1. line, continuous imprint
   = 07:   → monthly, 1. column or 1. line free, continuous imprint
   = 08:   → monthly, last column or last line of the first page free
   = 09:   → monthly, column or line after 31st free

**Units destined for North America are pre-programmed with
period duration = 01 = 1 week (consequence of setting card format no. 29)**

☞   Continue with "**E**". Next submenu "Current week".

Current week

The recorder must know the current week of the period.
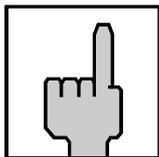
Hint
The current week can only be selected if the values "2", "3" or "4 weeks " have been entered in the submenu "period duration". Otherwise the submenu "current week" will be skipped and the recorder switches automatically to the next submenu "Number of columns".

Proceeding	

1.
 	
 ```03   01```
D1   D2   D3
	Select current week with "**R**".
	 Value range: 01 - 04
	 Definition:
	 D1 = **03** → indicates the 3rd submenu "Current week"
	 D3 = 01: → 1. W. of the card = current week.
	    = 02: → 2. W. of the card = current week.
	    = 03: → 3. W. of the card = current week.
	    = 04: → 4. W. of the card = current week.

2.	Confirm with "**E**" to continue to next submenu "Number of columns".

Number of Columns
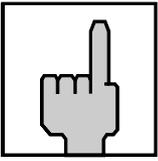
Hint
If a standard card format has been selected, the values shown in this submenu are pre-set and cannot be altered.

The number of columns can differ form time card to time card. At the same time the number of columns is pre-set (according to type of recorder and period duration) or can be selected out of a fixed range.

Definitions:

```
04    06
D1    D2    D3
```
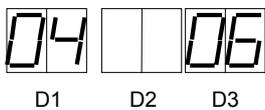
D1 = 04:   → indicates the 4th submenu "Number of columns".

D3 = XX: → number of columns.

**Units destined for North America are pre-programmed with
number of columns = 07 (consequence of setting card format no. 29)**

☞   Continue with "**E**". Next submenu: "Number of lines".
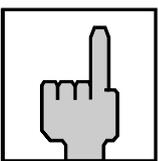
Number of Lines

Hint
If a standard card format has been selected, the values shown in this submenu are pre-set and cannot be altered.

The number of lines is displayed in this submenu. With a graphic recorder this menu item is not available.

Definitions:

```
05    28
D1    D2    D3
```
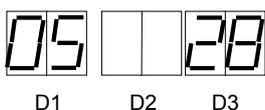
D1 = 05:   → indicates the 5th submenu "Number of lines".

D3 = XX: → number of lines

Start of Pay Period

This menu function allows to alter the start of the period. For some purposes there is no need that the printing field of time cards will start with the first of the month.
By indicating the date of day in this menu function the start of pay-period, therefore, can be set to any day of the month.
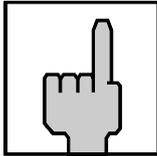
Hint
With cards of a 5 week pay-period capacity and automatic month-end correction, an eventual shifting of the start of the pay-period is not feasible.

Proceeding		
1.	D1 D2 D3	Select start of pay-period with "**R**". Value range: 01 - 31 D1 = **06** → indicates the 6th submenu "start of pay-period" D3 = xx → day **from 01 = Monday** **to 07 = Sunday** **Units destined for North America are pre-programmed with start of pay period = 01 = Monday**
2.		Confirm with "**E**".
3.		Continue with "**S**" to the next menu item "imprint".

Print Format

The symbol [symbol] is indicated by the column pointer.

It allows the user to define the print format of the time recorder.

It can be defined whether the weekday or date are printed at every clocking, or whether the minutes are printed in decimal hours (5/100). 48 print formats are stored in the unit. Each print format has a certain number and the print format must be selected via this number.

Print example:

```
12 08 47AM ——————  Field 4 (Mark AM/PM)
         └———————  Field 3 (example: minutes)
     └———————————  Field 2 (example: hours)
  └——————————————  Field 1 (example: date)
```
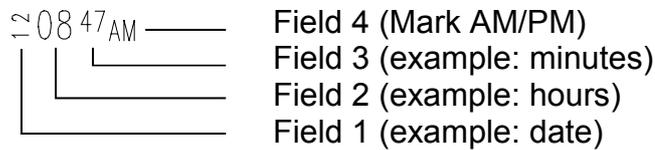
Available print formats of the unit: (not in full scale)

Format-No.	Field1	Field2	Field3	Field4	Example
01	Weekday	Hours	Minutes	-	FR08:58
02	Date	Hours	Minutes	-	12 08:58
03	Hours	Minutes	-	-	09:00
04	Weekday	Hours (12)	Minutes	AM/PM	FR08⁴⁷AM
05	Date	Hours (12)	Minutes	AM/PM	12 08⁴⁷AM
06	Hours (12)	Minutes	AM/PM	-	08⁴⁷AM
07	Weekday	Hours	1/100 hrs	-	FR08:83
08	Date	Hours	1/100 hrs	-	12 08:83
09	Hours	1/100 hrs	-	-	08:83
10	Weekday	Hours (12)	1/100 hrs	AM/PM	FR08⁸³AM
11	Date	Hours (12)	1/100 hrs	AM/PM	12 08⁸³AM

12	Hours (12)	1/100 hrs	AM/PM	-	08⁸³AM
13	Weekday	Hours	5/100 hrs	-	FR08:90
14	Date	Hours	5/100 hrs	-	2008:95
15	Hours	5/100 hrs	-	-	08:80
16	Weekday	Hours (12)	5/100 hrs	AM/PM	FR08⁸⁵AM
17	Date	Hours (12)	5/100 hrs	AM/PM	2008⁸⁵AM
18	Hours (12)	5/100 hrs	AM/PM	-	08⁸⁵AM

The following print formats correspond to the structure of the print formats no. 01 to 18. The print formats 19-36 are printed in condensed letters. Theses print formats should be used for time cards with very narrow columns (graphical cards).
(Examples not in full scale)

Format-No.	Field1	Field2	Field3	Field4	Example
19	Weekday	Hours	Minutes	-	FR15¹²
20	Date	Hours	Minutes	-	2415¹²
21	Hours	Minutes	-	-	15¹²
22	Weekday	Hours (12)	Minutes	AM/PM	FR03¹³PM
23	Date	Hours (12)	Minutes	AM/PM	2003¹³PM
24	Hours (12)	Minutes	AM/PM	-	03¹³PM
25	Weekday	Hours	1/100 hrs	-	FR15²³
26	Date	Hours	1/100 hrs	-	2215²³
27	Hours	1/100 hrs	-	-	15²³
28	Weekday	Hours (12)	1/100 hrs	AM/PM	FR03⁸³PM
29	Date	Hours (12)	1/100 hrs	AM/PM	2003⁸³PM
30	Hours (12)	1/100 hrs	AM/PM	-	03⁸³PM
31	Weekday	Hours	5/100 hrs	-	FR15²⁵

32	Date	Hours	5/100 hrs	-	$12 \, 15^{25}$
33	Hours	5/100 hrs	-	-	15^{25}
34	Weekday	Hours (12)	5/100 hrs	AM/PM	$FR \, 03^{85}{}_{PM}$
35	Date	Hours (12)	5/100 hrs	AM/PM	$12 \, 03^{85}{}_{PM}$
36	Hours (12)	5/100 hrs	AM/PM	-	$03^{85}{}_{PM}$

The print formats 37 to 48 have a lower line height. They can be used with time cards with narrow lines, e.g. Solari cards. (Examples not in full scale)

Format-No.	Field1	Field2	Field3	Field4	Example
37	Weekday	-	Hours	Minutes	FR 08:58
38	Date	-	Hours	Minutes	12 08:83
39	Hours	Minutes	-	-	09:00
40	Hours (12)	Minutes	-	AM/PM	08:47 AM
41	Weekday	-	Hours	1/100 hrs	FR 08:83
42	Date	-	Hours	1/100 hrs	12 08:83
43	Hours	1/100 hrs	-	-	08:83
44	Hours (12)	1/100 hrs	-	AM/PM	08:83 AM
45	Weekday	-	Hours	5/100 hrs	FR 08:90
46	Date	-	Hours	5/100 hrs	12 08:95
47	Hours	5/100 hrs	-	-	08:80
48	Hours (12)	5/100 hrs	-	AM/PM	08:85 AM

If the print formats stored in the recorder are not enough, you can create your own imprint. The character order as well as the characters, according to the ASCII-table, can be freely defined.

1. Select type of field.
2. Enter character height.
3. Enter character width.
4. Select characters from ASCII-table for freely defined weekday and freely defined mark.

Proceeding	
1. ⟨display: D1 D2 D3 showing "01"⟩	Select print format with "**R**". Value range: 00 - 48 Definition: 00 = Format freely defined 01 - 48 = according to table of available print formats **Units destined for North America are pre-programmed with print format = 38** ☞ If you do not want to alter the value displayed, continue with step 2.
2. ⟨display: D1 D2 D3 showing "01"⟩	Confirm selection with "**E**". ☞ If a stored print format is selected, continue with step 4. ☞ If you have selected code "00", continue with step 3.
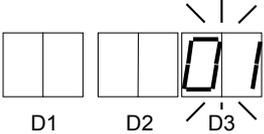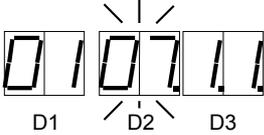
3. ⟨display: D1 D2 D3 showing "01 07 11"⟩	**Define a print format!**
	For the print 5 fields are available (see print example). Not all fields have to be defined. Definition is executed from left to right.
	
	D1 = **01** = first field
	
	D2 = Type of field
	        Value range: 00 - 13
	
	        Possibilities:
	        00 = Blank space
	        01 = Minutes
	        02 = Decimal hours 5/100
	        03 = 3-minute leap
	        04 = Decimal hours 1/10
	        05 = Decimal hours 1/100 (approx.)
	        06 = Hours
	        07 = Date
	        08 = Mark AM/PM for 12h-mode
	        09 = Machine number
	        10 = Weekday numeric
	        11 = Weekday freely defined
	        12 = Weekday according to nat. ident.
	        13 = 5-minute leap
	
	Select type with "**R**".

	Confirm selection with "**E**".
$01\ 07\ 11$ D1 D2 D3	D3 = Definition of the print format. left field = imprint height right field = imprint width Select desired characters with "**R**". Value range: 1 - 6 Possibilities: 1 = Normal 5x9 dots e.g.: 15 2 = small 5x7 dots, raised e.g.: 25 3 = small 5x7 dots, centred e.g.: 25 4 = small 5x7 dots, hanging e.g.: AM 5 = cross 7x5 dots, read from right e.g.: FR 6 = cross 7x5 dots, read from left e.g.: FR
	Confirm selection with "**E**".
$01\ 07\ 11$ D1 D2 D3	Select desired imprint width with "**R**". Value range: 1 - 4 Possibilities: 1 = narrow (2 cycles / Dot) e.g.: 15 2 = normal (3 cycles / Dot) e.g.: 15 3 = double (4 cycles / Dot) e.g.: 15 4 = bold (6 cycles / Dot) e.g.: 15
	Confirm selection with "**E**".
$02\ 06\ 11$ D1 D2 D3 to $05\ 08\ 11$ D1 D2 D3	Repeat the entry for the fields 02, 03, 04 and 05 as described for field 01. ☞ If you have not selected a freely defined character for the fields D2=09 or D2=11, continue with step 4. ☞ If you have selected a freely defined character (D2 = 09) or freely defined weekday (D2 = 11) for any field, the recorder switches automatically to D1 = 06 or D1 = 07 after field 05 has been confirmed.

	`06 41.20.`
	D1 D2 D3
	
	to
	
	`06 41.39`
	D1 D2 D3
		Machine Number freely defined
		
		D1 = 06
		
		In the fields D2 and D3 you have to enter a hexadecimal value, which is printed in the code-table on the next page.
		This code-table is based on the ASCII-code.
		
		Example: Machine Number "A9"
		D2 = 41
		D3 = 39
		
		Enter values with "**R**".
		Confirm each value with "**E**".
		
		☞ If no code-number is entered for the Machine Number, a blank space will be set and printed automatically.

	`07 37.41`
	D1 D2 D3
	
	to
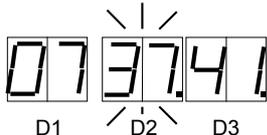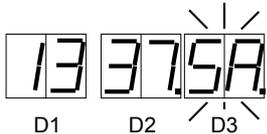	
	`13 37.5A`
	D1 D2 D3
		Weekday freely defined
		
		D1 = 07 for Monday
		    08 for Tuesday
		    09 for Wednesday
		    10 for Thursday
		    11 for Friday
		    12 for Saturday
		    13 for Sunday
		
		In the fields D2 and D3 you have to enter a hexadecimal value, which is printed in the code-table on the next page.
		This code-table is based on the ASCII-code.
		
		Example: Sunday → "7Z"
		D2 = 37
		D3 = 5A
		
		Enter character with "**R**".
		Confirm each character with "**E**".
		☞ If no code-number is entered for the weekday freely defined, a blank space will be set and printed automatically.

4.		Continue with "**S**". Next menu item "Column change".

Code-table for machine number freely defined

This table is based on the ASCII-Code.

In the table you can find the hexadecimal value for a character.
Any other characters are printed as blank spaces.

	0x	1x	2x	3x	4x	5x	6x	7x
x0			Space	0		P		
x1				1	A	Q		
x2				2	B	R		
x3				3	C	S		
x4				4	D	T		
x5				5	E	U		
x6				6	F	V		
x7				7	G	W		
x8				8	H	X		
x9				9	I	Y		
xA				:	J	Z		
xB					K			
xC					L			
xD					M			
xE					N			
xF					O			

Column Change

The symbol ⱞ⃒ is indicated by the column pointer.

Each time card is separated in lines and columns. The **column width** must be programmed so that the printer head is positioned according to the card separation. The values programmed in the menu item "Card specific parameters - number of columns" refer to this menu.
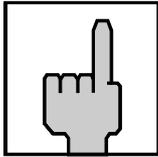
Hint
The column width can only be entered if you have selected the values "00" or "Co" in the menu "Card specific parameters". See Appendix A "Define your own card format".
If you have selected a standard card format, these values cannot be changed.

Definitions:

