

# Operating Instructions



## Construction Site Traffic Signal System MPB 4400



# General explanation of building site signalling equipment

## Signal safety

The German regulations of VDE, TL-LSA 97 and RiLSA describe among others the use of portable construction site traffic signal systems.

The above regulations stipulate that no signal safety feature as per RiLSA and VDE 0832 is necessary e.g. for construction sites with alternating one-way traffic control and a clearance speed of up to 30 km/h, insofar as the corresponding authorities have not imposed any stricter conditions or requirements.

All other construction site traffic signal systems used for controlling traffic at T-junctions, crossroads or pedestrian crossings must be equipped with a signal safety feature as per RiLSA and VDE 0832, and fulfil TL-LSA 97.

This safety feature requires a feedback message which can be transmitted by radio or cable. Radio-controlled traffic signals use top-quality radio modules which have been given an approval number by the German Federal Network Agency for electricity, gas, telecommunications, postal and railway markets (formerly RegTP).

Peter Berghaus GmbH produces and supplies construction site traffic signal systems with and without signal safety feature.

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# I. Introduction

The MPB 4400 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 AA) 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 4400\*\***  
One Way Traffic

Chapter II Number 1 + 2

**\* M P B 4400 VA\***  
One Way Traffic

Chapter II Number 3 + 4

**\*\*M P B 4400\*\***  
Cross-roads

Chapter II Number 5 + 6

**\* M P B 4400 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 4400\*\***  
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 53 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 53 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 Nighttime Mode, Day Programmes, Interval matrix, Forced Circulation and Data Transmission via PC

**\*\*M P B 4400\*\***  
**One Way Traffic**

**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 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 53 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 53 of this manual.

### 3. Input for One-Way Alternating-Direction Traffic

With traffic-flow dependency but without special options

**\*\*M P B 4400 VA\*\***  
**One Way Traffic**

**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 53 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 53 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 Nighttime Mode, Day Programme, Interval matrix, Forced Circulation and Data Transmission via PC

**\*\*M P B 4400 VA\*\***  
**One Way Traffic**

**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 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 53 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:

Control device:

Sending to light  
Datablock: 159 /

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

Transmission  
>> OK <<

Transmission  
>> OK <<

1 light correct  
programmed

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 53 of this manual.

## 5. Input for Junction-Merging and Intersection Traffic

Without traffic-flow dependency and without special options

**\*\*M P B 4400\*\***  
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 53 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**

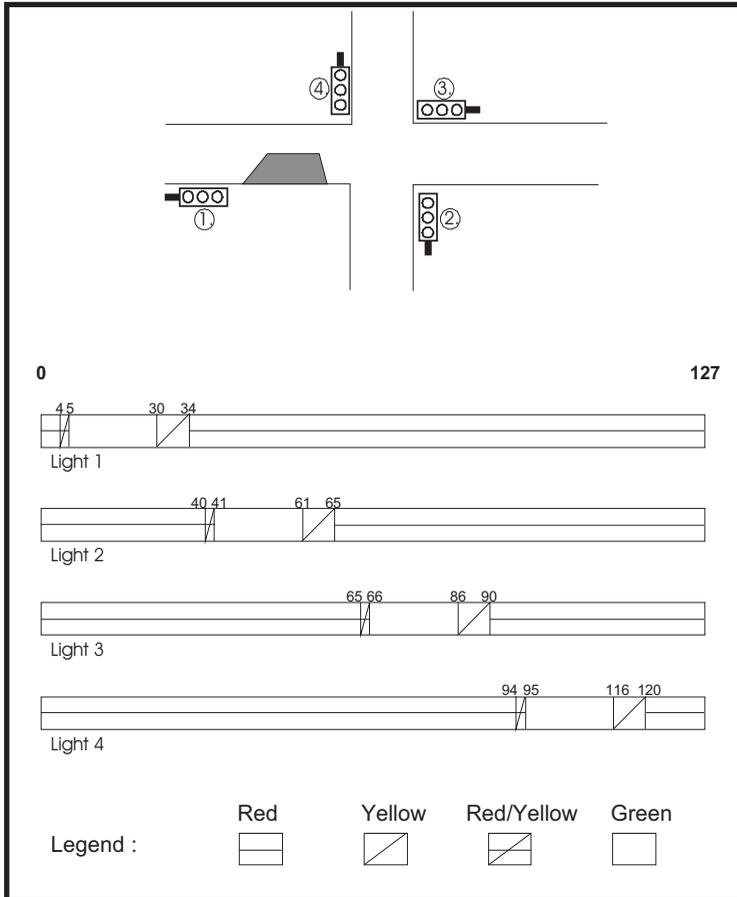
Select with the keys #1 and #3 the desired operating mode, for example "Cable" for cable operation.

