BERGHAUS
Verkehrstechnik

Operating Instructions

CE

Construction Site Traffic Signal System MPB 3200

GB

General explanation for construction site traffic signal systems

SIGNAL SAFETY FEATURE

The 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 short-term construction sites (up to four weeks) which are clearly organised (clearance distance up to 50 m) 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 signal safety feature requires a feedback message which can be transmitted by radio or cable. Radio-controlled traffic signal systems are equipped with top quality radio modules tested and certified to CE.
Under ideal conditions, the radio signals have a range of up to 2000 m.

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

Caution, important information:

Please note that permission is required to use radio traffic signal systems in most countries, so please consult your national regulations.

Table for adjusting the interim times (clearance times)

Interim times tz [s] (as per RiLSA)

Clearance distance [m]	Clearance speed Vr [km/h]			
	18	30	40	50
50	14	10	9	8
100	24	16	13	12
150	34	22	18	15
200	44	28	22	19
250	54	34	27	22
300	64	40	31	26
350		46	36	30
400		52	40	33
450		58	45	37
500		64	49	40
550			54	44
600			58	48

I. Introduction

MPB 3200 is the special signal system for vehicle-actuated alternating one-way traffic control (on-coming traffic system). The vehicle-actuated version is equipped with directional radar detectors as a standard feature.

The system can be supplied as radio, cable and quartz system.

MPB 3200 offers all monitoring features as per VDE and RiLSA:

- Red monitoring
- Green/green interlocking
- Status monitoring
- Interim time monitoring
- Watchdog monitoring (computer monitoring)

The following modes are possible with MPB 3200:

- Automatic fixed time mode
- Automatic green phase extension
- Automatic green on request (basic setting: all-red)
- All-red for radio and cable operation
- Manual mode from any signal head side for radio or cable operation
- Manual mode (continuous green) for quartz operation
- Manual mode (continuous red) for quartz operation
- Lights off
- Flashing

MPB 3200 is equipped with the following standard features:

- Overvoltage protection up to 28 V DC
- Automatic photocell (nighttime reduction)
- Commercially available halogen lights 12 V/10 W
- Reverse polarity protection and undervoltage protection
- Directional radar detectors (in the VA version)

Possible additional equipment for MPB 3200:

- LED signal module for red/yellow/green or red/green
- Equipped as 42 V traffic signal system (just one cable for voltage supply and data transfer between signal heads)
- External cable hand-held control
- External radio hand-held control
- Bus request (local public transport)
- SMS message

II. MPB 3200 front panel - overview

BERGHAUS Verkehrstechnik

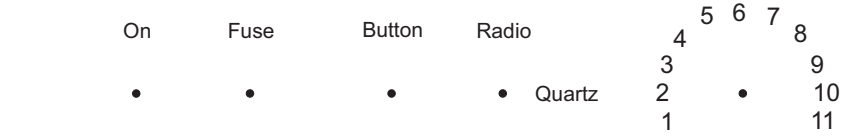
MPB 3200

Mobile traffic-light system

Synchronisation in quartz mode
1. Select mode 3, signal heads flash
2. Press the button to start the program.
3. At the second traffic light, press the button at exactly the moment when the first traffic light changes from green to yellow.

Time change for radio/cable mode during operation
1. Adjust the required times for transmitter (T) and receiver (R)
2. Press and hold the button for transmitter (T) or receiver (R) for min. 5 seconds and follow the display

Operating modes
1. Continuous green for quartz
2. Continuous red for quartz
3. Automatic for quartz
4. Lamps off
5. Flashing
6. Automatic: fixed time mode
7. Automatic: green time extended mode
8. Automatic: green on demand mode
9. All-red for radio/cable
10. Green transmitter for radio/cable
11. Green receiver for radio/cable

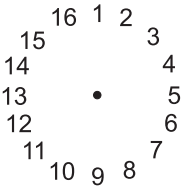


Button functions:
- Synchronise in quartz mode
- Time change in radio/cable mode
- Reset for fault

Operating modes

CAUTION:
Frequency selection switch is to be adjusted to the same setting in radio mode for both controllers.

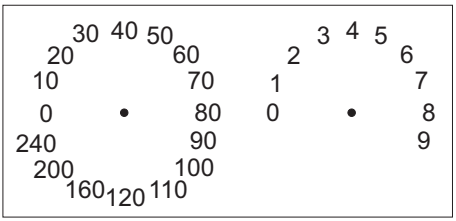
Adjusted as:
Receiver (R)
Transmitter (T)



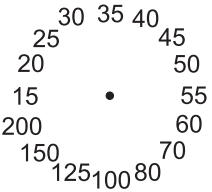
Frequency choice

CAUTION:
- In quartz mode, the clearance times and the green times must be adjusted to the same setting in both controllers.
- For radio or cable, the clearance times and the green times must be adjusted only in off state during initial commissioning of transmitter (T) and receiver (R).

Light/Display
Press repeatedly to access status information



Clearance time in seconds



Green time in seconds
Depending on setting for transmitter or receiver

When adjusted as:
Transmitter = R → T
Receiver = T → R

Film No. 167

Factory No.

III. Operating instructions for radio, cable and quartz-controlled construction site traffic signal system Type MPB 3200

Alternating one-way traffic at construction sites between 50 and more than 1000 m long can be controlled with the vehicle-actuated traffic signal system type MPB 3200.

