



BAUER

FOR A GREEN WORLD

OPERATING MANUAL

for

CORNER END TOWER

with

GPS - CONTROL



Version: VII / 2014

850 9997

EndBottom / Endtop 4.09



Introduction

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

The present manual is a detailed description. 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 **CONTROL PANEL CORNER ENDTOWER** in all inquiries, correspondence, warranty problems or parts orders.

We wish you success with your BAUER CORNER SYSTEM WITH GPS-CONTROL!



Product details

Type designation:**BAUER – CORNER END TOWER****Type version:**

Front panel location

Serial number:

Dealer:

Name:

Address:

Phone / Fax:

Date of shipment:

Manufacturer of the control unit:Röhren- und Pumpenwerk **BAUER** GmbH

Kowaldstr. 2

A - 8570 Voitsberg

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Owner or operator:

Name:

Address:

Phone / Fax:



Table of Contents

CONTROL CENTRE OF CORNER END TOWER	6
1 SET UP / MAIN COMPONENTS	7
1.1 CONTROL PANEL	7
1.1.1 DISPLAY	7
1.1.2 FUNCTIONS/MENU BUTTONS	7
2 CONTROL PANEL END TOWER BOTTOM	8
2.1 BOOTING	8
2.2 STATUS WINDOW	8
2.2.1 STATUS WINDOW	8
2.3 PARAMETER MENU	9
2.3.1 DESCRIPTION OF INDIVIDUAL PARAMETERS	9
2.3.1.1 VALVETIME	9
2.3.1.2 SPANP / LENKPOTI	9
2.3.1.3 CORNE.AUF / PIVOT	10
2.3.1.4 STATUS GOETT. / STEERING	10
2.3.1.5 STATUS ENDT / STATUS CORNE	11
2.3.1.6 SD1 / SD2	11
2.3.1.7 STATUS CAN CONTROLLER	12
2.3.1.8 NOZZLE GROUP V7-9	12
2.3.1.9 MAN SPEED / ENDGUNANGLE	13
2.3.1.10 SPAN SOLL F / SPAN SOLL R	14
2.3.1.11 SPANSENSOR PARAMETER PID P / PID I	14
2.3.1.12 SPANSENSOR PARAMETER PID D	14
2.3.1.13 FWD OFFSET / FWD WINDOW	15
2.3.1.14 RVW OFFSET / RVW WINDOW	15
2.3.1.15 DIST.SAFFWD / DIST.SAFRVW	16
2.3.1.16 FILTER X1 / FILTER X2	17
2.3.1.17 ENDSWITCHL / ENDSWITCHR	17
2.3.1.18 STEERPULSE / STEERPAUSE	18
2.3.1.19 STEERFACTOR / PULSEMAX	18
2.3.1.20 FILTERSPAN	19
2.3.1.21 ANTDIFFLEFT / ANTDIFFRIGHT	19
2.3.1.22 INPUT	20
2.4 MACHINE PARAMETER MENU	20
2.4.1 DESCRIPTION OF THE INDIVIDUAL PARAMETERS	20
2.4.1.1 DATE / TIME	21
2.4.1.2 LANGUAGE / IRRIGATION RADIUS	21
2.4.1.3 RADIUS OF LAST TOWER / FLOW	22
2.4.1.4 PERIOD OF TIME / PIN	22
2.4.1.5 MAXIMUM SPEED / DISPLAY LIGHT	23
3 CONTROL PANEL END TOWER TOP	23
3.1 BOOTING	23
3.2 STATUS WINDOW	23
3.2.1 STATUS WINDOW	23
3.3 PARAMETER MENU	24
3.3.1 DESCRIPTION OF INDIVIDUAL PARAMETERS	25
3.3.1.1 POTI OFFSET / VALVE TIME	25
3.3.1.2 SPANP / LENKPOTI	25
3.3.1.3 CORNE.AUF / PIVOT	25
3.3.1.4 STATUS GOETT. / STEERING	26
3.3.1.5 STATUS ENDT / STATUS CORNE	26
3.3.1.6 SD1 / SD2	27
3.3.1.7 STATUS CAN CONTROLLER	28
3.3.1.8 NOZZLE GROUP V1-6	28
3.3.1.9 MAN SPEED / ENDGUNANGLE	29
3.3.1.10 SPAN SOLL F / SPAN SOLL R	29
3.3.1.11 SPANSENSOR PARAMETER PID P / PID I	30



3.3.1.12	SPANSENSOR PARAMETER PID D	30
3.3.1.13	FWD OFFSET / FWD WINDOW.....	30
3.3.1.14	RVW OFFSET / RVW WINDOW	31
3.3.1.15	DIST.SAFFWD / DIST.SAFRVW.....	32
3.3.1.16	FILTER X1 / FILTER X2.....	32
3.3.1.17	ENDSWITCHL / ENDSWITCHR	33
3.3.1.18	STEERPULSE / STEERPAUSE	33
3.3.1.19	STEERFACTOR / PULSEMAX.....	34
3.3.1.20	FILTERSPAN.....	35
3.3.1.21	ANTDIFFLEFT / ANTDIFFRIGHT	35
3.3.1.22	INPUTS / OUTPUTS	35
3.4	MACHINE PARAMETER MENU.....	36
3.4.1	DESCRIPTION OF THE INDIVIDUAL PARAMETERS.....	36
3.4.1.1	DATE / TIME.....	36
3.4.1.2	LANGUAGE / IRRIGATION RADIUS.....	37
3.4.1.3	RADIUS OF LAST TOWER / FLOW.....	37
3.4.1.4	PERIOD OF TIME / PIN	38
3.4.1.5	MAXIMUM SPEED / DISPLAY LIGHT.....	38
4	FIRMWARE UPDATE.....	39
4.1	WITH PDA / LAPTOP	39
4.2	WITH BAUER PROGRAMME LOADER.....	39
4.3	RESTORE FACTORY SETTINGS.....	39
5	TECHNICAL DATA	40



CONTROL CENTRE OF CORNER END TOWER

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 equipment

**ATTENTION!**

During operation always keep the control centre closed to protect it against dirt and splash water.



1. Control panel CORNER ENDTOWER / bottom
2. Control panel CORNER ENDTOWER / top
3. Green illuminated button



1 SET UP / MAIN COMPONENTS

1.1 CONTROL PANEL



1.1.1 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*).

