OPERATING INSTRUCTIONS

for

LINESTAR PRO-G

Introduction

Thank you very much for purchasing a BAUER – microcomputer control unit

The present manual is a detailed description of our new **LINESTAR PRO-G**. If you need further information please contact our local dealer or **BAUER company** in Voitsberg.

All information contained in the present manual is based on the latest product details available at the time of printing.

BAUER company reserves the right to make changes without notice, without assuming any liability!

⚠	**Non-observance of this manual may cause personal injury or damage the equipment!**

Please make this manual available to your staff. You are kindly requested to state type and number of the software version of the **LINESTAR PRO-G** in all inquiries, correspondence, warranty problems or parts orders.

We wish you success with your BAUER LINESTAR PRO-G!

Product details

Type designation:		**BAUER – LINESTAR PRO-G**
Type version:		Front panel location
Serial number:		

Dealer:	Name:	
	Address:	
	Phone / Fax:	

Date of shipment:

Manufacturer of the control unit:

Röhren- und Pumpenwerk **BAUER** Ges.m.b.H.

Kowaldstr. 2

A - 8570 Voitsberg

Tel.: +43 3142 200 – 0

Fax: +43 3142 200-320 /-340

Owner or operator:	Name:	
	Address:	
	Phone / Fax:	

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CONTROL CENTRE OF LINESTAR PRO-G

Execution and material according to ÖVE and VDE standards, the components correspond to the IEC standards as well as to the VDE regulations.
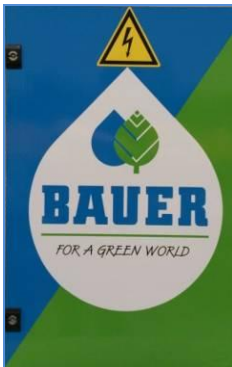
- Water-proof polyester cabinet (protection class IP 54) with lockable front door
- Pivoting control panel, can be opened only when the main switch is OFF
- System operating voltage 400V
- Control voltage: 230 V single phase
- Separating transformer for control voltage
- Standard industrial switchgears
- Cable connections with cable lugs
- Protection equipments

⚠ **ATTENTION!** During operation always keep the control centre closed to protect it against dirt and splash water.
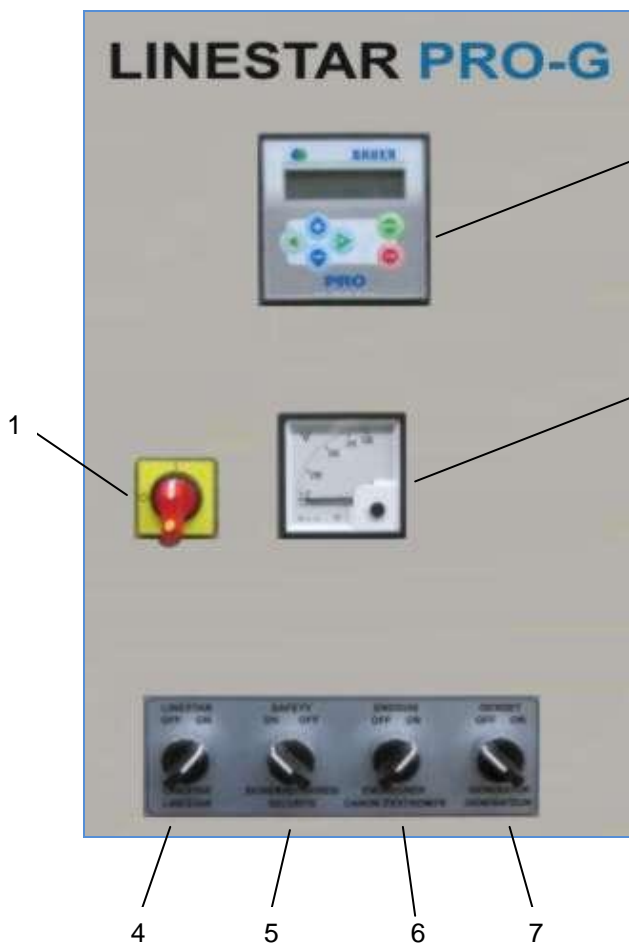
1. Main switch
2. Control panel LINESTAR PRO-G
3. Voltmeter
4. Switch "LINESTAR OFF - ON"
5. Switch "safety circuit ON - OFF"
6. Switch "ENDGUN OFF - ON"
7. Switch "GENSET OFF - ON"
8. Switch "EMERGENCY STOP" (*not mapped*)

1 SET UP / MAIN COMPONENTS

1.1 CONTROL PANEL

1.2 DISPLAY

Display with 2x16 signs, 2 lines, background lighting. If you do not use the keypad for a predetermined time, the background lighting switches off automatically. (adjustable timer for background lighting).

1.3 FUNCTIONS / MENU BUTTONS

START FORWARD(F) Start the machine forward (clockwise)

START REVERSE(R) Start the machine backwards (anti-clockwise)

MENU and **ENTER** By pressing this key you get to the operator level – double actuation for entering in the programming mode of a parameter and for acknowledging an entry.

STOP (**ESC** and **Machine**) Stop operation and multi–function of this button for operating at the technician level and for saving and leaving the programming mode.

+ With this button you can change the depth of precipitation for the current driving direction while operating and its second function is changing of parameters.

- With this button you can change the depth of precipitation for the current driving direction while operating and its second function is changing of parameters.

2 SWITCHING THE CONTROL UNIT ON

2.1   PUTTING INTO OPERATION OF NON TOWABLE SYSTEMS

Putting into operation is done only in the presence of a BAUER technician or of an authorized dealer and it must not be done by unqualified personal.

To ensure the best irrigation levels and an accurate position determination, it is necessary to determine the zero position at the putting into operation. Zero position means the position of where to start watering.
To ensure that no measurement error occurs due to the tolerances of the GPS position sensing, an offset of 10 m must be kept to zero position
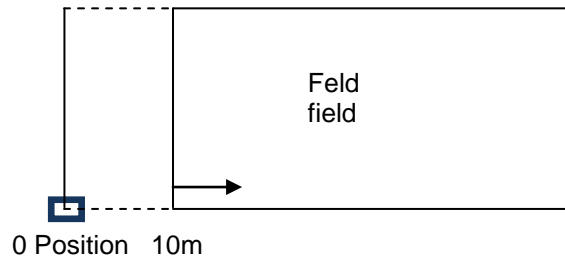
0 Position   10m
Figure 2.1.1: Zero position

2.1.1 SETTING OF ZERO POSITION WITH SYSTEM

Drive with the system to the zero position (*see figure 2.1.1 Zero position*). When you arrived at the correct position, wait for the LED at the GPS has stopped blinking and is lit constantly. This takes about 20 minutes and depends on the actual position / view to the GPS satellite.