Please proceed as follows to commission the system:

1. Open the bottom chamber with green lens in both signal heads. This is where the controllers are installed with the control elements and information display. Set the rocker switch to "System off" for both signal heads. All signal heads are 100% identical, so that you can choose for yourself which signal head works as transmitter or receiver (with active feedback). To do so, select one signal head as Transmitter (T) and adjust this accordingly at the second knob from the top. Then adjust the second signal head as Receiver (R).

2. Provide both signal heads with operating voltage 12 V DC by connecting batteries or power supply units type N1. Ensure that you do not confuse the polarity (red is plus).

3. Select the required transmission type with the "Radio/Quartz/Cable" function switch in the same setting for both controllers.

4. At both controllers, i.e. at the transmitter and receiver signal head, use the knobs to adjust the "clearance time in seconds", e.g. using the interim times table (page 4 of these instructions) or according to the phase plan for the particular construction site.

5. **Important note:**
   The set clearance time for the transmitter controller (R -> T) starts to run after the end of the green phase in the receiver controller, and the set clearance time for the receiver controller (T -> R) starts to run after the end of the green phase for the transmitter controller.

Adjusting the green phases for the transmitter and receiver in **radio, cable or quartz mode:**

5.a. Automatic fixed time mode or automatic for quartz
   Adjust the required green phase with the "Green phase in seconds" knob on the transmitter and receiver controller.

Adjusting the green phases for the transmitter and receiver for the following operating modes in **radio or cable mode:**

5.b. Automatic green phase extension and automatic request mode

Adjust the required **maximum green phase** with the **"Green phase in seconds"** knob on the transmitter and receiver controller.

Explanation for vehicle-actuated radio or cable mode for automatic green phase extension and automatic request mode:

a. *Minimum green phase*

*This is the phase which always runs even if there is no traffic. I**t has been adjusted permanently in the factory to 10 seconds.** In the automatic request mode, the system remains in the all-red basic setting if there are no vehicles present.*

b. *Time gap (extension time)*

*The time gap (extension time) is used to extend the green phase after the end of the internally fixed setting for the minimum green phase. Depending on the volume of traffic, the green phase can be extended up to the maximum green phase setting. If no more vehicles are registered between the minimum and maximum green phase (within 6 seconds), the current green phase is ended. **The time gap has been adjusted permanently in the factory to 6 seconds.***

6. Use the "Mode" knob to adjust the required mode for both controllers.

7. Set the rocker switch to **"System on"** for both signal heads.

Both signal heads now briefly show the signal pattern "yellow flashing". They then switch automatically to the switch-on program in the adjusted mode.

Note:

The clearance times and green phases for the transmitter and receiver can also be adjusted while the system is operating! However, changes to the clearance times and green phases for the transmitter or receiver which have been adjusted in the radio or cable mode are only adopted after pressing the button above the information display on one signal head for five seconds (the information display shows a time progress bar).

Changes in quartz mode have to be made to each signal head. To this end, please switch the traffic signal off first, and then resynchronise it again after making the changes.

Resynchronising in quartz mode

In quartz mode, check the synchronisation of the traffic signal every day and resynchronise if necessary (see IV, point 1.).

Aligning the radar detectors in vehicle-actuated mode

Always align the directional radar detector so that oncoming traffic is registered correctly, because otherwise troublefree vehicle-activated operation of the traffic signal cannot be warranted.
Correct alignment can be checked by using the red LED on the front of the radar detectors on the one hand, and the illuminated LCD information display on the front panels of every controller (display shows (+) during evaluation) on the other hand.

Changing the batteries

For quartz mode: when changing the batteries, synchronisation is retained for up to 15 minutes by an internal buffer battery; the signal head and the information display switch off. After the new battery has been connected, the system automatically switches back to the program.

For cable or radio mode: when changing the batteries, the signal heads and information display switch off, the other side automatically changes to red for one minute. After changing the battery, the signal head automatically changes to all-red according to the switch-on pattern, then the system starts normal operation again.

IV. Modes of MPB 3200

1. **Automatic for quartz**
   Switch the mode switch **for both controllers** to setting 3-Automatic for quartz. The times have already been adjusted as described above. The signal heads still flash. You can now synchronise the traffic signal. To do so, press the button on the first signal head and the program starts to run. At the second signal head, press the button exactly when the first signal head changes from green to yellow. In this mode, the previously adjusted green phases run according to the fixed setting, regardless of the volume of traffic. The traffic signal automatically performs the clearance time on the basis of the previously adjusted clearance times for transmitter and receiver.

   Factory time settings: red/yellow phase: 1 second
   yellow phase: 4 seconds
   (in the German MPB 3200 version, otherwise according to the corresponding national regulations)

2. Continuous green/continuous red for quartz (manual operation for quartz)

The manual operation settings are adjusted at the corresponding signal head.

Now set the mode switch for the corresponding controller to setting 1-Continuous green for quartz. The signal head now switches from the automatic program to continuous green and remains in this signal pattern until another mode is selected. Please note that the other signal head should already have been set to continuous red for quartz mode setting 2.

Manual operation is now possible by switching between the modes 1-Continuous green and 2-Continuous red; it is also possible to block the traffic flow completely by remaining in the setting 2-Continuous red.

3. Lamps off

Set the mode switch to setting 4-Lamps off at both controllers for quartz mode and at one controller for radio or cable mode. The lamps are switched off, the controller continues to run. In radio or cable mode, at the end of this current cycle the traffic signal switches to Lamps off with the switch-off pattern. To return to automatic mode, simply set the mode switch back to the required automatic setting. After a few seconds, the traffic signal switches back to the required program.