```
 0 1 0 1 0.5
 D1    D2   D3
```
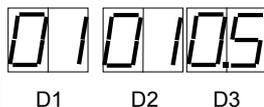
D1 = 00 to XX: → indicates the current column, starting with D1 = 00 and the column width of the first column (D2 and D3).

D1 = 00 = left card edge

D2, D3 = XX: → Current column width in mm, value is pre-set by the card format selected. Accuracy: 1/10 mm.

Example: D1 = 01   D2 = 01   D3 = 0.5
→ D1 = 1. column
→ D2 and D3 = column width = 10,5 mm

Units destined for North America are pre-programmed with left card edge = 5 mm, column width = 7 columns x 12mm (consequence of setting card format no. 29)

☞ The columns can be changed and the values checked by pressing "**E**".
If you want to continue with the next menu item, press "**S**".

Card Lift

The symbol ⥮ is indicated by the column pointer.

This menu is identical with the menu "Column change".
As many line values are displayed as programmed in the menu item "Card specific parameters - Number of lines".

Hint
The line height can only be entered if you have selected the values "00" or "Co" in the menu "Card specific parameters". See Appendix A "Define your own card format".
If you have selected a standard card format, these values cannot be changed.

Definitions:

```
 01   1  10.0
 D1    D2    D3
```

D1 = 00 to XX: → indicates the current line, starting with D1=00 and the
                      corresponding line value (D2 and D3).
                      D1 = 00 indicates the bottom line of the card.
                      D1 = 01 indicates the clocking field at a graphic recorder and
                           the lowest clocking line at a standard recorder.

D2, D3 = XX: → Line height in mm, value given by the card format selected.
                      Accuracy: 1/10 mm.

Example: D1 = 01   D2 = 11   D3 = 0.0
                  → D1 = 1. line = clocking field
                  → D2 and D3 = line height of the clocking field = 110 mm

                  Units destined for North America are pre-programmed with bottom line = 26 mm, clocking field = 110mm (consequence of setting card format no. 29)

☞   The lines can be changed and the values checked by pressing "**E**".
      If you want to continue with the next menu item, press "**S**".

Column Change Timing

The symbol is indicated by the column pointer.

After number and dimensions of the columns and lines have been defined or selected with a standard card format , the time has to be entered from which on the clocking shall be printed in the corresponding column or line.

In this menu the column change timing is defined. You have to distinguish between:

- Standard recorder with one card lift/day
- Standard recorder with two card lifts/day
- Graphic recorder

Standard Recorder with One Card Lift per Day

With a standard recorder each weekday is printed into a separate line. The time values when to print in which column can differ from weekday to weekday.
Due to this, all column change timings have to be programmed for each weekday.

Proceeding	
1.	Select weekday with "**R**". The weekdays are indicated by the LED's. If the menu item "Column change timing" is selected, the first LED flashes. 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday 7 = Sunday
2.	Confirm weekday with "**E**". The LED lights permanently.

3.	`01 07 00`
	D1 D2 D3
		Select **hour** with "**R**".
		
		Definition:
		D1 = column, 01 = 1. clocking column
		    The number of columns depends on the card format selected/defined.
		D2 = hours
		    Value range: 00 - 23; --
		
		☞ If "--" is selected, all time values for this day will be erased.

		Confirm hour with "**E**". ☞ If the field D2 is programmed with "--", this column is defined as manual column for the current day. If a clocking should be printed into this column, the column must selected manually (position key).
	`01 07 00` D1 D2 D3	Select **minutes** with "**R**". D3 = minutes Value range: 00 - 59
		Confirm minutes with "**E**".
4.	`02 11 00` D1 D2 D3	Repeat step 3 for the remaining clocking columns and their timing.
5.		After the last column value has been entered, press "**S**".
6.	1 2 3 4 5 6 7 ○ ● ○ ○ ○ ○ ○	Select next weekday with "**R**".
7.	1 2 3 4 5 6 7 ○ ● ○ ○ ○ ○ ○	Confirm weekday with "**E**". The LED lights permanently.

8.	`01 07 00`
	D1 D2 D3
		Repeat steps 3 to 7 for the remaining weekdays and their timing .
		☞ If the time values for the column changes have already been programmed and you only want to change a single value of a certain weekday you need not to advance through all weekdays.
		    1. Select desired weekday with "**R**".
		    2. Confirm weekday with "**E**" - first column value is displayed.
		    3. Press "**E**" until column with the value to be changed is displayed.

		4. Enter new time with "**R**".
		5. Quit setting by pressing "**S**" and select next weekday or continue as described under step 9.
9.		Quit menu "Column change timing" with "**S**" and switch to next menu item "Card lift timing".
		☞ When time values are entered for the first time respectively after a reset, all values have to be entered for each weekday before the menu can be left. The times of the previous day are offered as default values for the following day. When last time value has been entered, the menu can be left with "**S**".

Standard Recorder with Two Card Lifts per Day

If two daily card lifts shall be made, each day is arranged in two lines, e.g. all clockings in the morning are printed in the first line and all clockings in the afternoon are printed in the second line. See separate card catalogue, card format no. 06.

The timing for the first line has to be programmed first, then the timing for the second line. The distinction between first and second line is displayed in field D1.

D1 =   Line / Column
       1̲1 = first line of weekday (left digit)
           and
       1 1̲ = first clocking column (right digit)

The number of columns depends on the card format selected/defined. With every confirmation with key "**E**" the column counter will be increased automatically. After the last clocking column of the first line the displayed value of field D1 changes to the second line of the clocking day.
→ D1 = 21 = second line / first column.
The values for the second line can now be entered.

The programming of the values is identical to proceeding "standard recorder with one card lift per day".

Graphic Recorder

As a graphical card is not separated in IN- and OUT-clocking columns, but the days of a period are arranged horizontally, only one column change per day has to be executed. Only one column change timing per weekday has to be defined.

If a time value differing from $00{:}^{00}$.h is programmed, e.g. $00{:}^{30}$ h, bookings can be printed in the column of the previous day. So shifts which overlap the day-end can be printed in one column.

Programming of the time values is identical with proceeding "Standard recorder with one card lift".

Units destined for North America are pre-programmed with column change = 00:00 h for each weekday.

Card Lift / Line Change Timing

The symbol is indicated by the column pointer.

After the column change timing has been programmed in the last menu item, the card lift timing has to be programmed in this menu.
You have to distinguish between:

• Standard recorder

• Graphic recorder with leaping imprint
See menu item "Card specific parameters - Type of recorder - Graphic recorder".

• Graphic recorder with creeping imprint
See menu item "Card specific parameters - Type or recorder -Graphic recorder".

Standard Recorder

With standard recorders only one card lift per day is executed. Exception is a standard recorder with 2 card lifts per day.
The time value for the second column change has already been programmed in the menu "Column change - Standard recorder with two card lifts/day".

In this menu the timing for a column change from weekday to weekday has to be programmed.

If another time value than 00:^{00} h, e.g. 1:^{30} h, is programmed the clocking is printed in the line of the previous day. So shifts, overlapping the day-end can be printed in the same line.

The programming is identical with the proceeding "Column change timing - standard recorder with one card lift per day".
D1 = Present line $\rightarrow$ line counter is increasing automatically
D2 = Hours
D3 = Minutes

Graphic Recorder with Leaping Imprint

If a graphic recorder with leaping imprint has been selected, all card lift timings for each line have to be programmed. The timing from which the print should be started for the corresponding line must be determined.
The leaping imprint is used if certain periods, e.g. breaks, shall be shown clearly arranged.
The number of lines is pre-set by the line height (imprint field) selected in the menu "Card lift timing" and the print format (character dimensions) defined in the menu "Imprint".

The timing for the first (upper) line must be entered first. The number of this line is the total number of lines.
If not all lines possible have an individual timing, instead of the time value you can enter "--". There will be no clocking in a line defined with "--".

Conditions:

1.   Menu "Card specific parameters" $\rightarrow$ Type of recorder = 03
2.   Menu "Imprint" $\rightarrow$ Print format selected or freely defined.
                                                                Line height is always 3,5 mm, except the
                                                                complete imprint is defined 5x7 points,
                                                                centred. The line height then is 2,8 mm.
3.   Menu "Card lift timing" $\rightarrow$ Number of lines (imprint field) is defined.
                                                                Pre-set with standard cards.

Example:
         - Graphic card
         - Line height = 3,5 mm
         - Imprint field = 110 mm

For the determination of the number of lines the recorder divides the imprint field by the line height. The result of the division always is rounded off to the full decimal.

         $\rightarrow$ Number of lines = 31

Programming of the time values is the same as with standard recorders. The field D1 shows the line, in field D2 the hours have to be entered and in field D3 the minutes. You have to start with line 31 in descending order. The programming on the imprint field is from top to bottom.

The following example shows the programmed time values of the first weekday. The entered values are valid for all following weekdays.

		1	2	3	4	5	6	7	
			Name					Page	**1**

The diagram shows a time card with the following structure:

Head of the card
- Nr
- Name
- Page: 1
- Month:
- Target Hours:
- Remarks:

Imprint field (Height = 110 mm)

Columns numbered 1 through 7.

	Time	Label
Line 31	18:01	Punching OUT late
Line 30	16:30	Flexible time OUT
Line 29	16:00	
Line 28	15:40	
	15:20	Coretime
	15:00	
	14:40	
	14:20	
	14:00	
	13:30	
	13:15	
	13:00	
	12:45	
	12:30	Lunch break
	12:15	
	12:00	
	11:45	
	11:30	
	11:01	
	10:41	
	10:21	
	10:01	
	09:41	Coretime
	09:21	
	09:01	
	08:41	
	08:21	
Line 3	08:01	
Line 2	07:00	Flexible time IN
Line 1	06:00	Punching IN early

Bottom line

M								M
A								A
-								-
Tot								Tot

Graphic Recorder with Creeping Imprint

Only two time values per day must be programmed if a graphic recorder with creeping imprint has been selected.

With ascending imprint:
→   Time value for the start position of the card lift in the lower imprint field.
→   Time value for the end position of the card lift in the upper imprint field.

With descending imprint:
→   Time value for the start position of the card lift in the upper imprint field.
→   Time value for the end position of the card lift in the lower imprint field.

The position for any clocking between the two values is defined by the recorder automatically (with creeping imprint).
Any clocking beyond the time range defined will be printed in the same height as start or end position.

The programming is identical to the proceeding "Column change timing - standard recorder with one card lift per day".
D1 =   imprint field → the counter is increasing automatically
        00 = lower imprint field
        01 = upper imprint field
        By selection of descending imprint values for field D1 = 01 must be first entered, values for field D1 = 00 next.
D2 = Hours
D3 = Minutes

On graphic recorders the programmed values are valid for all weekdays. Entries for each weekday via the LED-panel are not required with graphic recorders.

Units destined for North America are pre-programmed with upper imprint field = 01:00 h, lower imprint field = 23:00 h.

Ribbon Colour Change

The symbol is indicated by the column pointer

The recorder offers the possibility to change between black and red imprint.
In this menu the point of time is programmed when the ribbon colour change shall be executed.
These time values must be programmed for all weekdays. Up to 8 time values per weekday can be programmed in any order. The values will automatically be ordered chronologically by the recorder.
The colour set remains active until another ribbon colour change is executed according to the time value programmed.

Example:
Monday   → Time 7:01 h for red ribbon.
same day   → Time 17:01 h for black ribbon.

As result of this setting all clockings between 07:01 h and 17:00 h will be printed in red, the clockings between 17:01 h and 07:00 h the next day in black.
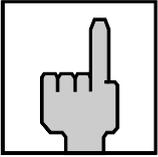
| | **Hint**
| | Two identical time values for one weekday (e.g. 17:00h for black and red imprint) cannot be programmed, that means that "E" or "S" can not be pressed to switch to the next item .

If no ribbon colour change is programmed, all clockings will be printed in black as this colour is pre-programmed for the printer ex factory.

The programming is identical to the proceeding "Column change timing - standard recorder with one card lift per day".

D1 = ribbon colour
        01 = black
        02 = red
        - - = erase time value
D2 = Hours
D3 = Minutes

Change or Erase Values for Ribbon Colour Change

All time values programmed can be changed at any time. Proceed as described on this page.

Proceeding

1. Call up programming routine (key "**R**").

2. Select menu "Ribbon colour change" (key "**S**").

3. Select weekday with time value(s) to be Changed (key "**R**").

4. Select time value to be Changed (advance with key "**E**").

5. Change time value (key "**R**").
   To Change further values on this weekday repeat steps 4 and 5.

6. Quit time entry for this weekday (key "**S**").
   To Change further values on other weekdays, repeat steps 3 to 6..

7. Quit menu "Ribbon colour change" (key "**S**").

8. Quit programming mode (advance to the end of the menu symbols with "**S**")
   → Current date is displayed.

If you want to erase any value of a weekday, proceed as described in above proceeding. To erase the value displayed, enter "--" in field D1. Confirm with "**E**". Now the next programmed value is displayed.

Example:

    01 06.30 h
    02 08.01 h
    01 11:30 h
    02 14:01 h
    01 16.00 h
    . . . and so on.

If you want to erase the value 02 08 01h, the next value displayed is: 01 11 30h. Now the submenu can be left as described or further values can be entered or erased. See proceeding on the previous pages.

Signal Operation

The item signal operation contains two functions: signal circuit and check of individuals.

The PERFECT time recorder is provided with a low power signal output for the controlling of an external relay. To this external relay it is possible to connect an external signal device.

If the unit is provided with the function check of individuals, the function signal circuit is no longer available. See section "check of individuals".

Each function of menu "Signal operation" is divided into 2 parts and each part has its own menu symbol:

- signal times for the signal circuit / check of individuals

- signal out-programming

In the menu item "Signal times", the times for signals on a weekday are programmed. To switch off the signal for a longer period, you can define this period in the menu "Signal out-programming".

Signal Times

The symbol is indicated by the column pointer.

External signal devices, e.g. a horn for the organisation of breaks or the plant illumination can be switched on and off at defined times by the programming of signal circuit.

Contrary to the check of individuals the signal circuit works person-independent, that means the release of the signal completely takes place according to defined time intervals.

The settings for signal time and duration for the signal circuit can be determined separately for each weekday, same as in the menu "Ribbon colour change".

Up to 16 signal times can be programmed per weekday,

If no times are entered for one weekday, e.g. on Saturday or Sunday there will be no signal in the corresponding day.

The programming is identical to the proceeding "Column change timing - standard recorder with one card lift per day".

D1 = signal duration in seconds
     - - = the belonging time value will be erased
D2 = Hours
D3 = Minutes

Change or Erase Signal Times

All time values programmed can be changed or erased at any time. Details to the following proceeding can be find in the previous proceeding.

Proceeding

1.   Call up programming routine (key "**R**").

2.   Select menu "Signal times" (key "**S**").

3.   Select weekday with values to be changed (key "**R**").

4.   Select value to be changed (advance with "**E**").

5.   Change signal duration and/or signal time (key "**R**").
    To change further values on the same weekday repeat steps 4 and 5.

6.   Quit entry for this weekday (key "**S**").
    To change any values on other weekdays repeat steps 3 to 6.

7.   Quit menu "Signal times" (key "**S**").

8.   Quit programming mode (advance to the end of the menu symbols with "**S**").
    → Current date is displayed.

If you want to erase single values of a weekday, proceed as described above. To erase the time value displayed, select " "--" with "**R** in the field D1. Confirm with "**E**". Now the next time value programmed is displayed.

Example:

> 04 09:00 Hr
> **08 09:15 Hr**
> 04 12:00 Hr
> 08 13:30 Hr
> . . . and so on.

If the value "08 09 15" is erased, the next value "04 12 00" will be displayed.
Now the menu can be left as described above or new time values can be entered.
See proceeding on the previous pages.

Signal Out-Programming

The symbol which is marked by the column pointer.

The time values programmed in the menu "Signal times" are valid for the entire year.
In the menu "Signal out-programming" time periods can be defined in which the
signal shall be switched off automatically, e.g. holidays, bank holiday, etc.
The dates to switch on and off the signal must be programmed. If the signal shall
only be switched off for one single day, it is enough to program the date the signal is
switched off. If no date to switch on the signal is programmed, the signal will be
switched on the following day.
Up to 16 dates can be programmed.
A programmed date can be changed or erased at any time. The dates can be
entered in any order, it is not necessary to order the dates chronologically. But the
date to switch off the signal must be followed by the date to switch on. All dates will
be ordered chronologically by the recorder.

The programming is identical to the proceeding "Column change timing - standard
recorder with one card lift per day". However, it is not necessary to select the
individual weekdays.

D1 = 00 = Signal off
       01 = Signal on
       - - = the belonging time value will be erased
D2 = date day
D3 = date month

☞   After confirming the **last** date input with key "**S**" the programming of the
       recorder is finished. After a short time the date of the day will be displayed at
       the recorder and the column pointer points at the current clocking column.

Change or Erase Signal Out-Programming

The date values programmed can be changed or erased at any time. Details to the following proceeding can be find in the previous proceeding.

Proceeding

1. Call up programming routine (key "**R**").

2. Select menu "Signal out-programming" (key "**S**").
→ The first date (chronologically ordered) is displayed.

3. Select date with value to be changed (advance with key "**E**").

4. Change criterion on/off and/or date (key "**R**" and "**E**").
To change further values repeat steps 3 and 4.

5. Quit entry and menu (key "**S**").
Programming mode is left.
→ Current date is displayed.

If you want to erase single values, proceed as described on this page. To erase the value displayed, select "--" in the field D1 with the key "**R**". Confirm "--" with "**E**". The next value (if programmed) is displayed.

Example:

