

TJM In-Car Charger with DC/DC-Converter Manual

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Product Description

The TJM-DBM is multifunctional Dual Battery System with DC/DC charger technology.

New Alternator technologies like smart alternators or charge-reducing alternators require sophisticated dual battery systems to function correctly.

The DBM can be configured with IGN-Signal (Ignition) for correct detection if the car is running and charging. 3 different charge levels/battery types with or without an additional equalize mode are user selectable. The 3 or 4 charge modes such as Bulk / Absorption (with optional Equalize) and Float offer an effective charge which is superior to a conventional dual battery system.

The 3 main applications are In-Car Charger 12V/12V, In-Car Charger 24V/12V and Trailer Charger 12V/12V.

When used as In-Car Charger (12V/12V) there are different TJM modules which can be combined with the DBM to get special functionality or extra performance.

Before installing the DBM identify which alternator type is in use and which charge level the Aux battery requires.

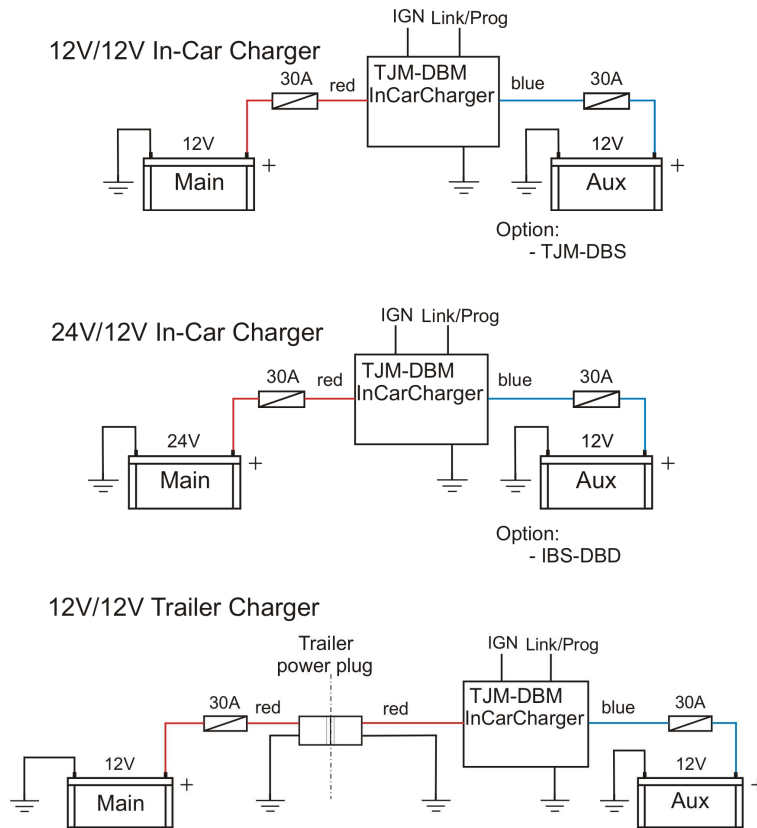
Warning

The installation and the startup process should only be done by people with training and experience in automotive electrical systems and battery technology.

The DBM is only designed to charge 12V Car batteries, like AGM, Calcium, special Li-Types and lead acid batteries. Other batteries such as non-rechargeable batteries must not be connected to the DBM. Some battery types produce explosive gases while charging. Installation specifications from the manufacturer must be considered.

Applications

In this overview the three main applications are shown with their options.



Technical Informations

The DBM provides a **3 to 4 step charging programm:**

1. Step: Bulk

The Bulk step is the first step of charging. In this step the battery is charged with a constant maximal charge current until chosen charge voltage is reached.

2. Step: Absorption

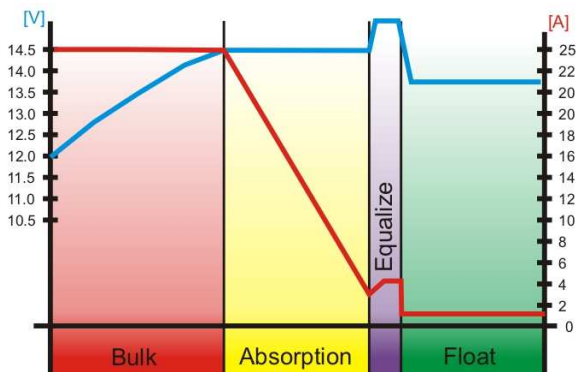
As soon as the chosen voltage is reached on the battery, the next step starts. While the absorption the most energy is charged into the battery. Here the charging current gets lower and lower while keeping the voltage constantly on chosen level.

3. Step: Optional Equalize

After current drops under 3 amps the optional equalize starts (only when configured and only once in a month at most). In this step the charger boosts the voltage for an additional 0.6V on the battery for a certain period. This forces the sulphation to be reversed which helps the battery to last longer and in a better state (**CAUTION:** not all the battery types are made for this step or need it. Instructions and specifications provided by the battery manufacturer must be considered!)

4. Step: Float

As the current drops below 3 amps in the absorption step, respectively the equalize is finished, the float step starts. As the charge procedure is finished at this point the charge voltage is reduced to 13.7V to counterbalance the self-discharge of the battery without overcharging it.



Programming the system

Procedure

1. Showing software version (automatically).
2. Configuration of charge level (manually)*.
3. Saving the selection (automatically).
4. Check for relay (automatically).
5. Indication if relay was found or not (automatically).
6. Change to Standby mode → configuration of system is complete (automatically).