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 53 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 4400\*\***  
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 53 of this manual.

## 7. Input for Junction-Merging and Intersection Traffic

With traffic-flow dependency but without special options

\* M P B 4400 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 53 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 53 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 4400 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 53 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.

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.

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 53 of this manual.

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

With the new software version of our **MPB 4400** 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.

## **10. Reading out data with the handbox while the traffic light is operating**

The current software version in the handbox and in the light system MPB 4400 now gives you the possibility of reading out the existing program from traffic light 1 or 1K1 to the handbox. In this way, you can make changes to the current program of the radio or cable traffic signal, or prepare the data for another traffic light system.

To do so, switch the handbox on. Use button 2 to move up in the menu until this appears

Receive data  
from light >3<

Now please go to light 1 or 1K1 and place the handbox in the control unit. Press button 3 to read the traffic light data from on-going operation and save these in the handbox. Now you can edit the data as explained above and send the possibly changed data back to the traffic signal, or use them to program another traffic light.

### 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: <b>yes</b> 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: <b>yes</b> 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 53 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 pedestrian request buttons. 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

#### Change in the handbox:

First switch the handbox off. Then press and hold button 1 and switch the handbox on (press "On" briefly).

Release button 1 after approx. 10 seconds. Use buttons 1 and 3 to increase and decrease the value marked with "> <". Use button 4 to move on to adjust the next value. If you press button 4 again after adjusting the value for seconds, this resets the internal clock to the previously adjusted values.

Note: it is important for the clock to be adjusted correctly if the data of a traffic signal are to be printed out or if the daytime programs or night-time operation are activated. This ensures that the reports are produced with the correct date and right time. The daytime programs and night-time operation are thus also switched on automatically at the right time.

#### Change in the signal system:

Please first adjust the current time in the handbox as described above. To update this time now in the traffic signal without reprogramming – e.g. when changing over from summer time to winter time – switch the handbox on and use button 2 to select the following menu point:

Light clock 1  
(1H1) set >3<

Now place the handbox in light 1 or 1K1. Press button 3 to transfer just the date and time from the handbox to the control unit. All other program settings in the light remain unchanged.

Press button 2 repeatedly to switch the handbox off.

#### 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< !

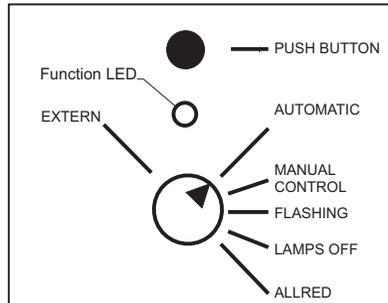
If the manual device is plugged into a flashing installation and then switched on, as though one wished to operate the installation manually, and the above message appears, then the installation had an error (for example, green-green violation).

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.

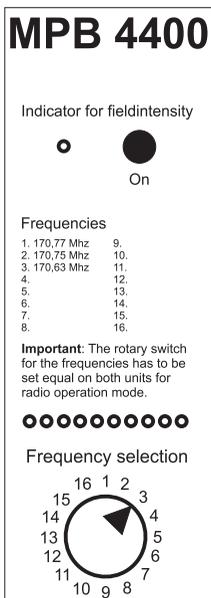
## Common comments

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.

## 7. Multi-frequency technology with field strength display (optional)



As an option, the MPB 4400 can be equipped with the very latest multi-frequency technology. In addition to the internally fitted special radio module, the frequency selection switch and detailed field strength display are integrated in the front panel. Altogether 10 coloured LEDs clearly show the reception field strength of the other traffic light. However, this depends on all control units being set to the same frequency (1 to 16). The quality of the radio connection is clearly indicated from red (inadequate) via yellow (adequate) to green for outstanding transmission. By taking account of the field strength display already before connecting up the other signal heads, this signal display can also be used to select a radio frequency with the lowest possible use in order to obtain a free channel.

The display lighting and field strength display is switched on by pressing the button "Field strength display and LCD lighting".