To save the zero position, press button "Set CENT".
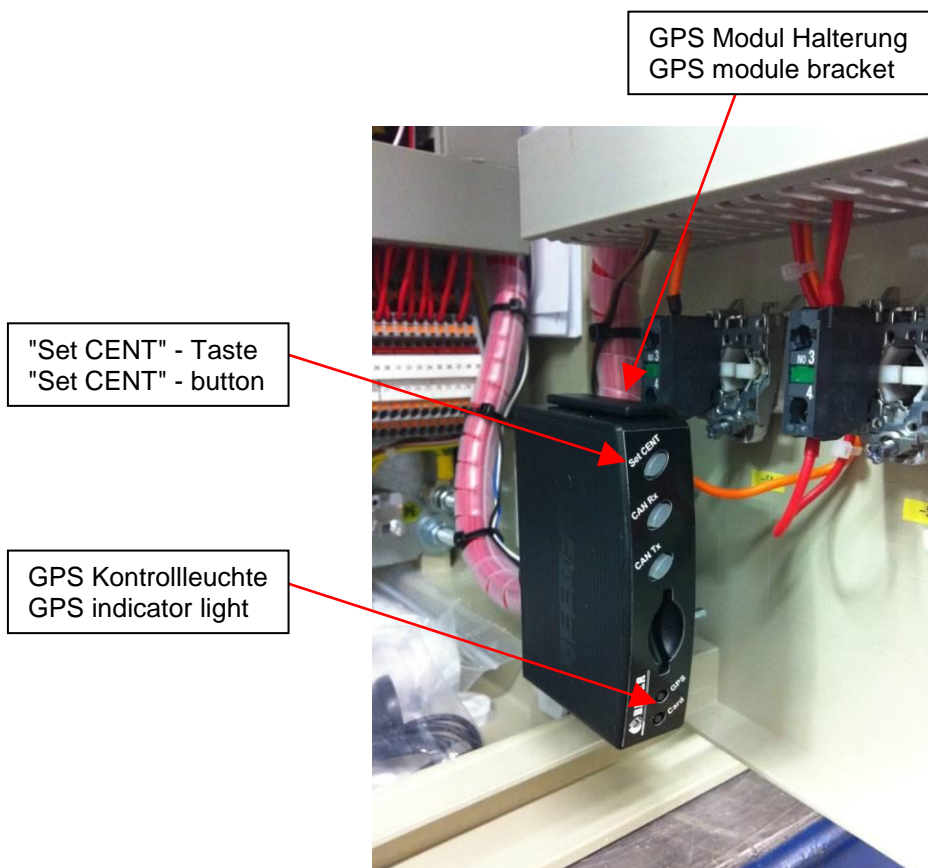
Fig 2.1.1.1: GPS module

Fig. 2.1.1.2: Buttons of GPS module

2.1.2 SETTING THE ZERO POSITION WITHOUT SYSTEM

If it was not possible to move the system directly to zero position (due to obstacles such as trees, fences, roads etc.), proceed as described below. Please note that you will need in addition a *12V battery* and the *BAUER START-UP CABLE.*

Remove the cable connected on the backside of the GPS module and remove the GPS module from the bracket. Remove furthermore the GPS antenna with cable from the bracket.

Go ca. 10 m away from the system towards the imaginary zero position *(see figure 2.1.1. Zero position).* Connect the GPS antenna and the *START-UP CABLE* supplied along again to the backside of the GPS module.

To connect the GPS module to a *12V battery*, loosen the two screws at the other end of the *START-UP CABLE*

and remove the plug. Please make sure to branch the outer wire to the ✚ pole and the inner wire to the ➖ pole of the battery *(see 2.1.2.1 Start-up cable - plug).* A wrong connection will damage the GPS receiver forever.
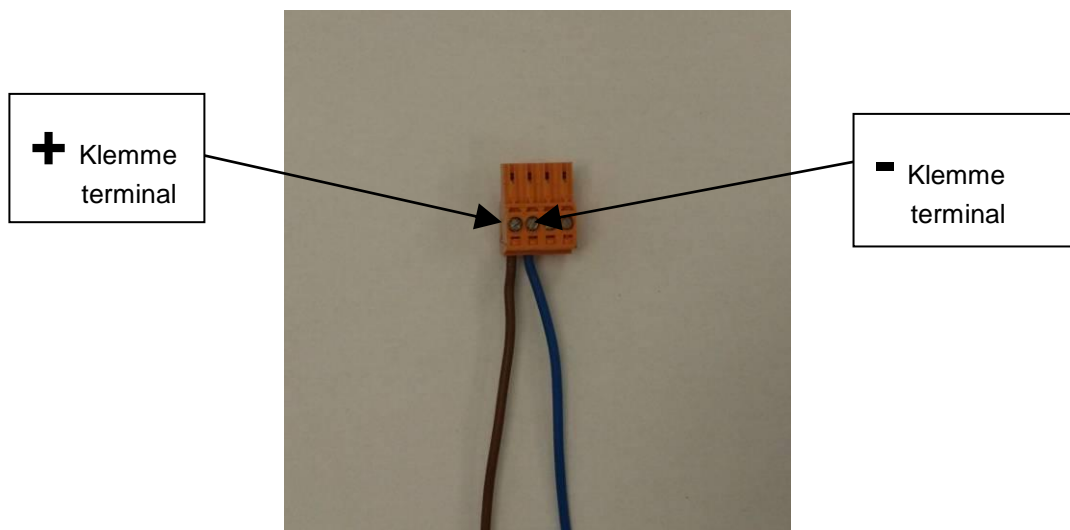
Figure 2.1.2.1:Start-up cable - plug

The GPS LED starts blinking when the GPS module has been connected correctly. Now proceed as described under *2.1.1 Setting of zero position with system.*

Proceed in inverse order to install the GPS module again in the control unit *LINESTAR PRO-G.*

You may also enter directly the coordinates of the zero position if you know them.
See in this context *2.2.1 Setting further zero positions - Creating a READ file.*

2.2   FIRST START-UP OF TOWABLE SYSTEMS

In case you have acquired a towable irrigation plant, the particular positions for the central towers must be defined as well. In this case the control unit LINESTAR PRO-G offers the option to save up to ten GPS positions.
Set the first zero position as described under *2.1 Putting into operation of non towable systems.*

2.2.1   SETTING FURTHER ZERO POSITIONS

- ***"CAN Rx"***   next memory position
- ***"CAN Tx"***   previous memory position
- ***"Set CENT"***   save GPS position

Figure 2.2.1.1: Buttons of GPS module

Proceed as follows:

In order to get to the next GPS position press "CAN Rx". With the button "Set CENT" you activate the new position. The new position is now stored in second place.

In order get to the next but one GPS position press twice "CAN Rx". With the button "Set CENT" you confirm the new position. The new position is now stored in third place.

In case you have pressed "CAN Rx" too often by mistake, press "CAN Tx" in order to get one memory position back.

If you are not sure at which storing position the GPS module is at the moment, disconnect the power supply of the GPS for a moment by unplugging the cable, and then plug it in again.

Analogous to this, set the remaining GPS positions.

Has the irrigation plant been towed to a different field, the new location successfully determined and stored, it is necessary to select the correct position or number on the PRO controller before putting the irrigation plant into operation.

*See also **machine parameters 5.1.21 Autoreverse / GPS.***
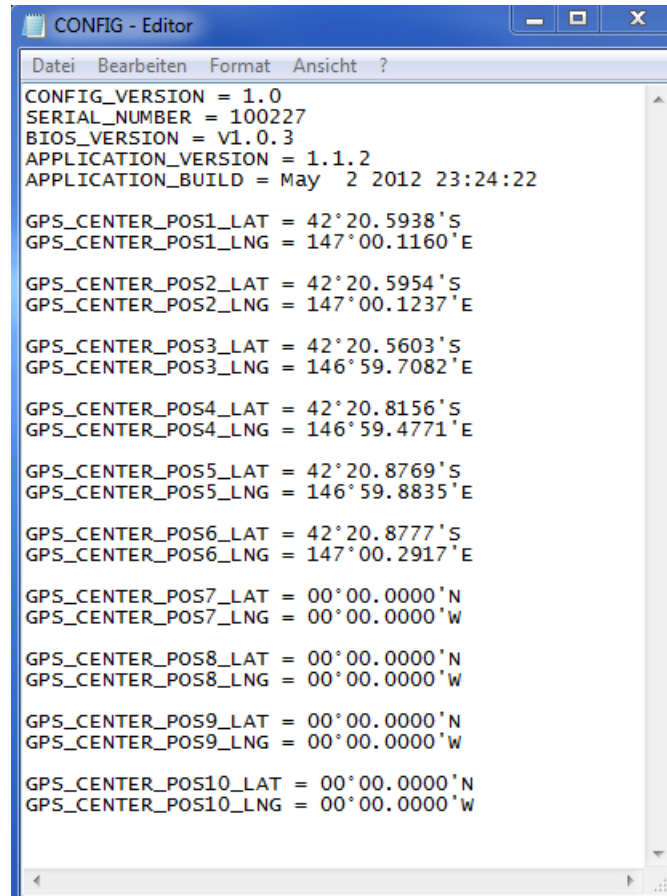
Checking the stored GPS positions:

The GPS receiver offers the possibility to check the stored GPS positions. In this case you need a SD memory card with any memory size.