```
00  01.01
01  06.01
00  24.12
01  31.12
and so on
```

If the value "01 06 01" is erased, the next "00 24 12" is displayed.
Now the menu can be left as described above or new values can be entered.
See proceeding on the previous pages.

Quit Programming Mode

The programming mode is left automatically when the last menu item "Signal out-programming" has been quitted with "**S**". The recorder executes an adjustment after which the recorder has accepted the programmed values.

When the adjustment has finished after some seconds, the analogue clock will be synchronised automatically with the internal quartz clock. During this synchronisation the current time is displayed.
When synchronisation has finished , check the time of the analogue clock.
If the clock shows the wrong time, you have to set the time of the internal quartz clock. See the description "Set date and time" at the beginning of this chapter.
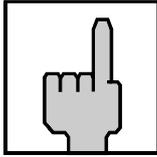
After the recorder has been adjusted to the new parameters and the analogue clock has been synchronised, the current date is displayed.
Make a sample clocking with one of your time card and compare the time printed on the time card with the time of the analogue clock. If the time on your time card differs from the time of the analogue clock, the synchronisation must be repeated. See in section "Set date and time - Synchronise analogue clock" at the beginning of this chapter.

If you wan to print out all parameter values, you can start now. Insert a protocol card and proceed as if you would program your recorder by calling-up the programming routine. Proceed further as described under the topic "Print out all parameters programmed" in this chapter.

On the following pages a complete protocol report with all explanations is printed. This is only an example. The values of your protocol report may differ from the values in this manual, but the dimensions and formats are identical.

Example of a protocol report

front
Menu Card specific parameters - menu Card lift

Protocol display	Label
▦	**Menu Card specific parameters**
01	Card format
01 07 06 16	(from left to right) type of recorder/period duration/ number of columns/number of lines
⏷	**Menu Imprint**
Ξ12:03	Print format
A1	Number freely defined, f.e. Machine number
MO DI MI DO FR SA SO	Weekdays freely defined (Example)
⋈	**Menu Column change**
007.0 012.0 012.0 012.0 012.0 012.0 012.0	Clocking column width (in mm) 1. value = card edge
⚒	**Menu Card lift**
023.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0 006.0	Line height (in mm) of clocking lines 1. value = bottom line
⏱⋈ 1 2 3 4 5 6 7	**Menu Column change timing**
07:00 07:00 07:00 07:00 07:00 07:00 07:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00 13:00 13:00 13:00 13:00 13:00 13:00 13:00 16:00 16:00 16:00 16:00 16:00 16:00 16:00 --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:-- --:--	Time values per weekday from 1 = Monday to 7 = Sunday
⏱⚒	**Menu Card lift timing**
00:00 00:00 00:00 00:00 00:00 00:00 00:00	Time values per weekday

Back
Menu Ribbon colour change - Menu Signal out-programming

Menu Ribbon colour change

Timing per weekday
01 = black
02 = red

Menu Signal times

Signal times per weekday
with signal duration in seconds

Menu Signal out-programming

Signal out periods during the year
01 = Signal on
00 = Signal off

Set Options

The options available for the recorder are installed on the recorder CPU with so-called option modules. These option modules are plugged onto the PC-board. In chapter 3 "Installation - Recorder installation" all option modules are shown in fig.7.

All options installed in the recorder have to be released via the option setting routine. This routine can be started when the recorder is switched on and the key "**R**" is pressed simultaneously until column change and card lift adjustment is finished. The options available and their status can be defined.
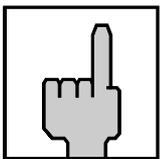
Hint	The option "Check of individuals" cannot be released via this routine. See paragraph "Check of individuals" on the following pages.

Proceeding	
1.	Switch recorder off.
2.	Keep "**R**" pressed and switch recorder on. Keep "**R**" pressed until synchronisation of the analogue clock has finished.
3. D1 D2 D3	Select status with "**R**", field D3. Definition: D1 = 01 = slave clock function = 02 = DCF-connection = 03 = Standby operation = 04 = Master clock function = 05 = Card face control D3 = 00 = Option disabled = 01 = Option enabled Value range: 00 - 01
4.	Confirm setting with "**E**". Recorder switches to next option.
5.	Repeat steps 3 and 4 for further options. ☞ If master clock function is released, continue with step 6. ☞ If the master clock function is blocked, the recorder returns to normal operation after the last digit has been confirmed with "**E**". Current date is displayed.

If the recorder is provided with the option "MASTER CLOCK" and if this option is released, code 04 01, the type of impulse for the slave clocks has to be entered. Both types of impulses, unipolar and bipolar, can be used.
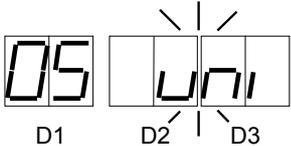
6.	`05 uni` D1 D2 D3	**Slave clocks** Select type of impulse with "**R**", field D2/D3. Definition: D1 = 05 = type of impulse for slave clocks D2/D3 = uni = unipolar slave clocks = bi = bipolar slave clocks
7.		Confirm setting with "**E**". ☞ Recorder returns to normal operation. Current date is displayed.

Check of Individuals

The symbol   is indicated by the column pointer.

The option check of individuals will be pre-set ex factory.
This option can only be installed later if the complete CPU-board is changed.
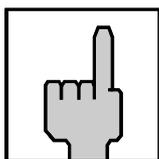
Hint
The functions signal times and check of individuals exclude each other. Both functions use the same circuit on the recorder CPU.

External signal devices, e.g. horn, lamp are switched on to defined times. These signal devices are controlled by a random number generator.
The percentage programmed is basis for the random number generator to activate the signal devices according to an internal selection procedure.

If the value "00" is entered, the function "Check of individuals" can be switched off completely.

Programming the percentage for "Check of individuals" replaces the menu "Signal times" with same menu symbol. If the menu "Ribbon colour change" is left, the value for the check of individuals can be programmed immediately.
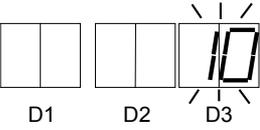
Proceeding		
1.	D1 D2 D3	Enter percentage with "**R**". Definition: D3 = percentage = 00 = block option check of individuals Value range: 00 - 99
2.		Confirm with "**E**".
3.		Continue with "**S**". Next menu item "Signal out-programming".

DCF-connection

This option can be released if the option module "DCF" has been built in and if an external DCF-receiver has been installed.
How this option can be released in the recorder, please read section "Set options" on the previous pages.

Hint
The functions DCF-connection and Slave clock exclude each other as both functions use the same circuit on the option module and on the PC-board.

When the option DCF-connection is released, the connection input will be scanned permanently on the option module. If a signal is received, the decimal point of the current date flashes in the display.
We recommend to use this flashing decimal point in the display to find out the best place for the DCF-antenna.

Slave clock function

The "slave clock function" can be released if the option module "POLA" has been built in and if an external master clock has been installed.
How this option can be released in the recorder, please see section "Set options" on the previous pages .
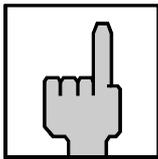
Hint
The functions DCF-connection and Slave clock exclude each other as both functions use the same circuit on the option module and on the PC-board.

A real POLA-operation is not possible with the PERFECT as slave clock. The POLA-signal is only used to synchronise the internal quartz clock, i.e. the clock is set to 00 seconds with every POLA-impulse.
During a power failure, the internal quartz clock is operating.

Standby Operation

This option can be released if the battery pack has been installed. How this option can be released in the recorder, please read in this chapter on the previous pages "Set options".

With this option, the time recorder will print up to 300 registrations over a power outage period of 24 hours.
If the recorder is provided with the option DCF-connection as well, the recorder changes from DCF-connection to the internal quartz clock in standby operation.

Master Clock

This option can be released if the option module "MASTER CLOCK" has been built in and if the external slave clocks have been connected. How this option can be released in the recorder, see section "Set options" on the previous pages . The slave clocks are also defined in the routine to release this option.
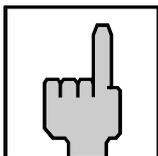
Hint
The function MASTER CLOCK can be combined with DCF or POLA.

If the recorder is provided with the option "MASTER CLOCK", all slave clocks have to be synchronised.

The slave clocks will be synchronised after the menu "Set Date/Time" has been selected. Make sure that bipolar slave clocks switch with the same polarity.
The polarity of the slave clocks can be found out by sending single impulses from the recorder. Any slave clock which does not switch synchronous has the wrong polarity. Turn the connection of this slave clock.

If all slave clocks switch synchronous, you must set all slave clocks to the same time manually. This time must be entered at the recorder. After the entry has been finished, all slave clocks will be synchronised with the time of the recorder.
Clocking is possible while slave clocks are synchronised.

As the recorder operates in a 12 h mode, only slave clocks with analogue dials can be used. When the change-over from Summer- to normaltime is executed by 1 h, the slave clocks need not to be set back 11 hours. The slave clocks will not receive any pulses until the master clock has the same time as the slave clocks.
A built-in current limit ensures that there will be no damage to the recorder in case of short circuit or overload at the slave clock output.

Proceeding	
1.	Call up "Set date/time" with "**E**". → see at the beginning of this chapter "Set date and time"
2.	Set date and time. ☞ If the current time/time is set → confirm with "**E**". ☞ After the last digit of the date entry ("year") has been confirmed with "**E**", the recorder switches to the slave clock synchronisation.
3.	Set slave clocks manually to same time
4. D1 D2 D3	Send single impulse to the slave clocks with "**R**". Definition: D1 = Slave clock synchronisation D3 = 1 = positive impulse = 0 = negative impulse Positive / negative impulse change after the key "**R**" is pressed.
5.	Make sure that all slave clocks will switch at even and uneven minutes with each single impulse. ☞ Turn connection of those slave clocks which have the wrong polarity.
6.	If the slave clocks operate synchronous, confirm with "**E**".
