

Operation Manual



Building Site Signalling Equipment MPB 4000



General explanation of building site signalling equipment

Signal safety

The use of transportable building site signalling equipment, among other things, is described in the regulations of the VDE and the RiLSA.

The above regulations determine that on building sites with one-way traffic regulations and a speed limit of 30 km/h, for example, signal protection in accordance with RiLSA and VDE 0832 is unnecessary as long as the responsible authorities do not change their conditions or increase their requirements.

All other building site signalling equipment for controlling traffic at junctions or crossings or, for example, pedestrian crossings must have signal protection in accordance with RiLSA and VDE 0832.

An acknowledgement that can be given via radio or cable is required for this signal protection. With radio-controlled signalling equipment, high-quality radio components which have a Reg TP (Federal Office for Telecommunication Licenses) approval number are used. The radio signals have a range of up to 2000 metres.

The company Peter Berghaus GmbH manufactures and delivers building site signalling equipment with or without signal protection.

Transport information - please observe!

Our building site signalling equipment must be standing when being transported. All signal transmission chambers and the control housing must always be closed properly and the control chamber must be locked to prevent damage from water!

If you do not observe this advice, you will automatically lose your guarantee!

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I. Introduction

The MPB 4000 is the universal signal equipment for all traffic situations subject to traffic light control, including installations for the following traffic patterns: one-way alternating-direction; junction-merging and pedestrian installations; also for intersection signal installations with 12 groups and a maximum of 24 signal heads with control units that are 100% identical in construction.

The installation can be supplied as **Quartz, Cable** or **Quartz, Cable-Radio Equipment**.

In cable as well as in radio mode, the equipment possesses all **monitor features specified by RiLSA:**

- **Red Light Monitoring**
- **Green-Green Prevention**
- **Green Status**
- **Interval Monitoring (required acc. to RiLSA, Appendix G.3)**
- **Watch Dog (computer monitoring)**

All data such as signal time plans and malfunctions with date can be printed out on a printer.

The following operating modes are possible:

1. Fixed time programme as well as fixed time programme with up to 4 daytime programmes
2. Traffic-flow-dependent mode as well as traffic-flow-dependent mode with up to 4 daytime programmes
3. Traffic-flow-dependent mode with green on demand with up to 4 daytime programmes
4. Flashing and darkness programme

Up to 4 start times with different blocks of days can be entered for all programmes.

MANUAL DEVICE MODELS

Switching the manual device off and on

Before you can set the manual device into operation, the batteries (4* Mignon) that are supplied with it must first be installed. To do this, open the battery chamber on the rear side of the device and insert the batteries (be sure the polarity is correct!). To switch the device on, briefly press the "ON" key.

The manual device will then display the manual device model. You can **switch off** the manual device by holding the #2 key pressed down for ca. 5 seconds.

The display shows the following, depending upon manual device model:

****M P B 4000****
One Way Traffic

Chapter II Number 1 + 2

*** M P B 4000 VA***
One Way Traffic

Chapter II Number 3 + 4

****M P B 4000****
Cross-roads

Chapter II Number 5 + 6

*** M P B 4000 VA***
Cross-roads

Chapter II Number 7 + 8

You have different programming possibilities available to you, depending upon manual device model. These are explained in detail in the Chapters listed next to the manual device displays.

1. Input for One-Way Alternating-Direction Traffic

without traffic-flow dependency and without special options

****M P B 4000****
One Way Traffic

You can programme one-way alternating-direction traffic with this manual device.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device. After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual. Switch further using key #4 until the manual device tells you to program the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing. If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio Cable

Select with the keys #1 and #3 the desired operating mode, for example "Quartz" for quartz operation.

With key #4 you then move further to the point for entering the

Site length:
>-< 50 m >+<

Here you can alter the length of the roadworks site using the keys #1 and

#3.

Once the value is set, proceed further with key #4.

Select: (km/h)
10 **30** 40 50 70

The current speed will be flashing. Set the required speed for within the roadworks site.

Then press key #4 again. The following will appear:

Clr.time 1 => 10s
Clr.time 2 = 10s

These two times have been calculated by the manual device.

For safety reasons, the displayed periods for traffic-clearing must be considered irreducible minimums. It is however possible to increase the times using key #3--to different extents, if desired: Thus, at a road works site on a mountain, for example, the ascending traffic can be allowed a longer traffic-clearing period. Traffic-clearing period #1 ends when traffic light #2 has finished its green signal.

Press key #4 once again and follow the display in the manual device:

Grn.time 1 => 5s
Grn.time 2 = 5s

The displayed value in the line in which the arrow is blinking can be altered using keys #1 and #3. With key #4, one moves one line down, and can then alter the time setting there.

At this point, all the entries in the manual device are completed.

Press key #4 once again. The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Plug the device into the first traffic light (traffic light #1). Switch the traffic light on. The following must be visible in the traffic light display:

12,8 V **Light ??**
No data !

a.) with *Quartz Operation*

Press key #4 on the manual device. The data from the hand device will be transmitted to the first traffic light (traffic light #1).

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

The second traffic light must still now be programmed. Plug the manual device into the second traffic light and switch the traffic light on, waiting then a moment until the following is displayed in the control device:

12,8 V **Light ??**
No data !

Now press key #4 on the plugged-in manual device. The data will be transmitted into the second traffic light (traffic light #2). The entire equipment (traffic light #1 and traffic light #2) synchronise themselves automatically and start the programme flow.

b.) with *Radio or Cable Operation without Special Options*

The selection proceeds as described in Item 1.2. You select however, depending upon the connection mode, not quartz but either radio or cable instead. For this you need programme only one traffic light with the manual device. Once you have linked the equipment with cables, switch on **one traffic light**.

Once it is programmed, this will be known as traffic light #1.

The following must be displayed in the control device:

12,8 V **Light ??**
No data !

The cable linkage is not required with a radio installation. Programme the first traffic light (traffic light #1) with the manual device, for which you plug the manual device into the traffic light and press key #4 after the display calls for it. The two displays then show the following:

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

After switching on traffic light #2, the programme is transmitted by radio or cable to the other traffic light (traffic light #2) and the installation starts up completely automatically.

***Warning:** In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

2. Input for One-Way Alternating-Direction Traffic

Radio or cable operation without traffic-flow dependency, but with special options such as Night-time Mode, Day Programmes, Interval matrix, Forced Circulation and Data Transmission via PC

****M P B 4000****
Einbahnwechsel

With this manual device you can programme one-way alternating-direction traffic without traffic-flow dependency, although with special options. Directions for setting the special options can be found starting on page 47 of this manual.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device. After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual.

Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing.

If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio" (the only special option available with quartz operation is Night-time Mode).

With key #4 you then move further to the point of entering the

Site length:
>-< 50 m >+<

Here you can alter the length of the roadworks site using the keys #1 and #3.

Once the value is set, proceed further with key #4.

Select: (km/h)
10 30 40 50 70

The current speed will be flashing. Set the required speed for within the roadworks site.

Then press key #4. The following will appear:

Clr.time 1 => 10s
Clr.time 2 = 10s

These two times have been calculated by the manual device. For safety reasons, the displayed periods for traffic-clearing must be considered irreducible minimums. It is however possible to increase the times using key #3--to different extents, if desired: Thus, at a road works site on a mountain, for example, the ascending traffic can be allowed a longer traffic-clearing period. Traffic-clearing period #1 **ends when traffic light #2 has finished its "Green"**.

Press key #4 once again and follow the display in the manual device. If you have selected Daytime Programme as a special option, then the following display appears. The method used to activate the special options is described in the annex under "Special Options".

Input >4<
Dayprogram 1

Here you are called upon to enter the 1st Daytime Programme:

Grn.time 1 => 5s
Grn.time 2 = 5s

The displayed value in the line in which the arrow is blinking can be altered using keys #1 and #3. With key #4, one moves one line down, and can then alter the time setting there.

When you are carrying out a re-programming, you have the opportunity of deleting old switch points that may be left over from a previous programming. For this, select "Yes", and confirm your choice with key #4.

Switchp. clear ?
yes no

Once you have completed these entries, the manual device will ask you for 4 switch points for the entered Daytime Programme #1. This means that once you have entered a Daytime Programme, you can have it start itself as many as four times a day, at the different times that you select:

Switchp. 1 Pro 1
Start:>06:00 Uhr

00:00 means in this connection no input. For midnight, you must enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

If you have selected two or more Daytime Programmes, then you will now be called upon to enter these as described above (Enter Daytime Programme #2).

After this entry, you have the opportunity of determining the Night-time Mode, if you have activated it as described in the annex under "Special Options".

Nightmode:
yes no

If you select "Yes" here, then you will be called upon to programme the Night-time Mode:

Input >4<
Nightprog. darkl

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 off
Start:>23:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

Afterwards, you have the opportunity to set the Night-time Mode for Flashing:

Input >4<
Nightprog. flash

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 flash
Start:>22:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

After you have selected the days, (press key #4), the following display appears, if you have set the Interval Matrix under Special Options to "Yes":

Meantimes
yes no

Using the keys #1 and #3, you can select whether or not you wish to activate the Interval Matrix.

The previous setting flashes. The Interval Matrix is an additional control function for monitoring the minimum traffic-clearing periods.

The Interval Time is the period of time between the end of the green phase (e.g. of traffic light #1) and the beginning of the clear signal (green) for a coming traffic flow that intersects or merges (in this case traffic light #2, as one-way alternating-direction traffic operation was selected). Traffic-clearing time computation proceeds automatically for one-way alternating-direction traffic.

After selection of the Interval Matrix, the following display appears:

from 1 => 2
10 sec

For one-way alternating-direction traffic, the intervals are adopted automatically from the traffic-clearing times, and can no longer be altered. This serves for adoption of the minimum traffic-clearing times. Confirm this with key #>4<. Now the display appears for setting the interval from traffic light #2 to traffic light #1 (this, too, will be automatically adopted):

from 2 => 1
10 sec

At this point, all the entries in the manual device are completed. Press key #4 once again. The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Switch on a traffic light (which then automatically becomes traffic light #1). The following must be visible in the traffic light display:

12,8 V **Light ??**
No data !

Plug the device into the first traffic light (traffic light #1). Press key #4 on the manual device. The data from the hand device will be transmitted to the first traffic light (traffic light #1).

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V **Light 1**
Light 2 missing !

After switching on traffic light #2, the programme is transmitted by radio or cable to the other traffic light (traffic light #2) and the installation starts up completely automatically.

*Warning: In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

3. Input for One-Way Alternating-Direction Traffic

With traffic-flow dependency but without special options

* M P B 4000 VA*
Einbahnwechsel

With this manual device you can programme one-way alternating-direction traffic with traffic-flow dependency, although without special options.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual. Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing.

If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio". If "Quartz" is selected, then **no** traffic-flow dependency is possible.

With key #4 you then move further to the point of entering the traffic-flow dependency:

Traffic related:
yes no

Set the traffic-flow dependency to "Yes" ("Yes" flashes) and confirm the selection with key #4. The manual device display shows the following:

Site length:
>-< 50 m >+<

Here you can alter the length of the roadworks site using the keys #1 and #3. Once the value is set, proceed further with key #4.

Select: (km/h)
10 30 40 50 70

The current speed will be flashing. Set the required speed for within the roadworks site. Then press key #4 again. The following will appear:

Clr.time 1 => 10s
Clr.time 2 = 10s

These two times have been calculated by the manual device. For safety reasons, the displayed periods for traffic-clearing must be considered irreducible minimums. It is however possible to increase the times using key #3--to different extents, if desired: Thus, at a road works site on a mountain, for example, the ascending traffic can be allowed a longer traffic-clearing period. Traffic-clearing period #1 ends when traffic light #2 has finished its green signal.

Press key #4 once again and follow the display in the manual device:

Grn1 min => 10s
Grn1 max = 35s

Now one can set a minimum and a maximum green time for signal group #1. Continue with key #4.

Grn2 min => 10s
Grn2 max = 25s

Now the same entries are made as above, this time for signal group #2. At this point, all the entries in the manual device are completed. Press key #4 once again. The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the

following message:

Put box into
Unit 1 >4<

Switch on a traffic light (which then automatically becomes traffic light #1). The following must be visible in the traffic light display:

12,8 V **Light ??**
No data !

