



M A H A G R O U P

# CONNECT SERIES

Roller Brake Testers for Passenger Cars,  
Vans and Commercial Vehicles

Extract from the Original Operating Instructions

BA023001\_101-en

C\_MBT C 3.5 W220  
C\_MBT C 3.5 W250  
C\_MBT S 3.5 W220  
C\_MBT S 3.5 W250  
C\_MBT C 4.0 W220  
C\_MBT C 4.0 W250  
C\_MBT S 4.0 W220  
C\_MBT S 4.0 W250  
C\_MBT C 5.0 W280  
C\_MBT S 5.0 W280

C\_MBT C 13.0 W280

C\_MBT S 13.0 R100 MS  
C\_MBT S 13.0 R100 MU  
C\_MBT S 15.0 R100 MS  
C\_MBT S 15.0 R100 MU  
C\_MBT S 18.0 R115 MS  
C\_MBT S 18.0 R115 MU  
C\_MBT S 18.0 R115 MI  
C\_MBT S 18.0 R160 MS  
C\_MBT S 18.0 R160 MU  
C\_MBT M 18.0 W301  
C\_MBT T 18.0 W360  
C\_MBT S 20.0 R115 MU  
C\_MBT S 20.0 R115 MI  
C\_MBT S 20.0 R160 MU

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**Manufacturer**

MAHA Maschinenbau Haldenwang GmbH & Co. KG  
Hoyen 20  
87490 Haldenwang  
Germany

Phone: +49 8374 585-0  
Fax: +49 8374 585-590  
Mail: maha@maha.de  
Web: www.maha.de

**Service**

MAHA SERVICE CENTER  
Maybachstraße 8  
87437 Kempten  
Germany

Phone: +49 8374 585-100  
Fax: +49 8374 585-491  
Mail: service@maha.de  
Web: www.mahaservicecenter.de

The present document is only an extract from the Original Operating Instructions. Download the complete edition from the MAHA website or request a printed copy from MAHA.

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# 1 General Safety Instructions

## 1.1 Introduction

- These operating instructions must be read carefully and understood before work commences.
- Please observe the specific safety information provided for the respective sections of the operating instructions.
- Adhering to the procedures, sequences and corresponding safety instructions is essential.
- A printed copy of the operating instructions must always be kept by the equipment.
- The relevant regulations regarding accident prevention and health and safety must be observed.

## 1.2 Symbols and Signal Words

### 1.2.1 Personal Injury



**DANGER**

indicates an immediate hazard which, if not avoided, will result in death or severe personal injury.

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**WARNING**

indicates a potential hazard which, if not avoided, could result in death or severe personal injury.

---



**CAUTION**

indicates a potential hazard which, if not avoided, could result in moderate or minor personal injury.

---

### 1.2.2 Property Damage

**NOTICE**

indicates a potentially harmful situation which, if not avoided, could result in damage to the equipment or surrounding objects.

---

## 1.3 What to Do in the Event of Defects or Malfunctions

If the fault cannot be rectified using the procedures described in section "Troubleshooting", proceed as follows:

- Switch off the main switch and secure it against being switched on again (unauthorised use).
- Contact service team.

## **1.4 What to Do in the Event of an Accident**

- Notify first aiders, the ambulance service and/or immediate care doctor:
  - Where did the accident happen (address, workshop ...)?
  - What happened?
  - How many are injured?
  - What injuries have occurred?
  - Who is reporting the accident?
- Keep calm and answer questions.

## **1.5 Requirements on Operating and Service Personnel**

Only persons qualified for testing in accordance with TRBS 1203 may be used as service personnel.

All persons involved in the operation, maintenance, assembly, dismantling and disposal of the equipment must

- be 18 years of age or older,
- have the mental and physical capacity for their role,
- be demonstrably trained and instructed,
- have read and understood the operating instructions, in particular the instructions on how to behave in the event of a malfunction and on proper use,
- observe the locally applicable regulations on occupational health and safety,
- show knowledge and experience in handling the equipment and the dangers posed.

## 2 Transport, Handling and Storage

### 2.1 Safety Instructions



#### WARNING

- For loading, unloading and transport, always use suitable lifting equipment, load handling devices (e.g. crane, forklift truck) and correct load attachment devices and lifting accessories. See also section "Transport and handling".
  - Always ensure that the parts to be transported are suspended or loaded properly and in a fall-proof manner, taking into account their size, weight and centre of gravity. Observe transport regulations!
  - Electrical work must only be performed by a specialist electrician in compliance with the national regulations, directives and standards. An electrical test/measurement must be performed and logged.
  - The system may only be installed and commissioned by service technicians of the manufacturer or by authorised service partners.
  - All parts of the electrical equipment must be protected from moisture and humidity.
  - The system must not be installed or operated in potentially explosive rooms or washing bays.
  - The operator must provide optional safeguards (e.g. warning lamps, barriers, monitoring of the presence of personnel in working pits) in accordance with the on-site conditions.
  - Personal protective equipment (safety boots and gloves) must be worn. The personal protective equipment must meet the safety requirements for the particular work being performed.
  - Secure the roller set with suitable means (e.g. barrier chain or tape). Depending on the country, the roller set must be secured with the optionally available cover when not in use (regulation in Germany). Alternatively, the automatic drive-over lowering bar can be used.
  - The display must be hung up in a safe area and must be folded up against the wall during downtime (wall-mounted hinge can be used as an option).
  - When folding up the display, always hold it on the outside. Crushing hazard!
  - Before connecting the supply line, it must be ensured that a lockable master switch or key switch (optional) is available for the use of the brake tester.
  - The emergency stop main switch, the emergency stop pushbutton (optional) and the signal lamp "Control On" must be positioned in the immediate vicinity of the test stand so that the emergency stop function according to DIN EN ISO 13850 is fulfilled.
-

## 2.2 Scope of Delivery

Each test stand is shipped from the factory with packaging as standard. The delivery contains:

- Roller set (basic equipment)
- Control cabinet (basic equipment)
- Options according to price list

The number of delivered packages and contents must be checked for damage and completeness according to the order confirmation. Any transport damage must be documented immediately and reported to the delivery carrier.

## 2.3 Packaging Information

In the following tables, the package weights are always indicated as approximate values, since they considerably depend on the equipment version and may vary accordingly.

### Centre of gravity of the packed roller set

The centre of gravity is approximately in the centre of the roller set or roller set halves.

	<b>C_MBT C 3.5 W220</b>	<b>C_MBT S 3.5 W220</b>	<b>C_MBT C 3.5 W250</b>	<b>C_MBT S 3.5 W250</b>
Dimensions Package Roller set (L x W x H)	240 x 80 x 50 cm	175 x 80 x 82 cm	295 x 80 x 50 cm	175 x 80 x 82 cm
Weight Package Roller set	350...550 kg	450...650 kg	400...650 kg	500...750 kg
Dimensions Package Control cabinet (L x W x H)	120 x 80 x 50 cm			
Weight Package Control cabinet	70...100 kg			

	<b>C_MBT C 4.0 W220</b>	<b>C_MBT S 4.0 W220</b>	<b>C_MBT C 4.0 W250</b>	<b>C_MBT S 4.0 W250</b>
Dimensions Package Roller set (L x W x H)	240 x 80 x 50 cm	175 x 80 x 82 cm	295 x 80 x 50 cm	175 x 80 x 82 cm
Weight Package Roller set	350...550 kg	450...650 kg	400...650 kg	500...750 kg
Dimensions Package Control cabinet (L x W x H)	120 x 80 x 50 cm			
Weight Package Control cabinet	70...100 kg			



	<b>C_MBT C 5.0 W280</b>	<b>C_MBT S 5.0 W280</b>	<b>C_MBT C 13.0 W280</b>
Dimensions Package Roller set (L x W x H)	295 x 80 x 50 cm	175 x 80 x 82 cm	295 x 80 x 50 cm
Weight Package Roller set	450...750 kg	550...850 kg	450...750 kg
Dimensions Package "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm		
Weight Package "Control cabinet Series"	70...100 kg		
Dimensions Package "Control cabinet Option" (L x W x H)	-		150 x 115 x 90 cm
Weight Package "Control cabinet Option"	-		100...130 kg

	<b>C_MBT S 13.0 R100 MU</b>	<b>C_MBT S 15.0 R100 MU</b>
Dimensions Package Roller set (L x W x H)	2x 150 x 115 x 90 cm	2x 150 x 115 x 90 cm
Weight Package Roller set	2x 600...900 kg	2x 600...900 kg
Dimensions Package "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm	
Weight Package "Control cabinet Series"	70...100 kg	
Dimensions Package "Control cabinet Option" (L x W x H)	150 x 115 x 90 cm	
Weight Package "Control cabinet Option"	100...130 kg	

	<b>C_MBT S 18.0 R115 MS</b>	<b>C_MBT S 18.0 R115 MU</b>	<b>C_MBT S 18.0 R115 MI</b>
Dimensions Package Roller set (L x W x H)	2x 225 x 115 x 65 cm	2x 150 x 115 x 100 cm	2x 150 x 150 x 75 cm
Weight Package Roller set	2x 850...1250 kg	2x 1000...1350 kg	2x 900...1200 kg
Dimensions Pack stück "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm		
Weight Package "Control cabinet Series"	70...100 kg		
Dimensions Pack stück "Control cabinet Option" (L x W x H)	150 x 115 x 90 cm		
Weight Package "Control cabinet Option"	100...130 kg		

	<b>C_MBT S 18.0 R160 MS</b>	<b>C_MBT S 18.0 R160 MU</b>
Dimensions Package Roller set (L x W x H)	2x 280 x 135 x 60 cm	2x 195 x 115 x 98 cm
Weight Package Roller set	2x 1300...1500 kg	2x 1100...1400 kg
Dimensions Package "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm	
Weight Package "Control cabinet Series"	70...100 kg	
Dimensions Pack stück "Control cabinet Option" (L x W x H)	150 x 115 x 90 cm	
Weight Package "Control cabinet Option"	100...130 kg	

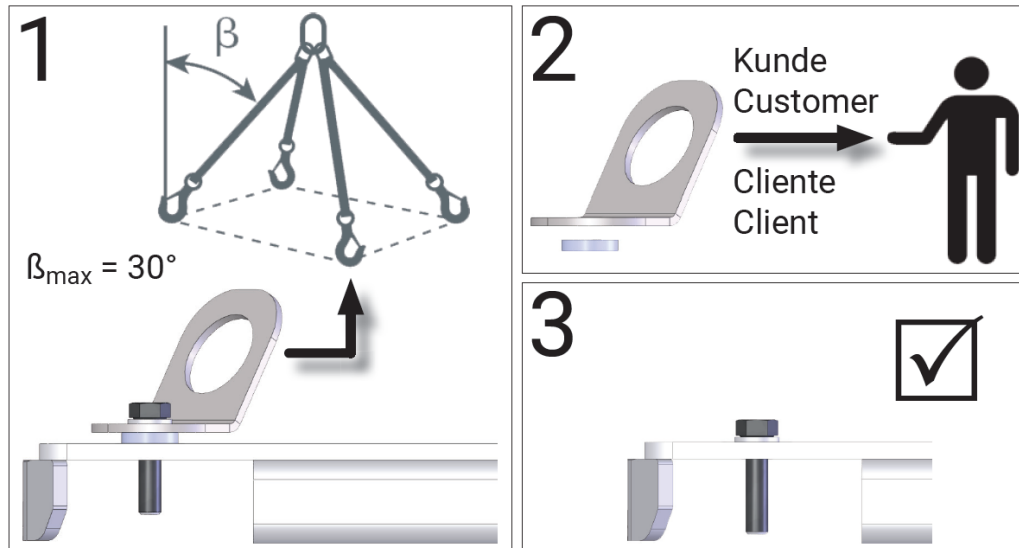
	<b>C_MBT S 20.0 R115 MU</b>	<b>C_MBT S 20.0 R115 MI</b>	<b>C_MBT S 20.0 R160 MU</b>
Dimensions Package Roller set (L x W x H)	2x 150 x 115 x 100 cm	2x 150 x 150 x 75 cm	2x 195 x 115 x 98 cm
Weight Package Roller set	2x 1000...1350 kg	2x 900...1200 kg	2x 1100...1400 kg
Dimensions Package "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm		
Weight Package "Control cabinet Series"	70...100 kg		
Dimensions Package „Control cabinet Option“ (L x W x H)	150 x 115 x 90 cm		
Weight Package „Control cabinet Option“	100...130 kg		

	<b>C_MBT M 18.0 W301</b>	<b>C_MBT T 18.0 W360</b>
Dimensions Package Roller set (L x W x H)	2x 250 x 130 x 93 cm	2x 280 x 115 x 70 cm
Weight Package Roller set	2x 750...950 kg	2x 1400...1600 kg
Dimensions Package "Control cabinet Series" (L x W x H)	120 x 80 x 50 cm	
Weight Package "Control cabinet Series"	70...100 kg	
Dimensions Package "Control cabinet Option" (L x W x H)	150 x 115 x 90 cm	
Weight Package "Control cabinet Option"	100...130 kg	

## 2.4 Transport and Handling

Transport and handling of the test stand is only permitted in the original packaging. On the pallet the packaged test stand can be moved with the forklift truck. For loading, unloading and insertion into the foundation, use the pick-up points shown below. Hand over the load suspension lugs to the operator for reuse (dismantling, repair) after the transport process.

Dimensions and centre of gravity of the packaged test stand are shown in section "Packaging Information".



*Pick-up points of the packaged test stand*

## 2.5 Storage

The packages must be stored in a covered location and protected from direct sunlight. Storage must take place at a temperature between  $-10\text{ }^\circ\text{C}$  and  $+60\text{ }^\circ\text{C}$ .

Packaging waste must be disposed of in accordance with applicable environmental regulations.