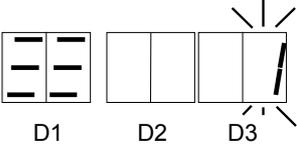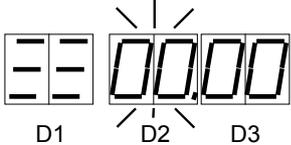
7.		Enter time of slave clocks at the recorder with "**R**".
		D2 = hours D3 = minutes
		Confirm hours with "**E**". Enter minutes with "**R**".
8.		Confirm minutes with "**E**".

If the entry has been confirmed with "**E**", all slave clocks will be synchronised automatically to the current time of the master clock.
This synchronisation can last a few seconds. The recorder returns immediately to normal operation after synchronisation is finished. Clocking is possible while slave clocks are synchronised. In standby operation the slave clocks are not supplied.

Card Face Control

If the card face control device is installed, also the function has to be enabled in the unit. See section "Set Options". The card face control prevents from punching on the wrong card side

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Commissioning after power failure

The recorder need not be programmed after a power failure. Normal operation is possible when power returns.

All parameter values and settings are stored in the recorder. These values are not erased by a power failure. Current time and date are also stored due to power reserve of the recorder. The analogue clock will be synchronised automatically when power returns.

If the power failure lasted for a longer period, the synchronisation of the analogue clock with the internal quartz clock can take some longer time.

Programming via PC

To program the recorder via PC, the program "P2020" and the connection cable between recorder and PC are required.

Supply: -3,5 " diskette
               - connection cable

Programming the recorder via PC is the most elegant and easiest way to adjust the recorder to any customer setting. While you are programming the recorder via PC, the program "P2020" offers you a help function for each menu item. With the function key F1 information concerning the programming can be inquired.

Different ways of programming are possible:

- Connect recorder with the PC, execute programming at the PC and transfer values to the recorder.

- Program all values on the PC without the recorder being connected, save values in the PC and transfer the values to the recorder later.

General Conditions for the Program "P2020"

- IBM-compatible PC, XT/AT and higher
  with a pulse rate of not more than 133 Mhz.

- Operating system MS-DOS, Version 3.1 and higher,
  or DR-DOS, Version 4.0 and higher.

- 640 KB conventional memory.
  $\rightarrow$ memory needed: approx. 150 KB

- Approx. 200 KB free memory on harddisk/diskette.

- Standard screen interface monochrome or colour.

- Printer to print out all parameter values programmed.

Installation of the Program "P2020"

Make a duplicate of the program diskette.

If your PC is provided with a harddisk, we recommend to copy the complete program "P2020" together with the help file from diskette on harddisk. Create a subdirectory, e.g. *PERFECT*, and copy the program with the command "*copy*" into this subdirectory.
More information about the command "copy" and "create a subdirectory", you can find in the manual for your operating system.

If you want to transfer the values programmed immediately to the recorder, you have to install the connection cable.
The cable must be plugged into a free serial interface, e.g. COM 1 or COM 2. The cable can also be plugged into COM 3 or COM 4.

Open the recorder and switch it off. Connect the cable with the rack-and-panel, plug X4 of the recorder CPU. The plug is coded and cannot be connected wrong. Switch recorder on.

Start the program out of the subdirectory with the command:

C:\>**P2020**

and press enter.
The info-window appears on the screen. The info-window contains further information about program version no. with language and manufacturer address. Press any key on the PC-Keyboard to get into the main menu.
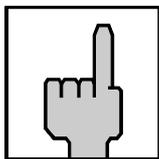
Hint
If the cable has been plugged into another serial interface than COM 1, the number of the serial interface has to be added with a blank space. For example: Cable is plugged into COM 2, command: P2020 2.

The program can be interrupted with "ESC". Values that have been programmed will not be stored.

Programming

The screen is divided into 3 sections: headline, working area and bottom line. In the headline, the current file name is displayed. If no file has been loaded, the name *"NONAME.PAR"* is displayed. The bottom line shows all commands for programming according to the menu.

The main menu contains following functions:

Options   → All options can be released (if installed). See product manual chapter 4 "Set options".

Upload   → Loading the current parameter values from the recorder to the PC. Connection recorder to PC is necessary.
If this function is selected without cable connection, after a short time the following error message will be displayed: "Transmission error!!!".

Download   → Transferring the current parameter values from the load file to the recorder. Connection recorder to PC necessary.
If this function is selected without cable connection, after a short time the following error message will be displayed: "Transmission error!!!".

Save   → Saving the current settings and values on harddisk or diskette. A file name has to be entered and, if necessary, the corresponding directory. The file name must have to extension ".PAR". This extension is added automatically by the recorder, if you have not entered it.

Load   → Loading a file from harddisk or diskette which contains certain parameter values and settings programmed.

New   → Standardises the loaded programming/file and sets the parameter values for national identification, card specific parameters and card format to the default values 01.
All other parameter values and settings will be erased.

Print   → The current parameter values and settings are printed out on the printer connected.

Edit   → Programming the recorder.
All parameters, according to the symbols on the recorder can be selected in this menu. See product manual, chapter 4 "Programming".

The functions of the main menu can be selected with the keys "Page↑" and "Page↓" and must be confirmed with enter. To program the parameter values in the edit menu, the keys displayed in the bottom line can be used. With the key "ESC" each submenu/program window is closed.

Attention!
Before you quit the programming, save all parameter values with the function "Save".

Chapter 5

Operation

Punching at the Recorder

Time Card Handling

With all models of time recorder, the card side on which the clock punch is to be printed must be facing towards the user.

1. Insert the time card into the card funnel until the card comes to a stop. Wait for the time recorder to finish printing.

2. Remove card from the time recorder.

If your company uses both sides of the time card, the employees must ensure that they are punching on the correct side of the time card to prevent the over-printing of punches.
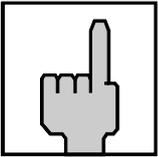
Hint
Do not pull the time card out of the time recorder while it is printing. This could cause the printing on the time card to be unreadable.

Requirements for Trouble Free Time Recording

- Always store time cards in a dry place. Humidity can cause the time cards to expand so that they will not fit into the time recorder.

- Keep the time cards in good condition and avoid mishandling damage, such as corner bending, folding, and tearing.

- Protect time cards against contamination from such as dirt, dust, and oil.

- Do not expose time cards to direct sunlight.

- Keep new and used time cards in the card box in which they were supplied. .

- Due to tolerances in the printing of the time cards, the position of the print may be changed. Therefore check the printing on the time card from time to time, and if necessary, adjust the print position by means of the stored adjustment routine.

- Have your time recorder serviced once a year by your local dealer.

Standard Recorder

IN- and OUT-clockings will be printed in separated columns. The clocking columns can be selected manually with the position key or automatically by the recorder according to the parameter setting. The column change for e.g. overtime, interruptions cannot be programmed and must be selected with the position key.

Clocking with Manual Column Selection

The clocking columns IN/OUT can be selected with the position key. The current clocking column is marked by the column pointer with funnel shield in the pointer field. The printer head advances to the next clocking column with each pressing of the position key. The column pointer advances from left to right.
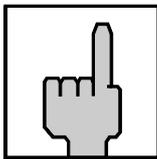
Hint
The position key is only for column selection and not for print release. If the right clocking column is already marked, you need not press the position key.
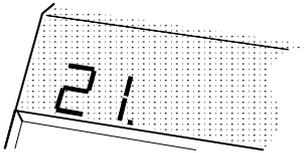
Proceeding		
1.		**Current date** is displayed. ☞ The current date must correspond to the clocking line on the time card, e.g. here line 21.
2.		Position of the **column pointer**. ☞ Does the column pointer mark the right clocking column?
3.		Select clocking column with **position key**. ☞ Press position key so often until the desired clocking is marked.
4.		Insert card into card funnel. Press card slightly down until clocking is released.
5.		Remove card from recorder.
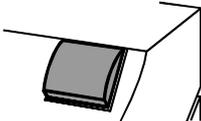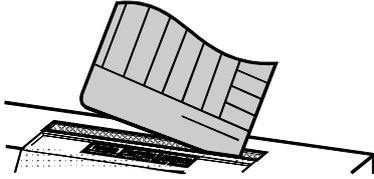
Clocking with Automatic Column Selection

If times for the column changes have been programmed, it is not necessary to select the clocking column with the position key.
But the position key is still active. If, for example, the clocking shall be printed in a column different from the column marked by the column pointer, this column can be selected with the position key.
When the clocking has been printed, the column pointer switches back to the "automatic column".

If the clocking column is selected manually and no clocking is executed, the column pointer switches back to the automatic column after about 3 seconds.
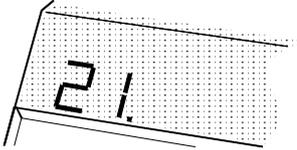
Proceeding		
1.		**Current date** is displayed. ☞ The date displayed must correspond with the clocking line on the time card, e.g. here line 21.
2.		Insert card into card funnel. Press card slightly down until clocking is released.
3.		Remove card from recorder.
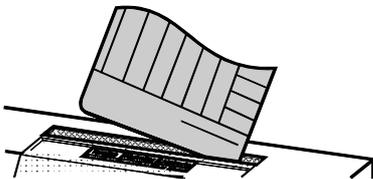
Clocking with Mixed Column Selection

The recorder is often programmed with mixed column selection. The first columns for the IN- and OUT-clockings in the morning and in the afternoon are defined as automatic columns, the other columns are defined as manual columns. In these manual columns extra times, e.g. overtime, interruptions, etc. are printed.
If a clocking column is selected manually with the position key, the column pointer switches back to the current automatic column after the clocking has been printed. If no clocking is executed, the column pointer switches back to the automatic column after about 3 seconds.
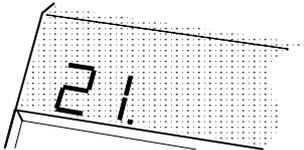