Plug the device into the first traffic light (traffic light #1). Press key #4 on the manual device. The data from the hand device will be transmitted to the first traffic light (traffic light #1).

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

After switching on traffic light #2, the programme is transmitted by radio or cable to the other traffic light (traffic light #2) and the installation starts up completely automatically.

*Warning: In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

4. Input for One-Way Alternating-Direction Traffic

Radio or cable operation with traffic-flow dependency and with special options such as Night-time Mode, Day Programme, Interval matrix, Forced Circulation and Data Transmission via PC

****M P B 4000****
Einbahnwechsel

With this manual device you can programme one-way alternating-direction traffic with traffic-flow dependency and with special options. Directions for setting the special options can be found starting on page 47 of this manual.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device. After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual.

Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing.

If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio".

If "Quartz Operation" is selected, neither traffic flow dependency nor special options such as Daytime Programme and Time Interval are

possible. With key #4 you then move further to the point of entering the traffic flow dependency:

Traffic related:
yes no

Set the traffic-flow dependency to "Yes" ("Yes" flashes) and confirm the selection with key #4. Pressing key #4 brings you then further to the point of entering

Site length:
>-< 50 m >+<

Here you can alter the length of the roadworks site using the keys #1 and #3.

Once the value is set, proceed further with key #4.

Select: (km/h)
10 **30** 40 50 70

The current speed will be flashing. Set the required speed for within the roadworks site.

Then press key #4 again. The following will appear:

Clr.time 1 => 10s
Clr.time 2 = 10s

These two times have been calculated by the manual device.

For safety reasons, the displayed periods for traffic-clearing must be considered irreducible minimums. It is however possible to increase the times using key #3--to different extents, if desired: Thus, at a road works site on a mountain, for example, the ascending traffic can be allowed a longer traffic-clearing period. Traffic-clearing period #1 ends when traffic light #2 has finished its "green".

Press key #4 once again and follow the display in the manual device. If you have selected Daytime Programme as a special option, then the following display appears. The method used to activate the special options is described in the annex under "Special Options".

Input >4<
Dayprogram 1

Here you are called upon to enter the 1st Daytime Programme:

Grn1 min => 10s
Grn1 max = 30s

Now one can set minimum and maximum green times for signal group #1. Continue with key #4.

Grn2 min => 10s
Grn2 max = 25s

Now the same entries are made as above, this time for signal group #2. The displayed value in the line in which the arrow is blinking can be altered using keys #1 and #3. With key #4, one moves one line down, and can then alter the time setting there.

Switchp. clear ?
yes no

When you are carrying out a re-programming, you have the opportunity of deleting old switch points that may be left over from a previous programming. For this, select "Yes", and confirm your choice with key #4.

Once you have completed these entries, the manual device will ask you for 4 switch points for the entered Daytime Programme #1. This means that once you have entered a Daytime Programme, you can have it start itself as many as four times a day, at the different times that you select:

Switchp. 1 Pro 1
Start:>06:00 Uhr

00:00 means in this connection no input. For midnight, you must enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

If you have selected more than one Daytime Programme, then you will now be called upon to enter these as described above (Enter Daytime Programme #2).

After this entry, you have the opportunity of determining the Nighttime Mode, if you have activated it as described in the annex under "Special Options".

Nightmode:
yes no

If you select "Yes" here, then you will be called upon to programme the Night-time Mode:

Input >4<
Nightprog. darkl

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 off
Start:>23:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

Afterwards, you have the opportunity to set the Night-time Mode for Flashing:

Input >4<
Nightprog. flash

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 flash
Start:>22:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

After you have selected the days, (press key #4), the following display appears, if you have set the Interval Matrix under Special Options to "Yes":

Meantimes
yes no

Using the keys #1 and #3, you can select whether or not you wish to activate the Interval Matrix. The previous setting flashes. The Interval Matrix is an additional control function for monitoring the minimum traffic-clearing periods.

The Interval Time is the period of time between the end of the green phase (e.g. of traffic light #1) and the beginning of the clear signal (green) for a coming traffic flow that intersects or merges (in this case traffic light #2, as one-way alternating-direction traffic operation was selected). Traffic-clearing time computation proceeds automatically for one-way alternating-direction traffic.

After selection of the Interval Matrix, the following display appears:

from 1 => 2
10 sec

For one-way alternating-direction traffic, the intervals are adopted automatically from the traffic-clearing times, and can no longer be altered. This serves for adoption of the minimum traffic-clearing times. Confirm this with key #>4<. Now the display appears for setting the interval from traffic light #2 to traffic light #1 (this, too, will be automatically adopted):

from 2 => 1
10 sec

At this point, all the entries in the manual device are completed. Press key #4 once again. The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Switch on a traffic light (which then automatically becomes traffic light #1). The following must be visible in the traffic light display:

12,8 V **Light ??**
No data !

Plug the device into the first traffic light (traffic light #1). Press key #4 on the manual device.

The data from the hand device will be transmitted to the first traffic light (traffic light #1).

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

After switching on traffic light #2, the programme is transmitted by radio or cable to the other traffic light (traffic light #2) and the installation starts up completely automatically.

***Warning:** In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

5. Input for Junction-Merging and Intersection Traffic

Without traffic-flow dependency and without special options

****M P B 4000****
Cross-roads

With this manual device you can programme junction-merging and/or intersection traffic for up to 4 groups and 24 signal heads with cable, and 4 signal heads with radio operation, without traffic-flow dependency and without special options.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual. Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing. If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" for cable operation.

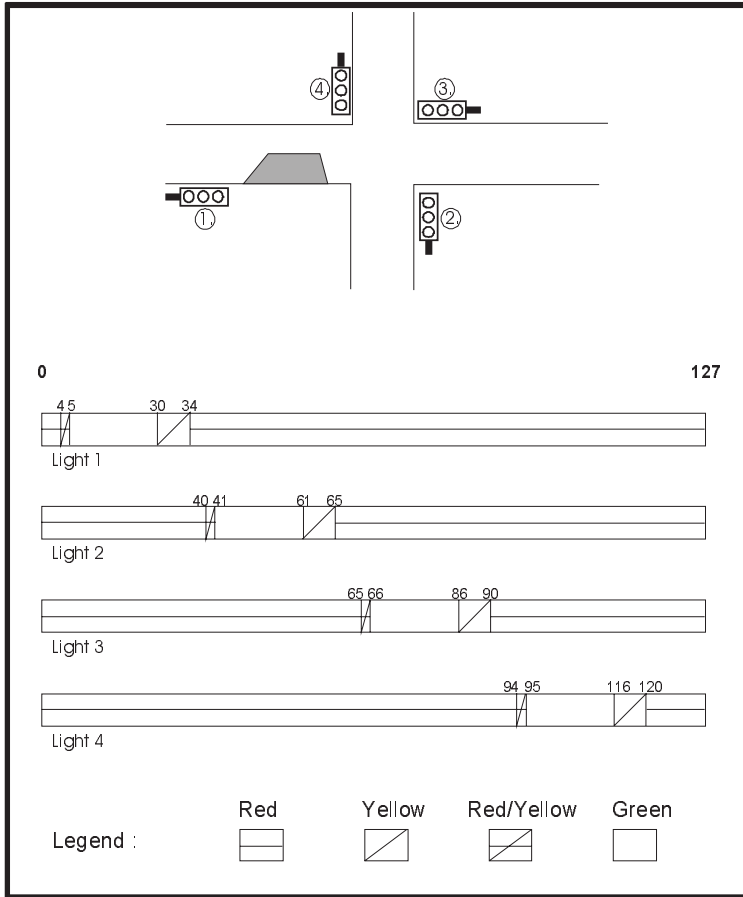
With key #4 you then move further to the point of entering the total number of groups:

Number groups:
One way 3 **4**

The current total will be flashing. You can now raise or lower the total,

using the keys #1 and #3, e.g. "4" for 4-Group operation.

Select for example 4 groups to be entered into the following signal time plan. Continue using key #4; it is simply the green times "from...to" that are being entered. The following illustration is offered for simplification. The installation is linked by wires:



First enter the green time for traffic light #1:
See illustration above... "Light 1"

Grn 1 from => 5s
Grn 1 til = 30s

Here, where the arrow is flashing, one can raise or lower the number of seconds. In the above illustration, traffic light #1 would show green from the fifth to the thirtieth second. If one had selected the operating mode "cable" or "radio" at the start, then one can still enter the number of signal heads after every "from...to" time entry. A distinction is made when doing so between roadway and pedestrian signal heads.

A pedestrian signal head stands at double red. You can simply insert a pedestrian symbol behind the diffusion plate. For entering the total number of signal heads of the different signal groups, the following display appears in the manual device:

Shead 🚗 Gr1> 1
Shead 🚶 Gr1 0

You can enter the number of the roadway signal heads in the first line: key #3 for more signal heads, key #1 for fewer. Pressing key #4 brings you into the second line, where one enters the total of pedestrian signal heads that functions parallel to the roadway signal heads of group #1.

F. blinking 1 :
yes no

If you select "Yes" during malfunction flashing, then the entire signal group shows "Yellow flashing" in the case of a malfunction (pedestrian signal heads are dark). Should you have altered the pre-setting to "No", then the entire signal group shows "Dark".

The entries for the groups #2, #3 and #4 are carried out in precisely the same way.

Continue with key #4.

The manual device presents automatically a circulation time, but this must be altered to the prescribed value according to the signal time plan.

Circ. time=> 127s

Then press key #4 again. The display shows:

Making
signalplan

After creation of the signal plan, the display changes to the following message:

Put box into
Unit 1 >4<

Plug the device into traffic light #1. Switch the traffic light on. The traffic light display shows the following:

12,8 V **Light ??**
No data !

Press key #4. The data from the hand device will be transmitted to the traffic light. The display in the manual device shows the following:

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

With radio or cable operation, you only need programme traffic signal #1 with the manual device. After you have wired the installation, or in the case of a radio installation, simply switch the other traffic lights on, **one after the other.**

The switching-on sequence of the signal heads determines the relationship to the signal groups with the corresponding number of signal heads per group. Not until the last signal head is switched on and the data has been transmitted via radio or cable does the installation start up automatically through the switching-on programme.

*Warning: In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation.***

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

6. Input for Junction-Merging and Intersection Traffic

without traffic-flow dependency, but with special options such as Night-time Mode, Day Programmes, Interval matrix, Forced Circulation and Data Transmission via PC

****M P B 4000****
Cross-roads

With this manual device you can programme junction-merging and/or intersection traffic for up to 4 groups and 24 signal heads with cable, and 4 signal heads with radio operation, without traffic-flow dependency but with special options. Directions for setting the special options can be found starting on page 49 of this manual.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device. After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 50 of this manual.

Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing. If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio".

With key #4 you then move further to the point of entering the number of groups:

Number groups:
One way 3 4

The current number of groups will be flashing. You can now raise or lower the total, using the keys #1 and #3, e.g. "4" for 4-group operation. Press key #4 once again and follow the display on the manual device. If you have selected as a special option "Daytime Programme", the following display will appear. The method used to activate the special options is described in the annex under "Special Options".

Input >4<
Dayprogram 1

Now you are called upon to enter the 1st daytime programme:

Grn 1 from => 5s
Grn 1 til = 30s

First enter the green time for traffic light #1:

(See for this the signal time plan example without daytime programme on page 23)

Here, where the arrow is flashing, one can raise or lower the number of seconds. Traffic light #1 would show green in the case presented above from the second to the seventh second.

If one had selected the operating mode "cable" or "radio" at the start, then one can still enter the number of signal heads after every "from...to" time entry. A distinction is made when doing so between roadway and pedestrian signal heads.

A pedestrian signal head stands at double red. You can simply insert a pedestrian symbol behind the diffusion plate. For entering the total number of signal heads of the different signal groups, the following display appears in the manual device:

Shead  Gr1> 1
Shead  Gr1 0

You can enter the number of the roadway signal heads in the first line: key #3 for more signal heads, key #1 for fewer. Pressing key #4 brings

you into the second line.

One enters there the total of pedestrian signal heads that functions parallel to the roadway signal heads of group #1.