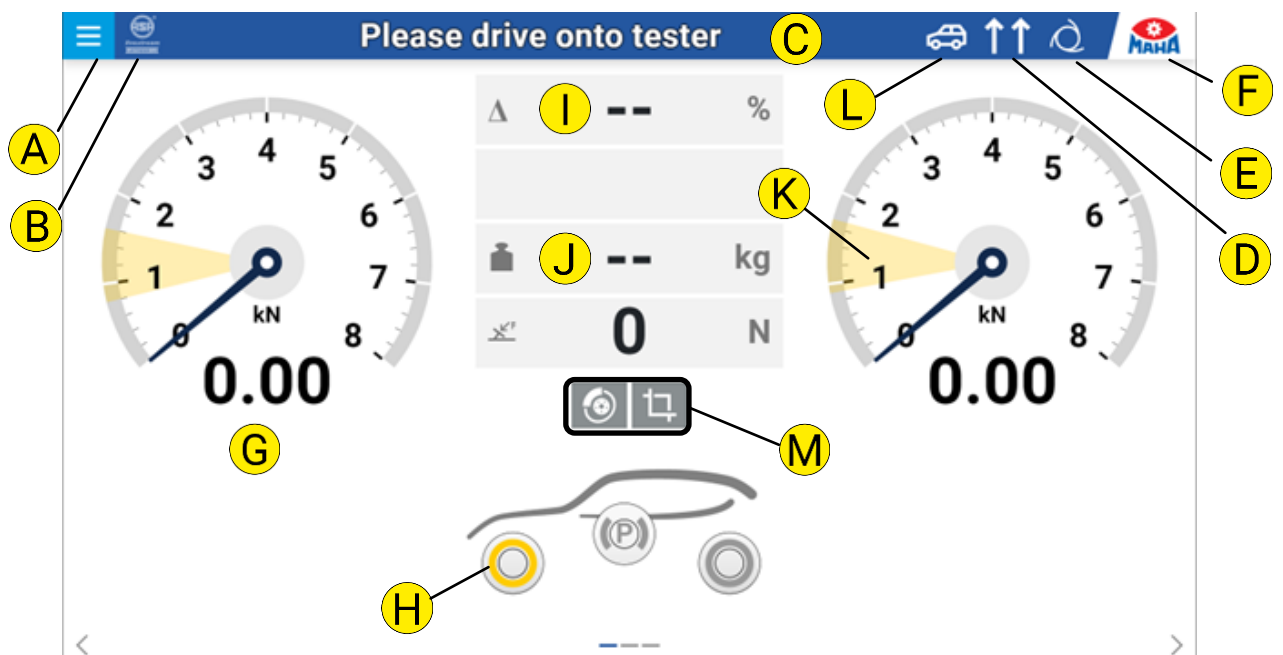
### 3 Description of the Software User Interface

The control board of the brake tester generates a website through which the user guidance and the measured value display takes place. The easiest way to connect to a C\_MBT brake tester is to use a standard computer with an Internet browser.

All common browsers (e.g. Mozilla Firefox, Microsoft Edge, Google Chrome) are supported in their current version.

#### 3.1 Measurement Screen in Car Mode

- Once the test rollers have been driven onto, the display automatically changes to the measurement screen.
- In the measurement screen, the current brake value and the difference in % are shown.
- After slip or pre-trigger (= memory threshold), the maximum brake forces of the measurement are displayed.
- The arrows at the bottom left and right can be used to switch between the measurement screen and the results screen (on touch-enabled devices also by swiping to the side).

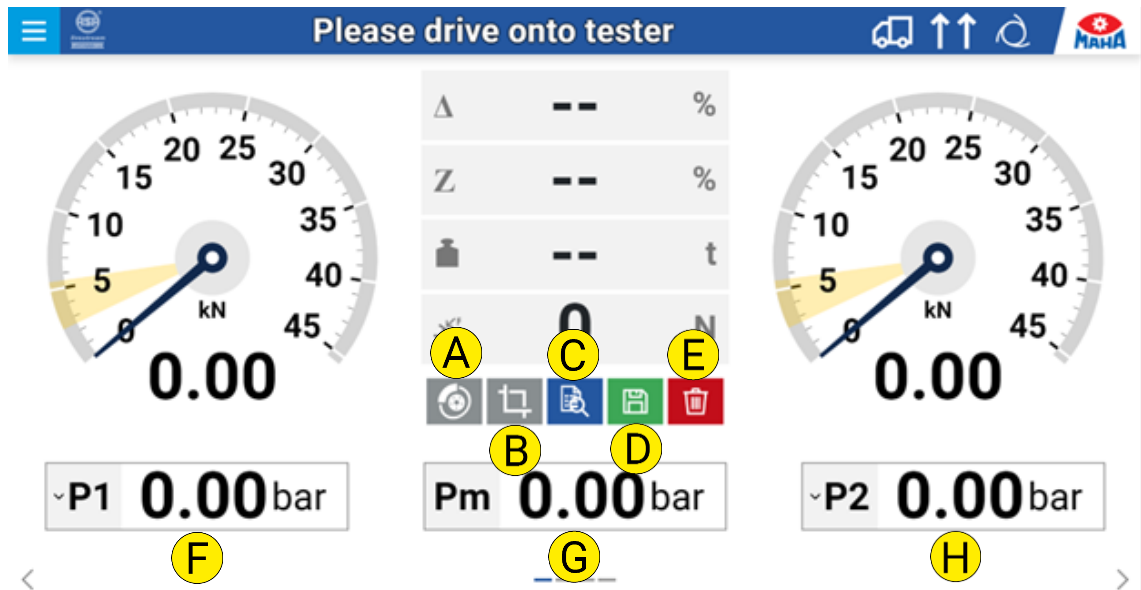


<b>A</b>	Burger menu	Opens a list of functions (see below).
<b>B</b>	ASA Livestream	Display whether ASA Livestream is activated; active = light blue
<b>C</b>	Status line	The status line serves as a user prompt.
<b>D</b>	Direction arrows	Indicates the set direction of rotation of the test rollers (both forward/backward or counter rotation).

<b>E</b>	Automatic/manual	Display whether automatic mode is activated or manual mode (then hand symbol).
<b>F</b>	Settings	Click on gear wheel opens system settings.
<b>G</b>	Brake force	Display of brake forces left/right in kN, as digital value and with pointer
<b>H</b>	Brake type indicator	The brake to which the current measured value is saved is always displayed highlighted in yellow.
<b>I</b>	Differential display	Displays the brake force differential in %
<b>J</b>	Weight display	Display of weight measurement (static: weight symbol filled, dynamic: weight symbol as outline)
<b>K</b>	Ovality segment	Ovality is measured in preset brake force area (marked yellow)
<b>L</b>	Vehicle type	Display of vehicle type currently active
<b>M</b>	For button assignment see section "Measurement Screen in Truck Mode"	

### 3.2 Measurement Screen in Truck Mode

The measured value display for truck testers is similar to that of the passenger car testers, extended by some functions which are described below.

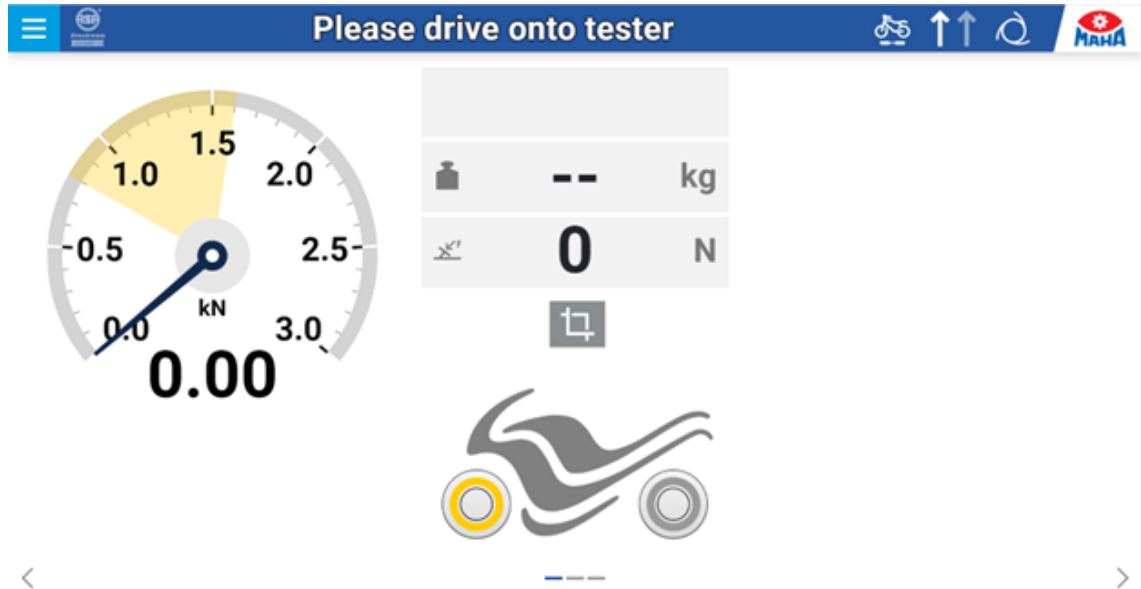


<b>A</b>	Manual ovality measurement	Ovality is measured immediately at current pointer position; segment size and time from settings are used
<b>B</b>	Manual end of measurement	Intermediate storage of the current measured value
<b>C</b>	Last measurement result	Re-displays
<b>D</b>	Save	with axle assignment and brake type
<b>E</b>	Delete	Deletes the current measurement value in the temporary memory
<b>F</b>	Pressure converter (opt.)	Brake pressure P1...P9 left wheel
<b>G</b>	Pressure converter (opt.)	Control pressure Pm
<b>H</b>	Pressure converter (opt.)	Brake pressure P1...P9 right wheel

If radio-controlled devices are present, another view is available, which can be accessed via the arrows at the bottom or by swiping to the side.

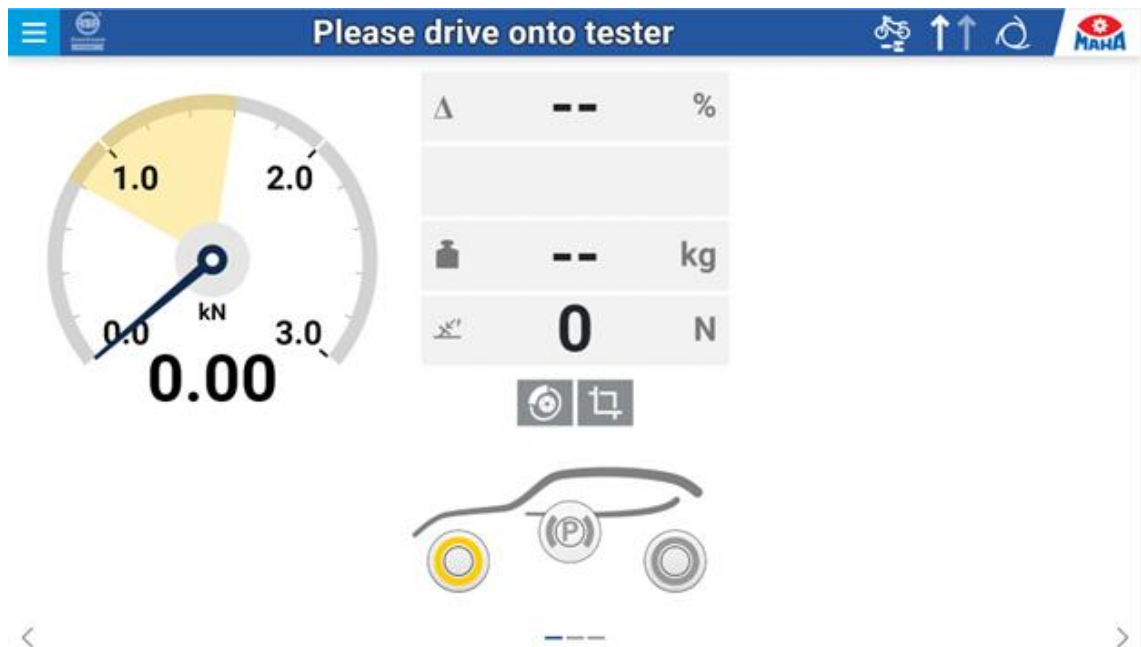
### 3.3 Measurement Screen in Motorcycle Mode

The measured value display in motorcycle mode is reduced to a single dial gauge. It is always located on the left of the user interface, regardless of the test stand side selected. The functions correspond to those in the semi-automatic car mode.



### 3.4 Measurement Screen in Tricycle Mode

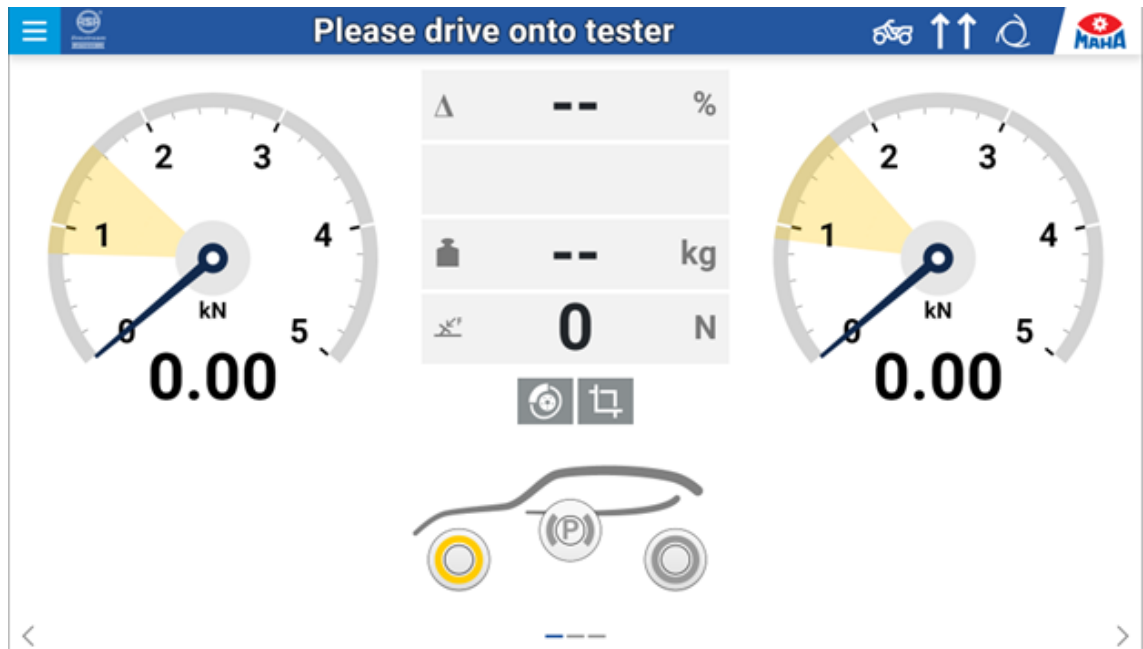
The measured value display in tricycle mode consists of one or two dial gauge(s), depending on whether the axle selected has one or two wheel(s).