Proceeding	
1.	**Current date** is displayed. ☞ The current date must correspond with the clocking line on the time card, e.g. here line 21.
	☞ Do you want to book an extra time? → Manual selection, continue with step 2. ☞ Do you want to execute an IN- or OUT-clocking? → Automatic selection, continue with step 3.
2.	Select clocking column with **position key**. ☞ Press position key so often until desired clocking column is marked.
3.	Insert card into card funnel. Press card slightly down until clocking is released.
4.	Remove card from recorder. ☞ With manual selection, the position key switches back to the automatic column.
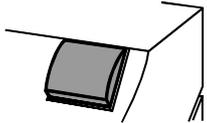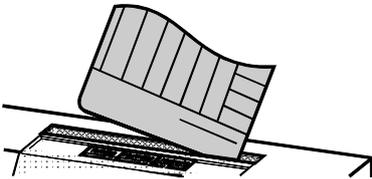
Graphic Recorder

There is no distinction between automatic and manual column selection if a graphic recorder is used. The column change is controlled by a time-program and is, in general, executed once a day.

There is no special separation between IN- and OUT-clockings and extra time if graphical cards are used. All clockings of one day are printed in the same vertical column. The column change is executed automatically by the recorder.

Contrary to the standard recorder the funnel shield shows the date of the period duration programmed. In normal operation the current date on the display must correspond with the date on the funnel shield marked by the column pointer.

Possible imprints with graphical cards:

- creeping imprint with start position at the bottom.

- creeping imprint with start position at the top.

- leaping imprint with start position at the bottom.

- leaping imprint with start position at the top.

The start position always refers to the first clocking of a day. More details and information about print formats with graphical cards can be found in chapter 4 "Commissioning - Programming - Card specific parameters".
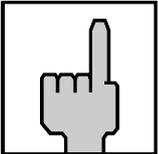
Hint
The position key need not be used at a graphic recorder. The clocking cannot be released with this key!
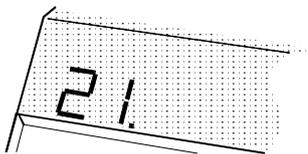
Proceeding		
1.		**Current date** is displayed. ☞ The current date must correspond with the clocking column on the time card, e.g. here column 21. If the card side is full, please turn card or use a new one.
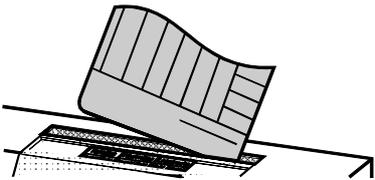
2.		Insert card into card funnel. Push card slightly down until clocking is released.
3.		Remove card from recorder.

Standby Operation

In order to maintain the normal operation during power failure the time recorder must be provided with a standby battery pack for the printer head.

With this option, the time recorder will print up to 300 registrations over a power outage period of 24 hours.
If the recorder is provided with DCF-connection, the DCF-connections will be switched off and the time of the analogue clock is set according to the internal quartz clock. If the unit is used as master clock, all slave clocks will be provided with impulses.

In case of power failure, the time recorder switches automatically to standby operation. Standby operation is indicated by a flashing line in the right segment of the digital display.
To save battery capacity all sub-functions, e.g. adjustment, programming, test runs etc. will be disabled. Ribbon changing can be done while the time recorder is in standby power mode.

Automatic column changes will be still executed if times for this function have been programmed.

See on the previous pages under the topic "Clocking at the Recorder".

Save Values

All parameter values programmed in the recorder can be saved on external data mediums.

Save values via PC

All values programmed in the recorder can be saved on harddisk/diskette with the function "Upload" in the Main Menu of the program "P2020".

To save the parameter values of the recorder, the connection cable between unit and PC has to be installed.
The PC device has to be plugged into terminal X4 on the recorder-CPU.
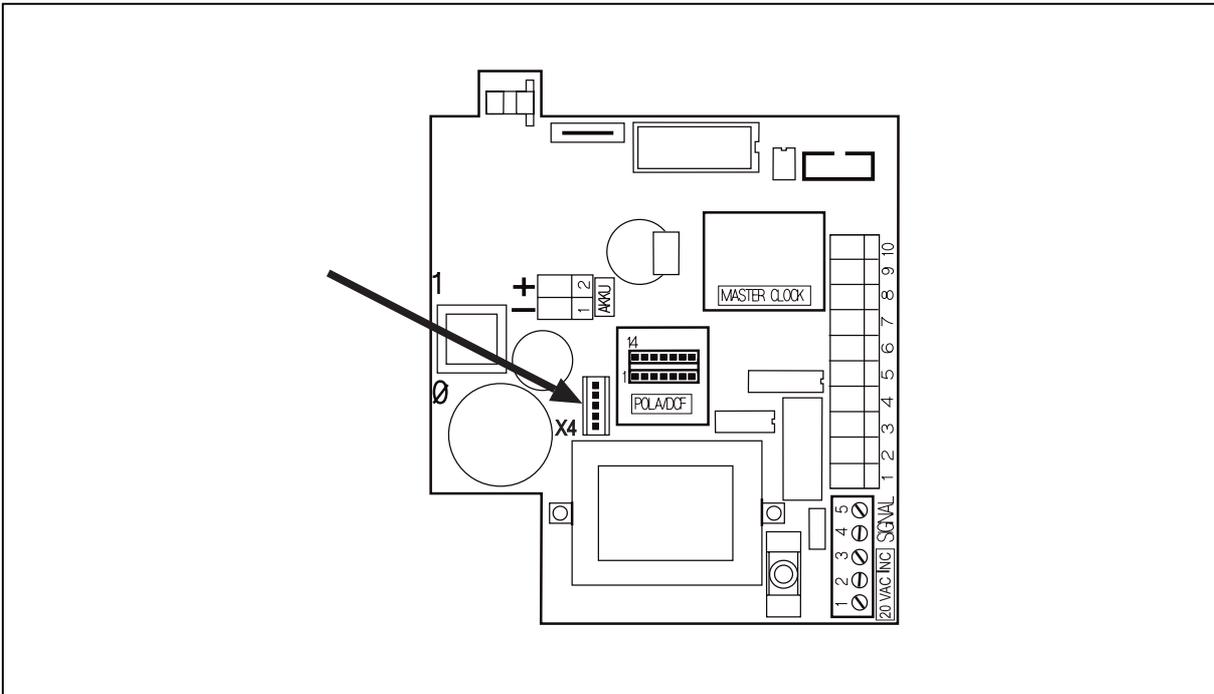
Fig. 18: Recorder-CPU with terminal X4

Chapter 6

Trouble Shooting

Error Messages

Any error at the time recorder is indicated by a combination on the display. If the problem cannot be solved, please contact your local dealer or e-mail us at:

www.service@isgustime.com

To avoid any confusion with the date, all error messages begin with the letter E.

Display	Reason	What can be done
E 1	P-Module, Error in resident memory. → Punching at the recorder is no longer possible.	Switch unit off and on. If the error message is still displayed, the P-Module has to be changed. Save all data before. After change of the P-module a complete reset must be carried out. Load the saved data into the recorder. Error not corrected, change PC-board
E3	RTC-module, error in real time clock component. → Punching at the recorder is no longer possible.	Switch recorder off and on. If the error message is still displayed, first carry out a complete reset. Error not corrected, change PC-board. Do not change only the RTC-module as it is a SMD component.
E4	Error in synchronization of the card lift, mechanical error. → Punching at the recorder is no longer possible.	Switch recorder off and on. If the error message is still displayed check all components of the card lift for soiling and clean if necessary. All parts must be moveable smoothly. Check all parts for wear. If the transport spindle or the bottom line controller is defective, change the complete card lift unit. Check lines and connections and repair if necessary. Check step-motor and function and change if necessary.

Display	Reason	What can be done
`E5`	Printer head is blocked or moves too hard. → A piece of paper may be pinched in the card guide. → Soiling. → no ribbon transport.	Switch off recorder. Remove metal rear cover, swing-out programming panel and check card guide, clean and event. remove impurity. Switch on recorder. Check all mechanical parts of the printer control for soiling. Clean light barrier and cycle wheel of the printer motor. Check printer motor and parts of the printer drive for smooth operation, change printer motor if necessary. Check ribbon and ribbon transport. Ribbon may be twisted or pinched.
`E6`	Program error → can only happen when the recorder is switched on.	Switch recorder off and on. If the error messages is still displayed, the EPROM has to be changed. Error not corrected, change the complete PC-board. Reprogram the recorder after change of the PC-board.
`E7`	Wrong program. → An attempt was made to use an operating system PROM of a not-suitable type of recorder. e.g. from 2005 to 2015	Use the operating system which is suitable for the type of recorder.
`Er  10`	Data transmission error → Occurs only with connection to PC	Press "E". → A partial reset is carried out. Then repeat data transfer. → See also chapter "reset" on the following pages. Error not corrected check line connection from recorder to PC.

Reset

You have to distinguish between 2 different resets:

- Complete reset
- Partial reset

	Attention
	Before each reset the set values and parameters of the recorder must be saved via PC.

Complete reset

A complete reset can be compared with the first start of the recorder in the factory. The card format 01 is selected and all time values will be erased. Now all columns can be selected manually, the line change is executed daily at 00:00 h. Thus a test operation is possible.
Additional to the partial reset, the variable values of the real time clock component are set as follows:

Card lift / line change adjustment	= 50 for no change
Column change adjustment	= 50 for no change
Analogue clock	= 00:00

After the reset the synchronisation is started automatically, date and time have to be entered

	Attention
	Before each reset the set values and parameters of the recorder must be saved via PC.

Proceeding		
1.		Switch off recorder.
2.		Press **R, E and S** simultaneously and switch recorder on. Keep these keys pressed until synchronisation is finished.
3.	|/ |/|/ — — — — — — /\ /\ /\	During the reset is executed all centre lines flash.

After the reset has finished, date and time has to be entered. For time setting see chapter 4 "Getting Started - Date / Time". Entry of the saved data via PC back into the recorder. If necessary readjust the imprint of the recorder.

Partial-reset

A partial-reset can be executed during normal operation. Date, card lift adjustment, column change adjustment and analogue clock will not be altered.

The following parameters will be erased or set to default value:

Language identification	= 01
Daylight saving time change-over	= 01
Time card parameter	= 01
Type of recorder	= --
Period duration	= --
Number of column	= --
Number of lines	= --
Print format	= 01.
Column change	= --
Card lift / line change	= --
Times for column change	= --
Times for card lift	= --
Ribbon colour change	= --
Signal	= --
Signal out-programming	= --

Proceeding		
1.		Recorder is switched on. Press **R** and **E** and keep pressed. Press **S**. Keep all 3 keys for 1 sec. until the beginning of the reset is displayed.
2.	|/ |/|/ ⊟⊟ ⊟⊟⊟ /|\ /|\/|\	Start reset with **E**. ☞ Reset can be interrupted with **R** and **S**.
3.	|/ |/|/ ▬▬ ▬▬▬ /|\ /|\/|\	During the reset is executed all centre lines flash.
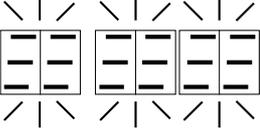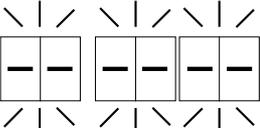
After reset has been finished, the recorder switches to normal operation. Current date is displayed. The saved parameters can be loaded back into the recorder.

Hardware test

The recorder is provided with special test routines to check different hardware modules and the function of them.

Display-, printer- and memory test

The test mode of the recorder is activated if the recorder is switched on and the key "E" is pressed simultaneously until the adjustment routine has finished. In this test mode the display, the printer and all the memories are checked.

When the test routine is started all the display elements are flashing. The card lift is set automatically for the print out of the test report. The test routine can be interrupted by pressing any key and is started as soon as a time card is inserted into the recorder.

In the printer test the word "DRUCKERTEST" and the numbers "0123456789" in the formats narrow, normal, double and bold are printed on the time card. To check the horizontal print position, 15 crosses are printed three times in the same line.
Now all the memories are checked. All the test results are printed on the time card.

Finally the test for the serial interface is performed. Therefore you have to connect the transmission conduction with the receiver conduction via the line adapter.

The line adapter build as a small circuit board is part of every supply with:

- Programming via PC

Before starting the test mode the circuit board has to be fixed to terminal X4 of the recorder CPU. The result is printed on the time card. If the line adapter is wrong positioned the message "NO CONNECTION" will be printed.

Attention!   The connection cable for programming via PC may not be plugged in during the hardware test.

Example of a hardware test:

```
DRUCKERTEST
0123456789
0123456789
0123456789
0123456789
+ + + + + + + + + + + +

SPEICHERTEST
RTCRAM    O.K.
RAM       O.K.
EEPROM    O.K.


RS232-TEST
RS232   O.K.
```

Test mode

The recorder is provided with a test mode where the internal clock is switched off and a month with 31 days can be advanced manually by a key. To start the test mode, please press "**R**" and then "**S**". Please keep both keys pressed for about 1 second.
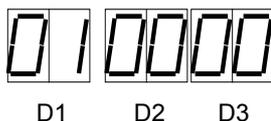
The time 00:00 and the current date 01 is displayed. The simulated month starts with a Monday. The current weekday is indicated by the LED's.

D1   D2   D3

With the key "**R**" the minutes and with "**E**" the weekday can be altered. If the key "**R**" is pressed for at least 1 second, the clock advances until another key is pressed. All card lifts and column changes are executed at the recorder. If a standard recorder is used, the column selection can be made manually. The print on the time card can be checked at any time selected.

The test mode is quitted with the same key combination as the start of the test mode.

PC-board

The PC-board of the recorder is a multilayer board in SMD-technique. The processor is on the rear side. The PC-board is connected with the rear panel by means of fixing screws at the mains transformer.

Fig. 19: PC-Board

(1)   X1   =   Terminal for power supply

(2)   X1   =   Terminal for signal operation
                 → floating contact: Contact, max. 250 V, 5 A

(3)   X3   =   Terminal step-motor for card lift adjustment
                 1 = yellow, 2 = red, 3 = orange, 4 = brown

(4)   X3   =   Terminal step-motor for printer spindle
                 5 = blue, 6 = red

(5)   X3   =   Terminal slide contact
                 7 = green, 8 = green

(6)   X3   =   Terminal card contact for print release
                 9 = black, 10 = black

(7)   X7   =   Interface operator board
                 Display, LED's, keys

(8)   Terminal for option module "MASTER CLOCK", master clock function,
        connected with X6.
        Output voltage 12 V, max. 50 mA, short-circuit proof

(9) B2 = Lithium battery
→ Buffering of time specific parameters, real time clock component,
Nominal voltage 3,3 V -5 %
If nominal voltage drops below 2,5 V,
change lithium battery. See position 13 "Test points".

(10) D4 = Operating system PROM
Pay attention to correct position when changing the EPROM. The
notch must point to the right side. See illustration.

(11) X2 = Interface printer
→ Control of the needle matrix printer head

(12) V17 = Fork light barrier for step-motor - printer spindle

(13) X10 = Test points TP1 - TP14

The test points mentioned above may be tested with a multi-functional
test unit if it is handled with care.
For test points that are not mentioned, a test system with test
programs is necessary for a qualified test. The test runs must be
performed under dynamical conditions and therefore they cannot be
performed locally.

Attention
Pay attention when using testing spikes for a manual test!
The plug contacts of the IC-socket must not be damaged.
Always test at test point 11 against ground. A measurement
between the wrong test points will lead to a damage of the PC-
board.

TP	Designation	Measured value	Condition
1	Lithium battery	3,3 V -5 %	Mains switch off
4	Nominal voltage U_N	4,3 V ±5 %	Power supply on
5	Line voltage U_B	5 V ±5 %	Power supply on
10	Real-time clock component U_{RTC}	3,3 V -5 %	Mains switch off
10	Real-time clock component U_{RTC}	5 V ±5 %	Power supply on
11	Ground		
12	Reset voltage U_R	5 V ±5 %	Power supply on

(14) S1 = Mains switch

(15) X5 = Terminal for battery pack, option
By connecting the battery pack pay attention that the right poles are
used.
+ = red, - = black.

(16) X4 = Interface for connection to external PC.

(17) Terminal for option module "Slave clock function/ DCF", plugged in at X6
      Slave clock function (POLA):   Input voltage 12 - 60 V,
                                      Input current 2 - 10 mA
                                      unipolar and bipolar impulses

      DCF: Voltage supply for DCF-receiver max. 12 V
                                      Output current max. 5 mA

(18) Fuse for Signal Output
      50 mA T

Change of Fuse for Signal Output

The low power signal output is protected by a replaceable fuse.
This fuse only effects the signal output and is not relevant for the whole unit. The
fuse in the external power supply is meant for the unit itself.
Use only fuses with the same technical data. → See appendix A "Technical
Specifications".

Attention
Before changing the fuse, switch off the unit and disconnect the
power supply.

---

1. Open the unit with the key and remove the front cover.

2. Disconnect the power supply (see illustr.).

3. Switch off the unit.

4. Slightly pull out the fuse from the fuse plug (see illustr.).

5. Take the new fuse and insert it into the fuse plug.
    Polarity need not be observed.

6. First connect the power supply and then switch on the unit.

7. Check the display. Current date must be displayed.
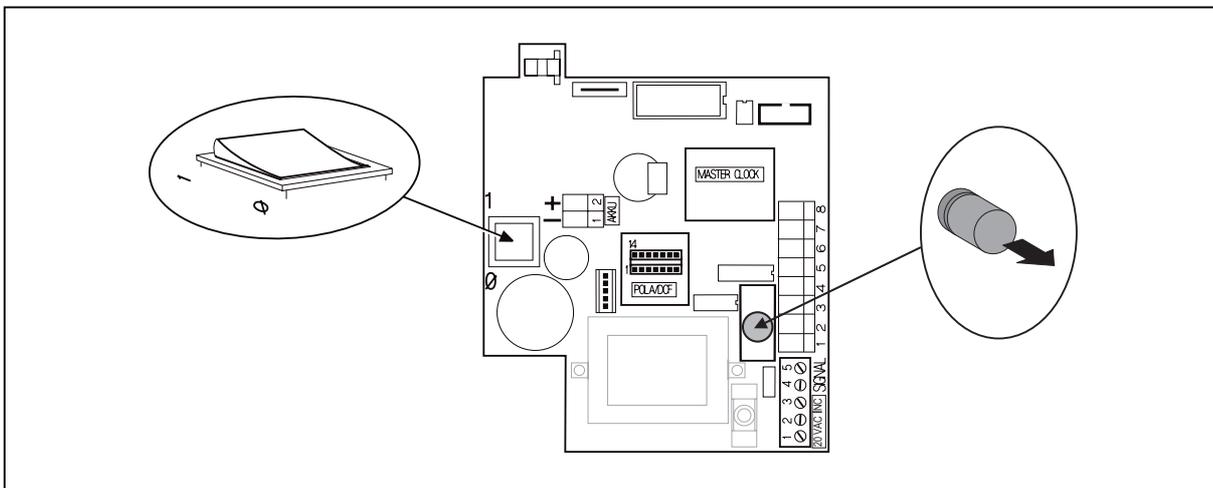
Fig. 20: PC-board with power switch and fuse for signal output

Chapter 7

Maintenance

Adjustment Routine

The position of the clocking on the time card is defined when programming the card lift and column change. But it may happen that the clocking is not printed exactly in the right position due to manufacturing tolerance and especially card tolerances. With this routine the position of the clocking on the time card can be adjusted in vertical and horizontal direction.
The clocking can be adjusted within -5.0 mm and +4.9 mm in both directions.

The adjustment is executed via the adjustment value which must be between 00 and 99. The value range corresponds with the dimensions of the recorder printed on this page. The adjustment value pre-programmed ex factory is 50 and this value means no change in print position. Changes are in steps of 0.1 mm.

Minimum dimensions of the card:

      - left card edge   3.5 mm
      - bottom line   16.5 mm

Card lift / line change

To check the position, the imprint programmed is printed in the first column, valid on 01.01.00 at 01:23, which usually is the first line.
After each clocking, a column change is executed. If a graphic unit is used, the clocking is orientated on the upper line of the imprint field. The position can be changed by pressing "R" (+) and "E" (-) in 0.1 mm steps.

Column change

The adjustment of the column change resp. the horizontal position of the clocking is identical to the adjustment of the card lift but the left card edge is used as reference line.

Proceeding		
1.		Recorder is switched on.
2.		Press **E** first, then **S**. Keep both keys pressed for about 2 seconds until display goes off.
3.	`50` D3	**Adjust card lift** Display = Adjustment value 50 = 0 mm, no correction Value range: 00 - 99 Shift clocking upwards with "**R**" (+). ☞ The distance between bottom line and clocking is increased.
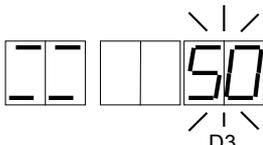
		Shift clocking downwards with "**E**" (-). ☞ The distance between bottom line and clocking is decreased. Step width: 0,1 mm. Example: Adjustment value 58 = clocking is shifted 0,8 mm upwards.
4.		Insert time card and execute a sample clocking.
5.		Repeat steps 3 and 4 until clocking is printed in correct position. Press "**S**" to adjust the column change.
6.	*III 50* D3	**Adjust column change** Display = Adjustment value 50 = 0 mm, no correction Value range: 00 - 99 Shift clocking to the right with "**R**"(+). ☞ The distance between left card edge and clocking is increased. Shift clocking to the left with "**E**" (-). ☞ The distance between left card edge and clocking is decreased. Step width: 0,1 mm. Example: Adjustment value 41 = clocking is shifted 0,9 mm to the left.
7.		Repeat adjustment and sample clocking until the horizontal position of the clocking is correct. Press "**S**" to quit adjustment routine.
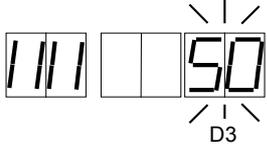
Changing the Ribbon

To change the ribbon the programming panel has to be swung out. The column pointer has to be moved to the park position.
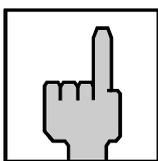
Hint
The ribbon used in the unit is a special ribbon. If you want to order further ribbons, please contact your local dealer or e-mail us at:

www.sales@isgustime.com

Proceeding

1.	The time recorder is switched on.

2.	Press "**R**" and "**E**" simultaneously and keep these keys pressed for 1 second.
	→ Column pointer moves to the park position right of the card funnel.

3.	Press the locking straps on the left and right side of the card funnel slightly towards the recorder and swing out the programming panel.

4.	Lift up and remove the ribbon cassette.

<table>
<tr>
<td>⚠️</td>
<td>Warning!
Depending on use, the printer head may be very hot.
Touching the printer head could cause burns.</td>
</tr>
</table>

5.	Insert new ribbon cassette and push slightly down.

	Tighten the new ribbon by winding the red ribbon tightening knob in the direction indicated by the arrow on the cassette. Position the free guide of the ribbon in the direction of the printer head.

	Make sure that the ribbon guide is inserted in front of the printer head and that the ribbon is not twisted or creased.

	The ribbon cassette must engage into the left and right locking straps.

6.	Check that the ribbon fits between the printer head and the ribbon guide. Tighten the ribbon again.

7.	Swing in the programming panel.
	Press "**R**" and "**E**" once again, see step 2.
	→ The column pointer moves back to initial position.

8.	Close the time recorder.

Cleaning the Time Recorder

The main problem is dust on electronic components.
In order to maintain the physical appearance of the time recorder, the cover must be occasionally cleaned.
The cleaning intervals depend on the operating conditions and the location.

When cleaning the time recorder with cloths, please observe the following recommendations:

•	Use only rags moistened with water or a soap-free detergent.

•	Do not use any detergent spray or wet rags.

•	Use only soft detergents without solvents of any kind.

•	Make sure to thoroughly dry all components after cleaning.

Appendix A

Define Your Own Card Format

Create a New Card Format

The proceeding to create and define a new card format is identical with the proceeding in chapter 4 "Commissioning - Programming".
To define a new card format the value "00" has to be selected in the menu "Card specific parameters".