In order to store the defined GPS positions, put the SD card into the card slot of the GPS module. The data is being generated immediately and stored in a text file with the name "CONFIG.txt". Wait about 10 seconds and then take out the memory card again.

Now you can save the data on your PC or check them respectively. In this case you can open the file in your Windows Explorer.

The following picture (*figure 2.2.1.2 CONFIG.txt*) shows a text file with 6 stored GPS –positions.

Figure 2.2.1.2: CONFIG.txt

Creating a READ – file:

If the GPS positions are known, there is also the possibility to create a "READ" text file and store the positions in the receiver.
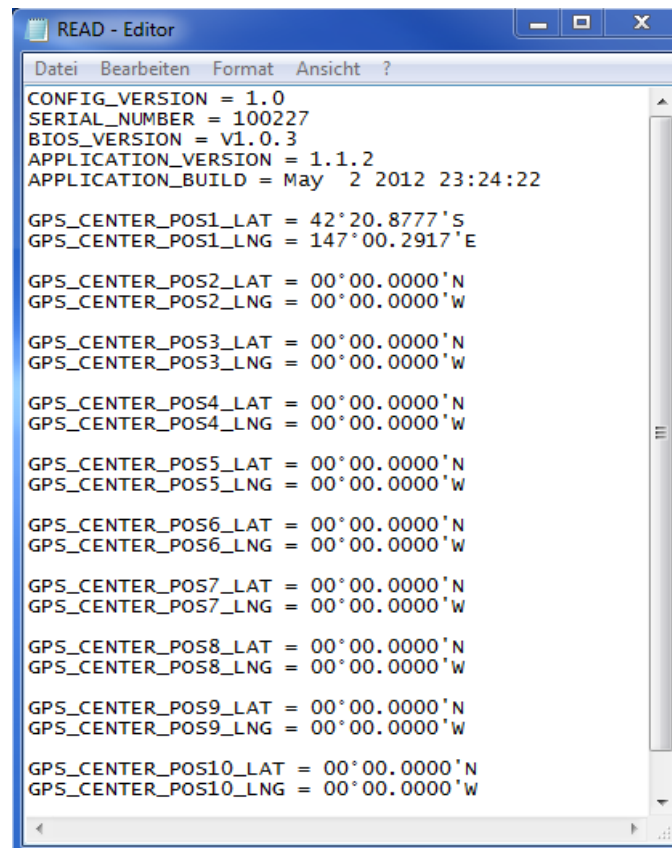
You can create a text file with the name "READ.txt" in the same format as a "CONFIG.txt" file (see picture 2.3). You can also use the existing CONFIG file by renaming the file to "READ.txt".

Now enter the required GPS positions and save the READ-file on the SD card. Take care that the memory card does not contain any other files.

In order to read in the new positions into the GPS module, the module must be restarted first. Disconnect the power supply by plugging out the cable. Put the SD card into the card slot of the GPS module and then connect the cable to the module again.

The position data is being read immediately. After 10 seconds the process is completed. You can take out your SD card again.

The following picture (figure *2.2.1.3 READ.txt*) shows a READ – file with one position entered.

Figure 2.2.1.3: READ.txt

2.3   BOOTING

After turning on the hardware MONOSTAR will appear on the display as well as the installed software version with loading date.
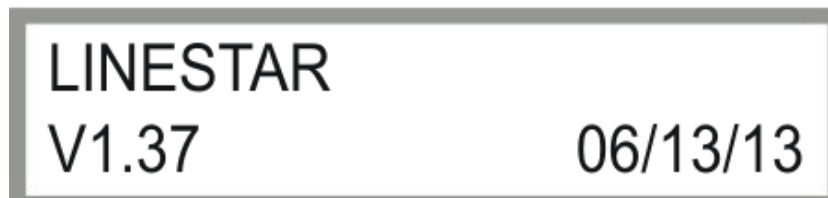
Fig. 2.3.1: Display after start

Subsequently "Initialize GSM modem" will be displayed. After correct initialization "GSM modem OK" should be on display, otherwise different error messages can be displayed.

After successful booting and initialization of the hardware, status window 1 will be displayed (*see chapter 3.1*).

3   STATUS WINDOW

The status window informs about the actual operation mode of the LINESTAR. After successful booting the status window opens automatically. The displayed parameters are permanently updated.   .

3.1   STATUS WINDOW

The status window (*fig. 3.1*) displays a two-column table informing about the actual operating mode. Please follow the explanation here after

Fig. 3.1.1: Status window 1
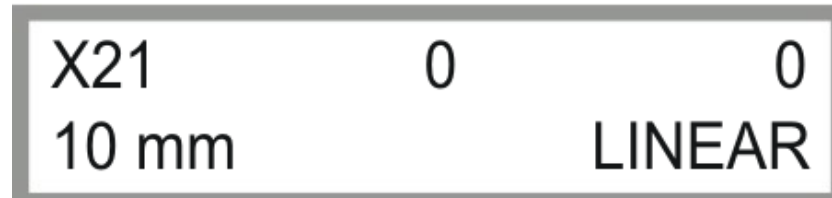
Fig. 3.1.2: Status window 2

Caution: Display status window 2 only with type "*L.S.GUID*" present in the Machine Parameter Menu.

Operating status

The following operating statuses are displayed:
- OFF — LINESTAR not operating
- FORWARD — LINESTAR moving in the indicated direction
- SAFET.FU — An error occurred at the frequency inverter.
- PR.STOP — LINESTAR was switched off because of insufficient water pressure
- REVERSE — LINESTAR moving in the indicated direction
- I2C-ERR — I²C communication error
- START — LINESTAR waiting till waiting period is up; pump is already active when starting
- SETUP — To manually align the LINESTAR and start in the opposite direction after automatic shutdown
- TURN CEN — The main cart is pivoting.
- DRIVE C — The main cart is in drive mode.
- INTERMED — LINESTAR has reached the intermediate stop.
- TURN END — The end tower is pivoting.
- SAFET.LE — Safety circuit left has been exceeded.
- SAFET.RI — Safety circuit right has been exceeded.
- DRIVE E — The end tower is in drive mode.
- CAN-ERR — CAN-BUS communication error
- SAFETY — LINESTAR has been switched off due to an error
- SAF.GUID — Subsoil control safety circuit has been exceeded
- G.SIGNAL — Subsoil control does not receive any signal from subsoil cable
- GPS ERR. — GPS communication error
- PARKPOS. — LINESTAR moving to or is already in preset parking position.

Remaining time of irrigation

Remaining time to complete the active program is indicated in hours and minutes. If the pivot is switched off, 0H/0MIN is displayed. Due to rounding errors and inexact machine parameters (in particular speed and the entry of the angles for calculation), the calculated irrigation time will not correspond to the actual irrigation time. If the pivot stops before the calculated irrigation time has elapsed, the irrigation time will be reset to zero. If the pivot takes longer than calculated, zero is displayed, even if the pivot has not yet ended the program.

Depth of irrigation

The actual depth of irrigation for the current driving direction is indicated while the pivot is moving; when the pivot stands still, the last active depth of irrigation is displayed.

Position

The actual position is on display. This value indicates where on the field the machine is currently.

CAUTION: This function is available with activated GPS only.

4 PARAMETER MENU

By pressing the MENU key the parameter menu is displayed. It consists of several windows that can be scrolled through with the keys $+$ and $-$. One window consists of one block with 2 parameters.

You can enter the programming mode by pressing the ENTER (Menu) key. The cursor blinks at the first parameter and it can be changed with the keys $+$ and $-$. You get to the second parameter by pressing the key RIGHT ARROW KEY (F). You get back to the first parameter by pressing the key LEFT ARROW KEY (R).

Press ENTER for saving or leave with ESC without saving.