1.1.2 FUNCTIONS/MENU BUTTONS

- | | |
|-------------------------------|---|
| START FORWARD(F) | Start the Pivot forward (<i>clockwise</i>) |
| START REVERSE(R) | Start the Pivot backwards (<i>anti-clockwise</i>) |
| 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 CONTROL PANEL END TOWER BOTTOM

2.1 BOOTING

When switching on the main switch, ENDTOWER BOTTOM will be on display and the software version installed with the date of set-up.



Figure 2.1: Display after start

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

2.2 STATUS WINDOW

The status window provides important information about the operating status of the *CORNER SYSTEM*. After booting has been completed, the status window opens automatically. The parameters shown in the status window are updated all the time.

2.2.1 STATUS WINDOW

The information about the current operating status is shown in the two columns of the status window (see Fig. 2.2). Below, the individual elements of the status window are described, from the top left to the bottom right corner of the window:

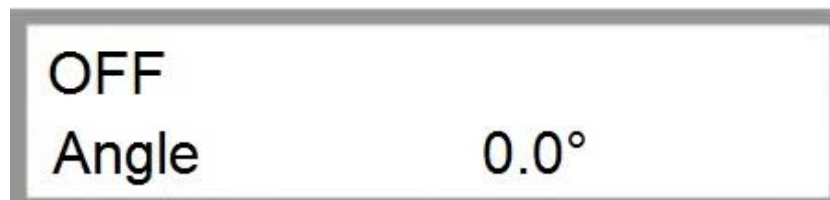


Figure 2.2: Status window

OPERATING STATUS

The following general operating statuses are displayed:

- OFF Pivot not operating
- FORWARD Pivot moving in the indicated direction
- WAITING Pivot waiting for the programmed start time to begin
- PAUSE Pivot is in the programmed irrigation pause
- SAFETY Pivot has been switched off due to an general interruption of safety circuit.
- ERROR Pivot has been switched off due to an error
- EMER.OP. System is in emergency operating mode, operating mode NOT permissible for CORNER SYSTEM, results in lasting damage to the system.

- OK System is in good order
- SAFE:OFF Pivot safety circuit has been switched off
- PR.STOP Pivot was switched off because of insufficient water pressure
- VOLT-ST Pivot turned off because of low voltage
- CAN-ERR CAN-BUS communication error
- I2C-ERR I2C communication error
- START Pivot waiting till waiting period is up; pump is already active when starting
- PARKPOS. Pivot moving to or is already in preset parking position.
- REVERSE Pivot moving in the indicated direction
- GPS ERR. GPS communication error
- RAIN Pivot has been switch off through rain sensor
- CORN.ERR Safety circuit interrupted at Corner



- SPANSENS Span sensor: interruption of safety circuit
- TILT ERR Tilting sensor: interruption of safety circuit
- LASTTOWE Last tower: interruption of safety circuit
- GUID.SAF BELOW GROUND GUIDANCE safety circuit has been exceeded
- GUID.SIG BELOW GROUND GUIDANCE does not receive any signal from subsoil cable
- CAN GOET communication error with antenna evaluator error
- CAN DRIV CAN communication error with frequency converter
- COMPRESS Maximal admissible running time of compressor has been exceeded (leakage)
- NO MOVE No movement of machine has been registered

The following GPS operating statuses are displayed.

- INVALID Invalid GPS reception
- GPSFIX GPS reception without base / corrective station
- DGPS GPS signal with corrective data, not sufficient for driving
- FLOAT GPS precision approx. 15 cm, driving possible at low speed
- RTK Maximum GPS precision, fluctuations depending on reception strength

Angle

Shows the current values for the angle of the CORNER SPAN.

2.3 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:

2.3.1 DESCRIPTION OF INDIVIDUAL PARAMETERS

2.3.1.1 VALVETIME

With **ValveTime**, you can configure the time period for both nozzle groups 5 and 8 in seconds. These nozzle groups are activated for a configured fraction of this time.

To prevent the simultaneous activation of all nozzle groups, set the value **ValveTime** to be slightly different for the **ENDTOWER TOP** and **ENDTOWER BOTTOM**.



Figure 2.3: Configuration of the nozzle control time period

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

2.3.1.2 SPANP / LENKPOTI

SpanP:



The left number indicates the *motor activation* or *regulation value* of the span sensor.
The right number indicates the *actual value* of the span sensor.

LenkPoti:

LenkPoti shows the ACTUAL value of the current steering angle.

ATTENTION: The values are machine values and are not related to any dimensional unit!

SpanP	0	1022
LenkPoti		880

Figure 2.4: Display of span sensor and steering sensor

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.3 CORNE.AUF / PIVOT

Corne.AUF shows the current angle of the CORNER SPAN relative to the pivot in °.

90° means that the CORNER span is swung in at a right angle, **165°** means that the CORNER span is swung out all the way.

OPEN (AUF) / CLOSE (ZU) shows the current CORNER span movement.

OPEN (AUF) indicates the process of swinging outward.

CLOSE (ZU) indicates the process of swinging inward.

Pivot indicates the current value of the imaginary connecting line between the CORNER tower and the central tower relative to the zero degree position (*GPS north*)

Corne.AUF	160°
Pivot	0.0°

Figure 2.5: Display of CORNER angle / pivot 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 **+** .

2.3.1.4 STATUS GOETT. / STEERING

STATUS GOETT. provides information about the CAN OPEN status of the TRACK UNIT (*BELOW GROUND GUIDANCE*).

Steering L 0 R 0 (Lenkung) provides information about the current steering activities.

L 0 indicates that no steering pulse to the *left* is currently active.

L 1 indicates that a steering pulse to the *left* is currently active.

The steering activities to the *right* are indicated in the same way.

STATUS GOETT.	00
Lenkung	L0 R0

Figure 2.6: STATUS CAN Status / Lenkung

ATTENTION: This menu item is used only on a CORNER SYSTEM with 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 $+$.

2.3.1.5 STATUS ENDT / STATUS CORNE

STATUS ENDT shows the CAN OPEN status of the frequency converter at the *end tower*.

Value range: Possible values for the CAN OPEN status are between 0 and 100.

100 means CAN OPEN *ready*,
0 means CAN OPEN *not ready*.

WARNING: The correct CAN OPEN status can only be displayed while the motor / frequency converter is running. If the motor is standing still, an incorrect status is shown on the display because no voltage is present on the CAN bus of the frequency converter.

STATUS CORNE shows the CAN OPEN status of the frequency converter at the *corner tower*.

Value range: Possible values for the CAN OPEN status are between 0 and 100.

100 means CAN OPEN *ready*,
0 means CAN OPEN *not ready*.