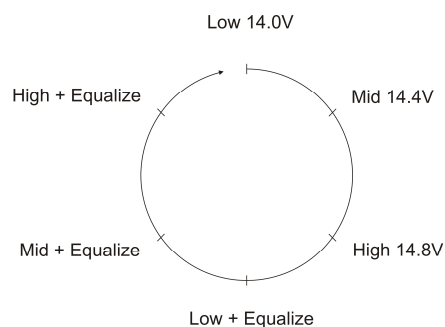
* For easy charge level selection it is most practical to leave the yellow (Prog/Link) wire open and finish first the configuration (contacting to GND) and only connect to Link Push-Button or green wire of battery monitor when DBM has switched to Stand-By mode (DBM Status LED is flashing green).

Configuration (manually)

The System automatically starts up when the black (GND) and the red (+Main) wires are connected and first shows its software version and then the Configuration Mode starts. When no change is made within 30 seconds after connecting the wires the DBM starts up in default mode (Low Level without Equalize) or in the last saved configuration. When the yellow (**Prog/Link**) wire is briefly contacted to GND, first contact within 30 seconds, the Charge Level steps to next level (Low / Mid / High with or without Equalize). The 6 program steps repeat in a cycle. If contact to GND is not made within 5 seconds, the selected Led flashes while the DBM saves the actual configuration. The DBM Configuration is now finished.

Charge Select Indication

High Level	Charge level High (14.8V)
Mid Level	Charge level Mid (14.4V)
Low Level	Charge level Low (14.0V)
Equalize	Equalize mode: Low/Mid/High +0.6V (only temporary)



Notice

Before configuring the Charge Level determine whether Equalize Mode is necessary for the Aux-Battery and whether any appliances are connect to the Aux Battery, which could shut down due to high Charge Voltage.

Selection of charge level

The default setting is Low at 14.0V without Equalize. Before choosing the chargelevel please consider the specifications supplied by the battery manufacturer. The Equalize Mode (if activated) reformates the battery the earliest every 30 days, this counteract the sulphation and enhances the efficiency of the battery. The following table may be used to assist with selecting the correct Charge Level:

High	SpiralCell / AGM / Pb flooded / Calcium / Lead Crystal
Mid	AGM / LiFePO4 / Lead Crystal
Low	GEL / LiFePO4

Instructions and specifications provided by the battery manufacturer must be considered!

After configuration

The System automatically checks for an installed relay (12V Version only) and indicates if a relay was found/ could not be found yet (restarts relay check automatically later) or no relay found.

When changing the Aux battery or to choose another Charge Level disconnect the red (+Main) wire and the blue (+Aux) (and if used the lightblue IGN) wire from batteries and restart the configuration as in description above with the **Link/Prog** wire (with installed Link-Button these contacts can be made by pushing the Button or with installed TJM-DBS by pushing the link Button on the monitor [with TJM-DBS make sure to push auto Button when the DBM changed to Stand-by mode]).

Relay Check List

- Directly after saving the selected charge level the system automatically starts to check if a relay is installed. This only happens with 12V/12V systems. The relay check will not be executed if DBM is used in a 24V/12V system and it directly changes to standby mode.
1. Therefore the relay will be turned on for a short time (you should hear the relay „clack“). The relay LED is turned on.
 2. After 2 seconds the relay and the relay LED will be turned off again.
 3. Afterwards it will be indicated by the two main and aux battery LED's if a relay was found or not. If both LED's are green the system found a relay. In case they are in orange the system didn't yet find a relay. In this case it will restart a relay check as soon as the engine is turned on. The LED's are red when there was no relay found.
 4. Change to standby mode.

Is only shown for 1 second!

Main Battery LED	Aux Battery LED	Status
red	red	No relay found
orange	orange	It will check again later
green	green	Relay found

Mounting

Mount the DBM with its **wires facing downwards** close to the Aux Battery on metal auto-body panel to provide the best cooling. Do not mount close to hot engine parts such as exhaust or turbo charger. Mount the DBM beside the radiator behind the grill if possible. The DBM will typically warm to around 40°C depending on application.

If the DBM experiences extreme heat due to inappropriate mounting position, the system will do a safety shut-down.



Wiring extension

If extension of the power wires red/black/blue is needed use 4mm² wires for up to 1 additional meter, for up to 3 additional meters use 6mm² and if needed longer use 10mm² (copper cross section – not external insulation size) wires. Use 10mm² wires to extend wires if DBM is mounted in a Trailer.

Installation

In this section all the installation steps are explained. Follow these steps for a correct installation.

Attention

Before installation

- Be aware of which application you are going to install. Only follow the steps for the specific application!

The choices are		
System	Description	Page
12V / 12V System	DBM only - Without options	9
12V / 12V System	With Jump Start Kit	10
12V / 12V System	With TJM-DBS and Relay	12
12V / 12V System	Trailer / Box	14
24V / 12V System	With optional IBS-DBD	15
24V / 12V System	Trailer / Box	16
24V / 12V System	Parallel operation	17

- First read all the installation steps and the programming steps in chapter **Programming the system** on page 6.
- Read aswell the notes for the **Mounting** and the **Wiring extension** on this page.

During installation

- The red wire is always connected to main battery and the blue wire always to aux battery! If the blue wire is connected to main battery this will lead to malfunction in a 12V/12V system and in a 24V/12V system it can even destroy the device! Reverse battery will destroy the device!
- Fuses have to be installed!