Below, the functions of the individual menu items are described:

4.1   DESCRIPTION OF INDIVIDUAL PARAMETERS

4.1.1 MODE / RUNNING LGT

Mode:

This parameter changes the actual operating mode
- LINEAR   Normal linear operating
- PIVOTING   End tower pivots around central unit
- SWIVEL.WH   Wheels of main cart and end tower (by option) respectively are swivelled electrically

Setting range: Press ENTER to change parameter. Press + – keys to change value, confirm value by pressing ENTER and exit programming mode with ESC.

Running length:

This value is twice the length of the supply hose and it corresponds to the distance between the hydrants.

Setting range: Press ENTER to change parameter. Press + – keys to change value, confirm value by pressing ENTER and exit programming mode with ESC.


```
MODE              LINEAR
Running lgt         120m
```

Fig. 4.1.1 Parameter for setting of operating mode and running length

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY $-$.

4.1.2 PARKING POSITION / PARKPOSIT

This parameter serves to bring the machine to its parking position.
When switching this parameter to ON (even during irrigation), the machine will go at full speed and in dry run to *parking position*.
Attention: During this process the machine can leave the current segment and passes through not adjusted segments.
Below, the parking position in **"m"** can be entered.

Note: "*Parkposit. 500m*" is only available with GPS.

Caution: *The positioning accuracy by means of the GPS module largely depends on local conditions and **in no case** can it replace a mechanical stop.*
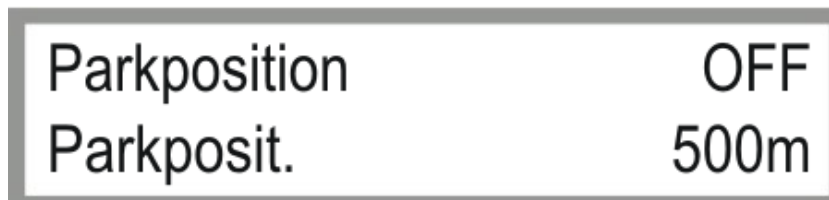
Fig. 4.1.2 Parameter for setting of parking position

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.3 INTERMEDIATE STOP / INTERMEDIATE POSITION

This parameter serves to bring the machine to its intermediate position.
When switching this parameter to ON, the machine will go at preset speeds (wet), depending on current segments, to *intermediate position*.

---

*Caution***:** *During this process the machine can leave the current segment and passes through not adjusted segments.*

Below, the *intermediate position* in **"m"** can be entered.

Note: "*Inter.Pos. 500m*" is only available with GPS.

Caution: *The positioning accuracy by means of the GPS module largely depends on local conditions and **in no case** can it replace a mechanical stop.*
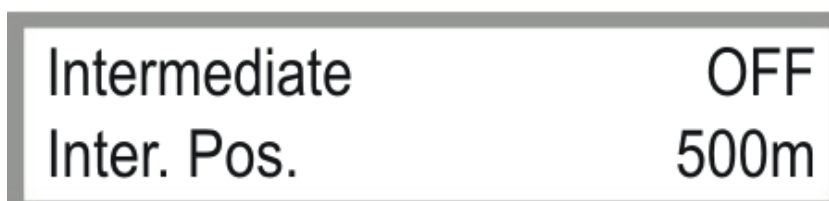
Fig. 4.1.3 Parameter for setting of intermediate position

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.4 SEGMENT 1 L / SEGMENT 1 R

This value serves to set the segment size in **"m"**. Example from L 0m to R 1000m means that the first *segment* has got a size of 1000m.

Note: 6 segments are only available with GPS. Without GPS use Segment 1.

Caution: *The positioning accuracy by means of the GPS module largely depends on local conditions and **in no case** can it replace a mechanical stop.*

```
Segment1      L        0m
Segment1      R     1000m
```
Fig. 4.1.4 Settings for segment 1

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

The size of segment can be set for all six segments as described above.

4.1.5 DEPTH FWD 1 / DEPTH REV 1

Depth1 FWD:

This value is the set amount of irrigation in *linear mode* in **"mm"** for the first segment for the driving direction FORWARD.
0 mm means that the machine is running with maximum speed. However the pump (depending on option) is switched off: DRY run.

Setting range: Changes from 0 mm to max. mm according to the set machine parameters.

Depth1 RVW:

This value is the set amount of irrigation in *linear mode* for the first segment for the driving direction REVERSE
0 mm means that the machine is running at max. speed. However the pump (depending on option) is switched off: DRY run.

Setting range: Changes from 0 mm to max. mm according to the set machine parameters.

Note: 6 Precipitation rates are only available with GPS. Without GPS use *Depth1*.

Fig. 4.1.5 Settings for precipitation rate

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

The size of segment can be set for all six segments as described above.

4.1.6 PIVOTD.FWD / PIVOTD.RVW

Caution: This parameter is not used for the LINESTAR.

Fig. 4.1.6 Settings for precipitation rate in pivot mode

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.7 ENDGUN1 ON 1 / ENDGUN1 OFF 1

Here you can set the segments for additional irrigation via the end gun. **Endgun1 ON** is the initial value in "**m**" for the first segment. **Endgun1 OFF** is the ending value in "**m**" for the first segment. With these settings, you can define both the position as well as the size of the segments (*maximum of 6 segments*).

Caution: This parameter only works with a set depth of precipitation of more than 0 mm.

Note: 6 segments for end gun are only available with GPS. Without GPS use Endgun1.

Fig. 4.1.7 Parameters for setting of ON and OFF range of end gun

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

The size of segment can be set for all six segments as described above.

4.1.8 SECTOR LIMIT LEFT / RIGHT

This parameter specifies the field sector boundaries in meters.

Note: This window is not used without GPS.

Caution: The positioning accuracy by means of the GPS module largely depends on local conditions and *in no case* can it replace a mechanical stop.

```
Left Limit                    10m
Right Lim.                  1000m
```
Fig. 4.1.8 Parameter input for sector operation

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.9 ERROR LOG

In this menu the last 20 errors recorded including date and time of error are indicated.

If no errors are recorded, the display indicates   **NO ERROR**.
Otherwise you can identify the error by reading the text.

If errors are recorded, the log can be browsed by pressing the RIGHT and LEFT arrow keys. The keys appear in the right and left corner of the display.

When entering the error log, the last error will be displayed first.
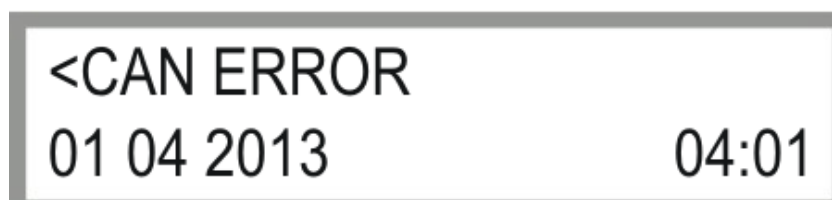
```
<CAN ERROR
01 04 2013                   04:01
```
Fig. 4.1.9 Error log

All error texts are explained below:

- *NO ERRORS*
    No failures occurred so far, failure log is empty. No effect when pressing LEFT or RIGHT ARROWS

- *LAST TOWER*
  A failure appeared at the end tower.
  This may be caused by malfunctions, for example, a safety circuit is interrupted

- *SAFETY CIRCUIT*
  Safety circuit has been cut
  Possible causes: emergency stop at control centre has been actuated, doglegging or additionally mounted end switch has been triggered.

- *PRESSURE SWIT.*
  Water pressure is too low for set monitoring time.

- *I2C ERROR*
  A communication error has occurred on the I2C bus. If the error appears more than once, it could be a hardware error

- *RTC ERROR*
  Real Time Clock error or I²C Bus error (repeated error warnings signal a hardware problem)

- *LOW VOLTAGE*
  The operation was interrupted due to low voltage.

- *CAN ERROR*
  No CAN communication with the tracking unit (below ground guidance).

- *ANT. NO SIGNAL*
  Receipt of the basic control is too low or frequency generator is not working.

- *GPS REC. ERROR*
  No CAN communication with the GPS module or no reception of the basic control.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.10 WET RUNNING HOURS

The operating hours in hours and minutes are indicated only for the operating time with the pump switched on (> 0 mm).
A reset is only possible by reloading the preset parameters.