During on-going operation, this display can also be used to optimize the position of the signal heads, as even the tiniest shift in position of often just a few centimetres can clearly improve or naturally also deteriorate the reception. With the detailed field strength display, you can now find the best position for using the signal heads in radio operation – so say goodbye to the dead spots!

Thanks to the multi-frequency feature, consisting of the special radio module, frequency selection switch and field strength display, in Germany it is possible to choose between four frequencies currently licensed in the 2m band for use by radio traffic lights. This choice can be extended to up to 16 frequencies for exports.

This means naturally that we can supply other frequencies or frequency ranges (e.g. 70 cm UHF) with many different transmitter output ratings for use outside Germany.

# 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

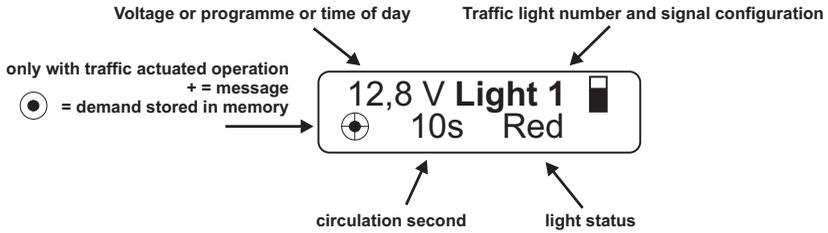
After this automatically-appearing message, the display should show the following:

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 60.

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 AA) 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 4400\*\*  
One Way Traffic

\* M P B 4400 VA\*  
One Way Traffic

\*\*M P B 4400\*\*  
Cross-roads

\* M P B 4400 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 53).

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 4400

- 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
- Upgrading for SMS radio monitoring
- Multi-frequency technology with field strength display

# IX. Technical Data

Operating voltage: approx. 9 - 14 V DC

Power consumption for radio operation (mean per signal head):  
approx. 1.25 A (halogen)  
approx. 0.42 A (LED)

Light sources: 12 V / 10 W halogen lamps – or optimised power-saving LED modules on request

Fuses: 4 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 equipment: Radio module, tested, in 1/3/16 channel version  
Licensed 2m band frequencies for Germany:  
151.09 MHz, 170.63 MHz, 170.75 MHz and 170.77 MHz  
Transmitter outgoing power level:  $\leq 100$  mW

Other frequency ranges and frequencies are possible together with e.g. higher transmitter output ratings according to the national regulations in the customer's country.

# X. Radar detector (option)

## **Description of functions: radar movement detector**

The movement detector mounted on this traffic light system MPB 4400 ("VA" for vehicle-actuated option) is a directional radar detector specially optimised for use in mobile signal systems.

The pivoting fixture on top of the traffic light signal head lets the radar detector be aligned ideally to the approaching traffic. A clearly visible red LED in the front of the radar detector shows the road user that his vehicle has been detected.

Movements are detected according to the Doppler principle. The sensor emits microwaves in the range of 24 GHz. These are reflected by objects moving towards the sensor, so that their frequency is changed. The sensor receives the changed frequencies with its planar microwave antenna and evaluates them accordingly. Approaching movements within the detection field are registered, evaluated reliably by the internal logic and forwarded to the traffic light controller.

Compared to conventional infrared detectors, one major advantage of these radar movement detectors specially optimised for mobile traffic light systems is that they are capable of distinguishing between an object coming towards or moving away from the radar detector. For example, only directional radar detectors are capable of implementing a reliable continuous red phase or green on request, when the approaching vehicle requests his own "green" from the traffic light.

Simple infrared movement detectors would also register traffic moving away from the traffic light – resulting in incorrect requests. Continuous red phases or green on request cannot be implemented with infrared detectors. In addition as a rule the detection range of a radar detector is not impaired by snow or rain.

