

# **«Filter-MB» Technical Manual**



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### Unit Description

“Filter-MB” (v 2.5) unit (hereinafter referred to as “the unit”) is designed for Mercedes-Benz 220, 215, 230, 164, 171, 203, 209, 211, 219, 251, 463, 639 and Maybach (240) vehicles. The unit’s purpose is to remove the blocking of video feed on the original monitor, which is automatically blocked when the car starts moving.

The unit is connected to the CAN-bus breakage and matches with it on hardware and software levels. The unit is fully transparent for both the vehicle and diagnostic equipment and does not interfere with the vehicle electronic equipment operation and original video system control and functioning.

The unit can operate in one of two modes: active (ON) and passive (OFF).

The unit can be activated and deactivated with one of two original steering wheel buttons:  or  or with specially assigned alternate button. Below any of these buttons is mentioned as “controlling button”. Original buttons save their primary functions independently from the unit operation mode. Unit activation and deactivation is carried out with long pressing of the controlling button (for no less than 2 sec) when the ignition is ON.

In Mercedes-Benz 164 (ML-class and GL-class) and 251 (R-class) vehicles  and  steering wheel buttons will activate and deactivate the unit only in case of Comand is in original AV system control mode.

Activated unit removes video feed blocking from the original screen without interfering with other equipment’s operation.

Deactivated unit retransmits CAN-bus signals without changing them. In the meantime, vehicle equipment operation including the display is carried out in accordance with original algorithms.

Information about unit operation mode is stored in permanent memory and its condition will not change should the power be deactivated.

LED is used for indicating the unit’s condition. It can be installed in any place or not installed at all. If the unit is OFF or the ignition is OFF then LED is always OFF. When switching the unit ON the LED turns ON for no less than 4 sec then shuts down. The LED indicates that the unit is ON by lighting with every pressing of control button for the time it is pressed and also by lighting for 4 sec when switching the ignition ON. For all the other cases, the LED is always OFF.

When the CAN-bus switches to hibernation mode, the unit enters the energy saving (standby) mode regardless of whether it is ON or OFF.

It is recommended to switch the unit OFF in case of: putting the car on maintenance in the service station, or when you need to use the standard navigation system and while you do not need to use the unit.

### Unit connection

#### General principles

Vehicle CAN-bus is pair of wires: CAN-L and CAN-H. Mercedes-Benz and Maybach vehicles are equipped with CAN-bus distributors.

#### Vehicle wiring colors:

In all Mercedes-Benz vehicles manufactured after 2001 and Maybach vehicles:

- CAN-L – brown
- CAN-H – brown with the red stripe.

In Mercedes-Benz vehicles with the first versions of 215 & 220 bodies (manufactured before 2001):

- CAN-L – white
- CAN-H – green.

Unit connection areas vary in different Mercedes-Benz vehicles. For Mercedes-Benz 211 and 219 (before 2008) the unit is to be connected to the breakage of the CAN-bus line connected to the Gateway unit (see fig. 2). For other Mercedes-Benz and Maybach vehicles the connection is made in the breakage of the CAN-bus line connected to Comand unit. In both cases it is necessary to make breakages in bus’s wires and insert the unit.

Unit port outputs are shown in Fig. 1.

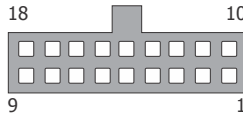


Fig. 1 Numeration of module terminal contacts, view from the side of wires..

Wire assignment is shown in Table 1

**Table 1. Unit port outputs assignment**

No	Wire Color	Type	Assignment
1	Black	Power supply	Ground
2	Brown	CAN 2	CAN-L vehicle data bus
3	Brown	CAN 1	CAN-L vehicle data bus
4	Green/Black	(-) Output	To the blue wire of the LED
5	Green/White	(-) Input	Alternative unit activation/deactivation button
6	-	-	-
7	-	-	-
8	-	-	-
9	-	-	-
10	Red	Power supply	+12V unit supply
11	Brown/Red	CAN 2	CAN-H vehicle data bus
12	Brown/Red	CAN 1	CAN-H vehicle data bus
13	Green	(+) Output	To the red wire of LED
14	-	-	-
15	-	-	-
16	-	-	-
17	-	-	-
18	-	-	-

CAN 1 and CAN 2 wire pairs of the unit are used for connecting the unit to vehicle's CAN bus: one of the pairs is connected to the bus from Comand (Gateway) unit's side, while the other is connected from distributor's side. It is irrelevant which line will be connected to Comand (Gateway) unit. It is important though not to mix CAN-H and CAN-L wires up.