After installation

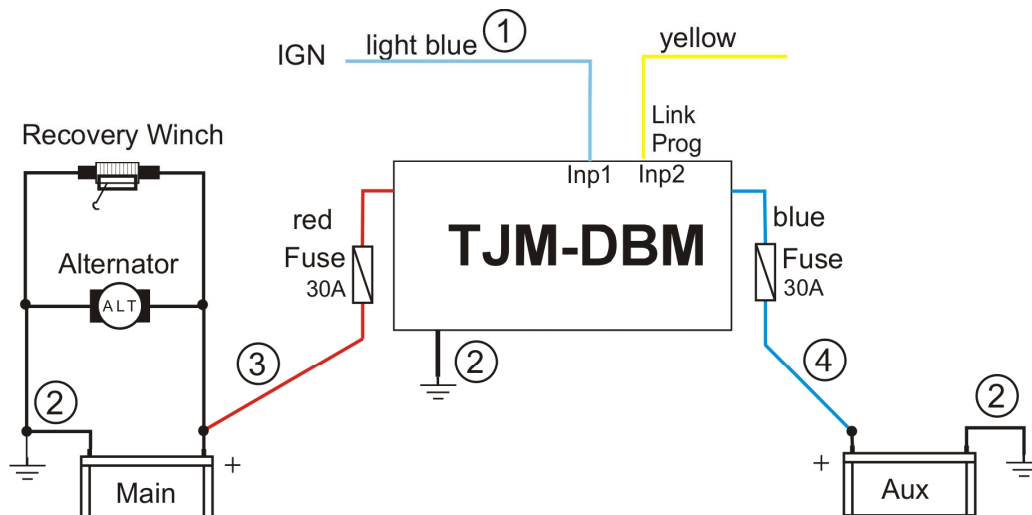
Do the control steps (The documents can be found by scanning the QR code on the installation page or online on our homepage <http://www.ibs-tech.ch/en/document-download/test-procedures-ibs.html>).



DBM only - 12V/12V-System without options

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.

Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection **IGN**:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 11.9V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 12.7V. The DC/DC Charging automatically starts when Main voltage is higher than 13.3V.

1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15), otherwise leave unconnected.
2. Connect all black GND wires.
3. Connect the red wire (+main) (**ATTENTION: system is starting up -> refer to page 6 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
4. Connect the blue wire (+aux) **last**.

Notice

For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!

DBM with JSK - 12V/12V-System with Jump Start Kit

Extra functions with Jump Start Kit TJM-DBMJSK

1 Link Start:

Vehicle can be started from Aux battery by pushing Link-button.

2 Automatic Winch support*:

the DBM recognises Winch usage and switches (engine has to be turned on) to Relay Support Mode for optimal charge sharing on both batteries.

3 Manual Winch support:

30 minutes or 2 hours manual Relay Link can be activated by pushing the Link-Button **once** (for 30 minutes) respectively **twice** (for 2 hours) **within 5 seconds**. A reset of this mode can be done by pushing the **Link-button** for **10 seconds**.

4 Solar Charge:

with installed solar panel on Aux battery the Main battery will be charged as well when Aux voltage is higher than 13.5V.

5 Fast Charge:

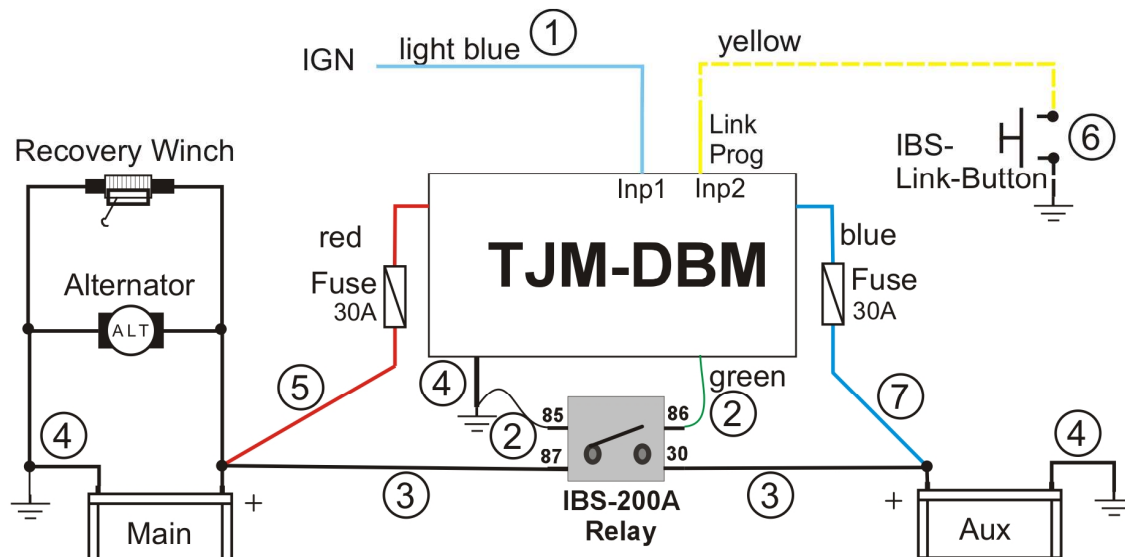
When the car is started the alternator first charges both Main and Aux battery (Fast Charge) and then the DBM switches to DC/DC Charge to get a 100% full Charge as configured.

6 RBM Function:

Relay Booster Module Function for Link Start when a low Main battery is detected.

*Only available when IGN signal is open (light blue wire not connected)!

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection **IGN**:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 11.9V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 12.7V. The DC/DC Charging automatically starts when Main voltage is higher than 13.3V.