4. Flashing

Set the mode switch to setting 5-Flashing at both controllers for quartz mode and at one controller for radio or cable mode. The system switches to yellow flashing, the controller continues to run. In radio or cable mode, the traffic signal only switches to flashing at the end of this current cycle. To return to automatic mode, simply set the mode switch back to the required automatic setting. After a few seconds, the traffic signal switches back to the required program.

5. Automatic fixed time mode

Set the mode switch to setting 6-Automatic fixed time mode at the controller selected as transmitter. This mode operates with the previously adjusted green phases, regardless of the volume of traffic. In this mode, the previously adjusted green phases run according to the fixed setting regardless of the volume of traffic. The traffic signal automatically performs the clearance time on the basis of the previously adjusted clearance times for transmitter and receiver.

Factory time settings: red/yellow phase: 1 second
yellow phase: 4 seconds
(in the German MPB 3200 version, otherwise according to the corresponding national regulations)

6. Automatic green phase extension

Set the mode switch to setting 7-Automatic green phase extension at the controller selected as transmitter. In this mode, the previously adjusted green phases run as maximum green phase, depending on the volume of traffic. The minimum green phase permanently adjusted in the factory is 10 seconds.

This minimum green phase always runs, regardless of vehicle traffic. The directional radar detectors register all oncoming vehicles and thus adjust the minimum green phase automatically to the volume of traffic, extending it up to the maximum green phase if necessary. The extension time for each radar detection, the so-called time gap, has been adjusted to 6 seconds in the factory.

7. Automatic green on demand mode

Set the mode switch to setting 8-Automatic green on demand mode at the controller selected as transmitter. In this mode, the previously adjusted green phases run as maximum green phase, depending on the volume of traffic. The minimum green phase permanently adjusted in the factory is 10 seconds.

This minimum green phase always runs, regardless of vehicle traffic, but it can be extended up to the maximum green phase, depending on the volume of traffic. The extension time for each radar detection, the so-called time gap, has been adjusted to 6 seconds in the factory. In contrast to setting 7-Automatic green phase extension, in mode 8 the system remains set to continuous red until a vehicle is registered by a radar detector. The signal head which has registered a vehicle now changes to green after the clearance time has expired. When there is an increase in the volume of traffic, the green phase is extended as described above. At the latest after the end of the maximum green phase, the signal head switches back to red and the traffic signal remains set to continuous red until the next vehicle is registered.

Note: in this mode with all-red basic setting, a compulsory cycle with a trigger time of 5 min has been permanently adjusted in the factory (can be changed on the PCB using the DIP switches). That means that the traffic signal still changes to green at least every 5 minutes, if the radar detectors are incorrectly adjusted or defect. This prevents traffic coming to a complete standstill.

Factory time settings:	red/yellow phase:	1 Sekunde
	yellow phase:	4 Sekunden

(in the German MPB 3200 version, otherwise according to the corresponding national regulations)

min. green phase:	10 Sekunden
time gap:	6 Sekunden

The settings described below for **manual mode in radio or cable mode** (switch settings 9, 10 and 11) are only adjusted at one signal head.

8. **All-red for radio/cable**
   Now set the mode switch at one controller to setting 9-All red for radio/cable. The traffic signal now switches from the automatic program to continuous red. The traffic signal remains in this signal pattern until it is set to another mode.

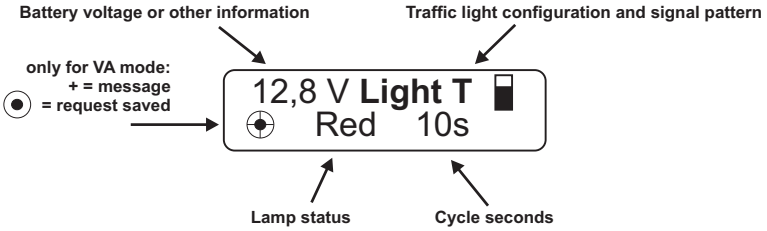
9. **Green transmitter for radio/cable**
   Set the mode switch at one controller to setting 10-Green transmitter for radio/cable. The traffic signal now switches from the automatic program (while observing the clearance times) to continuous green at the transmitter signal head. The traffic signal remains in this signal pattern until another mode is selected.

10. **Green receiver for radio/cable**
    Set the mode switch at one controller to setting 11-Green receiver for radio/cable. The traffic signal now switches from the automatic program (while observing the clearance times) to continuous green at the receiver signal head. The traffic signal remains in this signal pattern until another mode is selected.

Important note:
Modes 6-Automatic fixed time mode, 7-Automatic green phase extension and 8-Automatic request mode can only be selected from the controller which has been defined as transmitter. But for better clarity, they should be adjusted to the same setting in both controllers in normal mode.

The modes 4-Lamps off, 5-Flashing and 9-All red for radio/cable, 10-Green transmitter for radio/cable and 11-Green receiver for radio/cable can be adjusted at any signal head.

V. Explaining the information in the display



1. General information

When the system is switched on, it proceeds with an internal self-check and announces itself as Peter Berghaus Traffic Signal System MPB 3200; the software status is displayed. Then the current operating voltage is shown in plain text. The display lighting is now switched on for 10 minutes. During on-going operation, you can also switch the display lighting on for 10 minutes by pressing the "Light / Display" button to the right of the display; press this button several times to see the status information.

2. Information during on-going operation

After adjusting the mode, first the status of the connection is shown, followed by the selected mode as abbreviation, e.g. "AUTO", alternating with the operating voltage. Similarly, the display states whether the user has selected this signal head as transmitter "T" or receiver "R".