STATUS ENDT	0
STATUS CORNE	0

Figure 2.7: Status CAN BUS ENDTOWER / CORNER

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY $+$.

2.3.1.6 SD1 / SD2

SD1 and SD2 are antenna values of the BELOW GROUND GUIDANCE.

S1 shows the total value of antenna 1 (*forward*)

D1 shows the difference value of antenna 1 (*forward*)

S2 shows the total value of antenna 2 (*reverse*)

D2 shows the difference value of antenna 2 (*reverse*)

Total values reflect the field strength.

Difference values reflect the deviation from the cable.

SD1	0	0
SD2	0	0

Figure 2.8: Antenna values BELOW GROUND GUIDANCE

ATTENTION: This menu item is used only on a CORNER SYSTEM with 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 **+.**

2.3.1.7 STATUS CAN CONTROLLER

The first number of the first line represents the **transmit error counter** and counts the number of incorrectly transmitted CAN messages.

The second number of the first line represents the **receive error counter** and counts the number of incorrectly received CAN messages.

The third number of the first line represents the **bus off error counter** and counts the number CAN bus failures that have occurred.

In the second line, **A4** indicates the current CAN controller status.

The last number of the second line indicates the number of actually sent CAN messages.

The next-to-last number of the second line indicates the number of CAN messages to be sent.

T R	0	0	0
CAN A4		0	0

Figure 2.9: Status CAN Controller

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+.**

2.3.1.8 NOZZLE GROUP V7-9

In this menu, you can choose to manually activate or deactivate the nozzle groups 7 to 9 of the CORNER SPAN.



The first 3 numbers in the first line indicate the operating status of the pneumatic valves 7-9, where the possible values range from 0 to 255. The value "0" stands for "automatic", "1" and "255" stand for ON. The values in between correspond to a fraction of the time period "VALVETIME" (see 2.3.1.1) by which the respective nozzle group will be cycled.

Example: A displayed value of "80" would correspond to an activation duration for the corresponding nozzle group of 80/255 of the previously configured time duration (VALVETIME).

The last number in the second line indicates the currently selected valve, whereby "0" stands for group 1, "1" for group 2 etc.

To switch between the valves, press the "F" or "R" key on the PRO control panel.

To activate the selected valve, press the MENU / ENTER key. To deactivate the valve, press the MENU / ENTER key again.

ATTENTION: If the pneumatic valve is "activated", this means that the water supply to this nozzle group is interrupted. If the pneumatic valve is "deactivated", this means that the water supply to this nozzle group is open.



Figure 2.10: Test menu valves 7-9

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

2.3.1.9 MAN SPEED / ENDGUNANGLE

You can overwrite the current speed of the system under **Man Speed** in order to carry out special calibration or service work.

Setting range:

0 represents the slowest possible speed. The configured speed is taken from the main control unit.

Values larger than 0 correspond to a proportionally increasing machine speed.

WARNING: The displayed values are machine values that represent a proportional increase in the speed of the system. They are not values in "mm", etc.

The value defined **EndgunAngle** in ° indicates the angle of the CORNER span relative to the pivot as of which the endgun should be switched on. Below this configured value, the endgun is not activated even if a sector in this area was configured for the endgun in the main control unit.

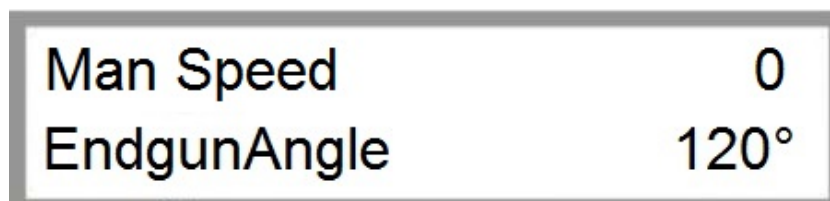


Figure 2.11: Man Speed / EndgunAngle



IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **—** .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.10 SPAN SOLL F / SPAN SOLL R

Span Set F indicates the regulator set value of the span sensor for forward travel.

Span Set R indicates the regulator set value of the span sensor for reverse travel.

Span Soll F	430
Span Soll R	430

Figure 2.12: Span sensor set values

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **—** .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.11 SPANSENSOR PARAMETER PID P / PID I

PID P, **PID I** and **PID D** are regulator parameters of the span sensor and may only be changed by a trained service technician.

PID P indicates the proportional component of the span sensor.

PID I indicates the integral component of the span sensor.

PID P	20
PID I	150

Figure 2.13: Configuring the proportional and integral portion of the span sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **—** .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.12 SPANSENSOR PARAMETER PID D

PID D is another control parameter of the span sensor and may only be changed by a trained repair technician.

PID D indicates the differential component of the span sensor.

Takt is the calculated activation cycle of the irrigation cycle specified by the *UNIVERSAL PRO-G* control system.



PID D	150
Takt	0

Figure 2.14: Configuring the differential portion of the span sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **—** .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.13 FWD OFFSET / FWD WINDOW

Fwd Offset is the configurable parallel offset of the 1st antenna (forward) from the track guide wire or to the stored GPS path.

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.

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that represent a proportional increase or magnification. They are not values in "mm", etc. The standard value for Fwd Window is 10.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in "cm". The standard value for Fwd Window in this case is 4.

Fwd Offset	0
Fwd Window	4

Figure 2.15: Configuring forward travel with the 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 **+** .

2.3.1.14 RVW OFFSET / RVW WINDOW

Rvw Offset is the configurable parallel offset of the 2nd antenna (reverse) from the track guide wire or to the stored GPS path.

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.

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that represent a proportional increase or magnification. They are not values in "mm", etc. The standard value for Rvw Window is 10.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in "cm". The standard value for Rvw Window in this case is 4.

Rvw Offset	0
Rvw Window	10

Figure 2.16: Configuring reverse travel

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+ .**

2.3.1.15 DIST.SAFFWD / DIST.SAFRVW

With **Dist.SafFwd** and **Dist.SafRvw**, you can define the limit values of the steering antenna of the CORNER tower for the safety shutdown.

Dist.SafFwd is the configurable maximum deviation of the 1st antenna (forward) for the safety shutdown.

Dist.SafRvw is the configurable maximum deviation of the 2nd antenna (reverse) for the safety shutdown.

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that proportionally represent the deviation of the antenna from the ideal track. They are not values in "mm", etc. The standard value for Dist.SafFwd / Dist.SafRvw is 300.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in "cm". The standard value for Dist.SafFwd / Dist.SafRvw in this case is 100.