1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15), otherwise leave unconnected.
2. Connect the relay with the green wire (terminal 86) and a GND wire (terminal 85).
3. Connect the power wires (minimal 25mm²) between **plus main and relay** and **plus aux and relay**.
4. Connect all black GND wires.
5. Connect now the red wire (+main) (**ATTENTION: system is starting up -> refer to page 6 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
6. With a TJM-DBMJSK connect the Link Push-Button to the yellow wire and make the GND connection as shown above.
7. Connect the blue wire (+aux) **last**.

If relay wasn't found due to missing aux connection while programming, follow the steps in **Relay not found – what now?**.

Notice

For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!

DBM with DBS - 12V/12V-System with TJM-DBS and Relay

Extra functions and applications with TJM-DBS

It is necessary to have a micro controlled version of the TJM-DBS to access all the extra functions. There has to be the light blue **µC**-sign on the cover of the TJM-DBS. Extra functions for analogue DBS systems are described on this page ('DBS analogue versions').

DBS software version 8.1

This version is fully DBM compatible.

1 Link Start:

Vehicle can be started from Aux battery by pushing Link-Button from TJM-DBS.

2 Automatic Winch Support*:

The DBM recognises Winch usage and switches (engine has to be turned on) to Relay Support Mode for optimal charge sharing on both batteries.

3 Manual Winch Support/Link:

Activation of 30 minutes manual Link by pushing Link-Button (on DBS) **once**.

By pushing Link Button **twice** within 3 seconds the 2 hours manual Link can be activated.

Manual reset by pushing Auto button on DBS.

4 Solar Charge:

With installed solar panel on Aux battery the Main battery will be charged as well when Aux voltage is higher than 13.5V.

5 Fast Charge:

When the car is started the alternator first charges both Main and Aux battery (Fast Charge) and then the DBM switches to DC/DC Charge to get a 100% full Charge as configured.

6 RBM function:

Relay Booster Module Function for Link Start when a low Main battery is detected.

*Only available when IGN signal is open (light blue wire not connected)!

DBS software version 2.2 to 8.0

These versions are partly DBM compatible.

Extra functions **1 Link start**, **2 automatic Winch support**, **4 solar charge**, **5 FastCharge**, aswell as **6 RBM function** work as described in 'DBS software version 2.2 to 8.0'.

3 manual Winch support/Link:

Engine has to be **turned off**:

30 minutes Link can be activated by pushing **Link-Button of DBS for 6**

seconds until the DBS **beeps**. Or for activating the 2 hour Link go through

following steps within 3 seconds: push **Link** -> push **Auto** -> push **Link for 6**

seconds until it **beeps** (on DBS).

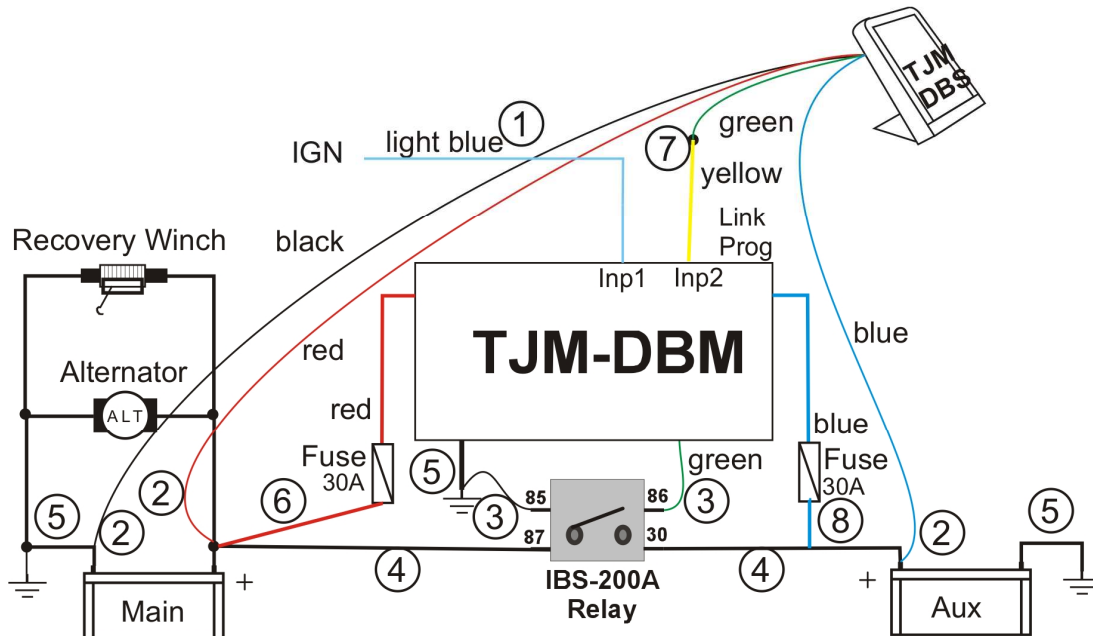
Now **start** the engine.

For resetting respectively to get back to normal functionality of the DBM it is necessary to push **Auto** button for another **6 seconds** until it **beeps**.

DBS analogue versions

The analogue version are not compatible with the DBM.

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection IGN:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 11.9V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 12.7V. The DC/DC Charging automatically starts when Main voltage is higher than 13.3V.