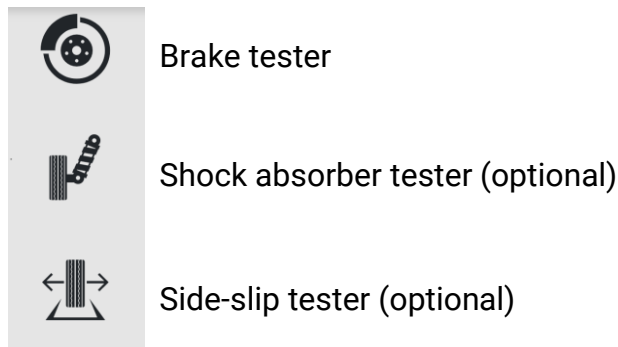
### 3.5 Measurement Screen in Quad Mode

The measured value display in quad mode corresponds to that in car mode, only the measurement range is dimensioned smaller by default.






















### 3.6 Burger Menu Functions



In the left column, it is possible to select between the functions for the different test devices (depending on the configuration of the test stand):






#### 3.6.1 Functions of Brake Tester

	Car mode
	Truck mode
	Motorcycle mode
	Tricycle mode, single wheel front


	Tricycle mode, single wheel rear	
	Quad mode	
	Car multi-axle mode	
	Weight-dependent Car-Truck switchover	(below the preset weight threshold Car mode, above Truck mode)
	Main direction of rotation	(default)
	Four-wheel	(Automatic counter-rotation operation, measurement of the respective forward rotating wheel. First left side, then automatically right side)
	Opposite direction (opt.)	(Measurement in the opposite direction of travel)
	Single wheel left	(Measurement of the left wheel only, right roller is stationary)
	Single wheel right	(Measurement of the right wheel only, left roller is stationary)
	Automatic roller start	(Default setting, automatic start 3 sec. after entering the test stand)
	Manual roller start via SmartDevice	
	Manual roller strat via radio remote control	
	Manual roller start via cable remote control	
	Lowering bar (opt.) automatic	(Lowering bar is controlled via light barrier or button)
	Lowering bar (opt.) manual	(Lowering bar is controlled via button)

	Pre-trigger	(Measurement when threshold value is exceeded)
	Pre-trigger Truck	(Save maximum brake force)

### 3.6.2 Functions of Shock Absorber Tester (optional)

	Shock Absorber Tester	(enables the shock absorber tester)
	Shock absorber tester Weighing mode	(enables weight measurement via shock absorber tester, no shock absorber test; only available if there is no weighing device in the brake tester!)
	Switch off shock absorber tester	(disables the shock absorber test)

### 3.6.3 Functions of Side-Slip Tester (optional)

	Switch off side-slip tester	(disables the side-slip test)
--	-----------------------------	-------------------------------




## 3.7 Results Display

- In the results display, the customer name and the vehicle license plate number or VIN can be entered for the current measurement, as well as the current mileage and the maximum permissible weight of the vehicle.
- The last stored measurements can be redisplayed (up to 10).
- If the ES\_IN/OUT protocol is activated (optional), a vehicle can be selected from a test list.
- The arrows at the bottom left and right can be used to switch between the results screen and the measurement screen (on touch-enabled devices also by swiping to the side).

### 3.7.1 Current Measurement










The screenshot shows the 'Current Measurement' page. At the top, there are four tabs: 'Vehicle selection' (A), 'Current measurement' (B), 'Measurement archive' (C), and 'Administration' (D). Below the tabs, there are sections for 'Personal data' (E) with fields for MAHA Firstname, MAHA Lastname, and Note; and 'Vehicle data' (F) with fields for license plate (OA MH 4), Mileage, MPW, and Calculation pressure (5 bar). The 'Measurement results' section (J) has a sidebar with 'Shock absorber' and 'Side-slip'. The main area shows a 'Total overview' (K) table with columns for Service brake and Parking brake. Below this is a detailed table with columns for axle number, force (kN), weight (t), deceleration (Δ%), and Z%. Callout L points to the 'Details +' link in the table.

- A** Vehicle selection (opt.) Opens a list with test orders (ES\_IN)
- B** Current measurement Results display for the current measurement
- C** Measurement archive Overview of the last (10) stored measurements
- D** Administration (opt.) Vehicle administration
- E** Personal data:
  - First, last name Entry of customer name
  - Note Entry of additional information (opt.)
- F** Vehicle data:
  - License plate/VIN Entry of license plate number / VIN
  - Mileage Entry of mileage
  - MPW Entry of maximum permissible weight
  - Calculation pressure in bar; only if extrapolation is active (opt.)
  - Pressure per axle in bar; only if extrapolation is active (opt.)

<b>G</b>		Save	Saves the current measurement results. Optional ES/IN: ES_OUT can also be generated, depending on the setting in the ES service
<b>H</b>		Forward (opt.)	Writes back the measurement results (ES_OUT), depending on the setting in the ES service
<b>I</b>		Delete	Deletes the measurement results
<b>J</b>			Selection of required test device
<b>K</b>			Overview of current measurement
<b>L</b>			Expand to detail view (see below)

### Detail view

























If the detail view is expanded with <+>, further measurement results can be seen, such as brake force sum, pedal forces, pressure values, weight, ovality and extrapolation.

<b>H</b>		← kN	kN →	Δ %	Z %	
1		4.83	3.69	24	25	Details +
	 	3.76	3.69	2	21	Details +
2		7.49	8.22	9	45	Details -
	Σ	15.71 kN				
		--	--			
		Px: 1.80 bar	Px: 1.90 bar	Pm: 1.95 bar		
		--	--		3.53 t	
		20 %	20 %			
	Factor i	5.07	4.73			
	F * i	66.04 kN				
		5.93	10.81	46	48	Details +

### 3.7.2 Measurement Archive

In the measurement archive, the stored measurements are listed (max. 10 vehicles) in order to redisplay them if required (by clicking “Show” button) or to print them in the form of a test report.

Use the arrows ⇅ to sort the corresponding column. Vehicle measurements that are no longer required can be deleted.

Current measurement	Measurement archive					
Search						
⌄ Date	Vehicle type	⌄ License plate/VIN	⌄ Mileage	Show	Print	Delete
24.07.2018 13:40		OA Motorcycle 1	123456			
24.07.2018 13:40		OA TriFront 1	123456			
24.07.2018 07:33		OA CAR 2	123456			
24.07.2018 13:40		OA MH 3	123456			
24.07.2018 13:40		OA MH 2	123456			
24.07.2018 13:40		OA MH 1	123456			

#### Print

If “Print” is selected, a window opens. Here the components can be selected that are to appear on the test report.

The displayed contact address can be edited in the system settings in section “General/Test report”.

When generating the test report, a PDF file is created, which can be saved on the computer, e.g. in the local download folder. This file can then be sent by e-mail or printed on paper on a connected printer.

#### Test report

Select the components to be printed.

**Brake tester**

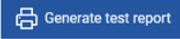
- Brake force
- Deceleration
- Extrapolation

**Shock absorber**

- Shock absorber tester
- Shock absorber tester graphic

**Side-slip**

- Side-slip



### 3.7.3 Vehicle Selection (optional)

As soon as the "Order Interface (ES\_IN/OUT)" option is activated under "Settings", a new view "Vehicle selection" appears.

If the pull-down menu is expanded with the down arrow, vehicles can be selected for which inspection orders have already been recorded (e.g. in the IT system of a car dealership or an inspection station). Manual license plate entry is not possible.

After selection, the fields for which entries have been made are automatically completed, e.g. vehicle type (car or truck, indicated by the symbol in front of the license plate), number of axles, VIN, mileage or maximum permissible weight. Measurements can then be taken for this vehicle.

The screenshot shows the MAHA software interface. At the top, there is a blue header with the text "Please drive onto tester" and the MAHA logo. Below the header, there are four tabs: "Vehicle selection", "Current measurement", "Measurement archive", and "Administration". The "Vehicle selection" tab is active. The interface is divided into three main sections: "Personal data", "Vehicle data", and "Inspection data".

- Personal data:** Includes a "Bemerkung" (Note) field.
- Vehicle data:** Includes fields for License plate (KE XY 123), VIN (012365478), Axles (2), Mileage (50000 km), Weight (3000 kg), First registration (29.09.2009), Manufacturer (FIAT), and Model (PANDA MREY514MK789).
- Inspection data:** Includes a date field (29.09.2009) and a "Start time" field (10:30:53).

Below the "Inspection data" section, there are three colored buttons: a green button with a car icon, a green button with a truck icon, and a red button with a car icon. A large license plate graphic "KE XY 123" is displayed in the center. To the right of the license plate, there is a list of measurement points: "Brake", "Shock absorber", and "Side-slip".

#### A Personal data:

- Note Entry of additional information (opt.)




#### B Vehicle data:

- License plate Vehicle selection via license plate number
- VIN Vehicle identity number
- Number of axles
- Mileage
- Weight Maximum permissible weight
- First registration
- Manufacturer

- Vehicle type                   Type 1 and Type 2 of vehicle
- Fuel type
- Turbo                            Turbo present
- Speed limiter                 Speed limiter present
- Taximeter                     Taximeter present

**C** Inspection data:

- Inspection date
- Start time
- End time
- Duration

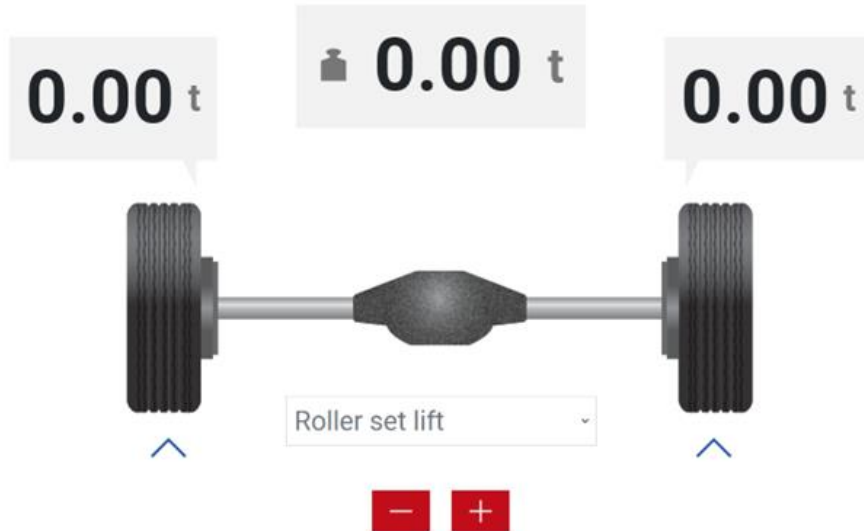
- |          |  |         |  |
|----------|--|---------|--|
| <b>D</b> |   | Save    | Save (transfer measured values to measurement archive)               |
| <b>E</b> |   | Forward | Forward (close test order and transfer measured values to IT system) |
| <b>F</b> |  | Delete  | Delete measured values   |



## 3.8 Optional Display Screens

### 3.8.1 Scale Screen (optional)

As soon as a weighing device is installed in the test stand, another view appears:



Here, the wheel weights are displayed above the wheels, and the axle weight is displayed above the axle.

Below the axle weight, the difference appears when the weight is changed.

#### **Load simulation (opt.)**

If additional devices for load simulation are installed (pull-down device or roller set lift), the load simulation can be operated via the +/- buttons below the axle:

- Plus increases the load
- Minus reduces the load

The arrows under the wheels indicate by movement whether the load simulation is active.

In the case that pull-down device as well as roller set lift are installed, the pull-down menu can be used to switch between both options.

### 3.8.2 Display Radio Participants (optional)

If a radio receiver is installed in the test stand and the optional radio pressure converters are enabled, another view appears:

Pm ---	P5 ---	PFM 0 N
P1 ---	P6 ---	RECO S ✓
P2 ---	P7 ---	
P3 ---	P8 ---	
P4 ---	P9 ---	

The existing radio participants are displayed here, e.g. the RECO S radio remote control, a PFM pedal force meter or RCD 50 radio pressure converter.

In addition, the measured values are displayed:

- "---" means that no measured values are available.
- "---" blue bordered means that a sensor is logged in, but not transmitting.
- Blue with values e.g. "0" means a sensor sends value 0.
- Blue with "charging" means sensor is charging its battery.
- "0 N", on the other hand, is a measured value.

Adding/removing a participant is done under Settings/Radio/Radio diagnostics.

## 3.9 Settings











Clicking on the gear wheel in the MAHA logo opens the System settings menu.



**INFO:** The “System settings” menu is locked if the test stand is occupied and no error is present. The menu is unlocked when the vehicle exits the test stand.

Here the following submenus are available in the left column:

	General
	Languages
	Settings, extended (only for logged in users)
	Radio (opt.)
	Brake tester
	Axle damping tester (opt.)
	Side-slip tester (opt.)
	Technician menu login

### 3.9.1 Description of the Submenus

#### General



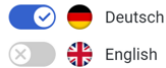
Support:	Contact and test stand information
Network:	IP settings, network name
External devices:	Connected analog displays, C_Box etc.
Event recording:	Display of events (EventLog)
Test protocol:	Configuration protocol, address header
Machine data:	Operating hours etc.