In radio mode, after pressing the "Light / Display" button, the display shows among others the reception field strength as a bar diagram. Press the button again to see the function of the "LDR" light sensor respectively brightness as a percentage together with the connection quality "GOOD / act." The status of the signal head is shown in diagrams in the display.

For example, ▮ means red, ▮ yellow and ▮ green. Similarly, this status is also shown in plain text and with a decreasing second time bar. In manual mode for radio or cable, two traffic light symbols are shown for better clarity, so that the operator also sees information about the status of the other side.

3. Function display of the radar detector (only for the "VA active" version)

In vehicle-actuated mode, the display shows the symbol **"+"** or **"(+)"** on the left. The radar detector has registered an oncoming vehicle, triggering a request to the controller which is now processed. The road user can see this when the red LED in the radar detector lights up briefly.

4. Display of defects

- **"Red defect T/R"** -> red bulb defect in transmitter/receiver
- **"Yellow defect T/R"** -> as above but yellow bulb defect
- **"Green defect T/R"** -> as above, but green bulb defect

Both signal heads only flash yellow when the red lamp is defect. Otherwise the display only contains the text information stated above. Now replace the defect bulb in the transmitter (T) or receiver (R) and quit the fault by pressing the button above the display. After the red defect has been remedied, the traffic signal starts up again automatically.

- **"No Rec.Light T/R"** -> transmission fault

Both signal heads flash yellow, the displays show the text information stated above. A fault has occurred in transmitting the data to the transmitter or receiver. In cable mode, please check the connecting cables and the plug-in connections. In radio mode, please first check whether the frequency has been set to the same setting for both signal heads (is only relevant for multi-frequency version). If the setting is correct, please check the antennas and the plug-in connections at the radio modules. After the fault has been remedied, the traffic signal starts up again automatically.

- **"Status green T/R"** -> nom/act. comparison of control command and signal pattern status
- **"E.gr.grp T/R"** -> green blocked (prevents both signal heads from showing green at the same time, this is not allowed)

Both signal heads flash yellow, the displays show the text information stated above. The traffic signal has sent an incorrect signal pattern. Green/green monitoring prevents both signal heads from actually showing green at the same time. Check the equipment visually for any signs of damage to the cases and any moisture. Quit the fault by pressing the button above the display at the displayed controller (T or R). If the fault occurs again, send the traffic signal to the factory to be checked.

VI. Special feature for export (emergency quartz mode)

For the export version, on request an automatic changeover can be activated between radio or cable and quartz mode (emergency quartz mode).

What does emergency quartz mode mean?

When an existing radio or cable transmission breaks down, when the emergency quartz function is activated in both controllers, the system automatically changes over to synchronised emergency quartz mode. And so the system continues to operate without any noticeable interruptions for vehicle traffic.

The following clearance times and green phases are observed:

- The adjusted clearance times are extended by a further 5 seconds at both signal heads (T + R).
- If you have adjusted green phases lasting up to 40 seconds, in the emergency quartz mode these are restricted to a fixed 25 seconds.
- If green phases have been adjusted for longer than 40 seconds, these are fixed internally to 45 seconds.

During the emergency quartz mode, in the background the traffic signal system constantly tries to restore the radio or cable connection, and switches back automatically to the previously adjusted mode when conditions for good transmission have been restored.

Note: *After being turned into the export version, when there is a radio or cable malfunction the traffic signal system then corresponds to type class A "Bottleneck traffic signal system without signal safety feature" (valid only in Germany).*

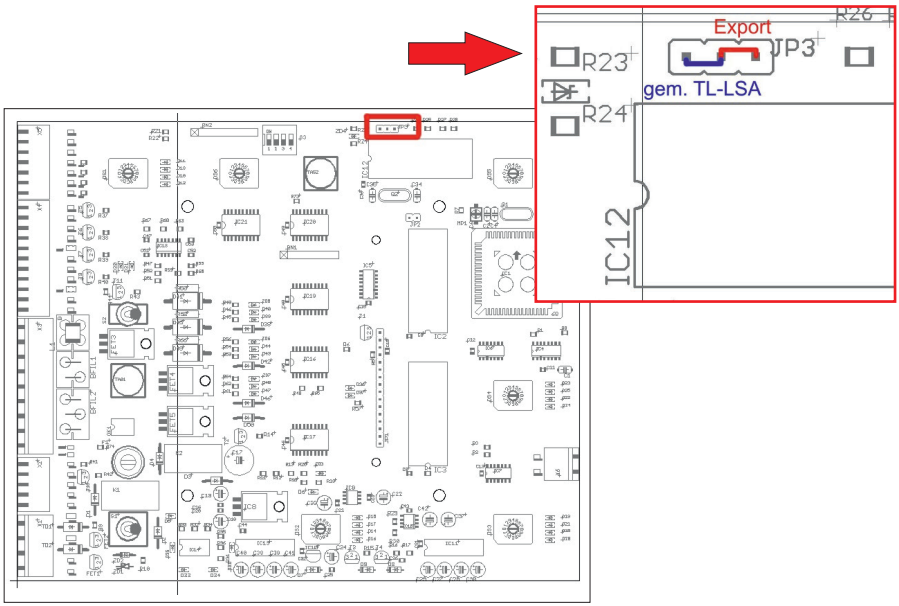
Important note: *If the system is operating in the emergency quartz mode, no data backup takes place on changing the battery. Please start the traffic signal again in the required mode after changing the battery.*

The traffic signal is changed over to the export version as follows:

Remove the front panels from both controllers, as described in chapter IX of these operating instructions.