1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15), otherwise leave unconnected.
2. Connect TJM-DBS as shown above (red on plus main, blue on plus aux, black on GND).
3. Connect the relay with the green wire (terminal 86) and a GND wire (terminal 85).
4. Connect the power wires (minimal 25mm²) between **plus main and relay** and **plus aux and relay**.
5. Connect all black GND wires.
6. Connect now the red wire (+main) (**ATTENTION: system is starting up -> refer to page 6 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
7. Connect the green wire of DBS to the yellow Link/Prog wire of the DBM.
8. Connect the blue wire (+aux) **last**.

If relay wasn't found due to missing aux connection while programming follow the steps in **Relay not found – what now?**.

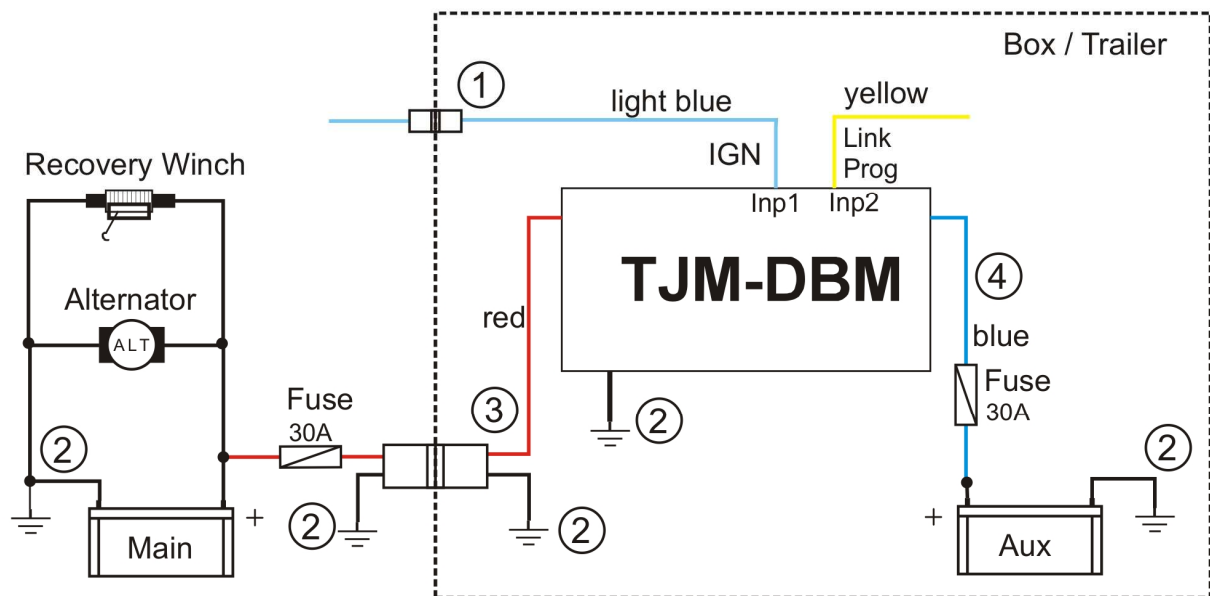
Notice

For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!

12V/12V-System in Trailer/Box

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.

Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection **IGN**:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 11.9V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 12.7V. The DC/DC Charging automatically starts when Main voltage is higher than 13.3V.

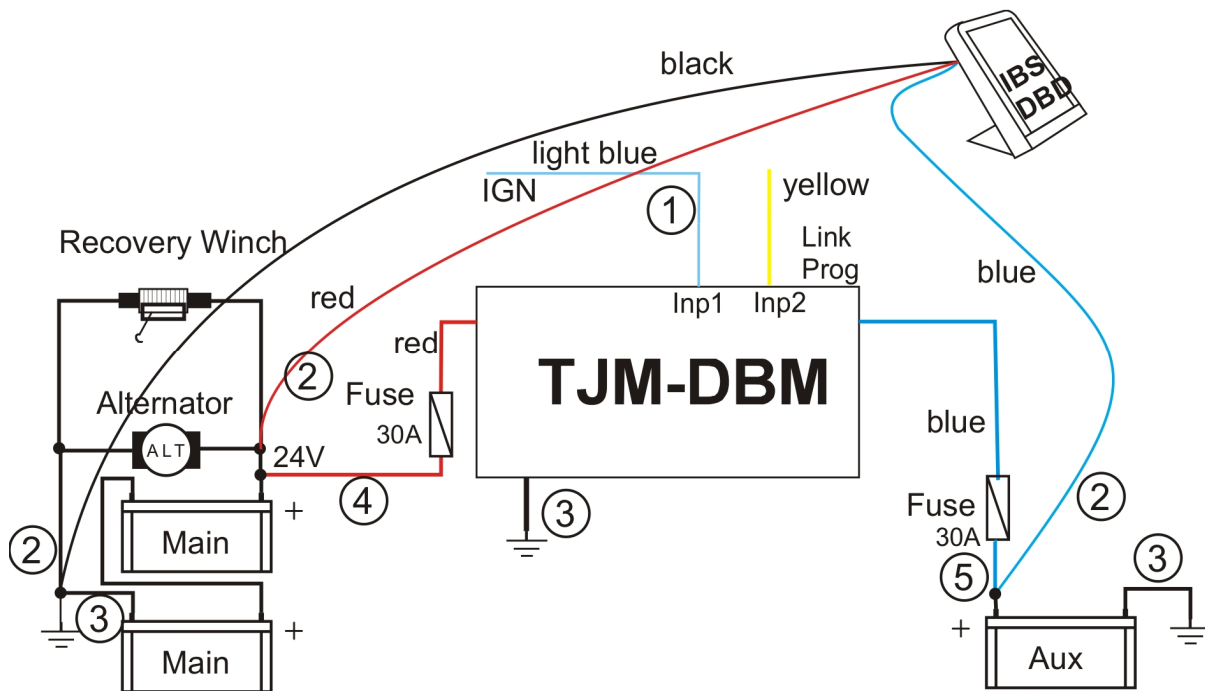
1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15) with a plug, otherwise leave unconnected.
2. Connect all black GND wires.
3. Connect now the red wire (+main) aswell with a plug (Brad Harrison) (**ATTENTION: system is starting up -> refer to page 6 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
4. Connect the blue wire (+aux) **last**.