Fig. 4.1.10 Operating hours wet

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.11 TOTAL RUNNING HOURS

The operating hours in hours and minutes are indicated for the total operating time.
A reset is only possible by reloading the preset parameters.

Fig. 4.1.11 Operating hours total

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

4.1.12 COUNTER ENDT (END TOWER) AND CYCLES

The item *counter* shows the actual timer reading of the end tower.

The first number displayed under the item *counts* indicates the calculated running time of the end tower whereas the second number shows the idle period of the end tower.

Fig. 4.1.12 Counter End Tower

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

4.1.13 COUNTER CT (CENTRAL TOWER) AND CYCLES

The item "*counter*" shows the actual timer reading of the central tower.

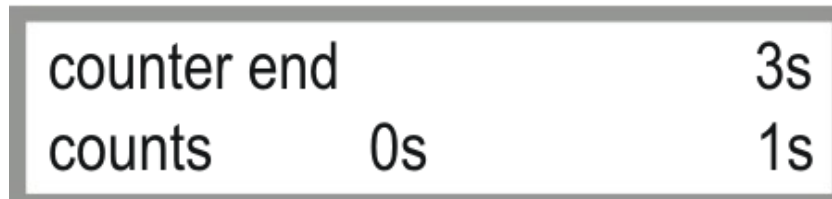The first number displayed under the item counts indicates the calculated running time of the system whereas the second number shows the idle period of the system (in LINEAR MODE, applies to both end and central tower).

Fig. 4.1.13 Car counter

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.14 STATUS BELOW GROUND GUIDANCE

Status window for Below Ground Guidance:
Display window only with type L.S.GUID present in the parameter menu.

The first line displays the values of the antennas, the left and the right one. It is to their own ratios, which reflect the deviation from the antenna cable. The smaller the value, the smaller the deviation.

The second line displays the filtered values. The value for filtering the can be set at the Machine Parameter Menu (*see 5.1.17 Filter X1 / Filter X2*).
The left bottom shows the coded status of Track Unit of the Below Ground Guidance.

Note: This window is not used for Furrow or Cable Guidance.

Fig. 4.1.14 Status Below Ground Guidance

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.15 ANTENNA VALUES (BELOW GROUND GUIDANCE) SD1 / SD2

First line:
Left value **S1**: *cumulative* value antenna 1
Right value **D1**: *difference* value antenna 1

Second line:
Left value **S2**: *cumulative* value antenna 2
Right value **D2**: *difference* value antenna 2

The *cumulative* values shows the field strength.
The *difference* values shows the deviation from the cable.

Note: This window is not used for Furrow or Cable Guidance.

Caution: For a trouble-free operation, the *cumulative* values must be between *12000* and *16000*.

If they were below these values, the signal will be too weak. If these values were higher, the steering antennas will oversteer. If the values were below *1000*, error *"No signal"* will be displayed.

```
SD1      14200          3
SD2      14300          5
```

Fig. 4.1.15 Antenna values (Below Ground Guidance)

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.16 STATUS INPUTS / OUTPUTS

Displays all actual input and output signals
0 = no voltage at input   1 = voltage at input
0 = output off   1 = output on

```
Input              0000000001
000000              00000000
```
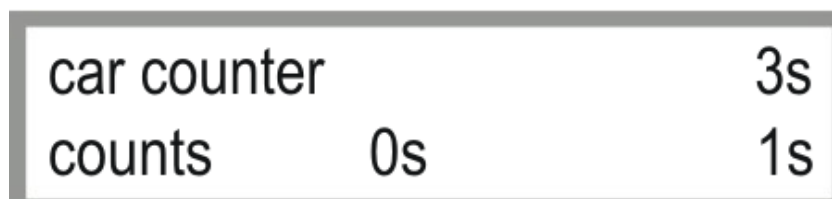
Fig. 4.1.16 Inputs / outputs

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.17 STATUS MODEM

This function concerns the signal level of the GSM Modems. Press the ENTER key to capture signal strength of modem and to read it on the display. If the displayed value is higher than 15, machine control by SMS should be possible.

Note: This window is not used without GSM or GPRS modem.
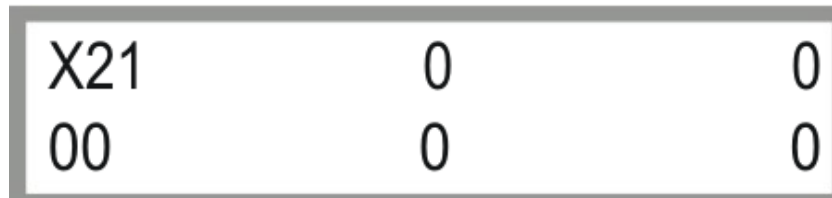
```
Modem        Status
Signal       Quality
```

Fig. 4.1.17 Status modem

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.18 COM READIN

Menu item concerning fault diagnosis of RS 232.

Caution: *This parameter is used by a BAUER service technician for error diagnosis only.*

comReadIn   00

Fig. 4.1.18 Fault diagnosis RS232

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.19 RUNTIME.ET / KORREKTT.ET

Current *counter value* of the correction control of *end tower*.

runntime.ET   0s
korrektt.ET   0s

Fig. 4.1.19 Runtime.ET / korrektt.ET

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.20 RUNTIME.CT / KORREKTT.CT

Shows current *counter value* of the correction control of *central tower*.

runntime.CT   0s
korrektt.CT   0s
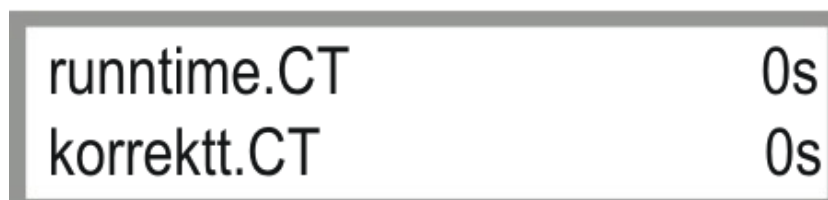
Fig. 4.1.20 Runtime.CT / correction CT

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.21 POS+ENCO

Caution: This parameter is used by a BAUER service technician for error diagnosis only.

Caution: This parameter is not used for the LINESTAR.

```
Pos+Enco              1.0m
0.00°              000 000
```

Figure 4.1.21: Error diagnosis encoder

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.22 NOT CONNECTED / PING TIME

1st line shows the *connection status* of the GPRS modem.

CONNECTED	Modem is connected / connection to server.
NOT CONNECTED	Modem is NOT connected / no connection to server.

2nd line shows the *counter / remaining time* to next ping.

Note: This window is not used without GPRS modem (visualisation).

```
NOT CONNECTED
pingtime              0s
```
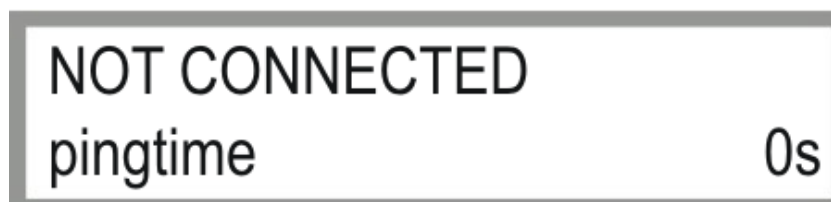
Fig. 4.1.22 Parameter GPRS-modem / ping time
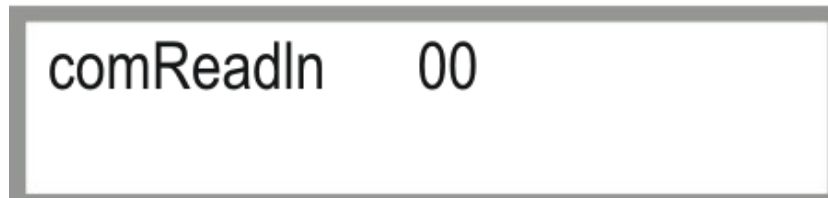
IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.23 RECONNT. / MODEM / PAR

Shows current values of GPRS-modem for visualisation.