The following values have to be entered:

- Time card parameters
- Column change and
- Card lift / line change

Time Card Parameters

The symbol ☐ is indicated by the column pointer

Continuation of chap. 4 "Getting Started - Programming - Time card parameters".
If the value "00" has been programmed in the menu "Time card parameters", the following parameters have to be programmed:

- Type of recorder
- Period duration
- Current week
- Number of columns
- Number of lines

Attention
If the card format is altered, the following values will be erased:
- Dimensions for column change and card lift
- Times for column change and card lift
- Times for ribbon colour change

Type of recorder

Two different types of recorders are available:

- Standard recorder
- Graphic recorder

Standard recorder
The clocking on the time card will be printed into lines according to the current day.
The card is separated in IN- and OUT-clocking columns, the days of one period are ordered one beneath the other.
→ See separate card catalogue

Graphic recorder
The clocking on the time card will be printed in columns according to the current day. The card is not separated in lines. Each clocking column corresponds to one day of the period. Graphical cards are often folded, so that all days of a period can be printed on one time card.

Two different print formats are available: "creeping imprint" and "leaping imprint". With "leaping imprint" the distances between IN- and OUT-clocking are defined exactly.
With "creeping imprint" the distances change according to the clocking time. Advantage of creeping imprint: An "early IN"- or "early OUT"-clocking can be seen on the time card.
If a graphic recorder with creeping imprint has been selected, you can choose between ascending and descending imprint.

Ascending imprint:	→	First clocking of the day will be printed on the bottom of the card.
Descending imprint:	→	First clocking of the day will be printed on the top of the card.

Attention
If the card format is altered, the following values will be erased:
- Dimensions for column change and card lift
- Times for column change and card lift
- Times for ribbon colour change

Proceeding	
1. ⬚⬚	Select type of recorder with "**R**".
D1 D2 D3	Value range: 01 - 05
	D1 = **01** → indicates the 1st submenu "Type of recorder"
	D3 = 01 = Standard recorder with one card lift/day.
	02 = Standard recorder with two card lifts/day.
	03 = Graphic recorder with "leaping imprint".
	04 = Graphic recorder with "creeping imprint", ascending.
	05 = Graphic recorder with "creeping imprint", descending.
2.	Confirm selection with "**E**". Recorder switches to next submenu "Period duration".

Period duration

The period duration refers to the time after which a payroll should be executed and the time card should be changed. Various period durations can be programmed in the unit. The period durations available depend on the type of recorder selected.

Type of recorder	Period durations available
01	1 week, 2 wk, 3 wk, 4 wk, 5 wk with month correction, monthly record
02	1 week
03	1 week, 2 weeks, monthly record
04	1 week, 2 weeks, monthly record
05	1 week, 2 weeks, monthly record

5 weeks with month correction
The recorder recognises automatically the various month cycles in the calendar year → 28-, 29-, 30- or 31-day cycle. The imprint of the 1. week starts automatically at the correct weekday.

Monthly record
The monthly record can be applicated for standard and graphic recorders.

- **Monthly, start position 1. column or 1. line, continuous imprint:**
  The recorder starts with the imprint in the 1. line/1. column. Space lines/space column will not be noticed.

- **Monthly, 1. line free, continuous imprint:**
  The recorder starts with the imprint in the 2. line/2. column. 1. line/1. column of each page will be left free.

- **Monthly, last line or last column of the first page free:**
  The recorder starts with the imprint in the 1. line/1. column. The last column/last line of the first page will be left free.

- **Monthly, line or column after the 31st free:**
  The recorder starts with the imprint in the 1. line/1. column. The line/column after the 31st will be left free. Months with 30, 28 (29) day-period the recorder continues automatically in the correct line/column with the 1st day of next month.

Attention
If the card format is altered, the following values will be erased:
- Dimensions for column change and card lift
- Times for column change and card lift
- Times for ribbon colour change

Proceeding		
1.	$\boxed{02}\ \boxed{}\ \boxed{04}$ D1　　D2　　D3	Select period duration with "**R**". Value range:　01 - 09 D1 = **02** → indicates the 2nd submenu 　　　　　"Type of recorder" D3 = 01　= 1 week 　　　02　= 2 weeks 　　　03　= 3 weeks 　　　04　= 4 weeks 　　　05　= 5 weeks with month correction 　　　06　= monthly, start 1.line/1.column, 　　　　　continuous imprint 　　　07　= monthly, 1.line/1.column free, 　　　　　continuous imprint 　　　08　= monthly, last line/column of first 　　　　　page free 　　　09　= monthly, line/column after 31st free
2.		Confirm selection with "**E**". Recorder switches to next submenu "Current week".

Number of columns

In this submenu the number of columns on the time card used which has to be programmed. The number of clocking columns can differ from time card to time card. The number is either pre-set or can be selected within a certain range depending on the type of recorder selected.

If a standard recorder is used, the number of columns can differ between 1 and 8.

If a graphic recorder is used, the number of columns is pre-set by the period duration selected.
Period duration　　01 = 1 week:　　　　→ Number of columns = 7
　　　　　　02 = 2 weeks:　　　　→ Number of columns = 14
　　　　06 - 09 = monthly record　→ Number of columns = 7 / 8 / 16

⚠ **Attention**
If the card format is altered, the following values will be erased:
- Dimensions for column change
- Times for column change

Proceeding		
1.	D1 D2 D3	Select number of columns with "**R**". Value range: depends on type of recorder D1 = **04** → indicates the 4th submenu "Number of columns" D3 = XX = Number of columns
2.		Confirm selection with "**E**". Recorder switches to next submenu "Number of lines".

Number of lines

In this submenu the number of lines on the time card used is programmed.

If a graphic recorder is used, no entry has to be made as graphical cards have only one line, the imprint field.

If a standard recorder is used, the number of lines is pre-set by the period duration selected.

Period duration   01 = 1 week: → Number of lines = 7
                                        → Number of lines = 14, if 2 lines/day
                   02 = 2 weeks: → Number of lines = 14
                   03 = 3 weeks: → Number of lines = 21
                   04 = 4 weeks: → Number of lines = 28
                   05 = 5 wk. with correct.: → Number of lines = 21
                    06 - 09 = monthly   → Number of lines = 16 / 21 / 31
                            correction

If a standard recorder with 2 card lifts/day is used, the number of lines is pre-set to 14.

 Attention
If the card format is altered, the following values will be erased:
- Dimensions for card lift
- Times for card lift

A-6 *Define your own card format*   Appendix A
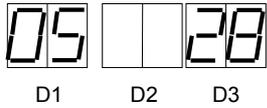
Proceeding		
1.	⠿⠿ ⠿⠿ D1 D2 D3	Select number of lines with "**R**". Value range: depends on type of recorder D1 = **05** → indicates the 5th submenu "Number of lines" D3 = XX = Number of lines
2.		Confirm selection with "**E**".
3.		Continue with "**S**". Next submenu "Imprint".

The menu "**Print Format**" is independent of the card format defined. See chapter 4 "Getting Started - Programming - Print Format".

Column change

The symbol ▶◀ is indicated by the column pointer

Definition of the column width.
The value entered in the menu item "Time card parameters - Number of columns" refers to this menu. If, e.g., the value 08 has been programmed as number of columns, the column width for each column is displayed in this menu.
For a card format freely defined, the values displayed can be altered according to the card format.

If the column widths for the next columns have been erased, the value of the previous column is displayed as default value. If the column width remains the same, confirm the column width displayed with "**E**".

The accuracy of the entry is 1/10mm. The recorder ensures that the sum of all column widths does not exceed the printer dimensions.

D1 = column
       00 = left card edge
       01 - xx = clocking column
       → The column No. will be increased automatically.

D2/D3 = column width in full mm
D3 (right digit) = column width in 1/10 mm
     → If the recorder will be programmed new, the first entered value will be
       displayed again for the following entries.

Card lift / line change

The symbol $\overline{\overline{\mathsf{\underline{\ }}}}$ is indicated by the column pointer

This menu item is identical to the menu "Column change". As many line values as programmed in the menu "Time card parameters - Number of lines" will be displayed.

The value 00 in field D1 indicates the bottom line.
Graphical cards have a bottom line as well but only one clocking line, the so-called imprint field. The value 01 in the field D1 indicates the height of the imprint field.

D1 = line
      00 = bottom line
      01 - xx = clocking line at the standard recorder
      $\rightarrow$ The line No. will be increased automatically.

      01 = Imprint field for graphic recorder

D2/D3 = line height in full mm
D3 (right digit) = line height in 1/10 mm
$\rightarrow$ If the recorder will be programmed new, the first entered value will be displayed
   again for the following entries.

☞   The programming of a card format different from the standard cards is now finished. Continue with the programming of time values as described in chapter 4 "Getting Started - Programming".

Adjust a Pre-programmed Standard Format

The recorder is provided with a copy-function. By this function standard card formats can be copied and altered later on.

Use of the function "Copy":

- Define your own card format.

  If you want to define a card format which is similar to a standard card format stored in the recorder, you can copy the standard card format with the function "Copy". Now the values of the card format can be altered according to your requirements.

- Adjust resp. alter a standard card format.

  If you realise that the standard format does no more correspond to your requirements, you can alter the format. All time values, e.g. for card lift, will remain.