Notice

For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!

24V/12V-System (with optional IBS-DBD Display)

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection **IGN**:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 23.8V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 25.3V. The DC/DC Charging automatically starts when Main voltage is higher than 26.2V.

1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15), otherwise leave unconnected.
2. Connect IBS-DBD as shown above (red on plus main, blue on plus aux and black on GND).
3. Connect all black GND wires.
4. Connect now the red wire (+main) (**ATTENTION**: system is starting up -> refer to page 6 **Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
5. Connect the blue wire (+aux) **last**.

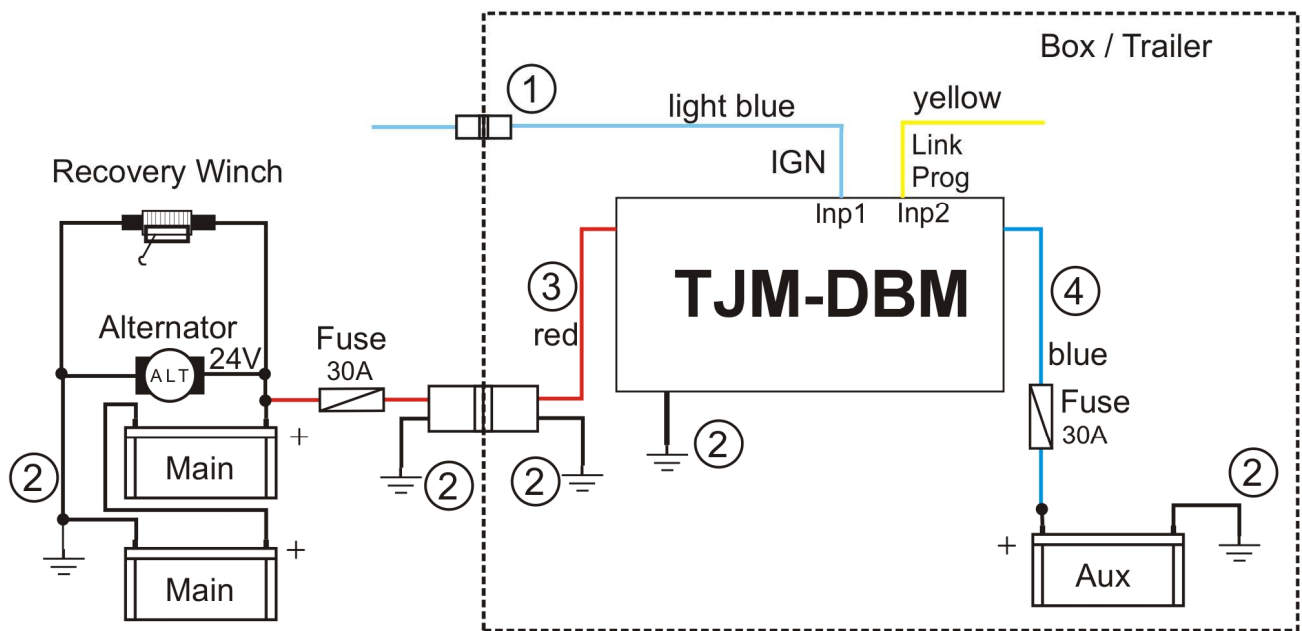
Notice

- For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!
- Red (+main) wire always on main battery with 24V!

24V/12V-System in Trailer/Box

For a better understanding of how the system is programmed first read the Programming the system steps on page 6. Otherwise the system may need to be reinstalled.

Read the notes for the mounting and wiring extension on page 8 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection IGN:

- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM keeps charging until the Main voltage drops below 23.8V or the alternator kicks in again.
- With all other alternators do not connect the light blue (IGN), DBM stops charging when the Main voltage drops below 25.3V. The DC/DC Charging automatically starts when Main voltage is higher than 26.2V.

1. **If needed** connect the light blue IGN wire on Car Ignition (Terminal 15) with a plug, otherwise leave unconnected.
2. Connect all black GND wires.
3. Connect now the red wire (+main) as well with a plug (Brad Harrison) (**ATTENTION: system is starting up -> refer to page 6 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
4. Connect the blue wire (+aux) **last**.

Notice

- For a safe installation it is necessary to install the fuses in the red wire path (+ main: 30A) and in the blue wire path (+ aux: 30A)!
- Red (+main) wire always on main battery with 24V!

24V / 12V parallel operation of DBM

To achieve a higher charge current in a 24V/12V system it is possible to operate up to three DBM in parallel. This allows a charge current up to 60A.

ATTENTION: Parallel operation of DBM is **only** possible in **24V/12V** systems!