F. blinking 1 :
yes no

If you select "Yes" during malfunction flashing, then the entire signal group shows "Yellow flashing" in the case of a malfunction (pedestrian signal heads are dark). Should you have altered the pre-setting to "No", then the entire signal group shows "Dark".

The entries for the groups #2, #3 and #4 are carried out in precisely the same way.

Continue with key #4.

The manual device presents automatically a circulation time, but this must be altered to the prescribed value according to the signal time plan.

Circ. time=> 127s

Press key #4 to reach the next menu.

Switchp. clear ?
yes no

When you are carrying out a re-programming, you have the opportunity of deleting old switch points that may be left over from a previous programming. For this, select "Yes", and confirm your choice with key #4.

Here the manual device will ask you for 1-4 switch points for the entered Daytime Programme #1.

This means that once you have entered a Daytime Programme, you can have it start itself as many as four times a day, at the different times that you select:

Switchp. 1 Pro 1
Start:>06:00 Uhr

00:00 means in this connection no input. For midnight, you must enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

If you have selected more than one Daytime Programme, then you will now be called upon to enter these as described above (Enter Daytime Programme #2).

After this entry, you have the opportunity of determining the Night-time Mode, if you have activated it as described in the annex under "Special Options".

Nightmode:
yes no

If you select "Yes" here, then you will be called upon to programme the Night-time Mode:

Input >4<
Nightprog. darkl

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 off
Start:>23:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

Afterwards, you have the opportunity to set the Night-time Mode for Flashing:

Input >4<
Nightprog. flash

Here you are asked to select 4 switch points for the Night-time Mode.

This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 flash
Start:>22:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

After you have selected the days, (press key #4), the following display appears, if you have set the Interval Matrix under Special Options to "Yes":

Meantimes
yes no

Using the keys #1 and #3, you can select whether or not you wish to activate the Interval Matrix.

The previous setting flashes. The Interval Matrix is an additional control function for monitoring the minimum traffic-clearing periods.

The Interval Time is the period of time between the end of the green phase (e.g. of traffic light #1) and the beginning of the clear signal (green) for a coming traffic flow that intersects or merges (e.g. traffic light #2). [Direct interval times (from 1=> 2, for example) are taken directly from the traffic-clearing time entries and take precedence. They cannot be altered. Indirect intervals times (from 1=> 3, for example) must be entered.]

After selection of the Interval Matrix, the following display appears:

from 1 => 2
10 sec

(The prescribed time is automatically taken from the traffic-clearing time and cannot be altered!)

Confirm the prescribed value using key #4.

Now the display appears for setting the interval from traffic light #1 to traffic light #3:

from 1 => 3
10 sec

You must undertake the settings for all interval times as described above. Once you have finished the entries, press key #4 once again.

The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Plug the device into the traffic light #1. Switch on the traffic light. The traffic light display shows:

12,8 V **Light ??**
No data !

Press key #4. The data from the hand device will be transmitted to the traffic light. The display in the manual device shows:

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

With radio or cable operation, you only need programme traffic signal #1 with the manual device. After you have wired the installation, bring the case of a radio installation, simply switch the other traffic lights on, **one after the other.**

The switching-on sequence of the signal heads determines the relationship to the signal groups with the corresponding number of signal heads per group. Not until the last signal head is switched on and the data has been transmitted via radio or cable does the installation start up automatically through the switching-on programme.

***Warning:** In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

7. Input for Junction-Merging and Intersection Traffic

with traffic-flow dependency but without special options

* M P B 4000 VA*
Cross-roads

With this manual device you can programme junction-merging and/or intersection traffic for up to 4 groups and 24 signal heads with cable, and 4 signal heads with radio operation, with traffic-flow dependency but without special options.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual.

Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing.

If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio".

With key #4 you then move further to the point of entering the traffic-flow dependency:

Traffic related:
yes no

Using key #1, set the traffic-flow dependency to "Yes" ("Yes" flashes) and confirm the selection with key #4.

With key #4 you then continue to the point of entering the number of groups:

Number groups:
One way 3 4

The current number of groups will be flashing. You can now raise or lower the total, using the keys #1 and #3, e.g. "4" for 4-group operation. Press key #4 once again. The following display will appear:

Clr.time 1 => 6s
Lengthen1= 5s

Here, where the arrow is flashing, alterations can be made. The traffic-clearing period #1 can be changed with the keys #1 and #3. The traffic-clearing period takes effect when the "green" of the previous traffic light (4) has ended. Pressing key #4 brings you into the second line. There one can set the time gap (extension time per message impulse), by which the green time is extended in connection with a message. As a rule, one sets a value here of 5 seconds. Continue downwards key #4.

Grn1 min => 5s
Grn1 max = 10s

Now one can set the minimum and maximum green times of the signal group #1. Press key #4.

continuous 1 :
yes no

Normally, the continuous requirement is set at "Yes". That means that the installation extends the green time for an oncoming vehicle (green extension mode). If one switches the continuous requirement to "No" with key #3 ("No" flashes), then the installation functions as a so-called "All-Red Installation". In such a situation, all the signal heads show all-red. The installation goes to green only when prompted. For this operating mode, the installation must be equipped with radar detectors with directional recognition. Press key #4.

Extend> Max 1 :
yes no

Here you can choose whether an infinite extension of green time is to be possible. If you select "Yes" (permanent green), then the green time will be extended until an "opposing" traffic light is prompted by radar detector. **For this it is absolutely mandatory that the green-max. time #1 be at least 1 second larger than the green-min time for this group.** Continue with key #4.

Shed 🚗 Gr1> 1
Shed 🚶 Gr1 0

Here you can set the number of signal heads on signal group #1. One can raise or lower the number of signal heads for the roadway signal heads in the first line, the number of pedestrian signal heads in the second. Pedestrian and roadway signal heads can also be mixed, so that pedestrian installations can also be established without any problem. The maximum total number is 24 signal heads (4 with radio). Continue with key #4.

F. blinking 1 :
yes no

If you select "Yes" during malfunction flashing, then the entire signal group shows "Yellow flashing" in the case of a malfunction (pedestrian signal heads are dark). Should you have altered the pre-setting to "No", then the entire signal group shows "Dark". Continue with key #4. Now you must enter the data for the signal groups #2, #3 and #4 in the same way.

Clr.time 2 => 6s
Lengthen2= 5s

Grn2 min => 5s
Grn2 max = 10s

continous 2 :
yes no

Shed 🚗 Gr2> 1
Shed 🚶 Gr2 0

F. blinking 2 :
yes no

The entries for the signal groups 3 and 4 are carried out analogously, as described above. Continue with key #4.

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Plug the device into the traffic light #1. Switch on the traffic light. The traffic light display shows:

12,8 V **Light ??**
No data !

Press# key #4. The data from the hand device will be transmitted to the traffic light. The display in the manual device shows:

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

With radio or cable operation, you only need programme traffic signal #1 with the manual device. After you have wired the installation, or in the case of a radio installation, simply switch the other traffic lights on, **one after the other.**

The switching-on sequence of the signal heads determines the relationship to the signal groups with the corresponding number of signal heads per group. Not until the last signal head is switched on and the data has been transmitted via radio or cable does the installation start up automatically through the switching-on programme.

***Warning:** In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

8. Input for Junction-Merging and Intersection Traffic

with traffic-flow dependency and with special options such as Night-time Mode, Day Programmes, Interval Matrix, Forced Circulation and Data Transmission via PC

* M P B 4000 VA*
Cross-roads

With this manual device you can programme junction-merging and/or intersection traffic for up to 4 groups and 24 signal heads with cable, and 4 signal heads with radio operation, with traffic-flow dependency and with special options. Directions for setting the special options can be found starting on page 49 of this manual.

Before programming the signal equipment, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display. If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter on page 52 of this manual. Switch further using key #4 until the manual device tells you to programme the traffic light. In doing so, the manual device requests a variety of entries. You can alter the date by using the keys #1 and #3. The number that is currently valid will be flashing.

If you hold the key pressed down for a longer time, then the numbers change more quickly.

The display shows:

Please select:
Quartz Radio **Cable**

Select with the keys #1 and #3 the desired operating mode, for example "Cable" or "Radio".

With key #4 you then move further to the point of entering the traffic-flow dependency:

Traffic related:
yes no

Using key #1, set the traffic-flow dependency to "Yes" ("Yes" flashes) and confirm the selection with key #4. With key #4 you then continue to the point of entering the number of groups:

Number groups:
One way 3 **4**

The current number of groups will be flashing. You can now raise or lower the total, using the keys #1 and #3, e.g. "4" for 4-group operation. Press key #4 once again, and follow the display in the manual device. If you have selected as a special option "Daytime Programme", the following display will appear. The method used to activate the special options is described in the annex under "Special Options".

Clr.time 1 => 6s
Lengthen1= 5s

Here, where the arrow is flashing, alterations can be made. The traffic-clearing period #1 can be changed with the keys #1 and #3. The traffic-clearing period takes effect when the "green" of the previous traffic light (4) has ended. Pressing key #4 brings you to the next line. There one can set the time gap (extension time per message impulse), by which the green time is extended in connection with a message. As a rule, one sets a value here of 5 seconds.

This entry is carried out for traffic-clearing period + time gap 1, 2, 3 and 4.

Continue downwards with key #4.

Input >4<
Dayprogram 1

Now you will be called upon to enter the 1st daytime programme.

Grn1 min => 5s
Grn1 max = 10s

Now one can set the minimum and maximum green times of the signal

group #1. Press key #4.

continous 1 :
yes no

Normally, the continuous requirement is set at "Yes". That means that the installation extends the green time for an oncoming vehicle (green extension mode). If one switches the continuous requirement to "No" with key #3 ("No" flashes), then the installation functions as a so-called "All-Red Installation". In such a situation, all the signal heads show all-red. The installation goes to green only when prompted. For this operating mode, the installation must be equipped with radar detectors with directional recognition. Press key #4.

Extend> Max 1 :
yes **no**

Here you can choose whether an infinite extension of green time is to be possible. If you select "Yes" (permanent green), then the green time will be extended until an "opposing" traffic light is prompted by radar detector. **For this it is absolutely mandatory that the green-max. time #1 be at least 1 second larger than the green-min time for this group.** Continue with key #4.

Shead 🚗 Gr1> 1
Shead 🚶 Gr1 0

Here you can set the number of signal heads on signal group #1. One can raise or lower the number of signal heads for the roadway signal heads in the first line, the number of pedestrian signal heads in the second. Pedestrian and roadway signal heads can also be mixed, so that pedestrian installations can also be established without any problem. The maximum total number is 24 signal heads (4 with radio). Continue with key #4.

F. blinking 1 :
yes no

If you select "Yes" during malfunction flashing, then the entire signal group shows "Yellow flashing" in the case of a malfunction (pedestrian signal heads are dark). Should you have altered the pre-setting to "No", then the entire signal group shows "Dark". The entries for the other

groups proceeds analogously. Use key #4 to proceed to the next menu.

Switchp. clear ?
yes no

When you are carrying out a re-programming, you have the opportunity of deleting old switch points that may be left over from a previous programming. For this, select "Yes", and confirm your choice with key #4.

Here the manual device will ask you for 1-4 switch points for the entered Daytime Programme #1.

This means that once you have entered a Daytime Programme, you can have it start itself as many as four times a day, at the different times that you select:

Switchp. 1 Pro 1
Start:>06:00 Uhr

00:00 means in this connection no input. For midnight, you must enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

If you have selected more than one Daytime Programme, then you will now be called upon to enter these as described above (Enter Daytime Programme #2).

After this entry, you have the opportunity of determining the Night-time Mode, if you have activated it as described in the annex under "Special Options":

Nightmode:
yes no

If you select "Yes" here, then you will be called upon to programme the Night-time Mode:

Input >4<
Nightprog. darkl

Here you are asked to select 4 switch points for the Night-time Mode. This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 off
Start:>23:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

Afterwards, you have the opportunity to set the Night-time Mod for Flashing:

Input >4<
Nightprog. flash

Here you are asked to select 4 switch points for the Night-time Mode (Flashing). This means you can have the Night-time Mode start itself as many as four times a day, at the different times that you select:

Switchp. 1 flash
Start:>22:00 Uhr

00:00 means in this connection no input. For midnight, you must therefore enter 24:00

After entering the starting time, you will be called upon to specify the days on which the programme is to be used.