Dist.SafFwd	300
Dist.SafRvw	300

Figure 2.17: 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 \oplus .

2.3.1.16 FILTER X1 / FILTER X2

With **Filter X1** and **Filter X2**, you can filter out faulty values that are detected by the steering antennas. Faulty values can be outliers (large, sudden changes in the antenna values), fluctuations due to interference, etc.

Filter X1 is the configurable filter value for the 1st antenna (forward).

Setting range: You can define filter values from 0 to 99. The larger the configured value, the more (faulty) antenna values are filtered out.

Filter X2 is the configurable filter value for the 2nd antenna (reverse).

Setting range: You can define filter values from 0 to 99. The larger the configured value, the more (faulty) antenna values are filtered out.

Filter X1	70
Filter X2	70

Figure 2.18: Configuring filter values with the BELOW GROUND GUIDANCE

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the standard value is 70, when using a **BAUER GPS CONTROL** this value is 10.

ATTENTION: The displayed values are machine values that represent a proportional increase or magnification. They are not values in "mm", etc.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \ominus .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \oplus .

2.3.1.17 ENDSWITCHL / ENDSWITCHR

With **Endswitch L** and **Endswitch R**, you can limit the maximum steering angle in order to prevent mechanical damage to the steering system or prevent faulty steering commands.

Endswitch L is the configurable limit to the steering in the counter-clockwise direction.

Setting range: The configurable values are greater than or equal to "0".

Endswitch R is the configurable limit to the steering in the clockwise direction.

Setting range: The configurable values are greater than or equal to "0".

ATTENTION: 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.



EndswitchL	170
EndswitchR	450

Figure 2.19: Configuring the steering of the CORNER 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 **+** .

2.3.1.18 STEERPULSE / STEERPAUSE

With **SteerPulse** (*LenkPuls*) and **SteerPause** (*LenkPause*), you can configure the maximum allowed number of steering pulses that may be processed without interruption (*SteerPause*). The steering pulse depends on the guide wire deviation and is automatically selected by the control.

WARNING: The steering of the CORNER tower is a major component of the CORNER system. Faulty settings can result in an incorrect path or damage; in the worst case, a complete breakdown of the system could result. Only change these values if you are 100% familiar with the system.

SteerPulse is the maximum allowed number of steering pulses.

Setting range: The configurable values are greater than or equal to "1".

SteerPause is the delay time between 2 consecutive steering pulses.

Setting range: The configurable values are greater than or equal to "0".

ATTENTION: The displayed values are machine values. They are not values in "mm", etc.

LenkPuls	1
LenkPause	60

Figure 2.20: Configuring the steering of the CORNER tower

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the standard value for **LenkPause** is 60, when using a **BAUER GPS CONTROL** this value is 40.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **—** .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

2.3.1.19 STEERFACTOR / PULSEMAX

SteerFactor (*Lenkfaktor*) and **PulseMax** (*PulsMax*) are parameters of the CORNER tower steering.



WARNING: The steering of the CORNER tower is a major component of the CORNER system. Faulty settings can result in an incorrect path or damage; in the worst case, a complete breakdown of the system could result. Only change these values if you are 100% familiar with the system.

SteerFactor is the factor of steering deviation (gain of steer pulses)

PulseMax is the maximum number of steer pulse periods per control time interval.

WARNING: 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.

LenkFaktor	1
PulsMax	1

Figure 2.21: SteerFactor / PulseMax

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **←**.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **→**.

2.3.1.20 FILTERSPAN

With **FilterSpan**, you can configure the filter value of the span sensor.

FilterSpan	60
------------	----

Figure 2.22: Configuring Filterspan

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **←**.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **→**.

2.3.1.21 ANTDIFFLEFT / ANTDIFFRIGHT

AntDiffLeft and **AntDiffRight** are factory-set values of the below ground guidance and must not be changed.

AntDiffLeft	100
AntDiffRight	100

Figure 2.23: AntDiffLeft / AntDiffRight



ATTENTION: This menu item is used only on a *CORNER SYSTEM* with *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 $+$.

2.3.1.22 INPUT

The activities of all inputs and outputs can be monitored in this status window. In addition, the function of the operating buttons on the PRO control panel can be checked.

1st line provides information about the operating status of the 10 inputs.

"0" signifies: no voltage at the input.

"1" signifies: voltage at the input.

2nd line:

1st number block provides information about the operating status of the 6 outputs.

"0" signifies: no voltage at the input.

"1" signifies: voltage at the input.

2nd number block provides information about the operating status of the 6 operating buttons on the PRO control panel.

"0" signifies: button not pressed.

"1" signifies: button pressed.

Press each of the buttons on the PRO control panel individually and test the functions of the individual operating buttons. When a button is pressed, the respective number changes from "0" to "1". If an error exists with an operating button, the respective number will remain either "0" or "1".

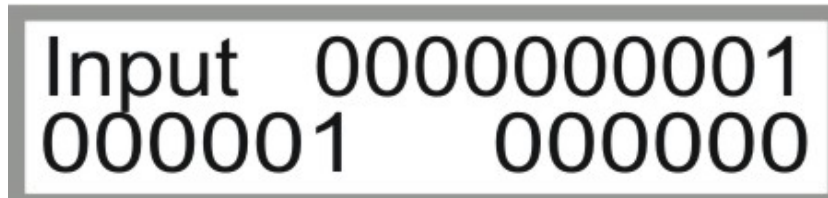


Figure 2.24: Inputs & Outputs

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY $+$.

2.4 MACHINE PARAMETER MENU

2.4.1 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 repair technicians



Figure 2.25: Parameter for code input



Figure 2.26: Entering code 12

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

2.4.1.1 DATE / TIME

Setting the system date and the time.

Enter the programming mode by pressing the key ENTER.

The cursor blinks at the current day. By using + and -, you can change the day.

By using the right arrow key, you get to the month and can change it by using + and - .

With the same procedure you get to the year and then to the time where you can set the time by again using + and - keys.

Save with ENTER and/or leave the programming mode with ESC.

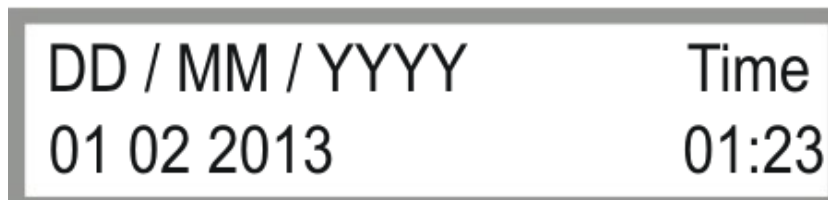


Figure 2.27: Setting of date and time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

2.4.1.2 LANGUAGE / IRRIGATION RADIUS

For changing the language, press ENTER to get to the programming mode.