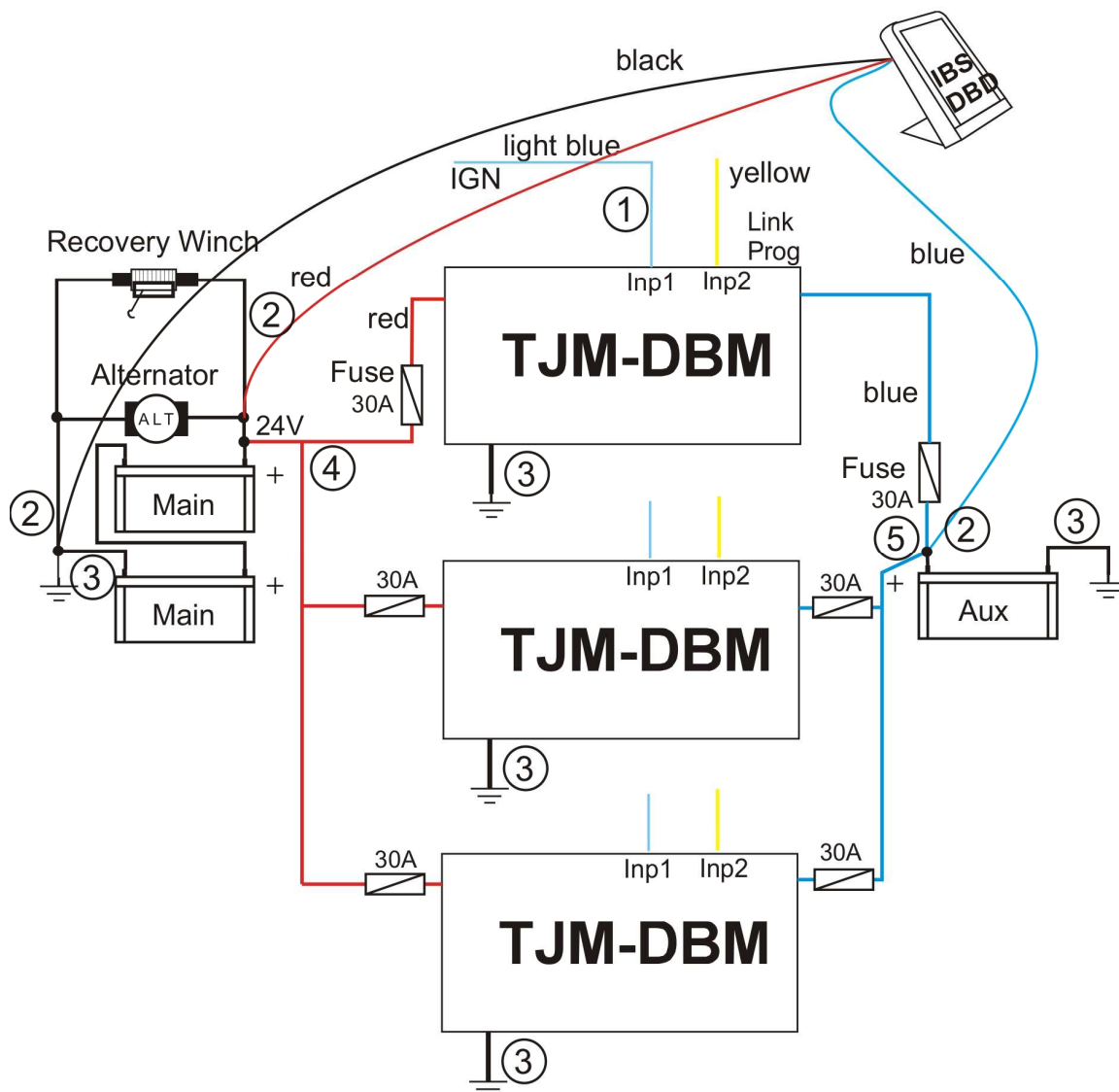
Never install more than three DBM for parallel operation!*

A fuse has to be installed in all separate paths!

IGN: either all the light blue wires are let open or are connected together on terminal 15!

Link/Prog: the yellow Link/Prog wires can be let open or can be connected together.

TAKE CARE THAT ALL DBM IN PARALLEL OPERATION HAVE THE SAME CONFIGURATION! (Charge Level setting!)



Check **24V/12V-System (with optional IBS-DBD Display)** on page 14 for installation instruction.

- TJM tested up to three Devices in parallel operation

Relay not found – what now?

Some conditions are necessary for an automatic relay recognition. If relay wasn't found follow these steps:

Check

- Check if
 1. Relay power wires are correctly installed.
 2. Green relay wire of DBM is connected to relay (terminal 86).
 3. Relay (terminal 85) is connected to GND.

What are the conditions?

- Needed for a proper recognition:
 1. There has to be at least a $\pm 0.5V$ voltage level difference between the main battery and the aux battery.

Start relay check

- If all elements in **Check** and **What are the conditions?** are granted:
 1. Push **Link Push-Button** (DBMJSK) or **Link Button** (TJM-DBS).
 2. Relay check is started.
 3. After about 2 seconds there will be the indication if relay was found now (shown for 2 seconds through **Main Battery** and **Aux Battery** LED, check chapter **Relay LED**).
- If elements in **Check** are granted but in **What are the conditions?** aren't:
 1. Start engine.
 2. Wait at least 5 seconds after engine started (alternator charge start) before to check the Relay LED.
 - Relay LED is on → Relay was found.
 - Relay LED is off:
 1. Push **Link Push-Button** (DBMJSK) or **Link Button** (TJM-DBS).
 2. Relay check is started.
 3. After about 2 seconds there will be the indication if relay was found now (shown for 2 seconds through **Main Battery** and **Aux Battery** LED, check chapter **Relay LED**).