Select Days
all Mo-Fr Sa-So

After you have selected the days, (press key #4), the following display appears, if you have set the Interval Matrix under Special Options to "Yes":

Meantimes
yes no

Using the keys #1 and #3, you can select whether or not you wish to activate the Interval Matrix. The previous setting flashes. The Interval

Matrix is an additional control function for monitoring the minimum traffic-clearing periods.

The Interval Time is the period of time between the end of the green phase (e.g. of traffic light #1) and the beginning of the clear signal (green) for a coming traffic flow that intersects or merges (e.g. traffic light #2). [Direct interval times (from 1=> 2, for example) are taken directly from the traffic-clearing time entries and take precedence. They cannot be altered. Indirect intervals times (from 1=> 3, for example) must be entered.]

After selection of the Interval Matrix, the following display appears:

from 1 => 2
10 sec

The prescribed time is automatically taken from the traffic-clearing time and cannot be altered!

Confirm the prescribed value using key #4. Now the display appears for setting the interval from traffic light #1 to traffic light #3:

from 1 => 3
10 sec

You must undertake the settings for all interval times as described above. Once you have finished the entries, press key #4 once again.

The display shows:

Making
signalplan

After the formulation of the signal plan, the display switches to the following message:

Put box into
Unit 1 >4<

Plug the device into the traffic light #1. Switch on the traffic light. The traffic light display shows:

12,8 V **Light ??**
No data !

Press key #4.

The data from the hand device will be transmitted to the traffic light.
The display in the manual device shows:

Manual device:

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Control device:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V Light 1
Light 2 missing !

With radio or cable operation, you only need programme traffic signal #1 with the manual device. After you have wired the installation, or in the case of a radio installation, simply switch the other traffic lights on, **one after the other**.

The switching-on sequence of the signal heads determines the relationship to the signal groups with the corresponding number of signal heads per group. Not until the last signal head is switched on and the data has been transmitted via radio or cable does the installation start up automatically through the switching-on programme.

***Warning:** In the event of a data loss at traffic light #1 or #2 (through activation of the on/off switch), the entire installation must be re-programmed in the case of a **radio signal installation**.*

Manual Options:

(Flashing, Lights Off, All-Red and Programme Selection)

The procedural methods with manual options can be found in Chapter V "Auxiliary Functions", on page 52 of this manual.

9. Reprogramming or changing time settings in radio/cable signalling equipment that has already been put into operation.

With the new **H.10.10** software version of our MPB 4000 traffic signal system you can carry out modifications to the radio/cable signalling equipment without having to switch off the signal system first. The signal system switches automatically to "all-red" during reprogramming and, after reprogramming is completed, switches automatically back to automatic operation.

Follow this procedure:

Use the manual programming device to correct/modify the required times or other data for your construction measures. Apart from the basic entries, such as:

- Number of groups,
- Number and type of signal heads (motor vehicle/pedestrian),
- Mode of operation radio/cable,

all information and data can be modified. When all entries are completed, the manual programming device shows the following display (already seen in previous programming):

Making
signalplan

Once the signal plan has been created, the display changes to the following:

Put box into
Unit 1 >4<

or

Put box into
Unit 1K1 >4<

Now plug the manual programming device into operating **traffic light 1** or **traffic light 1K1** (if traffic light 1 is operating with more than one signal head).

Press key 4 on the manual programming device.

The data from the manual programming device is then transferred to the operating signal system (during data transfer, the signal system switches automatically to all-red).

Manual device:

Sending to light
waiting for red

Sending to light
Datablock: 159 /

Transmission
>> OK <<

1 light correct
programmed

Handbox off
with key >4<

Control unit:

12,8 V **Light 1**
Receiving /

Transmission
>> OK <<

12,8 V **Light 1**
sending data /

12,8 V **Light 1**
Light 2 missing !

Transmission
>> OK <<

After the data has been transferred from the manual programming device to traffic lights 1 or 1K1 and then from traffic lights 1 or 1K1 to all other traffic lights, the signal system automatically starts up again.

III. Special Options with Quartz Operation

In order to reach the Menu items with special options, press key #2 several times after switching on the manual device.

Night-time Mode

Before putting the night-time mode function into operation, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display.

If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter of this manual. Switch the manual device on. Press key #2 several times, until the following display appears:

Nightmode: yes no

You can activate the night-time mode at this point in the display. You can move back and forth in the familiar way using keys #1 and #3. Once the night-time mode has been activated, the input prompt for the night-time mode will appear in the course of the programming. You then proceed as described in the course of the directions for operation.

IV. Special Options with Radio or Cable Operation

In order to reach the Menu items with special options, press key #2 several times after switching on the manual device.

Night-time Mode

Before putting the night-time mode function into operation, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device.

After approximately 10 seconds, the current time of day and date are presented automatically in the display.

If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter of this manual. Switch the manual device on. Press key #2 several times, until the following display appears:

Nightmode: yes no

You can activate the night-time mode at this point in the display. You can move back and forth in the familiar way using keys #1 and #3. Once the night-time mode has been activated, the input prompt for the night-time mode will appear in the course of the programming. You then proceed as described in the course of the directions for operation.

Daytime Programme

Neither the use nor the activation of daytime programmes is possible with quartz operation.

Before setting the daytime programme, you should make sure that the time of day and date are set correctly in the manual device. You can determine this by switching on the manual device. After approximately 10 seconds, the current time of day and date are presented automatically in the display.

If the information shown is not correct, then reset the numbers as described in the "Auxiliary Functions" Chapter starting on page 52 of this manual. Switch the manual device on. Press key #2 several times, until the following display appears:

Dayprograms:			
1	2	3	4

The pre-set value is flashing. Using the keys #1 and #3, you can select up to 4 daytime programmes. After you have selected the number of daytime programmes, continue to programme the installation as described in the course of the directions for operation.

Interval Matrix

The interval matrix is an auxiliary control function for monitoring the minimum traffic-clearing periods. The interval is the amount of time between the end of the green phase (e.g. of traffic light #1) and the start of the clear signal (green) for a subsequent intersecting or merging traffic flow (e.g. traffic light #2).

You have the opportunity of activating the interval matrix:

Meantimes	
yes	no

The pre-set value is flashing. You can select the setting using the keys #1 and #3.

Forced Circulation

Forced circulation serves the purpose of putting an emergency circulation into effect in cases of failure of radar movement detectors or antennae. Forced circulation is useful only in conjunction with a traffic-dependency-operated All-Red installation or installations that operate with green-on-demand features for side streets, for example. As an experiment, enter "Yes" in the Menu "Traffic-dept." using key #1 ("Yes" flashes). Then go back using key #2 until the following Menu appears:

Fail-safe: yes
every> 5 minutes

You can alter the value here with the keys #1 and #3 where the arrow is flashing. You go up one line using key #2. There you can switch to "Yes" using key #1 and "No" using key #3. The forced circulation is thus activated or not after each of the times set. This entry window will continue to be present until the setting for traffic dependency is switched back to "No".

Expect Data from PC...

With this function, the opportunity exists of entering data from a PC via interface. This option is explained in extra operating instructions for PC programming

To exit the special options menu items, press key #4 several times. This will then take you back to the programming procedures described in this operating manual.

V. Auxiliary Functions

1. Manual Options with One-Way Alternating-Direction Traffic:

(Manual Operation, Flashing, Lights Off, All-Red and Programme Selection)

Manual operation is possible only with either radio or cable operation. Simply plug the manual device into an installation that is in operation. After that, switch the manual device on using the key "ON".

The display now shows:

Please select:
Manual ==>

with key 3 --->
with key 1 <---

Hand operation => <=Flashing=> <=Lights Off=> <=All-Red=>
<=Programme Selection=> <=Manual Device Off

Select the operating mode using the keys #1 and #3. The traffic light installation is switched over to the selected operating mode with key #4. When >Manual Mode< is selected, the following display appears:

Please wait...
Green 1 is coming

The traffic light installation now runs to the next possible automatically pre-set green waiting point and stops there.

The display shows:

3=Go on 4=End
> Green1 there<

Now press key #3, so that the traffic light installation runs to the next automatically pre-set green waiting point. It is not possible to use this to shorten the traffic-clearing period (interval). If you wish to exit manual operation, then press key #4.

If you wish a different operating mode, for example "Flashing", "Lights Off", "All-Red" or "Programme Selection", then you can switch over to the desired operating mode using the menu item "Please Select:" (before doing this, switch the manual device off and then on again). Press for example key #3 in order to switch over to "Flashing". You switch on the selected operating mode by pressing key #4.

The manual device display shows:

Please wait...
>Flashing coming

The installation runs automatically to the switch point set internally and switches then to "Flashing".

The manual device now shows:

>Flashing there
Automatic >4<

Remove the manual device from the control unit and switch it off as shown by twice pressing key #4.

If you would like to switch back to "Automatic", then proceed as follows: plug the manual device into one of the control devices (it doesn't matter which one). **Then** switch the manual device on.

The manual device then displays the current operating mode of the installation in operation. In this example: "Flashing"

>Flashing there
Automatic >4<

Switch back with key #4 to automatic mode. Afterwards you will be called upon to switch the manual device off.

Entering programme selection proceeds as follows: plug the manual device into **traffic light #1**. After that, switch the manual device on using the key "ON". Select the operating mode using keys #1 and #3. The traffic light installation switches over using key #4 to the selected operating mode. The display now shows:

Please select:

Please select:
>-< Pro 1 >+<

Pro 1
Pro 2
Pro 3
Pro 4
Pro 7 (Off)
Pro 8 (Flashing)

Programme Selection can be carried out only at traffic light #1.

After selecting the programme, press key #4:

Please wait...
>Pro 1 coming

Non-programmed programmes cannot be selected. Remove the manual device from the control unit and switch it off as shown by twice pressing key #4.

If you would like to switch back to "Clock Mode", then proceed as follows: plug the manual device into one of the control devices (it doesn't matter which one). **Then** switch the manual device on.

The manual device then displays the current operating mode of the installation in operation. In this example: "Pro 1"

> Pro 1 < there
Clockmode: >4<

Switch over to clock mode using key #4.

2. Manual Options with Intersecting Traffic:

(Manual Operation, Flashing, Lights Off, All-Red and Programme Selection)

Manual operation is possible only with either radio or cable operation. Simply plug the manual device into an installation that is in operation. After that, switch the manual device on using the key "ON".

The display now shows:

Please select:
Manual ==>

with key 3 --->
with key 1 <---

Hand operation => <=Flashing=> <=Lights Off=> <=All-Red=>
<=Programme Selection=> <=Manual Device Off

Select the operating mode using the keys #1 and #3. The traffic light installation is switched over to the selected operating mode with key #4. When >Manual Mode< is selected, the following display appears:

Please wait...
--> Waitingpoint

The traffic light installation now runs to the next possible automatically

pre-set green waiting point and stops there.

The display shows:

3=Go on 4=End
>Waitingpoint<

Now press key #3, so that the traffic light installation runs to the next automatically pre-set green waiting point. It is not possible to use this to shorten the traffic-clearing period (interval). If you wish to exit manual operation, then press key #4.

If you wish a different operating mode, for example "Flashing", "Lights Off", "All-Red" or "Programme Selection", then you can switch over to the desired operating mode using the menu item "Please Select:" (before doing this, switch the manual device off and then on again). Press for example key #3 in order to switch over to "Flashing". You switch on the selected operating mode by pressing key #4.

The manual device display shows:

Please wait...
>Flashing coming

The installation runs automatically to the switch point set internally and switches then to "Flashing".

The manual device now shows:

>Flashing there
Automatic >4<

Remove the manual device from the control unit and switch it off as shown by twice pressing key #4.

If you would like to switch back to "Automatic", then proceed as follows: plug the manual device into one of the control devices (it doesn't matter which one). **Then** switch the manual device on.

The manual device then displays the current operating mode of the installation in operation. In this example: "Flashing"

>Flashing there
Automatic >4<

Switch back with key #4 to automatic mode. Afterwards you will be called upon to switch the manual device off.