On the control PCBs of transmitter and receiver, jumper "JP 3" (see marked section below) must be plugged into the other slot. In the factory setting, the jumper connects the left contact with the middle contact: this deactivates the emergency quartz mode (as per TL-LSA).

You can activate the automatic changeover between radio/cable and quartz mode by connecting jumper "JP3" so that it connects the middle contact with the right contact (Export).



Please note that this change has to be made to both control PCBs.

Then put the PCBs back as described in chapter IX. After switching on, the display shows **“Emergency quartz mode enabled”.** This function is permanently activated until jumper "JP3" is put back again.

VII. External cable hand-held control (accessory)

Commissioning and operation

1. Before plugging in the external cable hand-held control which is available separately as an accessory, first adjust the required mode on the hand-held control using the knob. The hand-held control takes priority so that the traffic signal immediately adopts the hand-held control setting as soon as this is plugged in.

Note: *There is no need for <u>any</u> adjustments to the two signal head controllers: the hand-held control is automatically detected as soon as it is plugged in!*

2. Connect the external hand-held control to the socket on the prepared controller. The corresponding socket (accessory) is below the green chamber.

3. The traffic signal now changes over from the automatic program (while observing the green phases) to the mode selected in the hand-held control.

4. The other modes are described in chapter IV of these operating instructions.

5. When the external hand-held control is disconnected from the socket, the traffic signal automatically changes back to the mode originally set in the controller.

6. Close the socket for the external hand-held control again with the fastened covering cap!

VIII. Bus priority – local public transport (accessory)

Description

In some applications, it can be appropriate for the bottleneck traffic control to give priority to local public transport. To this end, MPB 3200 can be modified with the installation of the local public transport jack available as an accessory so that it offers a potential-free contact, for example for connection a key switch for the transport company or the radio remote control unit, also available as accessory. Similarly, other detectors can be connected to the local public transport jack to give priority to buses.

Function

An oncoming bus is registered by the corresponding signal head as described above. The bus request now limits the green phase for the other side to the minimum green phase of 10 seconds. At the end of the adjusted clearance time, the bus on the requesting side sees green immediately up to the maximum period. If during this green phase a request should come from another bus from the same direction, the maximum green phase is specified.
A request from the other side during this period is saved and then runs subsequently.
If there are no other bus requests, the traffic signal continues to run in the adjusted vehicle-actuated mode until the next request is received.

Note: *Bus priority is possible in modes 7-Automatic request mode and 8-All-red for radio/cable.*

IX. Instructions for removing and fitting the controller PCB

The following tools are required for removing and fitting the controller PCB:

- 5,5 mm socket wrench
- 8 mm socket wrench
- medium Philips screwdriver
- medium slotted screwdriver

A. Removing the controller PCB

1. Carefully lever out the caps on the knobs, for example with your fingernails. You can now see a Philips screw. After you have loosened these screws, all knobs can be pulled off to the front.

2. Use the 8 mm socket wrench to carefully unscrew the two rocker switches.

3. Now you can pull the front panel off to the front.

4. You can now see the controller PCB. At about 3 cm from the corners towards the middle, you can see 4 setscrews with nuts. Use the 5.5 mm socket wrench to loosen the setscrews so that you can take the PCB out of the controller.

5. Now disconnect the connectors for the cable harness at the top and for the buffer battery at the bottom. You are now holding the control PCB.

B. Fitting the controller PCB

1. Restore the electrical connections between the cable harness and the control PCB: do not forget to connect up the light-sensitive sensor (LDR) for automatic adjustment to ambient brightness, as well as the buffer battery. Now fasten the controller PCB on the four studs in the green chamber. Then position the front panel over the controller. Put the knobs on their shafts and fasten initially by tightening the screws slightly. Then adjust to the smallest scale values.

2. Provide operating voltage 12 V DC by connecting batteries or power supply units type N1. Ensure that you do not confuse the polarity.

3. Now press and hold both buttons: at the same time, switch the signal head on with the rocker switch. First you see the message "Menu 1 D-switch settings" and the display shows a separate symbol for each knob, e.g.:

1	2	3	4	5	6
X	X	X	X	X	X

4. Counting anti-clockwise, we start with the frequency selection switch (1), followed by the tens (2) and digits switch (3) for the clearance time, then the green phase selection switch (4) and the transmitter/receiver selection switch (5). The mode switch (6) comes last.
   To adjust the knobs to the lowest scale value, please watch the display while turning for example frequency selection switch (1). As soon as the display under switch 1 shows a 1 instead of an X, you have reached the lowest value. Now you can align the scale arrow to 1 and screw the frequency selection switch to its shaft. Then set the cover cap on the screw head.

5. Proceed in the same way with the other knobs (2 to 6).
   In the end, the display should look like this:

1	2	3	4	5	6
1	0	0	15	T	1

6. Now press the "Light / Display" button to change to the service point "Menu 2 Additional setting 1". Here you can check that the LDR has been connected correctly and is functioning. To do so, briefly cover the light-sensitive sensor on the back of the green chamber with your hand. The previously displayed value must now decrease clearly.

7. Press the "Light / Display" button again to change to the service point "Menu 3 Additional setting 2". Here you can test the optional additional inputs for local public transport activation (B) and the SMS module (S) (if these optional items are present).

8. Press the "Light / Display" button one more time. You have left the service menu; the traffic signal is now ready and can be programmed for use.