Test of function

For testing the function and operation of the DBM it is always necessary to have both a starter and an auxiliary battery connected to the DBM. A power supply may be used to mimic the alternator.

Display overview

DBM Status LED

Pattern



Meaning

Operating (DC/DC or relay)
StandBy

Charge Select LED's

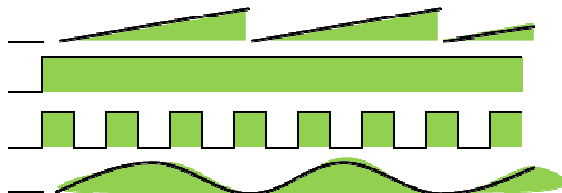
High Level	Charge level High (14.8V)
Mid Level	Charge level Mid (14.4V)
Low Level	Charge level Low (14.0V)
Equalize	Equalize Mode: Low/Mid/High +0.6V for limited time

Main Battery / Aux Battery LED's

Display of main/ aux battery	Status
green	Battery > 13,3V
orange	Battery condition is normal
red	Battery < 11.8V
red flashing	Batterie missing

Charge Status LED

Pattern



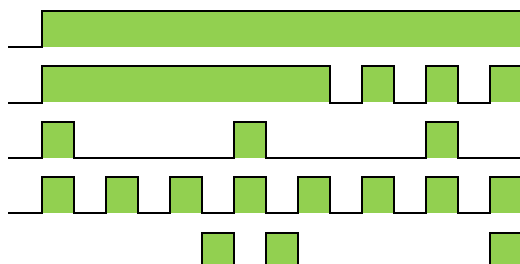
Meaning

Bulk
Absorption
Equalize
Float*

*With fully charged batteries the float charge can be active even when engine is turned off!

Relay LED

Pattern














































Meaning

30 minutes manual link
2 hours manual link
Automatic link (Main -> Aux)
Automatic link (Aux -> Main)
Signal follow mode

Error description

Error list

The **DBM Status** LED flashes red to indicate an error status.

Error	Number of blinking	Description
	<div> <div>StdBy</div> <div>Active</div> <div>  green flashing  green on </div> </div>	DC/DC converter charges / Stand-by
1	    ...	Over temperature >100°C / Main- or Aux battery low
2	     ...	Link error (Relay error) Error occurs the latest after 5 minutes when relay is defective or removed. The DBM operates now as if there was no relay. Check connections to relay. Check the relay. When new relay is installed start the engine and press the link push-button (JSK) respectively the link button (DBS) to start a relay check.
3	      ...	Overvoltage Main: >16V / >30V Aux: >16V
4	       ...	No charge current Charge current too low. Can occur when battery is absolutely fully charged
5	Flashing Main or Aux Battery  / 	Missing battery (Main or Aux battery)
6	  ...	Start up error
7	    ...	Over current
8	     ...	Internal error
9	      ...	Charge error

What to do / Resetting

Errors 1-5 are reset automatically when conditions are normal again.

Errors 6-9 (indicated without the green LED flashing) are reset automatically after 30 seconds.

24V/12V: Over voltage alert error 3, blue (+Aux) wire was first connected -> connect first the red (+Main) wire.

Alarm in combination with TJM-DBS (up to Software 8.0)

The combination of the DBM with a TJM-DBS and IBS-Relay can lead to an over voltage alarm*.

Because of higher charge voltage of the DBM compared to alternator charge voltage it is also possible to have a Link failure alarm* with TJM-DBS due to the difference between the Main and the Aux battery voltages of more than 0,5V.

* These alarm is indicated on TJM-DBS.

Specifications

Technical Specifications:

Input Voltage		6V-32V	
Automatic InCar Charge start Main to Aux		13.2V / 26.2V	
Automatic link level Main to Aux (only 12V!)		13.2V (with relay installed)	
Automatic link level Aux to Main (only 12V!)		13.5V (with relay installed)	
Charge Voltage	Charge Select	Absorption Voltage	Equalize Voltage
	Low	14.0V	14.6V
	Mid	14.4V	15.0V
	High	14.8V	15.4V
Relay link time (Automatic Mode)		10 min to 40 min (Depending on Aux)	
Relay manual link times		30 min / 2 h	
Absorption time		Min. 15 min / Max. 2 h	
Equalize time		Min. 10 min / Max 30 min	
Float Voltage		13.7 V (I _L < 3A)	
Charge current nom/max 12V/12V		20/23A	
Charge current nom/max 24V/12V		16A/18A	
Waterproofing		Silicon	
PCB Quality		IPC3 RoHS (military standard)	
Efficiency		Typically 95 %	
Standby Current		< 10 mA	
Dimensions		140 x 82 x 46 mm	
Weight DBM		0.6 kg	
Weight packed		1.0 kg	
Operable Temperature Range		-25°C - + 85°C	
Warranty		3 years	
Power wiring width (rd,bk,bl)		4mm ²	
EMC		CISPER 25 (Automotiv)	

Accessories

TJM-DBMJSK	Jump Start Kit (Link Push-Button und Relay)
IBS-DBD	IBS Display for 24V -> 12V Application
TJM-DBS	TJM Dual Battery System for extended function

TJM-DBS



IBS-DBD



TJM-DBMJSK



Personal Data

My Car: _____

Aux battery type: _____

My configuration: _____

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Included

- TJM-DBM System
- TJM-DBM Manual
- TJM-DBM Terminal kit (2 pieces of fuse holders and 30A fuses included)

TJM-DBM Manual date 19.02.2018

Manual version 2.2.2

Software version 2.6.0

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