Simply plug the manual device into an installation that is in operation. After that, switch the manual device on using the key "ON".

The display now shows:

Please select:

Please select:
>-< Pro 1 >+<

Pro 1
Pro 2
Pro 3
Pro 4
Pro 7 (Off)
Pro 8 (Flashing)

Programme Selection can be carried out only at traffic light #1.

After selecting the programme, press key #4:

Please wait...
>Pro 1 coming

Non-programmed programmes cannot be selected.

Remove the manual device from the control unit and switch it off as shown by twice pressing key #4.

If you would like to switch back to "Clock Mode", then proceed as follows: plug the manual device into one of the control devices (it doesn't matter which one). **Then** switch the manual device on.

The manual device then displays the current operating mode of the installation in operation. In this example: "Pro 1"

> Pro 1 < there
Clockmode: >4<

Switch over to clock mode using key #4.

3. Setting Date and Time

First switch the manual device off. Then, while holding key #1 pressed down, switch the manual device on (brief pressure on key "On").

After ca. 10 seconds, release key #1. By using keys #1 and #3, the value marked with "> <" can be raised and lowered. One proceeds to

the setting of the next value with key #4. When one presses key #4 once more after setting the seconds value, the internal clock will be set with the values that have just been selected.

Remark: a correctly-set clock is important if the data from a traffic signal installation are to be printed out or if the daytime programme or the night-time mode is activated. This ensures that the logs thus assembled are equipped with the right date and the correct time of day. The daytime programme and the night-time mode will also thus be automatically switched on at the right time.

4. Version Display in Manual Device

First switch the manual device off. Switch the manual device on, using the key "On"; the following message appears in the display:

PeterBerghaus
* Traffic Light *

Vers. H1010 08:40
Handbox: 685

The installed software version appears then in the first line and the serial number of the manual device in the second.

5. Acknowledging errors

Quit Failure
with key >4< !

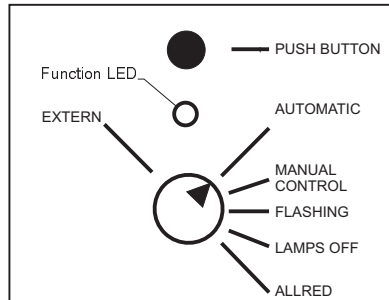
If the manual device is plugged into a flashing installation and then switched on, as though one wished to operate the installation manually, and the above message appears, then the installation had an error (for example, green-green violation).

In such cases, the message in the traffic light display is to be followed. That is where the error is more precisely described. An attempt can be made to acknowledge the error using key #4.

Should the installation still not start up after that, then the corresponding error must be eliminated.

6. Special Operation modes using internal and external rotary switches for manual options, such as manual operation, flashing, lights off and all-red

6.1. Setting special operating modes by means of built-in rotary switches (optional)



For example: manual operation (only possible with cable and radio control)

Set the rotary switch to manual operation; after approximately 5 seconds the red LED flashes. This means that the special operating mode you selected has been activated. If the red LED changes from flashing red to a continuous red light, the signal system is in the next possible green waiting point. By pressing the key, the signal system moves to the next green waiting point of the following signal group. When the key is pressed, the LED flashes red; when the next green waiting point is reached, the LED is again a continuous red light. It is therefore not possible to use this to shorten the traffic-clearing period (time interval). The sequence and current status of the individual signal groups can be observed on the traffic light display.

If you wish to exit manual operation, turn the rotary switch from manual operation back to automatic. The red LED switches itself off after approximately 5 seconds showing that the signal system has switched itself back to automatic operation.

If you wish to have further special operating modes, such as flashing, lights off and all-red, follow this procedure:

Turn the rotary switch from automatic to the desired special operating mode, e.g. flashing. After approximately 5 seconds, the red LED

flashes indicating that the special operating mode you selected has been activated. The signal system now operates until the preset switch-off time and then switches via a switch-off display to yellow flashing. (Please note that the only motor vehicle groups that flash are those that have been programmed with "yes" in the "Error flashing" menu item; pedestrian signal heads automatically have a dark display.) The LED lights up continuously when the selected special operating mode has been reached.

If you wish to exit the selected special operating mode (yellow flashing), turn the rotary switch back to automatic. The red LED turns itself off after approximately 5 seconds and the signal system automatically switches back to automatic operation via an activation program.

6.2. Setting special operating modes by means of external cable remote control (optional)

1. Set the rotary switch of the (optional) built-in manual control to the position "extern".
2. Choose the desired special operation mode by means of the rotary-switch on the external cable remote control.
3. Open the cap of the connector for the external cable remote control below the control chamber of the traffic light.
4. Connect the plug of the cable remote control to the connector of the traffic light and fasten it by turning around the nut of the plug.
5. After approx. 5 seconds the chosen special operation mode would be activated. The further steps for choosing the different special operation modes you could find in chapter 6.1 on the pages before.

Common comments

If several signal heads are modified with this accessory equipment, you have to be sure that the use would be made only at one signal head. On all other signal heads the rotary-switches have to stay in position “Automatic”.

Should one rotary-switch unnoticed not stay on “Automatic”-position, the red function-LED will show a fast blinking indication. This means a malfunction and the traffic light could not execute the chosen mode. Please, check which rotary-switch is not in the “Automatic”-position and bring him into the right position(Automatic). Now, after approx. 5 seconds, the chosen special operation mode would be activated.

Attention: It is not possible to choose the special operation mode “Flashing” and “Lamps Off” directly while staying in the special operation modes “Manual operation” or “Allred”. Hereby it is necessary to choose first the special operation mode “Automatic” and afterwards the desired special operation mode (Flashing or Lamps Off). A direct change between the other special operation modes is possible.

VI. Control Device

VI.1 Switching Control Device On and Off- Changing the Storage Batteries

The control device is equipped with only an On/Off switch and a fuse.

The maximum allowed value of the fuse is 6.3 A!

In order to put the installation into operation, the first thing is to *clamp on the storage battery in the battery box* (being careful to ensure correct polarity!) Switch on the traffic light using the main switch. The traffic light display will now automatically show the manufacturer and the EPROM version:

PeterBerghaus
* Traffic Light *

Epromversion:
H1010 08:40

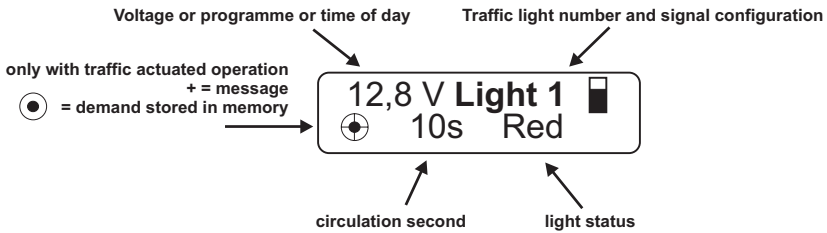
After this automatically-appearing message, the display should show the following:

12,8 V **Light ??**
No data !

The control unit can be re-programmed only in conjunction with the display "Expect Data"!

After successful programming, the signal head sends a message with the respective traffic light number.

The display appears as follows:



Should the installation be malfunctioning, then a clear description of the error will be displayed in the second line.

12,8 V Light 1
Light 2 missing !

or

12,8 V Light 1K1
Light 1K2 missing !

Warning:

If the installation is switched off for 10 seconds or more, then all data will be lost! The traffic light will then have to be re-programmed.

All data are retained while changing storage batteries.

Should the storage battery voltage fall below ca. 11 Volts during operation, a corresponding warning will appear in the display of the control device, when it is set for quartz operation.

Should the equipment be linked by either wiring or radio, then one can see at every signal head where the storage batteries need to be changed (see also at Error Description).

The following message appears:

Accu change !
10 V

VI.2 Error Messages for Control Device

The error messages of the control device are displayed in the lower line of the LED display. The error display is very user-friendly. All currently-active errors are displayed, one after the other, using clear designations in slow succession to one another.

In the cases of cable and radio installations, not just the errors of the individual equipment are displayed, but also those present at other traffic lights. When you are summoned to a malfunctioning installation, open at random a control device cover. There you will see for example in the display "Red 2 defective".

The displayed text speaks for itself. Proceed to traffic light #2 and overhaul the red light.

The installation will then return by itself to programme flow.

WRONG VERSION !

An attempt has been made to programme a new control device with an old manual device, or vice-versa (different EPROM versions). Remedy: contact us and request the current version number.

*INTERNAL FAILURE

The control device has a malfunction.

Switch the control unit off and then on again. Normally, this should remove the malfunction. If this is not the case, please send the control card to the factory for repair.

12,8 V Light 1 ■
Red defect 2

The red lamp at traffic light #2 is defective and must be replaced. After elimination of the error, the installation starts up again automatically. If the traffic light is fitted with LED-modules you have to quit the failure as described on page 58.

12,8 V Light 1 ■
Green status 3

This is a status error. Yellow or red status errors can also occur. In this

case of this error, the directive to the control does not conform to the actual task at hand. Acknowledge the error using the manual device. Should the error re-occur, then you must send the control panel to the factory for evaluation.

12,8 V Light 1 
E. Gr. Grp. 1/3


In the case of this error, for example, the signal groups #1 and #3 would be transmitting an "opposing" signal configuration not allowed in the program (in this example, both groups showed green simultaneously). The green-green monitoring prevents the two groups from actually displaying simultaneously green.

In order to determine the cause of the malfunction, you must now inspect groups #1 and #3. The group which shows a status error (green status) is the source of the malfunction.

Acknowledge the error with the manual device. If the error reappears, then you must send the control panel to the factory for evaluation.

12,8 V Light 1 
Meant. Grp. 3/2

In the case of this error, there is an interval error between groups #2 and #3. Check the input of your green and interval times for groups #2 and #3. Correct the times and re-programme the installation.

12,8 V Light 1 
No Rec. Light 2

In the case of this error, the transmission is being disrupted by the radio or cable line. In the example shown, traffic light #2 is affected. Causes for this could include:

with radio operation: Antenna beamers defective or missing Radio module defective or plug connection loose

with cable operation: Cable connection defective
 Plug connection loose

After elimination of the error, the installation automatically resumes the programme. The error need not be acknowledged with the manual device.

VII. MANUAL DEVICE

VII.1 Switching Manual Device On and Off

Before you can set the manual device into operation, the batteries (4* Mignon) that are supplied with it must first be installed.

To do this, open the battery chamber on the rear side of the device and insert the batteries (be sure the polarity is correct!).

To switch the device on, briefly press the "ON" key.

The manual device will then display the manual device model. You can **switch off** the manual device by holding the #2 key pressed down for ca. 5 seconds.

The display shows the following, depending upon manual device model:

M P B 4000
One Way Traffic

* M P B 4000 VA*
One Way Traffic

M P B 4000
Cross-roads

* M P B 4000 VA*
Cross-roads

VII.2 Switching Manual Device On and Off

In order to be able to transmit the data from the manual device to the control device, the manual device must be first pushed completely into the cavity of the control device. If the manual device was not correctly plugged in, or if data is still present in the installation, the display shows the following:

Transmission
>> Failure <<

Send again ?
<2>=Yes <4>=No

Repeat the transmission with key #2 or cancel it with key #4. Normally the manual device will show the following:

with cable and radio:

2 lights correct
programmed

1 light correct
programmed

Handbox off
with key >4<

Switch the device off using key #4. The manual device disconnects automatically after 10 minutes, if during that time no key has been activated.

Batteries empty..
Please change !

When this error message appears, one can still continue to work for a time. It is however to be recommended that a new set of batteries be installed.

Warning: Please switch off the manual device before replacing the batteries. (Do not use rechargeable storage batteries)

Internal Failure:
unknown menu

The manual device has a function error. Remove -- while this error message is being displayed -- the batteries from the manual device. Replace them and switch the manual device on again. Normally, the error should then be eliminated. If not, please forward the manual device for repair.

Box defect !
Please switch off

The device must be sent in for examination.

Set clock
Go on with >4<

The factory settings for date and time of day have been lost. After pressing key #4, a menu will be displayed with which the current time can be entered (for this see the chapter "Auxiliary Functions", starting on page 52).