X. Technical data

Operating voltage:	approx. 8 - 14 V DC
Power consumption in cable and quartz mode:	
Daytime operation:	approx. 1.14 A per signal head (halogen)
Daytime operation:	approx. 0.52 A per signal head (LED)
Nighttime operation:	approx. 0.78 A per signal head (halogen)
Nighttime operation:	approx. 0.45 A per signal head (LED)
Power consumption in radio mode:	
Daytime operation:	approx. 1.35 A per signal head (halogen)
Daytime operation:	approx. 0.75 A per signal head (LED)
Nighttime operation:	approx. 0.98 A per signal head (halogen)
Nighttime operation:	approx. 0.65 A per signal head (LED)
Lamps:	12 V/10 W halogen bulbs (commercially available) or optimised low-energy LED modules on request
Fuse:	4A, 5x20, medium-slow fuse (commercially available)
Control modes:	fixed-time, vehicle-actuated with green-phase extension, vehicle-actuated operation with green on request, all-red, manual mode, flashing, lamps off
Data transmission:	cable or digital radio path
Radio path:	max. length under ideal conditions approx. 2,000 m
Radio equipment:	radio module, CE ⓘ tested in 1-channel, 3-channel and 16-channel version. Licensed 2m band frequencies for Germany: 151.09 MHz, 170.77 MHz, 170.75 MHz, 170.63 MHz Transmitter output rating ≤ 100 mW

Other frequency ranges and frequencies are possible together for example with higher transmitter output ratings according to the customer's national regulations.

Annex 1: Radar detector (option)

Description of functions: radar movement detector

The movement detector mounted on this traffic light system MPB 3200 ("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, the radar detector also differentiates between people and vehicles. Furthermore, 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 Parts List

Article: Traffic signal system MPB 3200

Order no.	Article description
MPB 302	Signal head, type "Holland", 3-part, 210 mm, with lens hoods, completely wired, incl. battery cable, reflectors, equipped with G4 bulb holders and halogen lamps 12 V/10 W/G4, with connector prepared for MPB 3200 controller
MPB 309	Signal head rear panel for red chamber MPB 3200, 210 mm
MPB 308	Signal head rear panel for yellow chamber MPB 3200, 210 mm
MPB 307	Green chamber/controller rear panel for MPB 3200, 210 mm
EH 2014	Gasket for signal head chambers, "Holland" type
EH 2016	Signal head door without lens, "Holland type", 210 mm
EH 2017	Signal head door, type "Holland", with red lens, 210 mm
EH 2018	Signal head door, type "Holland", with yellow lens, 210 mm
MPB 304	Signal head / controller door, type "Holland", with green lens, 210 mm, with lock no. 641
EH 2012	Lock for controller door no. 641, incl. one key
EH 2008 A	Lock counter part for control chamber
ES 2641	Key no. 641
EH 2009	Closer for signal head door
EH 2008	Closer counterpart for chamber
EH 2020	Lens, red, type "Holland", 210 mm
EH 2021	Lens, yellow, type "Holland", 210 mm
EH 2022	Lens, green, type "Holland", 210 mm
EH 2034	Lens holder
EH 2023	Gasket for lens 210 mm, type "Holland"
EH 2030	Lens hood, type "Holland", 210 mm
EH 2031	Cover cap for signal head, type "Holland"
EH 2032	Gasket for cover cap, self-adhesive, type "Holland"
EH 2033	Intermediate ring for connecting signal head rear panels, type "Holland"
EG 0041	Halogen lamp 12 V/10 W/G4
EG 0084	Halogen G4 bulb holder
EH 2043	Reflector 200 with removable plate + 1 bulb holder
EH 2045	Removable plate for reflector with G4 bulb holder
EI 0023	Halogen-type reflector, 200 mm
EH 2100	LED signal head module RED for MPB 3200 as replacement
EH 2110	LED signal head module YELLOW for MPB 3200 as replacement
EH 2120	LED signal head module GREEN for MPB 3200 as replacement
ES 3097	Socket plug, 3-pin, for LED module system
ES 3098	Plug, 3-pin, for LED module system

EK 0001	Battery cable for MPB 3200 with ring eylet, without battery lug
EI 0041 M	Battery terminal (+), red
EI 0042 M	Battery terminal (-), green
MPB 313	Front plate MPB 3200 with imprint
MPB 110	Rotary toggle for switch with arrow disk and cap
ES 2031	Safety cap for fuse (5 x 20)
ES 2004	Fuse 5x20 / 4 A
ES 2041	Dimmer swtich with cable and threaded joint
ESP 530	Controller PCB for MPB 3200
ESP 087	Battery PCB 7.2V MPB 3200 with cable and connector
EF 4100	Multi-frequency radio module type SR-150A
EF 4150	Single frequency radio module type SR-150A
EP 6037	Radar detector 12 V incl. 0.5 m cable with mounted plug, without mounting bracket
MP 40001 V	Mounting bracket for radar detector and radio antenna type V
MP 400 H	Mounting bracket for radar detector in a cable system
EFV 005 A	Spare attachment set for antenna foot type V, only lock washer and nut
EFK 006	Antenna plug, BNC (adapter), type "Kathrein"
EFV 007	Antenna cable for radio antenna type V, but without BNC adapter
EFV 008	Antenna foot, type V, incl. clear gasket and attachment set: lock washer and nut
EFV 010	Antenna radiator, type V, frequency 170.xx MHz
EFV 011	Antenna radiator, type V, frequency 151.09 MHz
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 018	Spare tip protection for antenna radiator type V
EFV 019	Aluminium retaining tube for holding antenna radiator type V during transport
ES 3022	Flange coupling 4-pin, ballast
ES 3024	Angled plug 4-pin, ballast
ES 3033	Flange coupling 7-pin, ballast
ES 3032	Flange plug 7-pin, ballast
ES 3040	Cover cap for plug and flange plug, ballast
ES 3041	Cover cap for coupling and flange coupling, ballast
A 49600	Battery casing made of aluminium for 2 batteries
A 49610	Battery casing made of aluminium for 4 batteries
EE 0006	Castor, solid rubber
EE 0003	Cover cap for castor
EE 0012	Aluminium mounting tube for MPB 3200
EE 0014	Cover cap for mounting tube
EE 0005	Wing screw M 10x30
A 46500	Electronic switching system for 2 batteries
A 46501	Electronic switching system for 4 batteries

Peter Berghaus GmbH
Verkehrstechnik • Lichtinnovationen

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Fachbetrieb und Mitglied im Verein für Verkehrstechnik und Verkehrssicherung e.V.