By using + and - you can change the **language**. Confirm with ENTER and press ESC for leaving the programming mode. By pressing the right arrow key you change to the **irrigation radius**.

By using + and - you can change the radius; by pressing the left arrow key, you get back to LANGUAGE, press ENTER for saving and leave the programming mode with ESC.

The *irrigation radius* is the radius from the central tower to the final point of the pivot (final tower incl. overhang)



Figure 2.28: Setting of language and irrigation radius

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

2.4.1.3 RADIUS OF LAST TOWER / FLOW

The **radius to the final tower** is the radius to the last span without overhang.

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

These data are *important* for an exact calculation of the cycle time of the final tower.

For *changing* follow the same procedure as in the menus above.



Figure 2.29: Parameters radius to last tower and flow

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

2.4.1.4 PERIOD OF TIME / PIN

The **Timeperiod** is the sum of all *switch-on and switch-off times of the final tower*.

Depending on the set precipitation, the switch-on and switch-off times will be calculated and the sum results in the period of time.

The **PIN** is the **PIN CODE** of the **SIM card** which has been inserted into the GSM modem.

IMPORTANT! Before inserting the SIM card into the modem, set the PIN CODE, because otherwise you would possibly need to set a PUK CODE by means of a mobile phone.

For *changing* follow the same procedure as in the menus above.



Figure 2.30: Setting of period of time and PIN input

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .



2.4.1.5 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).



Figure 2.31: 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 + .

3 CONTROL PANEL END TOWER TOP

3.1 BOOTING

When switching on the main switch, ENDTOWER TOP will be on display and the software version installed with the date of set-up.



Figure 3.1: Display after start

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

3.2 STATUS WINDOW

The status window provides important information about the operating status of the **CORNER SYSTEM**. After booting has been completed, the status window opens automatically. The parameters shown in the status window are updated all the time.

3.2.1 STATUS WINDOW

The information about the current operating status is shown in the two columns of the status window (see Fig. 3.2) Below, the individual elements of the status window are described, from the top left to the bottom right corner of the window:



Figure 3.2: Status window



OPERATING STATUS

The following general operating statuses are displayed:

- OFF Pivot not operating
- FORWARD Pivot moving in the indicated direction
- WAITING Pivot waiting for the programmed start time to begin
- PAUSE Pivot is in the programmed irrigation pause
- SAFETY Pivot has been switched off due to an general interruption of safety circuit.
- ERROR Pivot has been switched off due to an error
- EMER.OP. System is in emergency operating mode, operating mode NOT permissible for CORNER SYSTEM, results in lasting damage to the system.
- OK System is in good order
- SAFE:OFF Pivot safety circuit has been switched off
- PR.STOP Pivot was switched off because of insufficient water pressure
- VOLT-ST Pivot turned off because of low voltage
- CAN-ERR CAN-BUS communication error
- I2C-ERR I²C communication error
- START Pivot waiting till waiting period is up; pump is already active when starting
- PARKPOS. Pivot moving to or is already in preset parking position.
- REVERSE Pivot moving in the indicated direction
- GPS ERR. GPS communication error
- RAIN Pivot has been switch off through rain sensor
- CORN.ERR Safety circuit interrupted at Corner
- SPANSENS Span sensor: interruption of safety circuit
- TILT ERR Tilting sensor: interruption of safety circuit
- LASTTOWE Last tower: interruption of safety circuit
- GUID.SAF BELOW GROUND GUIDANCE safety circuit has been exceeded
- GUID.SIG BELOW GROUND GUIDANCE does not receive any signal from subsoil cable
- CAN GOET communication error with antenna evaluator error
- CAN DRIV CAN communication error with frequency converter
- COMPRESS Maximal admissible running time of compressor has been exceeded (leakage)
- NO MOVE No movement of machine has been registered

The following GPS operating statuses are displayed.

- INVALID Invalid GPS reception
- GPSFIX GPS reception without base / corrective station
- DGPS GPS signal with corrective data, not sufficient for driving
- FLOAT GPS precision approx. 15 cm, driving possible at low speed
- RTK Maximum GPS precision, fluctuations depending on reception strength

Angle

Shows the current values for the angle of the CORNER SPAN.

3.3 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:

3.3.1 DESCRIPTION OF INDIVIDUAL PARAMETERS

3.3.1.1 POTI OFFSET / VALVE TIME

With **Poti Offse**, you can correct the angle between the **CORNER SPAN** and the **PIVOT** (see **3.3.1.3 CORNE.AUF / PIVOT**). Enter positive values for a correction in the clockwise direction and negative values for a correction in the counter-clockwise direction.

Check the newly configured angle in the menu after next, **3.3.1.3 CORNE.AUF / PIVOT**.

ATTENTION: Note that the parameter **Poti Offse** is not entered in degrees. The input is a proportional factor; this means that the larger the value entered for **Poti Offse**, the larger the correction.

With **ValveTime**, you can configure the time period for both nozzle groups 5 and 8 in seconds. These nozzle groups are activated for a configured fraction of this time.

To prevent the simultaneous activation of all nozzle groups, set the value **ValveTime** to be different for the **ENDTOWER TOP** and **ENDTOWER BOTTOM**.



Poti Offse	0
ValveTime	145

Figure 3.3: Configuring the angle and time period

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

3.3.1.2 SPANP / LENKPOTI

SpanP:

The left number indicates the *motor activation* or *regulation value* of the span sensor.

The right number indicates the *actual value* of the span sensor.

LenkPoti:

LenkPoti shows the ACTUAL value of the current steering angle.

ATTENTION: The values are machine values and are not related to any dimensional unit!



SpanP	0	1022
LenkPoti		880

Figure 3.4: Display of span sensor and steering sensor

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

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

3.3.1.3 CORNE.AUF / PIVOT



Corne.AUF shows the current angle of the CORNER SPAN relative to the pivot in °.

90° means that the CORNER span is swung in at a right angle, **165°** means that the CORNER span is swung out all the way.

OPEN (AUF) / CLOSE (ZU) shows the current CORNER span movement.

OPEN (AUF) indicates the process of swinging outward.

CLOSE (ZU) indicates the process of swinging inward.