---

## Languages



Sprache



Setting the language of the test stand

---

## Settings



Einstellungen

Geräte Akt./Deak. Optionen Software-Update/ZM-Zurücksetzen

Devices Act./Deact.:	Activate/deactivate test equipment
Options:	Activate booked general additional functions
SW Update:	Update option for software
Reset ZM:	Reset ZM to delivery state

---

## Radio



Funk

Optionen Funkdiagnose Justage

Options:	Bookable radio options (remote control, pressure converter, pedal/hand force meter)
Radio diagnostics:	Status information on end devices, user guidance for pairing the devices etc.
Adjustment:	Adjust end devices (only for logged-in users)

---

## Brake tester



Bremsprüfstand

Optionen Kalibrieren Bremskraft Kalibrieren Wiegeeinrichtung Diagnose

Options:	Activated devices and settings
Adjust brake force:	Display of values (force and digits)
Adjust weighing device (opt.):	Display of values (weight and digits)
Diagnostics:	Sensor diagnostics (range spring and proximity switch)
<i>Additionally for logged-in users:</i>	
Settings:	Parameters for car, truck, motorcycle, general, customer variables
Adjust brake force:	Set zero point, range spring settings etc.
Adjust weighing device (opt.):	Set zero point etc.
Diagnostics:	Motor can be switched in star/delta or fast/slow mode ( <i>service technician button required</i> )
Input/output test:	Activate outputs ( <i>service technician button required</i> ), readout inputs

---

---

## Shock absorber tester



Achsdämpfungsprüfstand

[Optionen](#) [Justage](#)

Settings:	Adjust measurement parameters of shock absorber tester (for logged-in users only)
Options:	Activate booked options
Adjustment:	Currently only possible via external „LON-Manager“ tool

---

## Side-slip tester



Radlauftester

[Optionen](#) [Justage](#)

Settings:	Adjust measurement parameters of side-slip tester
Options:	Activate booked options (triggers etc.)
Adjustment:	Adjust side-slip tester (only for logged-in users)

---

## Technician menu login



Activation of the technician menu

Online:	via internet connection with e-mail address and password, here also password change possible
Offline:	via maha-key-file, download from MAHA internet server, here <i>no</i> password change possible; once logged in: change password!

---

### 3.9.2 General/Network

The "Network MAHA (X13)" is permanently configured and cannot be changed! (Ethernet interface X13 on the central module)

On the other hand, the "Customer network (X12)" can be customized according to the requirements. (Ethernet interface X12 "EXT" on the central module).

Likewise, the "network name" under which the test stand reports in a network can be customised.

Below, information about the ASA Livestream and the external interface (both optional) is shown.

## General

Support	Network	External devices	Test report	Event log	Machine data
---------	---------	------------------	-------------	-----------	--------------

### Customer network (X12)

Status	✓ Connected
Mode	Client
MAC	MOCK_EXT_MAC
IPv4 / Network mask	10.10.10.2 / 255.255.255.0
IPv6	12345667889adfecb:3421
Gateway	10.10.10.1
New mode	<a href="#">Change</a>

### MAHA network (X13)

Status	✓ Connected
Mode	Server
MAC	MOCK_MAHA_MAC
IPv4 / Network mask	10.10.10.3 / 255.255.255.0
IPv6	12345667889adfecb:3421
Connected devices	mock_client_1: 10.10.30.30 mock_mac_1 mock_client_2: 10.10.30.31 mock_mac_2

### Network name

<input type="text" value="maha-mbt-mock"/>	<a href="#">Change</a>
--	------------------------

### ASA Livestream

Status	✗ Disconnected
Manager IP address	192.168.34.35
Transfer in progress	✗

### Status external interface

☰ Connected: Websocket Order Interface Example (Prüflinie 1, Sektion 8)

## X13 MAHA

The X13 MAHA interface is primarily used to connect a MAHA access point so that the test stand can be accessed via the access point's WiFi. The network interface at X13 MAHA tries to obtain IP addresses via DHCPv4/v6 for 30 seconds when the central module is started (or a cable is plugged in). If no DHCP server responds during this time, i.e. obtaining the addresses fails, then the ZM itself acts as a DHCPv4 server, assigns itself the address 192.168.201.1 and distributes IP addresses in the network in which the X13 MAHA interface is located.

### INFO:

This configuration cannot be changed. On the one hand, this ensures that the MAHA Access Point functions correctly with this interface, and on the other hand, this allows the network configuration of the X12 EXT interface to be performed via the X13 MAHA port.

## **X12 EXT**

The X12 EXT network interface is possible for integration of the central module into the customer network. To enable such integration conveniently, the X12 EXT interface can be configured according to customer requirements. It is recommended to perform the configuration of the X12 EXT interface via a device that is directly connected to the X13 MAHA port.

- DHCP server

To configure the X12 EXT interface as a DHCP server, "Server" must be selected as the new mode. After a restart of the central module, the X12 EXT interface then operates as a DHCP server. This means that the X12 EXT interface attempts to obtain IP addresses via DHCPv4/v6 for 30 seconds when the ZM is started (or a cable is plugged in). If no DHCP server responds during this time, i.e. obtaining the addresses fails, then the ZM itself acts as a DHCPv4 server and assigns itself the address 192.168.202.1.

### **INFO:**

In Germany, this interface must be used as an ASA interface and is configured accordingly ex works (as a DHCP client).

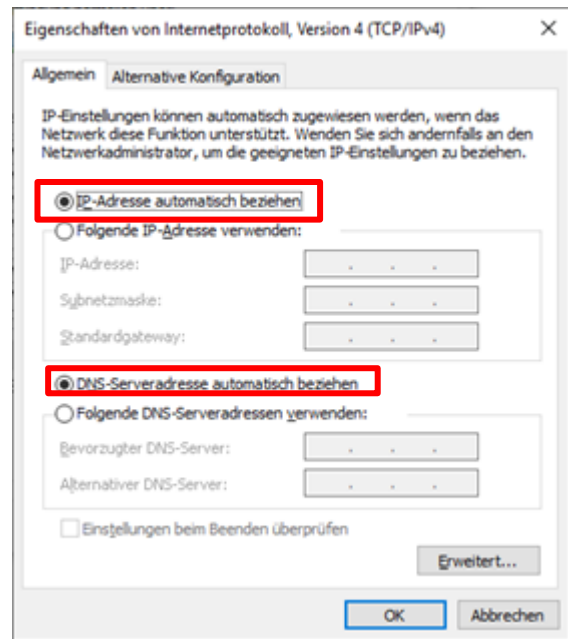
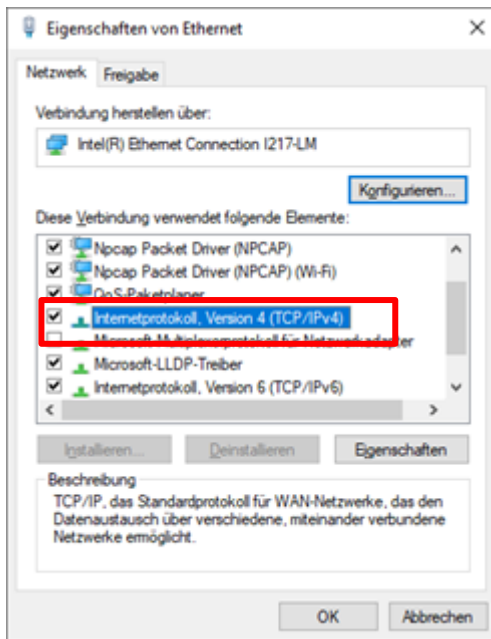
- Static IP

To configure the X12 EXT interface to a static IP, "Static IP" must be selected as the new mode. The IPv4 and Network mask fields are mandatory fields.

Optionally, a gateway can also be entered. After a restart of the central module, the X12 EXT interface then operates with static IP.

### **Procedure for configuring the X12 EXT interface**

- 1 Connect a laptop or similar to the X13 MAHA socket of the central module via a network cable. The network interface of the laptop must be configured as a DHCP client. This means that in the properties of the corresponding Ethernet connection in the "Internet protocol, version 4" element the "Obtain IP address automatically" and "Obtain DNS server address automatically" options must be enabled.



- 2 Call up the WebApp of the central module via a web browser. The central module can be reached either via the IP 192.168.201.1 or via the name of the ZM + .maha (in the delivery state this would be e.g. <http://maha-mbt.maha>).
- 3 Login to the technician menu, e.g. via a previously downloaded offline key.
- 4 Switch to the network area, select the desired mode and enter the desired configuration.

## Allgemein

Support   Netzwerk   Externe Geräte   Ereignisaufzeichnung   Prüfprotokoll   Maschinendaten

### Netzwerk Kunde (X12)

Status	✓ Verbunden
Modus	Client
MAC	MOCK_EXT_MAC
IPv4 / Netzwerkmaske	10.10.10.2 / 255.255.255.0
IPv6	123456789adfecb3421
Gateway	10.10.10.1
Neuer Modus	<div style="border: 1px solid black; padding: 2px;">             Client  <span style="background-color: #007bff; color: white; padding: 2px;">Client</span>              Server              Statische IP           </div>

### Netzwerk MAHA (X13)

## INFO:

Incorrect configuration of the X12 EXT interface can result in the central module no longer being accessible via the X12 EXT interface. A configuration correction can or must then be made via the X13 MAHA interface.



### 3.9.3 Technician Menu Login

In this sub-menu, the technician menu can be opened. However, this menu is only accessible to persons who are registered with MAHA.

#### **Online activation**

If the test stand is online, i.e. if it has a direct connection to the Internet, the user can log in with an e-mail address and password. These are usually managed by the MAHA Service Center after MAHA training has been completed.

After successful login, the **password** can also be **changed** here.

#### **Offline activation**

If the test stand is not online, the user can log in using a software key ("maha-key"). This file must be downloaded to the end device beforehand and is available on the MAHA homepage in the support area under "Software/Connect Downloads" (login with e-mail address and password required):

<https://www.maha.de/de/support/software/connect-downloads>

It can then be imported into the test stand using the "Select" button.

The keys are limited in time (usually four weeks after issuance) and only valid for a specific test stand (S/N related)!

## 4 Operation

### 4.1 Safety Instructions



#### WARNING

- Observe the statutory accident prevention regulations.
- Before the vehicle inspection, remove any foreign particles stuck in the tyre tread.
- Drive the vehicle on/off/over the test stand with the vehicle slowly (walking speed) and centrally.
- The driver must hold an appropriate driving licence for the vehicle to be tested and must not be under the influence of alcohol, drugs or medication that impairs driving ability.
- Perform regular visual inspections for damage in lines, hoses, actuators and sensors. If there are any defects or damage, the test stand must not be operated.
- Replace hydraulic hoses which are installed depending on the option (e.g. roller set lift) according to the specifications of DIN 20066 (or according to the locally applicable regulations, directives and standards) and carry out an assessment of the functional capability at regular intervals.
- The system must only be operated within its performance limits.
- The system must only be operated by instructed staff (qualified persons).
- When the system is not being used, it must be switched off and the main switch must be secured with a padlock to prevent it from being switched back on.
- In emergency situations, switch off the system with the emergency stop main switch or emergency stop pushbutton.
- Rotating or moving parts (e.g. test stand rollers) are dangerous.
- When vehicle engines are running in enclosed spaces, there is a risk of poisoning. The operator must ensure that there is sufficient air exchange.
- Unnecessary stress to the vehicle and test stand must be avoided.
- Once the vehicle is positioned in the roller set with the driven axle, the roller set must only be exited with the roller drive running. To protect the drive motors, an automatic test roller engagement takes place in the event of impermissible acceleration of the axle. In conjunction with an exit aid (electromechanical motor brake or DC brake), it is also possible to drive out of the test stand when the test rollers are stationary.
- Never externally start a vehicle with the system or apply regenerative braking. This may cause damage to the test stand.
- Vehicle doors shall be closed during the test.
- The operator must not leave the vehicle during the inspection.
- Vehicles must never be parked in/on the roller set or on the optional ramps.

Parking in the security area is not allowed.

- The accessibility of the emergency stop switch and emergency stop pushbutton must be ensured.
- 

## 4.2 Safety Devices



### WARNING

The safety devices (some of them optional) must be inspected regularly by an authorised service technician. Statutory requirements must be observed. *The test stand must not be operated with defective safety devices!*

---

- **Lockable main switch**

Used for ordinary switching on and off of the system and as emergency stop switch. The switch can be secured with a padlock to prevent unauthorised activation.

- **Emergency stop pushbutton**

Used for rapid switch-off during operation. It interrupts the movement. (Does not apply in the case of MSD axle damping tester!)

- **Indicator light “Control ON”**

The indicator light warns of a test stand that is ready to start. An independent start-up of the test rollers is also possible without an active display (e.g. TV set, monitor, smart device).

- **Start-up monitoring**

The start-up monitoring prevents the rollers from starting up if the wheels are locked up (bearing jammed, brake pads stuck). This device protects the vehicle/the vehicle’s tyres from damage.

- **Sensing rollers**

The magnitude of the slip is determined from the comparison of the drive speed with the sensing roller speed. To start the test stand, both sensing rollers must be pressed within two seconds.

- **Visual and acoustic warning devices**

The visual and acoustic warning devices must be installed in a suitable position and must be clearly perceptible at all times. In the event of warning device failure, the test stand must be taken out of service until the device is fully functional once again.

- **Pit safety system**

The pit safety system serves to protect a person located in the working pit (in the test roller area) from unexpected start-up of the test rollers. National regulations for contactless protective devices must be observed by the operator.

- **Yellow and black marker tape**

The yellow and black marker tape around the roller set and pit serves to cordon off the test stand and must be replaced if defective.

Item no. 19 6014 (38 mm) / 19 6015 (50 mm).

- **Warning and information signs**

Warning and information signs are affixed to the test stand. They must not be changed or removed. Defective warning and information signs must be replaced (for item no., see below).



54 2132



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## 4.3 Preparations

### 4.3.1 Switching on the Test stand

Set main switch -Q1 to position "I".