  The number of the format copied must be the same as the standard card format used before.

- Erase values of a card format.

  With "Copy" you can erase all **card specific values**, if the command "--" is entered into field D2 instead of the card number to be copied. Exception: All values in the menus "Ribbon colour change", "Signal circuit" and "Imprint".
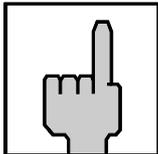
Hint
The function "Copy" can only be used to copy standard formats. Card formats freely defined or even altered standard formats cannot be copied in the recorder . In this case, we recommend to program the recorder via PC.

The function "Copy" can be activated in the menu "Time card parameters" ⎕ , "Select card format".

	Proceeding	
1.	D1 D2 D3	Menu "Card specific parameters - Select card format"
		Select copy-function with "**R**".
		Value range: 00 - xx; Co
2.		Confirm selection with "**E**".
3.	D1 D2 D3	Select card format to be copied with "**R**".
		Value range: 01 - xx; --
		☞ With the function "Copy" a standard card format will be changed into a card format to be freely defined.
		☞ The value "--" erases all card specific parameters of standard card format resp. a card format freely defined.
4.		Confirm with "**E**".
5.	D1 D2 D3	During the card format is copied resp. erased, the display shows "-- --.--".
		Recorder switches to the next menu "Imprint".

Proceed as described in this chapter under the topic "Create a new card format".
Any values of the column change and card lift can be altered with "**R**" or confirmed with "**E**".

Appendix B

Code-Table

Code-Table

Summary of all codes for programming the recorder

⊕ **Language identification**			
Setting	Code	Setting	Code
German	01	Danish	09
American	02	Swedish	10
English	03	Norwegian	11
French	04	Finnish	12
Spanish	05	Polish	13
Italian	06	Russian	14
Portuguese	07	Turkish	15
Dutch	08	Greek	16

☼ **Daylight saving time change-over**			
Setting	Code	Setting	Code
no change-over	00	change-over to EEZ - last Sunday in March - last Sunday in October	05
change-over acc. to CET - last Sunday in March - last Sunday in October	01	change-over to EEZ - last Sunday in March - 4th Sunday in October	06
change over acc. to CET - last Sunday in March - 4th Sunday in October	02	change-over to USA - 1st. Sunday in April - last Sunday in October	07
change-over to GMT - last Sunday in March - last Sunday in October	03		
change-over to GMT - last Sunday in March - 4th Sunday in October	04	change-over freely programmed	99

▯ **Time card parameters**			
Setting	Code	Setting	Code
Card format freely defined Copy and alter standard card format	00 Co	Number of standard card format	01 to xx

01 **Type of recorder**	Code
Standard recorder with one card lift/day	01
Standard recorder with two card lifts/day	02
Graphic recorder with leaping imprint	03
Graphic recorder with creeping imprint - ascending	04
Graphic recorder with creeping imprint - descending	05

02 **Period duration**	Code
1 week	01
2 weeks (not if type of recorder = 02)	02
3 weeks (only if type of recorder = 01)	03
4 weeks (only if type of recorder = 01)	04
5 weeks with month correction (only if type of recorder = 01)	05
Monthly with start position 1 (not if type of recorder = 02)	06
Monthly with start position 2 (not if type of recorder = 02)	07
Monthly, last line/column of 1st page free (not if type of recorder = 02)	08
Monthly, line/column after the 31st free (not if type of recorder = 02)	09

04 **Number of columns**	Code
Standard recorder - 1 to 8 columns	xx
Graphic recorder - 7 columns (1 week) or monthly	07
Graphic recorder - 14 columns (2 weeks)	14
Graphic recorder - 8 columns (monthly with start pos. 1 or 2)	08
Graphic recorder - 16 columns (monthly with start pos. 1 or 2)	16

05 **Number of lines**	Code
Standard recorder - 7 lines (1 week), only if period duration 01	07
Standard recorder - 14 lines (2 weeks), only if period duration 02	14
Standard recorder - 21 lines (3 weeks), only if period duration 03	21
Standard recorder - 28 lines (4 weeks), only if period duration 04	28
Standard recorder - 21 lines (5 weeks with month correction), only if period duration 05 or monthly	21
Standard recorder - 16 lines (monthly with start pos. 1 or 2), only if period duration 06 or 07	16
Standard recorder - 31 lines (monthly with start pos. 1), only if period duration 06	31

👁 **Print format**			

Setting	Code	Setting	Code
Print format freely defined	00	Number of print format according to the print table	01 to 48

Character	Code	Character	Code
Blank space	00	Date	07
Minutes	01	Mark AM/PM	08
5/100 hours	02	Mark freely defined	09
3-minutes-leap	03	Weekday numeric	10
1/10 hours	04	Weekday alpha freely def.	11
1/100 hours (approx.)	05	Weekday alpha- according	12
Hours	06	to national identification	
		5-minute step	13

Character height	Code x = right display digit	Character height	Code x = right display digit
Normal - 5 x 9 dots	1x	Small - 5 x 7 dots - hanging	4x
Small - 5 x 7 dots - raised	2x	Cross -7 x 5 dots - read from right	5x
Small - 5 x 7 dots - centred	3x	Cross -7 x 5 dots - read from left	6x

Character width	Code y = left display digit	Character width	Code y= left display digit
Small - 2 Cycles/Dot	y1	Double - 4 Cycles/Dot	y3
Normal - 3 Cycles/Dot	y2	Bold - 6 Cycles/Dot	y4

‖ Column change

Setting	Code
01 - xx = Clocking column, Code-Entry xxxx = Width in mm	xxxx
00 = left card edge, Code-Entry xxxx = Card edge in mm	xxxx

⤨ Card lift / line change

Setting	Code
01 - xx = Clocking line, Code-Entry xxxx = Line height in mm	xxxx
00 = Bottom line, Code-Entry xxxx = Bottom line in mm	xxxx

⏱▐▌ **Column change timing**	
Setting	Code
01 - xx = Column-No.., Code-Entry xxxx = Timing in HH.MM	xxxx

⏱▤ **Card lift / line change timing**	
Setting	Code
00 - xx = Position, Code-Entry xxxx = Timing in HH.MM	xxxx

⏱▭ **Ribbon colour change**	
Setting	Code
Ribbon colour black Ribbon colour red + code-entry xxxx = Timing in HH.MM	01 02 xxxx

⏱🔔 **Signal**	
Setting	Code
Code-Entry xxxxxx = Signal duration in seconds (2-digits) + Time to switch on in HH.MM (4-digits)	xxxxxx x

⏱🔔 **Check of individuals**	
Setting	Code
Code-Entry xx = Percentage	xx

⏱🔔 **Signal out-programming**	
Setting	Code
00 = Signal off 01 = Signal on code-entry xxxxxx = on/off (2-digits) + Date in DD.MM (4-digits)	xxxx x xxxx

Options

Setting	Code	Setting	Code
Option disabled	00	Slave clock function	01
Option enabled	01	DCF-function	02
		Standby operation	03
		Master clock function	04
		Card face control	05

Protection with Code-Numbers

Setting	Code	Setting	Code
Programming of all time values in the recorder	4711	Complete programming of the recorder	1888

Appendix C

Keyboard Commands

Keyboard commands

For easier understanding, the keyboard commands are separated into several groups: Programming, Punching, Error messages and Maintenance.
Symbol "□" = Switch on recorder.

Keyboard Commands for Programming

Key	Function
R approx. 2 sec.	Calls up the programming routine, recorder is switched on. How to control the programming routine: R → Changing the values displayed, selection of parameter values and settings. E → Entry, confirmation of selection. S → Column, switch to next menu item. Print out the values programmed: S + push an empty card (210 long) slightly down
R + □ approx. 2 sec.	Set options. Controlling the option routine: R → Set status, define type of impulse for slave clocks E → Confirmation and advancing in the routine.

Keyboard Commands for Punching

Key	Function
S	Position key, select punching column if manual selection is programmed.

E approx. 2 sec.	Calls up time setting routine, the recorder is switched on. commands in the time setting routine: R → Selection of time and date. E → Confirmation of selection and advancing. Synchronisation of slave clocks in case of master clock function: R → Sending single impulses. → Entering time for slave clocks. E → Confirmation and advancing.

Keyboard Commands on Error Messages

Key	Function
E	Er 10, Error on data transfer →Confirm with E, partial reset.
R + E + S + ▢ approx. 2 sec.	Complete reset, recorder is switched off. → All values in the recorder will be erased, including date/time. Controlling: E → Confirmation and advancing at time and date. R → Selection of date and time.
R + E + S approx. 2 sec.	Partial reset, recorder is switched on. → Parameter values are set to default values, Card-No. 01. Controlling: E → Start partial reset.
E + ▢ approx. 2 sec.	Recorder test, recorder is switched off. → Test of display, printer and memory. Controlling: E → Start test mode.

R + S
approx. 1 sec.
	Test mode, recorder is switched on.
	
	Controlling:
	R → short pressing = Changing the minutes in single steps.
	   keep key pressed = Fast advancing of values.
	E → Change of days, lines.
	   Column and card lift if a graphic recorder is used.
	S → Change of punching column.
	   No function if a graphic recorder is used.
	
	R+S → End of test mode.

Keyboard commands for maintenance

Key	Function
E + S approx. 2 sec.	Calls up adjustment routine, recorder is switched on. Controlling the card lift adjustment: R → +, moves imprint upwards. E → -, moves imprint downwards. S → Switches to column adjustment. Controlling the column adjustment: R → +, moves imprint to the right. E → -, moves imprint to the left. S → quits the adjustment routine.
R + E approx. 2 sec.	Ribbon change, recorder is switched on. → Column pointer in park position. R+E → Column pointer back into normal position.

Appendix D

Technical Specifications

Technical Specifications

Dimensions	Height: 280 mm (11.02 inches) Width: 220 mm (8.67 inches) Depth: 195 mm (7.68 inches)
Weight	3 kg
Supply voltage	20 V AC +/- 10 % 50 / 60 Hz
Current consumption	max. 800 mA
Power consumption	max. 45 VA
Protection type	IP 20
Protection class	I
Ambient temperature	5° C to 40° C (no direct sunlight)
Relative humidity	max. 80 %, non condensing

Connection	- Standby operation (Option)
	- Slave clock function (Option)
	  12-60V, 2-10mA,
	  unipolar/bipolar impulses
	- Master clock (Option),
	  Output 12V, 50mA max.
	- Signal circuit, see item "Signal operation"

Determination of time	Quartz, Pola
Signal circuit	Low power signal output: 15 V DC, 50 mA Fuse: 50 mA T
Printer	9 dot matrix printer
Battery pack	Nominal voltage 12 V Nominal capacity 600 mAh Discharge temperature: -20 to + 60° C Storage temperature: -30 to + 50° C Weight: 300 g

Plug-in power supply unit

Supply voltage	120 V / 20 V AC +/-10 % 50 - 60 Hz
Rated output	permanent 16 VA / max. 45 VA