Caution: This parameter is used by a BAUER service technician for error diagnosis only.

Note: This window is not used without GPRS modem (visualisation).

Fig. 4.1.23 Parameter GPRS-modem / ping time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5 MACHINE PARAMETER MENU

5.1 DESCRIPTION OF THE INDIVIDUAL PARAMETERS

For entering the machine parameter menu, press the key STOP.

Then the code display appears.

By using the UP and DOWN keys, you can set the code and confirm it by pressing the key ENTER.

If you use the correct code *Machine Parameter Menu* is displayed.

CODE=12   only for service technicians

Fig. 5.1a Parameter for code input

Fig. 5.1b Entering code 12

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

You can enter the programming mode by pressing the ENTER (Menu) key. The cursor blinks at the first parameter and it can be changed with the keys ✚ and ━ . You get to the second parameter by pressing

the key RIGHT ARROW KEY (F). You get back to the first parameter by pressing the key LEFT ARROW KEY (R).

Press ENTER for saving or leave with ESC without saving.

5.1.1 DATE AND TIME

Setting the system *date* and the *time*.

DD/MM/YYYY   Time
04 04 2013   14:04

Fig. 5.1.1 Setting of date and time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.2 LANGUAGE / IRRIGATION WIDTH

Setting the *language* and *irrigation width* of the machine.

The *irrigation width* is the length from the main cart to the final point of the machine (end tower incl. overhang).

Language   English
Irriga.width   108m

Fig. 5.1.2 Setting of language and irrigation width

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.3 RUNNING LENGTH / FLOW

The *running length* is twice the length of the supply hose in meters.

The *flow* is the calculated or measured system throughput in m³/h.

These values approve an exact calculation of machine runtime cycles.

```
┌──────────────────────────────────────┐
│ Running lgt              120m         │
│ Flow                    80m/h         │
└──────────────────────────────────────┘
```

Fig. 5.1.3 Setting of language and irrigation width

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

5.1.4 PERIOD OF TIME / ON-DELAY

The **time period** is the total of running time and idle period of the *end tower*.
Running time and idle period are calculated according to the set application rate. The total of running time and idle period is always the time period.

*The **On Delay*** is a delay in minutes for the motors after turning on the pumps to allow for irrigation under full pressure from the beginning.

```
┌──────────────────────────────────────┐
│ TimePeriod               60s          │
│ On Delay                  2m          │
└──────────────────────────────────────┘
```

Fig. 5.1.4 Setting of period of time and on-delay

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

5.1.5 PRESSURE SWITCH / PRESSURE DELAY

Enter **PRESSURE SWITCH ON** to activate system pressure monitoring by the means of a pressure switch.

The **PRESSURE Delay** is the time in minutes the system is waiting, when pressure gets too low, before a pressure FAILURE is displayed and the CENTERLINER is stopped.

Note: This window is not used without *pressure switch.*

```
┌──────────────────────────────────────┐
│ Pressure Swi.             ON          │
│ Press.Delay               5m          │
└──────────────────────────────────────┘
```

Fig. 5.1.5 Parameters for pressure switch and pressure delay

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

5.1.6 MAXIMUM SPEED / DISPLAY LIGHT

The ***MAXIMUM SPEED*** is a calculating factor in order to calculate the cycle times with the aid of the set precipitation. This parameter depends on the mounted gears, the engine speed, the diameter of the wheels and the condition of the surface.

DISPLAY LIGHT is the time for switching off the background lighting (if you do not press any key for the set time, the background lighting will be switched off).

```
M. Speed          105 m/h
Display L.           200s
```

Fig. 5.1.6 Setting of max. speed and display light

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

5.1.7 TELEPHONE NUMBER 1

You can set the ***phone number*** to which *all SMS will be sent (e.g. +43xxx for Austria)*.

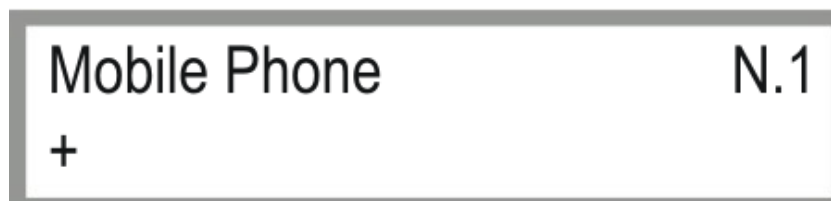**Note:** This window is not used without *GSM* or *GPRS modem.*

```
Mobile Phone         N.1
+
```

Fig. 5.1.7 Entering the phone number 1

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕ .

5.1.8 TELEPHONE NUMBER 2

Here you may set an optional **phone number 2** to which SMS will be sent *(e.g. +43xxx for Austria)*.

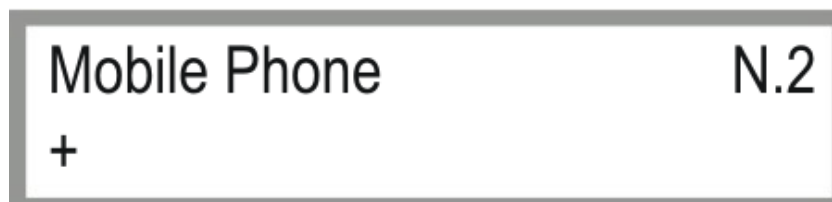**Note:** This window is not used without *GSM* or *GPRS modem.*

Fig. 5.1.8 Entering the phone number 2

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ‒ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.9 PIN / DRIVE ENDTO.

The *PIN* is the PIN CODE of the SIM card put into the GSM modem.

Caution: Be sure to set the PIN CODE before you put the SIM card into the modem. Otherwise you would have to set the PUK CODE by the means of a cell phone!!

Note: This window is not used without *GSM* or *GPRS modem*.

Drive end tower:

This parameter concerns the machine MONOSTAR and is related to its optional function "automotive moving of end tower" (end tower control for automotive moving).

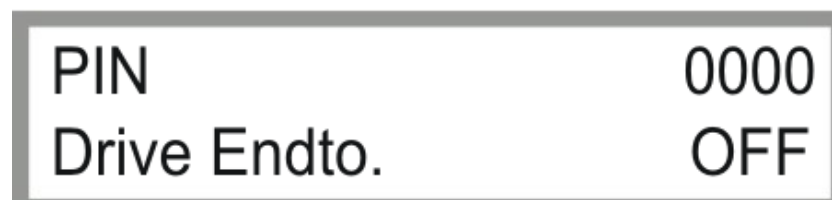**Caution**: This parameter is not used for the LINESTAR.

Fig. 5.1.9 Entering PIN Code / drive end tower

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ‒ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.10 MOTOROFFDELAY / MACHINE TYPE

Motoroffdelay *(in seconds)*:

Prevents too rapid response of the linear control (switch debouncing).

Type:

Select among machine type *Linestar* and *L.S.Guid*.

LineStar: Furrow / cable guidance
L.S.Guid: Below ground guidance

Fig. 5.10 Entering Motor-off-delay & machine type

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

5.1.11 M (MOTOR) RUNNING TIME / M (MOTOR) CORRECTION

The **MOTOR RUN TIME** concerns only system adjustment by means of the furrow guidance and here it means the time one motor (of the central tower or of the end tower) must run before the second motor must be turned on manually in order to eliminate mechanical stress in the system.

The **MOTOR CORRECTION** is the time for which the manually turned on motor will run after end of the set *MOTOR RUN TIME.*

Fig. 5.1.11 Entering motor runtime & motor correction time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

5.1.12 SEKTORP.L / SEKTORP.R

SektorP.L and *SektorP.R* concerning the limits when the machine runs in pivot mode.

Caution: This parameter is not used for the LINESTAR.

Fig. 5.1.12 Setting SektorP.L & SektorP.R

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.13 LCD INTENSITY / MOTORDELAY

LCD Intensity is the backlight intensity.

Motordelay is the delay after which the second wheel of the central tower gets started.