EG – Konformitätserklärung

Für das folgende Erzeugnis:

Transportable Signalanlage Typ MPB 3200

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 6100-6-1 für Wohnbereiche, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe

2. Elektromagnetische Verträglichkeit (EMV Teil 6-3), Fachgrundnorm Störsendung EN 6100-6-3 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) — 19.06.2006 (Datum) — (Unterschrift)

Peter Berghaus GmbH
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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.

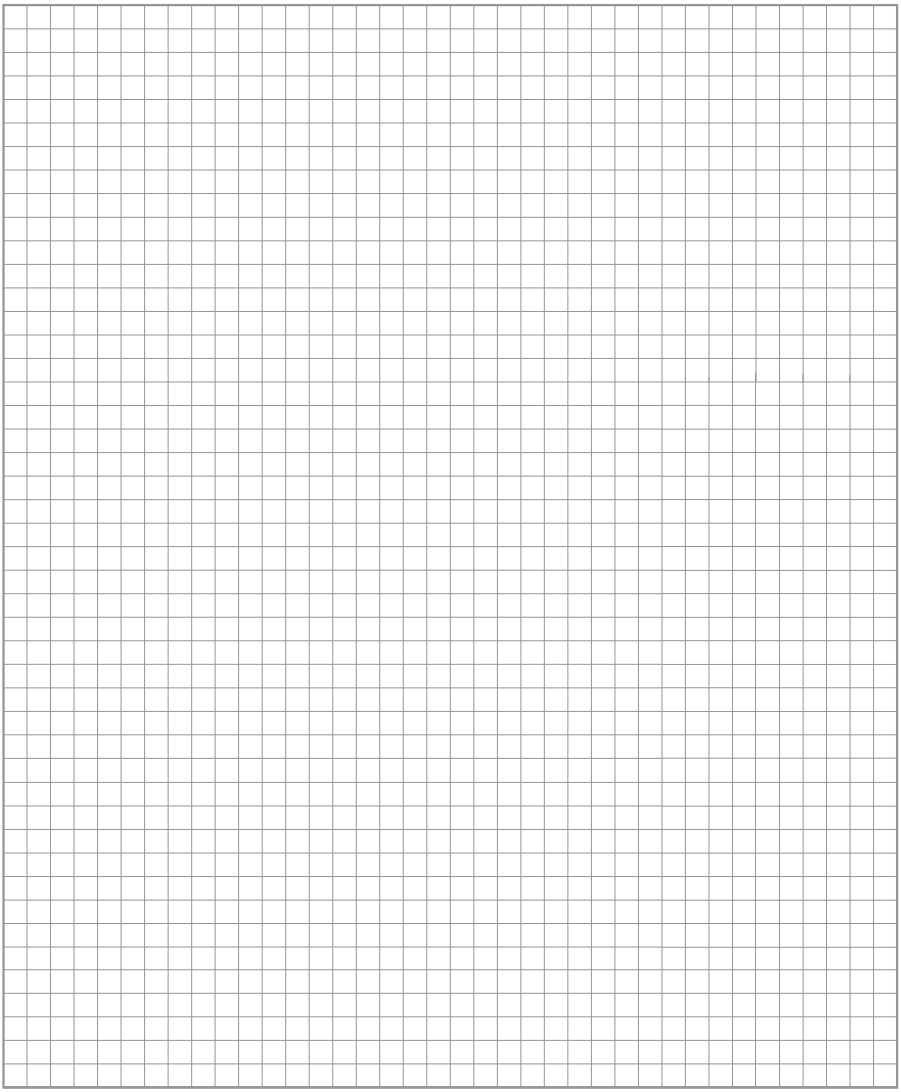
General transport instructions for mobile traffic signal systems