Pivot indicates the current value of the imaginary connecting line between the CORNER tower and the central tower relative to the zero degree position (*GPS north*).

Corne.AUF	160°
Pivot	0.0°

Figure 3.5: Display of CORNER angle / pivot 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 + .

3.3.1.4 STATUS GOETT. / STEERING

STATUS GOETT. provides information about the CAN OPEN status of the TRACK UNIT (*BELOW GROUND GUIDANCE*).

Steering L 0 R 0 (Lenkung) provides information about the current steering activities.

L 0 indicates that no steering pulse to the *left* is currently active.

L 1 indicates that a steering pulse to the *left* is currently active.

The steering activities to the *right* are indicated in the same way.

STATUS GOETT.	00
Lenkung	L0 R0

Figure 3.6: STATUS CAN Status / Lenkung

ATTENTION: This menu item is used only on a CORNER SYSTEM with 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 + .

3.3.1.5 STATUS ENDT / STATUS CORNE

STATUS ENDT shows the CAN OPEN status of the frequency converter at the *end tower*.

Value range: Possible values for the CAN OPEN status are between *0* and *100*.

100 means CAN OPEN *ready*,

0 means CAN OPEN *not ready*.



WARNING: The correct CAN OPEN status can only be displayed while the motor / frequency converter is running. If the motor is standing still, an incorrect status is shown on the display because no voltage is present on the CAN bus of the frequency converter.

STATUS CORNE shows the CAN OPEN status of the frequency converter at the *corner tower*.

Value range: Possible values for the CAN OPEN status are between 0 and 100.

100 means CAN OPEN *ready*,
0 means CAN OPEN *not ready*.

STATUS ENDT	0
STATUS CORNE	0

Figure 3.7: Status CAN BUS ENDTOWER / CORNER

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

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

3.3.1.6 SD1 / SD2

SD1 and **SD2** are antenna values of the BELOW GROUND GUIDANCE.

S1 shows the total value of antenna 1 (*forward*)

D1 shows the difference value of antenna 1 (*forward*)

S2 shows the total value of antenna 2 (*reverse*)

D2 shows the difference value of antenna 2 (*reverse*)

Total values reflect the field strength.

Difference values reflect the deviation from the cable.

SD1	0	0
SD2	0	0

Figure 3.8: Antenna values BELOW GROUND GUIDANCE

ATTENTION: This menu item is used only on a CORNER SYSTEM with 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 + .

3.3.1.7 STATUS CAN CONTROLLER

The first number of the first line represents the **transmit error counter** and counts the number of incorrectly transmitted CAN messages.

The second number of the first line represents the **receive error counter** and counts the number of incorrectly received CAN messages.

The third number of the first line represents the **bus off error counter** and counts the number CAN bus failures that have occurred.

In the second line, **A4** indicates the current CAN controller status.

The last number of the second line indicates the number of actually sent CAN messages.

The next-to-last number of the second line indicates the number of CAN messages to be sent.

T R	0	0	0
CAN A4		0	0

Figure 3.9: Status of CAN controller

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

3.3.1.8 NOZZLE GROUP V1-6

In this menu, you can choose to manually activate or deactivate the nozzle groups 1 to 6 of the CORNER SPAN.

The first 3 numbers in the first line indicate the operating status of the pneumatic valves 1-3, where the possible values range from 0 to 255. The value "0" stands for "automatic", "1" and "255" stand for ON. The values in between correspond to a fraction of the time period "VALVETIME" (see 3.3.1.1) by which the respective nozzle group will be cycled.

Example: A displayed value of "80" would correspond to an activation duration for the corresponding nozzle group of 80/255 of the previously configured time duration (VALVETIME).

The first 3 numbers in the second line indicate the operating status of the pneumatic valves 4-6.

The last number in the second line indicates the currently selected valve, whereby "0" stands for group 1, "1" for group 2 etc.

To switch between the valves, press the "F" or "R" key on the PRO control panel.

To activate the selected valve, press the MENU / ENTER key. To deactivate the valve, press the MENU / ENTER key again.

Attention: If the pneumatic valve is "activated", this means that the water supply to this nozzle group is interrupted. If the pneumatic valve is "deactivated", this means that the water supply to this nozzle group is open.

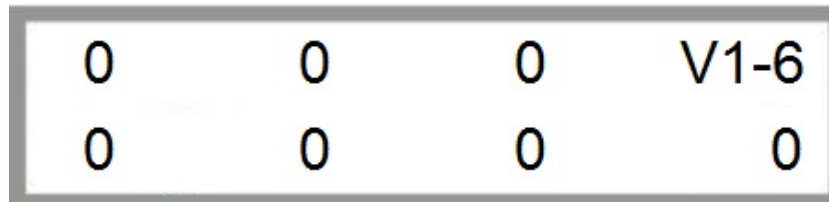


Figure 3.10: Test menu valves 1-6

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

3.3.1.9 MAN SPEED / ENDGUNANGLE

You can overwrite the current speed of the system under **Man Speed** in order to carry out special calibration or service work.

Setting range:

0 represents the slowest possible speed. The configured speed is taken from the main control unit.

Values larger than 0 correspond to a proportionally increasing machine speed.

WARNING: The displayed values are machine values that represent a proportional increase in the speed of the system. They are not values in "mm", etc.

The value defined **EndgunAngle** in ° indicates the angle of the CORNER span relative to the pivot as of which the endgun should be switched on. Below this configured value, the endgun is not activated even if a sector in this area was configured for the endgun in the main control unit.

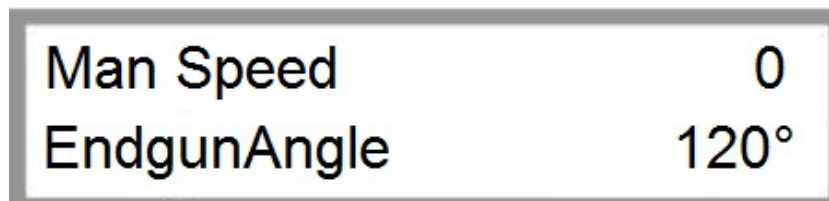


Figure 3.11: Display of manual speed and endgun angle

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

3.3.1.10 SPAN SOLL F / SPAN SOLL R

Span Set F indicates the regulator set value of the span sensor for forward travel.

Span Set R indicates the regulator set value of the span sensor for reverse travel.



Figure 3.12: Span sensor set values

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **-** .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

3.3.1.11 SPANSENSOR PARAMETER PID P / PID I

PID P, **PID I** and **PID D** are regulator parameters of the span sensor and may only be changed by a trained service technician.