Set both parameters at the same value for using the *CENTERLINER* in *pivot mode* continuously, e.g. *SEKTORP.L = 0°* & *SEKTORP.R = 0°.*

Fig. 5.1.13 Setting LCD Intensity & Motordelay

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.14 FWD OFFSET / FWD WINDOW (ONLY WITH BELOW GROUND GUIDANCE)

Fwd OFFSET is the configurable parallel offset of the 1st antenna (forward) from the track guide wire.

Setting range: Positive values yield an offset to the RIGHT, viewed in the FORWARD direction; negative values yield an offset to the LEFT.

Fwd Window is the configurable permissible range for the 1st antenna (forward) within which the antenna values can lie without triggering a correcting steering pulse.

*Setting range***:** The value entered represents the size of the window; in other words, if "10" is entered, the machine can deviate + / - 5 from the ideal guide wire track.

Caution: The displayed values are machine values that depict the deviation of the antenna from the ideal track on a proportional basis. They are not values in "mm", etc.

Caution: *This parameter is available only with the BAUER BELOW GROUND GUIDANCE.*

Default value for **FWD WINDOW** = 10

Fig. 5.1.14 Setting Fwd OFFSET & Fwd Window

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.15 RVW OFFSET / RVW WINDOW

Rvw OFFSET is the configurable parallel offset of the 2nd antenna (reverse) from the track guide wire.

*Setting range***:** Positive values yield an offset to the RIGHT, viewed in the FORWARD direction; negative values yield an offset to the LEFT.

Rvw Window is the configurable permissible range for the 2nd antenna (reverse), within which the antenna values can lie without triggering a correcting steering pulse.

*Setting range***:** The value entered represents the size of the window; in other words, if "10" is entered, the machine can deviate + / - 5 from the ideal guide wire track.

---
*Caution***:** The displayed values are machine values that depict the deviation of the antenna from the ideal track on a proportional basis. They are not values in "mm", etc.

Caution: This parameter is available only with the *BAUER BELOW GROUND GUIDANCE.*

Default value for **RVW WINDOW** = 10

| Rvw OFFSET | 0 |
| Rvw Window | 10 |

Fig. 5.15 Setting Rvw OFFSET & Rvw Window

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.16 DIS.SAFFWD / DIS.SAFRVW

Here you can determine the deviation XXXX of the antenna to the tracking to activate the safety circuit and stop the LINESTAR.
The first line sets the value of the deviation to the left / right in forward drive, the second line represents the value of the deviation to the left / right while reversing.

---
*Caution***:** The displayed values are machine values that depict the deviation of the antenna from the ideal track on a proportional basis. They are not values in "mm", etc.

Caution: This parameter is available only with the *BAUER BELOW GROUND GUIDANCE.*

Default value for **DIST.SAFFWD / DIST.SAFRVW** = 300

Fig. 5.1.16 Setting Dist.SafFwd & Dist.SafRvw

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.17 FILTER X1 / FILTER X2

Erratic values of the steering antennas (caused by bad signal, noise, faulty cabling, etc.) can be compensated by turning on a digital filter.

Filter X1 stands for filter settings of antenna 1, **Filter X2** stands for filter settings of antenna 2.
Permitted settings for "XXXX" is between "0" and "100", where "0" means no filtering, and "100" for maximum filtration.

Caution: This parameter is available only with the *BAUER BELOW GROUND GUIDANCE.*

Default values for **FILTER X1 / X2** = 60 - 85

Fig. 5.1.17 Setting Filter X1 & Filter X2

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.18 POS.FWD. 90 / POS.RVW. 90

Caution: This parameter is not used for the LINESTAR.

Fig. 5.1.18 Setting Pos.Fwd.90 & Pos.Rvw.90

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕.

5.1.19 POS.FWD. 270 / POS.RVW. 270

Caution: This parameter is not used for the LINESTAR.

Fig. 5.1.19 Setting Pos.Fwd.270 & Pos.Rvw.270

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕.

5.1.20 LINEARPOS. HYSTERESIS

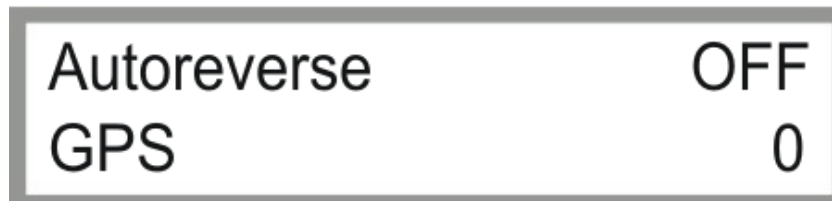| *Caution*: This parameter is not used for the LINESTAR. |
| --- |

Fig. 5.1.20 Setting Linearpos. hysteresis

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕.

5.1.21 AUTOREVERSE / GPS

AUTOREVERSE:

Here the function **Autoreverse** can be switched *ON* or *OFF*. If Autoreverse is switched *OFF* the *LINESTAR* will stop at the end of the field. If this function is switched ON the LINESTAR will automatically turn and will drive back to the other end until the maximum rounds are reached, then the LINESTAR will end the program and stop.

Caution: This function cannot be used with a LINESTAR with rigid connection line!

GPS allows for operation with ten different positions (towable system).

0:          GPS is deactivated

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛.

5.1.24 REMOTE CONTROL / GPS ERROR TIME

Remote con.: Configuration of communication: OFF, SMS or DATA

OFF: no data transmission
SMS: data transmission via SMS to the number entered
DATA: visualization on PC

GPS Error Time in minutes: After this time without a GPS receiver a GPS Error will appear and stop the program.

Note: This window is not used without *GSM* or *GPRS* modem and without *GPS.*
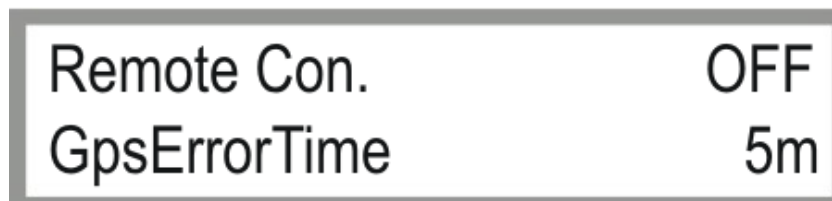
```
Remote Con.          OFF
GpsErrorTime          5m
```
Fig. 5.1.24 Setting Remote Con. & GpsErrorTime

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛.

5.1.25 COMM.TIMEOUT / PINGTIME

Settings for GPRS-modem when using visualisation.

Comm.Timeout:

Maximum time period after what a communication error is registered.

Note: This parameter is not used without *GSM* or *GPRS modem.*

Ping Time: Time period wherein a server ping is executed.

Note: This parameter is not used without *GSM* or *GPRS modem.*
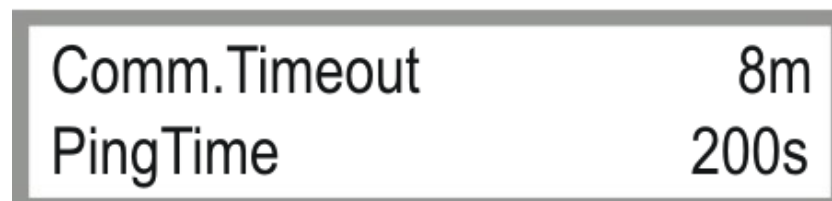
```
Comm.Timeout          8m
PingTime            200s
```
Fig. 5.1.25 Setting Comm.Timeout & PingTime

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛.

5.1.26 ADDRESS / PORT NUMBER

Use the address entered on the PC configuration for the relevant machine (*see Fig. 5.1.26b marked red*)
These numbers are available only once and they are clearly defined.