### 4.3.2 Variant 1: Establishing a Network Cable Connection

- Connect a PC or notebook (NB) to the central module (ZM) via network cable (Ethernet port X13 "MAHA").
- Alternatively, a WiFi access point can be connected to this Ethernet port X13, which usually offers four network interfaces. Then a PC/NB is connected to one of these interfaces. Other terminal devices can be connected to the other interfaces (e.g. analogue display or C\_BOX when using a TV monitor as a simultaneous display).
- Switch on PC/NB, log in after booting, open browser.
- Call the start page in the browser via the address: [http://maha-mbt\(.maha\)](http://maha-mbt(.maha)) (or <http://192.168.201.1>).
- Once the connection is established, the measurement screen is displayed (depending on the configuration for cars or trucks, see section "Description of the Software User Interface").

#### Info:

Alternatively, free QR code generators can be found on the Internet, which can be used to generate a personal QR code for the CONNECT brake tester.

If this is photographed (e.g. on iOS devices) or scanned with a QR code scanner app, the standard browser is automatically opened and the Internet address entered.



### 4.3.3 Variant 2: Establishing a WiFi Connection

If the test stand is to be controlled wirelessly, a WiFi router (e.g. TP-Link) can optionally be connected to the ZM (Ethernet X13 MAHA). This creates a separate WiFi for the brake tester and enables networking with corresponding accessories (e.g. analogue display, C\_BOX). This makes it possible to use browser-capable smart devices (SmartPhone, tablet PC) in addition to the PC/NB to operate the brake tester and display the measured values.

#### Windows PC

#### Info:

On the underside of the router, there is a label that indicates the name next to "SSID" and the wireless password next to "PIN". The router must be configured as an access point according to MAHA specifications (see section "Accessories > Configuration of WiFi Router").

- Connect WiFi router “TP-Link” with power supply and switch on.
- In the Network and Sharing Center, select WiFi router SSID “TP\_LINK\_xxxx” and establish a connection.
- Enter the wireless password “PIN”.



### Mobile devices (Android or iOS)

#### Info:

On the bottom of the optionally available WiFi router there is a label on which the name is printed next to "SSID" and the wireless password next to "PIN".

- Connect WiFi router “TP-Link” with power supply and switch on.
- On the mobile device, open the WiFi menu under “Settings”.

The device will now search for available WiFi devices.

- Select TP\_LINK\_xxxx.
- Enter password.

If no WiFi device is found, the connection must be set up manually using the SSID and the PIN.

#### Info:

Alternatively, free QR code generators can be found on the Internet, which can be used to generate a personal QR code for the CONNECT brake tester.

If this is photographed (e.g. on iOS devices) or scanned with a QR code scanner app, the WiFi menu is automatically opened and the SSID entered (barcode shown is an example only).



#### 4.3.4 Variant 3: Integration of the Test stand into Company Network

Alternatively, the ZM of the test stand can also be integrated into a company network. For this purpose, the Ethernet port X12 "EXT" can be configured analogue to a LAN interface of a PC, see section "General/Network":

This means that the brake tester can be reached within the network by connecting a computer via network cable to a usual network socket of this network. If this network also offers WiFi access, it is possible for the test stand to be operated directly via WiFi-capable terminals:

- Turn on computer/mobile device, log in after booting, open browser.
- Establish the browser connection as described above.

#### **ATTENTION:**

As soon as the test stand is available in the company network, it is visible and also accessible for all other network participants!

### 4.4 Test Procedure

#### 4.4.1 Drive on Test stand

#### **NOTICE**

Drive slowly (walking speed), centrally and straight on the test stand. The left and right sensing rollers must be actuated simultaneously.

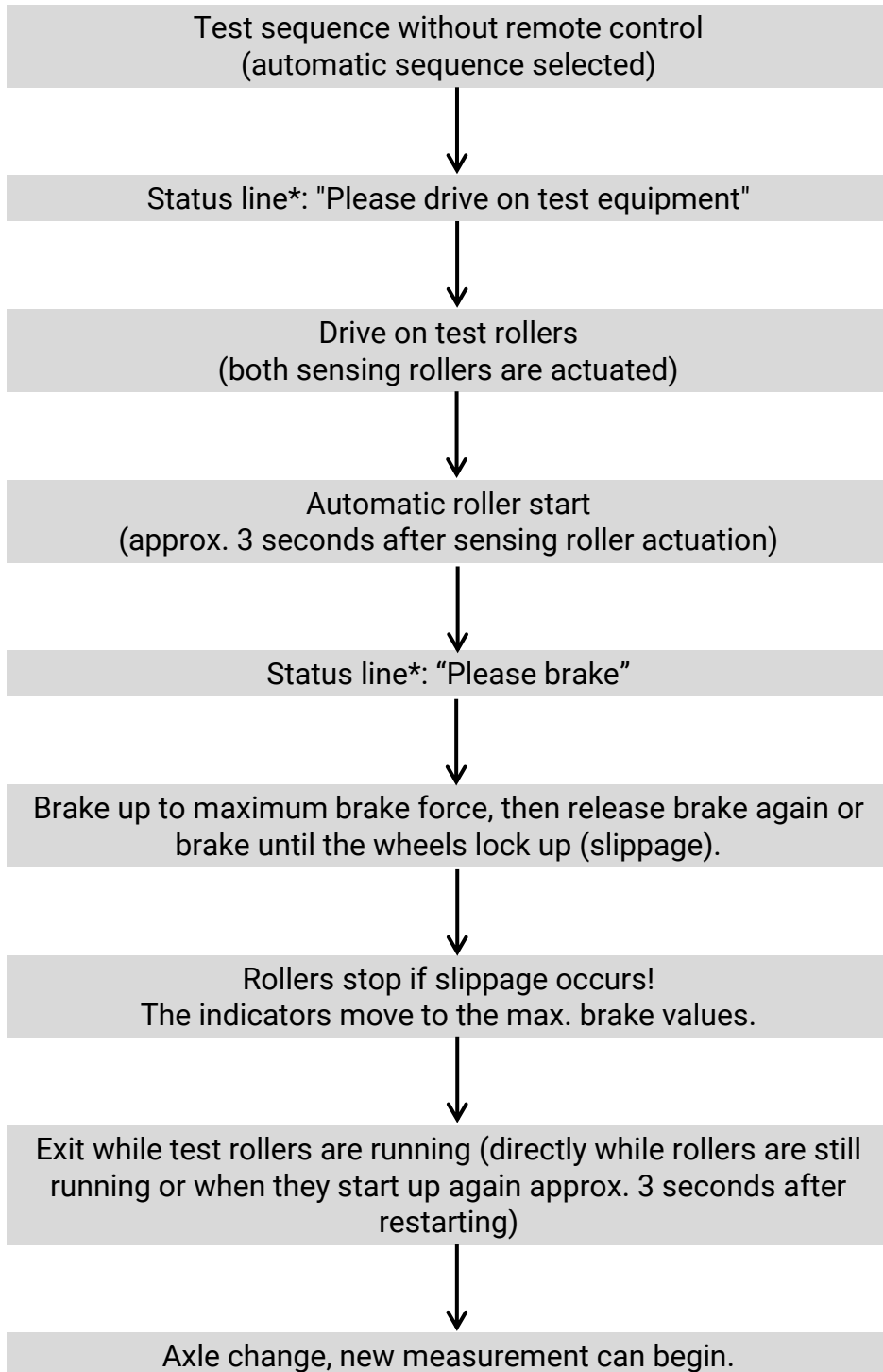
Position vehicles straight on roller set, for front wheel drive vehicles keep steering in straight ahead position during test.

---

#### 4.4.2 Carry out Brake Test with Automatic Sequence

**Info:**

A computer with monitor, a TV or a SmartDevice is required for operation.