After the correct setting of the internal clock has been made, this special menu will not be displayed again.

Please check
the data....

An error has been detected during data input. A prescribed programme flow can not be accomplished with the data as entered. Please check the data.

To many
Signalheads !!

While entering the roadway -- or pedestrian signal heads, more than 24 signal heads were entered. Please correct the erroneous input.

Group ? without
heads !!

If for example settings were made for 3 groups, and then the number of signal heads was set to "Zero" for group #1, then this error message will be displayed. Remedy: Should for any reason groups be operating without signal heads, then these always must be the *last* groups in the series: for example, with 4 groups, the least two are set to be "signal head-less" (signalg.: roadway, pedestrian=0).

Green min 1
too small !

This messages is displayed with the minimum green time for group #1 has not been met. The set green time of a group has been entered at less than 5 seconds. The green time selected is not to be less than 5 seconds, according to RiLSA. You must change the value for group #1.

!! Greentimes !!
!! overlapping !!

This message is displayed when there is a green-time overlap between 2 or more signal groups (both or more than two display green simultaneously).

As this can easily be so intended, you have the opportunity of confirming the message with key #3. This message is to be considered merely a warning.

**Quit Failure
with key >4< !**

If the above message appears after the manual device has been pushed into a flashing installation and then switched on, as if one had wanted to operate the installation by hand, then the installation has an error (green-green violation, for example).

In such cases the message in the traffic light display is to be consulted. The error will be described in greater detail there. An attempt can be made to first acknowledge the error using key #4.

Should the installation still not start up, then the corresponding error must be eliminated.

VIII. Accessories for MPB 4000

- Radio retrofitting
- Retrofitting for traffic-dependent operation
- Monitoring printer
- Interface for printer (4 groups)
- Interface for PC (laptop) programming (12 groups)
- Software for PC (laptop) programming
- Pedestrian symbols for signal heads
- Pedestrian demand tracer
- Installation external manual operation for signal head
- Operating device for external manual operation
- Internal manual operation for signal heads
- Retrofitting set for changeover to 42 V operation
- Installation parallel box for parallel signal heads
- Parallel signal heads
- Retrofitting for second red light
- Anti-theft protection for signal heads
- LED-modules for red / yellow / green

IX. Technical Data

Operating voltage: approx. 9 - 14 V DC

Voltage use with quartz or cable operation

Daytime operation: ca. 1.20 A per signal head (Halogen)
Daytime operation: ca. 0.48 A per signal head (LED)
Night-time operation: ca. 0.81 A per signal head (Halogen)
Night-time operation: ca. 0.32 A per signal head (LED)

Voltage use with radio operation

Daytime operation: ca. 1.40 A per signal head (Halogen)
Daytime operation: ca. 0.68 A per signal head (LED)
Night-time operation: ca. 1.10 A per signal head (Halogen)
Night-time operation: ca. 0.58 A per signal head (LED)

Light sources: 12 V / 10 W halogens with G4 threads (industry standard)
Optional the traffic light could be fitted with LED-modules

Fuses: 6.3 A, 5 x 20, semi-time lag (industry standard)

Operating modes: Fixed-period, traffic-dependent operation, traffic-dependent operation with green on demand (each with 4 daytime programmes) and manual operation

Data transmission: Quartz, cable, digital spark gap

Radio distance: max. length under ideal conditions: 2000m

Radar Detector MWD BF Description

1. General

The MWD BF is a directional recognition radar detector which was conceived specifically for use in the area of industrial gate and barrier installations.

The detection of movement proceeds in accordance with the Doppler Principle. For this the sensor sends out microwaves in the 24 GHz range. These are altered in their frequency by moving objects. The altered frequencies are received by the sensor, which evaluates them. Thus, every movement within the radar detection field is registered, subsequently evaluated using a logical analysis and communicated through a relay-output to the gate or locker control unit.

The radar detector also offers other advantages:

- One can choose between models with or without directional recognition
- Distinction can be made with directional recognition between approaching and retreating
- Voltage-free relay output
- Insensitivity to temperature and moisture variations, air currents and radio disruptions
- Voltage supply either AC or DC
- Sensitivity setting possible through opening in the front side of the housing
- Housing protected with the IP 65 Protection Type, and thus protected in all directions against dust and water jets
- Cost-saving installation
- Adjustment of operational parameters by key buttons or infrared remote control
- Compact plastic housing

2. Mounting

2.1 Place of installation

The device is centrally mounted above the sector to be monitored. The maximum mounting height is approx. 6m.

Hints for planning and installation:

- The device should be mounted at a point that is vibration-free.
- In order to avoid spurious release, there must not be *any objects in motion within the radiation field*.
- There must not be *any fluorescent tubes* within the radiation field of the detector.
- It should be avoided that the radiation fields of two motion detectors overlap, since this may lead to spurious releases.
- Do not install behind objects, building coverings or elements.
- If the radar detector is subject to rain or snow, then it should be set to the directional recognition mode (one-directional - retreating).

2.2 How to screw down the housing

The cover should be screwed down with a torque of approx. 1 Nm. Put the cover evenly into the groove of the housing and screw it down.

Attention! *If the cover is off straight, for example due to squeezed cable leads in between the screw guides, the tightness of the housing is impaired!*

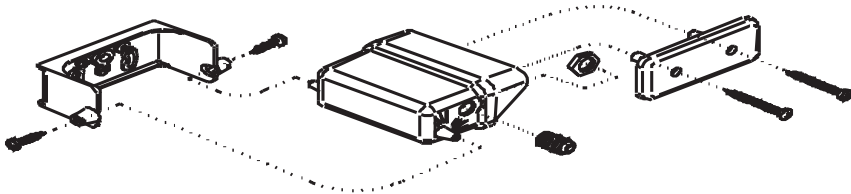


Figure 1: Magnified diagram of the housing

3. Adjustment and Initiation

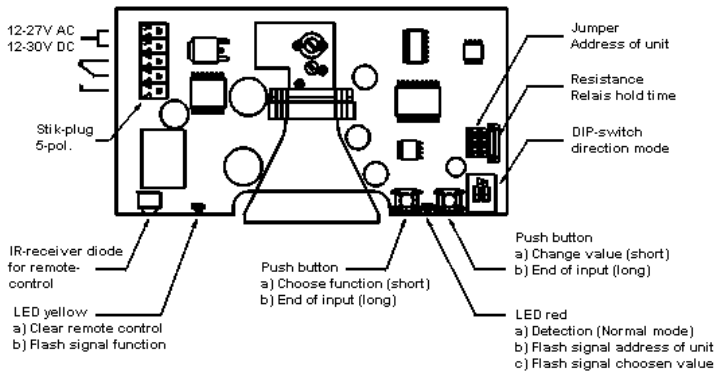


Figure 2: Operating elements on the printed board





3.1 Direction identification

The direction identification device of the motion detector may be adjusted by the DIP-switches located on the right side. DIP-switch No. 1 is assigned to approaching objects, which is adjusted most often. If DIP-switch Nr. 2 is switched on, the device reacts to objects that are *moving away from* the motion detector. If both DIP-switches are switched on or off, the direction identification is deactivated.

Direction identification	DIP-switch	
	1	2
Approaching		ON OFF
Moving away		OFF ON
Off		OFF OFF
		ON ON

3.2 Device address

In order to be able to adjust neighbouring motion detectors with a remote control, an address may be assigned to each appliance in sectors 1-4. For this purpose, a jumper field is located above the DIP-switches.

Address	Jumper position
1	
2	
3	
4	

3.3 LED display

Mode of operation	Yellow LED – left side	Red LED – right side
Object recognition	Off	Object identified
Adjustment with key button	Flash signals for function numbers	Flash signals acc. to parameter significance
Adjustment with remote control	a) Reception readiness for infrared remote control b) Flash signals for function numbers	a) Flash signals acc. to parameter significance b) Flash signals for device address

3.4 Fall-delay time of relay

The factory-alignment for the fall-delay time of the relay is 0,5 seconds. An extension of the fall-delay time to 2 seconds may be reached by removing the resistor, which is located next to the jumpers for the device address (figure 2).

Warning: The resistor may only be cut through in currentless condition! Please make sure that no components or strip conductors are damaged!

3.5 Personal suppression

If personal suppression is activated, the appearance of single persons will not trigger the device. For more information regarding adjustment of personal suppression, please see section 3.6.2 resp. 3.7.3.

Personal suppression is designed for the use in typical internal traffic situations at a shed gate. Deviating conditions (very low or high mounting height, setting angle is too steep or too flat, oblique mounting position) or untypical objects (e.g. fast moving persons, groups, very slow vehicles, high-lift trucks with fabric rolls etc.) may lead to

malfunctions if personal suppression is activated.

3.6 Adjustment with key buttons

Operational parameters (sensitivity, personal suppression) may be adjusted with the buttons located at the right side of the horn antenna.

<i>Left button / yellow LED:</i>	<i>select/indicate function</i>
<i>Right button / red LED:</i>	<i>change/indicate value</i>

If a function is selected for the first time, the function number is indicated on the yellow LED, followed by the currently set value on the red LED.

The adjustment process is terminated automatically 30 seconds after the last button has been pressed or by pressing a button for a longer time.

3.6.1 Selection of sensitivity

The sensitivity of the motion detector may be adjusted by degrees from 1 to 15. Each time the right button is pressed, the sensitivity is increased by one degree. Degree 15 is followed by degree 1.

<i>Yellow LED</i>	<i>flashes</i>	<i>1x</i>
<i>Red LED</i>	<i>flashes</i>	<i>1 x acc. to value of the current degree of sensitivity</i>

3.6.2 Personal suppression

The personal suppression of the motion detector may be activated (position 1) and de-activated (position 2) by using the button on the right side.

<i>Yellow LED</i>	<i>flashes</i>	<i>2x</i>
<i>LED rot</i>	<i>flashes</i>	<i>1x if personal suppression is activated 2x if personal suppression is de-activated</i>

3.6.3 Factory setting


In order to reset the parameters to the factory setting, both buttons are pressed while switching on power supply. Now, the following adjustments are made:

<i>Degree of sensitivity:</i>	<i>7</i>
-------------------------------	----------



Personal suppression: off

3.7 Adjustments with the optional infrared remote control MWDRC

3.7.1 How to activate the adjustment mode

Before the parameters of a motion detector can be changed with the remote control, the appliance has to be activated for this adjustment. For this purpose, please press the -key. Now, all motion detectors within the range of reception of the remote control will indicate the set device address on the red LED. If the address of the desired device is entered within 3 seconds by the numeral keys of the remote control, the activated device shows its readiness for entry on the yellow LED. All other appliances are not activated and return to their normal mode.

3.7.2 Selection of sensitivity

After the device has been cleared, the sensitivity of the motion detector may be changed with the keys  and . When the keys are pressed for the first time, the yellow LED indicates the number of the desired function with flash signals. The adjusted value is indicated by flash signals of the *red LED*. Sensitivity ranges from 1 to 15.

<i>Yellow LED</i>	<i>flashes 1x</i>	<i>(function 1)</i>
<i>Red LED</i>	<i>flashes 1 x acc. to value of current sensitivity level</i>	


Notice: Please switch off personal suppression when adjusting sensitivity.

3.7.3 Personal suppression

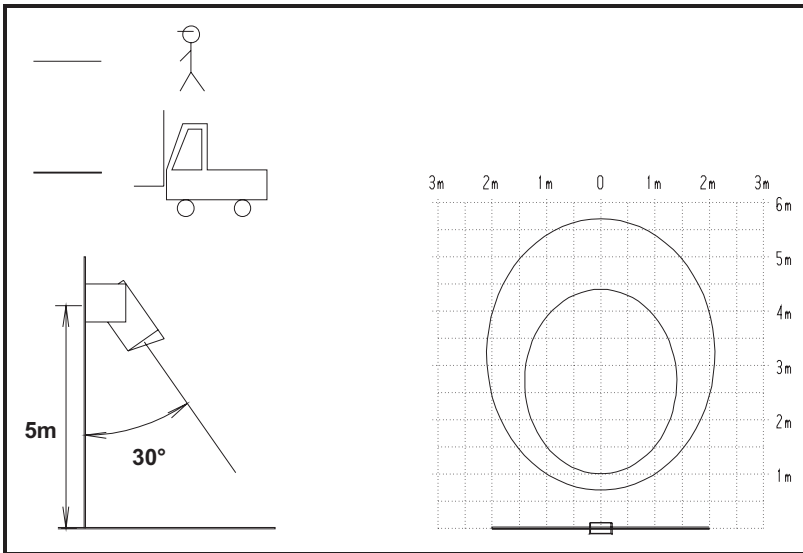
The -key changes the setting of the personal suppression.