Note: This window is not used without *GPRS modem* (visualisation)*.*

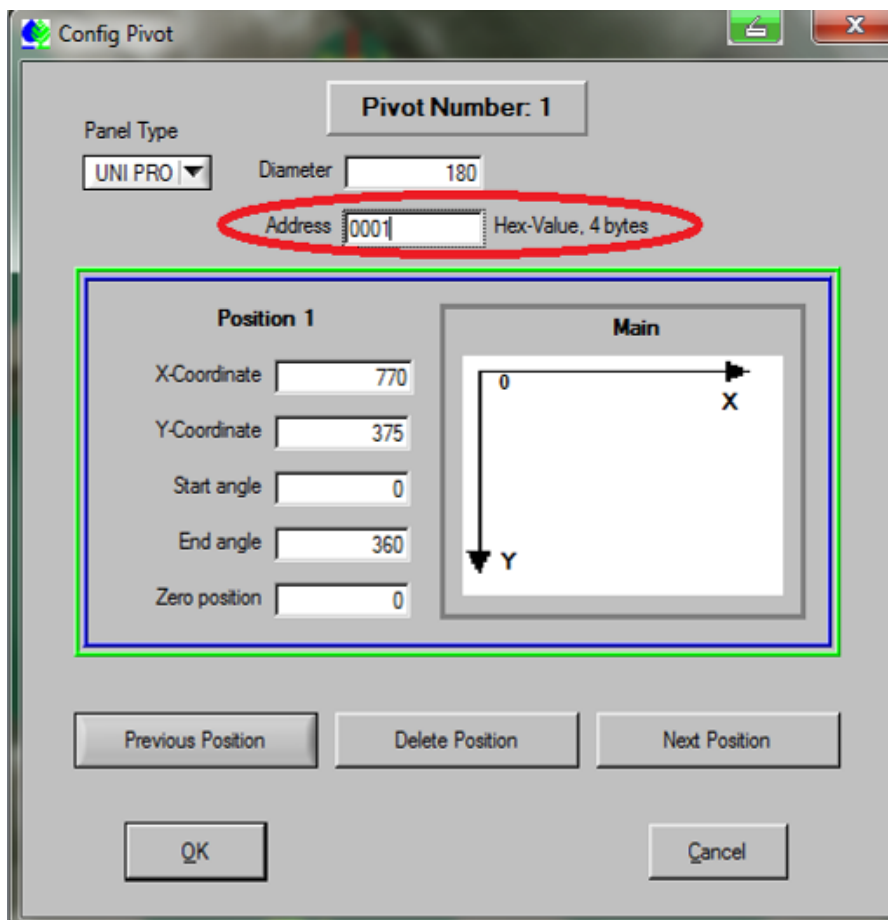*Fig. 5.1.26a Setting Address & port number*

Fig. 5.1.26b Address in PC configuration

Under parameter "port number", the internet connection number used is set.
The control unit tries to establish a TCP connection to the PC control centre on the port set.
The same port number must be entered on all machines and on the PC configuration (please mind port forwarding).

6 OPERATING VIA SMS

6.1 RECEIVING SMS MESSAGES WITH THE PRO CONTROLLER

You can receive various SMS messages with a standard GSM mobile phone when connecting a GSM modem to the Pro Controller. These can be STATUS messages after a STOP or a START of the machine or error reports, e.g. after a pressure loss or off-track running.

Procedure:
1) Start the PRO Controller.
2) Set the telephone number and the PIN Code in the machine parameter menu.
3) Shut off the Pro Controller and connect the GSM modem to the Pro Controller.
4) Turn on the Pro Controller and observe the initialization; GSM MODEM OK should be indicated on the display.
5) After successful boot procedure, an SMS is sent to the set telephone number. Then all functions of the Pro Controller with SMS function are active (sending error reports, status messages, acknowledgements per control SMS).

6.2 CONTROLLING THE PRO CONTROLLERS BY MEANS OF SMS MESSAGES

You may confirm the functions START, STOP or change the precipitation depth by SMS.

Starting the PRO Controllers by SMS

In order to start the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

FWD_CMDxx   *or*   **FWD_CMD**   (old version: **FWDxx** or **FWD**)
RVW_CMDxx   **RVW_CMD**   (old version: **RVWxx** or **RVW**)

Caution: ALL THE LETTERS NEED TO BE CAPITAL LETTERS!

xx stands for the chosen precipitation in mm.
xx always must have two digits. With a chosen precipitation of less than 10, you must enter, e.g., **FWD_CMD05** into the SMS in order to start forward operation of the machine with a precipitation of 5 mm (*longer texts will not be accepted*).

Caution: Changing precipitation rate via SMS is only possible for first segment.

Stopping the Pro Controller via SMS

In order to stop the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

STOP_CMD   (old version: **STOP**)

STATUS monitoring via SMS

In order to get the current STATUS of the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

STATUS_CMD   (old version: **STATUS**)

Replies of the Pro Controller
To each SMS sent, the Pro Controller returns a check-back SMS, reading:
- Machine status (e.g.: forward)
- Precipitation forward and reverse in mm
- System time
- Current cycle
- Maximum cycles
- Remaining irrigation time

7 FIRMWARE UPDATE

7.1 WITH PDA / LAPTOP

1.) Put the main switch of the control panel in position „OFF"
2.) Open the inner door and connect the PRO-module via a serial cable to the laptop (PC or PDA)
3.) Turn the main switch in position „ON" while pushing the MENU key (display shows: FLASH BOOT LOADER)
4.) Start the programme „**Download Tool**"
5.) Choose the correct COM interface (error message **comerror** if wrongly chosen)
6.) Load the latest file valid with the browser (e.g. ProzenttimerV5_20.hex)
7.) START DOWNLOAD – files should be downloaded without interruption until message: *Software Download successfully finished*
8.) Separate the serial connection
9.) Wait until display shows *load eprom,* the standard parameters are loaded and the PRO is booted.

7.2 WITH BAUER PROGRAMME LOADER

The firmware can be updated with the separately available *Programme Loader.*

1.) Put the main switch of the control panel in position „OFF"
2.) Open the inner door and connect the PRO-module via a serial cable to the *Programme Loader.*
3.) Connect power cable to the PRO-module (orange plug).
4.) Connect USB stick with desired *firmware* version to the *Programme Loader.*
   Caution: File needs to be stored in the root directory and renamed to "***firmware.hex***" (e.g. ProzenttimerV5_20.hex -> firmware.hex).
5.) Turn the main switch in position „ON" while pushing the MENU key (display shows: FLASH BOOT LOADER)
6.) Indicator light flashes, upload process is starting.
7.) Wait until display shows *load eprom,* the standard parameters are loaded and the PRO is booted.
8.) Separate the connection the *Programme Loader.*
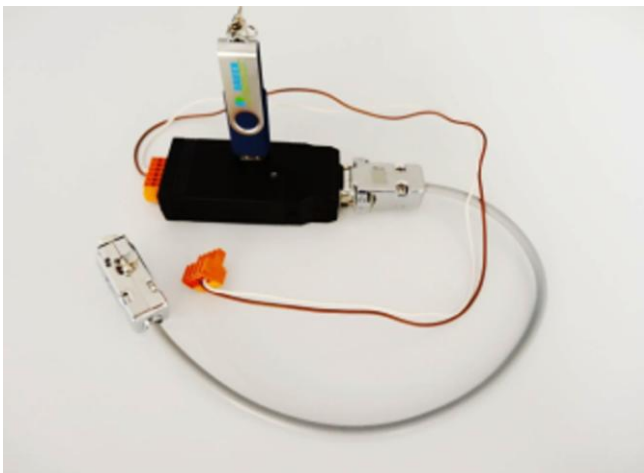
7.3 RESTORE FACTORY SETTINGS

1.) Turn main switch to „OFF". Turn main switch to „ON" while pushing *R+F*. Wait until display shows *load eprom*. The standard parameters are loaded and the PRO is booted.

8 TECHNICAL DATA

Control unit	
Voltage	230 V/50 Hz (+/- 10 %) or 12V -
Input	4 VA
Ambient temperature	0 to 65 °C
Dimensions (HxWxD)	85x90x75
Breaking capacity of the relays	230V~ 5A
Entries	230 V/50 Hz (+/- 10 %)

9 CONNECTION AND WIRING DIAGRAM

All inputs and outputs need to be connected at the rear with three plugs.