## **Applications:**

Mobile traffic light systems; reliable detection for traffic technology

**Special features:**

- Radar detection, insensitive to snow or rain
- Precise directional logic optimised to approaching vehicles
- Clear LED display on the detector shows when a vehicle has been detected
- Swivelling metal fixture for alignment exactly to the traffic flow
- Radar detector hinged for protection during transport
- Compact, weatherproof plastic housing

**Technical data: radar detector**

- Housing dimensions (W x H x D): 135x65x130 mm
- Material: ASA, PC plastic housing; steel holder
- Protection: IP65 for use outside
- Supply voltage: 12-27 VAC, 50-60 Hz; 12-30 VDC
- Power consumption: typical 1 W, max. 2.4 W
- Tolerable operating temperature: -20°C to +55°C
- Storage temperature: -30°C to +75°C
- Humidity: <95%, non-condensing
- Frequency: 24.125 GHz
- Transmission output: typical 40 mW EIRP; max. 100 mW EIRP
- Maximum mounting height: 7 m

# Spare Part List



Article: Traffic light type MPB 4400

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 2025	Signal head rear part, Model Holland, 210 mm, 1-part (red chamber)
EH 2010	Signal head rear part, Model Holland, 210 mm, 1-part (yellow-/green chamber)
EH 2011	Control unit housing Model Holland, 210 mm
EH 2012	Lock for control unit door Model Holland
EH 2008 A	Lock counterpart for control chamber
ES 2641	Key No. 641 for control unit housing Model Holland
EH 2009	Closer for signal head door
EH 2008	Closer counter part for signal head chamber
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 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
EI 0023	Reflector, halogen, 200 mm
EH 2100	LED traffic-light module RED for MPB 4400 as replacement
EH 2110	LED traffic-light module YELLOW for MPB 4400 as replacement
EH 2120	LED traffic-light module GREEN for MPB 4400 as replacement
EI 0041 M	Battery clamp shoe (+), red
EI 0042 M	Battery clamp shoe (-), blue

EK 0001	Battery cable for MPB 4400 without battery clamp shoe, with ring lugs
MP 4026	Front plate MPB 4400 compl. with 19 inch insert and plug bar, as well as On / Off switch and fuse element
MP 4045	Front plate MPB 4400 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 019	Control unit plate for MPB 4400
ESP 021 B	PCB for LCD display, illuminated
EF 4100	Multi-frequency radio module type SR-150A
EF 4150	Single frequency radio module type SR-150A
EP 6037	Mounting bracket for radar detector
EE 0031	Mounting bracket for radio antenna and radar detector
MP 40001V	Mounting bracket for radar detector and radio antenna type V
EFV 010	Antenna radiator type V, frequency 170.xx MHz
EFV 011	Antenna radiator type V, frequency 151.09 MHz
EFV 018	Spare tip protection for antenna radiator type V
EFV 012	Antenna set type V, complete, with antenna foot, gasket, lock washer, nut, connection cable, BNC adapter and antenna radiator (please state frequency)
EFV 019	Aluminium retaining tube for holding antenna radiator type V during transport
EFK 014	Clips for fastening antenna radiator during transport
EFV 008	Antenna foot, type V, incl. clear gasket and attachment set: lock washer and nut
EFV 005 A	Spare attachment set for antenna foot type V, only lock washer and nut
EFV 007	Antenna cable for radio antenna type V, but without BNC adapter
EFK 006	Antenna plug BNC (adapter)
ES 3022	Flange coupling 4-pole EVG
ES 3024	Angled plug 4-pole EVG
ES 3033	Flange coupling 7-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 4019 A	Housing for manual programming device MPB 4400 without foil keyboard
ESP 020	Plate for manual programming device
MP 4019	Foil keyboard for manual programming device
G 4591	Batterien 9 V für Handbox MPB
A 49600	Battery casing made of aluminium for 2 batteries
A 49610	Battery casing made of aluminium for 4 batteries
EE 0006	Caster 100% rubber 260 mm
EE 0003	Covering cap for caster
EE 0012	Mounting tube made of aluminium for MPB (apart from MPB 1400)
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

Verkehrstechnik • mobile Schutzwände



Peter Berghaus GmbH · Herrenhöhe 6 · 51515 Kürten-Herweg

Herrenhöhe 6 · 51515 Kürten-Herweg  
Tel. 0 22 07 / 96 77-0 · Fax 96 77-80  
mail@berghaus-verkehrstechnik.de  
www.berghaus-verkehrstechnik.de

## EG – Konformitätserklärung



Fachbetrieb und Mitglied im  
Verband für Verkehrstechnik  
und Verkehrsicherung e.V.