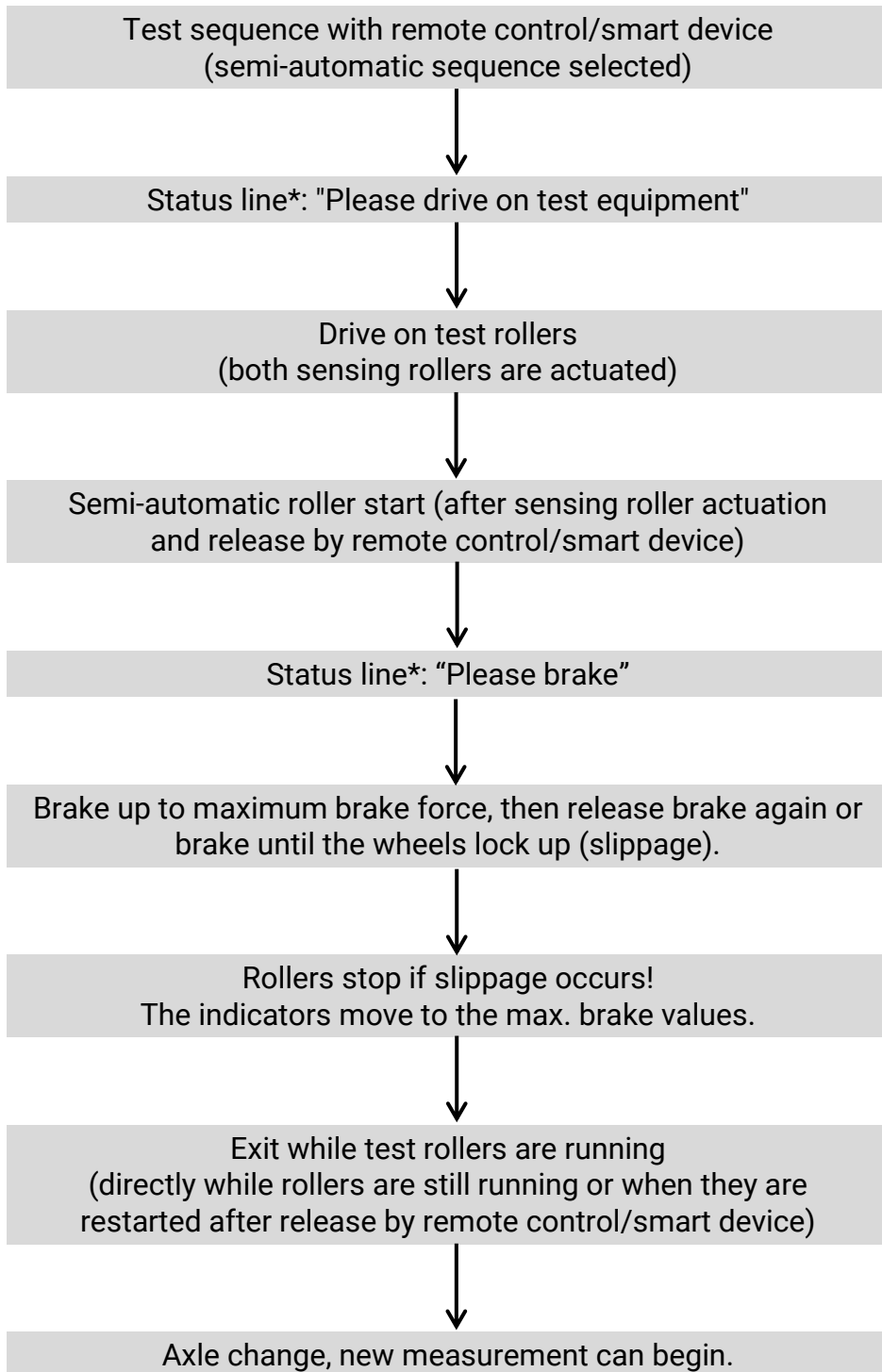
\*In conjunction with monitor display



### 4.4.3 Carry out Brake Test with Semi-Automatic Sequence

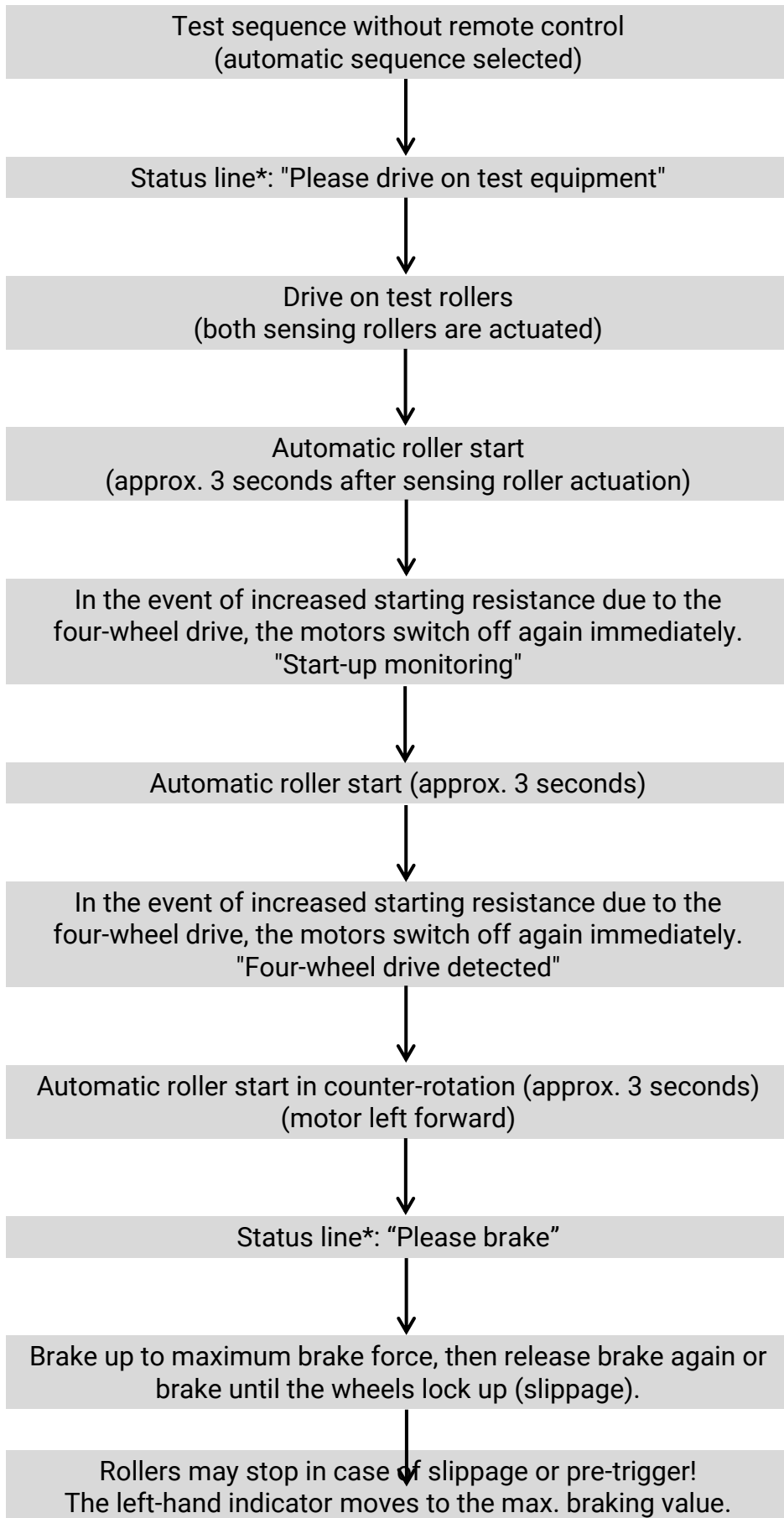
**Info:**

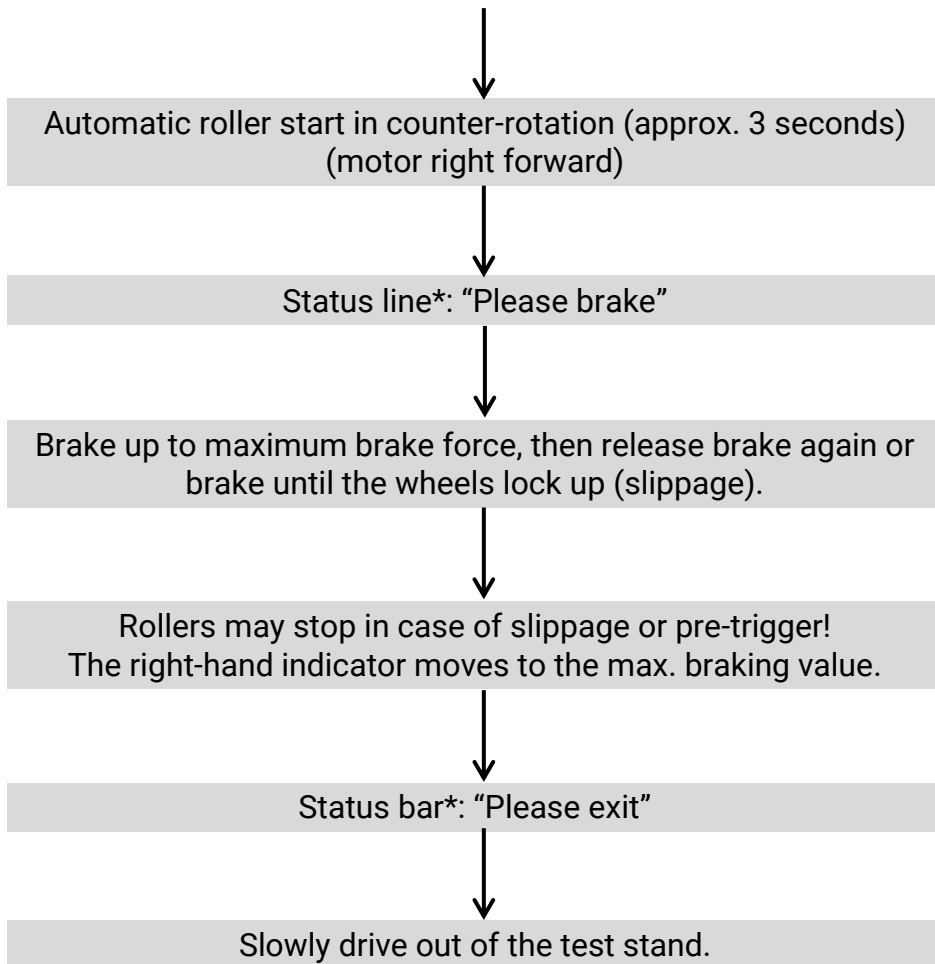
A computer with monitor, a TV or a SmartDevice is required for operation.



\*In conjunction with monitor display

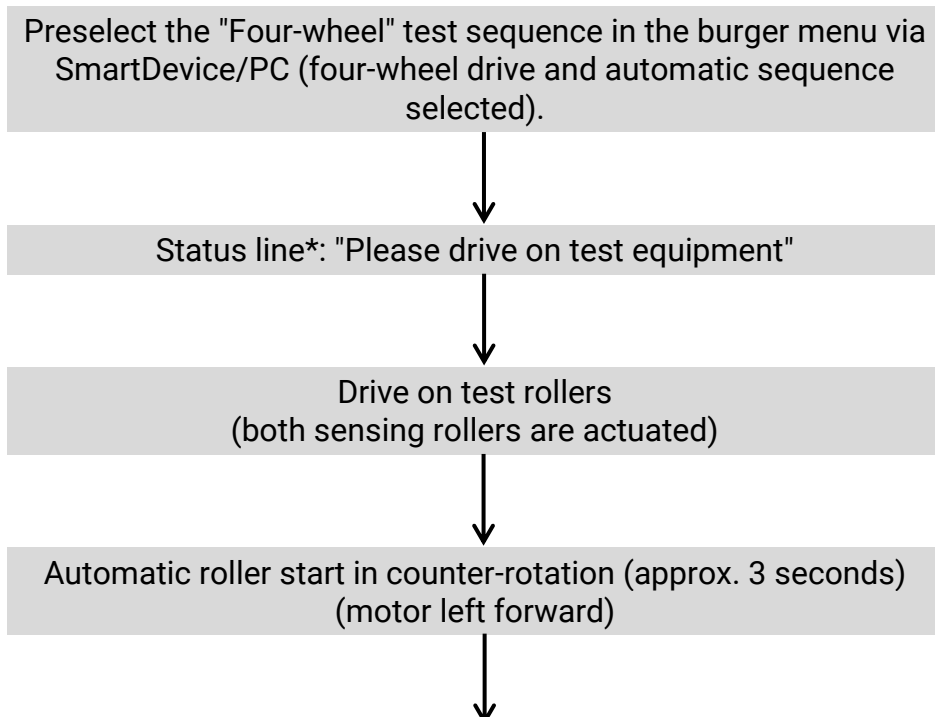
#### 4.4.4 Carry out 4WD Brake Test with SmartDevice/PC in Automatic Mode

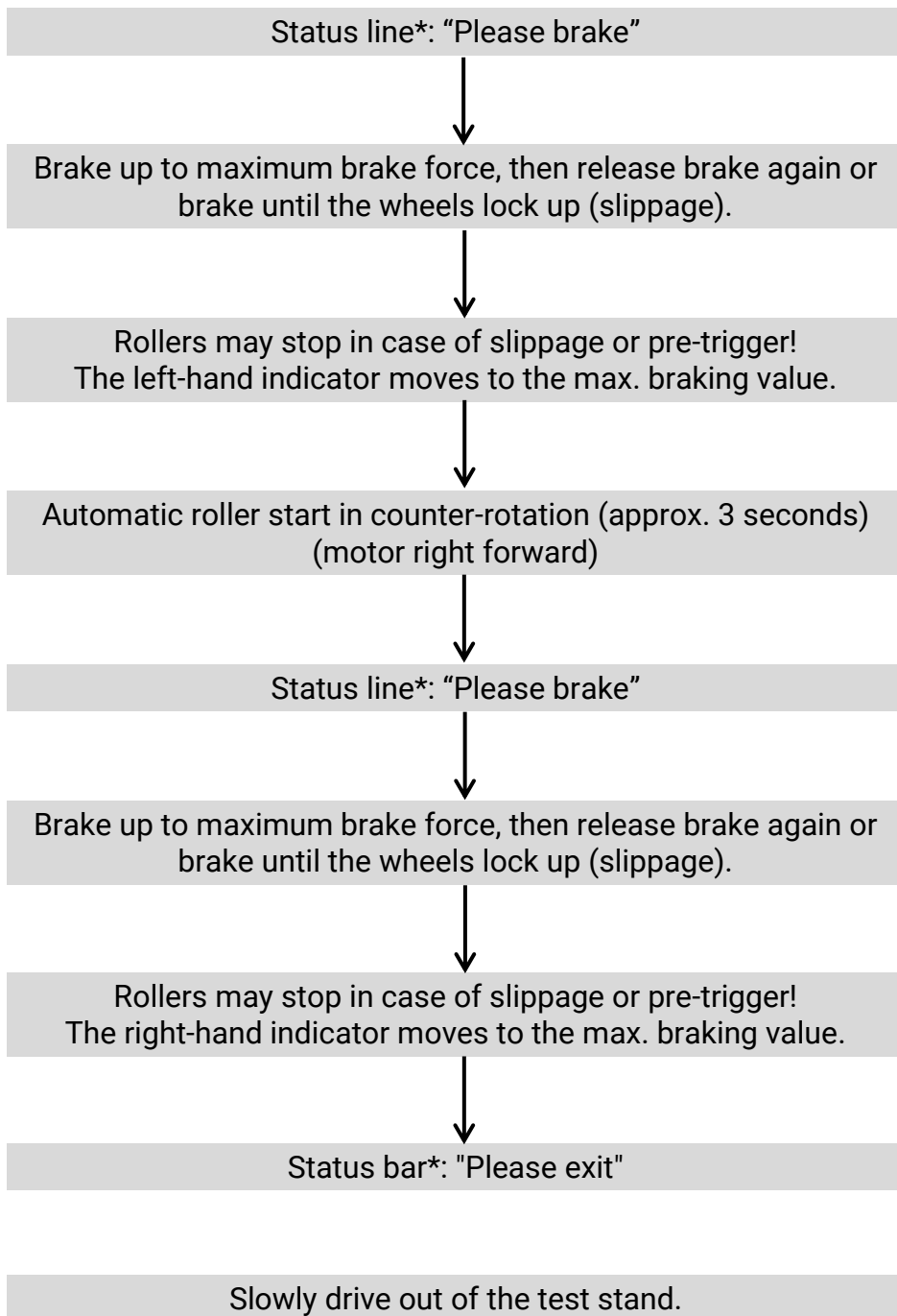




\*In conjunction with monitor display

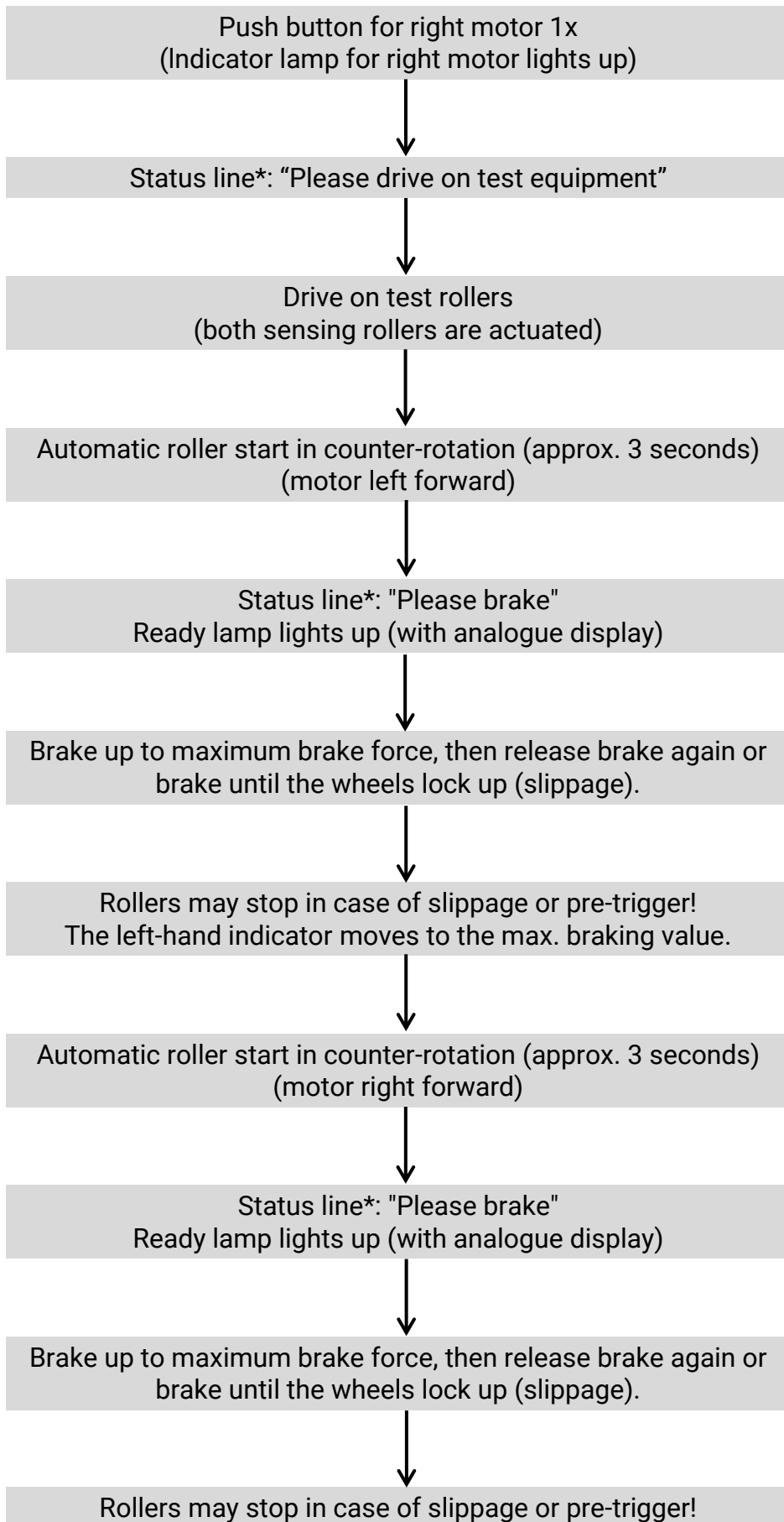
#### 4.4.5 Carry out Manual 4WD Brake Test with SmartDevice/PC in Counter-Rotation Mode





\*In conjunction with monitor display

#### 4.4.6 Carry out 4WD Brake Test in Counter-Rotation Mode with Pushbutton on Control Cabinet



The right-hand indicator moves to the max. braking value.