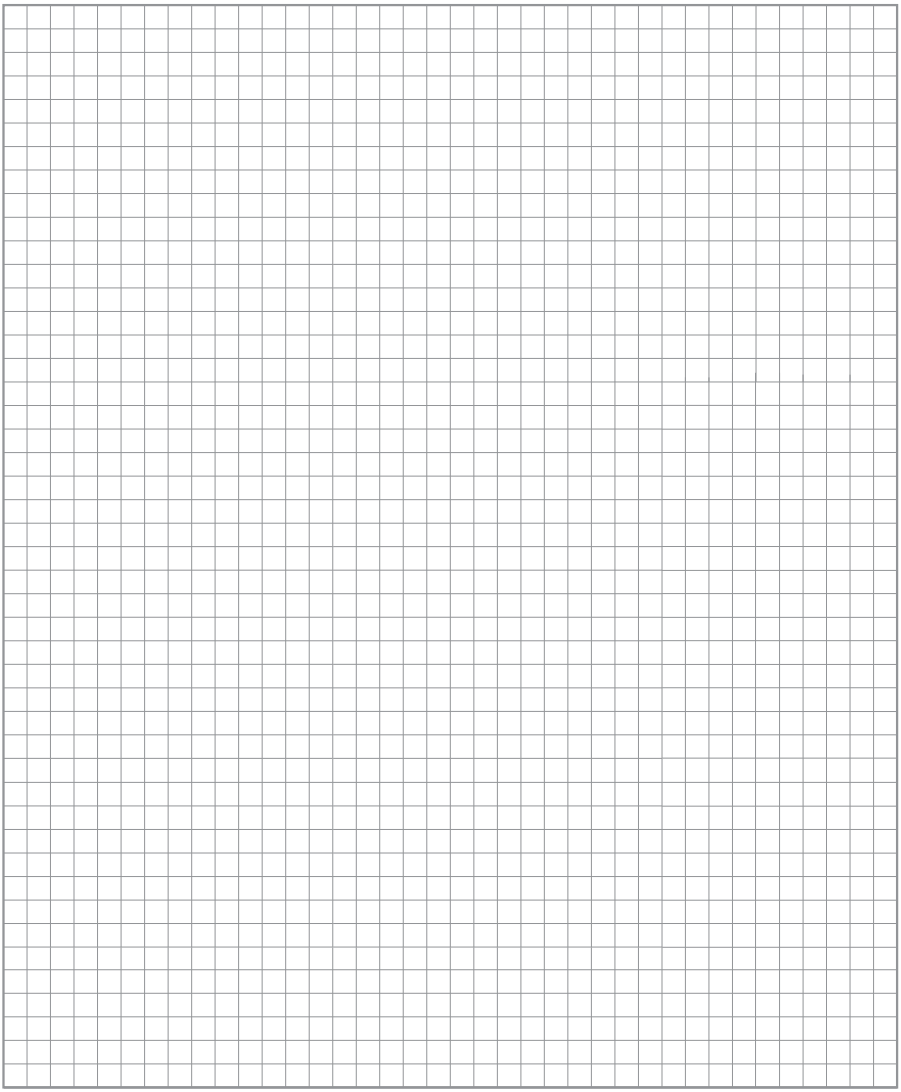
Please note!

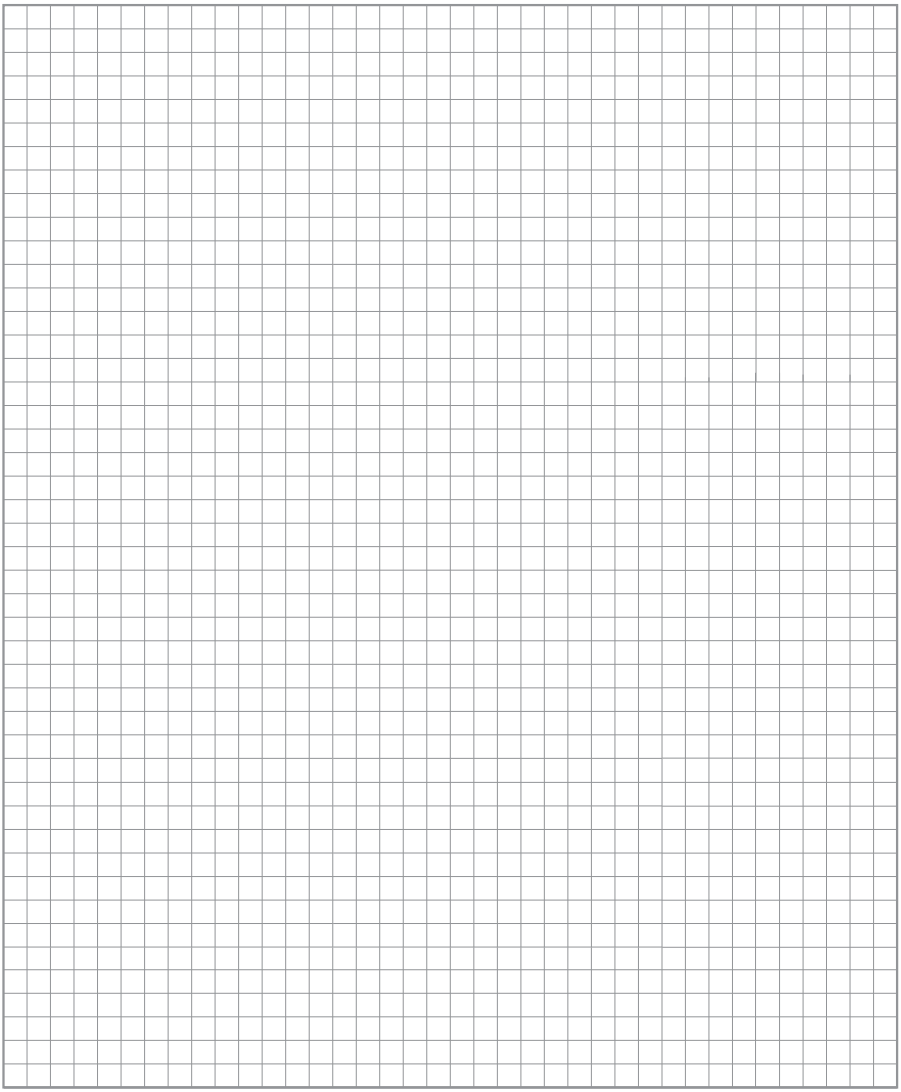
Our construction site traffic signal systems must always be transported standing upright on open vehicles with the lens hood pointing in the opposite direction.

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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5/2018