<i>Yellow LED</i>	<i>flashes 2x</i>	<i>(function 2)</i>
<i>Red LED</i>	<i>flashes 1x</i>	<i>if personal suppression is switched on</i>
	<i>2x</i>	<i>if personal suppression is switched off</i>

3.7.4 How to terminate the adjustment mode

Pressing the -key terminates adjustment with the remote control. The motion detector now returns to the normal detection mode. The yellow LED is extinguished. The red LED now continues to indicate detected objects. The object recognition mode is automatically activated, if no entry has been made with the key buttons or remote control for 30 seconds.

3.8 Adjustment of the detection zone



The MWD BF has a circular detection zone. Size and position of the detection zone may be altered by adjusting sensitivity and inclination angle. In general, the optimum inclination angle lies between 30° and 45°. In order to change the angle of radiation, please loosen the lateral screws located between support bar and housing. On both sides of the housing there are division marks in a 15° grid system.

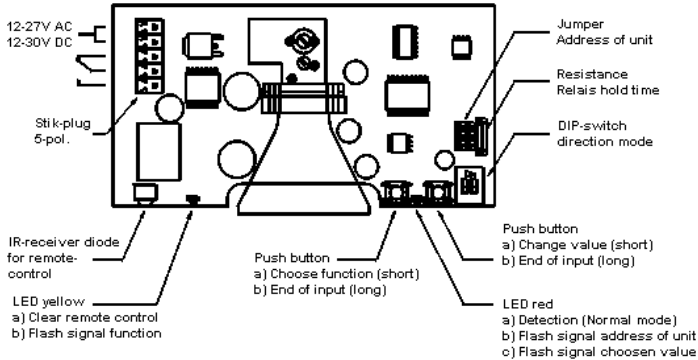
The size of the detection zone may change depending on the size and speed of the object to be detected. If the motion detector is mounted in a height of more than 4 meters and sensitivity is low, the detection zone for persons becomes very small.

4. Technical Data

Housing	Dimensions (without cable) 132 x 155 x 58 mm Colour black Housing pot plastic ASA Support bar plastic ASA Cover plastic PC
Weight (incl. support bar) Protective system	0,3 kg IP 65
Distribution voltage	12-27 V AC 12-30 V DC
Power draw	Typ. 1,5 W Max. 2,4 W
Admissible working temperature Storing temperature Air moisture	-20 °C to +55 °C -30 °C to +75 °C < 95 % non fogging
Frequency Transmitting power	24,125 GHz typ. 5 mW
Output relay max. turn-on voltage max. switching current min. switching current Contact type	24 V AC/DC 1 A at resistive load 1 mA 1 change-over contact (potential-free) In case of inductive load please provide for an external protective wiring or the relay contacts!
Connecting cable	Flexible, max. 5x1,0 qmm
Fall-delay time of relay	0,5 s / 2 s, selection with jumper
Maximum mounting height	6 m
Adjustable functions	By means of sliding switch on printed card Direction recognition off/approaching/moving away By means of key button or infrared remote control Sensitivity Personal suppression Factory setting (only key buttons)
CE-relevant standards	ETS 300 683

5. Short survey

Operating elements and pin configuration:



Direction recognition	DIP-switches	
	1	2
<i>Off</i>		OFF OFF
		ON ON
<i>Approaching</i>		ON OFF
<i>Moving away</i>		OFF ON

Device address for remote control	Jumper position
1	
2	
3	
4	

Remote control key	Function	Flash signal of LED Left right	Adjustment range
	Acivation	Ready Address	1 .. 4 (address)
/	Sensitivity	1x current value	1=low .. 15=high
	Extraction of persons	2x current value	1=on 2=off
i	-	-	-

Spare Part List



Article: Traffic light type MPB 4000

Order Number	Article Description
EH 2001	Signal head Model Holland, 3-part, 210 mm, with sun visors, completely wired (on clamp bar), incl. battery cable, reflectors, equipped with G4 thread mounts and halogen bulbs 12 V / 10 W / G4
EH 2005	Signal head Model Holland, 3-part, 210 mm, with sun visors, not wired, includes G4 thread mounts and reflectors, but without halogen bulbs
EH 2010	Signal head rear part, Model Holland, 210 mm, 1-part
EH 2011	Control unit housing Model Holland, 210 mm
EH 2012	Lock for control unit door Model Holland
EH 2641	Key No. 641 for control unit housing Model Holland
EH 2014	Sealing rubber for control unit housing Model Holland
EH 2015	Signal head door for control unit, with lock Model Holland
EH 2016	Signal head door without diffusion plate, Model Holland, 210 mm
EH 2017	Signal head door Model Holland, with red diffusion plate, 210 mm
EH 2018	Signal head door Model Holland, with yellow diffusion plate, 210 mm
EH 2019	Signal head door Model Holland, with green diffusion plate, 210 mm
EH 2020	Diffusion plate red, Model Holland, 210 mm
EH 2021	Diffusion plate yellow, Model Holland, 210 mm
EH 2022	Diffusion plate green, Model Holland, 210 mm
EH 2023	Sealing rubber for diffusion plate 210 mm, Model Holland
EH 2030	Sun visor Model Holland 210 mm
EH 2031	Cover cap for signal head Model Holland
EH 2032	Sealing ring for cover cap, self-adhesive, Model Holland
EH 2033	Intermediate ring for connecting signal head rear parts Model Holland
EH 2050	Pedestrian symbol walking for Model Holland 210 mm
EH 2051	Pedestrian symbol standing for Model Holland 210 mm
EH 2052	Bicycler symbol for Model Holland 210 mm
EH 2053	Pedestrian and bicycler symbol for Model Holland 210 mm
EH 2054	Arrow symbol for Model Holland, 210 mm, for red/yellow
EH 2055	Arrow symbol for Model Holland, 210 mm, for green
EG 0040	Halogen bulb 12 V / 5 W / G 4
EG 0041	Halogen bulb 12 V / 10 W / G 4
EG 0084	Halogen pin setting G 4
EH 2040	Reflector for G 4 setting, Model Holland 210 mm
EI 0024	Reflector with G 4 setting, Model Holland 210 mm
EH 2041	Reflector with two G 4 settings, Model Holland 210 mm (double red light)
EI 0020	Battery clamp shoe (+), red
EI 0021	Battery clamp shoe (-), green
EK 0001	Battery cable for MPB 4000 without battery clamp shoe, with ring lugs
MP 4026	Front plate MPB 4000 compl. with 19 inch insert and plug bar, as well as On / Off switch and fuse element

Spare Part List



Article: Traffic light type MPB 4000

Order Number	Article Description
MP 4045	Front plate MPB 4000 with 19 inch insert
ES 2063	On / Off switch 1 x A
ES 2065	Mixed plug bar for 19 inch insert
ES 2030	Fuse socket with locknut (5 x 20)
ES 2031	Safety cover for fuse (5 x 20)
ES 2006	Fuse 5 x 20 / 6.3 A
ES 2041	Dimming switch with connecting cable and screw connectors
ESP 010	Control unit plate for MPB 4000
ESP 021	Plate for LED display
EF 0009	Radio component Model FM-D 92 for MPB 4000
EP 6037	Radar detector 12 V incl. 0.5 m cable with mounted plug
EE 0031	Mounting bracket for radar detector
EE 0025	Mounting bracket for radio antenna and radar detector
EF 0026	Antenna beamer without wingnut and screw
EF 0046	Wingnut and screw for antenna beamer
EF 0036	Antenna cable with BNC plug and connection part
ES 3005	9-pole sub-plug for radio MPB 4000
ES 3022	Flange coupling 4-pole EVG
ES 3033	Flange coupling 7-pole EVG
ES 3024	Angled plug 4-pole EVG
ES 3032	Flange plug 7-pole EVG
ES 3040	Closing cap for plug and flange plug EVG
ES 3041	Closing cap for coupling and flange coupling EVG
MP 4028	Housing for manual programming device MPB 4000 without foil keyboard
ESP 020	Plate for manual programming device
MP 4019	Foil keyboard for manual programming device
MP 4470	1.5 V battery for manual programming device
A 49000	Storage battery protective box 1 storage battery
EE 0006	Caster 100% rubber 260 mm
EE 0003	Covering cap for caster
EE 0012	Mounting tube galvanised for MPB 4000
EE 0005	Wingscrew M 10 x 30
EE 0009	Hinged plug for storage battery case
A 46500	Switch-over electronics for 2 storage batteries
A 46501	Switch-over electronics for 4 storage batteries

Peter Berghaus GmbH

Signalbau – Baustellenabsicherungsprodukte

Peter Berghaus GmbH · Herrenhöhe 6 · 51515 Kürten-Herweg



EG - Konformitätserklärung

Für das folgend bezeichnete Erzeugnis :

Transportable Signalanlage Typ MPB 4000

wird hiermit bestätigt, daß es den Schutzanforderungen entspricht, die in der Richtlinie 89/336/EWG des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit festgelegt sind, außerdem entspricht es den Vorschriften des Gesetzes über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 9. November 1992.

Diese Erklärung gilt für alle Exemplare, die nach den anhängenden Fertigungszeichnungen - die Bestandteil dieser Erklärung sind - hergestellt werden.

Zur Beurteilung des Erzeugnisses hinsichtlich der elektromagnetischen Verträglichkeit wurden folgende einschlägige harmonisierte europäische Normen herangezogen :

1. Fachgrundnorm Störfestigkeit EN 50082-1 ; 1997
2. Fachgrundnorm Störsendung EN 50081-1 ; 1992
3. Signalsicherung nach VDE-0832 und Rilsa.

Kürten

(Ort)

17.3.98

(Datum)

(Unterschrift)



GRAND-DUCHE DE LUXEMBOURG

SERVICE DE L'ENERGIE
DE L'ETAT



SERVICE DE L'ENERGIE DE L'ETAT

Notified body
Organisme notifié - Notifizierte Stelle

Identification Number
No d'identification - Identifikationsnummer :

0499

EC-Type Approval Certificate

Attestation "CE de Type" / EG-Baumusterbescheinigung

according to the
conformément à - gemäß

Electromagnetic compatibility directive

Directive relative à la compatibilité électromagnétique / Richtlinie über die elektromagnetische Verträglichkeit

(89/336/EEC)

Certificate Holder:
Titulaire de l'attestation - Inhaber der Bescheinigung:

Peter BERGHAUS GmbH
Signalbau
Herrenhöhe, 6
D 51515 KUERTEN-HERWEG

Manufacturer:
Constructeur - Hersteller:

Peter BERGHAUS GmbH
Signalbau
Herrenhöhe, 6
D 51515 KUERTEN-HERWEG

Product Designation:
Désign. du produit - Produktbez.:

TRANSMITTER/RECEIVER

Product identification:
*Identification du produit
Produktidentifikation:*

Émetteur/Récepteur - Funkgerät
Wireless data communication FM-D 92
Ver. 1.4, 1200 Baud

This EC-Type Approval Certificate has been granted according to article 10.5 of the 89/336/EEC Directive concerning electromagnetic compatibility and its amendments. No compliance according to other EC Directives on electromagnetic compatibility and their requirements is given. Only the tested sample and the corresponding test report are covered by this EC-Type Approval Certificate, no authorization on product marking by a safety mark is given.