Für das folgende Erzeugnis:

### Transportable Signalanlage Typ MPB 4400

wird hiermit bestätigt, daß es den Schutzanforderungen entspricht, die in der Richtlinie 89/336/EWG des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten 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 61000-6-1 für Wohnbereiche, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe
2. Elektromagnetische Verträglichkeit (EMV Teil 6-3), Fachgrundnorm Störsendung EN 61000-6-3 für Wohnbereiche, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe
3. Signalsicherung nach VDE 0832 und RiLSA
4. Funkgeräte: ETSI EN 300 220-1, -2 / V.2.1.1. (2006-04)  
ETSI EN 301 489-1, -3 / V.1.4.1. (2002-08)

Kürten  
(Ort)

25.03.2011  
(Datum)

  
**Peter Berghaus GmbH**  
Verkehrstechnik • mobile Schutzwände  
Herrenhöhe 6 · 51515 Kürten  
Tel. 0 22 07 / 96 77-0 · Fax 96 77 80

## **Warranty for defects**

We offer a

**24 month guarantee**

for the signal systems produced by our company.

The guarantee covers all material and workmanship faults caused by faulty manufacture during this period of time.

Please send systems and parts of systems for replacement to our factory, postage/freight prepaid. We only replace parts showing faults in the material or workmanship. There are no claims to rescission or abatement, unless we are not able to rectify the damage.

No further claims can be fulfilled, in particular claims for damages as a consequence of defects.

The necessary time and opportunity to proceed with guarantee repairs must be made available following previous agreement. The guarantee becomes null and void if the customer or third parties make changes or repairs without prior consent. The guarantee does not cover any wear or damage caused by negligent or incorrect handling.

If in exceptional cases at the customer's request warranty repairs are to be carried out on site, i.e. at the road works where the system causing the complaint has been installed, the service technician's travel expenses and journey times are not covered by the warranty and shall be invoiced separately to the client.

The place of jurisdiction for all claims arising from the business relationship is Bergisch Gladbach, Germany.

## **General transport instructions for mobile traffic signal systems**

Please note!

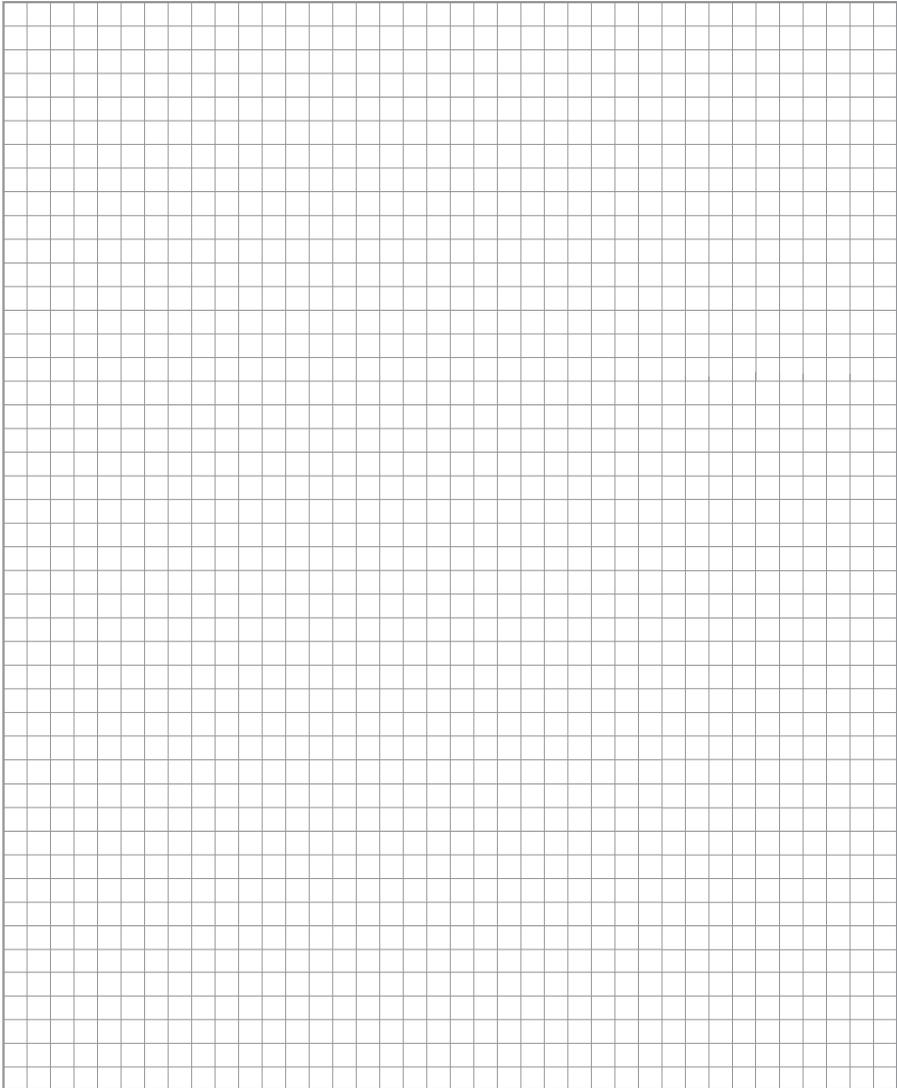
Our construction site traffic signal systems must always be transported standing upright on open vehicles with the lens hood pointing in the opposite direction.