Status bar\*: "Please exit"

Slowly drive out of the test stand.

\*In conjunction with monitor display

#### 4.4.7 Carry out Manual Single-Wheel Brake Test with SmartDevice/PC

Preselect test sequence "Single wheel left or right" in the burger menu via SmartDevice/PC.

Drive on test rollers  
(both sensing rollers are actuated)

Automatic roller start of left motor (exemplary, if left preselected) (approx. 3 seconds after sensing roller actuation)

Status line\*: "Please brake"  
Ready lamp lights up (with analogue display)

Brake up to maximum brake force, then release brake again or brake until the wheels lock up (slippage).

Rollers may stop in case of slippage or pre-trigger!  
The left-hand indicator moves to the max. braking value.

Automatic roller start (approx. 3 seconds)  
(motor left)

Status line\*: "Please brake"

Brake up to the maximum braking force, then release the brake again or brake until the wheel locks (slippage).



Rollers may stop in case of slippage or pre-trigger!  
The right-hand indicator moves to the max. braking value.

\*In conjunction with monitor display

**Info:**

A change of the wheel side left/right is possible by means of SmartDevice/PC when the test stand is in use.

**4.4.8 Carry out Single-Wheel Brake Test with Pushbutton on Control Cabinet**

Push button for right motor 2x  
(indicator lamp of right-hand motor is flashing)



Status line\*: "Please drive on test equipment"



Drive on test rollers  
(both sensing rollers are actuated)



Automatic roller start of the left motor  
(approx. 3 seconds after sensing roller actuation)



Status line\*: "Please brake"  
Ready lamp lights up (with analogue display)



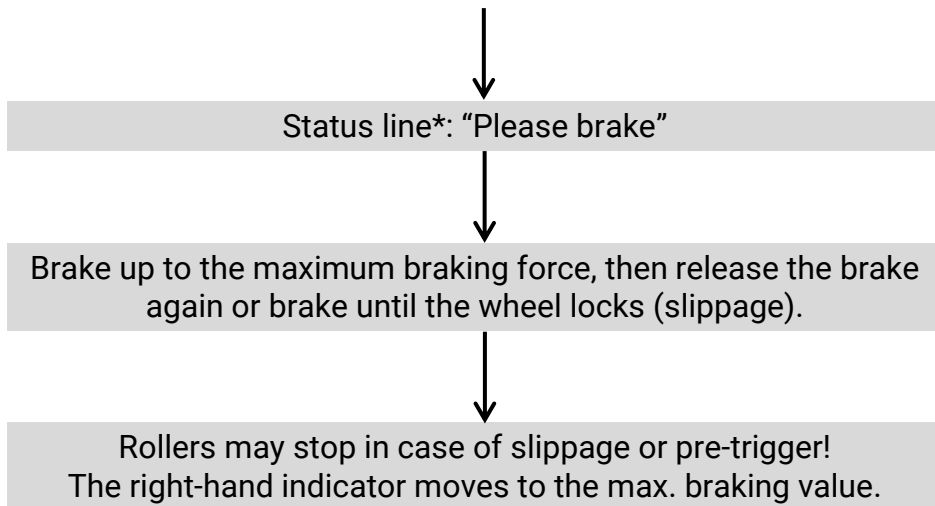
Brake up to the maximum braking force, then release the brake again or brake until the wheel locks (slippage).



Rollers may stop in case of slippage or pre-trigger!  
The left-hand indicator moves to the max. braking value.



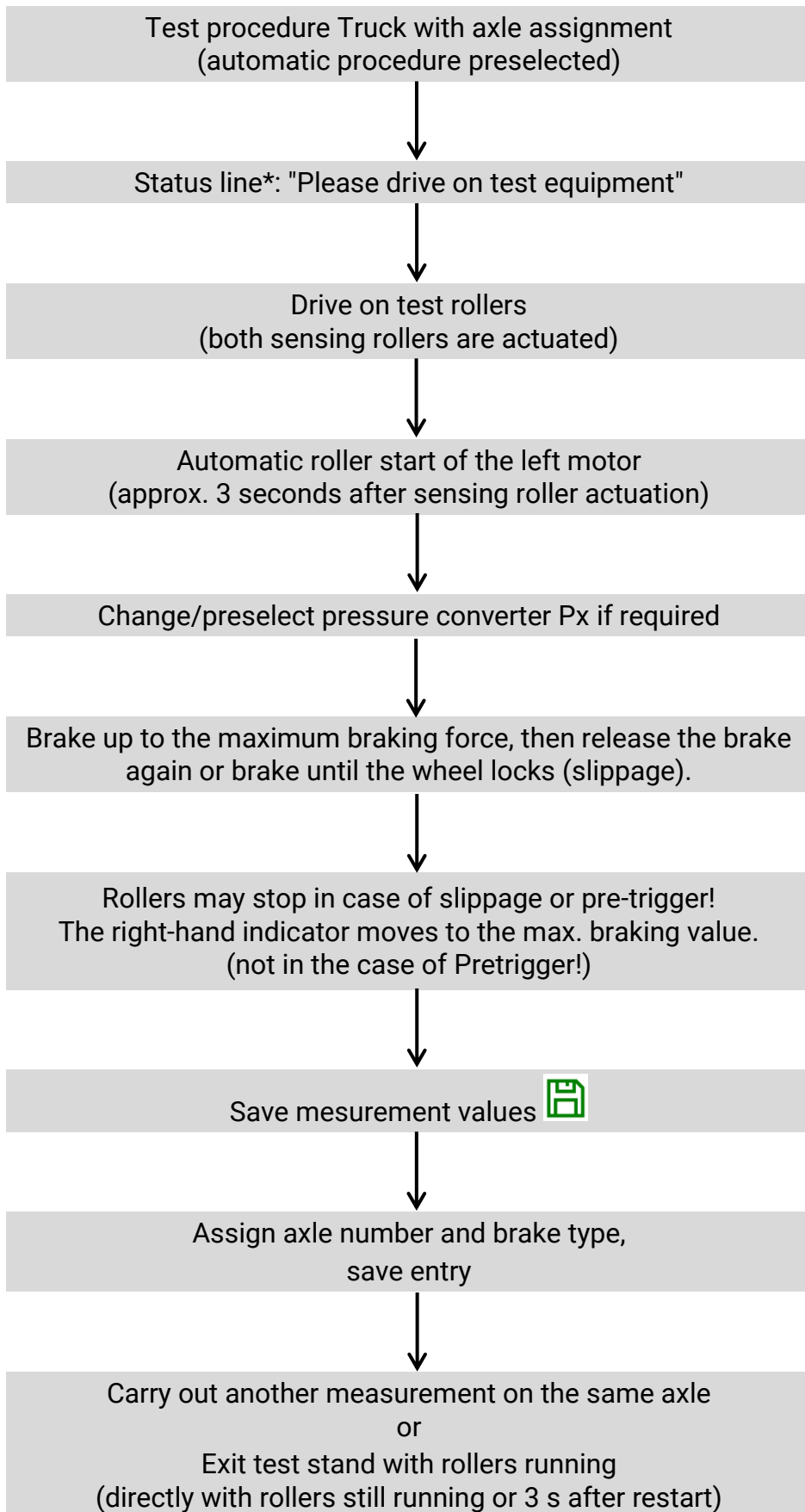
Automatic roller start (approx. 3 seconds)  
(motor left)



\*In conjunction with monitor display



#### 4.4.9 Test Procedure Truck with Axle Assignment (Automatic Procedure preselected)





Axle change, new measurement can be started.

#### 4.4.10 Drive off Test stand

Depending on the equipment, the following must be observed when leaving the test stand:

##### **NOTICE**

Do not drive the vehicle out of the test stand with the rollers stationary.  
Exception: Static extension aid is available.

---

##### **a Dynamic exit aid with automatic start**

Wait until rollers have been automatically restarted. Then drive the vehicle out of the test stand.

##### **b Dynamic exit aid with semi-automatic system**

Start rollers by releasing the semi-automatic. Then drive the vehicle out of the test stand.

##### **c Dynamic exit aid with start via RECO remote control**

Start rollers via RECO remote control. Then drive the vehicle out of the test stand.

##### **d Static exit aid (DC brake or electromechanical motor brake)**

Vehicle may be driven out of the test stand even with the rollers stationary.

##### **NOTICE**

In case of malfunction or failure of the motor brake or the automatic / semi-automatic roller start, it is possible to activate the exit aid with the drive axle of the vehicle:

- Slowly accelerate the vehicle in the test stand in the forward direction of travel.
- At approx. 3 km/h the rollers are switched on automatically by the test stand and the vehicle can be driven out of the test stand by moderate further acceleration.

**Attention:** The test stand starts automatically! Excessive acceleration can cause damage to the test stand.

---

## 4.5 Deceleration Table

Axle load in kg	Axle brake force in kN															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
200	50	100														
300	33	67	100													
400	25	50	75	100												
500	20	40	60	80	100											
600	17	33	50	67	83	100										
700	14	29	43	57	71	86	100									
800	13	25	38	50	63	75	88	100								
900	11	22	33	44	56	67	78	89	100							
1000	10	20	30	40	50	60	70	80	90	100						
1100	9	18	27	36	45	55	64	73	82	91	100					
1200	8	17	25	33	42	50	58	67	75	83	92	100				
1300	8	15	23	31	38	46	54	62	69	77	85	92	100			
1400	7	14	21	29	36	43	50	57	64	71	79	86	93	100		
1500	7	13	20	27	33	40	47	53	60	67	73	80	87	93	100	
1600	6	13	19	25	31	38	44	50	56	63	69	75	81	88	94	100

**Deceleration in %**

## 5 Troubleshooting

### 5.1 Safety Instructions



#### WARNING

- The control cabinet must be positioned in such a way that the emergency stop main switch or the emergency stop pushbutton (optional) is located in the immediate vicinity of the test stand at a height of 0.6...1.7 m above the stand level and can be assigned to the correct test stand in the case of test halls with several systems. This is necessary in order to fulfil the emergency stop function according to DIN EN ISO 13850. The "Control On" status light shall be fully visible from the test site.
  - Electrical work must only be performed by a specialist electrician in compliance with the national regulations, directives and standards. Accordingly, an electrical test/measurement must also be carried out and recorded.
  - All parts of the electrical equipment must be protected from moisture and humidity.
  - Even when the main switch is switched off, parts of the optional control cabinet heater (components, terminals, cores, cables, etc.) are still live.
  - During service work, the system must be depressurised and de-energised.
  - For all work in the roller set, it must be ensured that the main switch is switched off and secured against being switched back on and, where applicable, that the motor circuit breakers are switched off.
  - For work in the control cabinet or on the roller sets, be aware of the (optional) heater or hot parts.
  - Due to the coordination used in accordance with IEC 60947, the switching elements (contactors) in the associated circuit must be replaced after a short-circuit/ housing short-circuit, and also if the B10d value of 1,300,000 switching cycles in accordance with DIN EN ISO 13849-1/-2 is exceeded. Before connecting the supply cable, it must be ensured that it is de-energised and, among other things, that the 5 safety rules are observed.
  - Safety goggles must be worn when working on hydraulic/pneumatic components.
-

## 5.2 Error Codes

Description:

Error codes have a 5-digit notation according to the scheme "YY0XX"

- YY stands for the error code group (e.g. 32 "Speed sensor of the left sensing roller")
- 0 serves here as separator
- XX stands for the subcategory of the respective error code group (e.g. 00 for short circuit, 01 for cable break)
- Complete exemplary error code:  
32001 "Cable break at the speed sensor of the left sensing roller"

**Info:**

- All error codes are written to a log file and can be read out if required, see section "Operation > Settings > Event logging".
- On a C\_MSA analogue display, only the error code group is indicated by the two pointers; the complete 5-digit error code must be taken from the log file.