PID P indicates the proportional component of the span sensor.

PID I indicates the integral component of the span sensor.



PID P	20
PID I	150

Figure 3.13: Configuring the proportional and integral portion of the span sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **-** .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

3.3.1.12 SPANSENSOR PARAMETER PID D

PID D is another control parameter of the span sensor and may only be changed by a trained repair technician.

PID D indicates the differential component of the span sensor.

Takt is the calculated activation cycle of the irrigation cycle specified by the UNIVERSAL PRO-G control system.



PID D	150
Takt	0

Figure 3.14: Configuring the differential portion of the span sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY **-** .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

3.3.1.13 FWD OFFSET / FWD WINDOW

Fwd Offset is the configurable parallel offset of the 1st antenna (forward) from the track guide wire or to the stored GPS path.

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.



ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that represent a proportional increase or magnification. They are not values in “mm”, etc. The standard value for Fwd Window is 10.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in “cm”. The standard value for Fwd Window in this case is 4.

Fwd Offset	0
Fwd Window	4

Figure 3.15: Configuring forward travel with the 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 $+$.

3.3.1.14 RVW OFFSET / RVW WINDOW

Rvw Offset is the configurable parallel offset of the 2nd antenna (reverse) from the track guide wire or to the stored GPS path.

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.

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that represent a proportional increase or magnification. They are not values in “mm”, etc. The standard value for Rvw Window is 10.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in “cm”. The standard value for Rvw Window in this case is 4.

Rvw Offset	0
Rvw Window	10

Figure 3.16: Configuring reverse travel

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



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

3.3.1.15 DIST.SAFFWD / DIST.SAFRVW

With **Dist.SafFwd** and **Dist.SafRvw**, you can define the limit values of the steering antenna of the CORNER tower for the safety shutdown.

Dist.SafFwd is the configurable maximum deviation of the 1st antenna (forward) for the safety shutdown.

Dist.SafRvw is the configurable maximum deviation of the 2nd antenna (reverse) for the safety shutdown.

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the displayed values are machine values that proportionally represent the deviation of the antenna from the ideal track. They are not values in “mm”, etc. The standard value for Dist.SafFwd / Dist.SafRvw is 300.

ATTENTION: When using a **BAUER GPS CONTROL**, the displayed values are in “cm”. The standard value for Dist.SafFwd / Dist.SafRvw in this case is 100.

Dist.SafFwd	300
Dist.SafRvw	300

Figure 3.17: 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 + .

3.3.1.16 FILTER X1 / FILTER X2

With **Filter X1** and **Filter X2**, you can filter out faulty values that are detected by the steering antennas. Faulty values can be outliers (large, sudden changes in the antenna values), fluctuations due to interference, etc.

Filter X1 is the configurable filter value for the 1st antenna (forward).

Setting range: You can define filter values from 0 to 99. The larger the configured value, the more (faulty) antenna values are filtered out.

Filter X2 is the configurable filter value for the 2nd antenna (reverse).

Setting range: You can define filter values from 0 to 99. The larger the configured value, the more (faulty) antenna values are filtered out.

Filter X1	70
Filter X2	70

Figure 3.18: Configuring filter values with the BELOW GROUND GUIDANCE



ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the standard value is 70, when using a **BAUER GPS CONTROL** this value is 10.

ATTENTION: The displayed values are machine values that represent a proportional increase or magnification. They are not values in "mm", etc.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

3.3.1.17 ENDSWITCHL / ENDSWITCHR

With **Endswitch L** and **Endswitch R**, you can limit the maximum steering angle in order to prevent mechanical damage to the steering system or prevent faulty steering commands.

Endswitch L is the configurable limit to the steering in the counter-clockwise direction.

Setting range: The configurable values are greater than or equal to "0".

Endswitch R is the configurable limit to the steering in the clockwise direction.

Setting range: The configurable values are greater than or equal to "0".

ATTENTION: 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.

EndswitchL	170
EndswitchR	450

Figure 3.19: Configuring the steering of the CORNER tower

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

3.3.1.18 STEERPULSE / STEERPAUSE

With **SteerPulse** (*LenkPuls*) and **SteerPause** (*LenkPause*), you can configure the maximum allowed number of steering pulses that may be processed without interruption (*SteerPause*). The steering pulse depends on the guide wire deviation and is automatically selected by the control.

WARNING: The steering of the CORNER tower is a major component of the CORNER system. Faulty settings can result in an incorrect path or damage; in the worst case, a complete breakdown of the system could result. Only change these values if you are 100% familiar with the system.

SteerPulse is the maximum allowed number of steering pulses.



Setting range: The configurable values are greater than or equal to "1".

SteerPause is the delay time between 2 consecutive steering pulses.

Setting range: The configurable values are greater than or equal to "0".

ATTENTION: The displayed values are machine values. They are not values in "mm", etc.

LenkPuls	1
LenkPause	60

Figure 3.20: Configuring the steering of the CORNER tower

ATTENTION: When using a **BAUER BELOW GROUND GUIDANCE**, the standard value for **LenkPause** is 60, when using a **BAUER GPS CONTROL** this value is 40.

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

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

3.3.1.19 STEERFACTOR / PULSEMAX

SteerFactor (*Lenkfaktor*) and **PulseMax** (*PulsMax*) are parameters of the CORNER tower steering.

WARNING: The steering of the CORNER tower is a major component of the CORNER system. Faulty settings can result in an incorrect path or damage; in the worst case, a complete breakdown of the system could result. Only change these values if you are 100% familiar with the system.

SteerFactor is the factor of steering deviation (*gain of steer pulses*)

PulseMax is the maximum number of steer pulse periods per control time interval.

WARNING: 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.

LenkFaktor	1
PulsMax	1

Figure 3.21: Configuring the steering of the CORNER 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 + .

3.3.1.20 FILTERSPAN

With **FilterSpan**, you can configure the filter value of the span sensor.



Figure 3.22: Configuring Filterspan

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

3.3.1.21 ANTDIFFLEFT / ANTDIFFRIGHT

AntDiffLeft and **AntDiffRight** are factory-set values of the below ground guidance and must not be changed.