The black wire coming from the contact No. 1 of the unit port is connected to the vehicle body in the areas defined by manufacturer for connection of the factory electrical equipment ground.

Unit's red wire is connected to the one of the car wires with +12V constant voltage by means of 3A fuse.

Green/white wire is connected to vehicle's ground via normally open alternative control button in case when the button installation is necessary.

#### Conenction recomendations

Prior to commencing installation works please disconnect the vehicle battery terminal.

There are two possible ways of connection to CAN-bus: connection near Comand (Gateway) unit's port and connection in the vicinity of the distributor

Connection option 1: – near Comand (Gateway) unit's port.

First, it is necessary to provide access to the ports of the unit to which the unit will be connected. For MB 211 and 219 the unit in question is Gateway. It is the large electronic unit located in the trunk, to the left (see Fig. 2).

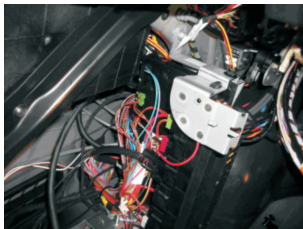


Fig. 2. CAN-bus line location in MB 211 and 219

For all other MB cars and Maybach this is Comand. It is located on the car central panel.

Then disconnect the port to which CAN bus is connected from this unit.

Then please write down all numbers of the unit contacts to which CAN-bus is connected (in order to remember colors and numbers of contacts correspondence). In this manual numeration of contacts is not mentioned because there are few different types of ports for Comand and Gateway units. CAN-bus wire colors description is shown at the page 2.

Next, disassemble the port, withdraw CAN-bus out of it and insert CAN-bus wires in the housing of the 2-contact port supplied in the delivery kit. Warning: CAN-H wire must be inserted into the contact No 1, while CAN-L is to be inserted into the contact No. 2. Connect the assembled 2-contact port to the counterpart of the wire harness of the module.

Insert the unit's wires with female-type connectors in place of withdrawn wires into the original vehicle port. Please note that the unit's CAN-L wire (brown) must be inserted instead of the factory CAN-L wire of the vehicle (see its color at page 2), CAN-H wire (red-brown) of the unit is inserted in place of original CAN-H wire of the vehicle.

Comand unit's power supply wires come to the same connector as CAN-bus comes to. It is possible to connect supplying wires of the unit to the supplying wires of Comand unit.

Next step is assembling the original port and reconnecting it with Comand (Gateway) unit.

Connection option 2: – close to distributor.

Prior to unit connection it is necessary to assemble the 2-contact port supplied with the unit.

For Maybach and all MB cars, except for MB 220, 215, 230:

- insert the unit's twisted wire pair with female-type connectors is to be inserted into the housing included in the standard delivery kit: brown wire must be inserted into the contact No. 1, brown-red wire is to be inserted into the contact No 2.

For MB 220, 215, 230:

- Disassemble the 2-contact port that is already assembled in unit's wire harness and change the wires' locations so that the brown wire is inserted into the contact No. 1, the brown-red one - into the contact No. 2.

- Insert unit's twisted wire pair with female-type connectors into the housing included in the standard delivery kit: the brown wire is inserted into the contact No. 1, the brown-red one - into the contact No. 2.

After that find the distributor connected to CAN bus line from Comand (Gateway) and disconnect this line from the distributor. Insert 2-contact port of the unit in its place. Connect the second 2-contact port of the unit to the original vehicle port withdrawn from the distributor.