<i>Error code</i>	<b>01000</b>
<i>Description</i>	Incomplete adjustment of brake force
<i>Possible solution</i>	Carry out adjustment of brake force
<i>Error code</i>	<b>02000</b>
<i>Description</i>	Incomplete adjustment of weighing device
<i>Possible solution</i>	Carry out adjustment of weighing device
<i>Error code</i>	<b>03000</b>
<i>Description</i>	Incomplete adjustment of side-slip tester
<i>Possible solution</i>	Carry out adjustment of side-slip tester
<i>Error code</i>	<b>10002</b>
<i>Description</i>	CAN bus error
<i>Possible solution</i>	Check CAN cable between ZM X1 and IFM X1 Check CAN address at IFM
<i>Error code</i>	<b>10003</b>
<i>Description</i>	CAN bus error
<i>Possible solution</i>	Check CAN cable between ZM X2 and radio receiver X4
<i>Error code</i>	<b>10005</b>
<i>Description</i>	UART error
<i>Possible solution</i>	Check supply voltage at X1 Perform software update
<i>Error code</i>	<b>10006</b>

<i>Description</i>	CAN bus error
<i>Possible solution</i>	Check CAN addresses at the IFM
<i>Error code</i>	<b>10007</b>
<i>Description</i>	CAN bus error
<i>Possible solution</i>	Check configuration "Split roller set" in MBT options Check CAN addresses at the IFM
<i>Error code</i>	<b>10008</b>
<i>Description</i>	IFM error
<i>Possible solution</i>	Check number of connected IFMs
<i>Error code</i>	<b>10009</b>
<i>Description</i>	IFM error
<i>Possible solution</i>	Check CAN cable between ZM X1 and IFM X1
<i>Error code</i>	<b>10011</b>
<i>Description</i>	Adjustment error
<i>Possible solution</i>	Check sensitivity values in Brake force adjustment menu
<i>Error code</i>	<b>10012</b>
<i>Description</i>	Adjustment error
<i>Possible solution</i>	Check sensitivity and offset values in Brake force adjustment menu
<i>Error code</i>	<b>10013</b>
<i>Description</i>	Adjustment menu
<i>Possible solution</i>	Check offset values in Brake force adjustment menu
<i>Error code</i>	<b>10016</b>
<i>Description</i>	MSD communication error X17
<i>Possible solution</i>	Check RS232 connection between MSD and IFM MSD axle damping tester can be disabled in the service menu
<i>Error code</i>	<b>14000</b>
<i>Description</i>	Emergency stop pushbutton
<i>Possible solution</i>	Release emergency stop pushbutton
<i>Error code</i>	<b>14003</b>
<i>Description</i>	Emergency stop
<i>Possible solution</i>	Drive from test stand Perform restart of test stand

<i>Error code</i>	<b>14006</b>
<i>Description</i>	Emergency stop Test stand driven on one side
<i>Possible solution</i>	Drive from test stand and drive on both sides
<i>Error code</i>	<b>14007</b>
<i>Description</i>	Emergency stop Vehicle does not match configuration
<i>Possible solution</i>	Correct vehicle configuration
<i>Error code</i>	<b>14012</b>
<i>Description</i>	Emergency stop Radio remote control
<i>Possible solution</i>	Release emergency stop on radio remote control
<i>Error code</i>	<b>14013</b>
<i>Description</i>	Emergency stop Incorrect IFM configuration
<i>Possible solution</i>	Check number of IFMs and CAN addresses
<i>Error code</i>	<b>14027</b>
<i>Description</i>	Emergency stop Voltage supply IFM and radio receiver
<i>Possible solution</i>	Check CAN connection between ZM X1 and IFM X1 Check voltage supply at radio receiver X7
<i>Error code</i>	<b>14028</b>
<i>Description</i>	Emergency stop Communication error to radio receiver
<i>Possible solution</i>	Check CAN connection to radio receiver
<i>Error code</i>	<b>14035</b>
<i>Description</i>	Emergency stop Initialisation error
<i>Possible solution</i>	Check connectors X4 and X5 on the IFM
<i>Error code</i>	<b>14040</b>
<i>Description</i>	Emergency stop Motor contactor query
<i>Possible solution</i>	Check contactor for defects
<i>Error code</i>	<b>14050</b>
<i>Description</i>	Emergency stop Pit safety device
<i>Possible solution</i>	Acknowledge pit safety
<i>Error code</i>	<b>14051</b>
<i>Description</i>	Emergency stop Overfloor protection
<i>Possible solution</i>	Release overfloor protection
<i>Error code</i>	<b>14060</b>
<i>Description</i>	Emergency stop No radio remote control paired
<i>Possible solution</i>	Pair radio remote control with radio receiver

<i>Error code</i>	<b>22000</b>
<i>Description</i>	Motor circuit breaker has tripped
<i>Possible solution</i>	Drive from test stand Set motor protection switch to "ON"
<i>Error code</i>	<b>32000</b>
<i>Description</i>	Speed sensor left sensing roller X9
<i>Details</i>	Short circuit
<i>Error code</i>	<b>32001</b>
<i>Description</i>	Speed sensor left sensing roller X9
<i>Details</i>	Cable break
<i>Error code</i>	<b>34000</b>
<i>Description</i>	Speed sensor right sensing roller X10
<i>Details</i>	Short circuit
<i>Error code</i>	<b>34001</b>
<i>Description</i>	Speed sensor right sensing roller X10
<i>Details</i>	Cable break
<i>Error code</i>	<b>35000</b>
<i>Description</i>	Speed sensor left test roller X11
<i>Details</i>	Short circuit
<i>Error code</i>	<b>35001</b>
<i>Description</i>	Speed sensor left test roller X11
<i>Details</i>	Cable break
<i>Error code</i>	<b>35002</b>
<i>Description</i>	Speed sensor left test roller X11
<i>Possible solution</i>	Check sensor distance to sprocket (approx. 2 mm)
<i>Error code</i>	<b>37000</b>
<i>Description</i>	Speed sensor right test roller X12
<i>Details</i>	Short circuit
<i>Error code</i>	<b>37001</b>
<i>Description</i>	Speed sensor right test roller X12
<i>Details</i>	Cable break
<i>Error code</i>	<b>37002</b>
<i>Description</i>	Speed sensor right test roller X12
<i>Possible solution</i>	Check sensor distance to sprocket (approx. 2 mm)



<i>Error code</i>	<b>40000</b>
<i>Description</i>	Zero point error Brake force
<i>Possible solution</i>	Restart test stand Check range spring clearance Check connectors X7 and X8 on IFM
<i>Error code</i>	<b>40001</b>
<i>Description</i>	Zero drift brake force left > 5 daN
<i>Possible solution</i>	Check strain gauge play
<i>Error code</i>	<b>40002</b>
<i>Description</i>	Zero drift brake force right > 5 daN
<i>Possible solution</i>	Check strain gauge play
<i>Error code</i>	<b>40003</b>
<i>Description</i>	Zero drift brake force between left and right > 5 daN
<i>Possible solution</i>	Check strain gauge play
<i>Error code</i>	<b>40004</b>
<i>Description</i>	Deviation from adjusted zero point left too large
<i>Possible solution</i>	Check strain gauge play Contact service
<i>Error code</i>	<b>40005</b>
<i>Description</i>	Deviation from adjusted zero point left too large
<i>Possible solution</i>	Check strain gauge play Contact service
<i>Error code</i>	<b>40006</b>
<i>Description</i>	Zero point drift left not normal: Brake tester locked
<i>Possible solution</i>	Check strain gauge play Turn off main switch and back on again Contact service
<i>Error code</i>	<b>40007</b>
<i>Description</i>	Zero point drift right not normal: Brake tester locked
<i>Possible solution</i>	Check strain gauge play Turn off main switch and back on again Contact service
<i>Error code</i>	<b>41000</b>
<i>Description</i>	Drive-on sensor left X4
<i>Details</i>	Short circuit

<i>Error code</i>	<b>41001</b>
<i>Description</i>	Drive-on sensor left X4
<i>Details</i>	Cable break
<i>Error code</i>	<b>41002</b>
<i>Description</i>	One-side drive-on detected on the left
<i>Possible solution</i>	Drive on test stand on both sides Check sensor distance of sensor X4
<i>Error code</i>	<b>42000</b>
<i>Description</i>	Drive-on sensor right X5
<i>Details</i>	Short circuit
<i>Error code</i>	<b>42001</b>
<i>Description</i>	Drive-on sensor right X5
<i>Details</i>	Cable break
<i>Error code</i>	<b>42002</b>
<i>Description</i>	One-side drive-on detected on the right
<i>Possible solution</i>	Drive on test stand on both sides Check sensor distance from sensor X5
<i>Error code</i>	<b>50000</b>
<i>Description</i>	Zero point error Weighing device
<i>Possible solution</i>	Unload the weighing device Perform restart of test stand
<i>Error code</i>	<b>50001</b>
<i>Description</i>	Zero point error Weighing device left
<i>Possible solution</i>	Unload the weighing device Perform restart of test stand
<i>Error code</i>	<b>50002</b>
<i>Description</i>	Zero point error weighing device right
<i>Possible solution</i>	Unload the weighing device Perform restart of test stand
<i>Error code</i>	<b>50003</b>
<i>Description</i>	Zero drift scale left > 10 daN
<i>Possible solution</i>	Unload the weighing device
<i>Error code</i>	<b>50004</b>
<i>Description</i>	Zero drift scale right > 10 daN

<i>Possible solution</i>	Unload the weighing device
<i>Error code</i>	<b>50005</b>
<i>Description</i>	Zero drift scale between left and right > 10 daN
<i>Possible solution</i>	Unload the weighing device
<i>Error code</i>	<b>50006</b>
<i>Description</i>	Deviation from adjusted zero point left too large
<i>Possible solution</i>	Unload the weighing device Contact service
<i>Error code</i>	<b>50007</b>
<i>Description</i>	Deviation from adjusted zero point right too large
<i>Possible solution</i>	Unload the weighing device Contact service
<i>Error code</i>	<b>50008</b>
<i>Description</i>	Zero point drift left not normal: Brake tester locked
<i>Possible solution</i>	Unload the weighing device Turn off main switch and back on again Contact service
<i>Error code</i>	<b>50009</b>
<i>Description</i>	Zero point drift right not normal: Brake tester locked
<i>Possible solution</i>	Unload the weighing device Turn off main switch and back on again Contact service
<i>Error code</i>	<b>51000</b>
<i>Description</i>	Vehicle on test stand when switching on
<i>Possible solution</i>	Drive from test stand (exit aid is enabled 1x)
<i>Error code</i>	<b>60000</b>
<i>Description</i>	Different firmware
<i>Possible solution</i>	Update firmware of ZM safety controller (update cable required) Update firmware of IFM safety controller (update cable required) Restart the entire system
<i>Error code</i>	<b>61000</b>
<i>Description</i>	Different firmware
<i>Possible solution</i>	Update firmware of radio receiver Restart the entire system
<i>Error code</i>	<b>70000</b>

<i>Description</i>	Zero point error Side-slip tester
<i>Possible solution</i>	Test plate must not be driven on Perform restart of test stand
<i>Error code</i>	<b>71000</b>
<i>Description</i>	Collision sensor Side-slip tester X19
<i>Details</i>	Short circuit
<i>Error code</i>	<b>71001</b>
<i>Description</i>	Collision sensor Side-slip tester X19
<i>Details</i>	Cable break
<i>Error code</i>	<b>72000</b>
<i>Description</i>	Drive-off sensor Side-slip tester X20
<i>Details</i>	Short circuit
<i>Error code</i>	<b>72001</b>
<i>Description</i>	Drive-off sensor Side-slip tester X20
<i>Details</i>	Cable break

## **6 Declaration of Conformity**

See following page(s).



# Original-EG-Konformitätserklärung Original EC Declaration of Conformity

CE023001-de-en



## MAHA Maschinenbau Haldenwang GmbH & Co. KG

erklärt hiermit als Hersteller in alleiniger Verantwortung, dass nachstehend bezeichnetes Produkt in Konzeption und Bauart den grundlegenden Sicherheits- und Gesundheitsanforderungen der hier genannten Richtlinien entspricht.

Bei Änderungen am Produkt, die nicht von oben genannter Firma genehmigt wurden, verliert diese Erklärung ihre Gültigkeit.

herewith declares as a manufacturer its sole responsibility to ensure that the product named hereafter meets the safety and health regulations both in design and construction required by the directives stated below.

This declaration becomes void if any change is made to the product that was not approved by named company beforehand.

### Typ | Model

C\_MBT C/S 3.5 W220/W250  
C\_MBT C/S 4.0 W220/W250  
C\_MBT C/S 5.0 W280  
C\_MBT C 13.0 W280  
C\_MBT S 13.0 R100 MS/MU  
C\_MBT S 15.0 R100 MS/MU  
C\_MBT S 18.0 R115 MS/MU/MI  
C\_MBT S 18.0 R160 MS/MU  
C\_MBT M 18.0 W301  
C\_MBT T 18.0 W360  
C\_MBT S 20.0 R115 MU/MI  
C\_MBT S 20.0 R160 MU

### Seriennummer | Serial Number

### Bezeichnung | Designation

Rollen-Bremsprüfstand

Roller Brake Tester

Optionen: Achsdämpfungsprüfstand  
C\_MSD C/S 2.5 W220/W250  
C\_MSD C/S 13.0 W220/W250

Options: Shock Absorber Tester  
C\_MSD C/S 2.5 W220/W250  
C\_MSD C/S 13.0 W220/W250

Radlauftester  
C\_MINC 2.5/4.0/18.0

Side-Slip Tester  
C\_MINC 2.5/4.0/18.0

### Richtlinien | Directives

2006/42/EG; 2014/30/EU; 2014/53/EU (Option)

2006/42/EC; 2014/30/EU; 2014/53/EU (Option)

### Normen | Standards

EN 60204-1:2018; EN ISO 13849-1:2016-06; EN ISO 12100:2010

### Bevollmächtigter für die Zusammenstellung der technischen Unterlagen

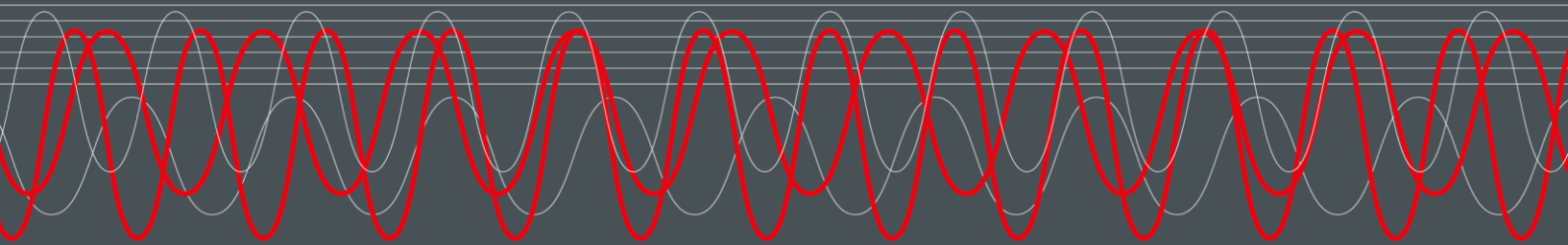
#### Person Authorised to Compile the Technical File

Ralf Kerkmeier, MAHA Maschinenbau Haldenwang GmbH & Co. KG, Hoyen 20, 87490 Haldenwang, Germany

Haldenwang, 2024-02-01

Dr. Peter Geigle  
Geschäftsführer | Managing Director





**MAHA MASCHINENBAU HALDENWANG GMBH & CO. KG**

Hoyen 20  
87490 Haldenwang  
Germany

☎ +49 8374 585 0  
✉ [maha@maha.de](mailto:maha@maha.de)  
🌐 [maha.de](http://maha.de)