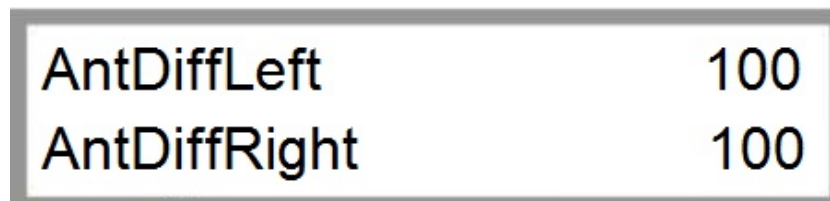


Figure 3.23: Configuring the steering of the CORNER tower

ATTENTION: This menu item is used only on a CORNER SYSTEM with BELOW GROUND GUIDANCE.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY \leftarrow .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY \rightarrow .

3.3.1.22 INPUTS / OUTPUTS

The activities of all inputs and outputs can be monitored in this status window. In addition, the function of the operating buttons on the PRO control panel can be checked.

1st line provides information about the operating status of the 10 inputs.

"0" signifies: no voltage at the input.

"1" signifies: voltage at the input.

2nd line:

1st number block provides information about the operating status of the 6 outputs.

"0" signifies: no voltage at the input.

"1" signifies: voltage at the input.

2nd number block provides information about the operating status of the 6 operating buttons on the PRO control panel.

"0" signifies: button not pressed.

"1" signifies: button pressed.



Press each of the buttons on the PRO control panel individually and test the functions of the individual operating buttons. When a button is pressed, the respective number changes from "0" to "1". If an error exists with an operating button, the respective number will remain either "0" or "1".



Figure 3.24: Display of inputs and 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 + .

3.4 MACHINE PARAMETER MENU

3.4.1 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 repair technicians



Figure 3.25: Parameter for code input



Figure 3.26: Entering code 12

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

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

3.4.1.1 DATE / TIME

Setting the system date and the time.

Enter the programming mode by pressing the key ENTER.

The cursor blinks at the current day. By using + and -, you can change the day.
By using the right arrow key, you get to the month and can change it by using + and - .



With the same procedure you get to the year and then to the time where you can set the time by again using + and – keys.

Save with ENTER and/or leave the programming mode with ESC.



Figure 3.27: 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 + .

3.4.1.2 LANGUAGE / IRRIGATION RADIUS

For changing the language, press ENTER to get to the programming mode.

By using + and – you can change the **language**. Confirm with ENTER and press ESC for leaving the programming mode. By pressing the right arrow key you change to the **irrigation radius**.

By using + and – you can change the radius; by pressing the left arrow key, you get back to LANGUAGE, press ENTER for saving and leave the programming mode with ESC.

The *irrigation radius* is the radius from the central tower to the final point of the pivot (final tower incl. overhang)



Figure 3.28: Setting of language and irrigation radius

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

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

3.4.1.3 RADIUS OF LAST TOWER / FLOW

The **radius to the final tower** is the radius to the last span without overhang.

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

These data are *important* for an exact calculation of the cycle time of the final tower.

For *changing* follow the same procedure as in the menus above.

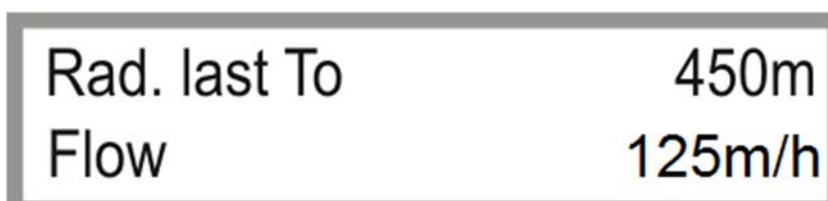


Figure 3.29: Parameters radius to last tower and flow



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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

3.4.1.4 PERIOD OF TIME / PIN

The **Timeperiod** is the sum of all *switch-on and switch-off times of the final tower*.

Depending on the set precipitation, the switch-on and switch-off times will be calculated and the sum results in the period of time.

The **PIN** is the **PIN CODE** of the **SIM card** which has been inserted into the GSM modem.

IMPORTANT! Before inserting the SIM card into the modem, set the PIN CODE, because otherwise you would possibly need to set a PUK CODE by means of a mobile phone.

For *changing* follow the same procedure as in the menus above.

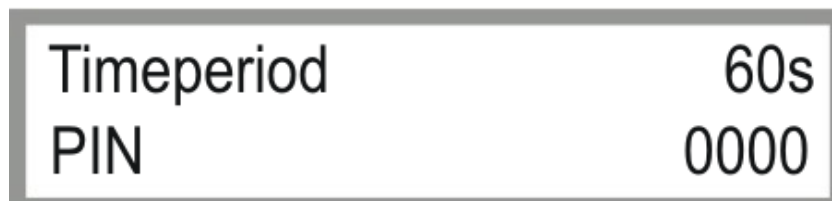


Figure 3.30: Setting of period of time and PIN input

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

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY **+** .

3.4.1.5 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).



Figure 3.31: 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 **+** .

4 FIRMWARE UPDATE

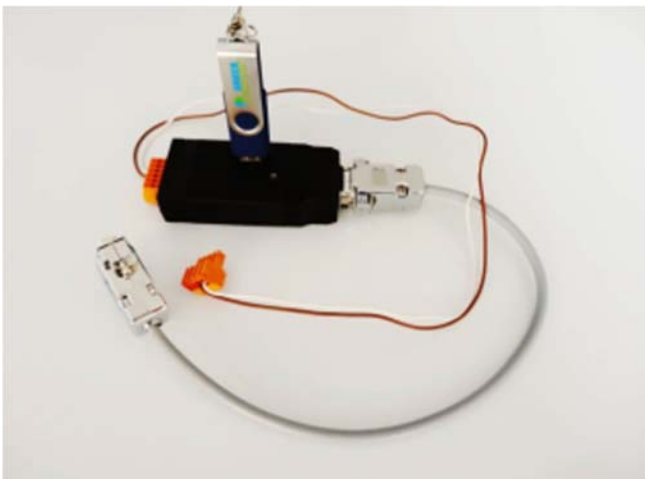
4.1 WITH PDA / LAPTOP

- 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 BOOTLOADER)
- 4.) Start the programme „DownloadTool“
- 5.) Choose the correct COM interface (error message **comerror** if wrongly chosen)
- 6.) Load the latest file valid with the browser (e.g. ProzenttimerV5_28.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.

4.2 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*.
ATTENTION: File needs to be stored in the root directory and renamed to "firmware.hex" (e.g. ProzenttimerV5_28.hex -> firmware.hex).
- 5.) Turn the main switch in position „ON“ while pushing the MENU key (display shows: FLASH BOOTLOADER)
- 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*.



4.3 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.



5 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 %)