Procedure of the distributor disassembly is shown at Fig. 3

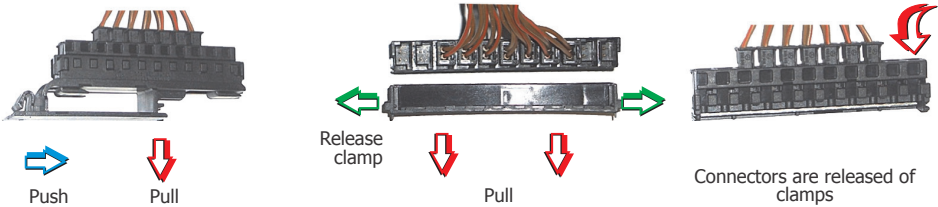


Fig. 3 Procedure of the distributor disassembly

Recommendations on finding the required wire pair in the distributor for Maybach and MB 164 cars.

The required distributor is located in the plastic panel, to the left from the driver`s feet. (see Fig. 4)



Fig. 4. Distributor location for 164 & 251 bodies (in the left plastic panel)

In order to remove the ports from the distributor it is necessary to remove the fixing strap. (see Fig. 3).

**Attention:** for the vehicles with 2008 and later version of Comand unit (see Fig. 5) Filter-MB unit is to be connected to the breakage of the CAN-bus line connected to Comand.



Fig. 5. 2008 and later version of Comand unit

Algorithm of finding for twisted pair wire coming from Comand unit:

1. Switch ACC mode ON (intermediate state of the ignition key, between ignition ON and OFF positions).
2. Switch Comand ON, set Tuner mode.
3. Adjust any radio wave.
4. Disconnect one of pairs from the distributor.
5. If the radio continues playing, insert the withdrawn connector back and go to the next one.
6. If Comand is switched off, probably you found necessary pair. Though it is necessary to double-check. In order to do that please check if front electric windows work to lift when pressing the corresponding button on the driver`s door.
7. If electric windows do not lift, insert the connector back into the distributor and check the next pair. If the electric windows are working when Comand is OFF, the required wire pair is found.

Therefore the required wire pair must correspond to following criteria: when it is disconnected from the distributor, Comand switches off, but the electric windows must work to lift when pressing the corresponding driver's door button.

Recommendation on finding the required wire pair in the distributor for certain MB models.

In MB 215 and 220 the required distributor is located in the plastic case which is located under the driver's carpet. Two twisted-pair wires have color marking located near the port. There is no sense in withdrawing them because they connect the distributors to each other.

For MB 220 cars manufactured after September 2003 equipped with optical MOST bus: when disconnecting the required port, Comand switches OFF in 3 sec and switches ON when connecting the port.

For the majority of vehicle models the following algorithm of finding the wire pair coming from Comand unit is applied:

1. Switch ACC and Comand on.
2. Set FM mode at Comand.
3. Make the panel show channel number with steering wheel menu option selection buttons.
4. Remove the protective cover from the distributor.
5. Remove the port from the distributor. If FM channel number disappears in 5 sec and reappears with the reconnection of the port, then you have selected the correct port.
6. If the port does not comply with the requirements of p. 5, please reconnect it to the distributor and repeat p. 5 until the necessary result is achieved. If all the ports have been tried and the required one has not been found, then the wrong distributor is studied.

**Table 2. Technical data and operation conditions**

Characteristic	Data
Voltage, V	9 ... 15
Max. current in working mode, mA	200
Max. current in standby mode, mA	1,5
Temperature, °C	- 40 ... + 85
Relative humidity, %	95

**Table 3. Standard delivery kit**

Item	Q-ty
Central unit	1 pc
Wire harness with terminal	1 pc
Plastic casing of two-contact terminal no 030 545 28 28	1 pc
LED indicator with wiring	1 pc
Technical Manual	1 pc
User memory card	1 pc
Package	1 pc

Product warranty is provided for 1 year since the moment of the sale if all the installation recommendations have been followed. In case of warranty case please contact to the company which sold this product to you.

Distributor \_\_\_\_\_ Date of sale \_\_\_\_\_



**AB75**

Manufacturer «TEC electronics» Ltd.  
Product is produced according to TY 4372-006-78025716-10.  
Certificate of origin No POCC RU.AB75.B00340  
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