Registered Certificate No: 9741731-03
No du Certificat - Zertifikats Nr.:

Technical Test Report: 97000202
Rapport d'essais - Prüfbericht:

Luxembourg, 10.01.97

Service de l'Énergie de l'État
34, avenue de la Porte-Neuve
B.P. 10
L-2010 LUXEMBOURG
Tel. (Int + 352) 46 97 46-1 Fax (Int + 352) 22 25 07


Jean-Paul HOFFMANN
Directeur

Certificate of Conformity

N° 03001637

Product definition	: Funkbaustein
Trademark	: PB P,Berghaus
Product name (Type)	: FM-D-92
Hardware version	: ---
Serial number	: ---
Software release number	: ---

particulars:

Operating frequency	: 142.100 MHz to 174.500 MHz
Alignment range	: 142.100 MHz to 174.500 MHz
Switching range	: 142.100 MHz to 174.500 MHz
Channel spacing	: 20 kHz
Rated RF output power	: ≤ 100 mW ERP
Temperature range	: -20 to 55 °C
Class of emission	: F3D

This Certificate of Conformity has been granted based on the results of various measurements and tests, performed by m. dudde hochfrequenz - technik on a representative sample of the above mentioned product. The tests have been carried out against the following specifications:

EN 300 220 -1, -3, / V1.3.1 (2000-09)

EN 301 489 -1, -3, / V1.3.1 (2002-08)

Statement: The tested sample fulfils the requirements in the above mentioned specifications. The associated Test report is: 03001637, 03001643 and 03001532.

This Certificate of Conformity has been granted to:

Peter Berghaus GmbH
Herrenhöhe 6
51515 Kürten
Germany
Telephone +49-2207-96770
Telefax +49-2207-967780

m. dudde hochfrequenz - technik



Manfred Dudde

Bergisch Gladbach, 17 07 2003

m. dudde hochfrequenz-technik

DIN EN ISO 9001 zertifiziert - Reg.-Nr.: 0298

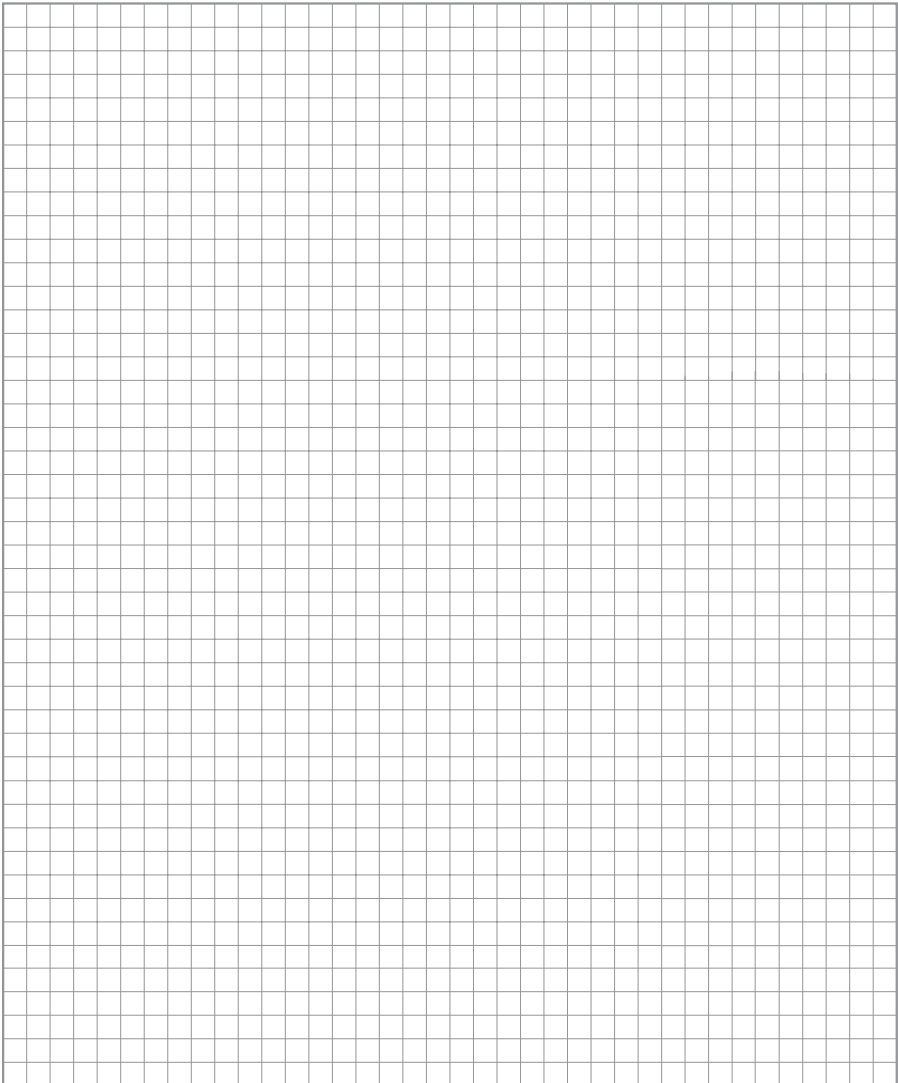
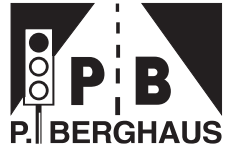
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Rottland 5a · D-51429 Bergisch Gladbach / Germany

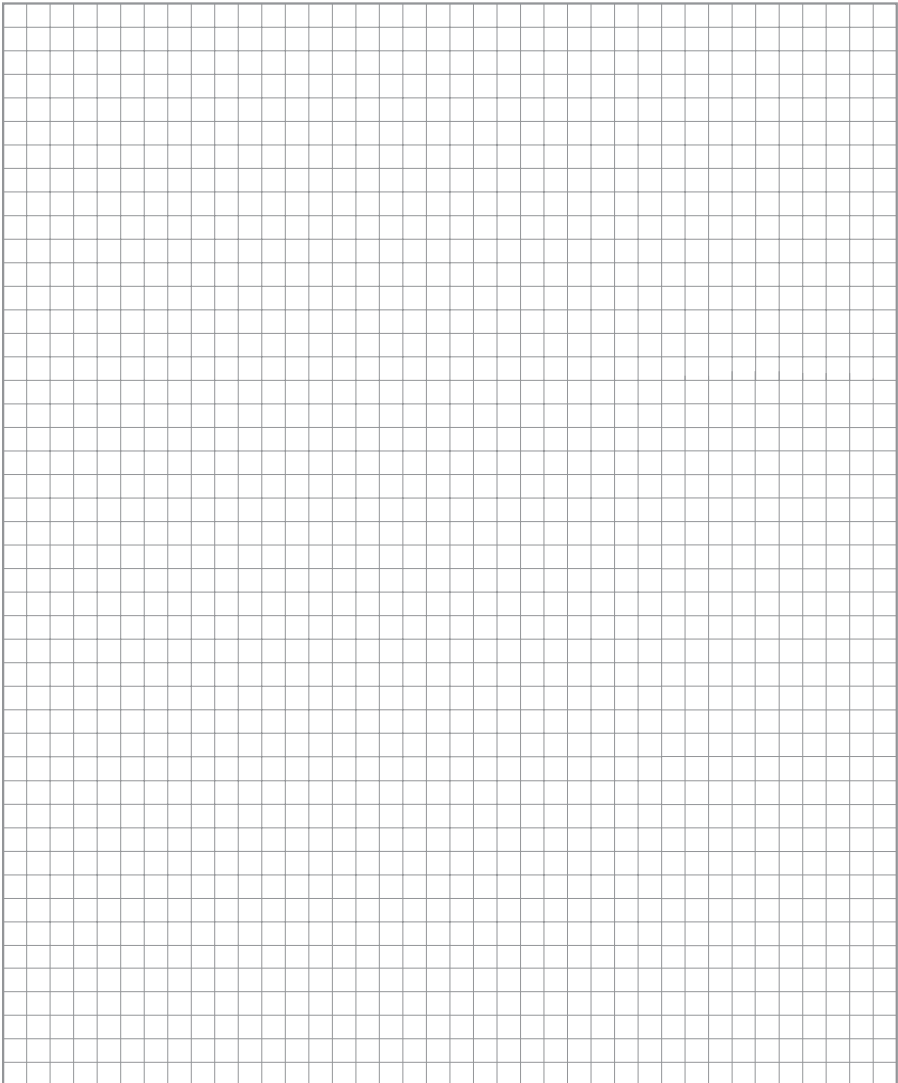
Telefon: +49 22 07- 96 89-0 · Telefax: +49 22 07- 96 89-20

email: manfred.dudde@t-online.de · www.dudde.com

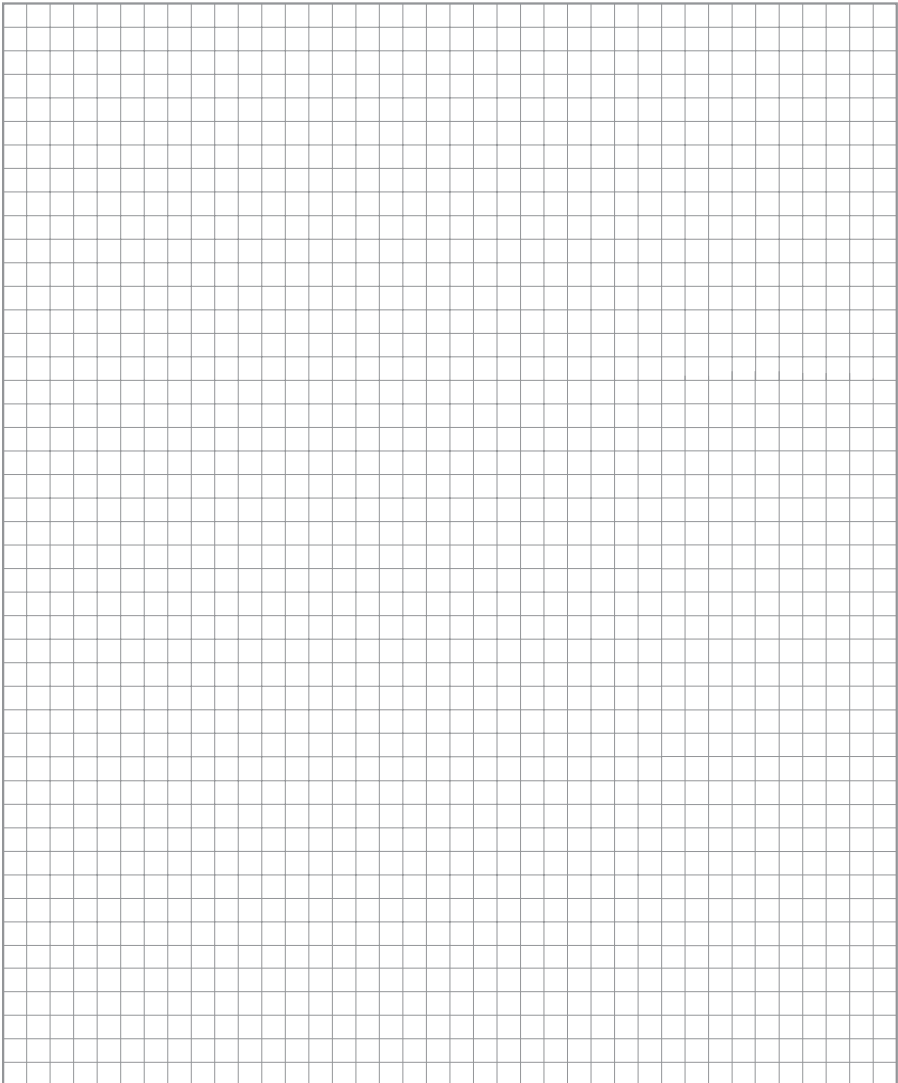
Peter Berghaus GmbH
Verkehrstechnik - Lichtinnovationen



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Verkehrstechnik - Lichtinnovationen



Warranty against defects

For the signalling equipment manufactured in our company

the period of warranty lasts for 24 months.

During this period we are liable for all material and processing errors which are the result of defective manufacturing.

Please send systems or sections of the equipment which need to be replaced post-free or carriage paid to our works. Only those parts with errors in the material or in the finishing will be replaced. There can be no demand for cancellation of sale or for lowering the purchase price unless the damage can not be repaired by us.

The occasion and time required for repairs under the warranty are to be given after a prior agreement has been made. The warranty expires if modifications or repair work are carried out by the customer or a third party without prior permission. Normal wear or damage which are the result of negligent or improper handling are not included under the warranty.



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06/2004