To prevent any water damage, all signal head chambers and the controller housing must always be closed properly and the controller housing should also be locked!

Failure to comply with these instructions automatically renders the warranty null and void!

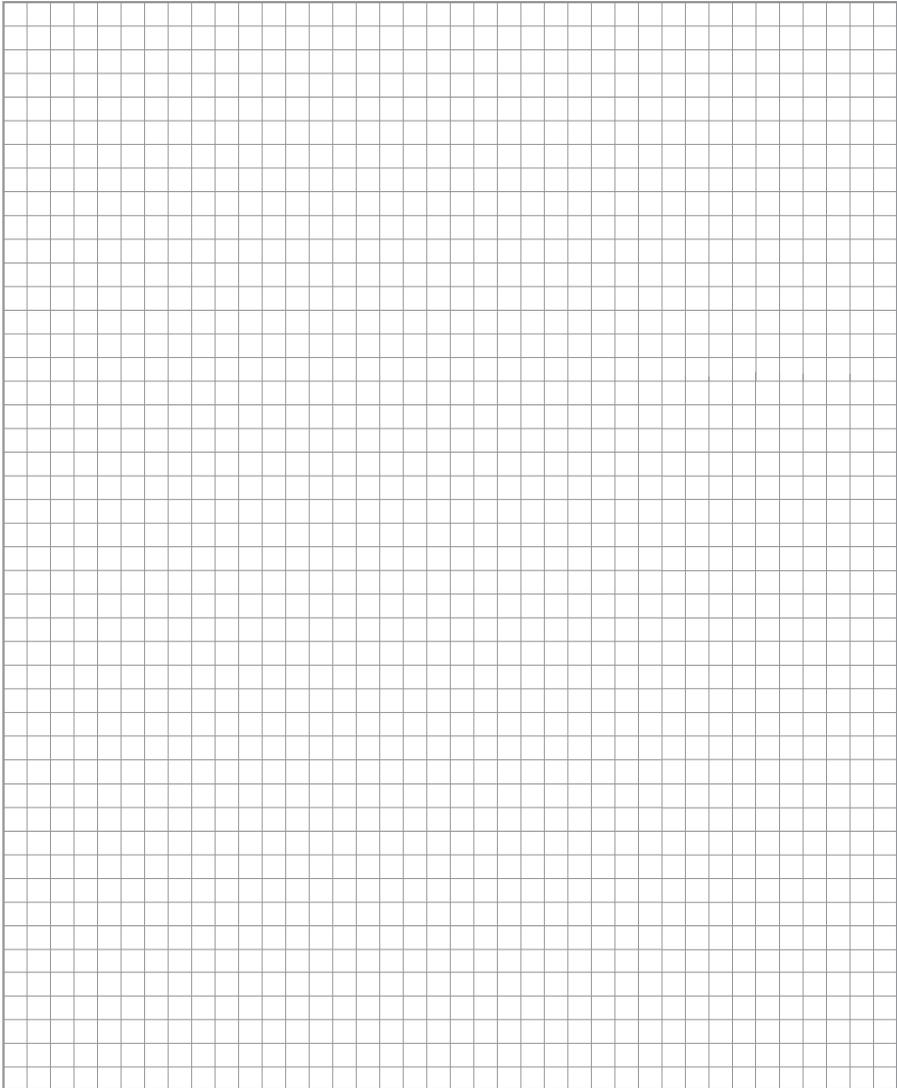
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Traffic Technology • Mobile Crash Barriers



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## **Peter Berghaus GmbH**

Herrenhöhe 6 · 51515 Kürten  
Telefon +49 (0)2207 9677-0  
[berghaus-verkehrstechnik.de](http://berghaus-verkehrstechnik.de)